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- Create a kanban rule for multiple activities
- Create a new kanban rule by duplicating an existing kanban rule
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- Create a sales event kanban rule
- Create a withdrawal kanban rule
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Supply Chain Management development

Gantt control development guide

Create a new transportation management engine

Extend inventory on-hand data entities

Finance and Operations apps development and administration

Dynamics 365 Finance

Dynamics 365 Commerce

Supply Chain Management home page

2/18/2021 • 2 minutes to read • [Edit Online](#)

This topic provides a list of the help topics and other resources in Dynamics 365 Supply Chain Management.

What's new and in development

Go to the [Dynamics 365 Roadmap](#) to see what new features are released and what new features are in development.

Core concepts and tasks

Select a feature area to learn more about it.

- [Asset management](#)
- [Cost accounting](#)
- [Cost management](#)
- [Inventory management](#)
- [IoT Intelligence](#)
- [Master planning](#)
- [Procurement and sourcing](#)
- [Product information management](#)
- [Production control](#)
- [Sales and marketing](#)
- [Service management](#)
- [Transportation management](#)
- [Warehouse management](#)

Dynamics 365 Finance

For information on Dynamics 365 Finance, go to the [Finance home page](#).

Videos

This short video summarize the new supply chain management features added to Microsoft Dynamics 365 for Finance and Operations version 8.0 (April 2018).

- [Synchronize a work order between Field Service and Finance and Operations](#)

These short videos summarize the new supply chain management features added to Microsoft Dynamics 365 for Finance and Operations, Enterprise edition 7.3 (December 2017).

- [Prospect to cash integration](#)
- [Optimization advisor](#)
- [Use warehouse template to copy configuration](#)

These short videos summarize the new supply chain management features added to Microsoft Dynamics 365 for Finance and Operations, Enterprise edition (July 2017).

- [Get started with Cost accounting](#)

- [Cost control mobile workspace](#)
- [Use Excel for cost analysis](#)
- [Approve purchase orders on a mobile device](#)
- [Visual scheduling with Gantt chart for production and batch orders](#)

The following tech conference recordings discuss supply chain management functionality from previous versions of Finance and Operations. This functionality is now part of Dynamics 365 Supply Chain Management; the same concepts still apply, and the procedures are similar in the current version.

- **Cost management:**
 - [Overview of Cost management](#)
- **Master planning:**
 - [Extend the demand forecasting functionality](#)
 - [Master planning - tips and tricks for troubleshooting performance](#)
 - [Help! MRP is slow!](#)
- **Product information management:**
 - [Product configurator in Microsoft Dynamics AX](#)
- **Warehouse management:**
 - [Get the best out of your warehouse management system](#)
 - [Dynamics AX 2012 R3: Advanced warehouse management - A day in the life of process manufacturing](#)
- **Production control videos:**
 - [Subcontracting operations and activities in manufacturing](#)
- **Transportation management videos:**
 - [Transportation management \(TMS\) in the new Microsoft Dynamics AX](#)

Blogs

There are many topics about manufacturing and supply chain management on the [Dynamics AX Manufacturing R&D Team Blog](#) and [Supply Chain Management in Dynamics AX R&D Team Blog](#). Most of these were written for the previous version, but the same concepts still apply, and the procedures are similar in the current version.

White papers

- [Lean manufacturing: Capable to promise and kanban job scheduling](#)
- [BOM calculation by using a costing sheet](#)

eLearning courses

For online courses and training, check out [Dynamics 365 Supply Chain Management on Microsoft Learn](#).

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Before you buy

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New to Dynamics 365 Finance, Dynamics 365 Supply Chain Management, or Dynamics 365 Commerce? We've put together step-by-step guidance whether you're still evaluating or ready to make a purchase.

Step one: Try out Finance and Operations free for 30 days

You can try Dynamics 365 for Finance, Dynamics 365 Supply Chain Management, or Dynamics 365 Commerce for 30 days through a simple email signup. The trial version of Finance and Operations applications includes Getting started task guides that provide step-by-step instructions that allow you to view specific scenarios in action. The product is available to explore and exercise scenarios, but cannot be customized. Demo data is included to ease the use of the product and to make the experience more meaningful. A reminder email will be sent 3 days prior to the trial expiration. Get details at [Sign up for preview subscriptions](#).

Step two: Choose a deployment option

You can now deploy Finance and Operations applications in the cloud or on-premises. Cloud deployments offer an ERP service that is fully managed by Microsoft, while on-premises deployments are deployed locally within a customer's data center.

The following considerations must be taken when you choose on-premises as a deployment option:

- Regulatory and compliance needs that are not available in the cloud certifications.
- Disconnected business process with intermittent internet connectivity required to access Microsoft Dynamics Lifecycle Services (LCS) for application lifecycle management.
- [Comparison of cloud and on-premises features](#).
- [System requirements for on-premises deployments](#).

IMPORTANT

On-premises deployments are not supported on any public cloud infrastructure, including Microsoft Azure.

For more information, see [Deployment options](#).

Step three: Buy and manage a subscription

To explore subscription options, go to the [Dynamics 365 pricing](#) page. This page includes several different plans to fit your organization's needs.

There are many ways to buy a subscription:

- Buy through a Cloud solution provider (cloud only).
- Buy through a partner, and use volume licensing (cloud or on-premises).
- Buy through a partner from the Dynamics price list (on-premises only).

Buy through a Cloud solution provider (cloud-only)

A Microsoft Cloud Solution Provider can work closely with you to understand the needs of your business or organization. Use the [Microsoft Partner Center portal](#) to find a partner to fit your needs.

Buy through a Dynamics partner (on-premises)

You must work with a partner to purchase Finance and Operations on-premises. For more information, see [Buy Finance + Operations \(on-premises\)](#).

Buy through volume licensing (cloud or on-premises)

If your organization has 250 or more Dynamics 365 users, you may be interested in a [Volume licensing agreement](#).

In volume licensing, Finance and Operations applications are available through:

- Enterprise Agreement
- Enterprise Agreement Subscription
- Enrollment for Education Solutions (under the Campus and School Agreement)
- Microsoft Products and Services Agreement (MPSA)

Choose your support option

Microsoft provides flexible, industry-leading support, services, and resources that enable users to quickly address technical issues and maximize return on your Dynamics 365 investment. Choose a plan that best meets your business requirements.

For additional resources, see:

- [Dynamics 365 Support](#)
- [Quick Start Guide for Microsoft Dynamics Cloud Service Support Benefits](#) (PDF)

Step four: Learn about FastTrack and plan your deployment

Microsoft FastTrack for Dynamics 365 is our customer success service designed to help you move to Dynamics 365 smoothly and confidently, so you can realize business value faster. When you participate in the FastTrack program, you will receive guidance on best practices and how to plan for successful rollouts. You will also learn ways to enable new users and expand capabilities – all at your own pace. Additionally, you will have access to Microsoft engineering resources committed to make your experience with Dynamics 365 a success. For more information, see [Microsoft FastTrack](#).

If you are upgrading from Dynamics AX 2012 or migrating from AX 2009

If you are a customer who is upgrading from Microsoft Dynamics AX 2012 or migrating from Microsoft Dynamics AX 2009, you may be eligible for a longer trial. Contact daxcf@microsoft.com for more information.

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Sign up for preview subscriptions

2/18/2021 • 7 minutes to read • [Edit Online](#)

This topic explains how to subscribe to the preview/partner offer and deploy an environment. The subscription that you create gives you a Microsoft Online Services test tenant and a Microsoft Dynamics Lifecycle Services (LCS) project where you can deploy an environment. This topic will also help you set up additional users in your Microsoft Online Services tenant and gain experience with service administration capabilities. Here are the skills that you will learn:

- Subscribe, and create a new Microsoft Online test tenant.
- Navigate to LCS projects.
- Use various features of LCS.
- Add users to Microsoft Azure Active Directory (Azure AD) and the client.
- View resources in your subscription email.

Key terms

- **Microsoft Online Services tenant** – A tenant is the group of all subscriptions and users for your organization. The tenant is created at the same time as your first subscription in Microsoft Online Services.
- **Subscription** – A subscription gives you an online cloud environment and experience. It also lets you see how customizations that you develop can be deployed to the cloud.
- **Microsoft Azure Active Directory** – The cloud environment includes Azure AD. Azure AD helps you manage users, groups, security roles, and licenses for online applications, much as you manage them for on-premise environments.
- **Users** – Users of the services that your organization has subscribed to are managed in Azure AD. Any users in your tenant can be added and assigned to security roles.
- **Developers and administrators** – Developers and administrators are users who also have access to LCS that lets them manage projects and environments. These users are also end users.
- **Organizational account** – Users receive Azure AD credentials. These credentials are separate from other desktop or corporate credentials. The Azure AD credentials are used to sign in to Microsoft 365 and other Microsoft cloud services. Users sign in by using their organizational account.

IMPORTANT

For this release, we ask that you not use any existing credentials that are associated with other online services, such as Microsoft 365 or Microsoft Dynamics CRM Online.

- **Microsoft account** – Microsoft accounts were formerly known as Passport accounts or Windows Live ID accounts. Currently, Microsoft accounts can't be used with Finance and Operations applications, Microsoft Dynamics 365 Commerce, or other Microsoft Online Services. However, Microsoft accounts are still required for Microsoft Connect and other Microsoft Business Solutions sites, such as CustomerSource, PartnerSource, Information Source, and Microsoft Dynamics Community. You will continue to use your Microsoft account to access these services.
- **Microsoft 365 admin center** – Microsoft 365 admin center is the subscription management portal

that Microsoft 365 provides for administrators. Microsoft 365 admin center is used to provide management functions for users and subscriptions.

- **Environments** – You can deploy as many single instances of a virtual machine (VM) as you require. We call these instances *environments*.

Prerequisites

1. You've received an email that invites you to participate in the preview.
2. If your company has an organizational account with Microsoft Online Services, and you're signed in, you must sign out before you continue. Alternatively, you can use **InPrivate Browsing** mode.
3. If you aren't sure whether you're signed in, delete your browser cookies, and then close your browser before you continue.

Subscribe

IMPORTANT

Only one person (tenant administrator) in an organization must perform this task. If you aren't the person who is subscribing to this release, wait until your organization has been signed up and you've received your user credentials. Then continue with the procedure.

1. Finance and Operations applications and Retail are available only to existing Microsoft Dynamics 365 channel partners and customers who are currently enrolled in the Business Ready Enhancement Plan (BREP) service plan. To subscribe, visit [PartnerSource Business Center](#).
2. On the **Account setup** page, in the **Country or region** field, select the country or region.
3. Follow the wizard and prompts to complete the sign-up, until you reach the last step.

You're ready to go... →

Start a new project in LCS

To use LCS to manage your environments, you must create a new project.

1. Go to <https://lcs.dynamics.com/Logon/Index>.
2. Select **Sign in**.
3. Sign in by using the account that you used to subscribe.
4. Select the plus sign (+) to create a new project.



Get started

Issue search



Learn

Find out more about Lifecycle Services through our TechNet resources.



Blog

Learn about scheduled maintenance and new feature releases from Lifecycle

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ContosoAX7
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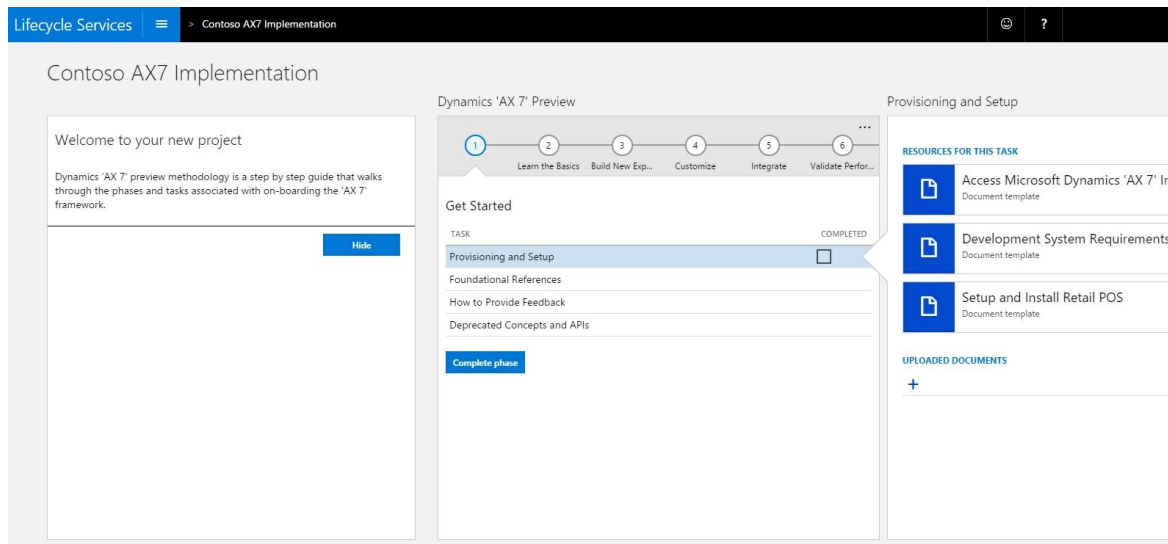
CostAccounting
Microsoft

DataPackageUpdate1
Microsoft

5. Select the project type.
6. Enter the project information, and then select **Create**.

If you plan to evaluate Commerce, be sure to select **Microsoft Dynamics 365 Commerce** in the **Product name** field.

The new project for managing your instance is created.



Add users to LCS

You're already set up as a user of your LCS project. If you've also added other Microsoft 365 users, you must add them to this project. Other administrators and developers will then be able to deploy their own environments. These LCS users are team members who will actively work on the implementation. Don't confuse them with end users. Start on the project page in LCS.

1. Scroll to the right, and then, in the **More tools** section, select the **Project users** tile.
2. In the upper left, select the plus sign (+) to add a new user.
3. In the **Email** field, enter the email address of the user that you're adding. This email address should be the Microsoft 365 organization email address that you created earlier.
4. In the **Project role** field, select **Project Owner**.
5. Select **Invite**.
6. Repeat steps 2 through 5 for all users in your organization.

Deploy environments

Environments should be deployed to an existing Azure subscription.

NOTE

Each developer of an environment must deploy their own system to Azure. However, only the first project user must set up the Azure subscription for deployment.

You can create environments in two ways:

- Deploy to Microsoft cloud services (Azure).
- Download a local virtual hard disk (VHD).

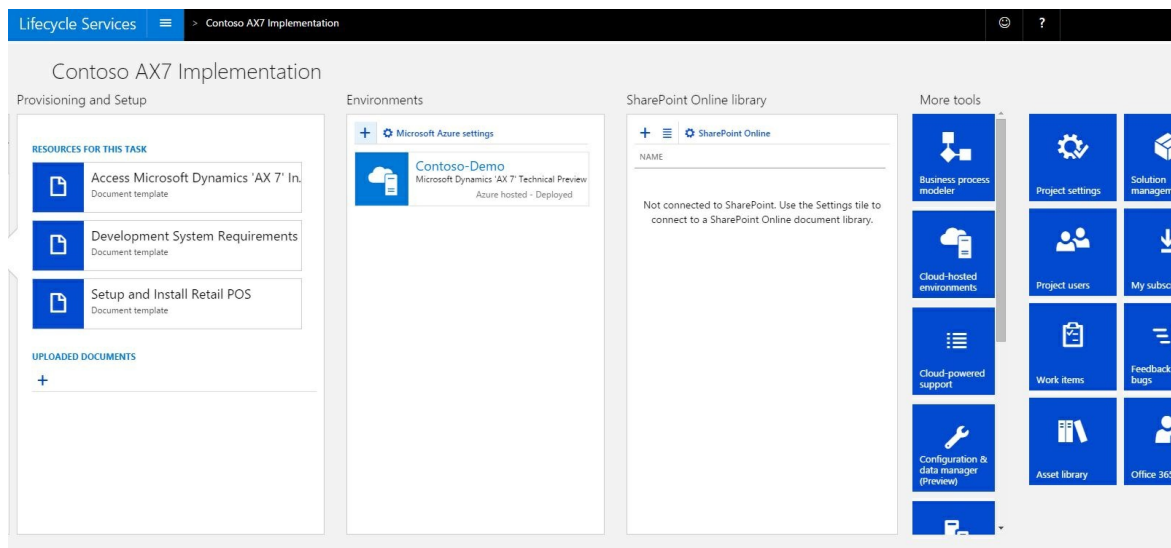
Start on the project page in LCS.

1. In the **Environments** section, select the plus sign (+). The **Microsoft Azure setup** dialog box appears.
2. Enter your Azure subscription ID. You can find your Azure subscription ID in Azure Portal (<https://ms.portal.azure.com/>), under **Settings** in the lower left.
3. Select **Next**.
4. Download the Azure Management Certificate to a local folder on your computer, and then upload it to Azure Management Portal by going to **Settings > Management Certificates**. This certificate will enable LCS to communicate with Azure on your behalf.
5. Return to LCS, and select **Next**.
6. Select the Azure region to deploy in. The **West US** region will have the fastest deployments, but it's important that you select a data center that is close to where you plan to use this system.
7. Select **Connect**.
8. In the list of available topologies, select the topology to deploy. You can select either the **Download** link to download the VHD or **Next** to deploy on Azure. Azure is the preferred path.
9. Enter the name of the environment.
10. Read the pricing and licensing terms, and then select the check box to indicate that you understand them.
11. Select **Next**.
12. Confirm the details, and then select **Deploy**.

NOTE

Developers and administrators who will use their own environments must sign in and repeat these steps.

After you deploy your environment, it's available in the **Environments** section.



13. Select the environment to view details about the deployment status. The first deployment will require a few hours, but each subsequent deployment will be much faster.
14. When the deployment status changes to **Deployed**, select **Login** to connect to the client, or select the name of the VM to connect to the development machine by using Remote Desktop. After the deployment is completed, you can find the base URL and the information that you require to connect to the environment via Remote Desktop.

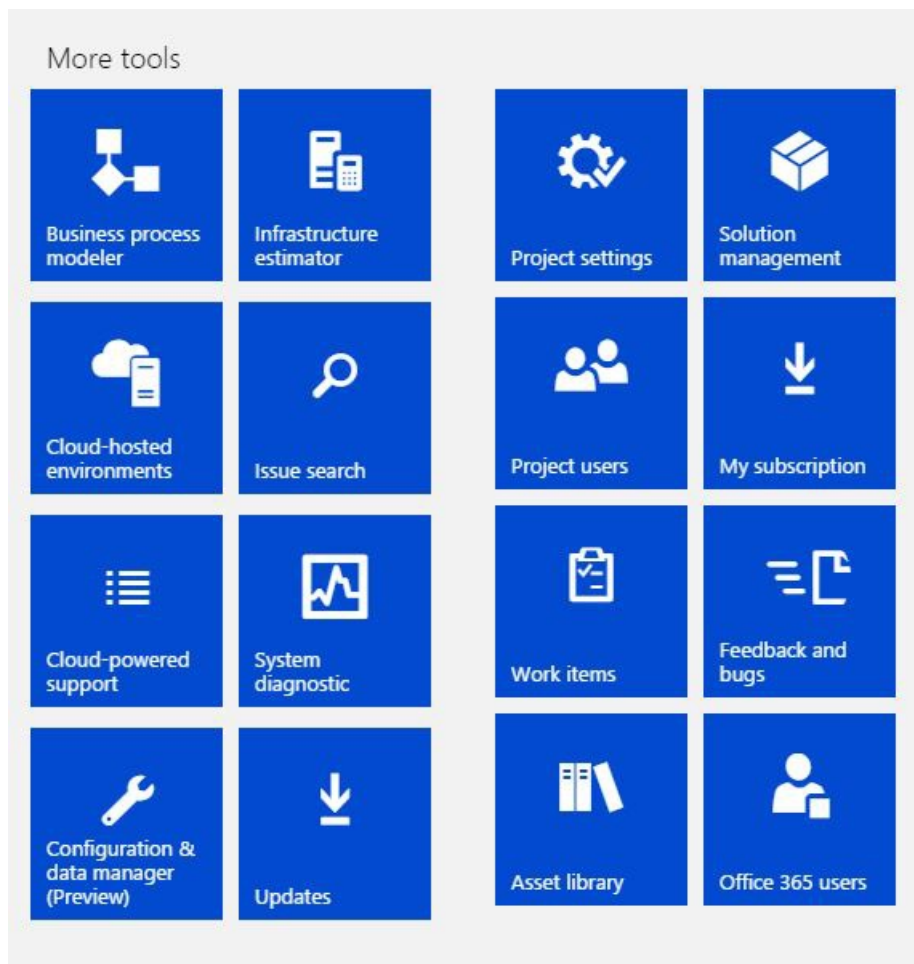
Use the features of LCS

LCS is the starting point for performing online administrative activities. Here are some of these activities:

- Deploy VMs on Azure.
- Access materials.
- Access downloads of tools and resources.

Explore the LCS project

1. Review the methodology, and complete the tasks and phases as you progress through the life cycle. The phases and task information lets you view tools and resources that are available throughout your enterprise resource planning (ERP) experience.
2. Scroll to the right, and review the tiles.



The available tiles include various tools and services in LCS. They also include the following additional tiles:

- **My subscription** – The Microsoft 365 subscription management portal is where you can view and work with your online subscriptions. By selecting **User and Groups** in the left navigation section of the page, you can also manage your online users.

NOTE

To access the page, you must be a member of the **Global Administrator** role for your organization's Microsoft Online Services tenant.

- **Feedback and bugs** – This tile opens the **General Feedback** page in Microsoft Connect. Use this page to record bugs, and to design change requests, feature requests, and suggestions.
- **Microsoft 365 users** – This tile opens the **Users and groups** page in Microsoft 365 admin center. You can add, update, and remove users, reset passwords, and assign licenses for other services.

NOTE

To access the page, you must be a member of the **Global Administrator** role for your organization's Microsoft Online Services tenant. The installing user is always a global administrator, but other users must be added to this role.

Office 365 admin center

Search help, community and admin center feature

active users | deleted users | security groups | delegated admins

dashboard
setup
users and groups
domains
licensing
sharing settings
service settings
service health
reports
support
purchase services
message center
tools

Single sign-on: [Set up](#) | [Learn more](#)
Active Directory® synchronization: [Set up](#) | [Learn more](#)
Change the password expiration policy for your users: [Change now](#)
Set Multi-factor authentication requirements: [Set up](#) | [Learn more](#)

<input type="checkbox"/>	DISPLAY NAME ^	USER NAME	STATUS
<input type="checkbox"/>	Tim Ball	Tim@LucernePublishing813.ccsctp.net	In cloud

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One Version service updates overview

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The following set of topics provide information that is related to service updates for Microsoft Dynamics 365 for Finance and Operations version 8.1 (October 2018) and later. This is applicable for cloud releases only.

- [Service update availability](#) – This topic provides information about the release cadence and release process.
- [Software lifecycle policy and cloud releases](#) – This topic provides information about the service updates, availability, and end of service.
- [One Version service updates FAQ](#) – This topic answers questions about the update process, tools, planning, and Retail service updates.

The experience for service updates consists of four distinct steps:

1. Configure
2. Notice
3. Update
4. Validate

The rest of this topic describes each step and provides links to related topics.

Configure

Customers can select a maintenance window, based on their business constraints. In Microsoft Dynamics Lifecycle Services (LCS), use the fields in the **Production environment update cadence** section on the **Update settings** tab of the **Project settings** page, as shown in the following image. A calendar of upcoming updates is available to help you plan ahead.

The screenshot displays the 'Project settings' page in the Microsoft Dynamics Lifecycle Services (LCS) interface. The breadcrumb trail shows 'Lifecycle Services' and 'App81Servicing-2 (Microsoft Dogfood)'. The left sidebar lists navigation options: 'Project overview', 'Organizations and ownership', 'SharePoint Online library', 'Visual Studio Team Services', 'Azure connectors', and 'Update settings' (which is highlighted).

The main content area is titled 'Project settings' and is divided into two sections:

- SANDBOX UPDATE ENVIRONMENT**: A text block explains that the selected environment will be updated 7 days before the production environment. Below this is a dropdown menu with 'app81servicingsb2 (Selected)' chosen.
- PRODUCTION ENVIRONMENT UPDATE CADENCE**: A text block explains that the sandbox environment configured above will be updated seven calendar days prior to the day you select for Production updates. Below this are four dropdown menus: 'Every month', 'Cadence' (set to 'Second week (Selected)'), 'Time Zone' (set to 'Eastern Time (UTC - 5) (Se...'), 'Day of the week' (set to 'Saturday (Selected)'), and 'Time Slot' (set to '4 AM to 7 AM (Selected)').

Below the cadence settings, there is a summary line: 'Updates to **Production** are scheduled for the **Saturday in Second week** of every month during **4 AM to 7 AM Eastern Time (UTC - 5)**.' A link to 'View the update calendar.' is provided.

There is also a section for pausing updates: 'Temporarily **pause updates** from being applied by Microsoft to the environments within this project for the selected time window. When updates resume, the designated sandbox and production environment will be updated to the **latest service update before it can be paused again**.' Below this is a 'No' checkbox, which is currently unchecked.

A 'Save' button is located at the bottom of the configuration area. A footer note states: 'To learn more on how these settings impact your update experience, visit the [Microsoft initiated service updates](#) topic.'

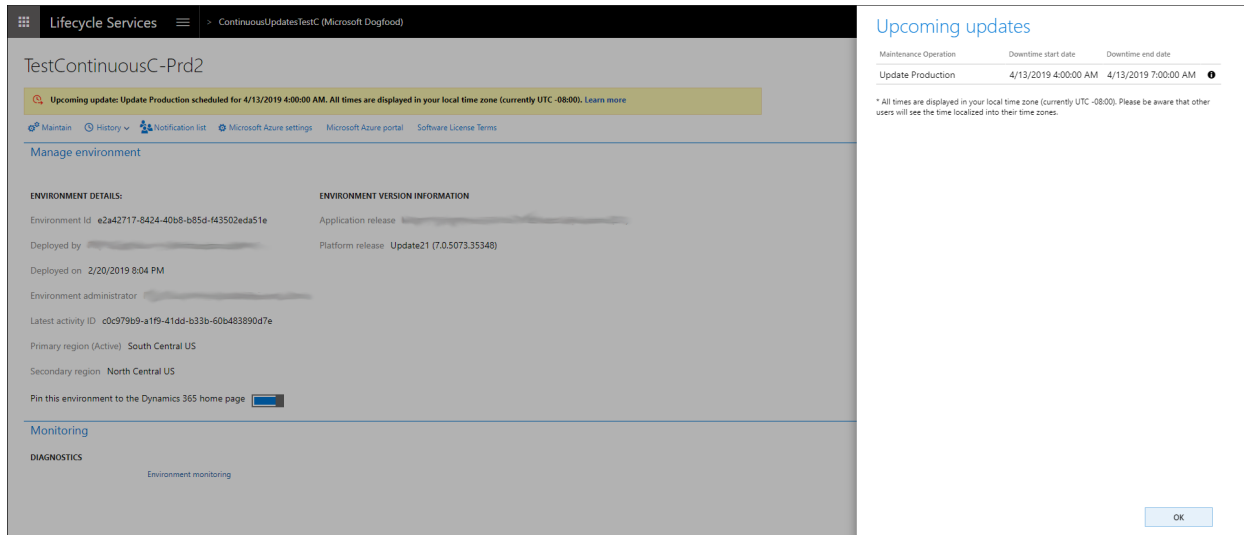
Users must opt in to new features and turn them on. All updates are applied first to the user acceptance testing (UAT) environment and then to the production environment. Therefore, customers have time to do any

validation that is required. Customers can select the environment that is updated. They can also pause an update for up to three months.

Notice

[Release plans](#) will be available to help you plan ahead and understand what is changing. You can learn about upcoming features up to three months in advance. The [What's new](#) topics provide details about the updates for specific months.

Additionally, a notification email will be sent five days in advance, and a notification will appear in LCS just before an update, as shown in the following illustration.

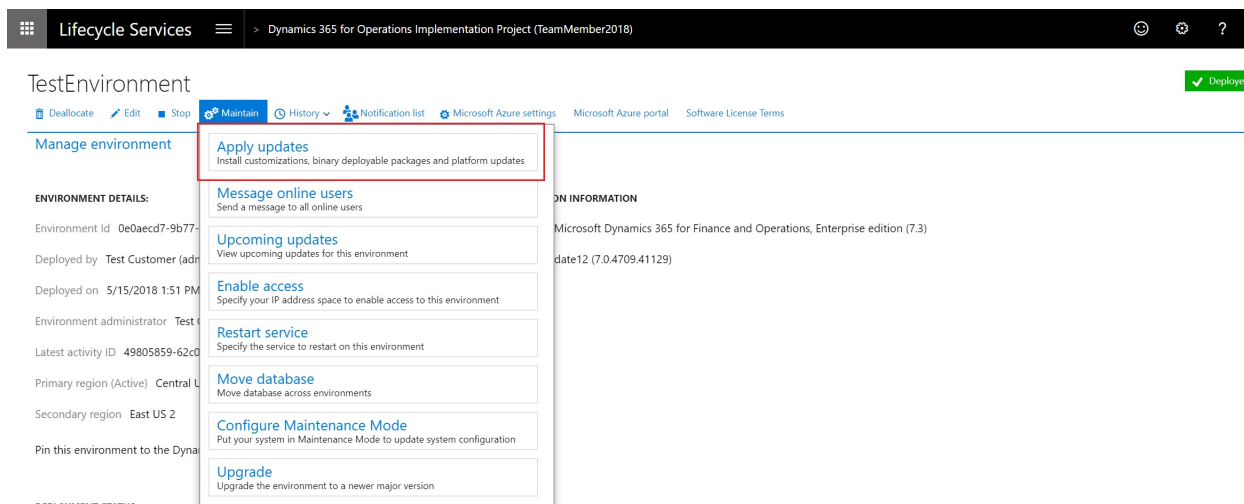


Update

After notifications have been sent, Microsoft will apply the update (**auto update**) during the designated maintenance window. After this operation is completed, a notification email will be sent to indicate the status of the update. Customers will also be able to **self-update** by using the standard update experience in LCS. For more information, see [Apply updates to cloud environments](#).

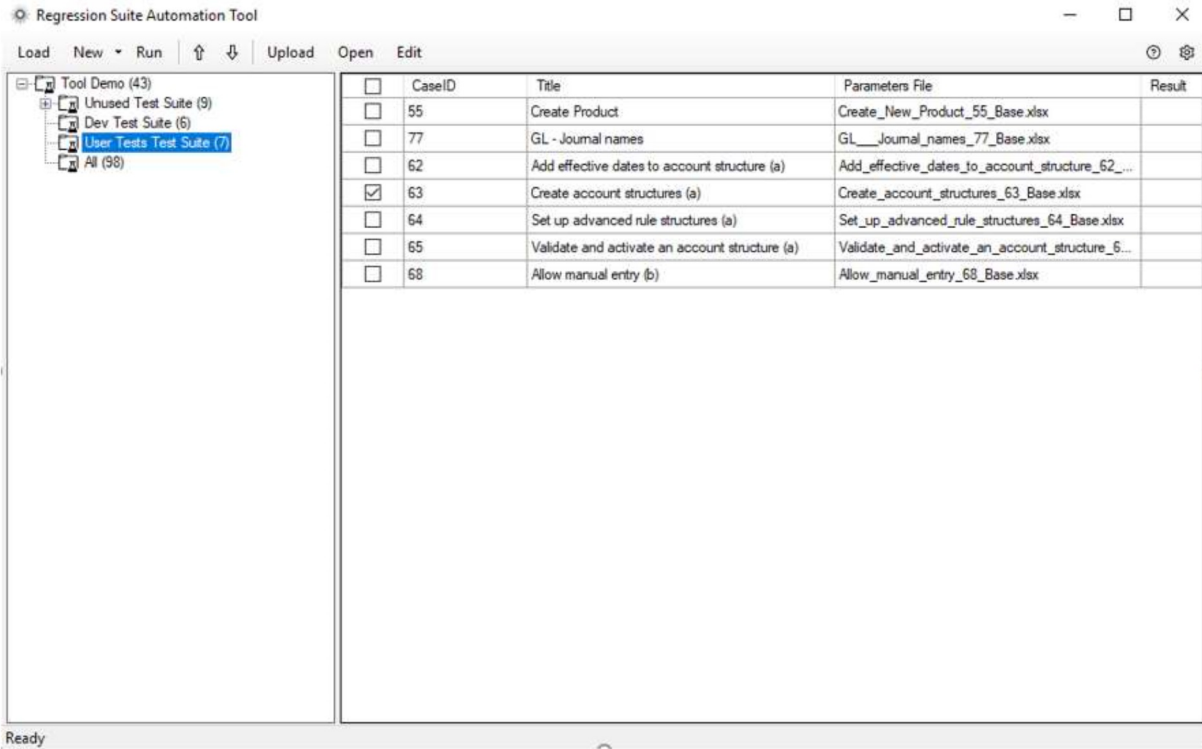
Customers who participate in the First release program will have an opportunity to update their sandbox environment and other environments early. To sign up for the First release program, go to <https://experience.dynamics.com>.

Customers will also be able to **self-update** by using the standard update experience in LCS, as shown in the following illustration.



Validate

After an update is completed in the UAT environment, a basic business process test can be executed to validate the environment. To support this effort, a no-code automation test tool for business process testing is available, as shown in the following illustration. For more information, see [Create and automate user acceptance tests](#).



Some customers have both external data integrations and internal data integrations. We recommend that these customers use the [Data task automation tool](#) for testing.

NOTE

Can you tell us about your documentation language preferences? [Take a short survey](#).

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

One Version service updates FAQ

2/18/2021 • 18 minutes to read • [Edit Online](#)

In July 2018 we announced a [change to the way we deliver Dynamics 365 updates](#) that will help you stay current in a consistent, predictable, and seamless manner. In June 2019, based on customer feedback we announced [New flexible service updates being made available](#). This FAQ is intended to provide clarity on the service updates, processes, and tools you can use to prepare for it. We will continue to add additional information to this topic as needed.

Can the update be delayed, what is the policy?

Yes, the customer can pause, delay, or opt-out of an update via Update Settings in the Lifecycle Services projects. A customer can choose to pause up to 3 consecutive updates. The following is an example of a delayed update:

- The customer is currently on version 10.0.2.
- The customer can pause updates 10.0.3, 10.0.4, and 10.0.5.
- The customer must take the 10.0.6 update when it is available.

With a release date in early April, when will the general availability package be made available?

Production updates for a monthly release will be scheduled for the first, second, and third weeks in of the month. Depending on the configuration that you set up in Lifecycle Services (LCS), you will receive updates during that specific week.

For the April 10.0 release, Microsoft will perform updates during the weekends of April 6, April 13, or April 20 based on the configuration that you set up in LCS. Sandbox updates will always be scheduled a week before the update. The configuration setup is available in LCS.

Customers can always choose to apply the update at an earlier time, or if there is a more convenient time than the suggested times in Lifecycle Services. If the customer is on the latest version the auto update will be canceled.

Service updates

What product versions are impacted by service updates?

VERSION	DESCRIPTION
8.1 and later	All customers on 8.1 and later will be scheduled for automatic monthly updates with a combined application and platform update starting November 2018. You will be required to be on an update that's no older than 4 months or 3 service updates. To pause an update, refer to Pause service updates .
8.0	Customers on 8.0 can manually apply the monthly platform and financial reporting updates. You will be required to have an update that's no older than 4 months or 3 service updates. The 8.0 application lifecycle ends in April 2019. Customers on 8.0 must update by April 30, 2019 to stay supported. In order to be on a supported application, customers should follow the process to update to the latest version. For more information, see Update environments from version 8.0 to 10.0.X .

VERSION	DESCRIPTION
7.x	Customers on 7.x can manually apply the monthly platform and financial reporting updates. You will be required to have an update that's no older than 4 months and 3 service updates. Customers on 7.x must update by April 30, 2019 to stay supported. If customer stays on version 7.3 past April 30 they will still receive automated platform updates every month. You are required to upgrade to 8.1 by April 2019 (unless extensions are not available). The only overlaid version in market will be version 7.3.

What does the service update contain?

For release 8.1 and later, service updates will contain application (including financial, reporting, and Commerce) and platform changes that are critical improvements to the service including regulatory updates. New experiences will be configurable. The service updates are backward compatible. There will be a single version representing this update.

What is a regulatory update?

A regulatory update is a new feature or an existing feature change required by law (usually for a specific country/region). The regulatory update is always required by a specific law enforcement date (LED) and should be enabled by this date or earlier.

What's the upcoming schedule of updates?

Service updates are available since November 2018. You have the option to apply the update when it is convenient for you, or let Microsoft auto-apply the service updates based on the selected maintenance window. You are required to have an update no older than 4 months.

To see a targeted release schedule, see [Service update availability](#).

Are there any major updates post 8.1?

There will be 2 major updates in April and October where new experiences can be enabled. Major updates will not require code or data upgrade. Breaking changes will be communicated 12 months in advance such that customers can plan accordingly. Such a change will only be introduced during a major update. The 10.0 release, which will be available in April 2019, will also be an update and not an upgrade.

What does it mean when an update is backward compatible?

Backward compatibility covers binary and functional compatibility. Binary compatibility means that you can apply an update on any runtime environment without needing to recompile, reconfigure, or redeploy customizations. This also means that on a development environment at design time, X++ public and protected APIs and metadata are not modified or deleted. If Microsoft needs to break compatibility by removing obsolete APIs, it will be communicated 12 months in advance and follow a deprecation schedule. Functional compatibility is about user experience, all new experiences will be opt-in for a 12-month period.

Backward compatibility does not include non-X++/metadata APIs. Microsoft reserves the right to update versions of any dependencies the product uses, as well as remove dependencies without early warning. Microsoft does not commit to maintain backwards compatibility of dependent software libraries unless expressly stated.

For more information on deprecation guidelines and deprecated methods and metadata elements, see [Deprecation of methods and metadata elements](#).

Can I apply a Platform service update to my existing 8.1 or later environments?

Customers on version 8.1 or later will only be able to apply the 8.1.x or v10.x Service updates. Platform only service updates cannot be applied to version 8.1.x or later. Platform service updates can only be applied to versions 7.x or 8.0.

Will Platform updates be able to be scheduled and delay/pause by customers?

Yes, customers who are on version 7.3 are able to schedule platform updates directly in Lifecycle Services. A delay/pause experience is also available.

Service updates for on-premises deployments

The policy and schedule for service updates are now the same for both cloud and on-premises deployments. This includes, for example, the option to delay applying up to 3 consecutive updates. How to apply each of these updates remains slightly different. For more information, see [Apply updates to on-premises deployments](#).

Process

How will Microsoft ensure quality of releases?

Ensuring quality of the release is a fundamental principle that's enabled through a series of progressive, rigorous, automated validations as described in [Service update availability](#).

Can I select the day and time to update?

Customers can configure the day and maintenance time windows in LCS. The service update, which is based on your update settings, will start within 15 minutes. Email will be sent to customers who opt in to receive LCS notifications with instructions included on how to update. Customers will be able to select the designated tier 2/UAT sandbox for the update. Customers will have 7 calendar days for testing and validation.

Customers can optionally choose to apply the update earlier to all environments through LCS. The production-ready, deployable package will be made available to all customers via the Action Center in Lifecycle Services. Customers are responsible for deploying the update to any additional sandbox or developer/build (tier 1) environments. For more information, see [Configure service update](#).

A service update was applied to the environment, when looking at the tile in Lifecycle Services for this environment what does the number on the tile represent?

The same service update will be auto applied to all customers by Microsoft. Microsoft will continue to service the latest update. The tile in LCS for that environment represents the cumulative number of hotfixes that are available to be applied to your environment. Because Microsoft will only auto apply the same version to all customers, you will be responsible for apply the cumulative hotfix package if it is required.

How do I update to the latest version?

Users can update to the latest version using the tiles on the Environment details page in LCS. After the update is released by Microsoft, the tile will show the update available. Customers can choose to apply the update on their own by going through the update experience on their sandbox and production environments.

How do I update the production environment to the same version after Microsoft updates the sandbox environment?

When Microsoft updates a sandbox environment, the package that is used for the update is saved in the project's asset library. The name of the package is prefixed by the words "Service Update." Because the package was already applied to the sandbox environment, you can mark this package as a Release Candidate. You can then go to the production environment and schedule to apply the package, just as you might schedule to apply any other update.

What is the expected downtime?

The expected downtime for a successful update is 30 minutes to 1 hour. However, we ask for three hours of downtime in case issues occur while the update is applied. We are actively working to reduce the downtime that is required, and you should expect improvements in the next few months.

What's the process for deprecation?

Before any feature is removed from the product, the deprecation notice will be announced in the product documentation 12 months prior to the removal.

For breaking changes that only affect compilation time, but are binary compatible with sandbox and production environments, the deprecation time will be less than 12 months. Typically, these are functional updates that need to be made to the compiler.

Can I delay an update?

You can pause an update up to 4 months or 3 consecutive service updates by way of LCS configuration. After this period, an update will be scheduled and auto-applied by Microsoft. The update experience for a delayed update will incur additional downtime.

Can I delay an update for longer than 3 consecutive service updates due to seasonal activity or other business reason?

No, service updates will be automatically applied to the sandbox, then 7 days later the update will be applied to the production environment if the environments are more than 3 service updates old. A customer can only pause up to 3 consecutive updates in a row. For example, if a customer on version 10.0 chooses to pause updates 10.0.1, 10.0.2, and 10.0.3 then service update 10.0.4 will be auto applied to the sandbox.

What if I find an issue during the sandbox update?

If you find an issue when doing validations in a sandbox environment, you can request to skip the update through LCS directly by providing a valid support ticket number and a business justification.

What if I find a critical issue during sandbox testing and I am not able to pause the Production auto update?

Critical issues should always be submitted to the support team via Lifecycle Services as soon as they are identified. The support staff will work with you on the resolution to the critical issue.

How much time do I get for validation?

You will get 7 calendar days for validation after the update is applied to your sandbox environment. If you need more time, you can access the deployable package via the action center in Lifecycle Service and apply to your environments. This will provide you with additional time to test the update prior to a production roll-out.

What happens when the service update is complete?

Once the service update is applied by Microsoft you will receive a notification if the update was successful or if it was not able to be applied. There can be several reasons an update was unable to be applied:

- Pending Package Sign-off - If a package is pending signoff, Microsoft will not apply the service update to production.
- Deployment Failure - If there was a deployment failure, the environment will be rolled-back to the original state.

If there is a failure, can I reschedule the update to be auto applied?

You will not be able to reschedule the update per se, but you may apply the package when it is convenient for you, just as you might schedule to apply any other update.

Will critical hotfixes be automatically applied to my sandbox/ production environment during auto-update?

The service update that will be made generally available, and auto applied to all customers will contain hotfixes and potentially new functionality. If a critical issue is reported after the service update has been applied, customers can pull that cumulative hotfix update from the tile in Lifecycle Services.

How will my ISVs stay current?

Service updates to customer environments will be backward compatible and no action is required by the Independent software vendors (ISVs). ISVs develop on the minimum required platform release that their code depends on. Breaking changes will have a 12-month lead time to enable ISVs to include and validate. We recommend that the ISVs be part of our [Partner early access program](#), so that they can get early access to the platform bits and validate their solutions against the update before it's made generally available.

What about new features?

All new features will be opt-in for a 12-month period and will not require any change management until you choose to enable the feature.

Are batch jobs suspended during a service update?

Batch jobs are suspended during the maintenance windows and resume when the maintenance is completed.

Tools

How can I get early access to non-released platform updates?

You can join the [First release program](#), where Microsoft will keep your system always current with the latest updates. If you are not already a member of the Dynamics 365 Insider Program, you will need to:

1. Sign up for the Insider Program using this URL: <https://experience.dynamics.com>
2. Accept the terms and conditions to become a Dynamics 365 Insider.
3. After your application has been approved (approximately 24 hours) you can then sign back into the Insider Portal to find the different preview programs available for you to join.
4. Preview Early Access Program (PEAP) and First Release: The program requires that you accept additional terms and conditions to join. Please look for these programs within the Dynamics 365 Insider Program after your nomination has been accepted.

Is there tooling available to support testing the latest release?

The [Regression Suite Automation Tool](#) is [available now](#). This tool significantly reduces the time and cost of user acceptance testing. User acceptance testing is typically required before taking a Microsoft application update or applying custom code and configurations to your production environment. It enables functional power users to record business tasks using the Task recorder and convert them into a suite of automated tests without the need to write source code. Test libraries are stored and distributed in Lifecycle Services using the Business Process Modeler (BPM) libraries and fully integrated with Azure DevOps for test execution, reporting, and investigation. Test data parameters are decoupled from test steps and stored in Excel data files.

How can I test and validate that the integrations continue to work?

Data task automation lets you easily repeat many types of data tasks and validate the outcome of each task. You can also use automated testing of data entities by using task outcome validation. For more information, see the [Data task automation](#) topic.

How can I determine what's changed in a service update?

The What's new or Changed documentation is the primary source for the details contained in each service update. The [Release plans](#) are the primary source of information for all new features and changes for a future release. Features will also include help topics in docs.microsoft.com as needed. An impact analysis tool will be available in LCS to help you better understand the impact on the features that you use.

How will I know if there is a deprecated feature that will impact me if I'm not doing active development/recompile my code?

Deprecated features will be documented with each release. For more information, see [Removed or Deprecated features](#).

Preparing for One Version

How can I log an extensibility request?

Extensibility requests can be logged in LCS. Details are available in the [Extensibility requests](#) topic. Please note the following timelines to log and use the available extensions.

DATE	EXTENSIBILITY REQUESTS
January 2019	All extensibility requests must be logged by January 1, 2019. ISVs and customers are requested to analyze the code and make these requests by this time. We will not provide exceptions to stay on 7.3 after April 2019, if the request has not been filed by January 1, 2019.
December 2019	Extensions will be available on/ before December 31, 2019 for the requests logged by January 1, 2019. Customers using these extensions are required to move to current version by April 2020.

What does end of service mean?

Microsoft will not provide any fixes to issues on versions that have reached end of service. Microsoft will also not investigate or troubleshoot any issue that you may encounter on a version that's older than 3 service updates. If you encounter an issue on a version that has reached end of service, you will be required to update to the latest update and report the issue if it persists.

All environments will continue to be operated by Microsoft. All automatic processes around your environments, such as monitoring or self-healing, will also continue as long as the environment is on a supported version.

Will individual hotfixes be supported?

Individual hotfixes will not be supported after 8.1. Customers must update to the latest cumulative update available to apply the fix (such as 8.1.1). Critical fixes will also be cumulative and available through the LCS servicing experience.

Will you notify me about critical hotfixes released for the monthly update that I'm on?

Customer reported issues are searchable via Lifecycle Services Issue Search. You can sign up to be notified when an open issue is resolved.

How can I upgrade to 8.x?

Refer to the [Process for moving to the latest update](#) topic to learn how to upgrade to the latest application. Updating from 8.0 to 8.1 will not require any data upgrade and will be a self-serve update with much reduced downtime.

Commerce service updates

What options are available to minimize impact to my Commerce cloud components?

Commerce cloud components will require the same down time as your Dynamics 365 headquarters. In an upcoming release, the Retail Cloud Scale Unit (RCSU) will be available to reduce and further schedule updates to your deployment. Please refer to our published release information on our [documentation](#) and [release notes](#) sites for additional details on RCSU.

Will there be options to take individual hotfixes for my commerce solution components?

All fixes and updates for commerce components will be cumulative.

What are the maintenance downtime requirements that may impact channel operations?

For retailers with a business need for redundancy, Modern POS offline capability allows core POS operations to be available for use while disconnected from the internet or while the cloud environment is being updated. Stores operating with Commerce Scale Unit will also continue to operate with support for core POS operations during cloud maintenance windows. For more information, see [Online and offline point of sale \(POS\) operations](#).

When will I need to update my in-store components?

All in-store components must be running released software that is less than one year old in order to maintain support. Customers are responsible for updating self-hosted components (such as components installed in stores or in privately managed datacenters) and ensuring that the installed versions of these components are actively supported.

Will there continue to be backward compatibility for the in-store components?

Updates to components hosted in the cloud will continue to preserve backward compatibility with component versions self-hosted by the retailer (such as components installed in stores or in privately managed datacenters - Modern Point of Sale, Commerce Scale Unit, Hardware Station) for 12 months after the release date for that version. Self-hosted components do not need to be updated at the same time as cloud-hosted components and can be updated on a separate cadence allowing time to roll out updates to stores.

What options are available for updating in-store components across my organization?

Customers can choose to update self-hosted components manually at each store or use mass update tools such as Microsoft System Center Configuration Manager, Microsoft Intune, etc.

What options do I have to slowly enable new functionality across my channels?

Microsoft provides several mechanisms to progressively roll-out and enable functional enhancements across stores, devices, and users.

- **Screen layout designer** – Most visual elements in POS are configured and centrally managed by an administrative user in the customer organization. This means that new POS operations will not automatically be displayed on POS unless explicitly configured for inclusion in corresponding screen layouts. Screen layouts are configured using Screen layout designer and can be specific to a store or POS device. For more information, see [Screen layouts for the point of sale \(POS\)](#).
- **Functionality profiles, POS permissions, Commerce parameters** – Significant elements of functionality in POS are typically configurable by the user. This can be configured through functionality profiles, POS permissions, commerce parameters, or other controls which allow for device, register, store, or user-level functionality control in applicable scenarios.
- **Modern Point of Sale and Commerce Scale Unit** – Because Modern Point of Sale and Commerce Scale Unit are self-hosted by the retailer, topologies which include either of these components enable roll out of updates at a separate (and slower) cadence, and in a more granular fashion than with cloud-only topologies.

NOTE

Can you tell us about your documentation language preferences? [Take a short survey](#).

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Manage Finance and Operations updates and your custom code lifecycle

2/18/2021 • 19 minutes to read • [Edit Online](#)

This topic describes application lifecycle use cases for Finance and Operations implementations. It's focused on the following scenarios:

- Managing your source code development branches
- Applying the next version of a Microsoft service update
- Applying a new version of your custom code

This topic applies to Microsoft Dynamics 365 Finance, Dynamics 365 Supply Chain Management, Dynamics 365 Commerce, and Dynamics 365 Project Operations.

The main goal is to show how to complete the following tasks:

- Stay up to date and manage Microsoft service updates (or quality updates) for Finance and Operations apps (including Dynamics 365 Commerce) in incremental phases, independently of the lifecycle of your own customization. This approach simplifies the update process, and reduces the cost and risk of regressions that are associated with all-in-one upgrade projects.
- Take advantage of source code branches for version control of your custom code. By using version control, you can isolate the rollout of critical changes and hotfixes from the development of new features and capabilities.

This topic doesn't explain how to use the different tools in Azure DevOps and Microsoft Dynamics Lifecycle Services (LCS). Instead, it's focused on processes and best practices. The [Apply the next version of a Microsoft service update](#) and [Apply a new version of your custom code](#) sections contain both an overview of the phases and the steps of the process.

This topic includes the following sections:

- [Environments](#)
 - [Environments that run your current release](#)
 - [Environments that run the next version of your custom code](#)
- [Manage source code branches](#)
- [Apply the next version of a Microsoft service update](#)
 - [Backward compatibility of Microsoft updates](#)
 - [Runtime compatibility](#)
 - [Design-time compatibility](#)
 - [Phase 1: Update the Finance and Operations implementation](#)
 - [Track 1: Update your runtime environments](#)
 - [Update Test 1](#)
 - [Update UAT](#)
 - [Update Prod](#)
 - [Track 2: Update your development environments](#)

- Error situations
 - Case 1
 - Case 2
 - Case 3
- Phase 2: Update CSU to version 10.0.11
 - Phase 2 prerequisites
 - Track 1: Update your CSU runtime environments
 - Update Test 1
 - Update UAT
 - Update Prod
 - Track 2: Update your development environments
- Phase 3: Update POS to version 10.0.11
 - Phase 3 prerequisites
 - Update your Commerce development environment
 - Option 1: Store component updates that include only runtime changes
 - Option 2: Store component updates that include runtime and custom changes
 - Update Process
 - Update Test 1
 - Update UAT
 - Update Prod
- Apply a new version of your custom code
 - Create a hotfix of your code
 - Update your custom code from release N to release N+1
- Upload, update, and deploy store components

Environments

This section describes the collection of Finance and Operations environments that the application lifecycle management (ALM) scenarios in this topic rely on. This configuration is typical for organizations that have implementations that rely on custom code (extensions). This custom code includes customizations that are provided by independent software vendors (ISVs).

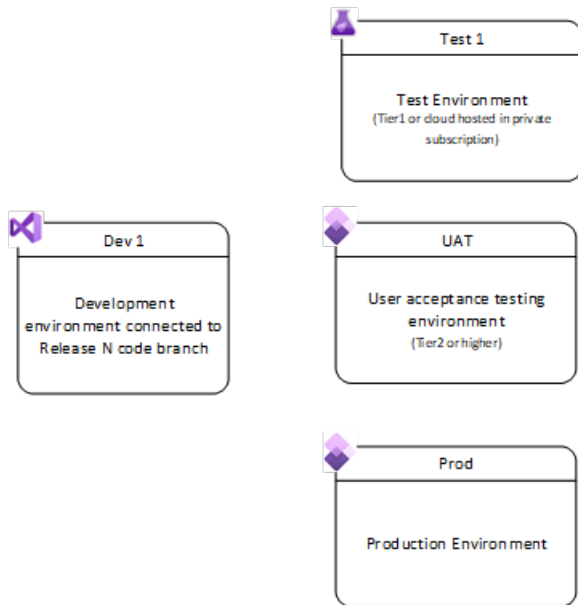
Environments that run your current release

The following environments are the environments in your current release:

- **Dev 1** – A development environment that runs the same version of Finance and Operations apps as the production environment. The Dev 1 environment uses Azure DevOps for version control of custom code. It's connected to the current release branch of your custom code. For more information, see the [Manage source code branches](#) section.
 - There are many options for development environments, both cloud and on-premises. For more information, see [Deploy and access development environments](#).
 - For build automation, use the new Azure DevOps Hosted Agents functionality. For more information, see [Build automation that uses Microsoft-hosted agents and Azure Pipelines](#).
- **Test 1** – A Tier-1 test environment that is used for functional and configuration testing. The Test 1

environment runs the same version of Finance and Operations apps as the production environment. It also runs the latest release version of your custom code extensions.

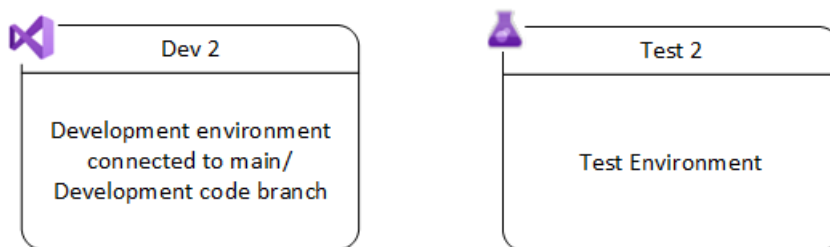
- **UAT** – A pre-production environment that is used for user acceptance testing. The UAT environment is a Tier-2 (Standard Acceptance Test) or higher environment. It runs the same version of Finance and Operations apps as the production environment. It also runs the latest release version of your custom code extensions. This environment is typically connected to a copy of the production database.
- **Prod** – Your live production environment that runs on your production database.



Environments that run the next version of your custom code

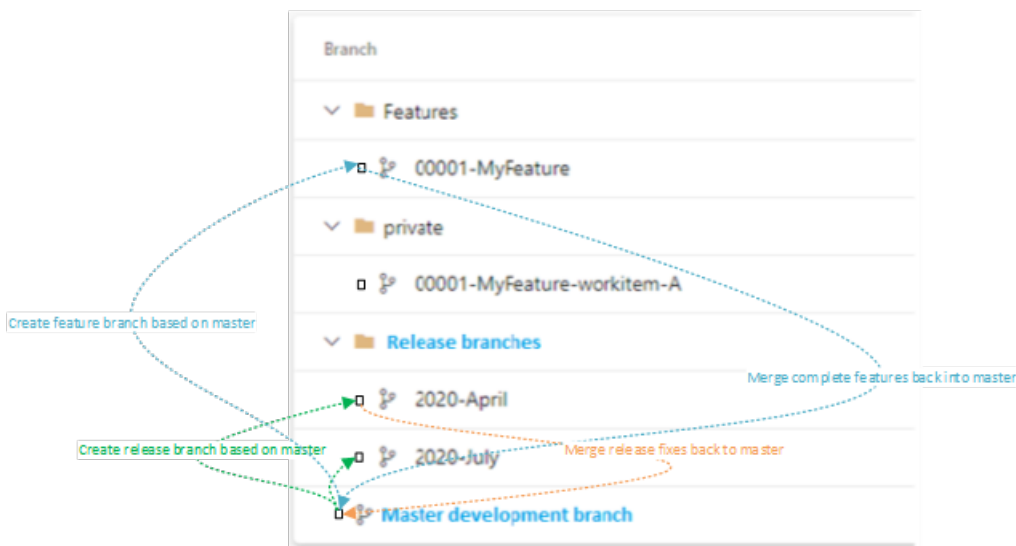
The following environments run the next version of your custom code:

- **Dev 2** – A development environment that is used for development of the next version of your custom code extensions. It uses Azure DevOps for version control of custom code. It's connected to the development branch (**main** branch) of your custom code. For more information, see the [Manage source code branches](#) section.
- **Test 2** – A functional test environment that is used for testing of the next version of your custom code extensions.



Manage source code branches

It's important that you follow best practices as you manage branches of custom code. In this way, you help minimize cost, and ensure the quality of your releases and updates.



The **main** branch (development branch) contains the latest functioning version of the next release of your code.

When you work on new features, create a new feature branch out of the **main** branch. Then, when the feature work is completed, integrate the feature branch back into the **main** branch.

The release branches contain the code base of your official releases. In the preceding illustration, the assumption is that you have only one release branch, **release/2020-April**. **2020-April** isn't a build. It's a source code branch. Because you will probably create hotfixes for your release, you will make changes and produce builds out of this release branch.

- Don't use release branches to develop new features. Use them only for critical fixes or changes that are required in your live environment.
- After you've made a change in a release branch, integrate the branch back into the **main** branch. In this way, you ensure that your next release also contains the fix.
- Among the example environments that were described earlier, the Dev 1 environment will be connected to the **release/2020-April** branch.

When you're ready to release a new version of your custom code, create a new release branch that is based on the **main** branch. For this example, you will create a new release branch that is based on **main** and named **2020-July**.

You might have private branches that individual developers work in while they work on a specific work item that is based on a specific branch of your code. Private branches are merged back into their parent branch when the work is completed. For more information, see [Learn about branching strategies for Team Foundation Version Control \(TFVC\) and how to select an effective strategy](#).

Apply the next version of a Microsoft service update

By using a phased approach, you help maximize the efficiency when service updates are taken. Each phase updates one component of your implementation.

1. **Phase 1** – Update your Finance and Operations environments.

Your current version of Commerce Scale Unit (CSU) and Point of Sale (POS) will work correctly with the new Finance and Operations update. For example, version 10.0.7 of CSU is compatible with version 10.0.11 of Finance and Operations apps.

2. **Phase 2** – Update CSU.

3. **Phase 3** – Update POS.

When you take a Microsoft update, you don't have to update your custom code to the next version. By taking

Microsoft updates without bundling them with custom code updates, you help simplify the update process. You also help reduce the cost and risk of regressions that are associated with all-in-one upgrade projects.

Backward compatibility of Microsoft updates

It's important that you understand what Microsoft means by *backward compatibility of service updates*, so that you have context for the next sections of this topic. Service and quality updates are *runtime* backward-compatible. However, they aren't always *design-time (compile-time)* backward-compatible.

Runtime compatibility

All Microsoft updates are intended to be runtime backward-compatible. This compatibility covers both binary compatibility and functional compatibility. Runtime compatibility means that customizations that exist in production and sandbox environments will continue to work after Microsoft service updates are deployed to those environments. Those updates include service updates and quality updates. Runtime compatibility also means that Microsoft updates are backward-compatible with customizations that were compiled on an earlier platform.

Binary compatibility is backward only. You can compile a customization on an older application version and platform version, and deploy it to an environment that is running a later version. However, you can't deploy code to an environment that is running a version that is earlier than the version that the code was compiled on.

Design-time compatibility

Design-time (compile-time) backward compatibility means that developers can apply updates to their development environments and successfully compile their code without having to make any changes.

Microsoft aims for design-time compatibility. However, some updates might include changes that aren't compatible at design time, but that are binary-compatible. Therefore, after an update is applied, new errors or warnings might occur when your code is compiled. Here are some examples of these changes:

- Microsoft makes an enumeration extensible.
- Microsoft marks an API as obsolete or internal.
- Microsoft introduces a new compiler error to help prevent unsafe coding practices.

All these changes might require work on your solution. Design-time breaking changes that are binary-compatible don't require a 12-month deprecation notice. These breaking changes are documented for each service update. For more information, see [What's new and changed in Platform updates](#).

Phase 1: Update the Finance and Operations implementation

This section summarizes the process that you use to update your Finance and Operations implementation to the latest service update. An update from version 10.0.7 to version 10.0.11 is used as an example.

This phase is divided into two tracks. These tracks can occur in parallel.

- **Track 1** – Update your runtime environments.
- **Track 2** – Update your development environments.

After you complete track 1, you will be live on version 10.0.11, unless you encounter one of the error situations that are described in the [Error situations](#) section.

Track 1: Update your runtime environments

By completing track 1, you essentially complete your Finance and Operations update to version 10.0.11, because your production environment will be live on version 10.0.11. You don't have to recompile your custom code as part of this track.

Update Test 1

The Test 1 environment is running version 10.0.7 together with the latest released version of your custom extension. Although an update of Test 1 isn't a prerequisite in this flow, it's recommended, because it adds another level of functional verification and predictability. This update should be completed before the UAT environment is updated. The sooner that you update Test 1 and validate on it, the more predictable your "real"

update (that is, the update of the UAT and Prod environments) will be.

1. Apply version 10.0.11 of Finance and Operations apps to Test 1.
2. Sign off on functional scenarios. You can use the [Regression Suite Automation Tool](#) to automate user acceptance testing on test and UAT environments.
3. If regressions are encountered, see the [Error situations](#) section.

Update UAT

The UAT environment is running version 10.0.7 together with a released version of your custom extension. (The UAT environment is the same as the Prod environment.)

1. Apply version 10.0.11 of Finance and Operations apps to UAT.

Your UAT environment might be configured so that it's automatically updated by Microsoft. However, you can always pull the update as soon as it's available.

2. Complete user acceptance testing, and sign off.
3. If regressions are encountered, see the [Error situations](#) section.

Update Prod

1. Apply version 10.0.11 of Finance and Operations apps to Prod.

Your Prod environment might be configured so that it's automatically updated by Microsoft. However, you can always pull the update as soon as it's available.

2. Sign off.

Track 2: Update your development environments

The purpose of track 2 is to update the Dev 1 environment to version 10.0.11. Dev 1 is your **main** development environment that is connected to the current release branch of your custom code. It's running version 10.0.7 of Finance and Operations apps. By completing track 2, you ensure that Dev 1 runs version 10.0.11 together with your latest release, and that it's ready for any future hotfixes that are required for your code.

1. Apply version 10.0.11 of Finance and Operations apps to Dev 1.
2. Compile your custom code, and do testing.
3. Make any required changes to your custom code.
4. Check code changes in to the release branch.
5. If you have more than one development environment, follow these steps for each environment:
 - a. Apply version 10.0.11 of Finance and Operations apps to the development environment.
 - b. Sync and compile your latest custom code from the target code branch.

Error situations

Case 1

During track 1, a bug is found that requires a Microsoft quality update. If Microsoft releases the update in a timely manner, use the new Microsoft update instead of the original service update to complete track 1.

Case 2

During track 1, a bug is found that requires a Microsoft service update. However, the update can't be released in a timely manner.

As a workaround for this issue, Microsoft proposes a change to your custom code.

1. Modify your code in Dev 1 (in the release branch), and test your updates.
2. Check code changes in to the release branch.
3. Create a new deployable package out of the release branch.

4. Apply the new deployable package to Test 1 and/or UAT.

NOTE

Custom code that is compiled on version 10.0.7 can be deployed to any runtime environment that is running version 10.0.7 or later. Therefore, you don't yet have to update Dev 1 to version 10.0.11. However, you might already have done that update as part of track 2.

Case 3

During track 1, a bug is found that requires a change to your custom code. This bug might be in either your code or the ISV code.

1. Modify your code in Dev 1 (in the release branch), and test your updates.
2. Check code changes in to the release branch.
3. Create a new deployable package out of the release branch.
4. Apply the new deployable package to Test 1 and/or UAT.

Phase 2: Update CSU to version 10.0.11

This section summarizes the process that you use to update your Commerce Scale Units to the latest service update. An update from release 10.0.7 (Commerce version 9.17) to release 10.0.11 (Commerce version 9.21) is used as an example.

Phase 2 prerequisites

Before you update your CSUs, you must update the Commerce headquarters environments (in the Finance and Operations app) to the same release or a later release. For this example, that release is 10.0.11.

This phase is divided into two tracks. These tracks can occur in parallel.

- **Track 1** – Update your CSU runtime environments.
- **Track 2** – Update your development environments.

After you complete track 1, you will be live on release 10.0.11 (Commerce version 9.21), unless you encounter one of the [error situations](#) that were described for phase 1.

Track 1: Update your CSU runtime environments

By completing track 1, you essentially complete your CSU update to version 10.0.11, because your production environment will be live on version 10.0.11. You don't have to recompile your custom code as part of this track.

Update Test 1

The software as a service (SaaS) components of Commerce aren't currently supported in Tier-1 environments (development/test environments). A copy of Retail Server runs locally in each Tier-1 environment, and the deployment of both Microsoft code for Retail Server and retail customizations will be done through the previous system, where application binary packages and retail deployable packages are applied against the infrastructure as a service (IaaS) instance.

Update UAT

The UAT environment is running CSU that corresponds to release 10.0.7, together with the same version of your retail extension that the production environment is running.

1. Update the Commerce Scale Unit. Select **9.21 (10.0.11)** as the target version. For more information, see [Phase 2: Update CSU to version 10.0.11](#)
2. Complete user acceptance testing, and sign off.
3. If regressions are encountered, see the [Error situations](#) section.

Update Prod

1. Update the Commerce Scale Unit. Select **9.21 (10.0.11)** as the target version. For more information, see [Phase 2: Update CSU to version 10.0.11](#)
2. Sign off.

Track 2: Update your development environments

1. Get the latest version of the Retail software development kit (SDK).
 - a. Apply the Finance and Operations service update for release 10.0.11 to Dev 1.
 - b. Get the updated version of the Retail SDK from %ServiceDrive%\RetailSDK\Update**<newest directory>**
2. In your **main** (development) branch, update the Retail artifacts from the new version of the Retail SDK.
3. Compile. The new version should be backward-compatible and should not require any changes to your code.
4. Commit the change that includes the Retail SDK update.
5. Make any required changes to your custom code.
6. Commit code changes to the target branch.
7. Optional: If you have more than one development environment, merge the latest changes from step 4, and compile the latest custom code.

Phase 3: Update POS to version 10.0.11

This section summarizes the process that you use to update your store components, such as Modern POS and Hardware Station, to the latest service update. An update from release 10.0.7 (Commerce version 9.17) to release 10.0.11 (Commerce version 9.21) is used as an example.

Unlike updates for Commerce headquarters (in the Finance and Operations app) and CSU, updates for store components are delivered in the same packages. After you update Commerce headquarters and CSU, you have the following options:

- **Option 0 (no operation is required)** – Leave the store components in their previous release if the version is supported and in-policy.
- **Option 1** – Update the store components runtime (Microsoft code) so that it matches the same release as CSU.
- **Option 2** – Update the store components runtime (Microsoft code) and customization together.

In the rest of this section, the assumption is that you want or have to update the store components (option 1 or option 2).

After you complete this phase, you will be live on release 10.0.11 (Commerce version 9.21) for store components, unless you encounter one of the [error situations](#) that are described for phase 1.

Phase 3 prerequisites

Phase 3 has the following prerequisites:

- The Commerce headquarters components (in the Finance and Operations app) were updated to the same release or a later release before the CSUs were updated. In this example, the version is 10.0.11.
- The CSUs were updated to the same release as, or a later release than, the store components. In this example, the release is 10.0.11.

Update your Commerce development environment

Follow the steps in the [Track 2: Update your development environments](#) section.

Option 1: Store component updates that include only runtime changes

This option generates a new retail deployable package that contains your store components. It includes changes only from the Microsoft code.

1. Update your release branch, which has the code that is currently being used in the production environment, to the Retail SDK that matches your target release. In this example, the version is 10.0.11 (9.21). Follow the

steps in the [Track 2: Update your development environments](#) section.

2. Generate a new build for the retail deployable package. This build contains the same set of customizations that is currently in the production environment, plus version 10.0.11 (9.21) of the Microsoft code.

Option 2: Store component updates that include runtime and custom changes

This option generates a new retail deployable package that contains your store components. It includes changes from both the Microsoft code and customizations.

1. Update your release branch, which has the code that is currently being used in the production environment, to the Retail SDK that matches your target release. In this example, the version is 10.0.11 (9.21). Follow the steps in the [Track 2: Update your development environments](#) section.
2. Commit changes.
3. Update custom code for store components, or update references to ISV-updated components.
4. Generate a new build for the retail deployable package. This build contains updated custom code plus version 10.0.11 (9.21) of the Microsoft code.

Update process

Update Test 1

The SaaS components of Commerce aren't currently supported in development or test one-box environments. A copy of Retail Server runs locally in each development or test one-box environment, and the deployment of both Microsoft code for Retail Server and retail customizations will be done through the previous system, where application binary packages and retail deployable packages are applied against the IaaS instance.

The Test 1 environment is running version 10.0.11 of Commerce headquarters and a local version of CSU from previous phases. An update of Test 1 isn't a prerequisite in this flow. Because there is no CSU in this environment, this step is mostly for verification.

1. Upload, update, and deploy the store components. For more information, see the [Upload, update, and deploy store components](#) section.
2. Sign off on functional scenarios.
3. If regressions are encountered, see the [Error situations](#) section.

Update UAT

Clients that point to the UAT environment are running applications (for example, Modern POS) for release 10.0.7 (the same version that is currently running in the production environment).

1. Upload, update, and deploy the store components. For more information, see the [Upload, update, and deploy store components](#) section.
2. Sign off on functional scenarios.
3. If regressions are encountered, see the [Error situations](#) section.

Update Prod

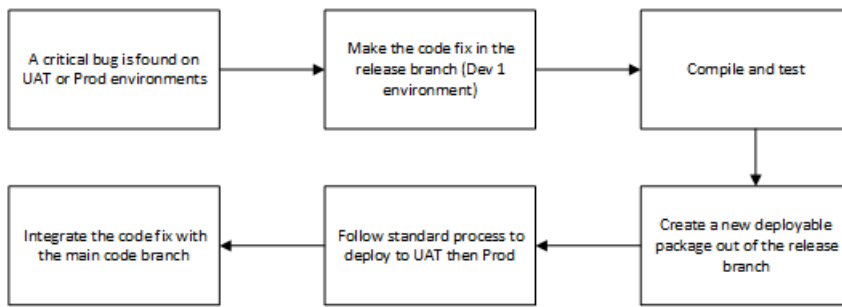
1. Upload, update, and deploy the store components.
2. Sign off.

Apply a new version of your custom code

This section describes the recommended flow for two use cases that require that you update your UAT and/or Prod environment with a new build of your custom extension.

Create a hotfix of your code

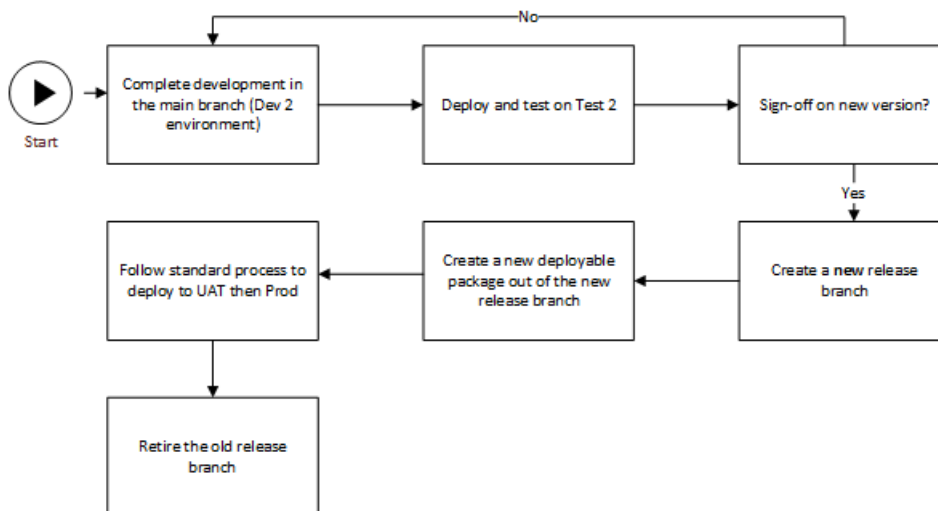
When a critical bug is found in the UAT or Prod environment, fix the bug in the release branch (not in the **main** or development branch), and use the standard process to apply a deployable package to UAT and Prod.



1. In Dev 1, make the code fix in the release branch. If the required fix is in ISV code, ask the ISV to send you a new build of the current release, not the next version of the solution.
2. Compile and test.
3. Create a new deployable package out of the release branch.
4. Deploy on Test 1, and sign off if sign-off is required.
5. Use the standard process to deploy custom code first to UAT and then to Prod.
6. Integrate the code fix with your **main** code branch.

Update your custom code from release N to release N+1

When you're ready to release the next version of your custom code, use the following process to create and deploy the new release.



1. In the Dev 2 environment, or another environment that is connected to the **main** branch, complete development in the **main** branch.
2. Deploy and test on Test 2.
3. Repeat steps 1 through 2 until the new version is signed-off on.
4. Create a **new** release branch.
5. Create a new deployable package out of the **new** release branch.
6. Use the standard process to deploy custom code first to UAT and then to Prod.
7. Retire the old release branch.

Upload, update, and deploy store components

1. Upload the retail deployable package to LCS.
2. Update Application Object Server (AOS) with the latest client.
3. Upload the retail deployable package to your Asset library:
 - Older deployments (earlier than version 10.0.11): Software deployable package
 - New deployments (version 10.0.11 and later): Retail self-service installers

4. Update Commerce headquarters with the new self-service installers for store components:
 - **Older deployments (earlier than version 10.0.11):** Deploy the retail deployable package to Commerce headquarters via LCS.
 - **New deployments (version 10.0.11 and later):** In Commerce headquarters, on the **Commerce parameters** form, on the **Channel deployment** tab, select **Check for package updates**. This update will bring in the packages that are available on the **Retail Self-service package** tab in the LCS Asset library.
5. Assign the client versions to your devices.
6. Download the installers for the desired client type and device.
7. Install in target device.
8. Test and validate.

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Software lifecycle policy and cloud releases

2/18/2021 • 9 minutes to read • [Edit Online](#)

This topic outlines the lifecycle and support policies for the Finance and Operations online service.

Modern Lifecycle Policy

The Finance and Operations online service is covered by the Modern Lifecycle Policy. The Modern Lifecycle Policy covers products and services that are serviced and supported continuously. For more information about this policy, see [Modern Lifecycle Policy](#). Licensed customers must stay current with updates to the Finance and Operations online service in accordance with the following servicing and system requirements:

- Customers purchasing subscriptions of Finance and Operations and operating on the following application versions will experience continuous updates of the Platform and Financial Reporting. Microsoft will continually update these components with the option to postpone up to 3 consecutive service updates.
 - Dynamics 365 for Operations version 1611 (November 2016)
 - Dynamics 365 for Finance and Operations, Enterprise edition (July 2017)
 - Dynamics 365 for Finance and Operations, Enterprise edition 7.3
 - Dynamics 365 for Finance and Operations, version 8.0 (April 2018)
- Platform versions maintain backward compatibility with the application versions that are supported at the time of the platform release within the application support lifecycle. For more information about platform versions, see [Cloud platform monthly updates FAQ](#).
- Critical fixes and non-critical updates are handled in the following way:
 - **Critical fixes** – Critical fixes include security fixes and any fixes that are required to adhere to the availability service level agreement (SLA) that the service supports. Critical fixes will be made available in the latest platform update version and in the latest service update for customers operating on version 8.1. In addition, to help protect the customer and the online service, Microsoft might apply critical fixes directly to a customer's environment. If a critical fix must be applied, Microsoft will notify the customer about the required downtime window (if there will be any downtime) and apply the fix to the applicable environment. The critical fix will update the system to the latest update version.
 - **Non-critical updates** – Customers operating on the following application releases must update to the most current Finance and Operations platform and financial reporter version to deploy non-critical updates.
 - Dynamics 365 for Operations version 1611 (November 2016)
 - Dynamics 365 for Finance and Operations, Enterprise edition (July 2017)
 - Dynamics 365 for Finance and Operations, Enterprise edition 7.3
 - Dynamics 365 for Finance and Operations, version 8.0 (April 2018)

Customers operating on release 8.1 must update to the most current service update to deploy non-critical updates.

NOTE

Application and platform releases expire at the end of the month of their software lifecycle.

Microsoft will not provide any fixes to issues on versions that have reached end of service. Microsoft will also not investigate or troubleshoot any issue that you may encounter on an older version. If you encounter an issue on a version that has reached end of service, you will be required to update to the latest update and report the issue if it persists.

All environments will continue to be operated by Microsoft. All automatic processes around your environments, such as monitoring or self-healing, will also continue as is for supported versions.

Dates and versions for application and platform releases

Table 1: Continuous update releases

For information about the new features included in each release, click the links in the **Version** column.

RELEASE	MAJOR RELEASE OR SERVICE UPDATE	VERSION	BUILD NUMBER	AVAILABILITY	END OF SERVICE
Dynamics 365 for Finance and Operations	Major release	10.0	10.0.8	April 2019	Not applicable (continuously updated)*
Dynamics 365 for Finance and Operations	Major release	8.1	8.1.136	October 2018	Not applicable (continuously updated)*

* Indicates a major release is required to be updated through service updates. Service updates are cumulative in nature and may include updates for some or all of the following components: Platform, Application, Financial Reporting, Retail, and operating system updates. You will be required to have an update that's no older than 3 service updates. The 8.1.x version series will be replaced by version 10.0, which is targeted for release in April 2019. For more information, see [One Version service updates FAQ](#).

Table 2: Application releases

For information about the new features included in each release, select the links in the **Version** column.

RELEASE	MAJOR OR MINOR RELEASE	VERSION	BUILD NUMBER	AVAILABILITY	END OF SERVICE
Dynamics 365 for Finance and Operations	Major release	8.0	8.0.30	April 2018	April 30 2019
Dynamics 365 for Finance and Operations, Enterprise edition	Major release	7.3	7.3.11971.56116	December 2017	April 30 2019*
Dynamics 365 for Finance and Operations, Enterprise edition	Major release	July 2017	7.2.11792.56024	June 2017	April 30 2019

RELEASE	MAJOR OR MINOR RELEASE	VERSION	BUILD NUMBER	AVAILABILITY	END OF SERVICE
Dynamics 365 for Operations	Major release	1611	7.1.1541.3036	November 2016	April 30 2019
Dynamics AX	Minor release	7.0.1	7.0.1265.23014	May 2016	June 2017
Dynamics AX	Major release	7.0	7.0.1265.3015	February 2016	June 2017

* All customers must be on the latest version of Finance and Operations by April 2019. However, we are making an exception for customers who have unfulfilled [extension requests](#) that have been submitted to Microsoft. Those customers who submitted extensibility requests by January 1, 2019, will be supported on version 7.3 until their extensibility requests are fulfilled. Customers are expected to upgrade to the latest version within 90 days of the extensibility request being fulfilled. For more information, see [One Version service updates FAQ](#).

Table 3: Platform releases

For information about the new features included in each release, select the links in the **Release** column.

RELEASE	BUILD NUMBER	AVAILABILITY	EXPIRATION DATE
Platform update 31	7.0.5457	January 2020	N/A (Continuously updated)
Platform update 30	7.0.5407	November 2019	N/A (Continuously updated)
Platform update 29	7.0.5372	October 2019	N/A (Continuously updated)
Platform update 28	7.0.5314	July 2019	N/A (Continuously updated)
Platform update 27	7.0.5286	June 2019	N/A (Continuously updated)
Platform update 26	7.0.5257	May 2019	N/A (Continuously updated)
Platform update 25	7.0.5222	April 2019	N/A (Continuously updated)
Platform update 24	7.0.5179	March 2019	N/A (Continuously updated)
Platform update 23	7.0.5126	January 2019	N/A (Continuously updated)
Platform update 22	7.0.5095	December 2018	N/A (Continuously updated / Retired)
Platform update 21	7.0.5073	October 2018	N/A (Continuously updated / Retired)
Platform update 20**	7.0.5030	October 2018	N/A (Continuously updated / Retired)
Platform update 15*	7.0.4841	March 2018	N/A (Continuously updated / Retired)
Platform update 12	7.0.4709	November 2017	November 2018
Platform update 11	7.0.4679.35176	October 2017	October 2018

RELEASE	BUILD NUMBER	AVAILABILITY	EXPIRATION DATE
Platform update 10	7.0.4641.16233	August 2017	August 2018
Platform update 9	7.0.4612.35162	July 2017	July 2018
Platform update 8	7.0.4565.16212	June 2017	June 2018
Platform update 7	7.0.4542.16189	May 2017	May 2018
Platform update 6	7.0.4509.16180	April 2017	April 2018
Platform update 5	7.0.4475.16165	March 2017	March 2018
Platform update 4	7.0.4425.16161	February 2017	February 2018
Platform update 3	7.0.4307.16141	November 2016	November 2017
Platform update 2	7.0.4230.16130	August 2016	August 2017
Platform update 1	7.0.4127.16103	May 2016	May 2017
Platform 7.0	7.0.4030.16079	February 2016	January 2017

** Platform updates 16, 17, 18, and 19 have not been made generally available.

* Platform updates 13 and 14 have not been made generally available.

Table 4: Application updates

The application updates listed below consist of a small subset of application enhancements released on top of Finance and Operations versions 8.0, 7.3, and 7.2 (July 2017). These updates do not affect the support lifecycle of the release--support is in-line with the policies for each release.

Note that application updates are not cumulative. The individual packages only contain the enhancements that were included in that specific release. However, if there is a dependency between two packages, then both packages will be included.

For information about the new features included in each update, click the links in the **Version** column.

RELEASE	VERSION	BUILD NUMBER	AVAILABILITY
Dynamics 365 for Finance and Operations	8.1.3: KB 4470000 Microsoft Dynamics 365 for Finance and Operations version 8.1.3 with Platform update 23*	8.1.227	January 2019
Dynamics 365 for Finance and Operations	8.1.2: KB 4470000 Microsoft Dynamics 365 for Finance and Operations version 8.1.2 with Platform update 22*	8.1.195	December 2018

RELEASE	VERSION	BUILD NUMBER	AVAILABILITY
Dynamics 365 for Finance and Operations	8.1.1: KB 4470000 Microsoft Dynamics 365 for Finance and Operations version 8.1.1 with Platform update 21*	8.1.170	October 2018
Dynamics 365 for Finance and Operations	8.0.4: KB 4458992 Microsoft Dynamics 365 for Finance and Operations - Version 8.0.4 (Binary part)*, KB 4458993 Microsoft Dynamics 365 for Finance and Operations - Version 8.0.4 (X++ part)*	8.0.35.15532	August 2018
Dynamics 365 for Finance and Operations	8.0.3: KB 4346176 Microsoft Dynamics 365 for Finance and Operations - Version 8.0.3 (Binary part)*, KB 4346172 Microsoft Dynamics 365 for Finance and Operations - Version 8.0.3 (X++ part)*	8.0.35.15342	July 2018
Dynamics 365 for Finance and Operations	8.0.2: KB 4340414 Microsoft Dynamics 365 for Finance and Operations - Version 8.0.2 (Binary part)*, KB 4340413 Microsoft Dynamics 365 for Finance and Operations - Version 8.0.2 (X++ part)*	8.0.35.15211	July 2018
Dynamics 365 for Finance and Operations	8.0.1: KB 4295107 Microsoft Dynamics 365 for Finance and Operations - Version 8.0.1 (Binary part)*, KB 4294515 Microsoft Dynamics 365 for Finance and Operations - Version 8.0.1 (X++ part)*	8.0.30.15107	June 2018
Dynamics 365 for Finance and Operations, Enterprise edition	7.3.2: KB 4093261 Microsoft Dynamics 365 for Finance and Operations - Version 7.3.2 (Binary part)*, KB 4093262 Microsoft Dynamics 365 for Finance and Operations - Version 7.3.2 (X++ part)*	7.3.11971.62687	March 2018
Dynamics 365 for Finance and Operations, Enterprise edition	7.3.1: KB 4093139 Microsoft Dynamics 365 for Finance and Operations - Version 7.3.1 (Binary part)*, KB 4091727 Microsoft Dynamics 365 for Finance and Operations - Version 7.3.1 (X++ part)*	7.3.11971.62430	March 2018

RELEASE	VERSION	BUILD NUMBER	AVAILABILITY
Dynamics 365 for Finance and Operations, Enterprise edition	Application update 5: KB 4053277 Application Update 5 for Microsoft Dynamics 365 for Finance and Operations (Binary part)* , KB 4053278 Application Update 5 for Microsoft Dynamics 365 for Finance and Operations (X++ part)*	7.2.11792.62725	November 2017
Dynamics 365 for Finance and Operations, Enterprise edition	Application update 4: KB 4047325 Application Update 4 for Dynamics 365 for Finance and Operations (Binary part)* , KB 4047321 Application Update 4 for Dynamics 365 for Finance and Operations (X++ part)*	7.2.11792.62509	October 2017
Dynamics 365 for Finance and Operations, Enterprise edition	Application update 3: KB 4043284 Application Update 3 for Dynamics 365 for Finance and Operations (Binary part)* , KB 4043285 Application Update 3 for Dynamics 365 for Finance and Operations (X++ part)*	7.2.11792.62370	September 2017
Dynamics 365 for Finance and Operations, Enterprise edition	Application update 2: KB 4039142 Application Update 2 for Dynamics 365 for Finance and Operations (Binary part)* , KB 4039487 Application Update 2 for Dynamics 365 for Finance and Operations (X++ part)*	7.2.11792.62192	September 2017
Dynamics 365 for Finance and Operations, Enterprise edition	Application update 1: KB 4035749 Application Update 1 for Dynamics 365 for Finance and Operations (Binary part)* , KB 4035751 Application Update 1 for Dynamics 365 for Finance and Operations (X++ part)*	7.2.11792.62089	July 2017

* The link points to a Knowledge Base (KB) article. You must sign in to Lifecycle Services (LCS) to view the KB article.

Support matrix

Platform updates are compatible with all application versions that are supported at the time of release.

Table 5: Downloadable virtual hard drive (VHD) releases

Use of the VHDs is subject to the [Software license terms](#).

RELEASE	VHD NAME	VHD EXPIRATION DATE
Platform update 12 / Application release 7.2	FinandOps7.2PlatUpdate12.vhd	May 24, 2018
Platform update 12 / Application release 7.3	FinandOps7.3PlatUpdate12.vhd	June 05, 2018
Platform update 15 / Application release 7.3	FinandOps7.3withPlatUpdate15	December 08, 2018

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Software lifecycle policy and on-premises releases

2/18/2021 • 3 minutes to read • [Edit Online](#)

This topic outlines the lifecycle and support policies for Microsoft Dynamics 365 Finance + Operations (on-premises) releases.

Modern Lifecycle Policy

Finance + Operations (on-premises) software is covered by the Modern Lifecycle Policy. The Modern Lifecycle Policy covers products and services that are serviced and supported continuously. For more information about this policy, see [Modern Lifecycle Policy](#).

Licensed customers must stay current with updates to the Finance + Operations (on-premises) software in accordance with the following servicing and system requirements. This policy requires that the customer maintain Software Assurance (SA) or the Enhancement Plan, and deploy updates as noted later in this topic. Customers who want to use the Fixed Support Lifecycle Policy (5+5) must downgrade to Microsoft Dynamics AX 2012 R3. If a customer lapses on SA or the Enhancement Plan, the customer will be eligible only for the perpetual license rights to Microsoft Dynamics AX 2012 R3 and must uninstall Microsoft Dynamics 365 for Finance and Operations (on-premises) software.

On-premises software update policies

The customer is in full control of its on-premises deployments and must follow this policy. The customer is in control of installing updates in its on-premises environments. Microsoft will support the Finance + Operations (on-premises) software through December 31, 2027, at a minimum, but only if the customer keeps the deployed software current according to this policy.

Critical fixes and non-critical updates are handled in the following way:

- **Critical fixes** – Critical fixes include security fixes and any fixes that are required to support reliability and availability. Critical fixes will be made available in the latest platform update version.
- **Non-critical updates** – Customers must update to the most current Finance and Operations platform and financial reporter version to deploy non-critical updates.

Finance + Operations (on-premises) release dates

Continuous service updates

As of November 2018, on-premises service updates are released continuously. For more information about version numbers and availability dates, see [Software lifecycle policy and cloud releases](#). For more information about One Version service updates, see [One Version service updates FAQ](#).

Application releases

Application releases expire at the end of the month of their software lifecycle.

RELEASE	VERSION	BUILD NUMBER	AVAILABILITY	EXPIRATION DATE	PRODUCT LIFE
Continuous service updates	-	-	-	-	-

RELEASE	VERSION	BUILD NUMBER	AVAILABILITY	EXPIRATION DATE	PRODUCT LIFE
Dynamics 365 for Finance and Operations (on-premises)	10.0	10.0.8	March 2019	June 2019	December 2027
Dynamics 365 for Finance and Operations (on-premises)	8.1	8.1.136	November 2018	April 2019	December 2027
Dynamics 365 for Finance and Operations, Enterprise edition (on-premises)	7.3	7.3.11971	March 2018	April 2020*	December 2027
Dynamics 365 for Finance and Operations, Enterprise edition (on-premises)	July 2017	7.2.11792	June 2017	April 2019	December 2027

* All customers must be on the latest version of Finance and Operations by April 30, 2019. However, we are making an exception for customers who have unfulfilled [extension requests](#) that have been submitted to Microsoft. Those customers can be on version 7.3 until April 2020. For more information, see [One Version service updates FAQ](#).

Platform releases

Platform releases expire at the end of the month of their software lifecycle.

RELEASE	BUILD NUMBER	AVAILABILITY	EXPIRATION	END OF LIFE
Continuous service updates	-	-	-	-
Platform update 20	7.0.5030	November 2018	February 2019	December 2027
Platform update 15	7.0.4841	June 2018	September 2018	December 2027
Platform update 12	7.0.4709.41182	March 2018	June 2018	December 2027
Platform update 11	7.0.4679.35176	October 2017	April 2018	December 2027
Platform update 10	7.0.4641.16233	August 2017	April 2018	December 2027
Platform update 9	7.0.4612.35162	August 2017	April 2018	December 2027
Platform update 8	7.0.4565.1612	July 2017	April 2018	December 2027

NOTE

Platform releases are cumulative in nature. Any fixes, critical or non-critical, will require customers to take the latest available version of the platform.

Downloadable virtual hard drive (VHD) releases

Use of the VHDs is subject to the [Software license terms](#).

RELEASE	VHD NAME	VHD EXPIRATION DATE
Platform update 12 / Application release 7.2	FinandOps7.2PlatUpdate12.vhd	May 24, 2018
Platform update 12 / Application release 7.3	FinandOps7.3PlatUpdate12.vhd	June 05, 2018
Platform update 15 / Application release 7.3	FinandOps7.3withPlatUpdate15	December 08, 2018

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Service update availability

2/18/2021 • 5 minutes to read • [Edit Online](#)

Microsoft is committed to delivering predictable service updates. These service updates will be made generally available for self-deployment approximately 2 weeks prior to Microsoft automatically applying the update.

Customers will be able to take up to 8 service updates per year and are required to take a minimum of 2 service updates per year. Customers can choose to pause up to 3 consecutive updates at a time. Pausing a service update can apply to the designated user acceptance testing (UAT) sandbox, production, or both environments. After the pause window has ended and if the customer has not self-updated to a supported service update, Microsoft will auto-apply the latest update based on the configuration selection made available in Lifecycle Services (LCS). To learn more about how to pause service updates, see [Pause service updates through Lifecycle Services](#).

NOTE

Service updates will not be provided during the months of March, June, September, and December.

Targeted release schedule (dates subject to change)

NOTE

Sandbox auto-update takes place 7 days prior to the production update. End of service indicates the date when no new cumulative service updates will be provided.

VERSION	PREVIEW AVAILABILITY (PEAP)	GENERALLY AVAILABLE (SELF-UPDATE)	AUTO-UPDATE SCHEDULE (VIA LCS UPDATE SETTINGS) PRODUCTION START DATE	END OF SERVICE
10.0.20	May 28, 2021	July 16, 2021	July 30, 2021	October 22, 2021
10.0.19	April 23, 2021	June 18, 2021	July 2, 2021	September 17, 2021
10.0.18	March 5, 2021	April 16, 2021	April 30, 2021	July 16, 2021
10.0.17	February 1, 2021	March 19, 2021	April 2, 2021	June 11, 2021
10.0.16	November 20, 2020	January 22, 2021	February 1, 2021	April 30, 2021
10.0.15	October 9, 2020	December 4, 2020	January 1, 2021	March 19, 2021
10.0.14	September 4, 2020	October 23, 2020	November 1, 2020	January 22, 2021
10.0.13	August 3, 2020	September 18, 2020	October 1, 2020	December 4, 2020
10.0.12	May 29, 2020	July 22, 2020	August 1, 2020	October 23, 2020
10.0.11	April 17, 2020	May 29, 2020	July 1, 2020	September 11, 2020

VERSION	PREVIEW AVAILABILITY (PEAP)	GENERALLY AVAILABLE (SELF-UPDATE)	AUTO-UPDATE SCHEDULE (VIA LCS UPDATE SETTINGS) PRODUCTION START DATE	END OF SERVICE
10.0.10	March 6, 2020	April 10, 2020	May 1, 2020	July 3, 2020
10.0.9/Platform update 33	February 1, 2020	March 13, 2020	April 1, 2020	June 5, 2020
10.0.8/Platform update 32	November 29, 2019	January 17, 2020	February 1, 2020	May 1, 2020
10.0.7/Platform update 31	October 25, 2019	November 29, 2019	January 1, 2020	March 9, 2020
10.0.6/Platform update 30	September 6, 2019	October 11, 2019	November 1, 2019	January 13, 2020
10.0.5/Platform update 29	August 2, 2019	September 13, 2019	October 1, 2019	December 2, 2019
10.0.4/Platform update 28	June 7, 2019	July 12, 2019	August 1, 2019	October 14, 2019
10.0.3/Platform update 27	May 10, 2019	June 14, 2019	July 1, 2019	September 9, 2019
10.0.2/Platform update 26	April 12, 2019	May 17, 2019	June 1, 2019	August 12, 2019
10.0.1/Platform update 25			May 1, 2019	June 10, 2019

NOTE

The [Software lifecycle policy](#) applies to customers enrolled in First Release and when the service update is made generally available.

Sign up for the PEAP program by joining the Insider Program available at <https://experience.dynamics.com>. After your nomination has been accepted, join the program.

Public previews are made available as a deployable package via the Shared Asset Library in Lifecycle Services. For more details, see [One Version service updates FAQ](#).

Service update overview

Service updates are continuous, touchless updates that provide new features and functionality. They eliminate the need to do expensive upgrades every few years. The service updates maintain backward compatibility, which means there is no need to 'merge your code'. We recommend leveraging tools such as the Regression suite automation tool (RSAT) for regression testing.

You are in control and manage how your organization receives these updates. For example, you can sign up for the First Release program so that your organization receives updates first. You can apply the updates to any of

your environments manually (self-update) or remain on the default release schedule and receive the auto-updates when you schedule them using LCS.

Service updates contain both application and platform changes that are critical improvements to the service, including regulatory updates.

Release processes

Each new release is designed and developed by the Dynamics 365 team. Any new release is first validated by the feature team, then by the Finance and Operations teams. During this time, extensive testing is done on various test topologies. A compatibility checker also runs tests to ensure backward compatibility. In addition, a [Release Validation Program](#) is available for customers to join. This program allows customers to share artifacts, such as databases and code, that is used for benchmarking and tested with automation to provide an additional layer of quality assurance.

Preview Early Access Program (PEAP) is available to partners, customers, and ISV's who opt in through the [PEAP Survey](#). As a participant in the PEAP program you will have first access and visibility into the preview for the upcoming service update. The preview service update is used to validate customizations, learn about new features, and provide feedback to Microsoft. During this phase, the service update must be deployed on a Dev/Test environment. This release cannot be used in production. To join the PEAP program, sign up via the [PEAP Survey](#).

The First Release program is open to all customers. Customers who join the First Release program will be the first, select group of customers to take the service update all the way to production. Microsoft will manage the deployment of this service update to a UAT sandbox and then 7 days later will auto-deploy the update to production. Customers participating in this program have the additional benefit of having dedicated Microsoft engineers closely monitoring the environments for any issues after updates have been applied. To join First Release, sign up via the [First Release Survey](#).

The service update will be made generally available using the action center in LCS. When the service update is available, it can be manually applied to all environments including production. If the service update has not been applied to the designated sandbox or production environment, Microsoft will auto-apply the update based on the Update settings for the LCS project. To learn more, see [Configure service updates through Lifecycle Services](#).

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Apply updates to cloud environments

2/18/2021 • 9 minutes to read • [Edit Online](#)

This topic describes how you can use Microsoft Dynamics Lifecycle Services (LCS) to automatically apply updates to cloud environments.

IMPORTANT

Updates are applied using deployable packages. Applying updates causes system downtime. All relevant services will be stopped, and you won't be able to use your environments while the package is being applied. You should plan accordingly.

Supported environments

All environments deployed through Lifecycle Services are supported.

NOTE

If you have a build environment, you can only use LCS to apply Binary updates and Data upgrade packages. You can't use LCS to apply an Application Deployable package.

For other environments (listed below), you must use Remote Desktop Protocol (RDP) to connect to the environment and install from the command line. For information about manual package deployment, see [Install deployable packages from the command line](#).

- Local development environments (Downloadable virtual hard disk [VHD])
- Multi-box dev/test environments in Microsoft Azure (Partner and trial projects)

Key concepts

Before you begin, you should understand *deployable packages*, *runbooks*, and the *AXInstaller*. A deployable package is a unit of deployment that can be applied in any environment. A deployable package can be a binary update to the platform or other runtime components, an updated application (AOT) package, or a new application (AOT) package. The AXInstaller creates a runbook that enables installing a package. For more details, see [Packages, runbooks, and the AXUpdateInstaller in depth](#) at the end of this topic.

Supported package types

- **AOT deployable package** – A deployable package that is generated from application metadata and source code. This deployable package is created in a development or build environment.
- **Application and Platform Binary update package** – A deployable package that contains dynamic-link libraries (DLLs) and other binaries and metadata that the platform and application depend on. This is a package released by Microsoft. This is available from the **All binary updates** tile from LCS.
- **Platform update package** – A deployable package that contains dynamic-link libraries (DLLs) and other binaries and metadata that the platform depend on. This is a package released by Microsoft. This is available from the **Platform binary updates** tile from LCS.
- **Commerce deployable package** – A combination of various packages that are generated after the Commerce code is combined.
- **Merged package** – A package that is created by combining one package of each type. For example, you can

merge one binary update package and one AOT package, or one AOT package and one Commerce deployable package. The packages are merged in the Asset library for the project in LCS.

NOTE

A binary package and a Commerce deployable package can't be included in the same merged package.

For information about how to download an update from LCS and what you see in the tiles based on your environment version, see [Download updates from Lifecycle Services \(LCS\)](#).

If your environment is on an application version 8.1 and later, then the **Platform Update package** does not apply to your environment. Starting with 8.1 and later releases, **Application and Platform Binary update package** is the one that applies since application and platform will be combined into a single cumulative package and will be released by Microsoft. Also note that you will no longer be applying granular X++ hotfixes and will get all application and platform updates together. This means that on the environment details page, clicking on **View detailed version information** will not have details on the granular hotfixes or KBs applied as there is no way to apply them.

Prerequisite steps

- **Make sure that the package that should be applied is valid.** When a package is uploaded to the Asset library, it isn't analyzed. If you select the package, the package status appears in the right pane as **Not Validated**. A package must pass validation before it can be applied in an environment by using the following procedures. The status of the package will be updated in the Asset library to indicate whether the package is valid. We require validation to help ensure that production environments aren't affected by packages that don't meet the guidelines.

There are three types of validations:

- Basic package format validations
 - Platform version checks
 - Types of packages
- **Make sure that the package is applied in a sandbox environment before it's applied in the production environment.** To help ensure that the production environment is always in a good state, we want to make sure that the package is tested in a sandbox environment before it's applied in the production environment. Therefore, before you request that the package be applied in your production environment, make sure that it has been applied in your sandbox environment by using the automated flows.
 - **If you want to apply multiple packages, create a merged package that can be applied first in a sandbox environment and then in the production environment.** Application of a single package in an average environment requires about 5 hours of downtime. To avoid additional hours of downtime when you must apply multiple packages, you can create a single combined package that contains one package of each type. If you select a binary package and an application deployable package in the Asset library, a **Merge** button becomes available on the toolbar. By clicking this button, you can merge the two packages into a single package and therefore reduce the total downtime by half.
 - **Make sure that the Application binary update package is applied to your dev/build environment before it is applied to your sandbox and production environment** - If the application binary package is applied directly to your Tier 2+ sandbox environment but is not applied on your dev/build environment, the next time you move an AOT package from dev/build box (which does not have the same application binaries as your sandbox environment) to sandbox, some of the application binaries will be overwritten with what is in your dev/build environment. This could result in a regression of the version of your sandbox environment.

Apply a package to a non-production environment by using LCS

Before you begin, verify that the deployable package has been uploaded to the Asset library in LCS.

1. For a binary update, upload the package directly to the Asset library. For information about how to download an update from LCS, see [Download updates from Lifecycle Services \(LCS\)](#). For an application (AOT) deployable package that results from an X++ hotfix, or from application customizations and extensions, create the deployable package in your development or build environment, and then upload it to the Asset library.
2. Open the **Environment details** view for the environment where you want to apply the update.
3. Click **Maintain > Apply updates** to apply an update.
4. Select the package to apply. Use the filter at the top to find your package.
5. Click **Apply**. Notice that the status in the upper-right corner of the **Environment details** view changes from **Queued** to **In Progress**, and an **Environment updates** section now shows the progress of the package. You can refresh the page to check the status.
6. Continue to refresh the page to see the status updates for the package application request. When the package has been applied, the environment status changes to **Deployed**, and the servicing status changes to **Completed**.

Apply a package to a production environment by using LCS

In a production environment, customers can schedule a downtime for when they want the update to be applied.

IMPORTANT

An important prerequisite for applying a package to a production environment is that the package must be successfully applied to at least one sandbox environment in the same project.

1. After the update is successfully applied in a sandbox environment, go to the project's asset library. On the **Asset library** page, select the **Software deployable package** tab, select the package that you want to move to production, and click **Release candidate**. This indicates that this package is ready for production deployment.
2. Open the **Environment details** view for the production environment where you want to apply the package.
3. Select **Maintain > Apply updates** to apply the package.
4. Select the package to apply in your production environment, and then click **Schedule** to submit a request to apply it.

NOTE

The list of packages includes only the packages that have been successfully signed off in the sandbox environment, and that have been marked as release candidates.

5. Specify the date and time to schedule the package application. Click **Submit**, and then click **OK** to confirm. Note that your environments will be unavailable to perform business while the package is being applied.
6. At the scheduled downtime, package deployment will start.
7. After the environment is serviced, you can monitor the status. The **Servicing status** field indicates the status of package application. Additionally, a progress indicator shows the number of steps that have

been run, out of the total number of steps that are available.

8. After the deployment is successfully completed, the **Servicing status** field is set to **Completed**.
9. If package application isn't successfully completed, Microsoft will investigate the issue. The **Servicing status** field will indicate that package application has failed. The environment will be rolled back to a good state.

Troubleshoot package deployment failures

If package deployment fails, see the [Troubleshoot package application issues](#) topic.

Applying updates and extensions

If you are updating a Tier-2 Sandbox or Production environment on application version 8.1.2.x or newer and have initialized Cloud Scale Unit, you will also need to update Commerce channel components. For more information, see [Update Retail Cloud Scale Unit](#).

If you're using components (such as Modern POS), after you've applied updates and extensions in your environment, you must also update your in-store components. For more information, see [Configure, install, and activate Modern POS \(MPOS\)](#).

Packages, runbooks, and the AXUpdateInstaller in depth

Deployable packages, runbooks, and the AXUpdateInstaller are the tools you use to apply updates.

Deployable package – A deployable package is a unit of deployment that can be applied in an environment. A deployable package can be a binary update to the platform or other runtime components, an updated application (AOT) package, or a new application (AOT) package. Deployable packages downloaded from LCS or created in a development environment cannot be applied across product types. For example, a Finance deployable package cannot be applied in a Commerce app environment, and vice versa. If you have an existing customization for a Finance and Operations app that is compatible with the Commerce app, and you would like to apply it to a Commerce environment, you will need to re-package your source code in a Commerce development environment, and conversely if moving in the other direction.

AXDeployablePackage_20160212_22_57_44.zip - ZIP archive, unpacked size 1,221,43; ← Zip format

Name	Size	Pack...	Type
..			File folder
ALMService			File folder
AOSService			File folder
BIService			File folder
DevToolsService			File folder
DIXFService			File folder
MRApplicationService			File folder
MROneBox			File folder
MRProcessService			File folder
PerfSDK			File folder
ReportingService			File folder
RetailCloudPos			File folder
RetailSDK			File folder
RetailSelfService			File folder
RetailServer			File folder
RetailStorefront			File folder
SCMSelfService			File folder
TestAssets			File folder
UserSID			File folder
AutoTriggerETWManifestRefresh.ps1	10,1...	6,065	Window...
AXUpdateInstaller.exe	18,6...	9,365	Applicati...
DefaultServiceModelData.xml	13,4...	724	XML Do...
DefaultTopologyData.xml	1,199	430	XML Do...
HotfixInstallationInfo.xml	2,999	443	XML Do...
Microsoft.Dynamics.AX.AXInstallationInfo.dll	26,3...	12,7...	Applicati...
Microsoft.Dynamics.AX.AXUpdateInstallerBase.dll	42,7...	18,7...	Applicati...
Switch.dll	40,6...	18,9...	Applicati...
System.Management.Automation.dll	2,68...	896...	Applicati...

← Changed files/ folder

← Update Installer

← Modules information

← Topology information

Runbook – The deployment runbook is a series of steps that are generated in order to apply the deployable package to the target environment. Some steps are automated, and some steps are manual. AXUpdateInstaller lets you run these steps one at a time and in the correct order.

- Generated based on topology of deployments with multiples VMs
- Contains step by step information for applying deployable package
- Provides sequence of steps across VMs in multi-box/ HA environment
- Integration for apply automation scripts at each step
 - Stop/ start AOS service, batch service
 - Report deployment, DB sync, ...

```
<?xml version="1.0" encoding="UTF-8"?>
<RunbookData xmlns:xsi="http://www.w3.
  <RunbookID>AXDeployablePackage_2<
  + <RunbookTopologyData>
  + <RunbookServiceModelData>
  + <RunbookStepList>
  + <RunbookLogs>
  </RunbookData>
```

```
<Name>AX topology</Name>
<MachineList>
  - <Machine>
    <Name>AOS-77edc66f7a1</Name>
    - <ServiceModelList>
      <string>AOSService</string>
      <string>DIXFService</string>
      <string>RetailCloudPos</string>
      <string>RetailSelfService</string>
      <string>RetailServer</string>
      <string>SCMSelfService</string>
    </ServiceModelList>
  </Machine>
  + <Machine>
  - <Machine>
    <Name>BI-4bb1b0a48fa5</Name>
    - <ServiceModelList>
      <string>ReportingService</string>
    </ServiceModelList>
  </Machine>
  - <Machine>
    <Name>BI-3c0207c4482e</Name>
```

```
- <Step>
  <ID>1</ID>
  <Description>Stop script for service model: AOSService on machine: AOS-77edc66f7a1</Description>
  <MachineName>AOS-77edc66f7a1</MachineName>
  <ServiceModelName>AOSService</ServiceModelName>
  - <ScriptToExecute>
    <FileName>AutoStopAOS.ps1</FileName>
    <Automated>true</Automated>
    <Description>Stop AOS service and Batch service</Description>
    <RetryCount>0</RetryCount>
  </ScriptToExecute>
  <StartTime>2016-02-17T01:14:45.2397318+00:00</StartTime>
  <EndTime>2016-02-17T01:14:48.6772116+00:00</EndTime>
  <StepState>Completed</StepState>
</Step>
+ <Step>
```

AXUpdateInstaller – When you create a customization package from Microsoft Visual Studio or a Microsoft binary update, the installer executable is bundled together with the deployable package. The installer generates the runbook for the specified topology. The installer can also run steps in order, according to the runbook for a specific topology.

Additional resources

Install deployable packages from the command line

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Apply updates to on-premises deployments

2/18/2021 • 8 minutes to read • [Edit Online](#)

This topic explains how to apply supported updates to Dynamics 365 Finance + Operations (on-premises). All updates to on-premises environments are done through Microsoft Dynamics Lifecycle Services (LCS).

Search for and download updates

For more information about how to find the updates that you can apply to your on-premises environment, see [Issue search in Lifecycle Services \(LCS\)](#). For information about how to download updates from the tiles in the **Updates** section of the **Environment details** page in LCS, see [Download updates from Lifecycle Services \(LCS\)](#).

NOTE

When you are updating an on-premises environment, always select updates from the update tiles on the **Environment details** page. If you select updates from another location, the updates might not work.

Update an on-premises deployment

You can apply updates to an on-premises environment either during deployment or after the deployment is completed.

While an on-premises environment is being deployed, you can select to deploy a custom package in the **Advanced** settings. For more information about how to apply customizations or application X++ updates, see [Develop and deploy custom models to on-premises environments](#).

To apply updates to an on-premises environment after it has been deployed, in LCS, on the **Environment details** page for the environment, under **Maintain**, select **Apply updates**.

NOTE

You can apply updates after deployment only on environments that have Platform update 12 for Finance and Operations or later. The environment must also have the latest version of the local agent available in LCS. For more information, see [Update the local agent](#). If you're on a platform version that is older than Platform update 12, you can reconfigure an environment that is already deployed to update the customizations or update to the latest platform release. For more information about how to redeploy an environment, see [Redeploy on-premises environments](#).

Apply application or binary updates through LCS

The following steps can be used to apply X++, All Binary, or Platform binary updates.

IMPORTANT

The application of updates requires downtime for your environment. Therefore, no business transactions can be performed in the environment during the update. When you complete the following steps, verify that the system isn't being used, and that an official downtime notice has been communicated to all system users.

IMPORTANT

To move to the latest platform, always select the platform update from the **Platform Binary Updates** tile on the **Environment details** page. If you select updates from another location, the updates might not work.

Prerequisites

- Before you begin, complete a full backup of the Management Reporter (MR), Microsoft Dynamics AX, and Microsoft SQL Server Reporting Services (SSRS databases). Although the code is restored through LCS, the database must be manually restored to help guarantee that there is no data loss.
- Update your environment to the latest build of Platform update 12.
- Update the local agent to the latest version. For more information, see [Update the local agent](#).
- Depending on the type of update, complete the following steps to generate a deployable package:
 - **Platform binary updates** – Download or save the update directly to the Asset library in LCS by following the steps in [Download updates from Lifecycle Services \(LCS\)](#).
 - **Application binary updates** – Download or save the update directly to the Asset library in LCS by following the steps in [Download updates from Lifecycle Services \(LCS\)](#).
 - **Application X+ + updates** – Download the required hotfix to your development environment, and then follow the steps in [Create deployable packages of models](#).
 - **Customizations** – Follow the steps in [Develop and deploy custom models to on-premises environments](#).

Update a sandbox environment

1. In the LCS Asset library, upload the deployable package that was generated in the "Prerequisites" section of this topic to the **Software deployable packages** tab.
2. In LCS, open the on-premises implementation project, and then open the **Environment details** page of the environment to update.
3. Under **Maintain**, select **Apply updates**. A slider shows the updates that were uploaded to the Asset library. Note that only packages that are marked as **Valid** in the Asset library appear.

If you are on local agent version 2.1.0 and higher, complete the following steps.

1. Select the update, and then click **Prepare**. Clicking on **Prepare** will prepare your on-premises environment for servicing.

NOTE

During preparation, the environment state will be **Deployed** but the Deployment status field will show the progress of Preparation. Steps such as formatting the package and downloading the package are executed during preparation. The environment is not directly touched during preparation and hence there is no downtime during the preparation phase. Users can continue to use the system during preparation.

2. After the preparation is complete, you will see **Abort** and **Update Environment** buttons. To start applying the update, click **Update Environment**. If preparation fails, see the "Resolve a failed update application" section later in this topic.
3. In the confirmation message, select **Yes**. The servicing operation has started on this environment. This is the start of the downtime on your environment.
4. The environment state is changed from **Deployed** to **Deploying**.
5. After the update is completed, the environment state is changed back to **Deployed**. If application of the

update fails, the environment state is changed to **Failed**. For information about what to do if package application fails, see the "Resolve a failed update application" section later in this topic.

6. Open the **History** and **Environment details** pages to view the operations that were performed on the environment. You can also view a record of major actions that were performed on the environment, such as deployments, servicing, and rollbacks.

If you are on local agent version lower than 2.1.0, complete the following steps.

1. Select the update, and then click **Apply**.
2. In the confirmation message, select **Yes**. The servicing operation has started on this environment. This is the start of the downtime on your environment.
3. Environment state changes from **Deployed** to **Preparing**.

NOTE

During preparation, steps such as formatting the package and downloading the package are executed during preparation. The environment is not directly touched during preparation and hence there is no downtime during the preparation phase. Users can continue to use the system during preparation. However, we recommend that the downtime starts when the environment enters the **Preparing** state.

4. After preparation is complete, the environment state is changed from **Preparing** to **Deploying**.
5. After the update is completed, the environment state is changed back to **Deployed**. If application of the update fails, the environment state is changed to **Failed**. For information about what to do if package application fails, see the "Resolve a failed update application" section later in this topic.
6. Open the **History** and **Environment details** pages to view the operations that were performed on the environment. You can also view a record of major actions that were performed on the environment, such as deployments, servicing, and rollbacks.

Update a production environment

Before you update a production environment, you must successfully complete the package application update on a sandbox environment.

1. In the project for the sandbox environment that you applied the package to, open the Asset library, and then, on the **Software deployable packages** tab, select the package, and mark it as a **Release candidate**.
2. On the **Environment details** page, under **Maintain**, select **Apply updates**. In the dialog box, only packages that are marked as a **Release candidate** are shown.
3. Select the Release candidate package to be applied to the Production environment.
4. The rest of the Update flow is the same as that of a sandbox environment. Your update experience will differ based on the version of the local agent running on your environment. We recommend that you always run with the latest version.

Resolve a failed update application

When preparation fails, the environment state is **Deployed**. When the application of an update fails, the environment state is **Failed**. The first step is to determine why there is a failure. The location of the logs varies, depending on the stage where the failure occurred:

- **Preparation stage:** If the operation fails during the **Preparation** stage, the logs are uploaded to LCS. In the log files, select **Download logs** to download the log files. If the package has any merge issues, the error is included in the log file.
- **Deploying stage:** If the operation fails during the **Deploying** stage, the logs are located in the on-premises

environment. You must sign in to the environment, and then access the logs and event viewer.

For more information about how to use the troubleshooting logs, see [Troubleshoot on-premises deployments](#).

After you review the logs and determine the cause of the failure, complete one of the following operations to restore the environment to a healthy state. No actions can be performed on an environment that is in a **Failed** state. The environment must first be restored to a healthy state.

- **Retry failed operation** – If update application fails, select **Retry** to recover from the failed operation.
- **Abort failed operation** – Because there is no change made to the on-premises environment, if the preparation fails, you have the option to cancel the operation. Select **Abort** to cancel the preparation.
- **Roll back the update** – To roll back the update that failed, select **Rollback**. Before you start the rollback, you must restore the database to the last known good state. When you select **Rollback**, the environment is restored to the last known good state. The environment state is then changed to **Preparation**, then to **Deploying**, and then to either **Deployed** or **Failed**.

NOTE

The **Rollback** button doesn't roll back the database. You're responsible for restoring the database to the last known backup that was made before update application. This step is critical to help guarantee that there is no data loss.

- **Refresh the state** – If update application fails during the **Preparation** stage, the failure is on the LCS side, and update application hasn't yet started. Therefore, the on-premises environment is in a good state. To restore the LCS environment state to **Deployed**, on the project dashboard page, select **Refresh**.
- **Delete and redeploy an environment** – If the retry and rollback options don't work, you must delete and redeploy the environment. To delete the environment, on the project dashboard page, select **Delete**. You then see the option to configure the environment.

IMPORTANT

This option should **not** be used on a production environment. However, it can be used on a sandbox deployment to restore the environment to a healthy state.

Because this option requires that you do a fresh deployment of the environment, you lose any updates that were previously applied. Any customizations and binary updates must be reapplied to the environment.

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Configure service updates through Lifecycle Services (LCS)

2/18/2021 • 4 minutes to read • [Edit Online](#)

In Microsoft Dynamics Lifecycle Services (LCS), you can specify how and when you receive service updates from Microsoft for your environments.

IMPORTANT

This feature is available only to customers who are using **version 8.1 and later** or are using **version 7.3**, and who are **not** part of the [First release](#) program. Microsoft is working to make the feature available to First release customers. For customers who are on version 7.1, 7.2, or 8.0, you can take the update manually using the regular servicing flows.

Only users (customers or partners) who are assigned to the **Project owner** role in LCS can configure updates. Additionally, updates can be configured only for **implementation projects**.

Follow these steps to change your update settings.

NOTE

These settings apply only to service updates. They have no effect on the operating system-level security updates that are applied to your environments every month.

1. In LCS, in your implementation project, open the **Project settings** page.

This page has a new tab that is named **Update settings**.

2. On the **Update settings** tab, set the following configuration options as you require:

- **Update environment** – Select an alternate sandbox environment that should be updated before the production update.

By default, Microsoft first updates the Tier 2 Standard Acceptance Test (sandbox) environment that is included in the base offer. It then applies the update to the production environment. If you've purchased Tier 2 and higher sandbox add-on environments and want a different sandbox to be updated, you can use this field to change the default environment to an alternate environment.

IMPORTANT

The environment that you select here will be updated seven calendar days before the update cadence that is selected for the production environment.

- **Production environment update cadence** – Select a recurring cadence for updates to your production environment. The sandbox environment that is selected in the **Update environment** field will be updated seven calendar days before the selected cadence. The following options are available:
 - **Select the cadence** – Select whether to receive updates in the first, second, or third week of the month.
 - **Select one of the three time-zones** – Select the time zone that the production environment

should be updated in: Eastern Time (UTC – 5), Hong Kong Time (UTC + 8), or Greenwich Mean Time (UTC + 0).

- **Select a day of the week:** Select the day in the week when you want to receive updates.
- **Select a time slot:** Select the time slot when you want to receive updates.

NOTE

Currently, only a few options are available for the day of the week and time slot options. Microsoft will add more options soon, such as weekdays for customers.

IMPORTANT

If the above time slots do not meet your needs, you always have the option to do a self-update at a time that is convenient to you by taking the update and applying it to your environments using the regular servicing flows.

3. When you've finished setting the configuration options, select **Save**.

After you set the update environment and update cadence, Microsoft generates an update calendar for the next six months. This calendar shows exactly when the configured sandbox and production environments will be updated. Therefore, you will know when to expect each update. To view the calendar, select the **View update calendar** link under the **Production environment update cadence** options.

IMPORTANT

After the settings are saved, you can change them at any time. However, if there is an ongoing rollout, the new settings won't be used to update the existing rollout timings. Instead, they will start to be used in the next rollout. An ongoing rollout is defined by the 14-day period between the date when the email notification about the update of the sandbox environment is sent and the date when the production environment is updated.

For more information about how to pause updates to configured sandbox and production environments, see [Pause service updates through Lifecycle Services \(LCS\)](#).

For more information about One Version and Microsoft-managed service updates, see [One Version service updates FAQ](#).

Canceled updates

A scheduled update could be canceled for various reasons. Here are some of the common reasons that could cause a scheduled update to be canceled by Microsoft.

- An error was found during update preparation. The update preparation starts approximately 4 hours before the update to ensure that the environment is in a healthy state. If the environment was in a failed state or maintenance mode, the scheduled update will be canceled before it starts.
- An error was found while updating the environment. If there were issues during the update, the scheduled update will be canceled and the environment is rolled back to the previous state.
- The environment is already running on the latest version. There's no need to apply the update again, the scheduled update will be canceled before it starts.
- The target environment is not found. If the designated sandbox was deleted or the production environment has not been deployed, the scheduled update will be canceled before it starts.
- You're enrolled in the [First Release program](#). The First Release program has different release cadence so the previously scheduled updates will be canceled.

You can find the canceled updates via the **View recent canceled updates** in the update settings. It will show all canceled updates, if any, within the last 2 scheduled updates.

NOTE

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Pause service updates through Lifecycle Services (LCS)

2/18/2021 • 5 minutes to read • [Edit Online](#)

This topic explains how to pause updates to your sandbox and production cloud environments by using Microsoft Dynamics Lifecycle Services (LCS). This topic does not apply to on-premises environments.

IMPORTANT

This feature is available only to customers who are using **version 8.1 and later** or are using **version 7.3**, and who are **not** part of the [First release](#) program. Microsoft is working to make the feature available to First release customers. For customers who are on version 7.1, 7.2, or 8.0, you can take the update manually using the regular servicing flows.

Microsoft updates your configured sandbox and production environments to the latest service update that Microsoft has released. Microsoft notifies you about upcoming updates to your environments via email and through notifications in LCS. At that point, if you can't proceed with the update for some reason, you can pause it through LCS.

For more information about how to change the configured sandbox environment and set the production update cadence, see [Configure service updates through Lifecycle Services \(LCS\)](#).

Who can pause service updates?

Only users (customers or partners) who are assigned to the **project owner** role in LCS can pause updates. Additionally, updates can be paused only for **implementation projects**.

Staying current with service updates helps guarantee that customers always run on the latest set of fixes that Microsoft has released, so that they have the best service experience. Therefore, Microsoft doesn't allow updates to be paused indefinitely.

You can't use LCS to pause updates if you're three or more updates behind the latest update that Microsoft has released. For example, if the latest update that Microsoft has released is version 10.0.0, customers who are on version 8.1.3, version 8.1.2, and version 8.1.1 **can** pause updates. However, customers who are on version 8.1.0 **can't** pause updates, because they are more than three updates behind. Customers who are on version 7.3 can get only platform updates. For example, if the last platform update that Microsoft has released is Platform update 25, customers who are on Platform update 24, Platform update 23, and Platform update 22 **can** pause updates. However, customers who are on Platform update 21 **can't** pause updates.

What can I pause?

If you decide to pause updates, you have two options:

- Pause updates only to your production environment.
- Pause updates to both your sandbox environment and your production environment.

You can pause a maximum of three continuous updates at a time. For example, if you're using version 8.1.3, you can pause update version 10.0.0, 10.0.1 and 10.0.2. However, you can't pause update version 10.0.3. In addition, in the month of June, you can pause the next three updates. However, you will not be able to pause updates scheduled for October, November, December and later. Similarly, for customers on version 7.3 for platform only updates, if you're using Platform update 23 then you can pause update 24, update 25, and update 26, but you

cannot pause update 27. We will be releasing 8 updates in a year. We require you to take at least two updates in a year.

IMPORTANT

There is no way to pause more than three updates, regardless of your industry or business schedule. If you are more than three updates behind and you find a critical issue during validations in your sandbox environment after the update, you can contact Microsoft Support to pause the update to your production environment. This is only required if you are more than three updates behind and you are unable to use the pause updates functionality available in LCS to pause the update to production.

If you pause updates to your sandbox environment, updates are automatically also paused for your production environment, because Microsoft always updates configured sandbox environments before production environments.

How do I pause updates?

To pause updates, follow these steps.

1. In LCS, in your implementation project, open the **Project settings** page.

This page has a new tab that is named **Update settings**.
2. On the **Update settings** tab, set the **Pause updates** option to **ON**.
3. Select **Edit settings**.
4. In the dialog box that appears, select whether you want to pause updates to your production environment only, or to both your sandbox environment and your production environment.
5. Select **Next**.
6. Select your reason for pausing updates. If you select **Issue found during validations**, you must enter a valid support ticket number. You can add any additional details that will help Microsoft understand why you want to pause updates.
7. When you've finished, select **Confirm**.

You can also edit an existing pause. You can either extend the duration of the pause, so that updates are paused for a longer time, or cancel it, so that updates are resumed. To edit a pause, select **Edit settings**. The limitations about the number of updates that you can pause still apply.

To cancel a pause and resume updates to your environments, set the **Pause updates** option to **OFF**.

Any time that you pause updates or edit an existing pause, a notification appears at the top of the **Update settings** tab. This notification shows what has been paused. An email is also sent to all stakeholders (the project owner and environment manager), to notify them that service updates for the selected environments have been paused. If someone cancels an existing pause and resumes updates, the notification disappears, and an email is sent to inform the stakeholders that updates have resumed.

IMPORTANT

You can pause updates through LCS until four hours before the start of the downtime window.

You can cancel a pause and choose to resume updates only 7 days prior to the start of the downtime date. If you are past that date then you will not be able to cancel a pause.

What happens after the pause duration expires?

Cumulative service updates help guarantee that customers always run on the latest set of fixes that Microsoft has released, so that they have the best service experience. Therefore, Microsoft doesn't allow updates to be paused indefinitely.

There are two ways to cancel pauses, so that updates are resumed:

- Someone manually cancels an ongoing pause, as explained in the previous section.
- The duration that was set for the pause expires, and updates to the configured environments are automatically resumed.

In both cases, an email is sent to inform the stakeholders.

For more information about service updates, see [One Version service updates FAQ](#).

NOTE

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Get notified about service updates through Lifecycle Services (LCS)

2/18/2021 • 2 minutes to read • [Edit Online](#)

This topic explains how you can stay up to date about service updates from Microsoft.

Microsoft uses service updates to update your configured sandbox and production environments to the latest released version. Microsoft notifies you about upcoming updates to your environments via email and through notifications in Microsoft Dynamics Lifecycle Services (LCS).

Here are the different types of notifications that you will receive:

- **Notification when an update is made available:** When a new release is made generally available, Microsoft surfaces a notification in your implementation projects' action center. You can then save that update in your projects' asset library, if you want to apply the update to your environments before Microsoft does an automatic update. When Microsoft does an automatic update, it also saves a copy of the update in your projects' asset library.
- **Notification that is sent five days before the update:** Microsoft notifies you five days before it updates your environment. After you've configured your update cadence, you will receive notifications about upcoming updates five days before they occur. These notifications take three forms:
 - **Email notification:** Project owners, environment managers, and users who are listed as additional stakeholders for an environment are notified by email about the upcoming update.
 - **Notification bar on the environment details page:** A notification that appears on the environment details page in LCS informs the customer about the upcoming update.
 - **Upcoming update reflects the update:** On the environment details page in LCS, select **Maintain > Upcoming Update** to open a dialog box that contains details about the upcoming update.
- **Notification that is sent one hour before the update:** One hour before the start of the downtime window, users in the application receive a notification. This notification asks users to save their work, because the environment will be taken down for an update.
- **Notification that is sent when the update is completed:** After Microsoft has finished updating your configured environment, it notifies you by email about the outcome of the update. This email is always sent, regardless of whether the update was successfully applied. It's sent to project owners, environment managers, and users who are listed as the additional stakeholders for the environment. If Microsoft can't start the update for some reason, the email includes a reason to explain why the update wasn't started.

After you receive a notification, if you can't proceed with the update for some reason, you can pause it. For more information about how to pause updates to configured sandbox and production environments, see [Pause service updates through Lifecycle Services \(LCS\)](#).

For more information about One Version and Microsoft-managed service updates, see [One Version service updates FAQ](#).

NOTE

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Data task automation

2/18/2021 • 17 minutes to read • [Edit Online](#)

Data task automation lets you easily repeat many types of data tasks and validate the outcome of each task. Data task automation is very useful for projects that are in the implementation phase. For example, you can automate the creation and configuration of data projects. You can also configure and trigger the execution of import/export operations, such as the setup of demo data and golden configuration data, and other tasks that are related to data migration. You can also create automated testing of data entities by using task outcome validation.

IMPORTANT

Data task automation isn't currently supported for on-premises environments. The user who executes data task automation must be in the same tenant as the application environment and LCS project.

We recommend the following approach for data task automation.

1. Identify the data-related tasks that will benefit from automation.

We recommend that implementation teams review their configuration management plan and data migration plan to identify potential data tasks for automation, and also to identify data entity test cases.

2. Define tasks.

Tasks are defined in an XML manifest. You can keep your manifest under source control as part of configuration management in your application lifecycle management (ALM) strategy.

3. Put the data packages that are related to data task automation in the Shared asset library of Microsoft Dynamics Lifecycle Services (LCS). You can also use a specific LCS project as you require.

Data task automation manager can consume packages from any sandbox and/or production environment that is related to the LCS project.

IMPORTANT

- The user account that runs Data task automation manager must have access to LCS and to the LCS project that is referenced in the manifest for data packages.
- Although data task automation can be run in any environment in the cloud, we strongly recommend that you not run any import/export tasks that use integration application programming interfaces (APIs) in a production environment. Data task automation that involves integration APIs should be used only for automated testing.

4. Run the data tasks, and then review the outcomes.

Data task automation manager provides the success or failure outcome for each task. It also provides insights into the reason why a task failed.

IMPORTANT

Although data task automation can be run in any environments in the cloud, we recommend that you not run any import/export tasks that use integration APIs in a production environment. Data task automation that involves integration APIs should be used only for automated testing.

The following video is a 55-minute TechTalk that walks you through an early release of Data task automation manager: [Task automation framework](#).

Task manifest

A task must be defined in an XML manifest. This section describes the manifest. For guidance about how to name and design the manifest, see the "Best practices for manifest design" section later in this topic.

Manifest root

The `<TestManifest>` element is the root of the manifest. All other elements are children of this element.

```
<?xml version='1.0' encoding='utf-8'?>
<TestManifest name='Data management demo data set up'>
  <SharedSetup />
    <JobDefinition ID='ImportJobDefinition_1' />
    <EntitySetup ID='Generic' />
  </SharedSetup>
  <TestGroup />
</TestManifest>
```

ELEMENT	ELEMENT CARDINALITY	ATTRIBUTES	ATTRIBUTE DESCRIPTION
<code><TestManifest></code>	1..1	name	The <i>name</i> helps to identify the purpose of the manifest.

Shared setup

The **Shared setup** section defines general task parameters and behaviors for all tasks in the manifest.

PARENT ELEMENT	ELEMENT	ELEMENT CARDINALITY	ATTRIBUTES	ATTRIBUTE DESCRIPTION
<code><TestManifest></code>	<code><SharedSetup></code>	1..1	-	This element takes no attributes.

Data files

`<DataFile>` elements define the data packages and data files that the tasks in the manifest will use. The data files must be either in the LCS asset library of your LCS project or in the Shared asset library.

```
<DataFile ID='SharedSetup' name='Demo data-7.3-100-System and Shared' assetType='Data package'
lcsProjectId='' />
<DataFile ID='FinancialsHQUS' name='Demo data-7.3-200-Financials-HQUS' assetType='Data package'
lcsProjectId='' />
<DataFile ID='FinancialsPICH' name='Demo data-7.3-200-Financials-PICH' assetType='Data package'
lcsProjectId='' />
<DataFile ID='FinancialsPIFB' name='Demo data-7.3-200-Financials-PIFB' assetType='Data package'
lcsProjectId='' />
```

PARENT ELEMENT	ELEMENT	ELEMENT CARDINALITY	ATTRIBUTES	ATTRIBUTE DESCRIPTION
<SharedSetup>	<DataFile>	1..n	-	-
	<DataFile>	-	ID	
	<DataFile>	-	name	Name of the asset that represents the data file.
	<DataFile>	-	assetType	The asset type in LCS asset library that stores the data file. This is the asset type name as shown in LCS asset library.
	<DataFile>	-	lcsProjectId	The LCS project that has the data file in its asset library. If the project ID is specified as " " then, it indicates the Shared asset library.

Data project definition

The <JobDefinition> element defines the data project definition. There can be more than one job definition in a manifest.

```

<JobDefinition ID='ImportJobDefinition_1'>
  <Operation>Import</Operation>
  <ConfigurationOnly>No</ConfigurationOnly>
  <Truncate></Truncate>
  <Mode>Import async</Mode>
  <BatchFrequencyInMinutes>1</BatchFrequencyInMinutes>
  <NumberOfTimesToRunBatch >2</NumberOfTimesToRunBatch>
  <UploadFrequencyInSeconds>1</UploadFrequencyInSeconds>
  <TotalNumberOfTimesToUploadFile>1</TotalNumberOfTimesToUploadFile>
  <SupportedDataSourceType>Package</SupportedDataSourceType>
  <ProcessMessagesInOrder>No</ProcessMessagesInOrder>
  <PreventUploadWhenZeroRecords>No</PreventUploadWhenZeroRecords>
  <UseCompanyFromMessage>Yes</UseCompanyFromMessage>
  <LegalEntity>DAT</LegalEntity>
  <PackageAPIExecute>true</PackageAPIExecute>
  <PackageAPIOverwrite>false</PackageAPIOverwrite>
  <PackageAPIReexecute>false</PackageAPIReexecute>
  <DefinitionGroupID>TestExport</DefinitionGroupID>
  <PackageName>TestExportPackage</PackageName>
</JobDefinition>

```

PARENT ELEMENT	ELEMENT	ELEMENT CARDINALITY	ATTRIBUTE	DESCRIPTION
<SharedSetup>	<JobDefinition>	1..n	ID	The job definition ID is used in the tasks to reference the definition to be used for the data project.

PARENT ELEMENT	ELEMENT	ELEMENT CARDINALITY	ATTRIBUTE	DESCRIPTION
<JobDefinition>	<Operation>	1..1	-	The operation to be performed is specified by the following values: - Import - Export
	<Truncate>	1..1	-	This is a Boolean field with possible values of Yes or No. This is applicable only when operation is set to <i>Import</i> .
	<Mode>	1..1	-	The mode specifies the method using which the operation must be performed. The possible values are: - Import async - Export async - Recurring batch: This uses the enqueue API. Dequeue API is not supported yet. Package API supports both export and import.
	<ConfigurationOnly>	0..1	-	This is a Boolean field with possible values of Yes or No. This must be set to Yes if the task is only to configure the data project but not to perform the specified operation.
	<BatchFrequencyInMinutes>	1..1	-	This specifies the frequency in which the batch must be scheduled. This is applicable only when mode is set to <i>recurring batch</i> .
	<NumberOfTimesToRunBatch>	1..1	-	This is used to set a limit to how many times the scheduled batch should run. This is applicable only when mode is set to <i>recurring batch</i> .

PARENT ELEMENT	ELEMENT	ELEMENT CARDINALITY	ATTRIBUTE	DESCRIPTION
	<UploadFrequencyInSeconds>	1..1	-	This is used to control the rate at which a file is uploaded to the recurring batch job for import. This must be used only for automated testing of recurring integrations in non-production environments. This is applicable only when mode is set to <i>recurring batch</i> and operation is set to <i>Import</i> .
	<TotalNumberOfTimesToUpload>	1..1		This controls the total number of times the file should be uploaded to the recurring batch. This must be used only for automated testing of recurring integrations in non-production environments. This is applicable only when mode is set to <i>recurring batch</i> and operation is set to <i>Import</i> .
	<SupportedDataSourceType>	1..1		This must be used to specify if a file is being sent to the recurring batch or a package. This is only applicable when mode is set to 'recurring batch'.
	<ProcessMessagesInOrder>	1..1		This is a Boolean field with possible values of Yes or No. This is applicable only when mode is set to <i>recurring batch</i> and operation is <i>Import</i> .
	<PreventUploadWhenZeroRecords>	1..1		This is a Boolean field with possible values of Yes or No. This is applicable only when mode is set to <i>recurring batch</i> and operation is <i>Export</i> .

PARENT ELEMENT	ELEMENT	ELEMENT CARDINALITY	ATTRIBUTE	DESCRIPTION
	<UseCompanyFrom Message>	1..1		This is a Boolean field which can be set to Yes or No. This is applicable only when mode is set to <i>recurring batch</i> and operation is <i>Import</i> .
	<LegalEntity>	1..1		This is used to specify the legal entity in which the import/export job must be executed.
	<PackageAPIExecute >	1..1		Refer to package API documentation to understand this parameter. This is a Boolean field which takes 'true' or 'false'.
	<PackageAPIOverwrite>	1..1		Refer to package API documentation to understand this parameter. This is a Boolean field which takes 'true' or 'false'.
	<PackageAPIReexecute>	1..1		Refer to package API documentation to understand this parameter. This is a Boolean field which takes 'true' or 'false'.
	<DefinitionGroupID>	1..1		Refer to package API documentation to understand this parameter. This is a string field.
	<PackageName>	1..1		Refer to package API documentation to understand this parameter. This is a string field.

Entity setup

The **Entity setup** section defines the characteristics of an entity that a task in the manifest will use. There can be more than one definition, one for each entity that is used by the tasks in the manifest.

```

<EntitySetup ID='Generic'>
  <Entity name='*'>
    <SourceDataFormatName>Package</SourceDataFormatName>
    <ChangeTracking></ChangeTracking>
    <PublishToBYOD></PublishToBYOD>
    <DefaultRefreshType>Full push only</DefaultRefreshType>
    <ExcelWorkSheetName></ExcelWorkSheetName>
    <SelectFields>All fields</SelectFields>
    <SetBasedProcessing></SetBasedProcessing>
    <FailBatchOnErrorForExecutionUnit>No</FailBatchOnErrorForExecutionUnit>
    <FailBatchOnErrorForLevel>No</FailBatchOnErrorForLevel>
    <DisableEntity>No</DisableEntity>
    <SkipStaging>Yes</SkipStaging>
    <ParallelProcessing>
      <Threshold></Threshold>
      <TaskCount></TaskCount>
    </ParallelProcessing>
    <MappingDetail StagingFieldName='RoundingRulePrices' AutoGenerate='Yes' AutoDefault='No'
    DefaultValue='' IgnoreBlankValues='No' TextQualifier='No' UseEnumLabel='No'/>
  </Entity>
</EntitySetup>

```

PARENT ELEMENT	ELEMENT	ELEMENT CARDINALITY	ATTRIBUTE	DESCRIPTION
<SharedSetup>	<EntitySetup>	1..n	ID	An identification that will be used by tasks to reference an entity definition to be used.
<EntitySetup>	<Entity>	1..1	name	The entity element is identified by the entity's name. However, to facilitate easy manifest definition, this element also supports * as a wild card which will mean all entities being used in a task. This comes in very handy when using data packages with hundreds of entities in a task.
<Entity>	<SourceDataFormat Name>	1..1	-	This is the file format to be used for the entity.
	<ChangeTracking>	1..1	-	This is a Boolean field with possible values of Yes or No. It enables or disables change tracking on the entire entity.
	<PublishToBYOD>	1..1	-	This is a Boolean field with possible values of Yes or No.

PARENT ELEMENT	ELEMENT	ELEMENT CARDINALITY	ATTRIBUTE	DESCRIPTION
	<DefaultRefreshType>	1..1	-	This sets the default refresh rate on the entity. The possible values are <i>Incremental push only</i> or <i>Full push</i> .
	<ExcelWorkSheetName>	1..1	-	This is used to specify the worksheet to be used for the entity.
	<SelectFields>	1..1	-	This can be used to specify the fields to be included in the template for an export operation.
	<SetBasedProcessing>	1..1	-	This is a Boolean field with possible values of Yes or No. It is used to enable or disable set based processing on an entity.
	<FailBatchOnErrorForExecutionUnit>	1..1	-	This is a Boolean field with possible values of Yes or No. It is used to enable or disable failure at execution unit level on an entity.
	<FailBatchOnErrorForLevel>	1..1	-	This is a Boolean field with possible values of Yes or No. It is used to enable or disable failure at execution level on an entity.
	<DisableEntity>	1..1	-	This is a Boolean field with possible values of Yes or No. It is used to enable or disable an entity in a data project.
	<SkipStaging>	1..1	-	This is a Boolean field with possible values of Yes or No. It is used to skip staging table for an entity during exports.

PARENT ELEMENT	ELEMENT	ELEMENT CARDINALITY	ATTRIBUTE	DESCRIPTION
	<ParallelProcessing>	1..1	-	This is used to define the parallel processing set up for an entity. The task will delete these settings if already exists at the beginning of the task and it will delete the created settings at the end of its execution.
<ParallelProcessing>	<Threshold>	1..1	-	This specifies the threshold for the parallel processing rule.
	<TaskCount>	1..1	-	This is used to specify the number of parallel tasks to be used for parallel processing.
<Entity>	<MappingDetail>	0..n	-	Allows to configure the <i>auto generate</i> , <i>auto default</i> and other settings on the mapping for an entity.
	<MappingDetail>	-	StagingFieldName	This attribute is used to identify the entity column for which the settings are to be specified.
	<MappingDetail>	-	AutoGenerate	This is a Boolean field with possible values of Yes or No for enabling/disabling auto generate option.
	<MappingDetail>	-	AutoDefault	This is a Boolean field with possible values of Yes or No for enabling/disabling auto default option.
	<MappingDetail>	-	DefaultValue	This is the default value to be used if auto defaulting is enabled.

PARENT ELEMENT	ELEMENT	ELEMENT CARDINALITY	ATTRIBUTE	DESCRIPTION
	<MappingDetail>	-	IgnoreBlankValues	This is a Boolean field with possible values of Yes or No for enabling/disabling this option.
	<MappingDetail>	-	TextQualifier	This is a Boolean field with possible values of Yes or No for enabling/disabling this option.
	<MappingDetail>	-	UseEnumLabel	This is a Boolean field with possible values of Yes or No for enabling/disabling this option.

Test groups

Test groups can be used to organize related tasks in a manifest. There can be more than one test group in a manifest.

```

<TestGroup name='Set up Financials'>
  <TestCase Title='Import shared set up data package' ID='3933885' RepeatCount='1' TraceParser='off'
  Timeout='20'>
    <DataFile RefID='SharedSetup' />
    <JobDefinition RefID='ImportJobDefinition_1' />
    <EntitySetup RefID='Generic' />
  </TestCase>

  <TestCase Title='Import financials for HQUS' ID='3933886' RepeatCount='1' TraceParser='off'
  Timeout='20'>
    <DataFile RefID='FinancialsHQUS' />
    <JobDefinition RefID='ImportJobDefinition_1'>
      <LegalEntity>HQUS</LegalEntity>
    </JobDefinition>
    <EntitySetup RefID='Generic' />
  </TestCase>

  <TestCase Title='Import financials for PICH' ID='3933887' RepeatCount='1' TraceParser='off'
  Timeout='20'>
    <DataFile RefID='FinancialsPICH' />
    <JobDefinition RefID='ImportJobDefinition_1'>
      <LegalEntity>PICH</LegalEntity>
    </JobDefinition>
    <EntitySetup RefID='Generic' />
  </TestCase>

  <TestCase Title='Import financials for PIFB' ID='3933888' RepeatCount='1' TraceParser='off'
  Timeout='20'>
    <DataFile RefID='FinancialsPIFB' />
    <JobDefinition RefID='ImportJobDefinition_1'>
      <LegalEntity>PIFB</LegalEntity>
    </JobDefinition>
    <EntitySetup RefID='Generic' />
  </TestCase>
</TestGroup>

```

PARENT ELEMENT	ELEMENT	ELEMENT CARDINALITY	ATTRIBUTES	DESCRIPTION
<TestManifest>	<TestGroup>	1..n	-	-
	<TestGroup>	1..1	Name	This is the name for the group to identify its functional reason.
<TestGroup>	<TestCase>	1..n	-	The task is defined in this element. The task can refer to the shared set up to inherit task parameters and task behavior. The task can also override parameters and behavior at its level thus making the management of the manifest simple.
	<TestCase>	-	Title	This is the title for the task.
	<TestCase>	-	ID	This is the ID for the task. This can be alphanumeric with a max character limit of 10.
	<TestCase>	-	RepeatCount	This is a placeholder for a future functionality. However, this must be specified with a value of <i>1</i> .
	<TestCase>	-	TraceParser	This is a placeholder for a future functionality. However, this must be specified with a value <i>off</i> .
	<TestCase>	-	Timeout	This is the maximum duration a task will be monitored by the task automation manager. If the task is still active beyond the timeout specified, the manager will proceed to the next task in the manifest.

PARENT ELEMENT	ELEMENT	ELEMENT CARDINALITY	ATTRIBUTES	DESCRIPTION
<TestCase>	<DataFile>	1..n	-	This element is used to define the file or data package to be used by the task. This can reference to an already declared file or a data package in the shared section of the manifest. A task can have more than one data file specified for recurring batch import scenarios only. For other scenarios, even if more than one files are specified, the first file is what will be used by the task.
	<JobDefinition>	1..1	-	This element is used to define the data project to be used by the task. This can reference to an already declared job definition in the shared section of the manifest. The task can override elements of job definition to a new value than what is defined in the shared set up.
	<EntitySetup>	1..1	-	This element is used to define the entity set up for entities used by the task. This can reference to an already declared entity set up in the shared section of the manifest. The task can override elements of entity setup to a new value than what is defined in the shared set up.

Best practices for manifest design

You can define a manifest in many ways. Here are a few pointers that you should consider when you design a manifest.

Granularity

We recommend that you determine the granularity of your manifest as a functional decision. Your team must

decide whether it wants to manage many manifests or manage changes in a single manifest.

- Start with as many manifests as your team thinks you logically need. Later, when the team actually starts to run the manifests, it might find that it uses fewer manifests than it expected, and it might want to merge them. In this case, you can merge manifests.
- Consider separation of duties. For example, you might have one manifest for the setup of demo data and another manifest for the setup of the golden configuration for your environment. In this way, you can make sure that team members use only the manifests that they are supposed to use.
- Consider user access to LCS. For example, larger and globally distributed implementation teams might have multiple instances of the application or multiple LCS projects.

Inheritance

The manifest schema supports inheritance of common elements that will apply to all tasks in the manifest. A task can override a common element to define a unique behavior. The purpose of the **Shared setup** section is to minimize repetition of configuration elements, so that elements are reused as much as possible. The goal is to keep the manifest concise and clean, to improve maintenance and readability.

Source control

Manifests that must be used by all the members of an implementation team should be stored in source control in the Application Object Tree (AOT). This approach not only provides the benefits of source control, but also enables a process to distribute or make manifests available to all users in a consistent manner. This approach also enables configuration management for data projects that are related to data management, if manifests are used for configuration.

Number of job definitions and entity definitions

For most of the use cases, one job definition in a manifest should be enough, because inheritance can be used to change the behavior at the task level. This principle also applies to entity definitions.

Validations

Data task automation manager performs validations, based on the setup of a task. If a task fails, you can quickly determine the reason for the failure by viewing the validations after the task is completed. The level of information that Data task automation manager provides is optimized to facilitate initial discovery. For detailed investigation, you must look at the corresponding data project and its execution details.

The following data validations are currently supported:

- **Job status** – This validation checks whether the job was successful.
- **Batch status** – This validation checks whether the batch was successful.
- **Message status** – If the test is about integrations, the message status is validated.
- **Truncation** – If truncation is enabled, this validation checks whether truncation occurred.
- **Skip staging** – If **Skip staging** is enabled on a test, this validation checks whether staging was skipped.

Example 1: Configuration management for data projects

The `<ConfigurationOnly>` element can be used to create configuration tasks for data projects. When `ConfigurationOnly` is set to `Yes`, the data projects are only created but not executed. This allows for managing data projects across environments in an automated manner.

```
<?xml version='1.0' encoding='utf-8'?>
<TestManifest name='Data management demo data set up'>
  <SharedSetup>
    <DataFile ID='SharedSetup' name='Demo data-7.3-100-System and Shared' assetType='Data package'
lcsProjectId='' />
    <DataFile ID='FinancialsHQUS' name='Demo data-7.3-200-Financials-HQUS' assetType='Data package'
```

```

lcsProjectId='' />
  <DataFile ID='FinancialsPICH' name='Demo data-7.3-200-Financials-PICH' assetType='Data package'
lcsProjectId='' />
  <DataFile ID='FinancialsPIFB' name='Demo data-7.3-200-Financials-PIFB' assetType='Data package'
lcsProjectId='' />

  <JobDefinition ID='ImportJobDefinition_1'>
    <ConfigurationOnly>Yes</ConfigurationOnly>
    <Operation>Import</Operation>
    <Truncate>No</Truncate>
    <Mode>Import async</Mode>
    <BatchFrequencyInMinutes>1</BatchFrequencyInMinutes>
    <NumberOfTimesToRunBatch >2</NumberOfTimesToRunBatch>
    <UploadFrequencyInSeconds>1</UploadFrequencyInSeconds>
    <TotalNumberOfTimesToUploadFile>1</TotalNumberOfTimesToUploadFile>
    <SupportedDataSourceType>Package</SupportedDataSourceType>
    <ProcessMessagesInOrder>No</ProcessMessagesInOrder>
    <PreventUploadWhenZeroRecords>No</PreventUploadWhenZeroRecords>
    <UseCompanyFromMessage>Yes</UseCompanyFromMessage>
    <LegalEntity>DAT</LegalEntity>
  </JobDefinition>

  <EntitySetup ID='Generic'>
    <Entity name='*'>
      <SourceDataFormatName>Package</SourceDataFormatName>
      <ChangeTracking>No</ChangeTracking>
      <PublishToBYOD>No</PublishToBYOD>
      <DefaultRefreshType>Full push only</DefaultRefreshType>
      <ExcelWorkSheetName></ExcelWorkSheetName>
      <SelectFields>All fields</SelectFields>
      <SetBasedProcessing>No</SetBasedProcessing>
      <FailBatchOnErrorForExecutionUnit>No</FailBatchOnErrorForExecutionUnit>
      <FailBatchOnErrorForLevel>No</FailBatchOnErrorForLevel>
      <FailBatchOnErrorForSequence>No</FailBatchOnErrorForSequence>
      <ParallelProcessing>
        <Threshold></Threshold>
        <TaskCount></TaskCount>
      </ParallelProcessing>
    </Entity>
  </EntitySetup>
</SharedSetup>

  <TestGroup name='Set up import jobs for Financials'>
    <TestCase Title='Set up import job for shared set up data package' ID='3933885' RepeatCount='1'
TraceParser='off' TimeOut='20'>
      <DataFile RefID='SharedSetup' />
      <JobDefinition RefID='ImportJobDefinition_1' />
      <EntitySetup RefID='Generic' />
    </TestCase>

    <TestCase Title='Set up import job for financials HQUS' ID='3933886' RepeatCount='1'
TraceParser='off' TimeOut='20'>
      <DataFile RefID='FinancialsHQUS' />
      <JobDefinition RefID='ImportJobDefinition_1'>
        <LegalEntity>HQUS</LegalEntity>
      </JobDefinition>
      <EntitySetup RefID='Generic' />
    </TestCase>

    <TestCase Title='Set up import job for financials PICH' ID='3933887' RepeatCount='1'
TraceParser='off' TimeOut='20'>
      <DataFile RefID='FinancialsPICH' />
      <JobDefinition RefID='ImportJobDefinition_1'>
        <LegalEntity>PICH</LegalEntity>
      </JobDefinition>
      <EntitySetup RefID='Generic' />
    </TestCase>

    <TestCase Title='Set up import job for financials PIFB' ID='3933888' RepeatCount='1'

```

```

TraceParser='off' Timeout='20'>
  <DataFile RefID='FinancialsPIFB' />
  <JobDefinition RefID='ImportJobDefinition_1'>
    <LegalEntity>PIFB</LegalEntity>
  </JobDefinition>
  <EntitySetup RefID='Generic' />
</TestCase>
</TestGroup>
</TestManifest>

```

Example 2: Automated setup of demo data

The following manifest shows the setup of demo data for three legal entities when the demo data packages are stored in the Shared asset library. The difference in this example from the previous example is the actual execution of the data projects to set up the demo data. This is accomplished by not using the ConfigurationOnly option or setting it to No to use it for consistency of the manifest.

```

<?xml version='1.0' encoding='utf-8'?>
<TestManifest name='Data management demo data set up'>
  <SharedSetup>
    <DataFile ID='SharedSetup' name='Demo data-7.3-100-System and Shared' assetType='Data package'
lcsProjectId='' />
    <DataFile ID='FinancialsHQUS' name='Demo data-7.3-200-Financials-HQUS' assetType='Data package'
lcsProjectId='' />
    <DataFile ID='FinancialsPICH' name='Demo data-7.3-200-Financials-PICH' assetType='Data package'
lcsProjectId='' />
    <DataFile ID='FinancialsPIFB' name='Demo data-7.3-200-Financials-PIFB' assetType='Data package'
lcsProjectId='' />

    <JobDefinition ID='ImportJobDefinition_1'>
      <Operation>Import</Operation>
      <Truncate></Truncate>
      <Mode>Import async</Mode>
      <BatchFrequencyInMinutes>1</BatchFrequencyInMinutes>
      <NumberOfTimesToRunBatch >2</NumberOfTimesToRunBatch>
      <UploadFrequencyInSeconds>1</UploadFrequencyInSeconds>
      <TotalNumberOfTimesToUploadFile>1</TotalNumberOfTimesToUploadFile>
      <SupportedDataSourceType>Package</SupportedDataSourceType>
      <ProcessMessagesInOrder>No</ProcessMessagesInOrder>
      <PreventUploadWhenZeroRecords>No</PreventUploadWhenZeroRecords>
      <UseCompanyFromMessage>Yes</UseCompanyFromMessage>
      <LegalEntity>DAT</LegalEntity>
    </JobDefinition>

    <EntitySetup ID='Generic'>
      <Entity name='*'>
        <SourceDataFormatName>Package</SourceDataFormatName>
        <ChangeTracking></ChangeTracking>
        <PublishToBYOD></PublishToBYOD>
        <DefaultRefreshType>Full push only</DefaultRefreshType>
        <ExcelWorkSheetName></ExcelWorkSheetName>
        <SelectFields>All fields</SelectFields>
        <SetBasedProcessing></SetBasedProcessing>
        <FailBatchOnErrorForExecutionUnit>No</FailBatchOnErrorForExecutionUnit>
        <FailBatchOnErrorForLevel>No</FailBatchOnErrorForLevel>
        <FailBatchOnErrorForSequence>No</FailBatchOnErrorForSequence>
        <ParallelProcessing>
          <Threshold></Threshold>
          <TaskCount></TaskCount>
        </ParallelProcessing>
      </Entity>
    </EntitySetup>
  </SharedSetup>

  <TestGroup name='Set up Financials'>

```



```
<TestCase Title='Import shared set up data package' ID='3933885' RepeatCount='1' TraceParser='off'
TimeOut='20'>
  <DataFile RefID='SharedSetup' />
  <JobDefinition RefID='ImportJobDefinition_1' />
  <EntitySetup RefID='Generic' />
</TestCase>

<TestCase Title='Import financials for HQUS' ID='3933886' RepeatCount='1' TraceParser='off'
TimeOut='20'>
  <DataFile RefID='FinancialsHQUS' />
  <JobDefinition RefID='ImportJobDefinition_1'>
    <LegalEntity>HQUS</LegalEntity>
  </JobDefinition>
  <EntitySetup RefID='Generic' />
</TestCase>

<TestCase Title='Import financials for PICH' ID='3933887' RepeatCount='1' TraceParser='off'
TimeOut='20'>
  <DataFile RefID='FinancialsPICH' />
  <JobDefinition RefID='ImportJobDefinition_1'>
    <LegalEntity>PICH</LegalEntity>
  </JobDefinition>
  <EntitySetup RefID='Generic' />
</TestCase>

<TestCase Title='Import financials for PIFB' ID='3933888' RepeatCount='1' TraceParser='off'
TimeOut='20'>
  <DataFile RefID='FinancialsPIFB' />
  <JobDefinition RefID='ImportJobDefinition_1'>
    <LegalEntity>PIFB</LegalEntity>
  </JobDefinition>
  <EntitySetup RefID='Generic' />
</TestCase>
</TestGroup>
</TestManifest>
```

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Delivering ISV solutions using One Version

2/18/2021 • 17 minutes to read • [Edit Online](#)

Thanks to One Version, new updates are now automatically broadcast, downtime is minimal, and customers enjoy the benefits of staying current with recent features and fixes without having to go through expensive upgrades.

Feature management lets customers control when new features are applied. Therefore, as an independent software vendor (ISV) partner, you can innovate together with Microsoft to take advantage of new features without having to handle the waiting times that come with long release cycles. When all your customers run on current versions, you have fewer versions to maintain. You can focus instead on building quality into the solutions that you provide for your customers.

The process of servicing current versions is also more seamless and safer than it was in earlier versions. Previously, patching required that individual fixes be combined and merged into a customer environment.

Extensibility allows for deployment of side-by-side solutions that give customers more choices about how they configure their solutions.

In the One Version model, customer user acceptance testing (UAT) environments and production environments are updated every month. It's critical that updates not cause issues. However, Microsoft acknowledges that both technical issues and functional issues may arise when environments are updated.

- Technical issues include breaking changes in application programming interfaces (APIs) that customizations in your solutions use.
- Functional issues that customers experience can be caused by the untimely introduction of new features. Microsoft will put any new functionality that might affect existing processes under feature management. In this way, customers can control when new functionality is adopted. Therefore, they have time to validate, document, and train their users about the new features.
- Functional issues might also be unintended changes that cause functional regressions.

Prevention of technical and functional issues is difficult and requires close coordination between Microsoft and you as an ISV partner. The Microsoft goal is that you will adopt practices that resemble Microsoft practices. This topic explains how you and Microsoft can achieve this goal together. Over the next several months, Microsoft will release new practices and tools to help you. This topic will be updated as the tools and practices evolve.

This topic includes the following sections:

- [Servicing customers](#)
- [Compatibility](#)
 - [Runtime compatibility](#)
 - [Design-time compatibility](#)
- [Developing new releases](#)
 - [Designing for extensibility](#)
 - [Data upgrade](#)
 - [Feature exposure](#)
- [Branches and builds](#)
- [Testing](#)

- [Deploying updates](#)
- [ISV solutions as part of One Version automated deployment](#)
- [Should I release binaries or source code?](#)

Servicing customers

Dynamics 365 Finance and Operations apps run on Microsoft Azure. Therefore, it's a solution that runs as a service. Microsoft services companies 24/7, either proactively from alerts that report unusual behavior, or from support tickets that are submitted by customers or their partners. Microsoft has a range of tools to help support the services that are running. These tools include usage data that is collected from the services. To help safeguard customer data, Microsoft is also careful about who can access customer systems.

When Microsoft analyzes an issue, it might determine that the issue is related to your ISV solution. Microsoft reports this type of issue to you, so that you can follow up offline.

Companies can opt out of updates for two consecutive service updates before the next service update is applied to their environments. Therefore, at any time, Microsoft can expect that companies will be running one of the last three monthly updates.

When Microsoft resolves an issue that requires a code fix, it generally includes that code fix in the next monthly update. However, very critical issues that are reported, such as production outage, might require that a fix be provided for the version that customers are currently running.

Similar policies apply to your ISV solution, and you might also have to provide a code update. For your solution to be binary-compatible with all your customers, it must be built on the oldest platform release that you want to support. All new updates that Microsoft releases are intended to be binary backward-compatible. This compatibility gives you the option of maintaining only one servicing version of your solution that is based on the oldest of the three most recent updates. Therefore, you must maintain just one released solution. You can then use that solution to update all your customers, regardless of which of the three most recent updates they are running. As your customers adopt new Microsoft updates, you can rebase your maintained solution to a newer release to remain current with the three most recent updates.

This recommendation applies to servicing and maintaining your released solution. You will use a different approach to develop new releases of your solution. For more information, see the [Developing new releases](#) section of this topic.

Compatibility

Microsoft diligently tries to guarantee compatibility with existing customizations. To achieve this goal, Microsoft uses strict practices in its engineering processes, together with tool and automation support that helps identify API contracts that are unintentionally broken. Telemetry lets Microsoft engineers determine customizations that reference or extend a Microsoft API.

Updates to Finance and Operations apps that are applied to customer environments are intended to be functionally compatible and binary-compatible with existing customizations. This compatibility covers not only APIs, but also functionality and the user experience. Customers must explicitly opt in to all new experiences.

Any deprecation or breaking change in binary or functional compatibility will be announced 12 months in advance. Therefore, you will have enough time to align your customizations with an alternative design. You must pay attention to the monthly updates to Microsoft documentation, and you must review the APIs that are marked as obsolete (deprecated) or internal. In this way, you will be able to manage changes in a timely manner.

The following sections define and describe the aspects of backward compatibility: runtime compatibility and design-time compatibility.

Runtime compatibility

All new updates are intended to be runtime backward-compatible. This compatibility covers both binary compatibility and functional compatibility. Runtime compatibility means that customizations that exist in production and sandbox environments will continue to work after new updates are deployed in those environments. These updates include both service updates and quality updates.

Runtime compatibility also means that changes made by Microsoft to the platform will be backward-compatible with customizations that were compiled on an earlier platform.

Binary compatibility is backwards only. You can compile a customization on an older platform, and deploy it to a customer environment that has been updated to a later version. You cannot deploy code compiled on a later version than the one running on the environment you deploy to.

Design-time compatibility

Design-time backward compatibility (that is, compile-time compatibility) means that developers can apply updates to their development environments and successfully compile their code without having to make any changes.

You must be aware of how APIs in your solution are used in your customers' implementations, and how you can use these APIs without causing breaking changes. As part of this effort, you must pay careful attention to what is changed and rely on engineering best practices. For examples of changes that you should avoid, see [Breaking changes](#).

You should try to meet a bar that resembles the bar that Microsoft sets. In that way, both you and Microsoft can help avoid creating regressions.

All Microsoft updates are intended to be binary (runtime) compatible, and Microsoft also aims for design-time compatibility. However, there is one category of required changes that is **not** design time-compatible but remains binary-compatible. After an update is applied, new errors or warnings might occur when your code is compiled. Here are some examples of these changes:

- Microsoft makes an enumeration extensible.
- Microsoft marks an API as obsolete or internal.
- Microsoft introduces a new compiler error to help avoid unsafe coding practices.

All these changes might require work on your solution.

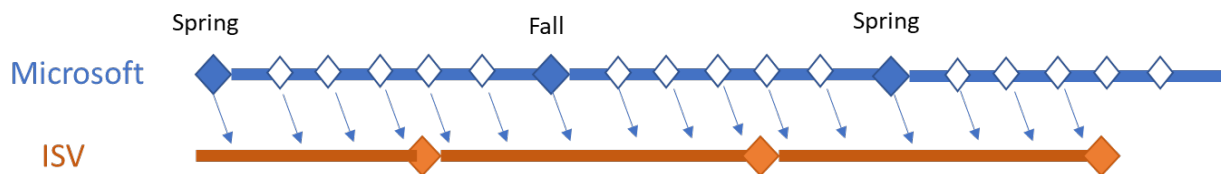
Design-time breaking changes that are binary-compatible don't require a 12-month deprecation notice.

Developing new releases

Together, One Version and the fact that the Finance and Operations apps run as a service provides a great vehicle for collecting feedback. Feedback is useful, because it helps Microsoft decide which new features it should add to upcoming updates. Historically, the Microsoft approach has been to release major releases that include many new features. However, the new model encourages a different approach. Therefore, Microsoft has moved to a series of continuous updates that gradually build on the available capabilities of the system. In many cases, one update contains an initial small feature that Microsoft then enriches in later updates. In some cases, Microsoft must provide staging for new features, and must use feature exposure to hide the new features or control modifications to them.

We recommend that you follow a similar approach for your ISV solutions. You will benefit from quicker integration and extension of new standard features.

As the following illustration shows, the frequency of your new releases can be independent of Microsoft releases. You should consider adopting a strategy for source code branching, as described in the [Branches and builds](#) section of this topic.



What is essential is the quality of every update that is released. Although testing helps guarantee quality, quality must also be built in during the design and implementation phases. In the One Version model, there are some new dimensions to consider, as described in the following sections.

Designing for extensibility

To design your solution for extensibility, you must consider now only how you will customize by extending the standard application, but also how you will enable customization of your ISV solutions by your customers and partners.

Make sure that customizations are additive instead of intrusive, and follow the guidance on the [Extensibility home page](#).

Don't be too creative about the way that you build your customization. Otherwise, you might extend an API that is questionable and increase the risk that later updates will break your solution. Instead, log an [extensibility request](#), and ask that Microsoft create a more explicit API that is more resilient to breakage.

Design solutions that are extensible. For inspiration, see [Write extensible code](#).

Design for backward compatibility to avoid breaking customer implementations. A good strategy is to be explicit about what you offer for hooking and wrapping extension code. The way that you decorate your methods gives you lots of control over which methods you enable extensions for. For more information, see [Attributes that make methods extensible](#).

Data upgrade

The types of data upgrade jobs that existed in earlier versions are no longer supported. This change was made because Microsoft wants to provide minimum downtime while a production environment is updated.

Database synchronization is still run during upgrade, and it supports basic operations such as adding new tables, field, and indexes.

To prevent downtime, Microsoft is introducing new ways of driving data upgrade that are run asynchronously. For example, data upgrade will sometimes be triggered when a feature is turned on through a feature flag. This new approach for data upgrade differs significantly from earlier approaches and will become available in upcoming updates. Documentation resources will also be available.

Feature exposure

In the One Version model, updates are managed by Microsoft and pushed to customer environments. Pushed updates should not require that customers adjust to functional changes, or that they train their users about new or changed features every month. Pushed updates also should not cause customers to delay updates to their environment.

Feature management is a new concept that puts customers in control of deciding when new or changed features are used. Customers can review, validate, and document new or changed features before they are adopted. They can also train users before new or changed processes are adopted, to reduce the impact on daily operations.

Feature management will be released in upcoming monthly updates.

You should consider using feature management with your ISV solution to let customers control when new features are adopted.

Branches and builds

As an ISV, you should plan on a minimum of two source code branches: a servicing branch and a development branch.

Servicing branch

The servicing branch is used to produce bug fixes for your ISV solution. As the ISV, you specify the frequency of releases from the branch and distribution of the releases. The expectation is that these releases from the servicing branch will be binary cumulative releases.

The base Microsoft version that you use to build your ISV solution should match the oldest version that customers use with the solution. In the One Version model, that version starts with version 8.1 and is a maximum of three months old.

Development branch

The development branch is used to develop new capabilities for the ISV solution. As the ISV, you determine the frequency of releases from the development branch. You don't have to synchronize your releases with the monthly Microsoft releases. The best approach might be to decouple your release schedule from the Microsoft release schedule and deliver releases less often. A quarterly or biannual cadence is a good starting point.

The base Microsoft version in the development branch should be either the latest released version that is available or the released version that you plan to use for servicing when your new release goes out. The goals are that you innovate together with Microsoft by staying as current as is feasible, and that your development model allows for uptake of recent feature work.

Testing

Microsoft has several checks and balances in its development process to help guarantee functional and binary compatibility. ISV solutions must be validated with each Microsoft release to help guarantee this compatibility. The expectation is that you will do this validation during the Partner Early Access Program (PEAP) phase of each release.

It's very important that you provide quick turnaround for feedback, so that you will have time to fix any issues before the monthly updates are deployed in customer environments.

Test automation is important for quick validation of new updates. Microsoft plans to release the test framework and libraries to support you as you build your test automation.

Microsoft has an extensive suite of tests that support our validation. The expectation is that you, as an ISV, will create your own suites of automated tests.

In addition to the SysTest automation framework that is aimed at developers, the [Regression Suite Automation Tool \(RSAT\)](#) enables automation of business processes without requiring that code be written. Functional users can use the RSAT to record their critical tests and automate part of their UAT. You can also use the RSAT as you start to build your test automation.

Recently, Microsoft released the [Acceptance test library resources](#) and accompanying libraries. This framework is aimed at developers and lets them build tests that are more comprehensive than unit tests. The libraries that accompany the framework help make it a seamless way to build suites of tests.

Currently released products – Testing binary and functional compatibility

The currently released product that is maintained in the servicing branch should first be tested for binary and functional compatibility. Your suite of automated developer tests, automated functional tests, and manual tests for your ISV solution should be run on an environment that has the new version from Microsoft and your existing ISV solution. Because this test run is testing for binary and functional compatibility, the ISV solution should **not** be recompiled.

If the testing is successful, this step will validate that a customer installation of the current version of your ISV solution won't have to be updated when Microsoft broadcasts the new release to the customer.

If the testing isn't successful, you, as the ISV, must immediately notify Microsoft through the [PEAP communication process](#). This process uses Yammer and an issue notification process. The issue will require either a fix from Microsoft or a fix in your ISV solution. A fix in your solution might, in turn, require that customers be updated from the servicing branch. In both cases, Microsoft must know about the issue, so that it can become more proactive in its processes for future releases.

Currently released products – Testing design-time compatibility

Next, the currently released product that is maintained in the servicing branch should be tested for design-time compatibility. To do this testing, you should compile the solution against a deployment of the new Microsoft release. Although the goal of Microsoft is to minimize design-time compatibility issues, they might occur in some situations. One example is when Microsoft makes an enumeration extensible, and the solution uses it in a manner that assumes an underlying integer representation (for example, it uses the enumeration value in a logical comparison or mathematical function). Although the code will continue to work in a customer deployment because the underlying values are maintained, a compiler error is generated and addressed in future releases. Another example of a design-time compatibility issue is when Microsoft introduces a new compiler error to protect against unsafe coding patterns. To learn about more categories of design-time compatibility issues, see [Breaking changes](#).

You should run your suite of automated developer tests, automated functional tests, and manual tests on an environment that has the new version from Microsoft and your compiled ISV solution.

If the testing is successful, this step will validate that your ISV solution won't have to be updated even if source code is supplied to the customer and the customer recompiles the ISV solution.

If the testing isn't successful, and the issue isn't one of the categories that are described in [Breaking changes](#), you, as the ISV, must immediately notify Microsoft through the [PEAP communication process](#). This process uses Yammer and an issue notification process. The issue will require either a fix from Microsoft or a fix in your ISV solution. A fix in your solution might, in turn, require that customers be updated from the servicing branch. In both cases, Microsoft must know about the issue, so that it can become more proactive in its processes for future releases.

Currently released products – Updating the base build

As Microsoft updates your customers to new releases, you should periodically update the base build, so that it matches the oldest version that is used by customers who run your ISV solution.

Solutions that are in development

You validate your new solution development on either the latest released version or the released version that you plan for to use for servicing when your new release goes out. However, in both cases, consider doing validation on the most current version. This validation will help with early discovery of issues or uptake work that you must do.

If an unexpected break occurs, then you, as the ISV, must immediately notify Microsoft through the [PEAP communication process](#). This process uses Yammer and an issue notification process.

Deploying updates

For Microsoft standard platform and application updates, One Version servicing includes a process for automated updates of customer environments. However, this automation isn't currently available for ISV solutions. For more information, see [ISV's as part of One Version service updates](#).

ISV solutions are manually updated, and you control your release cadence. The binary backward compatibility allows for safe updates of the standard platform and application.

The update process includes database synchronization (for example, the addition of new fields and indexes).

ISV solutions as part of One Version automated deployment

Although Microsoft doesn't currently plan to release ISV solutions as part of the One Version automated deployment process, this option might become available at some point. However, Microsoft must first align engineering processes to make this option feasible.

Here are some areas where alignment will be required:

- **Feature management** – The user must be able to control when a new feature is turned on.
- **Backward compatibility and compliance** – Compliance with API customization usage is required.
- **Feature deprecation** – Advanced notice about deprecation of features or APIs must be provided.
- **Test automation suite**
- **Testing during the preview phase**
- **ISV solution sign-off and upload**
- **Automated deployment scripts**
- **Zero downtime** – Deployment of updates must be instantaneous.
- **Data migration without downtime**
- **Support for on-call duty, for servicing of critical production issues**

Should I release binaries or source code?

Binary compatibility is supported, provided that you don't recompile. We recommend that your ISV solution not be compiled in customer environments. Instead, you should deploy precompiled binaries that you've prepared and validated. Your solution binaries can then be created from your servicing branch, based on an earlier version, when this approach is practical.

If an implementation partner or customer compiles your solution in an updated environment, new warnings and errors might occur, as was mentioned in the [Design-time compatibility](#) section of this topic. Therefore, we recommend that implementation partners not compile your solution. However, this recommendation doesn't mean that you shouldn't share your source code to help support debugging, for example. You should just consider taking steps to avoid compilation of your code, so that implementation partners aren't exposed to design-time issues.

NOTE

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Create and automate user acceptance tests

2/18/2021 • 8 minutes to read • [Edit Online](#)

You can use Task recorder and Business process modeler (BPM) to create user acceptance test libraries. Task recorder is a powerful tool to record test cases and organize them by business process using BPM. As a Microsoft partner you can use BPM to distribute test libraries to your customers via LCS and LCS solutions. If you are a customer, use BPM to author and distribute test libraries across different projects and team.

Because BPM can be synchronized with Azure DevOps (formerly known as Visual Studio Team Services), you can automatically create test cases (including test steps) in your Azure DevOps project. Azure DevOps can then serve as your test configuration and test management tool where you can create targeted test plans and test suites, manage the execution of tests and investigate results. For more information about testing with Azure DevOps, see [What are test plans, test suites, and test cases?](#)

This topic walks through the process of creating and executing acceptance test suites to be used for manual or automated testing.

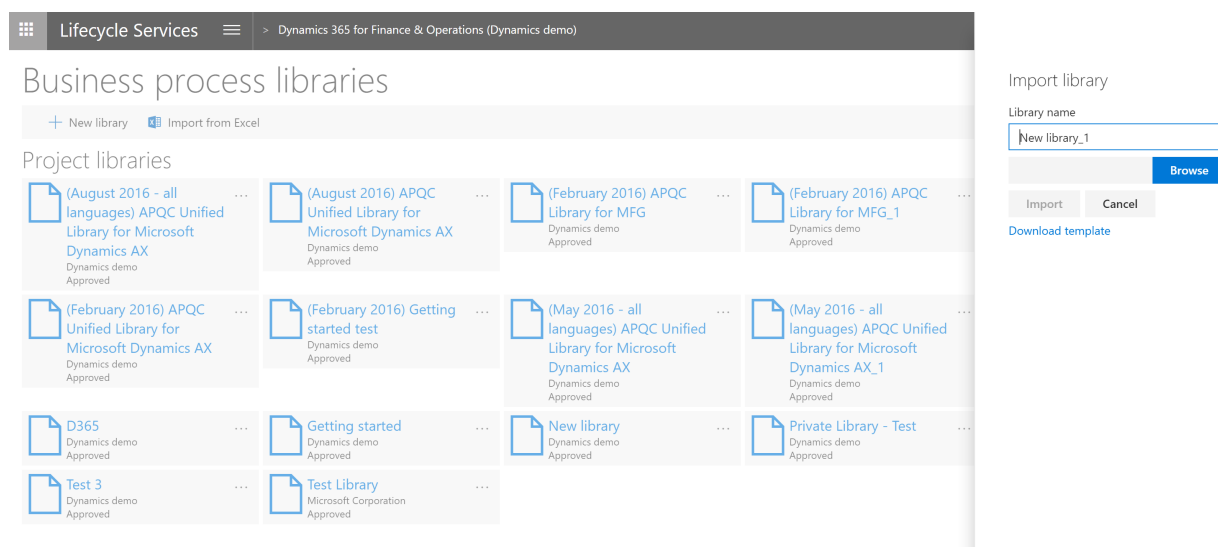
Create a Scenario Acceptance Testing BPM library

BPM is a great LCS tool to describe a hierarchy of business processes and user tasks. LCS also allows Microsoft partners and customers to author and distribute BPM libraries across LCS projects via the Asset library. This section describes how to take advantage of BPM to define your acceptance test library.

Create a BPM library

There are several ways to create a Business process modeler (BPM) library. For more information about how to create libraries in BPM, see [Create, edit, and browse Business process modeler \(BPM\) libraries](#).

For illustration purposes, this topic uses a library that contains common business processes, such as create an expense report and approve order requests. The library was created by using the Excel import functionality.



The screenshot displays the Lifecycle Services interface for Dynamics 365 for Finance & Operations. The main area shows a grid of 'Business process libraries' with various titles like '(August 2016 - all languages) APQC Unified Library for Microsoft Dynamics AX' and 'Getting started test'. On the right, an 'Import library' dialog is open, showing a text input field with 'New library_1' and buttons for 'Browse', 'Import', 'Cancel', and 'Download template'.

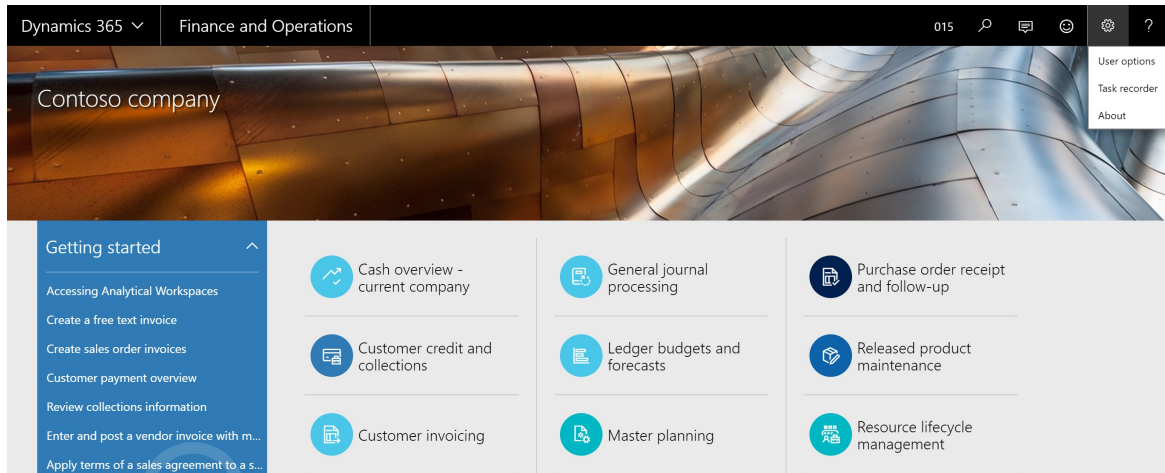
Record test cases and save to BPM

After you have created a BPM library, you'll need to use Task recorder to create your test cases and then upload the cases to BPM. There are several ways to do this.

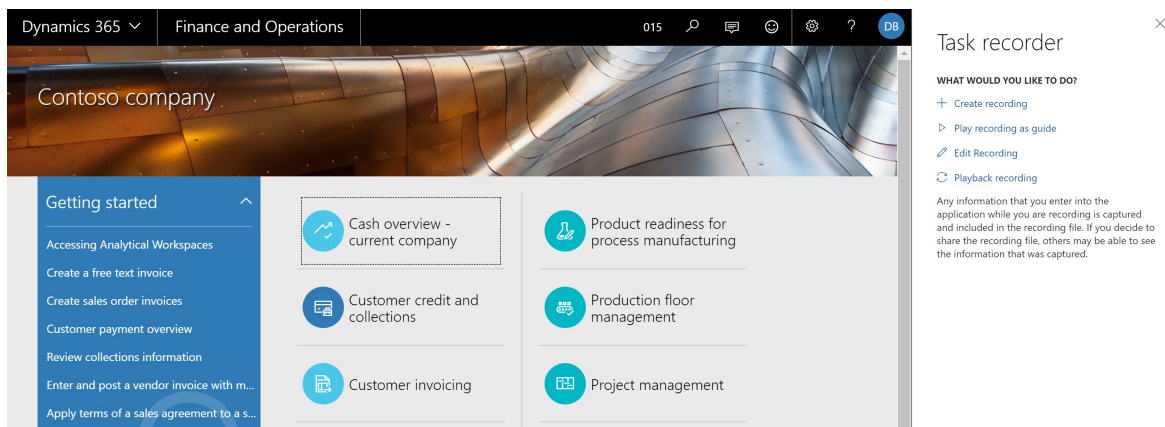
If you're using a BPM library that already has all of the necessary task recordings (test cases) attached, you can skip this step. Otherwise, follow the instructions below to create new task recordings.

Create and save a new task recording

1. Open the client and sign in.
2. Select the company that you want to use while recording.
3. Go to **Settings > Task recorder**.



4. Click **Create a new recording**.
5. Enter a name for the recording, and then click **Start**. Recording begins the moment that you click **Start**.
6. When the recording is complete, in the Task recorder pane, click **Stop**.
7. To save the task recording to an attached BPM, click **Save to Lifecycle Services**.



8. Select the library that you want to save the recording to, and then click **Save**. Otherwise, select **Save to Disk** and follow the steps in the next section, "Upload an AXTR file to BPM."

NOTE

To enable the effective execution of your tests using automation tools, make sure all of your task recordings start on the main dashboard of your application. For end-to-end processes that are performed by more than one user, we recommend that you divide your task recordings into user-specific tasks. This simplifies the maintenance of test cases and allows you to execute test cases in the context of security roles, which is a best practice.

Upload an AXTR file to BPM

If you have saved your recordings (AXTR files) to disk, follow these steps to upload them to BPM.

1. In Lifecycle Services (LCS), in your project, on the **Business process libraries** page, select the library to upload the task recording to.
2. Click **Author and edit** and in the lines, locate and select the process to upload the task recording to.

3. In the right pane, click **Upload**.

(August 2016) APQC Unified Library for Microsoft Dynamics AX

The screenshot shows the APQC Unified Library interface. On the left, there is a search bar and a list of processes. The 'Develop Vision and Strategy' process is selected. On the right, there is a detailed view of this process, including its name, description, and metadata.

Process	Diagrams	Reviewed
Develop Vision and Strategy	18	0/4
Develop and Manage Products and Services	31	0/2
Develop and Manage Customer Experience	11	0/5
Market and Sell Products and Services	18	0/5
Market Products and Services	5	0/2
Deliver Products and Services	128	0/6
Merchandise Products and Services	9	0/2
Manage Customer Service		0/3
Deliver Products	6	0/4
Develop and Manage Human Capital	36	0/6
Manage Information Technology	13	0/7
Manage Financial Resources	267	0/10
Acquire, Construct, and Manage Assets	1	0/4
Manage Enterprise Risk, Compliance, and Resiliency		0/3
Manage External Relationships		0/5
Develop and Manage Business Capabilities	4	0/6

Overview Requirements

Name: Develop Vision and Strategy

Description: Develop vision and strategy establishes a direction and vision for an organ defining the business concept and long-term vision, as well as developing strategy and managing strategic initiatives. Processes in this category focus vision, a mission, and strategic objectives, which culminate in creating mea that the organization is moving in the desired direction.

Modified by:

Modified at: 08/30/2016, 2:09 PM PDT

APQC ID: 10002

APQC hierarchy ID: 1

Keywords:

4. Click **Browse** to find and select the file to upload, and then click **Upload**.

The screenshot shows the same APQC Unified Library interface as above, but with an 'Upload AXTR' dialog box open on the right. The dialog box has a 'Browse' button and 'Upload' and 'Cancel' buttons.

Save an existing task recording to BPM

1. To attach an existing task recording, sign in to the client.
2. Go to **Settings > Task recorder**.
3. Select **Edit Task Recording** and attach the file by either saving directly to LCS or downloading the AXTR and then uploading to BPM.

Guidelines for recording test cases

Follow these guidelines when authoring and recording your test cases, especially if you are planning to automate test execution. The process and tools described in this article apply to business process acceptance tests. They are not meant to replace component and unit testing that is typically owned by developers.

- Author a limited number of test cases that, when combined, cover complete end-to-end processes.
- Focus on business processes that have been customized.
- An individual test case (recording) should cover one or two business tasks only, typically executed by one person. This simplifies task recording maintenance. Do not combine a complete end-to-end business process such as "Procure to Pay" or "Order to Cash" into one large task recording. For example, instead of having RFQ > Purchase Order > Product Receipt > Vendor Invoice > Vendor Payment as one test case, divide the process into three or four test cases. You will have the opportunity to combine these tests into an ordered

test suite later.

- A test case should have at least one validation. Try to validate critical fields that cover the impact of other fields. For example: Validation of totals on sales or purchase orders cover the unit price/quantity/discount/tax ...etc.
- Avoid printing a report in a test case. If a test case needs to print a report, it should be selected on screen.
- 80+% of test cases should be of transactions or source documents. Master data should be limited to up to 20% of test cases only.

Synchronize and configure your test plan in Azure DevOps

An acceptance test library is your starting point. It typically contains all test cases (task recordings) of a particular application organized by business process. During a particular test pass, you usually do not need to execute all test cases. What test cases you select depends on the phase of your implementation or the nature of the update you are planning to apply to your production environment. Azure DevOps enables you to organize your test cases in test plans and test suites. A test plan contains one or more test suites (A subset of your test library); test cases can belong to more than one test suite.

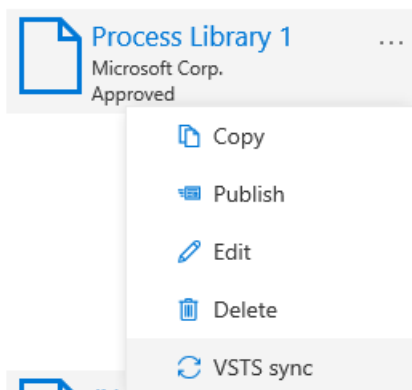
Once you have selected your acceptance testing BPM library, synchronize it with Azure DevOps and create your test plan and test suites.

Sync with Azure DevOps

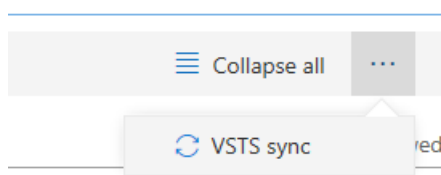
Synchronize your BPM library with your Azure DevOps project. For more information, see [Synchronize BPM libraries with Azure DevOps](#).

After configuration is complete, synchronize the BPM library with a Azure DevOps project.

1. On the **Business process libraries** page, on the tile for the library that you want to synchronize, select the ellipsis button (...), and then select **Azure DevOps sync**.



You can also start Azure DevOps synchronization from the toolbar in a BPM library. Select the ellipsis button (...), and then select **Azure DevOps sync**.



2. After Azure DevOps synchronization is complete, select the ellipsis button (...), and then select **Sync test cases**.

DemoLibrary

Keyword or AOT object name (\$FormName)		
+ Add process Delete process Import Move process Collapse all ...		
Process		
Create Trip Report		
^ Create Expense Report		0/8
Click New expense report		-
Select Purpose Value		-
Enter Map to travel requisition		-
Enter Transaction Date		-
Select Expense category		-
Select Merchant		-
Enter Transaction amount value		-
Click Save		-
^ Approve Order Request		0/9

- ✓ VSTS sync
- ✓ Sync test cases

3. When this step is complete, your task recordings will become test cases in Azure DevOps and a link will appear under the **Requirements** tab.

DemoLibrary		
Keyword or AOT object name (\$FormName)		
+ Add process Delete process Import Move process Collapse all ...		
Process	Diagrams	Reviewed
Create Trip Report		-
^ Create Expense Report		0/8
Click New expense report		-
Select Purpose Value		-
Enter Map to travel requisition		-
Enter Transaction Date		-
Select Expense category		-
Select Merchant		-
Enter Transaction amount value		-
Click Save		-
^ Approve Order Request		0/9
Open order		-
Review Order Type		-
Enter Value for Maximum Cost		-

Overview **Requirements**

+ Add requirement

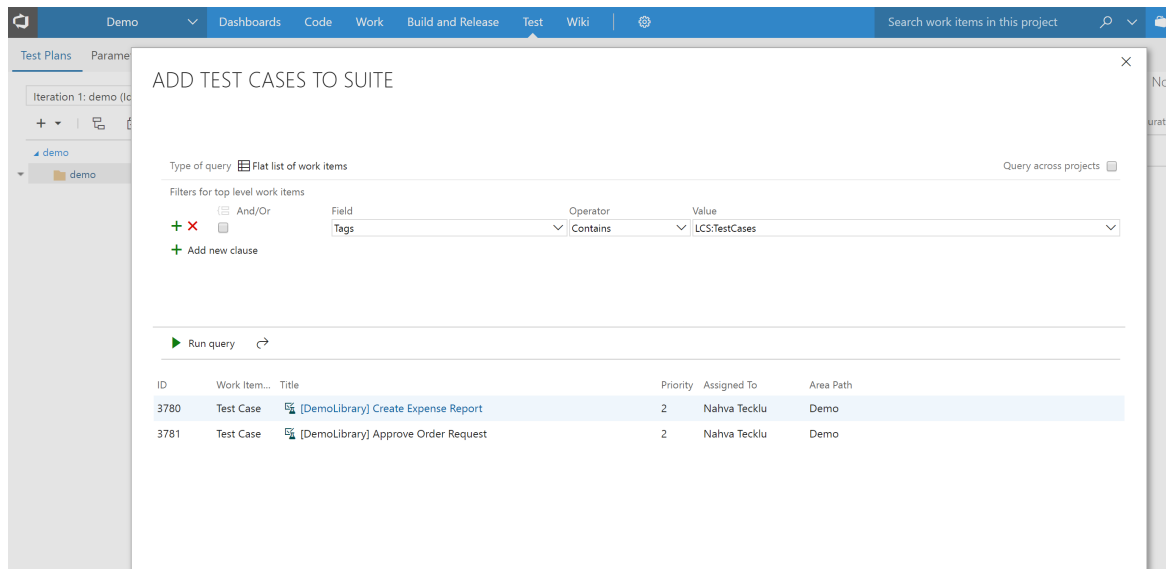
ID	Work item name
3761	[DemoLibrary] Create Expense Report
	Requirement name
	There are no requirements
	Test case name
3780	[DemoLibrary] Create Expense Report

In addition to the test steps, the task recording XML file is attached to the Azure DevOps test case. This file will be needed if you want to automate test execution.

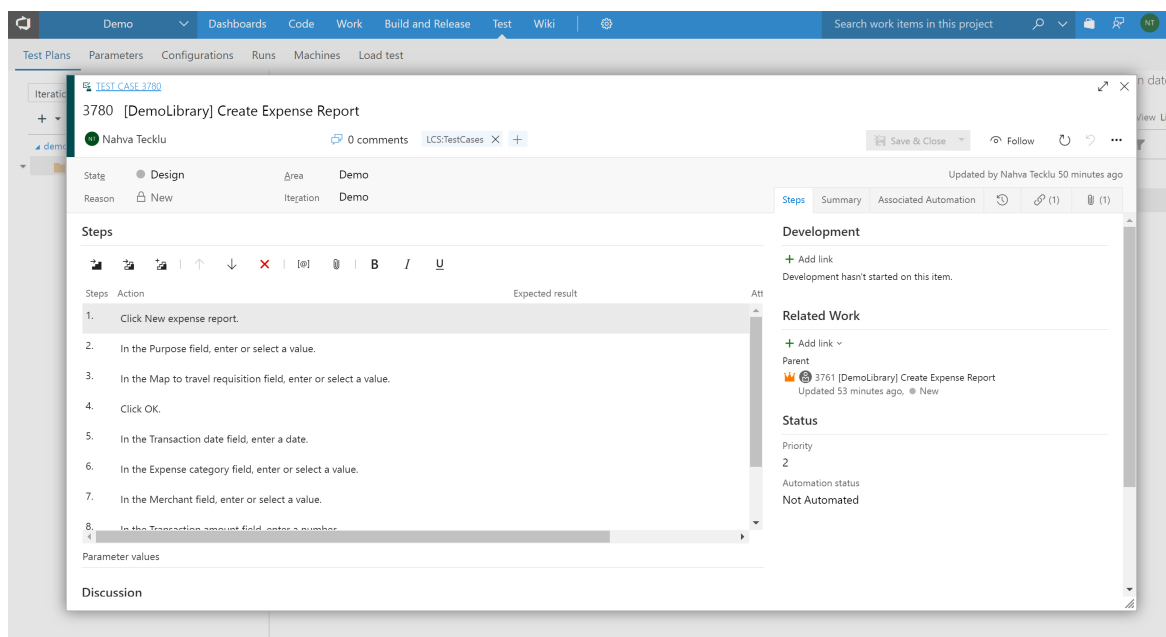
Create a test suite in Azure DevOps

Next, you will need to create a test plan and test suite in Azure DevOps. This will allow you to execute an ordered suite of test cases and easily manage, investigate, and track the results.

1. Sign in to Azure DevOps and select the project and test plan that you want to test in.
2. On the toolbar, select **Test > Test Plans**.
3. In the left pane, select **+**, and then select **Static suite**.
4. Enter a name for the suite.
5. Click **Add existing** and query the tag **LCS:Test Cases**.
6. Click **Run > Add test cases**.



7. Select the test case to view details and the attached XML file.



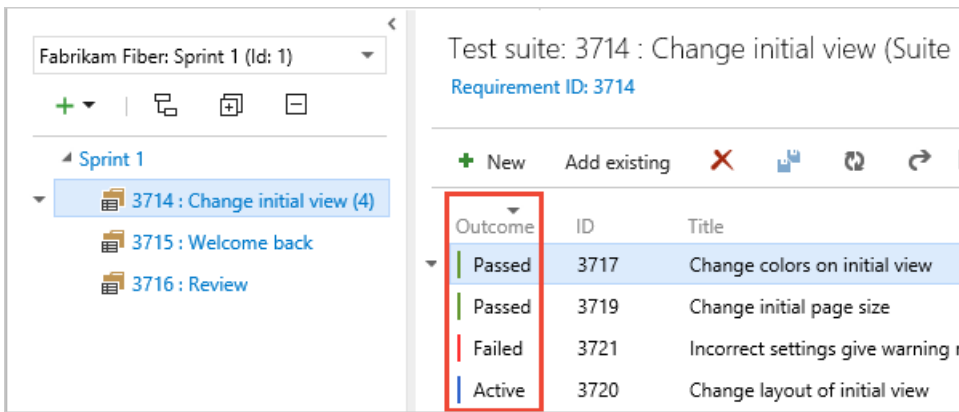
NOTE

This example shows how to create one comprehensive acceptance test suite with all test cases added. Instead, you should create various test suites under the same test plan and then use custom queries to add specific test cases to a test suite. A test case can belong to more than one test suite.

Execute your tests

Run manual test cases

After you have a test suite, you are ready to use it for regression testing after updates have been made to your application in a sandbox or test environment. You can run the test cases in your test suite manually or play the task recordings that are part of the test suite and use Azure DevOps to mark the test cases as passed or failed.



Azure DevOps also provides a tool, **Test Runner**, to manage manual test case execution. For more information about using Test Runner, see [Run manual tests](#).

We recommend that you take advantage of Azure DevOps as it provides a rich set of management features not only for testing, but result management and mitigation.

Run automated test cases

The platform for Finance and Operations provides developers with tools to author test cases based on task recordings and use Azure DevOps to manage the automated execution of these test cases.

Developers can use the build and test automation capabilities of **build and test** environments. For details, see the [Continuous delivery home page](#).

Functional power users can automate the execution of their test cases using the **Regression suite automation tool**. For more information, [download the tool](#) and read the [Regression suite automation tool](#).

Investigate test runs

Once an automated run is complete, on the Azure DevOps toolbar, select **Test > Runs** (or **Test Plans > Runs**) to investigate your test run. Select the desired test run to investigate test case failures and errors. You can also go to your test suite in Azure DevOps to see the latest results associated with your test cases. For more information on testing and test management in Azure DevOps, see the [Azure DevOps documentation](#).

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Deploy a demo environment

2/18/2021 • 2 minutes to read • [Edit Online](#)

This topic explains how to deploy a demo environment on Microsoft Azure using Microsoft Dynamics Lifecycle Services (LCS). This topic applies to deploying a demo environment for:

- Dynamics 365 Finance
- Dynamics 365 Supply Chain Management
- Dynamics 365 Commerce

Prerequisites

Before you begin your deployment, the following prerequisites must be in place:

- Verify that you have an Azure subscription, and that you are a co-administrator on it.
- Verify that you have access to an LCS project and permissions to deploy an environment.
- Verify that you've connected your Azure subscription to your LCS project by using the information in the [Complete the Azure Resource Manager \(ARM\) onboarding process](#) topic.

Deploy a demo environment

Use this procedure to deploy a demo environment on Azure using LCS.

1. In LCS, open your project, and then, in the **Environments** section, click the plus sign (+).
2. Select the Azure environment topology, and then select **Demo**.
3. Select a topology.
 - For Finance and Operations, select the most recent Azure Resource Manager (ARM) topology for Finance and Operations.
 - For Commerce, select **Dynamics 365 for Commerce - Demo**.
4. In the **Deploy environment** dialog box, enter the name of the environment. This name should be unique in the Azure subscription. To make environments easy to identify, consider forming an acronym using the user's name and the topology.
5. Select the size of the virtual machine (VM). You must use **Ev3-series sizes** for Finance and Operations workloads. We recommend **Ev3**. If you experience allocation failures, see the [Azure troubleshooting guide](#).
6. Set the **Instances** field to 1.

NOTE

The size of the VM and the number of instances affect the cost of your subscription. For more information, see [Azure pricing](#).

7. Click **Advanced settings** to add customizations to your deployment. For the demo environment, we recommend that you keep the default settings.
8. Agree to the licensing and pricing terms, and then click **Next**.

9. In the **Confirm** message box, click **Deploy**.
10. Open the **Cloud hosted environments** page to view the status of the deployment. After the deployment is successfully completed, the environment will be ready.

Log on to your demo environment

To log on to your demo environment, do the following.

1. In LCS, open the **Cloud-hosted environments** page, and select the demo environment that you just deployed.
2. Scroll to the right and in the **Environment details** pane, under **Cloud services**, click the appropriate link:
 - **Log on to Finance and Operations**
 - **Log on to Commerce**

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Deployment options

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You can deploy Finance and Operations apps in the cloud or on-premises. Cloud deployments offer an ERP service that is fully managed by Microsoft, while on-premises deployments are deployed locally within a customer's data center.

IMPORTANT

On-premises deployments are not supported on any public cloud infrastructure, including Azure.

The following table provides a comparison of the capabilities provided by the two deployment options.

Dynamics 365 deployment options		
Capability	Cloud	On-premises
Infrastructure and data location	<ul style="list-style-type: none">Full Microsoft managed cloud serviceMicrosoft managed data centers	<ul style="list-style-type: none">Customer or partner managed infrastructureDisconnected data centerLocal data residency
Data trustee	<ul style="list-style-type: none">Microsoft	<ul style="list-style-type: none">Customer
Application lifecycle management (ALM)	<ul style="list-style-type: none">Managed by MicrosoftCustomer access to ALM and telemetry using Lifecycle Services (LCS)	<ul style="list-style-type: none">Managed by customer or partner with cloud-based ALM and telemetry using LCS
Cloud capabilities	<ul style="list-style-type: none">High availability and disaster recovery includedSandbox environments	<ul style="list-style-type: none">Automated deployment and telemetry using LCS
Intelligence and analytics	<ul style="list-style-type: none">Author and publish Power BI reportsReady-made Analytical workspacesPinning tiles and Reports from PowerBI.com	<ul style="list-style-type: none">Author and publish PowerBI reports
Updates, health monitoring	<ul style="list-style-type: none">Provided through LCS	<ul style="list-style-type: none">Provided through LCS
Licensing	<ul style="list-style-type: none">Subscription	<ul style="list-style-type: none">License with Software Assurance/Business Ready Enhancement Plan, or subscription

Why cloud

Cloud deployments provide a cloud service that is easy to scale up or down as needed, as well as data centers that are fully managed by Microsoft. The time spent implementing Finance and Operations apps can be significantly shortened, fewer customizations may be required, and the costs of IT hardware and infrastructure are lower.

Cloud deployments include high availability, disaster recovery, sandbox environments, and application lifecycle management combined with cloud-based systems of intelligence, infrastructure, compute, and database services in a single offering. When needed, data failover in the cloud, automated deployment and continuous updates, and elastic compute capacity are available. A cloud deployment also provides data aggregation, financial reporting, and intelligence.

The cloud service provides customers with the greatest value, the broadest range of functionality, the best application lifecycle experience, the easiest and broadest integration with Microsoft Azure services, the best option for business insights and intelligence, and the most value for customers' technology investments.

Why on-premises

With an on-premises deployment, existing data center investments can be leveraged. Customers can also configure their enterprise preferences to meet the regulatory and compliance needs of their business, comply with data sovereignty rules in regions where there are no Azure Data Centers, or ensure business continuity in areas with limited public infrastructure.

A customer's business data and processes are disconnected from the cloud and are stored and run locally in the customer's or their partner's data center. Some connectivity is required for system management and updates which are enabled through Microsoft Dynamics Lifecycle Services (LCS), a cloud-based application lifecycle management service. Customer data that is related to the configuration and application customization may be stored in the cloud.

For customers who choose to run Finance and Operations apps in their own data center, the on-premises deployment option will have a similar user-interface and application functionality as other deployment options. However, customers must take on the following responsibilities:

- Stand up their own infrastructure.
- Configure their own high-availability and disaster recovery solutions.
- Stand up sandbox environments.
- Manage their infrastructure, including scheduling operating system updates.

The additional costs to deploy and manage these capabilities might lead to higher deployment costs and a greater Total Cost of Ownership (TCO). Tools for deploying the Finance and Operations apps and updates will be available to partners and customers via Lifecycle Services. Unlike the cloud deployment option, Advanced Analytics and Azure Machine Learning are not included in the on-premises deployment option.

NOTE

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Comparison of cloud and on-premises features

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This topic shows a comparison of features available in cloud vs. on-premises for the following applications:

- [Dynamics 365 Finance](#)
- [Dynamics 365 Supply Chain Management](#)
- [Dynamics 365 Commerce](#)
- [Dynamics 365 Human Resources](#)

Information about the [development and administration features](#) is included, as well.

The following tables list the application areas. Cloud and on-premises support is listed for the feature as a whole. Where specific features differ from the area overall, the features are listed on a separate line in the Feature column.

Dynamics 365 Finance

AREA	FEATURE	CLOUD	ON-PREMISES
Compliance and certifications		Yes	Yes
	SOC 1 Type 1 certification	Yes	No
Data management and integration		Yes	Yes
	Export data to your own data warehouse	Yes	Yes
	Enable the export of incremental updates to a data entity	Yes	Yes
	Data integrations	Yes	Yes
Document management		Yes	Yes
Financial management		Yes	Yes
Help		Yes	No
Human resources		Yes	Yes
Intelligence		Yes	Yes
	Electronic reporting (ER)	Yes	Yes
	ER: Integration with LCS	Yes	No

AREA	FEATURE	CLOUD	ON-PREMISES
	ER: Integration with SharePoint	Yes	No
	ER: Integration with Regulatory Configuration Services (RCS)	Yes	No
	ER: Uses local file system as storage of ER configurations accessible via ER repositories	No	Yes
	Integration with PowerBI.com	Yes	No
	Integration with PowerBI Desktop	No	Yes
	Analytical workspaces	Yes	No
	Intelligent business process: Recommendations	Yes	No
	Authoring Power BI reports with OData using Power BI desktop or Excel PowerQuery tools	Yes	No
	SQL Server Reporting Services (SSRS) supports scaling out	Yes	No
	Telemetry is transferred into the cloud	Yes	No
Lifecycle services		Yes	Yes
	Configurable business processes	Yes	No
Localizations		Yes	Yes
Mobile app, workspaces, and platform		Yes	Yes
Office integration		Yes	Yes
Organization administration		Yes	Yes
Payroll		Yes	Yes
	Direct deposit	Yes	No

AREA	FEATURE	CLOUD	ON-PREMISES
Project management and accounting		Yes	Yes
Security		Yes	Yes
Service management		Yes	Yes
Web client		Yes	Yes
	Task recorder - Save or load task recordings from the BPM library	Yes	No
Support		Yes	Yes
	Access to Support via the Help & Support menu	Yes	No
	Business events	Yes	Yes (either internet connectivity is required or custom endpoints must be implemented to send/receive business events within intranet)

Dynamics 365 Supply Chain Management

AREA	FEATURE	CLOUD	ON-PREMISES
Asset management		Yes	No
Compliance and certifications		Yes	Yes
	SOC 1 Type 1 certification	Yes	No
Cost accounting		Yes	Yes
	Cost accounting content pack for Power BI	Yes	No
	Cost accounting workspace for mobile app	Yes	No
Cost management		Yes	Yes
	Cost management content pack for Power BI	Yes	No
Data management and integration		Yes	Yes

AREA	FEATURE	CLOUD	ON-PREMISES
	Configuration-driven extension	Yes	No
	Export data to your own data warehouse	Yes	Yes
	Enable the export of incremental updates to a data entity	Yes	Yes
	Data integrations	Yes	Yes
Document management		Yes	Yes
Help		Yes	No
Intelligence		Yes	Yes
	Electronic reporting (ER)	Yes	Yes
	ER: Integration with LCS	Yes	No
	ER: Integration with SharePoint	Yes	No
	ER: Integration with Regulatory Configuration Services (RCS)	Yes	No
	ER: Uses local file system as storage of ER configurations accessible via ER repositories	No	Yes
	Integration with PowerBI.com	Yes	No
	Integration with PowerBI Desktop	No	Yes
	Analytical workspaces	Yes	No
	Intelligent business process: Recommendations	Yes	No
	Authoring Power BI reports with OData using Power BI desktop or Excel PowerQuery tools	Yes	No
	SQL Server Reporting Services (SSRS) supports scaling out	Yes	No

AREA	FEATURE	CLOUD	ON-PREMISES
	Telemetry is transferred into the cloud	Yes	No
Inventory management		Yes	Yes
Lifecycle services		Yes	Yes
	Configurable business processes	Yes	No
Localizations		Yes	Yes
Manufacturing		Yes	Yes
Master planning and forecasting		Yes	Yes
Planning optimization		Yes	No
Mobile app, workspaces, and platform		Yes	Yes
Office integration		Yes	Yes
Organization administration		Yes	Yes
Procurement and sourcing		Yes	Yes
	Punch-out to external catalog from purchase requisition	Yes	No
	Purchase spend analysis Power BI reports	Yes	No
Product information management		Yes	Yes
Product master data		Yes	Yes
Production		Yes	Yes
	Production performance Power BI reports	Yes	No
Project management and accounting		Yes	Yes
Sales		Yes	Yes

AREA	FEATURE	CLOUD	ON-PREMISES
	Sales and profitability performance Power BI reports	Yes	No
Security		Yes	Yes
Service management		Yes	Yes
Supply chain management		Yes	Yes
Transportation management		Yes	Yes
Vendor collaboration		Yes	No
Warehouse management		Yes	Yes
	Mobile warehouse app	Yes	Yes
	Warehousing Power BI reports	Yes	No
Web client		Yes	Yes
	Task recorder - Save or load task recordings from the BPM library	Yes	No
Support		Yes	Yes
	Access to Support via the Help & Support menu	Yes	No

Dynamics 365 Commerce

To see a list of capabilities that are available in on-premises deployments, see [Commerce capabilities that are available in on-premises deployments](#).

Dynamics 365 Human Resources

AREA	FEATURE	CLOUD	ON-PREMISES
All Human Resources areas	All Human Resources features	Yes	No

Development and administration features

AREA	FEATURE	CLOUD	ON-PREMISES
Build and test		Yes	Yes

AREA	FEATURE	CLOUD	ON-PREMISES
Extensibility		Yes	Yes
Monitoring and telemetry		Yes	Yes
Platform compatibility		Yes	Yes
Servicing		Yes	Yes
	Servicing environments	Yes	No
Trace Parser		Yes	Yes
PerfTimer		Yes	Yes*
Upgrade		Yes	Yes
	Upgrade	Yes	No
	Upgrade and support for previous versions	Yes	No
Visual Studio development		Yes	Yes

* In on-premises environments, PerfTimer only shows results for the client.

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Cloud deployment overview

2/18/2021 • 15 minutes to read • [Edit Online](#)

Working with Microsoft to deploy Finance and Operations apps in the cloud requires that you understand the environment and subscription that you are deploying to, who can perform which tasks, and the data and customizations that you need to manage. We recommend that you sign up for the Full Microsoft FastTrack for Dynamics 365 to help speed your deployment and implementation - it's a program that provides training and consulting to help you realize business value faster. For more information, see [Microsoft FastTrack](#). If you choose to use the Essentials FastTrack program instead, you will be using the Implementation Project Methodology in Lifecycle Services (LCS) to help you manage your implementation project.

Customer lifecycle, subscriptions, and environment types

Microsoft assumes that all customers will follow a lifecycle similar to the following for all cloud deployments, and therefore need different environment topologies at each phase.

- Evaluate
- Develop customizations, if needed.
- Curate a "golden configuration" environment that contains only module configurations without master or transactional data. This is to be the baseline for your data migration testing and eventual go live.
- Install and test customizations and partner solutions on a tier-1 sandbox (Development or test environment).
- Test customizations, partner solutions and data configuration on a tier-2 sandbox environment.
- Deploy customizations and data configurations to a production environment with high availability.

At some phases of a project, you may have all of the environments live at once. For more information, about the default licenses and tiers that are available, see the [Dynamics 365 Licensing Guide](#).

You may notice the terms cloud hosted or Microsoft subscriptions. A *cloud hosted subscription* means that the customer or partner brings their own Azure subscription and deploys Finance and Operations apps to it, for evaluation and development purposes only. The customer or partner pays for the resources deployed to their Azure subscription based on the Azure price list. A *Microsoft subscription* means that the customer purchases Finance and Operations licenses, which will then allow them to deploy environments to an Azure subscription which is managed by Microsoft, therefore, the customer has no separate Azure billing.

With each Enterprise offer, two environments are included by default:

- One Tier 2 sandbox (multi-box environment) for user acceptance testing (UAT).
- One production environment with high availability (HA).

Additional environments may be purchased as add-ons. For information about licensing and what is included in Microsoft Dynamics 365, see the [Dynamics 365 Licensing Guide](#).

Here's how the lifecycle maps to the available environments. If you already have environments deployed in your Lifecycle Services project, you can find the Environment Type and Environment Sub type on each environment's details page.

LIFECYCLE PHASE	ENVIRONMENT TIER	SUBSCRIPTION	ENVIRONMENT TYPES	ENVIRONMENT SUB-TYPE
Evaluation and analysis	Tier 1 Sandbox	Cloud hosted	Customer Managed	Demo

LIFECYCLE PHASE	ENVIRONMENT TIER	SUBSCRIPTION	ENVIRONMENT TYPES	ENVIRONMENT SUB-TYPE
Customize	Tier 1 Sandbox	Cloud hosted or VHD	Customer Managed	Develop
Golden configuration	Tier 1 Sandbox	Cloud hosted	Customer Managed	Develop
User acceptance testing (UAT)	Tiers 2-5 Sandbox	Microsoft	Microsoft Managed or Self-service	Not applicable
Go live	Production	Microsoft	Microsoft Managed or Self-service	Not applicable

Tiers 2-5 can be purchased to increase performance of the environment. The higher the tier, the more compute and database capacity is reserved for your use. For more information about Self-service environment types, check out the [Self-service deployment overview](#).

Environment lifecycle operations

Users with the Environment Administrator or Project Owner roles in Lifecycle Services can perform various lifecycle operations on their environments. These operations often involve downtime on the environment until the task is finished. Each of these operations are located under or next to the **Maintain** button on each environment details page.

LIFECYCLE OPERATION	DESCRIPTION	LEARN MORE
Apply software	Install Microsoft updates, ISV solutions, or your own customization packages.	Apply updates to cloud environments
Enable access	Allow list your IP for Remote Desktop or database access	See the Remote Desktop section later in this topic
Restart services	Ability to restart components of your environment	Restart environment services
Move database	Full data lifecycle management	Database movement operations
Maintenance mode	Ability to change configuration with only admin access	Maintenance mode
Upgrade	Upgrade code and data from 7.x to the latest version	Process for moving to the latest update
Deallocate	Ability to turn off an environment not being used, or to troubleshoot a failed action	Not applicable
Start	Ability to turn on an environment for use	Not applicable
Delete	Ability to delete an environment previously deallocated	Not applicable

Security and compliance

Finance and Operations is PA-DSS 3.1 certified which means that all communications between components are secured out-of-the-box.

All Finance and Operations front-end virtual machines in Microsoft Azure are configured during deployment to only accept TLS 1.2.

IMPORTANT

Customers who have administrator access to Microsoft-managed sandboxes, including any add-on sandboxes purchased, must follow these guidelines:

- By default, automatic Windows update is enabled for all Tier 1 - 5 sandboxes and should NOT be disabled. This ensures that any time that Microsoft pushes security or critical infrastructure updates to your environment, your environment receives the latest set of updates and is updated each month with the operating system fixes that Microsoft releases.
- Admin passwords on these environments should NOT be changed. Environments that have admin passwords changed will be flagged by Microsoft. Microsoft reserves the right to, and will reset the admin password.
- Adding new user accounts to any Microsoft managed VM is NOT permitted. Microsoft reserves the right to, and will remove the newly added user accounts without providing notice.

Finance and Operations is not covered by a FedRAMP ATO at this time. If Finance and Operations is provisioned in the United States, all customer data at rest is stored in data centers located in the United States, as described in [International availability of Dynamics 365](#). Finance and Operations does not support any other Dynamics 365 US Government or Microsoft 365 GCC compliance attributes (for example, access by US screened personnel, and support for CJIS and IRS 1075).

Remote Desktop

Microsoft-managed environments

WARNING

Microsoft will be removing the use of Remote Desktop by customers and partners. Each environment will first have administrator access removed, but still allow non-administrator access to the virtual machines. After this, all access will be removed. For each step of this phased removal, an email notification will be sent to the Notification list setup for each environment. All Remote Desktop access will be removed by November 2020.

Customers are required to complete additional setup to connect to virtual machines (VMs) through Microsoft Remote Desktop (RDP). This additional setup applies to all Microsoft-managed environments, including Tier 1 through Tier 5 sandboxes and add-ons. In order to connect to Tier 1 through Tier 5 sandbox environments, you must explicitly enable access (safe list) from your organization's IP address space. This can be done by a Lifecycle Services (LCS) user who has access to the **Environment** page (**Maintain** > **Enable Access**) where they can enter the IP address space that will be used to connect to the virtual machines through Remote Desktop. Access rules are either a single IP address (example: 10.10.10.10) or an IP address range (example: 192.168.1.0/24). You may add multiple entries at once as a semi-colon(;) separated list (example: 10.10.10.10;20.20.20.20;192.168.1.0/24). These entries are used to configure the Azure Network Security Group that is associated with your environment's virtual network. For more information, see [Security rules](#).

IMPORTANT

Customers need to ensure that RDP endpoints are secured through explicit IP safe list rules as mentioned above. The IP safe list rules must adhere to the following conditions.

- IP safe list rules must NOT use asterisk/zero.
- Wide IP address ranges must NOT be used.
- IP address ranges must restrict to the customer's CORPNET.
- If computers outside the customer's CORPNET (such as a home office) are used to connect to sandbox environments, only the specific IP addresses of the computers used to connect to the sandbox environments must be added.
- Azure Datacenter IP address ranges must NOT be added.
- Public IP addresses, such as a coffee shop location, must NOT be added.
- IP safe list rules should be removed when not in use. Periodic review of environment IP safe list rules is recommended.

Microsoft will run periodic tests on the Microsoft Managed environments validating that the environments are sufficiently restricted. Microsoft reserves the right to and will remove any IP Address safe list rules that violate the above guidelines, immediately without providing notice.

Partner/Customer managed environments

By default, Remote Desktop is enabled for all non-Microsoft managed environments. We recommend that customers restrict access to any environments that belong to their subscriptions. This can be done by configuring Network Security Group rules on the environments directly in Azure Portal.

Windows Remoting (WinRM)

Windows Remoting (WinRM) is disabled on all environments. Although you can enable WinRM on environments that belong to your subscriptions through Azure Portal, we strongly recommend that you do not do this.

WARNING

Exceptions to enable WinRM will not be granted for any Microsoft-managed environments.

Availability

The guaranteed uptime for Finance and Operations apps is 99.9%. Planned downtime occurs once a month and lasts no longer than eight hours. Because the work completed during the downtime doesn't always take eight hours, we will always communicate the estimated amount of time that your environments will be down. For more information, see [Get support for Finance and Operations apps or Lifecycle Services \(LCS\)](#).

High-availability features

To ensure service availability, all production environments are protected by using default Azure high availability (HA) features. HA functionality provides ways to avoid downtime caused by the failure of a single node within a datacenter, and DR features protect against outages broadly impacting an entire datacenter. Azure availability sets are used to prevent single-point-of-failure events. For more information about Azure availability sets, see [Use availability zones to protect from datacenter level failures](#). High availability for databases is supported through Azure SQL. For more information, see [Overview of business continuity with Azure SQL Database](#).

Disaster recovery features

Production environments are configured with Azure disaster recovery support that includes the following:

- Azure SQL active-geo replication is configured for the Finance and Operations database of the production

environment. For more information about SQL replication, see [Compare geo-replication with failover groups](#).

- Geo-redundant copies of Azure blob storage (containing document attachments) in other Azure regions. For more information, see [Azure Storage redundancy](#).
- Same secondary region for the Azure SQL and Azure blob storage replication.

Only primary data stores are supported by replication. The Financial reporting services and Entity store database use transformed data from the primary database and must be generated after the recovery site has been set up and the Finance and Operations service has started.

Service availability in Azure Regions

Finance and Operations apps can be deployed into a subset of Microsoft Azure datacenters using Dynamics Lifecycle Services (LCS). Azure is generally available in datacenters and geographical locations around the world. With Finance and Operations apps, customers can specify the region or datacenter where their customer data will be stored. Microsoft may replicate data to other regions for data durability, but we will not replicate or move customer data outside the geographical location. For more details, see the [Service description white paper](#).

IMPORTANT

Regardless of where customer data is stored, Microsoft does not control or limit the locations from which customers or their end-users may access it. For more information, see [International availability of Dynamics 365](#).

Upcoming changes to region availability

Dynamics 365 solutions consist of a collection of multiple services. Looking across Dynamics 365 applications, the Power Platform and the Azure services that they both depend on, the required matrix of services is quite large and growing. We have locked on a strategy of selecting a subset of data center regions across the globe to simplify ensuring that we have availability of the full portfolio of required services. Our plan is to optimize to have minimal latency between the component services of a solution and as a result, we are focused on having the full portfolio of services available in each of the designated data centers.

Additionally, the Finance and Operations architecture is being enhanced to build on self-service for greater elasticity, stronger reliability, and more seamless maintenance. Customers gain material efficiency by having deeper self-service deployments in fewer data centers. This transition also benefits from selecting a subset of Azure regions. To that effect, the regional availability of Finance and Operations apps will now be **limited to East US, West US, and Central US in North America** for all new projects. For a list of the latest supported regions, see [International availability of Dynamics 365](#).

Support for East US2, West US2, West Central US, North Central US, and South Central US will continue to be available for projects and environments that currently have their data stored in those regions on Microsoft-managed environments.

NOTE

Microsoft will work with customers to move them to an appropriate data center beginning October 19, 2020. This will happen in a phased approach. Select customers will receive advance notification before we migrate them to a supported region.

If there are other customer workloads that are not part of the Dynamics 365 or Power Platform family that also require proximity to the Dynamics 365 and Power Platform services, Microsoft will work with customers to coordinate a plan for the overall migration. For more information, see [Cloud deployment overview: Frequently asked questions](#).

Frequently asked questions

Why does the status display 'Maintenance' on my environment in LCS?

To provide the best experience and performance, Microsoft performs maintenance operations on your environment. During some of these maintenance operations, your environment status may display one of the following statuses:

- Preparing for maintenance
- Prepared for maintenance
- Maintenance in progress

While your environment is in this state and until the status returns to 'Deployed', you will not be able to perform any lifecycle operations, such as package applications. There will be no impact to Finance and Operations apps. Users can continue with normal operations without any service interruption. You will receive an email notification before any maintenance operation puts your environment in this state.

How do I connect to the SQL database on my Sandbox environment?

To connect to the SQL database in your Sandbox environment, follow the steps in [Enable just-in-time access](#).

How do I access a development instance?

For information about how to access development instances, configure on-premises development VMs, and find configurations settings for developers and administrators, see [Deploy and access development environments](#).

How do I deploy a demo environment?

A demo environment includes only Microsoft demo data. You can use a demo environment to explore default features and functionality. For more information, see [Deploy a demo environment](#).

How do I move my customizations between environments?

To move customizations from a development to a sandbox or production environment, see [Create deployable packages of models](#)

Can I bring my own domain name?

You can bring your own domain name if it is running Azure Active Directory (AAD), and the administrator of your AAD instance has enabled the Finance and Operations apps within their AAD. This is usually done through the office email, after you buy a license. When you click the link to accept the offer, AAD is set up for you.

Can I add guest AAD accounts as users?

You can add guest AAD accounts if you have correctly configured them within Azure Active Directory, and enabled the Finance and Operations apps within your AAD.

Why am I no longer able to see the Private AOS machines in one or more of my Tier 2 through Tier 5 Sandbox environments?

The Private AOS VMs were part of your environment configuration as they were needed to secure communication between the AOS and BI machines in the past. With recent updates, all communication between AOS and BI machines are secure directly and no longer need the intermediary Private AOS machines. Therefore, we are in the process of rolling out removing the Private AOS machines. As we are removing the machines in batches, you may notice that only some of your environments have the Private AOS machines removed. This change will not impact functionality or security in any way and will be transparent to you.

Why am I no longer able to Remote Desktop into one or more of my Tier 1 through Tier 5 Microsoft managed Sandbox environments?

Microsoft managed Tier 1 through Tier 5 sandbox environments require Remote Desktop management endpoints to be restricted to specific IP Address sets (safe list). Microsoft regularly validates that the environments are sufficiently restricted. Microsoft reserves the right to immediately remove any IP Address safe list rules that violate the above guidelines without notice. You may not be able to Remote Desktop into your

environment for one of these reasons:

- Your current IP address is not in the safe list.
- Your IP has changed from the IP address listed in the safe list.
- Microsoft deleted the rule containing your IP address from the safe list because it violated a guideline.

To regain access to the environment, you will need to add the IP address of the computer from which you are connecting to. To do this, complete the steps [Remote Desktop](#) section earlier in this topic.

When will the availability of reduced regions go into effect for new onboarding?

Beginning August 1, 2020, new projects for Finance and Operations will be onboarded to the following regions:

- East US
- West US
- Central US

My environments are currently in the regions that will be deprecated. How will this change affect me?

We will deprecate support for the following regions only for new projects that will be onboarded on or after August 1, 2020:

- East US2
- West US2
- West Central US
- North Central US
- South Central US

This will not affect any environments that have their data stored in the deprecated regions before August 2020. In the near future there is a transition plan to move customers in the deprecated regions into the reduced regions.

I'm unable to redeploy an environment after deleting it, the environment slot is missing.

This is due to the license expiring, which means that you no longer have the minimum required licenses to obtain an environment slot. Please review your [subscription status](#) and then reactivate the expired license to enable the redeployment.

NOTE

Can you tell us about your documentation language preferences? [Take a short survey](#).

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

System requirements for cloud deployments

2/18/2021 • 3 minutes to read • [Edit Online](#)

This topic lists the system requirements for the current version of Dynamics 365 Finance and Dynamics 365 Supply Chain Management for cloud deployments. If this step is appropriate, before you install one of these apps, you should verify that the system that you're working with meets or exceeds the minimum network, hardware, and software requirements.

Supported web browsers

Users can access the apps by using the most recent versions of these popular browsers:

- Microsoft Edge (recommended: [Chromium-based Edge](#))
- Google Chrome
- Apple Safari
- Internet Explorer 11 (deprecated, not recommended)

NOTE

For optimal performance and an optimal experience, we recommend that you use the latest version of a modern browser, especially Microsoft Edge. Support for Internet Explorer 11 is deprecated. For more information, see the [Internet Explorer deprecation announcement](#).

To find the latest release for each web browser, go to the software manufacturer's website.

NOTE

- To enable Task Recorder to capture screenshots and include them in Microsoft Word documents that are generated, you must install a pre-release Chrome extension.
- The Workflow Editor and Report Designer for Financial reporting are started as ClickOnce applications. They require a 64-bit-compatible operating system. Only Microsoft Edge and Internet Explorer (on a supported version of Microsoft Windows) support ClickOnce applications out of the box. If you're using Chrome, you must install a ClickOnce extension, such as [Meta4](#) to use ClickOnce applications. If you use Chrome in incognito mode, make sure that the ClickOnce extension is also enabled for incognito mode.
- To preview PDF files, we recommend that you use browsers such as Microsoft Edge (latest publicly available version) on Windows 10, or Google Chrome (latest publicly available version) on Windows 10, Windows 8.1, Windows 8, Windows 7, or Google Nexus 10 tablet.

Network requirements

- The app is designed for networks that have a latency of 250–300 milliseconds (ms) or less. This latency is the latency from a browser client to the Microsoft Azure datacenter that hosts the app. We recommend that you test network latency at [AzureSpeed.com](#).
- Bandwidth requirements for the app depend on your scenario. Most typical scenarios require a bandwidth that is more than 50 kilobytes per second (KBps). However, we recommend more bandwidth for scenarios that have high payload requirements, such as scenarios that involve workspaces or extensive customization.

In general, the app is optimized for the internet. The number of round trips from a browser client to the Azure datacenter is very small, and the whole payload is compressed.

WARNING

Don't calculate bandwidth requirements from a client location by multiplying the number of users by the minimum bandwidth requirements. The concurrent usage of a given location is very difficult to calculate. Customers who are concerned about bandwidth requirements should use a preview version of the app.

.NET Framework requirements

The app requires the Microsoft .NET Framework version 4.6.2 for all ClickOnce applications, such as the document routing agent. For installation instructions, see [Install the .NET Framework for developers](#).

Supported Microsoft Office applications

The following Microsoft Office applications are supported in cloud:

- To run the Microsoft Excel and Word add-ins, you must have Microsoft Office 2016 for Windows installed. For more information about version requirements, see [Troubleshoot the Office integration](#).
- To view documents that are generated by the Export to Excel or Export to Word functionality, you must have Microsoft Office 2007 or later installed.

Requirements for development on local VMs

For information about the requirements for development on local virtual machines (VMs), see [VM that is running locally](#).

Database collation

The only supported collation for application databases in the cloud is `SQL_Latin1_General_CP1_CI_AS`. Please ensure that your SQL Server and database collations in development environments are set to this. Also ensure that any configuration environments that are published to Sandbox have this same collation.

Additional resources

[Get evaluations copies](#)

NOTE

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On-premises deployment home page

2/18/2021 • 2 minutes to read • [Edit Online](#)

You can deploy Dynamics 365 Finance + Operations (on-premises). When you choose an on-premises deployment type, the system requirements, hardware sizing, and functionality differ from a cloud deployment. This topic provides links to content that contains information specific to on-premises deployments.

Get started

- [On-premises deployment overview](#)
- [Plan and prepare for on-premises deployments](#)
- [System requirements for on-premises deployments](#)
- [Hardware sizing requirements for on-premises environments](#)
- [Buy Finance + Operations \(on-premises\)](#)
- [Comparison of cloud and on-premises features](#)

Onboard

- [Set up on-premises projects in Lifecycle Services \(LCS\)](#)
- [Set up and deploy on-premises environments \(Platform update 12 and later\)](#)
- [Install network printer devices in on-premises environments](#)
- [Configure SQL Server Reporting Services for on-premises deployments](#)
- [Develop and deploy custom models to on-premises environments](#)

Work in your on-premises deployment

- [Configure document management](#)
- [Import Electronic reporting \(ER\) configurations](#)
- [Document generation, publishing, and printing in on-premises deployments](#)
- [Configure proxies for on-premises environments](#)
- [Set up technical support for Finance and Operations apps](#)
- [Client internet connectivity](#)
- [Apply updates to on-premises deployments](#)
- [Redeploy on-premises environments](#)
- [Reuse the same AD FS instance for multiple environments](#)

Commerce

- [Commerce capabilities that are available in on-premises deployments](#)
- [Installation steps for Retail channel components in an on-premises environment](#)
- [Configure, install, and activate Modern POS \(MPOS\)](#)
- [Configure and install Commerce Scale Unit](#)

Upgrade

- [In-place upgrade process for on-premises environments](#)

Other resources

- [Troubleshoot on-premises deployments](#)
- [Scripts for resolving issues in on-premises environments](#)
- [Certificate rotation](#)
- [On-premises diagnostics](#)
- [Removed or deprecated features for Finance and Operations](#)
- [Software lifecycle policy and on-premises releases](#)

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

System requirements for on-premises deployments

2/18/2021 • 10 minutes to read • [Edit Online](#)

This topic lists the system requirements for the current version of Microsoft Dynamics 365 Finance + Operations (on-premises) deployments. Before you install, when this step is appropriate, verify that the system that you're working with meets or exceeds the minimum network, hardware, and software requirements.

IMPORTANT

Dynamics 365 Finance + Operations (on-premises) deployments are not supported on any public cloud infrastructure, including Azure.

Network requirements

Dynamics 365 Finance + Operations (on-premises) can work on networks that use Internet Protocol Version 4 (IPv4) or Internet Protocol Version 6 (IPv6). Consider the network environment when you plan your system, and use the following guidelines.

Network response time

The following table lists the minimum network requirements for the connection between the web browser and Application Object Server (AOS), and for the connection between AOS and the database in an on-premises system.

VALUE	WEB BROWSER TO AOS	AOS TO DATABASE
Bandwidth	50 kilobytes per second (KBps) per user	100 megabytes per second (MBps)
Latency	Less than 250–300 milliseconds (ms)	Less than 1 ms (local area network [LAN] only). AOS and the database must be co-located.

- Finance + Operations is designed for networks that have a latency of 250–300 milliseconds (ms) or less. This latency is the latency from a browser client to the datacenter that hosts Finance + Operations.
- Bandwidth requirements depend on your scenario. Typical scenarios require a bandwidth of more than 50 KBps between the browser and the server. However, we recommend higher bandwidth for scenarios that have high payload requirements, such as scenarios that involve workspaces or extensive customization. The specific amount of bandwidth depends on use.

Deployments where AOS and the Microsoft SQL Server database are in different datacenters aren't supported. AOS and the SQL Server database must be co-located.

In general, Finance + Operations is optimized to reduce browser-to-server round trips. The number of round trips from a browser client to the datacenter is either zero or one for each user interaction, and the payload is compressed.

WARNING

Don't calculate bandwidth requirements from a client location by multiplying the number of users by the minimum bandwidth requirements. The concurrent usage of a given location is very difficult to calculate. We recommend that you use a real-life simulation against a non-production environment as the best gauge of performance for your specific case.

LAN environments

In LAN environments, Microsoft Remote Desktop in Microsoft Windows Server isn't required in order to connect to Finance + Operations. However, Remote Desktop might be required for servicing operations on the virtual machines (VMs) that make up the server deployments.

WAN environments

In wide area network (WAN) environments, Remote Desktop in Windows Server isn't required in order to connect to Finance + Operations.

Internet connectivity requirements

Finance + Operations doesn't require internet connectivity from user workstations. However, some features won't be available if there is no internet connectivity.

Browser client	An intranet scenario without internet connectivity is a design point for the on-premises deployment option. Some features that require cloud services won't be available, such as Help and Task guide libraries in Microsoft Dynamics Lifecycle Services (LCS).
Server	The AOS or Microsoft Azure Service Fabric tier must be able to communicate with LCS. The on-premises browser-based client doesn't require internet access.
Telemetry	Telemetry data might be lost if there are long interruptions in connectivity. Interruptions in connectivity to LCS don't affect the on-premises application functionality.
LCS	Connectivity to LCS is required for deployment, code deployment, and servicing operations.

Telemetry data transfer to the cloud

Most telemetry data is stored locally and can be accessed by using Event Viewer in Microsoft Windows. A small subset of telemetry events is transferred to the Microsoft telemetry pipeline in the cloud for diagnostics. Customer data and user-identifiable data aren't part of the telemetry data that is sent to Microsoft. VM names are sent to Microsoft to help with environment management and diagnostics from the LCS portal.

Domain requirements

Consider the following domain requirements when you install Finance + Operations:

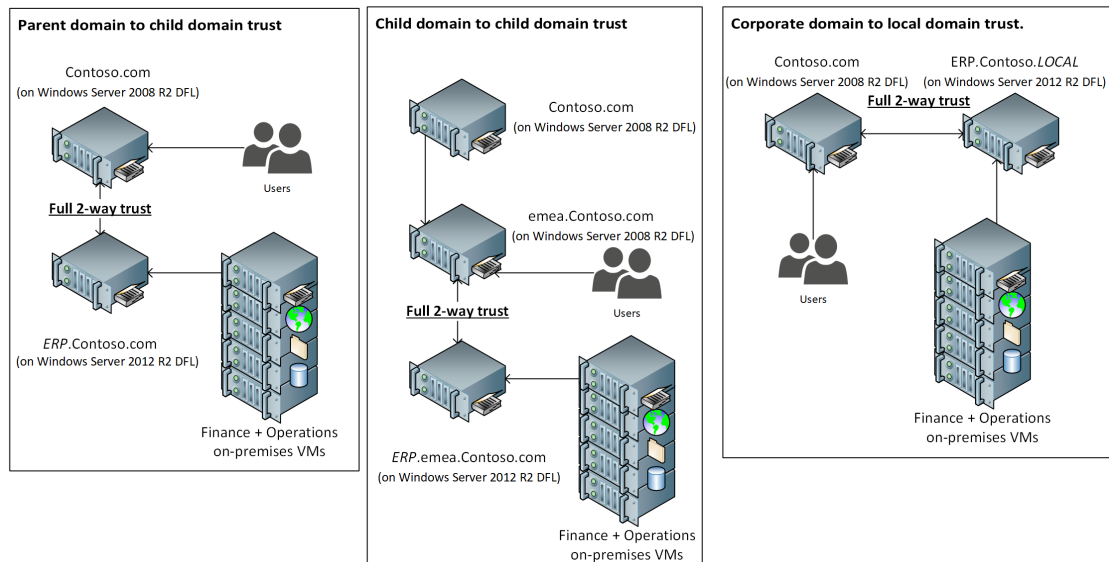
- VMs that host Finance + Operations components must belong to an Active Directory domain. Active Directory Domain Services (AD DS) must be configured in native mode.
- VMs that run Finance + Operations components must have access to each other. This access is configured in AD DS.
- The domain controller must be Microsoft Windows Server 2012 R2 or later, and the domain functional level must be 2012 R2 or more.

Full 2-way trust

For compatibility with corporate domain controllers on Windows Server 2008 R2 domain functional level (DFL), a full 2-way trust between the Windows Server 2008 R2 DFL user domain and the Windows Server 2012 R2 DFL Finance + Operations service domain is supported in Platform update 33 and later.

This means that users of the Finance + Operations (on-premises) application will come from the Windows Server 2008 R2 DFL domain, and the resources and service accounts hosting the Finance + Operations (on-premises) infrastructure and services will come from the Windows Server 2012 R2 DFL domain.

Examples for a full 2-way trust setup could be.



Known limitations with using the full 2-way trust setup

- Import of security groups from the Windows Server 2008 R2 user domain is not supported.

Hardware requirements

This section describes the hardware that is required in order to run Finance + Operations.

The actual hardware requirements vary, based on the system configuration, the data composition, and the features that you decide to use. Here are some of the factors that can affect the choice of appropriate hardware:

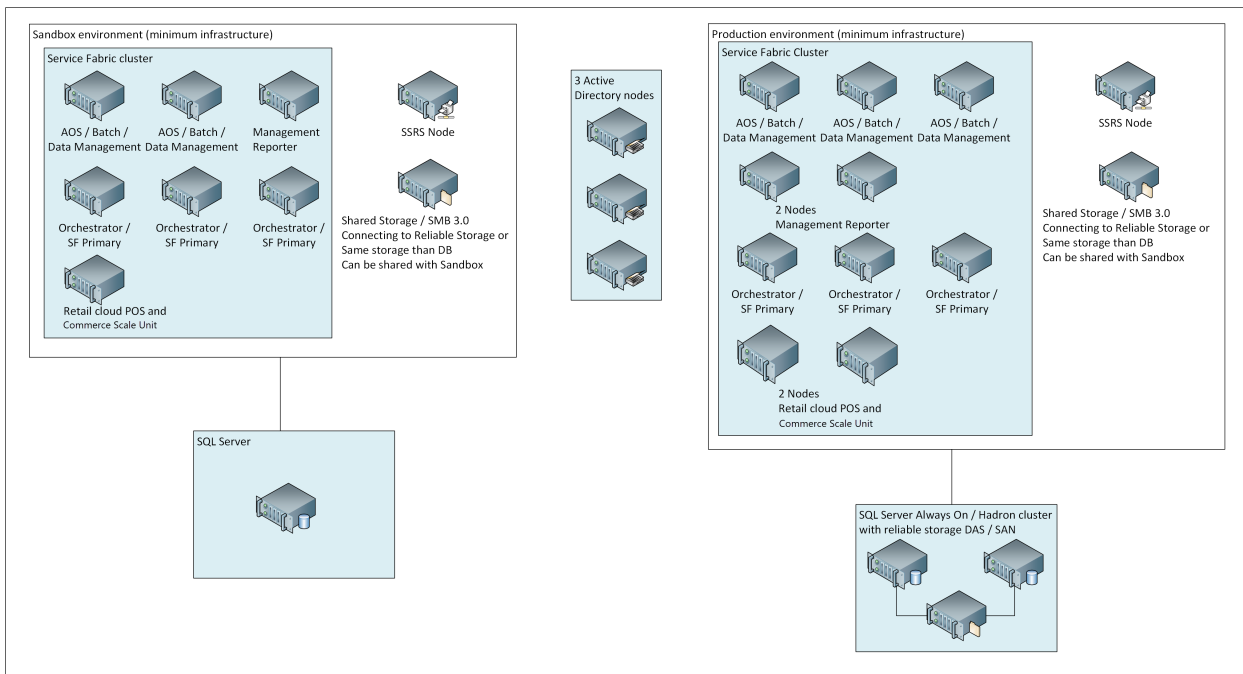
- The number of transactions per hour
- The number of concurrent users

Minimum infrastructure requirements

Finance + Operations uses Service Fabric to host the AOS, Batch, Data management, Management reporter, and Environment orchestrator services.

SQL Server must have a high-availability HADRON setup that has at least two nodes for production use.

The following illustration shows the minimum number of nodes that is recommended for your Service Fabric cluster.



Processor and RAM requirements

The following tables list the number of processors and the amount of random-access memory (RAM) that are required for each role that is required in order to run this deployment option. For more information, see the recommended minimum requirements for a Service Fabric standalone cluster in [Plan and prepare your Service Fabric cluster](#).

NOTE

If other Microsoft software is installed on the same computer, the system must also comply with the hardware requirements for that software. If other server applications are installed on the same computer as AOS, we recommend that you limit those server applications 1 gigabyte (GB) of RAM.

Sizing by role and topology type

TOPOLOGY	ROLE (NODE TYPE)	RECOMMENDED PROCESSOR CORES	RECOMMENDED MEMORY (GB)
Production	AOS, Data management, Batch	8	24
	Management Reporter	4	16
	SQL Server Reporting Services	4	16
	Orchestrator	4	16
	SQL Server	8	32
Sandbox	AOS, Data management, Batch	4	24
	Management Reporter	4	16

TOPOLOGY	ROLE (NODE TYPE)	RECOMMENDED PROCESSOR CORES	RECOMMENDED MEMORY (GB)
	SQL Server Reporting Services	4	16
	Orchestrator	4	16
	SQL Server	8	32

Minimum sizing estimates for production and sandbox deployments

TOPOLOGY	ROLE	NUMBER OF INSTANCES
Production	AOS (Data management, Batch)	3
	Management Reporter	2
	SQL Server Reporting Services	1
	Orchestrator**	3
	SQL Server	2
Sandbox	AOS, Data management, Batch	2
	Management Reporter	1
	SQL Server Reporting Services	1
	Orchestrator	3
	SQL Server	1
<i>Summary for production and sandbox topologies</i>		<i>19</i>

* The numbers in this table are being validated by our preview customers and might be adjusted based on the feedback from those customers.

** Orchestrator is designated as the primary node type and will also be used to run the Service Fabric services.

Initial estimates for the back-end SQL Server and AD DS

	ROLE	VMS/INSTANCES	CORES	TOTAL CORES	MEMORY PER INSTANCE (GB)	TOTAL MEMORY (GB)
Shared infrastructure	SQL Server*	2	8	16	32	64

	ROLE	VMS/INSTANCES	CORES	TOTAL CORES	MEMORY PER INSTANCE (GB)	TOTAL MEMORY (GB)
	File server/Storage area network/Highly available storage	The back-end storage must be based on solid-state drives (SSDs) on a runtime storage area network (SAN). Size and input/output operations per second (IOPS) throughput is based on the size of the workload.				
	Active Directory	3	4	12	16	48
<i>Summary for shared infrastructure</i>		5		28		112

* SQL Server sizes are highly dependent on workloads. For more information, see [Hardware sizing requirements for on-premises environments](#). Separate SQL Server machines for sandbox and production environments must be used. However, SQL Server can be shared in all sandbox environments.

Storage

- AOS – Finance + Operations uses a Server Message Block (SMB) 3.0 share to store unstructured data. For more information, see [Storage Spaces Direct in Windows Server 2016](#).
- SQL – The following options are viable:
 - A highly available SSD setup
 - A SAN that is optimized for online transaction processing (OLTP) throughputs
 - High-performance direct-attached storage (DAS)
- SQL Server and data management IOPS – The storage for both data management and SQL Server should have at least 2,000 IOPS. Production IOPS depends on many factors. For more information, see [Hardware sizing requirements for on-premises environments](#).
- VM IOPS – Each VM should have at least 100 write IOPS.

Virtual host requirements

When you set up the virtual hosts for an environment, see the guidelines in [Plan and prepare your Service Fabric cluster](#) and [Describing a service fabric cluster](#). Each virtual host should have enough cores for the infrastructure that is being sized. Multiple advanced configurations are possible, where SQL Server resides on physical hardware but everything else is virtualized. If SQL Server is virtualized, the disk subsystem should be a fast SAN or the equivalent. In all cases, make sure that the basic setup of the virtual host is highly available and redundant. In all cases, when virtualization is used, no VM snapshots should be taken.

Finance + Operations falls under Microsoft's standard support policy regarding operation on non-Microsoft virtualization platforms – specifically VMWare. For more information, read [Support policy for Microsoft software](#). In short, we support our products in this environment, but if we are asked to investigate an issue, we may ask the customer to first reproduce the problem without the virtualization platform or on the Microsoft virtualization platform.

Software requirements for all server computers

The following software must be present on a computer before any Finance + Operations components can be

installed:

- The Microsoft .NET Framework. See [Deployment setup](#) for version information.
- Service Fabric

For more information, see [Plan and prepare your Service Fabric cluster](#).

Supported server operating systems

The following table lists the server operating systems that are supported.

OPERATING SYSTEM	NOTES
Microsoft Windows Server 2016 Datacenter or Standard	These requirements are for the database and the Service Fabric cluster that hosts AOS. Only en-US OS installations are supported.

Software requirements for database servers

- Only 64-bit versions of SQL Server 2016 are supported.
- Only `SQL_Latin1_General_CP1_CI_AS` is valid for the server and database collation. For more information about how to select a collation for a SQL Server database, see the [SQL Server documentation](#).
- In a production environment, we recommend that you install the latest cumulative update (CU) for the version of SQL Server that you're using.

The following table lists the SQL Server versions that are supported for the databases. For more information, see the minimum hardware requirements for [SQL Server](#).

REQUIREMENT	NOTES
Microsoft SQL Server 2016 Standard Edition or Enterprise Edition	For the hardware requirements for SQL Server 2016, see Hardware and Software Requirements for Installing SQL Server 2016 .

Software requirements for Application Object Server (AOS)

- SQL Server Integration Services (SSIS)

Software requirements for Reporting Server (BI)

- SQL Server Reporting Services (SSRS)

Software requirements for client computers

Users can access Finance + Operations by using the most recent versions of these popular browsers:

- Microsoft Edge (recommended: [Chromium-based Edge](#))
- Google Chrome
- Apple Safari
- Internet Explorer 11 (deprecated, not recommended)

NOTE

For optimal performance and an optimal experience, we recommend that you use the latest version of a modern browser, especially Microsoft Edge. Support for Internet Explorer 11 is deprecated. For more information, see the [Internet Explorer deprecation announcement](#).

Software requirements for Active Directory Federation Services

Active Directory Federation Services (AD FS) on Windows Server 2016 is required.

The domain controller must be Windows Server 2012 R2 or later, and the domain functional level must be 2012 R2 or more. For more information about domain functional levels, see the following pages:

- [What Are Active Directory Functional Levels](#)
- [Understanding Active Directory Domain Services Functional Levels](#)
- [Full 2-way trust](#)

Supported Microsoft Office applications

The following Microsoft Office applications are supported in on-premises deployments:

- To run the Microsoft Excel and Microsoft Word add-ins, you must have Microsoft Office 2016 for Windows (or newer) installed. For more information about version requirements, see [Troubleshoot the Office integration](#).
- To view documents that are generated by the Export to Excel or Export to Word functionality, you must have Microsoft Office 2007 or later installed.

Hardware and software requirements for Commerce components

Currently, Finance + Operations doesn't include the Commerce components.

NOTE

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Buy Finance + Operations (on-premises)

2/18/2021 • 3 minutes to read • [Edit Online](#)

Microsoft Dynamics 365 Finance + Operations (on-premises) offers a variety of license types to best suit the needs of your organization. To better understand how Finance + Operations (on-premises) is licensed, please work with your partner, who can access the [Licensing guide](#) on PartnerSource. When you are ready to purchase licenses for your organization, work with your partner to follow the steps outlined in this topic.

IMPORTANT

On-premises environments are not supported on any public cloud infrastructure, including Azure.

Purchase client access licenses

To run on-premises environments, you must obtain the proper number of client access licenses (CALs) for your organization per the licensing guide. The CAL purchased for an individual user determines the functionality that the user has the rights to use. User CALs can be purchased from the [Microsoft Volume Licensing Service Center](#).

Purchase server licenses

A server license is required for every server running Finance + Operations (on-premises). After purchasing your server licenses, work with your partner to download a license file from the [PartnerSource Business Center](#). Keep this license file handy, as the details it contains will be used when setting up your Lifecycle Services (LCS) project.

Partners can download a customer's Finance + Operations (on-premises) license file from the PartnerSource Business Center using these steps:

1. Log on to the [PartnerSource Business Center](#).
2. Enter the customer name or account number in the **Find A Customer** field, and then click **Search**.
3. Click the company name of the customer. This opens the **Customer Summary** page.
4. Under **Registered Products**, click **Registration Keys**.
5. Select **version 07** in the **Request and Display License Keys For Version** field.
6. Click **Display License Keys**.
7. On the **Request License Keys** page, select **Download Current License/Registration Key**.
8. Click **Save As** in the **File Download** dialog box, select the folder where you want to download the license file to in the **Save As** dialog box, and then click **Save**.

NOTE

If you cannot see registration keys in PartnerSource Business Center, you will need to ensure that your PartnerSource Business Center Profile has **Can See Registration Keys** set to **Yes**.

Get started with Lifecycle Services (LCS)

To purchase Finance + Operations (on-premises) you must have a Microsoft Online Services ID. The Microsoft Online Services ID is used to provision an LCS project that contains the necessary artifacts for on-premises environments. LCS is the service where on-premises environments will be provisioned, Business Process Model

created/uploaded, hotfixes are made available, support cases are entered and managed, license key serial number activation submitted, etc.

The Microsoft Online Services ID is required to provision and register Finance + Operations (on-premises) into entity-owned hardware and environment. See the Provisioning guide (linked to below) to complete the provisioning and registration process. If a Microsoft Online Services ID already exists, the process must be completed by the Global Administrator. If creating a Microsoft Online Services ID for the first time, the person initiating the process will be the Global Administrator.

If you have an existing Microsoft Online Services trial or paid subscription, you already have a Microsoft Online Services ID that was created at the time of sign-up. When you click a link below, choose to sign in with this account if you want to use this same Azure Active Directory (AAD) tenant for the on-premises environment.

Access to the Provisioning guide can be found here:

- [Provisioning guide on CustomerSource](#)
- [Provisioning guide on PartnerSource](#)

After you have logged into LCS, a project will be automatically provisioned for you. The LCS project will allow you to deploy an on-premises environment. For more details on getting started with your LCS project, see [Set up on-premises projects in Lifecycle Services \(LCS\)](#).

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Configure the Warehousing app for on-premises deployments

2/18/2021 • 4 minutes to read • [Edit Online](#)

This topic describes how to configure Dynamics 365 for Finance and Operations – Warehousing app for on-premises deployments.

Prerequisites

The Warehousing app is available on Android and Windows operating systems. To use the app for on-premises deployments, at a minimum, it must be version 1.1.1.0. You must also have one of the following supported versions of Dynamics 365 Finance + Operations (on-premises). Use the information in the following table to evaluate if your hardware and software environment supports the configuration.

PLATFORM	VERSION
Android	4.4 and up
Windows (UWP)	Windows 10 (all versions)
App version	1.1.1.0 and above
Dynamics 365	Dynamics 365 Finance + Operations (on-premises) with Platform update 11

To be able to reach your on-premises resources with the app, you will need to create DNS records for your AOS and for Active Directory Federation Services (AD FS). For guidance, see [Create DNS zones, and add a record](#).

Create an application entry in AD FS

For a successful authentication exchange between AD FS and Finance + Operations, an application entry must be registered in AD FS under an AD FS application group. To create this application entry, run the following Windows PowerShell commands on a machine where the AD FS is installed. The user account must have enough permissions to administer AD FS.

1. Enter the following command in the Windows PowerShell console to create the application entry.

```
Add-AdfsClient -Name 'Dynamics 365 for Finance and Operations - Warehousing' -ClientId ([guid]::NewGuid()) -ClientType Confidential -GenerateClientSecret -RedirectUri '\<Resource URL\>' -ADUserPrincipalName '\<Admin user\>'
```

- The <Resource URL> can, for example, be `https://ax.d365ffo.onprem.contoso.com` (where `https://ax.d365ffo.onprem.contoso.com` is the URL to access Finance + Operations).
- The <Admin user> can be any user with admin access to the AD FS machine.

2. Save the values that you received.

3. Run the following command to grant permission to the application.


```
Grant-AdfsApplicationPermission -ClientRoleIdentifier '\<Client ID received in previous steps\>' -
ServerRoleIdentifier '\<Resource URL\>' -ScopeNames 'openid'
```

Create and configure a user account

To enable Finance + Operations to use your AD FS application, you must create a user account in Microsoft Dynamics 365 with the same user credentials as the user of the Warehousing app:

1. Create a user in Finance + Operations and assign the Warehousing mobile device user role to the user.
 - a. Go to **System administration > Common > Users**.
 - b. Create a new user.
 - c. Assign the warehouse mobile device user role, as shown in the example screenshot.

USERS
WMAPP : WMAPP

User details

User ID WMAPP	Email WMAPP@contoso.net	Person [Dropdown]
User name WMAPP	Telemetry ID {00000000-0000-0000-0000-00...}	Enabled Yes <input checked="" type="checkbox"/>
Provider https://sts.windows-ppe.net/	Company [Dropdown]	

User's roles

+ Assign roles Remove role Assign organizations

Roles

- System user
 - Warehouse mobile device user

2. Associate your AD FS application with the Warehousing app user.
 - a. In Finance + Operations, click **System administration > Setup > Azure Active Directory applications**.
 - b. Create a new line.
 - c. Enter the client ID that you obtained when you created an application entry in AD FS (step 2 in "Create an application entry in AD FS"). Enter a name, and select the Warehousing app user.

Dynamics 365 Operations System administration > Setup > Azure Active Directory applications

Save + New Delete OPTIONS 🔍

Azure Active Directory applications

Filter

✓	Client Id	Name	User ID
✓	aaaaaaaa-1234-bbbb-5678-cccccccccc	Device 1	WMAPP [Dropdown]

Certificates

Make sure that the devices with the app installed have the correct certificates to access the resources. If you are using self-signed certificates, these will need to be installed on each device by importing star(AX) and AD FS to the trusted route of the computer account/user account. For more information, see [Create and export a self-signed certificate](#).

IMPORTANT

Environments with self-signed certificates will not be accessible from Android devices. If you need to access the environment from an Android device, use publicly trusted certificates for AD FS and Finance + Operations. Alternatively, you can also use AD CS to generate the certificates for AD FS and Finance + Operations. However, if you do this you will have to manually import the certificate authority certificate into your Android device.

Configure the application

You must configure the Warehousing app on the device to connect to the server through the AD FS application.

1. In the app, open **Connection settings**.
2. Enter the following information:
 - a. **Active Directory Client ID** - The client ID that you obtained when you created an application entry in AD FS (step 2 in "Create an application entry in AD FS").
 - b. **Active Directory Client Secret** - The client secret obtained when you created an application entry in AD FS.
 - c. **Active Directory Resource** - The DNS URL for the AOS. Append the URL with '/namespaces/AXSF'.
For example: `https://ax.d365ffo.onprem.contoso.com/namespaces/AXSF`
 - d. **Active Directory Tenant** - The DNS URL for the AD FS machine. Append the URL with '/adfs/oauth2'.
For example: `https://adfs.d365ffo.onprem.contoso.com/adfs/oauth2` Make sure to use the CNAME of the ADFS machine (in the example the CNAME is `https://adfs.d365ffo.onprem.contoso.com`)
3. **Company** - Enter the legal entity to which you want the application to connect.
4. Select the **Back** button in the top-left corner of the application.

The application will now connect to your server and the log-in screen for the warehouse worker will display.

5. If you do not have a telemetry ID for the Warehouse app, you might encounter some errors. This is a known issue. The workaround is to sign in to an existing client to get a Telemetry ID. This issue will be fixed in a future release.

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Dynamics 365 Finance and Dynamics 365 Supply Chain Management - operated by 21Vianet in China

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NOTE

Effective November 2020:

- Common Data Service has been renamed to Microsoft Dataverse. For more information, see [Power Automate Blog](#).
- Some terminology in Microsoft Dataverse has been updated. For example, *entity* is now *table* and *field* is now *column*. For more information, see [Terminology updates](#).

This topic will be updated soon to reflect the latest terminology.

Microsoft Dynamics 365 online services operated by 21Vianet is designed to comply with regulatory requirements in China. The services are a physically separated instance of cloud services operated and transacted by a local operator, Shanghai Blue Cloud Technology Co., Ltd (“21Vianet”). This is a wholly owned subsidiary of Beijing 21Vianet Broadband Data Center Co., Ltd. located in mainland China.

Microsoft strives to maintain functional parity between our commercially available service and Finance and Operations apps operated by 21Vianet in China. However, there are notable exceptions to this, which are affected by dependent service or partner-solution availability, market priorities, or compliance regulations.

Provisioning

Customers in China have two options from which to select how they want to access Finance and Supply Chain Management apps.

- Services operated by 21Vianet in China - 21Vianet operates and offers Finance and Supply Chain Management services in China. This option provides a consistent application experience that is the same as global offerings. This option also meets the demands of customers who prefer to use online services provided by a local company that stores their data within China. These services are subject to Chinese laws.
- Services operated by Microsoft – This option is for Finance and Supply Chain Management customers that prefer to use services managed and delivered by Microsoft. For all new customers and existing customers, if the customer purchases Microsoft Azure, Dynamics 365, and Office using an Enterprise Agreement, Microsoft 365 and/or Dynamics 365 can co-exist on the tenant.

For information on provisioning environments, see [Create and manage environments in the Power Platform Admin center](#).

Features not available

Due to certain technical dependencies, the following features listed will not be available for general availability of the Dynamics 365 Services operated by 21Vianet. For information about future feature availability, see [Business applications and platform release plans](#).

- **Development, build, and testing of customizations** will be unavailable in **Azure DevOps** in

Mainland China. However, use of Azure DevOps on-premises will be available in China in April 2019. Also, Azure DevOps can be used in other regions. For more information, see [Developer guide for Azure China 21Vianet](#).

- [Set up and maintain vendor collaboration](#) will be unavailable due to Azure Active Directory limitations.
- Certain **mobile apps** (e.g., [Install and configure the Warehousing app overview](#) and [Project time entry mobile workspace](#)) will be unavailable due to the Google Play Store not being available in China; however, alternatives are being considered.
- The **mobile platform** will not be available because certain App store dependencies are unavailable in China.
- The following **Microsoft Dynamics Lifecycle Services (LCS)** features will have a different experience or will be unavailable due to the dependencies that are not available:
 - **APQC Business process modeler (BPM) Library** will be unavailable. However, base Business process modeler (BPM) functionality will be available for custom models in April 2019. Search functionality in the BPM will be unavailable in China.
 - **Electronic reporting (ER) overview assets** will not be available automatically, but can be manually uploaded from the LCS global asset library.
 - **Code upgrade** will be unavailable for upgrades from Dynamics AX 2012.
 - **Service and Support requests** will be available through LCS but 21Vianet is the service operator. For more information, see [Support for Dynamics 365 Finance and Operations apps operated by 21Vianet in China](#).
 - **Extensibility requests** will be unavailable.
 - Hotfix requests will be unavailable.
 - [Dynamics 365 Translation Service overview](#) will not be available.
 - **Embedded Power Apps** and connectivity to Microsoft Power Apps and Microsoft Power Automate will be unavailable.
 - [Data integration using Dataverse overview](#) will be unavailable.

NOTE

The Lifecycle Services URL for implementations operated by 21Vianet in China is lcs.dynamics.cn.

- The following features will not be available due to certain **current Azure Active Directory limitations** in China:
 - The **System administration > Setup > B2B Invitation configuration** page will not be available due to business-to-business (B2B) being unavailable in Azure Active Directory in China. For more information, see [What is guest user access in Azure Active Directory B2B](#).
- **Conditional access** is an Azure Active Directory feature that is available for the Azure Active Directory Premium 2 SKU. This is unavailable in China.
- The Microsoft Dynamics 365 Payment Connector for PayPal is not available in China.

Additional resources

- [Dynamics 365 support site for 21Vianet \(Chinese\)](#)

- [Support for Dynamics 365 Finance and Operations apps operated by 21Vianet in China](#)
- [Model-driven apps in Dynamics 365 - operated by 21Vianet in China](#)
- [Dynamics 365 Privacy statement \(Dynamics 365 隐私声明\)](#)
- [Dynamics 365 Service Level agreement \(世纪互联在线服务的服务级别协议\)](#)
- [Dynamics 365 Legal information \(Dynamics 365 法律信息\)](#)
- [Service terms for Dynamics 365 Lifecycle Services](#)
- [OSPT of Dynamics 365 \(世纪互联在线服务的服务级别协议\)](#)
- [Azure Docs \(in Chinese\)](#)
- [Azure China 21Vianet](#)
- [Business applications availability in China – operated by 21Vianet in China](#)

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Finance and Operations apps in France

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As of July 2019, Finance and Operations apps, Power Apps, and Power Automate are available in France's datacenters. This new deployment option serves customers in regulated industry and commercial organizations that do business with entities in France that require local data residency. Power BI has been available since March 2019.

The deployment of the Dynamics 365 services in France, are built upon the foundational principles of security, privacy, compliance, transparency, and reliability, offering French organizations a complete cloud infrastructure and platform, as well as familiar productivity and business application tools. All of this means that customer data stays resident within France.

Microsoft strives to maintain functional parity between our commercially available service and Dynamics 365 offerings in France. However, there are few exceptions affected by dependent service or partner-solution availability, market priorities, or compliance regulations. For more information about these exceptions or for questions about services in France, contact [Microsoft Dynamics Online support](#).

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

What's new or changed in Finance and Operations apps home page

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Application releases

To see what's new or changed in each release of a Finance and Operations app, see the following topics:

- **Finance:** [What's new or changed in Dynamics 365 Finance](#)
- **Supply Chain Management:** [What's new or changed in Dynamics 365 Supply Chain Management](#)
- **Commerce:** [What's new or changed in Dynamics 365 Commerce](#)
- **Human Resources:** [What's new or changed in Dynamics 365 Human Resources](#)

Platform updates

To see what's new or changed in the Platform updates for Finance and Operations apps, see the following topic:

- [What's new or changed in Platform updates](#)

Lifecycle Services releases

To see what's new or changed in Lifecycle Services, see the following topic:

- [What's new or changed in Lifecycle Services \(LCS\)](#)

NOTE

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What's new or changed in Dynamics 365 Supply Chain Management

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Releases of Dynamics 365 Supply Chain Management

To see what's new or changed in each release of Dynamics 365 Supply Chain Management, see the following topics.

VERSION	BUILD NUMBER	AUTO-UPDATE AVAILABILITY	LEARN MORE
10.0.16	10.0.689	February 2021	What's new or changed in Dynamics 365 Supply Chain Management version 10.0.16
10.0.15	10.0.644	January 2021	What's new or changed in Dynamics 365 Supply Chain Management version 10.0.15
10.0.14	10.0.605	November 2020	What's new or changed in Dynamics 365 Supply Chain Management version 10.0.14
10.0.13	10.0.569	October 2020	What's new or changed in Dynamics 365 Supply Chain Management version 10.0.13
10.0.12	10.0.507	August 2020	What's new or changed in Dynamics 365 Supply Chain Management version 10.0.12
10.0.11	10.0.464	July 2020	What's new or changed in Dynamics 365 Supply Chain Management version 10.0.11
10.0.10	10.0.420	May 2020	What's new or changed in Dynamics 365 Supply Chain Management version 10.0.10
10.0.9	10.0.383	April 2020	What's new or changed in Dynamics 365 Supply Chain Management version 10.0.9

VERSION	BUILD NUMBER	AUTO-UPDATE AVAILABILITY	LEARN MORE
10.0.8	10.0.319	February 2020	What's new or changed in Dynamics 365 Supply Chain Management version 10.0.8
10.0.7	10.0.283	January 2020	What's new or changed in Dynamics 365 Supply Chain Management version 10.0.7
10.0.6	10.0.234	November 2019	What's new or changed in Dynamics 365 Supply Chain Management 10.0.6

Releases before November 2019

To see what's new or changed in releases before November 2019, see the following topics.

RELEASE	VERSION	BUILD NUMBER	AVAILABILITY	LEARN MORE
Microsoft Dynamics 365 for Finance and Operations	10.0.5	10.0.197	October 2019	What's new or changed in Dynamics 365 for Finance and Operations version 10.0.5 (October 2019)
Microsoft Dynamics 365 for Finance and Operations	10.0.4	10.0.136	July 2019	What's new or changed in Dynamics 365 for Finance and Operations version 10.0.4 (July 2019)
Microsoft Dynamics 365 for Finance and Operations	10.0.3	10.0.107	June 2019	What's new or changed in Dynamics 365 for Finance and Operations version 10.0.3 (June 2019)
Microsoft Dynamics 365 for Finance and Operations	10.0.2	10.0.80	May 2019	What's new or changed in Dynamics 365 for Finance and Operations version 10.0.2 (May 2019)
Microsoft Dynamics 365 for Finance and Operations	10.0.1	10.0.51	April 2019	What's new or changed in Dynamics 365 for Finance and Operations version 10.0.1 (April 2019)
Microsoft Dynamics 365 for Finance and Operations	10.0	10.0.8	April 2019	What's new or changed in Finance and Operations version 10.0 (April 2019)

RELEASE	VERSION	BUILD NUMBER	AVAILABILITY	LEARN MORE
Microsoft Dynamics 365 for Finance and Operations	8.1.3	8.1.227	January 2019	What's new or changed in Dynamics 365 for Finance and Operations version 8.1.3 (January 2019)
Microsoft Dynamics 365 for Finance and Operations	8.1.2	8.1.195	December 2018	What's new or changed in Dynamics 365 for Finance and Operations version 8.1.2 (December 2018)
Microsoft Dynamics 365 for Finance and Operations	8.1.1	8.1.170	October 2018	What's new or changed in Dynamics 365 for Finance and Operations version 8.1.1 (October 2018)
Microsoft Dynamics 365 for Finance and Operations	8.1	8.1.136	October 2018	What's new or changed in Dynamics 365 for Finance and Operations version 8.1 (October 2018)
Microsoft Dynamics 365 for Finance and Operations	8.0	8.0.30, 8.0.35	April 2018	What's new or changed in Dynamics 365 for Finance and Operations version 8.0 (April 2018)
Microsoft Dynamics 365 for Finance and Operations, Enterprise edition	7.3	7.3.11971.56116	December 2017	What's new or changed in Dynamics 365 for Finance and Operations, Enterprise edition 7.3
Microsoft Dynamics 365 for Finance and Operations, Enterprise edition	July 2017	7.2.11792.56024	June 2017	What's new or changed in Dynamics 365 for Finance and Operations, Enterprise edition (July 2017)
Microsoft Dynamics 365 for Operations	1611	7.1.1541.3036	November 2016	What's new or changed in Dynamics 365 for Operations version 1611 (November 2016)
Microsoft Dynamics AX	7.0.1	7.0.1265.23014	May 2016	What's new or changed in Dynamics AX application version 7.0.1 (May 2016)

RELEASE	VERSION	BUILD NUMBER	AVAILABILITY	LEARN MORE
Microsoft Dynamics AX	7.0	7.0.1265.3015	February 2016	What's new or changed in Dynamics AX 7.0 (February 2016)

NOTE

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Preview of Dynamics 365 Supply Chain Management 10.0.17 (April 2021)

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IMPORTANT

Some or all of the functionality noted in this topic is available as part of a preview release. The content and the functionality are subject to change. For more information about preview releases, see [One version service updates FAQ](#).

This topic lists features that are either new or changed in the Microsoft Dynamics 365 Supply Chain Management preview of version 10.0.17. This version has a build number of 10.0.761 and is available as follows:

- **Preview of release:** February 2021
- **General availability of release (self-update):** March 2021
- **General availability of release (auto-update):** April 2021

Features included in this release

The following features are included in this release. Some of the listed features are still in preview, while others may already be generally available. Follow the links to the [release plan](#) to see the official release dates for each feature.

Most of these features must be enabled using [Feature management](#) before you can use them.

Asset management

- [Apply rules for grouping work orders while running a maintenance plan](#)
 - For more information, see [Creating work orders](#).
- [Bill customers for maintenance work](#)
 - For more information, see [Bill for maintenance on customer-owned assets](#).
- [Plan maintenance based on accumulated asset counter values](#)
 - For more information, see [Maintenance plans](#).

Inventory and logistics

- [Integration framework for material handling equipment for automated warehouse processes \(previously MHAX\)](#)
- [Landed cost](#)
- [Packing vs. storage dimensions](#)
 - For more information, see [Set different dimensions for packing and storage](#).
- [Saved views for inventory and logistics](#)
 - For more information, see [Standard saved views for Supply Chain Management](#).
- [Schedule warehouse work creation](#)
 - For more information, see [Schedule work creation during wave](#).
- [Set default financial dimensions for inventory standard cost revaluation vouchers](#)
 - For more information, see [Manage standard cost updates](#).

- [Small parcel shipping \(SPS\)](#)
 - For more information, see [Small parcel shipping](#).
- [Warehouse execution with scale units in the cloud](#)
 - For more information, see [Warehouse management workloads for cloud and edge scale units](#) and [Warehouse orders for cloud and edge scale units](#).
- [Warehouse management mobile application](#)
 - For more information, see [Install and connect the Warehouse Management app](#) and [Mobile device user settings](#).

Manufacturing

- [Asset management capabilities in the production floor execution interface](#)
 - For more information, see [How workers use the production floor execution interface](#).
- [Override the default reservation principle for materials in production](#)
 - For more information, see [Override the default reservation principle for materials in production](#).
- [Saved views for production control](#)
 - For more information, see [Standard saved views for Supply Chain Management](#).
- [Manufacturing execution with scale units in the cloud](#)
 - For more information, see [Manufacturing execution workloads for cloud and edge scale units](#).

Planning

- [Coverage time fence support for Planning Optimization](#)
 - For more information, see [Coverage time fences](#).
- [Forecast submodel support for Planning Optimization](#)
 - For more information, see [Master planning with demand forecasts](#).
- [Purchase requisition support for Planning Optimization](#)
 - For more information, see [Purchase requisitions](#).
- [Saved views for planned orders](#)
 - For more information, see [Standard saved views for Supply Chain Management](#).

Product information management

- [Enable change management on existing products](#)
 - For more information, see [Enable change management on existing products](#).

New and updated documentation resources

We have recently added or significantly updated the following help topics. They aren't necessarily related to the new features added for this release, as listed in the previous section, but they may help you to get more out of existing features.

Cost management

- [Troubleshoot cost management](#)

Asset management

- [Set up the Asset management mobile workspace](#)

Inventory and logistics

- [Configure product filters for warehouse transactions](#)
- [Partial location cycle counting](#)

- [Pick line grouping](#)
- [Troubleshoot inventory operations](#)
- [Warehouse slotting](#)

Manufacturing

- [Design the production floor execution interface](#)

Planning

- [Intercompany planning](#)
- [Inventory marking with Planning Optimization](#)
- [Production planning](#)
- [Purchase requisitions in master planning](#)

Additional resources

Platform updates for Finance and Operations apps

Microsoft Dynamics 365 Supply Chain Management 10.0.17 includes platform updates. To learn more, see [Platform updates for version 10.0.17 of Finance and Operations apps \(April 2021\)](#).

Bug fixes

For information about the bug fixes included in each of the updates that are part of 10.0.17, sign in to Lifecycle Services (LCS) and view the [KB article](#).

Dynamics 365: 2021 release wave 1 plan

Wondering about upcoming and recently released capabilities in any of our business apps or platform?

Check out the [Dynamics 365: 2021 release wave 1 plan](#). We've captured all the details, end to end, top to bottom, in a single document that you can use for planning.

Removed and deprecated Supply Chain Management features

The [Removed or deprecated features in Dynamics 365 Supply Chain Management](#) topic describes features that have been or are scheduled to be removed or deprecated for Supply Chain Management.

- A *removed* feature is no longer available in the product.
- A *deprecated* feature is not in active development and may be removed in a future update.

Before any feature is removed from the product, the deprecation notice will be announced in the [Removed or deprecated features in Dynamics 365 Supply Chain Management](#) topic 12 months prior to the removal.

For breaking changes that only affect compilation time, but are binary compatible with sandbox and production environments, the deprecation time will be less than 12 months. Typically, these are functional updates that need to be made to the compiler.

NOTE

Can you tell us about your documentation language preferences? [Take a short survey](#).

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

What's new or changed in Dynamics 365 Supply Chain Management 10.0.16 (February 2021)

2/18/2021 • 3 minutes to read • [Edit Online](#)

This topic lists features that are either new or changed in Microsoft Dynamics 365 Supply Chain Management version 10.0.16. This version has a build number of 10.0.689 and is available as follows:

- **Preview of release:** November 2020
- **General availability of release (self-update):** January 2021
- **General availability of release (auto-update):** February 2021

Features included in this release

The following features are included in this release. Some of the listed features are still in preview, while others may already be generally available. Follow the links to the [release plan](#) to see the official release dates for each feature.

- [Customizable shop floor execution interface](#)
 - For more information, see [Set up a device to run the production floor execution interface](#).
- [Inventory Visibility Add-in for Dynamics 365 Supply Chain Management](#)
 - For more information, see [Inventory Visibility Add-in](#)
- [Validate license plates on source document lines](#)
 - For more information, see [Warehouse configuration overview](#).
- [Warehouse management outbound workload visualization](#)
 - For more information, see [Outbound workload visualization](#)

Most of these features must be enabled using [Feature management](#) before you can use them.

New and updated documentation resources

We have recently added or significantly updated the following help topics. They aren't necessarily related to the new features added for this release, as listed in the previous section, but they may help you to get more out of existing features.

- [Attribute-based sales prices for constraint-based product configuration](#)
- [Automatic allocation of charges](#)
- [Hazardous materials overview](#) (and related topics)
- [Migration to Planning Optimization for master planning](#)
- [Purchasing cXML Enhancements](#)
- [Troubleshoot cost management](#)
- [Troubleshoot inbound warehouse operations](#)
- [Troubleshoot load building and shipments](#)
- [Troubleshoot master planning](#)
- [Troubleshoot outbound warehouse operations](#)
- [Troubleshoot partial releases and partial shipments](#)
- [Troubleshoot the product configurator](#)

- [Troubleshoot product information](#)
- [Troubleshoot procurement and sourcing workflows](#)
- [Troubleshoot purchase orders](#)
- [Troubleshoot prices, discounts, agreements, and rebates](#)
- [Troubleshoot product receipts and invoicing](#)
- [Troubleshoot discrete manufacturing](#)
- [Troubleshoot picking and packing](#)
- [Troubleshoot process manufacturing](#)
- [Troubleshoot reservations in warehouse management](#)
- [Troubleshoot sales orders](#)
- [Troubleshoot sales quotations](#)
- [Troubleshoot upgrade and migration to advanced warehouse management](#)
- [Troubleshoot warehouse app connection issues](#)
- [Troubleshoot warehouse configuration](#)
- [Troubleshoot warehouse replenishment](#)
- [Troubleshoot warehouse setup](#)
- [Troubleshoot warehouse work](#)
- [Putaway clusters](#)
- [Replenishment strategies](#)
- [Work split](#)
- [Work with location directives](#)

Additional resources

Platform updates for Finance and Operations apps

Microsoft Dynamics 365 Supply Chain Management 10.0.16 includes platform updates. To learn more, see [Platform updates for version 10.0.16 of Finance and Operations apps \(February 2021\)](#).

Bug fixes

For information about the bug fixes included in each of the updates that are part of 10.0.16, sign in to Lifecycle Services (LCS) and view the [KB article](#)

Dynamics 365: 2020 release wave 2 plan

Wondering about upcoming and recently released capabilities in any of our business apps or platform?

Check out the [Dynamics 365: 2020 release wave 2 plan](#). We've captured all the details, end to end, top to bottom, in a single document that you can use for planning.

Removed and deprecated Supply Chain Management features

The [Removed or deprecated features in Dynamics 365 Supply Chain Management](#) topic describes features that have been or are scheduled to be removed or deprecated for Supply Chain Management.

- A *removed* feature is no longer available in the product.
- A *deprecated* feature is not in active development and may be removed in a future update.

Before any feature is removed from the product, the deprecation notice will be announced in the [Removed or deprecated features in Dynamics 365 Supply Chain Management](#) topic 12 months prior to the removal.

For breaking changes that only affect compilation time, but are binary compatible with sandbox and production environments, the deprecation time will be less than 12 months. Typically, these are functional updates that need to be made to the compiler.

NOTE

Can you tell us about your documentation language preferences? [Take a short survey.](#)

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

What's new or changed in Dynamics 365 Supply Chain Management 10.0.15 (January 2021)

2/18/2021 • 2 minutes to read • [Edit Online](#)

This topic lists features that are either new or changed in Microsoft Dynamics 365 Supply Chain Management version 10.0.15. This version has a build number of 10.0.644 and is available as follows:

- **Preview of release:** October 2020
- **General availability of release (self-update):** November 2020
- **General availability of release (auto-update):** January 2021

Features included in this release

The following features are included in this release. Some of the listed features are still in preview, while others may already be generally available. Follow the links to the [release plan](#) to see the official release dates for each feature.

- **Cloud and edge scale unit management with manufacturing and warehouse execution workloads**
 - For more information, see [Cloud and edge scale units for manufacturing and warehouse management workloads](#).
- **Create and process transfer orders from the warehouse app**
 - For more information, see [Create transfer orders from the warehouse app](#).
- **Default RFQ reply fields for vendor bidding**
 - For more information, see [Requests for quotation \(RFQs\) overview](#).
- **Engineering Change Management Add-in for Dynamics 365 Supply Chain Management**
 - For more information, see [Engineering change management overview](#).
- **Mixed-reality Guides for manufacturing**
 - For more information, see [Provide mixed-reality Guides for workers in production](#).
- **New user experience for production floor execution**
 - For more information, see [How workers use the production floor execution interface](#).
- **Process warehouse app events**
 - For more information, see [Warehouse app event processing](#).
- **Saved views for the Released products page**
 - For more information, see [Saved views](#).
- **USMCA certification of origin document**
 - For more information, see [USMCA certification of origin](#).

Most of these features must be enabled using [Feature management](#) before you can use them.

Additional resources

Platform updates for Finance and Operations apps

Microsoft Dynamics 365 Supply Chain Management 10.0.15 includes platform updates. To learn more, see [Platform updates for version 10.0.15 of Finance and Operations apps \(October 2020\)](#).

Bug fixes

For information about the bug fixes included in each of the updates that are part of 10.0.15, sign in to Lifecycle Services (LCS) and view the [KB article](#).

Dynamics 365: 2020 release wave 2 plan

Wondering about upcoming and recently released capabilities in any of our business apps or platform?

Check out the [Dynamics 365: 2020 release wave 2 plan](#). We've captured all the details, end to end, top to bottom, in a single document that you can use for planning.

Removed and deprecated Supply Chain Management features

The [Removed or deprecated features in Dynamics 365 Supply Chain Management](#) topic describes features that have been or are scheduled to be removed or deprecated for Supply Chain Management.

- A *removed* feature is no longer available in the product.
- A *deprecated* feature is not in active development and may be removed in a future update.

Before any feature is removed from the product, the deprecation notice will be announced in the [Removed or deprecated features in Dynamics 365 Supply Chain Management](#) topic 12 months prior to the removal.

For breaking changes that only affect compilation time, but are binary compatible with sandbox and production environments, the deprecation time will be less than 12 months. Typically, these are functional updates that need to be made to the compiler.

NOTE

Can you tell us about your documentation language preferences? [Take a short survey](#).

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Removed or deprecated features in Dynamics 365 Supply Chain Management

2/18/2021 • 3 minutes to read • [Edit Online](#)

This topic will be updated as new removed or deprecated features are documented for Dynamics 365 Supply Chain Management.

- A *removed* feature is no longer available in the product.
- A *deprecated* feature is not in active development and may be removed in a future update.

This list is intended to help you consider these removals and deprecations for your own planning.

NOTE

Detailed information about objects in Finance and Operations apps can be found in the [Technical reference reports](#). You can compare the different versions of these reports to learn about objects that have changed or been removed in each version of Finance and Operations apps.

Features removed or deprecated in the Supply Chain Management 10.0.15 release

Internet Explorer 11 support for Dynamics 365 is deprecated

Reason for deprecation/removal	Effective December 2020, Microsoft Internet Explorer 11 support for all Dynamics 365 products is deprecated, and Internet Explorer 11 won't be supported after August 2021. This will impact customers who use Dynamics 365 products that are designed to be used through an Internet Explorer 11 interface. After August 2021, Internet Explorer 11 won't be supported for such Dynamics 365 products.
Replaced by another feature?	We recommend that customers transition to Microsoft Edge.
Product areas affected	All Dynamics 365 products
Deployment option	All
Status	Deprecated. Internet Explorer 11 won't be supported after August 2021.

Use of built-in Supply Chain Management master planning engine for manufacturing scenarios

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Reason for deprecation/removal	To enhance performance and minimize the SQL database load during master planning runs, the built-in Supply Chain Management master planning engine is being replaced by Planning Optimization. Planning Optimization allows for fast planning runs that can be performed even during office hours. This enables planners to react immediately to changes in demand or planning parameters.
Replaced by another feature?	Yes, Planning Optimization will replace the existing built-in Supply Chain Management master planning engine.
Product areas affected	Supply Chain Management - Master planning
Deployment option	Cloud only. Planning Optimization is not supported with on-premises deployments.
Status	Deprecated. By October 1, 2021, manufacturing scenarios will no longer be supported with the built-in Dynamics 365 Supply Chain Management master planning engine. For manufacturing scenarios, customers must use Planning Optimization for master planning calculations. For more information, see Planning Optimization documentation . Customers with on-premises deployments of Dynamics 365 Supply Chain Management may continue to use the Supply Chain Management master planning engine for manufacturing scenarios after October 2021. However, no more feature enhancements will be provided.

Features removed or deprecated in the Supply Chain Management 10.0.11 release

Use of built-in Supply Chain Management master planning engine for distribution scenarios

Reason for deprecation/removal	To enhance performance and minimize the SQL database load during master planning runs, the built-in Supply Chain Management master planning engine is being replaced by Planning Optimization. Planning Optimization allows for fast planning runs that can be performed even during office hours. This enables planners to react immediately to changes in demand or planning parameters.
Replaced by another feature?	Yes, Planning Optimization will replace the existing built-in Supply Chain Management master planning engine.
Product areas affected	Supply Chain Management - Master planning
Deployment option	Cloud only. Planning Optimization is not supported with on-premises deployments.

Status	Deprecated. By April 1, 2021, distribution scenarios will no longer be supported with the built-in Dynamics 365 Supply Chain Management master planning engine. For distribution scenarios, customers must use Planning Optimization for master planning calculations. For more information, see Planning Optimization documentation . Customers with on-premises deployments of Dynamics 365 Supply Chain Management may continue to use the Supply Chain Management master planning engine for distribution scenarios after April 2021. However, no more feature enhancements will be provided.
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Previous announcements about removed or deprecated features

To learn more about features that have been removed or deprecated in previous releases, see [Removed or deprecated features in previous releases](#).

NOTE

Can you tell us about your documentation language preferences? [Take a short survey](#).

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Removed or deprecated features in previous releases

2/18/2021 • 51 minutes to read • [Edit Online](#)

NOTE

Effective November 2020:

- Common Data Service has been renamed to Microsoft Dataverse. For more information, see [Power Automate Blog](#).
- Some terminology in Microsoft Dataverse has been updated. For example, *entity* is now *table* and *field* is now *column*. For more information, see [Terminology updates](#).

This topic will be updated soon to reflect the latest terminology.

IMPORTANT

This topic is no longer updated. To see a current list of features that have been removed or deprecated from Finance and Operations apps, search for "**Removed or deprecated features**" content that relates to the app you're using.

This topic describes features that have been removed or deprecated from Dynamics 365 for Finance and Operations and previous releases of that product.

- A *removed* feature is no longer available in the product.
- A *deprecated* feature is not in active development and may be removed in a future update.

This list is intended to help you consider these removals and deprecations for your own planning.

Detailed information about objects in Finance and Operations apps can be found in the [Technical reference reports](#). You can compare the different versions of these reports to learn about objects that have changed or been removed in each version of Finance and Operations apps.

Finance 10.0.7 with Platform update 31

Chinese voucher types without Account groups selection

Reason for deprecation/removal	Changed to the feature with account groups selection.
Replaced by another feature?	Yes
Product areas affected	Application
Deployment option	All
Status	Deprecated: By December 1, 2020, we plan to no longer support Chinese voucher types setup without Account groups selection. Find more details about new feature design in What's new in 10.0.7

Finance and Operations 10.0.6 with Platform update 30

DimensionHash.getHash(str_message)

Reason for deprecation/removal	Windows is deprecating the use of SHA1, as documented in Windows Enforcement of SHA1 Certificates .
Replaced by another feature?	Yes
Product areas affected	Application
Deployment option	All
Status	Deprecated: By April 1, 2020, developers must use the platform APIs found in the class HasFunction .

Hash.ComputeSHA1Hash(string message)

Reason for deprecation/removal	Windows is deprecating the use of SHA1, as documented in Windows Enforcement of SHA1 Certificates .
Replaced by another feature?	Yes
Product areas affected	Platform
Deployment option	All
Status	Deprecated: By April 1, 2020, developers must use the platform APIs found in the class HasFunction .

FormDateTimeControl.setUtcString()

Reason for deprecation/removal	We are retiring the setUtcString() method, because a better replacement method is available.
Replaced by another feature?	Yes
Product areas affected	Platform
Deployment option	All
Status	Deprecated: By October 1, 2020, we plan to no longer support the setUtcString() method. Developers should be using the setUtcDateTime() method instead.

Reason for deprecation/removal	Not legally required.
Replaced by another feature?	No
Product areas affected	Italian localization
Deployment option	All
Status	Deprecated: By October 1, 2020, we plan to no longer support the Blacklist report (IT) – Feature reference IT-00001 .

Domestic tax report – Feature reference IT-00003

Reason for deprecation/removal	Not legally required.
Replaced by another feature?	No
Product areas affected	Italian localization
Deployment option	All
Status	Deprecated: By October 1, 2020, we plan to no longer support the Domestic tax report – Feature reference IT-00003 .

Finance and Operations 10.0.5 with Platform update 29

US Payroll tax updates

Reason for deprecation/removal	We are retiring tax updates for the US Payroll functionality due to low usage and enhanced functionality that is now offered via strategic integrations.
Replaced by another feature?	Yes
Product areas affected	Payroll
Deployment option	All
Status	Deprecated: By July 31, 2024, we plan to no longer provide tax updates to US Payroll customers. The functionality will remain in the product, but enhancements will no longer keep the functionality up to date, and any product defects will be evaluated on a case-by-case basis.

NOTE

This represents a change from the original discontinuation date of October 1, 2021. For more information, see [Tax updates being retired for US Payroll feature in Microsoft Dynamics 365 for Finance and Operations](#).

Data management staging clean up

Reason for deprecation/removal	Does not meet the core requirements that are needed for scheduling periodic cleanup.
Replaced by another feature?	Yes, the Job history cleanup feature is being added to meet the scenarios holistically.
Product areas affected	Data management
Deployment option	All
Status	Deprecated: Target timeframe for the functionality to be removed is December 2020.

Finance and Operations 10.0.4 with Platform update 28**France: FEC Accounting data export in XML**

Reason for deprecation/removal	Replaced by TXT format, French FEC audit file is available through General ledger > Periodic tasks > Data export .
Replaced by another feature?	Yes
Product areas affected	General ledger
Deployment option	All
Status	Deprecated. Target timeframe for the functionality to be removed is July 2020.

Legacy navigation bar

Reason for deprecation/removal	Header alignment with other Dynamics and Office products. For more details, see Updated navigation bar that aligns with the Office header .
Replaced by another feature?	Starting in Platform update 24, a restyled navigation bar that features search was introduced.
Product areas affected	Web client

Deployment option	All
Status	Deprecated: Starting in April 2020, the legacy navigation bar will no longer be available. Until that point, customers can revert to the legacy navigation bar through the Client performance options page.

Finance and Operations 10.0.2 with Platform update 26

Legacy default action behavior

Reason for deprecation/removal	The legacy behavior for default actions in grids results in an unexpected column having the default action link after grid columns have been reordered via personalization. The new sticky default action feature corrects this. For more details, see Sticky default actions in grids .
Replaced by another feature?	Starting in Platform update 21, a feature for "sticky default actions" was introduced. This feature can be enabled on the Client performance options page.
Product areas affected	Grids in the web client
Deployment option	All
Status	Deprecated: Starting in April 2020, sticky default actions will be the default behavior, without a mechanism to revert to the legacy behavior.

Legacy "is one of" filtering experience

Reason for deprecation/removal	The "is one of" filtering experience went through a redesign in Platform update 22, with the plan for this to eventually be the only "is one of" filtering experience.
Replaced by another feature?	Starting in Platform update 22, an improved "is one of" filtering experience became available on the Client performance options page. For more information, see Optimized is one of filtering experience .
Product areas affected	Web client
Deployment option	All
Status	Deprecated: Starting in April 2020, the improved "is one of" experience will be the default behavior, without a mechanism to revert to the legacy behavior.

Parameter to enable sales orders with multiple project contract funding sources

Support for creating project-based sales orders where the project contract has multiple funding sources is

enabled with the Project management parameters setting **Allow sales orders for project with multiple funding sources**. By default, this parameter is not enabled.

Reason for deprecation/removal	The functionality will always be enabled after the parameter is removed.
Replaced by another feature?	No. The functionality to support project-based sales orders with multiple funding sources will always be enabled.
Product areas affected	The Allow sales orders for projects with multiple funding sources parameter will be removed. The following methods will be modified when the parameter is removed: ctrlSalesOrderTable method in ProjStatusType class, validate method for ProjId field, and run method in SalescreateOrder form. The following methods will be deprecated when the parameter is removed: IsSalesOrderAllowedForMultipleFundingSources in ProjTable table file, IsAllowSalesOrdersForMultipleFundingSourcesParam Enabled method in ProjTable table file, AllowSalesOrdersForMultipleFundingSources data field in ProjParameters form and ProjParameterEntity files, IsAssociatedToMultipleFundingSourcesContract private method in ProjTable table file.
Deployment option	All
Status	Deprecation is planned for the April 2020 release wave.

Legacy workflow reports for tracking and instance status

Reason for deprecation/removal	The legacy workflow reports for tracking and instance status are being deprecated because they are no longer referenced from the navigation. The report names are WorkflowWorkflowInstanceByStatusReport and WorkflowWorkflowTrackingReport .
Replaced by another feature?	The workflow history form can be used instead.
Product areas affected	Web client
Deployment option	All
Status	Deprecated: Target timeframe for the functionality to be removed is April 2020.

Finance and Operations 10.0.1 with Platform update 25

Deprecated APIs and potential breaking changes

Deriving from internal classes is deprecated

Reason for deprecation/removal	Before Platform update 25, it was possible to create a class or table that derives from an internal class/table that is defined in another package/module. This is not a safe coding practice. As of Platform update 25, the compiler will display a warning.
Replaced by another feature?	The compiler warning will be replaced by an error in Platform update 26. This change is backward compatible at runtime, which means that Platform update 25 or newer can be deployed on any sandbox or production environment without the need to modify custom code. This change only affects development and compile time.
Product areas affected	Visual Studio development tools
Deployment option	All
Status	Deprecated: The warning will become a compilation error in Platform update 26.

Overriding internal methods is deprecated

Reason for deprecation/removal	Before Platform update 25, it was possible to override an internal method in a derived class that is defined in another package/module. This is not a safe coding practice. As of Platform update 25, the compiler will display a warning.
Replaced by another feature?	This warning will be replaced by a compile error in Platform update 26. This change is backward compatible at runtime, which means that Platform update 25 or newer can be deployed on any sandbox or production environment without the need to modify custom code. This change only affects development and compile time.
Product areas affected	Visual Studio development tools
Deployment option	All
Status	Deprecated: The warning will become a compilation error in Platform update 26.

Finance and Operations 10.0.0 with Platform update 24

Renaming released products

Reason for deprecation/removal	When you use the Rename primary key function to change the ItemId of a released product, only direct foreign key references are updated. Any other references to the released product, such as from production orders, will retain the old ItemId. As a result, there could be inconsistent data that will eventually block business processes.

Replaced by another feature?	No.
Product areas affected	Product information management
Deployment option	All
Status	Removed as of Finance and Operations 10.0.0 with Platform update 24.

Finance and Operations 8.1.3 with Platform update 23

SQL Server Reporting Services ReportViewer Control

Customers can use the **Export** action provided by the embedded SQL Server Reporting Services (SSRS) ReportViewer control to download documents produced by Finance and Operations applications. This HTML-based presentation of the report offers users a non-paginated preview of the document.

Reason for deprecation/removal	The non-paginated nature of the HTML-based preview experience does not deliver fidelity with the physical documents ultimately produced by Finance and Operations. By fully embracing PDF as the standard format for business documents, users are able to take advantage of a modern viewing experience with improved performance when producing application reports.
Replaced by another feature?	Going forward, PDF documents will be the default format for reports rendered by Finance and Operations.
Product areas affected	This change does not impact customer scenarios where reports are distributed electronically or sent directly to printers.
Deployment option	All
Status	Deprecated: A removal date has not been set for this feature. The functionality to automatically preview application reports using an embedded PDF viewer is planned for the May 2019 Platform update.

Client KPI controls

Embedded key performance indicators (KPIs) could be modeled in Visual Studio by a developer and further customized by the end user.

Reason for deprecation/removal	The native client controls used to define KPIs have low customer uptake and rely on a developer to add trackable metrics.

Replaced by another feature?	PowerBI.com service delivers world-class tooling for defining and managing KPIs based on data from external sources. In an upcoming release, we plan to enable you to embed solutions hosted on PowerBI.com in application workspaces.
Product areas affected	This update will prevent developers from introducing new KPI controls in Visual Studio designer.
Deployment option	All
Status	Deprecated: A removal date has not been set for this feature.

Deprecated APIs and future breaking changes

Field groups containing invalid field references

Reason for deprecation/removal	<p>It is possible for table metadata definitions to have field groups containing invalid field references. If deployed, this can cause runtime failures in Financial Reporting and SQL Server Reporting Services (SSRS). This issue is currently categorized as a <i>compiler warning</i> rather than an <i>error</i>, meaning that the deployable package creation and deployment can proceed without fixing the issue. To fix this issue:</p> <ol style="list-style-type: none"> 1. Remove the invalid field reference from the table field group definition. 2. Recompile. 3. Ensure any warnings or errors are addressed.
Replaced by another feature?	This warning will be replaced by a compile error in the future.
Product areas affected	Visual Studio development tools
Deployment option	All
Status	Deprecated: The warning is a compile-time error with platform updates for version 10.0.11 of Finance and Operations apps.

Complete list

To access the full list of APIs that are being deprecated, see [Deprecation of methods and metadata elements](#).

Finance and Operations 8.1 with Platform update 20

Batch transfer rules for subledger journal account entries

The Synchronous transfer mode is being deprecated in the General ledger parameters. This mode is replaced by Asynchronous and scheduled batch only, which already exist as options for transfer. For additional information, see the [General Ledger Parameters – Batch transfer rules](#) blog.

Reason for deprecation/removal	We are removing the synchronous option due to performance impact to the system.
Replaced by another feature?	Asynchronous and scheduled batch are options to use in place of Synchronous.
Product areas affected	General Ledger, Accounts payable, Accounts Receivable, Procurement, Expense
Deployment option	All
Status	Deprecated: Target timeframe for the functionality to be removed is the 10.0 version.

Electronic reporting for Russia

Feature for configuring .txt and .xml file formats of declarations.

Reason for deprecation/removal	Replaced with Electronic reporting.
Replaced by another feature?	Yes.
Product areas affected	General Ledger
Deployment option	All
Status	Removed as of Finance and Operations 8.1 with Platform update 20.

Financial reports generator for Russia

A tool for setting up data collection for accounting and tax reports, and to export data to XLS and DOC report templates. Functional parts: Export data to XLS and DOC report templates, queries, fixed requisites are removed.

Reason for deprecation/removal	Removed parts are replaced with Electronic reporting.
Replaced by another feature?	Yes. Financial reports setup user interface should be used for setting up data collection rules by GL accounts or tax registers. Export data to various file types, fixed requisites and query-like data collection rules should be configured in Electronic reporting.
Product areas affected	General ledger.
Deployment option	All
Status	Removed as of Finance and Operations 8.1 with Platform update 20.

Integration with external providers for sending electronic reporting through communication channels for

Russia

Feature exporting generated electronic files of declarations to folder for further sending to official providers of electronic reporting as well as importing state back.

Reason for deprecation/removal	Replaced with electronic messages configurable feature.
Replaced by another feature?	Yes.
Product areas affected	General Ledger, Tax
Deployment option	All
Status	Removed as of Finance and Operations 8.1 with Platform update 20.

Profit tax register wizard

Feature for creating templates for new profit tax registers. This feature creates X++ objects for new registers, which are then created as templates with the appropriate calculation logic added in.

Reason for deprecation/removal	Feature is not compatible with the Finance and Operations extensibility model.
Replaced by another feature?	No
Product areas affected	Tax
Deployment option	All
Status	Removed as of Finance and Operations 8.1 with Platform update 20.

Finance and Operations 8.0 with Platform update 15

No features have been removed or deprecated with this release. Platform update 15 is cumulative and contains new or changed features from Platform update 13, Platform update 14, and Platform update 15.

Finance and Operations, Enterprise edition 7.3 with Platform update 12

Personalized product recommendations

Starting February 15, 2018, retailers will no longer be able to display personalized product recommendations on a point of sale (POS) device. For more information, see [Product recommendations overview](#).

Reason for deprecation/removal	We are removing the current version of the product recommendation service as we redesign this feature with a better algorithm and newer retail-oriented capabilities.

Replaced by another feature?	No. However, after Spring 2018, we plan to bring back this feature to leverage a new recommendation service.
Product areas affected	Personalized product recommendations in POS.
Deployment option	All
Status	Removed as of February 15, 2018. This affects customers running Dynamics 365 for Operations 1611 and later.

Extension of the list of Electronic reporting (ER) functions

The possibility to introduce custom functions to be used in the ER expression builder (for more information, see [Extend the list of Electronic reporting \(ER\) functions](#)) is not supported any more. Due to changes of the ER APIs, the API to call built-in functions from the ER expression builder became internal and can't be extended any longer.

Reason for deprecation/removal	Code sealing initiative
Replaced by another feature?	<p>None. Whenever a new built-in function is needed, a new extension request must be addressed to the ER framework team.</p> <p>As a temporary work around while the requested function is under development by the ER team, the required logic can be programmed as a method of a custom application class. This method can be accessed in an ER expression as a property of the added ER data source of the Application\Class type that refers to that custom application class.</p>
Product areas affected	Electronic reporting framework
Deployment option	All
Status	Removed as of Finance and Operations, Enterprise edition 7.3.

Inventory by item group and Inventory by inventory dimension aging reports

These two reports are no longer supported in Finance and Operations. Instead, the **Inventory aging** report can be used to improve the user experience.

Reason for deprecation	Duplicate functionality
Replaced by another feature?	Yes. The two reports have been replaced by the Inventory aging report.
Product areas affected	Inventory management, Cost management

Deployment option	All
Status	Deprecated: The menu items for the two reports have been removed in version 7.3. However, the code for the reports remains in the product. The plan is to remove the code in a future release.

Power BI content packs available on AppSource

The **Cost management**, **Financial performance**, and **Retail channel performance** content packs, available on the [Microsoft AppSource](#) site, are deprecated as a consequence of product updates in Microsoft Power BI. System administration forms used to deploy these content packs to PowerBI.com are also being deprecated in Finance and Operations.

Reason for deprecation/removal	Product updates in Microsoft Power BI.
Replaced by another feature?	The Cost management , Financial performance , and Retail channel performance content packs, available on the AppSource site, are being replaced by analytical applications which allow for solution integrations at the database level. For more information about analytical applications, see Embedded Power BI in workspaces .
Product areas affected	Cost management, Finance, and Retail
Deployment option	Cloud only (Integration with PowerBI.com is not supported in on-premises deployments.)
Status	Deprecated: Target timeframe for the functionality removal is Q2 2018.

Standard UI in data management workspace

The standard UI in data management is the legacy UI, which is the default UI presented to the users when they visit the data management workspace.

Reason for deprecation/removal	We are investing in providing new user experiences in the new UI.
Replaced by another feature?	The new UI called <i>Enhanced views</i> is replacing the old UI.
Product areas affected	Data management workspace
Deployment option	All
Status	Deprecated: Target timeframe for the functionality to be removed is Q2 2018.

Excise, Sales Tax, Service Tax for India

These taxes have been subsumed into Indian GST.

Reason for removal or deprecation	These taxes have been subsumed into Indian GST.
Replaced by another feature?	Indian GST
Product areas affected	Tax
Deployment option	All modules
Status	Deprecated: A removal date has not been set for this feature.

File Validation Utility (FVU) for India

Reason for removal or deprecation	Lack of customer usage
Replaced by another feature?	No
Product areas affected	Indian withholding tax
Deployment option	All modules
Status	Deprecated: A removal date has not been set for this feature.

TDS/TCS certificate for India

Users can download this from the government portal.

Reason for removal or deprecation	Lack of customer usage
Replaced by another feature?	No
Product areas affected	Indian withholding tax
Deployment option	All modules
Status	Deprecated: A removal date has not been set for this feature.

Export/import (EXIM) incentive scheme for India

Reason for removal or deprecation	Lack of customer usage
Replaced by another feature?	No
Product areas affected	Import and export

Deployment option	All modules
Status	Deprecated: A removal date has not been set for this feature.

Dynamics 365 for Retail 7.2

Personalized product recommendations

Starting February 15, 2018, retailers will no longer be able to display personalized product recommendations on a point of sale (POS) device. For more information, see [Product recommendations overview](#).

Reason for deprecation/removal	We are removing the current version of the product recommendation service as we redesign this feature with a better algorithm and newer retail-oriented capabilities.
Replaced by another feature?	No. However, after Spring 2018, we plan to bring back this feature to leverage a new recommendation service.
Product areas affected	Personalized product recommendations in POS.
Deployment option	All
Status	Removed as of February 15, 2018. This affects customers running Dynamics 365 for Retail 7.2 and later.

Finance and Operations, Enterprise edition July 2017 with Platform update 8

Currency conversion for accounting and reporting currencies

Currency conversion for accounting and reporting currencies was introduced when the euro was introduced.

Reason for deprecation/removal	Limited usage and addition of the Copy legal entity functionality as a replacement.
Replaced by another feature?	No, but the Copy legal entity and Configurations features were added to make it easier to move to a company that has changing core requirements.
Product areas affected	Financial management
Status	Deprecated: A removal date has not been set for this feature.

Warehouse mobile devices portal

Warehouse mobile devices portal (WMDP) was a standalone component that was intended for on-premises self-deployment. This component is no longer supported in Finance and Operations. A native app that improves the user experience has replaced the functionality of WMDP.

Reason for deprecation/removal	Duplicate functionality.
Replaced by another feature?	Yes. This feature has been replaced by Finance and Operations - Warehousing. For more information about setup and prerequisites, see Install and configure the Warehousing app overview .
Product areas affected	Warehouse management, Transportation management
Deployment option	Warehouse mobile devices portal (WMDP) was a standalone component that was intended for on-premises self-deployment.
Status	Deprecated: Target timeframe for the functionality to be removed is Q4 2019.

Advanced bank reconciliation matching rule for manual matching

A matching rule was used to select and mark a bank document when documents were manually matched in the reconciliation worksheet.

Reason for deprecation/removal	Limited usage.
Replaced by another feature?	No. Column filtering capabilities should be used to find documents for reconciliation.
Product areas affected	Cash and bank management
Deployment option	All
Status	Removed as of July 2017.

Dynamics 365 for Operations 1611 with Platform update 3

AEB payment formats for Spain

The Consejo Superior Bancario payment formats were used to send remittance files to the bank for customer payments and vendor payments. The content of these formats was determined by the Asociación Española de Banca. It covers Cuaderno 19, 32, 58, 34.

Reason for deprecation/removal	The payment formats are no longer used.
Replaced by another feature?	Yes, ISO20022 Credit transfer and Direct debit payment formats for Spain
Product areas affected	Accounts payable, Accounts receivable

Status	Deprecated: A removal date has not been set for this feature.

Bank payments transfer for Lithuania

Bank payment transfers were generated and printed by using the Payment transfer (LT) export format for Lithuania. The Lithuanian market began to use LITAS, the unified electronic banking system, in 2005.

Reason for deprecation/removal	The payment formats are no longer used.
Replaced by another feature?	Yes, ISO20022 Credit transfer payment format for Lithuania
Product areas affected	Accounts payable
Status	Deprecated: A removal date has not been set for this feature.

BBS Direkte Remitting payment formats for Norway

BBS Direkte Remitting payment formats include customer payment collection export (direct debit) and return message import.

Reason for deprecation/removal	The payment formats are no longer used.
Replaced by another feature?	The AvtaleGiro customer payment format for Norway can be used to generate direct debit messages. Return message import will be implemented in future releases.
Product areas affected	Accounts payable, Accounts receivable
Status	Deprecated: A removal date has not been set for this feature.

Chart of Accounts tool for Spain

This tool is used when a chart of accounts in Spain requires major changes. Users can import a new chart of accounts in Microsoft Excel or text format, and can also import financial statements.

Reason for deprecation/removal	Limited usage
Replaced by another feature?	No
Product areas affected	General ledger
Status	Deprecated: A removal date has not been set for this feature.

Dom80 payment format for Belgium

Legacy Belgian payment format for payment collection (direct debit).

Reason for deprecation/removal	The payment format is no longer used.
Replaced by another feature?	Yes, ISO 20022 Direct debit payment format for Belgium
Product areas affected	Accounts receivable
Status	Deprecated: A removal date has not been set for this feature.

DTA/EZAG payment formats for Switzerland

DTA/EZAG formats are integrated into the ESR system, because they can carry on the reference number. Because the reference number isn't mandatory, these formats can be used to process any vendor payments. These formats are used by companies that have a bank account in a location other than "Postfinance."

Reason for deprecation/removal	The payment formats are no longer used.
Replaced by another feature?	Yes, ISO20022 Credit transfer payment format for Switzerland
Product areas affected	Accounts payable
Status	Deprecated: A removal date has not been set for this feature.

EDIFACT-DIRDEB payment format for Austria

EDIFACT-DIRDEB payment format for payment collection (direct debit).

Reason for deprecation/removal	The payment format is no longer used.
Replaced by another feature?	Yes, ISO 20022 Direct debit payment format for Austria
Product areas affected	Accounts receivable
Status	Deprecated: A removal date has not been set for this feature.

EDIVAT for Belgium

EDIVAT is an obsolete Belgian standard for electronic declaration via secure mail. Dynamics AX 2012 retains the read-only solution to enable access to the historical data.

Reason for deprecation/removal	The functionality is no longer used.
Replaced by another feature?	No

Product areas affected	General ledger
Status	Deprecated: A removal date has not been set for this feature.

eGiro EDIFACT CREMUL payment import format for Norway

eGiro is based on the international UN EDIFACT CREMUL (Multiple Credit Advice Message) standard that is used for automatic posting of customer payments. In Dynamics AX, eGiro is implemented as a customer payment import format.

Reason for deprecation/removal	The payment format is no longer used.
Replaced by another feature?	Yes, the ISO20022 Camt.054 notification import.
Product areas affected	Accounts receivable
Status	Deprecated: A removal date has not been set for this feature.

External inventory for Poland

Evidence of goods that are taken from a vendor for sales without purchase. Goods that are handled in external inventory don't affect standard inventory, and can be sold and then purchased automatically. This process creates real inventory movements.

Reason for deprecation/removal	Replaced by another feature
Replaced by another feature?	Yes, the core Inbound consignment functionality
Product areas affected	Accounts payable, Inventory management
Status	Deprecated: A removal date has not been set for this feature.

Financial reports generator for Eastern Europe

A tool is used to set up data collection for accounting and tax reports, and to export data to XLS and DOC report templates.

Reason for deprecation/removal	Limited usage
Replaced by another feature?	No. The tool will be replaced by Electronic reporting configurations in future releases.
Product areas affected	General Ledger

Status	Deprecated: A removal date has not been set for this feature.

Import of customer payment transactions for Finland

You can select an import format for Finnish payments to import customer payment transactions from an external file that the bank provides.

Reason for deprecation/removal	The payment format is no longer used.
Replaced by another feature?	Yes, the ISO20022 Camt.054 notification import.
Product areas affected	Accounts receivable
Status	Deprecated: A removal date has not been set for this feature.

Import of payment transactions into a general ledger journal for Finland

A format that is specific to Finland is used to import accounting transactions into the general ledger.

Reason for deprecation/removal	The payment format is no longer used.
Replaced by another feature?	Yes, the ISO20022 Camt.053 bank statement import using Advanced Bank Reconciliation.
Product areas affected	Accounts receivable
Status	Deprecated: A removal date has not been set for this feature.

Integration with Isabel synchronized (CIS) for Belgium

Isabel is the framework for electronic banking in Europe and is a de-facto standard in Belgium.

Reason for deprecation/removal	Integration with Isabel client has been discontinued.
Replaced by another feature?	No. The payment formats that are no longer used are replaced by ISO20022 Credit transfer payment format for Belgium.
Product areas affected	Accounts payable
Status	Deprecated: A removal date has not been set for this feature.

Modifications in the chart of accounts and accounting rules for Spain

This feature is used for changes in the chart of accounts and accounting rules in Spain. It maps accounts to help

transform the old chart of accounts into the new chart of accounts, and compares the previous fiscal year with the new fiscal year, even if they were posted to different account numbers.

Reason for deprecation/removal	Limited usage
Replaced by another feature?	No
Product areas affected	General ledger
Status	Deprecated: A removal date has not been set for this feature.

Pagamento Fornitori vendor payment format

Legacy Italian payment format for credit transfers.

Reason for deprecation/removal	The payment format is no longer used.
Replaced by another feature?	Yes, ISO20022 Credit transfer payment format for Italy
Product areas affected	Accounts payable
Status	Deprecated: A removal date has not been set for this feature.

Payment export formats for Estonia

The Telehansa and Teleservice formats are used for bank payment export.

Reason for deprecation/removal	The payment formats are no longer used.
Replaced by another feature?	Yes, ISO20022 Credit transfer payment format for Estonia
Product areas affected	Accounts payable
Status	Deprecated: A removal date has not been set for this feature.

Payment file archive for Norway

When payment files are generated, the file archive automatically archives all files that are created, even files that were previously written or read.

Reason for deprecation/removal	Replaced by another feature
Replaced by another feature?	Yes, Electronic reporting archived jobs

Product areas affected	Accounts payable, Accounts receivable, Organization administration
Status	Deprecated: A removal date has not been set for this feature.

Payment import formats for Estonia

The Telehansa and TeleTeenus formats are used for bank payment import.

Reason for deprecation/removal	The payment formats are no longer used.
Replaced by another feature?	Yes, the ISO20022 Camt.054 bank notification import.
Product areas affected	Accounts receivable
Status	Deprecated: A removal date has not been set for this feature.

Payroll information in Human Resources

Human Resources Payroll information

Reason for deprecation/removal	This functionality has been replaced by core Payroll and Human Resources pages.
Replaced by another feature?	Benefits, Earnings , and other related pages that were previously in US Payroll have been reconfigured, and are now part of the core Human Resources configuration to help support external payroll processing. This functionality is accessed by using the Human Resources 1 > Payroll configuration key.
Product areas affected	Human Resources, Payroll
Status	Removed as of Dynamics 365 for Operations version 1611.

Performance management goal workflow

Performance management includes goal management and integration with performance reviews.

Reason for deprecation/removal	Performance management was redesigned, and the number of goal pages was reduced to simplify the process.
Replaced by another feature?	No. Goals are visible to managers through the Manager Self Service portal, and can be changed and viewed by the manager.
Product areas affected	Human capital management

Status	Removed as of Dynamics 365 for Operations version 1611.

Postgirot and Postgirot Utland payment formats for Sweden

Postgirot and Postgirot Utland payment formats for Sweden.

Reason for deprecation/removal	The payment formats are no longer used.
Replaced by another feature?	Yes, ISO20022 Credit transfer payment format for Sweden
Product areas affected	Accounts payable
Status	Deprecated: A removal date has not been set for this feature.

Radio frequency identifier

Radio Frequency Identification (RFID) is a data-collection technology that uses electronic tags to store identification data and a no-line-of-sight requirement reader to capture the identification data.

Reason for deprecation/removal	Low customer usage and a limited feature set.
Replaced by another feature?	No
Product areas affected	Inventory management
Status	Removed as of Dynamics 365 for Operations 1611.

Report about state invoices numbering for Latvia

Latvian legislation provides specific rules about the numbering of sales invoices. The functionality lets you assign specific numbers to sales invoices, based on the user or user group. You can then generate a report or an XML file. You can also print a report about invoice numbers that are used.

Reason for deprecation/removal	The state invoice numbering no longer has to be maintained. The report about used invoice numbers is no longer required.
Replaced by another feature?	No
Product areas affected	Accounts receivable
Status	Deprecated: A removal date has not been set for this feature.

Set up the names of the manager and general accountant of a company for Lithuania

The names of the manager and the general accountant of a company can be specified in the company

information and used in different local report printouts.

Reason for deprecation/removal	Replaced by another feature
Replaced by another feature?	Yes, the setup of officials can be used for the same purpose.
Product areas affected	Accounts payable, Accounts receivable, Cash and bank management
Status	Deprecated: A removal date has not been set for this feature.

Shipping carrier interface

Reason for deprecation/removal	Duplicate functionality
Replaced by another feature?	Partially replaced by Transportation management
Product areas affected	Sales and marketing, Inventory management
Status	Removed as of Dynamics 365 for Operations version 1611.

Telepay payment formats for Norway

Telepay payment formats include vendor payment export (credit transfer) and customer payment collection (direct debit).

Reason for deprecation/removal	The payment formats are no longer used.
Replaced by another feature?	Yes, ISO20022 Credit transfer payment format and AvtaleGiro customer payment format for Norway, as well as pain.002 and camt.054 bank notification return files import.
Product areas affected	Accounts payable, Accounts receivable
Status	Deprecated: A removal date has not been set for this feature.

Vendor payment export formats for Finland

Two formats for exporting payments are available for Finland. LM02 (FI) is used for domestic payments, and LUM2 (FI) is used for foreign payments.

Reason for deprecation/removal	The payment formats are no longer used.
Replaced by another feature?	Yes, ISO20022 Credit transfer payment format for Finland

Product areas affected	Accounts payable
Status	Deprecated: A removal date has not been set for this feature.

Warehouse management II

Reason for deprecation/removal	The Warehouse management II solution (WMS II) that was available in the Inventory management module duplicates functionality that is in the Warehouse management module that was released in Dynamics AX 2012 R3.
Replaced by another feature?	The Warehouse management module that was released in AX 2012 R3, Dynamics AX 2012 R3 CU8, and Dynamics AX 2012 R3 CU9 replaces the Warehouse management II features. The new module has more advanced features and more flexible warehouse management processes than Warehouse management II.
Product areas affected	Inventory management, Sales and marketing, Procurement and sourcing
Status	Removed as of Dynamics 365 for Operations version 1611.

Worker reminders in Human Resources

Human Resources Payroll information

Reason for deprecation/removal	Low usage
Replaced by another feature?	No
Product areas affected	Human resources
Status	Removed as of Dynamics 365 for Operations version 1611

Workflow for creating goals

A workflow for managing the creation of employee goals is one of several workflows that were available to help coordinate the performance management process.

Reason for deprecation/removal	Performance management has been completely redesigned in Finance and Operations.

Replaced by another feature?	The redesigned Performance management feature gives more control over the content of the goals, the measurements that are used to track progress, and the attachment of supporting documentation. Goals can be stored as templates and then reused. This feature can help you set up additional goals for your employees more quickly.
Product areas affected	Human capital management
Status	Removed as of Dynamics 365 for Operations version 1611.

Dynamics AX 7.0

Ability to cancel changes to a vendor invoice

Reason for deprecation/removal	Performance enhancement
Replaced by another feature?	No
Product areas affected	Accounts payable
Status	Removed as of Dynamics AX 7.0.

AIF, AxD, and AxBC integrations

In Application Integration Framework (AIF), data can be exchanged with external systems through business logic that is exposed as services. Dynamics AX includes services that are based on documents and .NET Business Connector (AxBC). A document is created by using XML. The XML includes header information that is added to create a *message* that can be transferred into or out of Dynamics AX. Examples of documents include sales orders and purchase orders. However, almost any entity, such as a customer, can be represented by a document. Services that are based on documents use the **Axd <Document>** classes.

Reason for deprecation/removal	The architecture of AIF and AxDs could not be scaled to a cloud service. There were performance issues around bulk import.
Replaced by another feature?	This feature is replaced by the Data Import/Export framework, which supports recurring bulk import/export. For AxBC, we recommend that you use the actual tables.
Product areas affected	AxDs, AxBCs, and AIF
Status	Removed as of Dynamics AX 7.0.

Billing code rate scripts

Billing scripts were used to calculate billing rates for billing codes. This scripts required custom development in the C Sharp or Visual Basic programming language. In the current version of Dynamics AX, the **billing code rate scripts** are not supported.

Reason for deprecation/removal	The support for the custom C Sharp or Visual Basic scripts was not added in Dynamics AX 7.0.
Replaced by another feature?	No
Product areas affected	Public sector, Accounts receivable
Status	Removed as of Dynamics AX 7.0.

BOMs without BOM versions

When the **BOM versions** configuration key was disabled, bill of materials (BOM) versions were hidden in all forms, and the system forced a 1:1 relationship between released products and BOMs. In the current version of Dynamics AX, the **BOM versions** configuration key can't be disabled.

Reason for deprecation/removal	Using a configuration key to control BOM versions doesn't scale in a cloud environment.
Replaced by another feature?	No
Product areas affected	Product information management, Inventory management
Status	Removed as of Dynamics AX 7.0.

Brazilian Bordero

Specific method of payment for Brazilian companies

Reason for deprecation/removal	Support for the Brazilian Bordero method of payment has been discontinued from Brazilian localization
Replaced by another feature?	No
Product areas affected	Accounts payable
Status	Deprecated: A removal date has not been set for this feature.

Brazilian Sintegra statement

Federal tax statement for ICMS tax

Reason for deprecation/removal	This statement is no longer applicable in some Brazilian states.
Replaced by another feature?	No. Users can use Generic Electronic reporting tool to configure the statement if required under specific situations.

Product areas affected	Fiscal books
Status	Deprecated: A removal date has not been set for this feature.

Brazilian SCAN contingency mode for NF-e

(SCAN) contingency environment is used to generate, export, and import the status of a Nota Fiscal eletrônica (NF-e) when the environment of Secretaria da Fazenda (SEFAZ) is not available.

Reason for deprecation/removal	This method of contingency is no longer applicable in all Brazilian states
Replaced by another feature?	No
Product areas affected	Accounts receivable
Status	Deprecated: A removal date has not been set for this feature.

Business Analyzer

This mobile application let users review key business metrics.

Reason for deprecation/removal	This functionality has been replaced by another feature.
Replaced by another feature?	The Monitor financial performance content pack for Microsoft Power BI will include key financial metrics that were previously available in Business Analyzer.
Product areas affected	General ledger
Status	Deprecated: The use of Business Analyzer has been deprecated.

Business statistics

The setup of business statistics inquiries that can help you analyze the performance of the organization

Reason for deprecation/removal	Legacy approach to business intelligence (BI), low customer usage, and a limited feature set
Replaced by another feature?	New BI solutions for the current version of Dynamics AX
Product areas affected	Procurement and sourcing, Accounts payable, Sales and marketing, Accounts receivable
Status	Removed as of Dynamics AX 7.0.

Change document date function in Invoice approval journal

Reason for deprecation/removal	Low usage
Replaced by another feature?	Yes. The document date on the posted vendor transaction can be changed.
Product areas affected	Accounts payable
Status	Removed as of Dynamics AX 7.0.

ClieOp03 payment format for the Netherlands

Reason for deprecation/removal	The format is no longer applicable in the Netherlands, because it has been replaced by SEPA functionality.
Replaced by another feature?	SEPA payments export
Product areas affected	All modules
Status	Deprecated: A removal date has not been set for this feature.

Compliance Center

The Compliance Center was an Enterprise Portal site for managing the documentation requirements for compliance initiatives that are related to the Sarbanes-Oxley law.

Reason for deprecation/removal	Lack of customer usage. Microsoft SharePoint includes the same capability that was available in the Compliance Center.
Replaced by another feature?	No
Product areas affected	Compliance and internal controls
Status	Removed as of Dynamics AX 7.0.

Connector for Microsoft Dynamics

This tool was used to integrate key data from Microsoft Dynamics CRM to Dynamics ERP applications.

Reason for deprecation/removal	This functionality has been replaced by another feature.
Replaced by another feature?	Dataverse
Product areas affected	Connector for Dynamics

Status	Removed as of Dynamics AX 7.0.

Container unit and multi dimension on-hand

Reason for deprecation/removal	Duplicate functionality
Replaced by another feature?	Yes. Since AX 2012, this functionality has been replaced by the consolidated batch orders feature set. This feature set includes the consolidated on-hand view.
Product areas affected	Product information management, Production control, Inventory management, Sales and marketing
Status	Removed as of Dynamics AX 7.0.

Cue group metadata

Reason for deprecation/removal	Cue groups were used to display one or more Cues in the FactBox area. There was limited uptake, and there were also performance concerns, because a record change in a parent form caused one query per Cue in the Cue group.
Replaced by another feature?	No
Product areas affected	All modules
Status	Removed as of Dynamics AX 7.0.

Cue metadata

Reason for deprecation/removal	Cue metadata was limited to count or sum information.
Replaced by another feature?	Tile metadata was introduced to provide more flexibility for modeling. For example, you can model current counts, navigation, and key performance indicators (KPIs). Count tile metadata is the direct replacement of the Cue metadata.
Product areas affected	All modules
Status	Removed as of Dynamics AX 7.0

Danish check format

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Reason for deprecation/removal	Support for the Danish check format layout has been discontinued, and the report has been removed from DK localization.
Replaced by another feature?	No
Product areas affected	All modules
Status	Deprecated: A removal date has not been set for this feature.

Data partitions

Data partitions provide a logical separation of data in the Dynamics AX database.

Reason for deprecation/removal	Data partitions were introduced in Dynamics AX 2012 R2 to enable data isolation. In a common scenario, a company has subsidiaries, and the data from one subsidiary should not be visible to another subsidiary, even though both subsidiaries are managed by the same IT department. However, extra scripts and management overhead throughout the program were required in order to create new partitions and populate them with data, and to back up partition data. In the cloud, where we have access to platform as a service (PaaS) database services (Microsoft Azure SQL Database), it's much more efficient to use a database as the isolation container than to do isolation in the program. Regardless of whether data partitioning is required for subsidiaries, for multiple tenants, or just for scale, we believe that the scenarios can be handled better through multiple instances of Finance and Operations.
Replaced by another feature?	Customers using data partitions must use multiple instances of Finance and Operations if database level separation is a critical issue.
Product areas affected	All modules
Status	Removed as of Dynamics AX 7.0.

Database and file share storage for attachments

Dynamics AX 2012 allowed storage of attachments in the database and in file shares. Both of those options are no longer supported.

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Reason for deprecation/removal	Files share storage is no longer supported because cloud-hosted environments cannot communicate with local file shares. Database storage has been deprecated in favor of Azure Blob storage. Azure Blob storage is equivalent to storage in the database, as documents can only be accessed through Finance and Operations client forms. This provides the added benefit of providing storage that doesn't negatively affect the performance of the database. Blob storage is the default storage mechanism for Document Management and works immediately.
Replaced by another feature?	Database storage has been deprecated in favor of Azure Blob storage.
Product areas affected	All modules
Status	Removed as of Dynamics AX 7.0.

Delimitation

Reason for deprecation/removal	No use of the functionality was found.
Replaced by another feature?	No
Product areas affected	Time and attendance
Status	Removed as of Dynamics AX 7.0.

Desktop client

Reason for deprecation/removal	The Dynamics AX client experience has been redesigned to improve usability across multiple platforms and devices.
Replaced by another feature?	The new web client is based on the desktop Form metadata and programming model that have been modified to provide a rich web platform.
Product areas affected	All modules
Status	Removed as of Dynamics AX 7.0.

Direct database connection

In Dynamics AX 2012 R3, Retail Modern POS could connect directly to the Channel DB in similar fashion to Enterprise POS. This was in addition to the standard communication method of Retail Modern POS communicating through Retail Server.

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Reason for deprecation/removal	Direct database connectivity required lower security protocols and was primarily used to achieve the highest levels of performance. Due to the performance and security enhancements that have occurred in Finance and Operations, this functionality now causes more issues than it solves.
Replaced by another feature?	No. Only standard Retail Server communication is now supported.
Product areas affected	Channel DB/Retail Modern POS
Status	Removed as of Dynamics AX 7.0.

Dutch SWIFT MT940

Reason for deprecation/removal	Generic functionality is now used instead of localized functionality.
Replaced by another feature?	Yes, this functionality has been replaced by Advanced bank reconciliation functionality.
Product areas affected	All modules
Status	Deprecated: A removal date has not been set for this feature.

eBilanz (XBRL for Germany)

This functionality provided eXtensible Business Reporting Language (XBRL) output that is intended specifically for the German eBilanz taxonomy.

Reason for deprecation/removal	Lack of customer usage
Replaced by another feature?	This feature hasn't been replaced by another feature, but multiple specialized XBRL packages that provide rich XBRL functionality are available for the German market.
Product areas affected	Management Reporter
Status	Deprecated: A removal date has not been set for this feature.

Enterprise Portal client

Reason for deprecation/removal	A single client platform has been provided.

Replaced by another feature?	The new web client is based on the desktop form metadata and programming model that have been modified to provide a rich web platform.
Product areas affected	All modules
Status	Removed as of Dynamics AX 7.0.

Environmental sustainability

Reason for deprecation/removal	Low customer usage and a limited feature set
Replaced by another feature?	No
Product areas affected	Compliance and internal controls, Accounts payable
Status	Removed as of Dynamics AX 7.0.

Form ActiveX and Managed Host controls

Reason for deprecation/removal	The ActiveX and Managed Host controls are based on the deprecated desktop client.
Replaced by another feature?	The extensible control framework supports building new controls that are based on HTML, CSS, and JavaScript, and is a first-class control in the Microsoft Visual Studio Tooling environment.
Product areas affected	All modules
Status	Removed as of Dynamics AX 7.0.

Generate prenotes by using a batch

Prenote generation can't be done by using a batch, but it can still be done by a user.

Reason for deprecation/removal	No form exists to persist and display the resulting prenote file when it's generated by using a batch.
Replaced by another feature?	Prenotes can still be generated, and the user has control over the location where the file is saved.
Product areas affected	Accounts payable, Accounts receivable, Cash and bank management
Status	Removed as of AX 7.0.

German DTAUS payment export and account statement import (totals and transactions)

Reason for deprecation/removal	The format is no longer applicable in Germany, because it has been replaced by Single Euro Payments Area (SEPA) functionality.
Replaced by another feature?	Yes, this functionality has been replaced by SEPA payment export and advanced bank reconciliation functionality for importing account statements.
Product areas affected	All modules
Status	Deprecated: A removal date has not been set for this feature.

German DTAZV payment format in domestic Currency

Reason for deprecation/removal	The format is no longer applicable in Germany, because it has been replaced by SEPA functionality.
Replaced by another feature?	SEPA payments export
Product areas affected	Accounts payable
Status	Deprecated: A removal date has not been set for this feature.

German MT940 import

Reason for deprecation/removal	Generic functionality is now used instead of localized functionality.
Replaced by another feature?	Yes, this functionality has been replaced by Advanced bank reconciliation functionality.
Product areas affected	All modules
Status	Deprecated: A removal date has not been set for this feature.

German XML EU Sales list

Reason for deprecation/removal	The XML format for German EU Sales List reporting is no longer supported. Only the ELMA5 text file format can be used to submit the EU Sales List report to the German Tax Office.
Replaced by another feature?	No

Product areas affected	Tax
Status	Deprecated: A removal date has not been set for this feature.

GL SSRS reports

Reports that include the following menu items have been removed: **Summary trial balance**, **Detailed trial balance**, **Chart of accounts**, **Audit trail**, **Balances**, and **Balance list**.

Reason for deprecation/removal	Financial Microsoft SQL Server Reporting Services (SSRS) reports have been replaced by Management Reporter capabilities and default reports.
Replaced by another feature?	Management Reporter (labeled Financial reporting in the current version of Dynamics AX)
Product areas affected	General ledger
Status	Removed as of Dynamics AX 7.0.

InfoPart and FormPart metadata

Reason for deprecation/removal	InfoPart and FormPart metadata enabled the creation of FactBoxes for two different clients.
Replaced by another feature?	InfoPart metadata, which was a simplified form definition, is converted into a Form by upgrade tooling. FormPart metadata, which referenced a Form, is replaced by a more direct reference that is created by upgrade tooling.
Product areas affected	All modules
Status	Removed as of Dynamics AX 7.0.

Main account list page

A list of accounts for the legal entity and related balance information

Reason for deprecation/removal	Balance information is available on the Trial balance list page by account and dimension.
Replaced by another feature?	Main accounts contains the same list of accounts that the Main account list page contained. The grid view in Main accounts also shows an even smaller, grid-like view.
Product areas affected	General ledger

Status	Removed as of Dynamics AX 7.0.

Malaysia and Singapore bank cash flow report

This feature let the user print a cash flow report that shows transactions and details of the cash inflows and outflows for a specific date range for selected bank accounts.

Reason for deprecation/removal	The same information can be obtained from the Inquiry bank transaction.
Replaced by another feature?	The Inquiry bank transaction
Product areas affected	Cash and bank management
Status	Deprecated: A removal date has not been set for this feature.

Mexican CFD electronic invoice

This feature enabled the generation of Mexican electronic invoices by using the Comprobante Fiscal Digital (CFD) method, where the company signs the invoice by requesting the related authorization from the government. This feature also provides a monthly report that includes all electronics invoices that were issued in the period.

Reason for deprecation/removal	The method is no longer applicable. The generation of electronic invoices by using the CFD method was deprecated by the tax authorities and replaced by the Comprobante Fiscal Digital a través de Internet (CFDI) method, where the signing is delegated to the third-party provider (PAC). The monthly report has been removed, and an inquiry option lets users inquire about historical transactions.
Replaced by another feature?	No
Product areas affected	Account receivables, Project
Status	Deprecated: A removal date has not been set for this feature.

Mexico realized and unrealized VAT

Dynamics AX 2012 managed unrealized value-added tax (VAT) by using Mexico-specific functionality for unrealized tax.

Reason for deprecation/removal	Duplicate functionality
Replaced by another feature?	Yes, this functionality has been replaced by standard conditional sales tax functionality that is provided by Core.

Product areas affected	Tax
Status	Deprecated: A removal date has not been set for this feature.

Microsoft Outlook integration

Reason for deprecation/removal	This functionality has been replaced by Microsoft Exchange Server integration.
Replaced by another feature?	Yes
Product areas affected	Sales and marketing
Status	Removed as of Dynamics AX 7.0.

Private blocking of inventory and warehouse management journals

The inventory and warehouse journals no longer support the ability to mark a journal as private for a selected user. Only the process of blocking journals as private for user groups and blocking during editing is supported.

Reason for deprecation/removal	No use of the functionality was found.
Replaced by another feature?	No
Product areas affected	Inventory management
Status	Removed as of Dynamics AX 7.0.

Product builder

Product builder was used to dynamically configure items from a sales order, purchase order, production order, sales quotation, project quotation, or item requirement. Based on a product model that had modeling variables, the user could select values to meet the customer requirements and get a unique product variant that had a BOM and route.

Reason for deprecation/removal	Product builder exposed X++ code to end users and isn't supported in the current version of Dynamics AX. It has been removed to avoid duplicate maintenance efforts on overlapping, sizeable codebases.
Replaced by another feature?	Yes. The constraint-based configuration was introduced in Dynamics AX 2012 where the depreciation of Product builder in future versions was already announced. The constraint-based configuration technology is selected on the product masters to enable the configuration. To learn more, see Product configuration overview .

Product areas affected	Product information management, Sales and marketing
Status	Removed as of Dynamics AX 7.0.

Production Floor app

This is the app for tablet devices running Windows 8.1 RT and Windows 8.1 Pro.

Reason for deprecation/removal	With the change to a web-based client, it is possible to deliver similar functionality through the native Dynamics AX 7.0 client. The Job Card Device provides a production floor user interface that is optimized for touch and tablet form factors.
Replaced by another feature?	Yes. The Job Card Device, which is a native part of Dynamics AX 7.0.
Product areas affected	Production control
Status	Deprecated: A removal date from the Microsoft store has not yet been set for this feature.

Rename product dimension

This feature let you change the name of one of the three standard product dimensions (size, color, or style) to a name that better suited your business requirements. Renaming included all the labels where the product dimension name was used.

Reason for deprecation/removal	The current version of Dynamics AX doesn't support label changes at run time.
Replaced by another feature?	No
Product areas affected	Product information management
Status	Removed as of Dynamics AX 7.0.

Retail Server connectivity using HTTP

In Dynamics AX 2012 R3, the Retail Server could function using HTTP communication (non-secured). This was in addition to the standard communication using HTTPS.

Reason for deprecation/removal	Due to new security requirements, only secured communication using TLS 1.2 (or above, as available) is now supported. The self-service installer will automatically configure the computer for this communication.
Replaced by another feature?	No. Only standard HTTPS communication is now supported.

Product areas affected	Retail Server
Status	Removed as of Dynamics AX 7.0.

Role Center pages

Reason for deprecation/removal	Role Center pages were built on the deprecated Enterprise Portal platform, which has been replaced by the new web client platform in the current version of Dynamics AX.
Replaced by another feature?	The new Workspace form pattern provides users with a process-centered design that provides easy access to commonly used tasks within that process.
Product areas affected	All modules
Status	Removed as of Dynamics AX 7.0

Sales tax jurisdictions

Reason for deprecation/removal	Low customer usage and a limited feature set
Replaced by another feature?	No
Product areas affected	US sales tax
Status	Removed as of Dynamics AX 7.0.

Sites Services

Sites Services let you build websites that extend your business processes to the Internet without IT support.

Reason for deprecation/removal	The Microsoft Azure infrastructure that is used by Dynamics AX has new capabilities that can be used instead (for example, Azure sites).
Replaced by another feature?	No
Product areas affected	HR recruiting, Case management, Request for quotes, Vendor registration, Collaborative workspaces for opportunities and campaigns
Status	Removed as of Dynamics AX 7.0.

SSAS demand forecasting strategy

Reason for deprecation/removal	The design of the feature cannot be supported in the new cloud architecture.
Replaced by another feature?	Azure Machine Learning demand forecasting strategy
Product areas affected	Master planning
Status	Removed as of Dynamics AX 7.0.

Vendor invoice pool excluding posting details

Reason for deprecation/removal	Low usage. This functionality has been replaced by the Invoice journal that has workflow functionality.
Replaced by another feature?	Workflow capabilities of the Invoice journal.
Product areas affected	Accounts payable
Status	Removed as of Dynamics AX 7.0.

Virtual company accounts

The virtual companies feature is no longer supported in Dynamics AX. The virtual companies feature let users set up tables that could be shared by a set of companies. For a description of the feature, see [Company accounts and Virtual company accounts](#). The feature works by grouping tables into collections that are assigned to virtual companies, which are groups of existing “real” companies. Queries are created so that all the companies in the virtual company can access the data in the tables of the associated table collections.

Reason for deprecation/removal	<ul style="list-style-type: none"> - Virtual companies must be set up before data is stored in the tables. Retrofitting virtual companies onto an existing implementation is very difficult. - Because there has been so much data normalization in the current version of Dynamics AX, it has become difficult to know what to add to the table collections. For example, it's difficult to know which tables to share. All the tables referenced from tables that are in a virtual company must also be added. Because of table normalization, even simple master data that is spread across multiple tables must be part of the virtual company. Any mistake that is made here will cause functional issues. - When a table is part of a virtual company, it loses information about the origin of the data, and only the virtual company is recorded.
Replaced by another feature?	Global tables can be used to make tables accessible from all companies. Currently, there is no replacement.
Product areas affected	All modules

Status	Removed as of Dynamics AX 7.0.

Windows 8 tablet app

The Windows 8 tablet app provided functionality for expense entry and approval.

Reason for deprecation/removal	Finance and Operations is compatible with tablets. The tablet app is no longer required.
Replaced by another feature?	No.
Product areas affected	Expense management
Status	Removed: This functionality is only available for Dynamics AX 2012 R3.

Workplanner

Reason for deprecation/removal	Low usage
Replaced by another feature?	No, but the Profile relation page, which is opened from the Profile groups page, supports the same business scenario as the deprecated Workplanner page.
Product areas affected	Time and attendance
Status	The code has not been removed. However, the form, JmgWorkPlanner, was not migrated.

X++ financial statements

Reason for deprecation/removal	This functionality has been replaced by another feature.
Replaced by another feature?	Management Reporter (labeled Financial reporting in the current version of Dynamics AX)
Product areas affected	General ledger
Status	Removed as of Dynamics AX 2012

NOTE

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AX 2012 features that were postponed

2/18/2021 • 11 minutes to read • [Edit Online](#)

This topic lists features of Microsoft Dynamics AX 2012 that were postponed. These features weren't implemented in Microsoft Dynamics AX 7.0. In the following table, the **Current status** column indicates whether the feature has been implemented since the AX 7.0 release.

For a detailed list of the release date for each version, see [Software lifecycle policy and cloud releases](#).

AX 2012 FEATURE THAT WAS POSTPONED	DESCRIPTION	CURRENT STATUS (AS OF FEBRUARY 2019)
Absence management in Human resources	Functionality for entering absence transactions isn't included. Additionally, functionality for approving absence transactions as a manager isn't included. Setup capabilities that are required for integration with other modules are available through the Human Resources 2 configuration key.	Implemented in Dynamics 365 Human Resources
Alerts	Alerts help users keep track of data changes in the system.	Implemented in Platform update 15
Bank payment order for Latvia and Lithuania	You can print a payment order for Latvia and Lithuania. This feature will be available in a future update.	Not implemented
Bankgirot AP return format for Sweden	The Bankgirot return format is used to import bank return messages. This feature will be available in a future update.	Not implemented
Client drag-and-drop	The web client controls have application programming interfaces (APIs) for drag-and-drop operations, but these APIs are based on the deprecated desktop client technology and they require a redesign so that they work on the new web client platform. APIs that support drag-and-drop operations will be reviewed for inclusion in a future update.	Not implemented
Client right-to-left (RTL) layout	RTL layout is now supported.	Implemented in Platform update 2

AX 2012 FEATURE THAT WAS POSTPONED	DESCRIPTION	CURRENT STATUS (AS OF FEBRUARY 2019)
Cost accounting	The Cost accounting module is designed to meet the requirements of internal costs and profitability reports at multiple organizational levels. To define the cost object level, the module depends on a correct mapping of financial dimensions. The module lets you perform advanced allocations of cost origin from expenditures that are registered in the general ledger or budget. It also lets you compare realized costs and budgeted costs.	Implemented in version 1611
Customer self-service (CSS)	CSS lets you create approved customer records. It also allows users to view selected product catalogs, order items, and view the status of invoices. Additionally, CSS lets you create and follow return orders.	Not implemented
Customizable help topics	The ability to create customized help topics has not yet been implemented. Custom task guides and custom field help are available. This feature will be available in a future update.	Not implemented
Employee self-service (ESS)	ESS shows employees several tiles that have task-related and career-related information on a single page. Employees can view pending work items and click links that open pages where they can take action on their tasks. ESS pages also show employees the status of their certifications, when their next performance reviews are scheduled, skills, goals, and compensation information, and other information, such as balances for vacation and sick time. Employees can also access a company directory from their ESS page.	Implemented in version 1611
External questionnaire and recruiting functionality	Functionality for externally posting questionnaires and open jobs will be added to Human Resources in a future update.	External questionnaire functionality hasn't been implemented. Recruiting functionality is available in Microsoft Dynamics 365 Talent: Attract.
Fiscal printers for Poland	Integration with Polish fiscal printers enables the required information to be sent to the fiscal printer in the correct format during invoice posting. Examples of Polish fiscal printers include the Posnet Thermal and Elzab Omega printer types. This feature will be available in a future update.	Not implemented

AX 2012 FEATURE THAT WAS POSTPONED	DESCRIPTION	CURRENT STATUS (AS OF FEBRUARY 2019)
General budget reservations	The General budget reservations document is sometimes referred to as a commitment. Public sector entities often use this document to set aside or earmark budgeted funds so that they aren't available for other purposes.	Implemented in version 8.1
Graphics tab on the Fixed asset value model and Depreciation book profile pages	The chart shows the depreciation, accumulated depreciation, and net book value over time. Users can click the Data tab to view more detailed information than the chart shows. This chart will be redesigned in a future update.	Not implemented
Intelligent Data Management Framework (IDMF)	IDMF is an add-on tool that lets system administrators optimize performance. IDMF assesses the health of the application, analyzes current usage patterns, and helps reduce database size.	Not implemented
Microsoft Project client integration	The Microsoft Project client is integrated with projects.	Implemented in version 7.2 (July 2017 update)
Procurement site	In previous versions, the Employee self-service procurement site lets you enter requisitions for employees, view the status of an order (created, received, or receipt confirmed), and request onboarding of a new vendor. You could configure different procurement catalogs to show on the site depending on policy. You could also design procurement catalogs by adding new nodes. In the current version, procurement catalog capabilities are reduced and are used only to limit the products that can be ordered for an organization. The structure is always based on the Procurement categories hierarchy. Additionally, on the procurement site the employee could approve a vendor invoice and confirm receipts in relation to the requisitions and derived purchase orders.	Not implemented
Secure global address book	The ability to help secure the global address book by legal entity and address book is not available. This feature will be available in a future update.	Not implemented
Specifications for Electronic reporting (ER) payment formats	Currently, you must enter the payment format specifications manually. In a future update, you will be able to select payment format specifications in	Not implemented

AX 2012 FEATURE THAT WAS POSTPONED

a list. The following payment specifications are currently supported per payment format.

CURRENT STATUS (AS OF FEBRUARY 2019)

[!NOTE] Values for these supported payment specifications are used as payment specification parameters on the **Payment specification** page for a selected method of payment.

BTL91 for the Netherlands

PAYMENT SPECIFICATION (USED IN ER)	EXPORT FORMAT DESCRIPTION
ChqBen	Cheque, Begunstigde
ChqOff	Cheque, Kantoor opdrachtgever
ChqPri	Cheque, Opdrachtgever
TrfBenBen	Overboeking Begunstigde/Begunstigde
TrfBenBenUrg	Overboeking Begunstigde/Begunstigde Spoed
TrfEurBen	Overboeking Euro/Begunstigde
TrfEurBenUrg	Overboeking Euro/Begunstigde Spoed
TrfEurEur	Overboeking Euro/Euro
TrfEurEurUrg	Overboeking Euro/Euro Spoed
TrfForBen	Overboeking VV-rekening/Begunstigde
TrfForBenUrg	Overboeking VV-rekening/Begunstigde Spoed
TrfForFor	Overboeking VV-rekening/VV-rekening

AX 2012 FEATURE THAT WAS POSTPONED

PAYMENT SPECIFICATION (USED IN ER)

EXPORT FORMAT DESCRIPTION

CURRENT STATUS (AS OF FEBRUARY 2019)

TrfForForUrg

Overboeking
VV-
rekening/VV-
rekening Speed

Betalingservice for Denmark

PAYMENT SPECIFICATION (USED IN ER)

EXPORT FORMAT DESCRIPTION

B0112

BS-B 0112: Lang tekst & adresse

B0113

BS-B 0113:
Erstat. bet. lang tekst

T0112

BS-T 0112: Lang tekst & adresse

T0117

BS-T
0117:FK;kort
frist;lang
tekst&adr.

Nordea vendor for Denmark

PAYMENT SPECIFICATION (USED IN ER)

EXPORT FORMAT DESCRIPTION

56

Currency account transfer between Nordea accounts in Denmark

47

Domestic check

45

Domestic transfer

50

Express transfer

55

Intercompany transfer (domestic)

51

Intercompany transfer to a foreign bank

54

International check

52

Nordea intercompany payment

AX 2012 FEATURE THAT WAS POSTPONED

PAYMENT SPECIFICATION (USED IN ER)

EXPORT FORMAT DESCRIPTION

CURRENT STATUS (AS OF FEBRUARY 2019)

43

Request for transfer

46

Transfer form/giro payment

ISO20022 Credit transfer (CH)

PAYMENT SPECIFICATION (USED IN ER)

EXPORT FORMAT DESCRIPTION

Tp1.ESROPS

Type 1 - ESR orange payment slip

Tp21.ISR1SPS

Type 2.1 - IS red 1 stage payment slip

Tp22.ISR2SPS

Type 2.2 - IS red 2 stage payment slip

Tp7.Dmstc

Type 7 - Domestic postal order

TpE1.PSWR

Type E1 - Payment slip with reference

TpE2.PSWN

Type E2 - Payment slip with notifications

AvtaleGiro (NO)

PAYMENT SPECIFICATION (USED IN ER)

EXPORT FORMAT DESCRIPTION

Varsling

AvtaleGiro-trans with notification

AutoGiro (NO)

PAYMENT SPECIFICATION (USED IN ER)

EXPORT FORMAT DESCRIPTION

Melding

Autogiro-trans with notification

eFaktura (NO)

AX 2012 FEATURE THAT WAS POSTPONED	PAYMENT SPECIFICATION (USED IN ER) DESCRIPTION	EXPORT FORMAT DESCRIPTION	CURRENT STATUS (AS OF FEBRUARY 2019)		
	<table border="1"> <tr> <td>Reklame</td> <td>Include advertising flag</td> </tr> </table>	Reklame	Include advertising flag		
Reklame	Include advertising flag				
	ISO20022 Credit transfer (DK)				
	<table border="1"> <tr> <td>PAYMENT SPECIFICATION (USED IN ER)</td> <td>EXPORT FORMAT DESCRIPTION</td> </tr> </table>	PAYMENT SPECIFICATION (USED IN ER)	EXPORT FORMAT DESCRIPTION		
PAYMENT SPECIFICATION (USED IN ER)	EXPORT FORMAT DESCRIPTION				
	<table border="1"> <tr> <td>EasyAccountTransfer</td> <td>Easy-account with CVR (NKV)</td> </tr> </table>	EasyAccountTransfer	Easy-account with CVR (NKV)		
EasyAccountTransfer	Easy-account with CVR (NKV)				
	<table border="1"> <tr> <td>Paym_slip</td> <td>Transfer forms (OCR)</td> </tr> </table>	Paym_slip	Transfer forms (OCR)		
Paym_slip	Transfer forms (OCR)				
	ISPAG-CNAB240 format (BR)				
	<table border="1"> <tr> <td>PAYMENT SPECIFICATION (USED IN ER)</td> <td>EXPORT FORMAT DESCRIPTION</td> </tr> </table>	PAYMENT SPECIFICATION (USED IN ER)	EXPORT FORMAT DESCRIPTION		
PAYMENT SPECIFICATION (USED IN ER)	EXPORT FORMAT DESCRIPTION				
	<table border="1"> <tr> <td>A</td> <td>OP (payment order), DOC (wire transfer), TED (other type of wire transfer), and direct credit in the account</td> </tr> </table>	A	OP (payment order), DOC (wire transfer), TED (other type of wire transfer), and direct credit in the account		
A	OP (payment order), DOC (wire transfer), TED (other type of wire transfer), and direct credit in the account				
	<table border="1"> <tr> <td>J</td> <td>Bar code payments (invoice with bar code or other type of documents with bar code)</td> </tr> </table>	J	Bar code payments (invoice with bar code or other type of documents with bar code)		
J	Bar code payments (invoice with bar code or other type of documents with bar code)				
	<table border="1"> <tr> <td>O</td> <td>Tax payments or other public services payments</td> </tr> </table>	O	Tax payments or other public services payments		
O	Tax payments or other public services payments				
US Payroll	US Payroll provides gross-to-net processing for employees in the United States. In Payroll, you can set up, enter, and maintain all payroll records and transactions.		Implemented in version 1611		

AX 2012 FEATURE THAT WAS POSTPONED	DESCRIPTION	CURRENT STATUS (AS OF FEBRUARY 2019)
Vendor collaboration (Vendor Portal)	<p>Dynamics AX 2012 provided vendor portal capabilities via Enterprise Portal. Financial and Operations also provides these capabilities. In version 7.1 (also known as Dynamics 365 for Operations 1611), a vendor could view and respond to purchase orders.</p> <p>In version 7.3, the vendor can view and respond to RFQs. Vendors can also view and edit selected information from the vendor record such as addresses, contact information, and contact persons, and they can upload documents in relation to their certifications.</p>	Implemented in version 7.3
Vendor requests - external request to become a new vendor	<p>Dynamics AX 2012 provided the ability for an anonymous user to sign up to be a vendor in the system, which could lead to a vendor request for adding a new vendor to the vendor master. In version 7.3, the anonymous request from a prospective vendor can be imported via an entity (Data Management/OData), which can lead to inviting the vendor - or the vendor's contact person - to register more details about the prospective vendor. The information provided is included in a new vendor request that can be reviewed and approved via a workflow process. An approval of the vendor request leads to creation of a new vendor account.</p>	Implemented in version 7.3
Vendor requests in general	<p>Dynamics AX 2012 had a concept of vendor requests that served various purposes related to updating vendor-related information, such as requesting new procurement categories for the vendor, internal employees requesting new vendors, or requesting to add a vendor to another company. Only the vendor's request of being added as a vendor has been implemented in version 7.3.</p>	Not implemented

AX 2012 FEATURE THAT WAS POSTPONED	DESCRIPTION	CURRENT STATUS (AS OF FEBRUARY 2019)
[Russia] Tax registers	<p>Legal entities can use registers to disclose their revenues and expenses. The registers are used to track revenue and expense data from the time that primary documents, such as sales invoices and delivery notes, are first entered by using the calculation of cost prices for production. The data from the registers is used to confirm the declared profit of the legal entity. This functionality includes the following features:</p> <ul style="list-style-type: none"> • Current period incomes • Tax expenses • Other expenses of current period • Unrealized expenses of current period • Other unrealized expenses • Accounts receivable debt – inventory • Bad debts reserve calculation • Bad debts reserve movement • Accounts receivable movement • Procedure for writing-off AR bad debts • Accounts payable debt - inventory • Accounts payable debt movement • Procedure for writing-off AP bad debts • Goods cost calculation • FA object information • IA object information • FA depreciation • IA depreciation • FA/IA sale • Depreciation bonus recovery 	Implemented in version 8.1.3
[Russia] Electronic export/import format for Client-Bank interface and reconciliation procedure	Electronic formats for export of outgoing payments, and import of incoming payments.	Implemented in version 8.1.3
[Russia] VAT declaration	Electronic format of VAT declaration.	Implemented in version 10.0.1
[Russia] Cash Flow Management	The functionality which obtains a cash flow forecast and performs an analysis, manages payments on a daily basis using payment schedule journals, controls the company's cash position, and maintains the company's cash flows with centralized control,	Implemented in version 10.0.1

AX 2012 FEATURE THAT WAS POSTPONED	DESCRIPTION	CURRENT STATUS (AS OF FEBRUARY 2019)
[Russia] Accounting reporting format	Electronic format of the following accounting reports: BalanceSheet, IncomeStatement, CashFlow, EquityStatement, TargetUsageMoney	Implemented in version 10.0.1
[Russia] Assessed tax reporting	Assessed tax declaration.	Implemented in version 10.0.1
[Russia] Land tax reporting	Land tax declaration. Creation of Land tax declaration by separate divisions.	Implemented in version 10.0.1
[Russia] Transport tax reporting	Transport tax declaration.	Implemented in version 10.0.1
[Russia] Indirect tax return (VAT and Excise) on import of goods	Indirect (withholding) tax return (VAT and Excise) on import of goods from state members of Customs union.	Implemented in version 10.0.1
[Russia] Journal of Alcohol sales in Retail	Daily Alcohol journal.	Implemented in version 10.0.1
[Russia] Optional posting of transfer orders to General ledger	Option to post/not post transactions to General ledger when posting a transfer order.	Implemented in version 8.1.2
[Russia] Inventory owner	Inventory dimension used to track owner of inventory (consignment stock, bailment, tolling, etc.).	Implemented in version 10.0.1
[Russia] AP/AR - Third-party miscellaneous charges	Registration of third-party miscellaneous charges and allocation by the following regimes: Inclusion into cost of purchased goods (allocation to invoices lines from other vendors), and redrawing to other parties re-allocation to other expense accounts.	Implemented in version 8.1.1
[Russia] Goods in transit from vendor	Registering goods in transit from vendor by special posting profile with Item type "purchased items en route". Creating Act of inventory holdings en route. (INV-6)	Implemented in version 8.1.2
[Russia] Goods in transit - sales to customer with postponed passing of property	Post sales invoice with postponed property transfer: no customer debts posted, all outgoing taxes are posted, items are transferred to transit warehouse. Register passing of property with posting debts and items sale from transit warehouse.	Implemented in version 8.1.2
[Russia] Bailment - accounting at bailee side	Accounting of inventory receipt for bailment as required by the Law and generation of primary form MX-1. Accounting of inventory return from bailment and generation of primary form MX-3. Bailment costs calculation from bailee side.	Implemented in version 8.1.2

AX 2012 FEATURE THAT WAS POSTPONED	DESCRIPTION	CURRENT STATUS (AS OF FEBRUARY 2019)
[Russia] Bailment - accounting at owner side	Accounting of inventory transfer to bailment and inventory return from bailment on goods owner side under bailment service contract.	Implemented in version 8.1.2
[Russia] Localization of Process Industries solution	Basic localization in two areas: correspondence of accounts for all new general ledger postings, and functional coexistence of Process Industries features and Russian country context (no issues when both Process Industries and Russian country context are enabled).	Implemented in version 10.0.1
[Russia] Alcohol sales declarations: Application 6, 7, 8 for wholesale. Applications 11, 12 for retail	Keeping track of alcoholic beverages types including producers, unit of measures, licenses for retail and wholesale trade. Preparing data for alcoholic beverages activities, including printing declarations and exporting them in XML format through e-reporting.	Implemented in version 10.0.1

NOTE

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End of mainstream support for Microsoft Dynamics AX 2009, Dynamics AX 2012, and Dynamics AX 2012 R2

2/18/2021 • 4 minutes to read • [Edit Online](#)

Mainstream support for Dynamics AX 2009 Service Pack 1 (SP1), Dynamics AX 2012, and Dynamics AX 2012 R2 ends on October 9, 2018. After that date, only security hotfixes will continue to be provided for these three versions through the extended support period that continues until October 12, 2021. For more information, see support.microsoft.com.

Mainstream support for Dynamics AX 2012 R3 continues through October 12, 2021. Microsoft will continue making security hotfixes, non-security hotfixes, and regulatory updates for Dynamics AX 2012 R3 throughout that mainstream support period. The source code for these non-binary, non-security hotfixes and regulatory updates will continue to be available for customers, and their partners, active on the Enhancement Plan or Software Assurance.

Dynamics AX 2009 SP1, Dynamics AX 2012, and Dynamics AX 2012 R2 customers can selectively integrate those changes as required. Customers and partners can get the source code from packages attached to relevant Dynamics AX 2012 R3 KB articles published on Lifecycle Services (LCS) and discoverable through Issue Search.

Customers are advised to upgrade to the latest version of Finance and Operations apps, such as Dynamics 365 Finance, Supply Chain Management, Retail, and Human Resources:

- Dynamics AX 2009 Service Pack 1 customers should use the [migration tool](#) that is available.
- Dynamics AX 2012 and Dynamics AX 2012 R2 customers should upgrade to Finance and Operations apps through Dynamics AX 2012 R3 using the upgrade tool that is available. Additional upgrade information is available in the [Upgrade from AX 2012 to Finance and Operations apps](#) topic.

Frequently asked questions

When does the mainstream support for Dynamics AX 2009 Service Pack 1, Dynamics AX 2012, and Dynamics AX 2012 R2 end?

Mainstream support ends on October 9, 2018.

Was the information of the end date of the mainstream support for Dynamics AX 2009 Service Pack 1, Dynamics AX 2012, and Dynamics AX 2012 R2 available before?

Yes, it was always publicly available on the Microsoft Support Lifecycle site at support.microsoft.com.

Can customers on Premier Extended Hotfix Support or on Unified Support Advanced and Performance Levels get a non-security hotfix or regulatory update?

No. Neither non-security hotfixes nor regulatory updates will be available for the Dynamics AX products during the Extended Support phase of the product lifecycle (Dynamics AX 2009 SP1, Dynamics AX 2012, or Dynamics AX 2012 R2).

While the ability to request a non-security hotfix for select products is included with Unified Support Advanced and Performance Levels, Microsoft has determined that non-security hotfixes cannot be provided with a *commercially reasonable* effort for these products. As a result, no requests for non-security hotfixes or regulatory updates will be accepted. However, Microsoft will continue making security hotfixes, non-security hotfixes, and regulatory updates for Dynamics AX 2012 R3 throughout that mainstream support period. The source code for these non-binary, non-security hotfixes and regulatory updates will continue to be available for

customers, and their partners, active on the Enhancement Plan or Software Assurance. Dynamics AX 2009 SP1, Dynamics AX 2012, and Dynamics AX 2012 R2 customers can selectively integrate those changes as required. Customers and partners can get the source code from packages attached to relevant Dynamics AX 2012 R3 KB articles published on LCS and discoverable through LCS Issue Search.

I knew about the regulatory change before October 9, 2018, but it has the law enforcement date after October 9, 2018. Will I still get a regulatory update for Dynamics AX 2009 Service Pack 1, Dynamics AX 2012, and Dynamics AX 2012 R2?

No, we will only provide regulatory updates for Dynamics AX 2009 Service Pack 1, Dynamics AX 2012, and Dynamics AX 2012 R2 for regulatory changes with the law enforcement dates on or earlier than October 9, 2018.

A customer or partner can already download a fix through LCS and inspect the code by installing it into a test Dynamics AX 2012 R3 environment. Is there any difference with the approach that you have proposed?

No, there is no difference.

What happens if a new bug is found by a customer in Dynamics AX 2009 Service Pack 1, Dynamics AX 2012, or Dynamics AX 2012 R2?

The bug must be reproducible in Dynamics AX 2012 R3. If it is reproducible and accepted, then a hotfix will be provided for Dynamics AX 2012 R3 and the customers can elect to integrate this hotfix in their version themselves, or work with their partners to integrate the changes.

How are binary hotfixes handled for Dynamics AX 2009 Service Pack 1, Dynamics AX 2012, and Dynamics AX 2012 R2?

If a hotfix is needed for a part of the system where Microsoft does not provide the source code and it is not a security bug, the hotfix will not be provided.

NOTE

Can you tell us about your documentation language preferences? [Take a short survey.](#)

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Help system

2/18/2021 • 6 minutes to read • [Edit Online](#)

Users of the following apps can access context-sensitive Help and other content that is based on the same Help system:

- Microsoft Dynamics 365 Commerce
- Dynamics 365 Finance
- Dynamics 365 Human Resources
- Dynamics 365 Supply Chain Management

In all these apps, you can access product-specific Help from the **Help** pane.

The screenshot displays the Microsoft Dynamics 365 interface. The main window shows a sales order for 'Contoso Retail San Diego' with a table of sales order lines. The Help pane is open on the right side, showing a search bar and a list of help topics.

T...	Variant number	Item number	Product name	Sales category	CW quantity	CW unit	Quantity	Unit	Delivery type
		D0001	MidRangeSpeaker	Speakers			20.00	ea	Stock
		L0001	MidRangeSpeaker2	Speakers			29.00	ea	Stock
		P0001	AcousticFoamPanel				123.00	ea	Stock
		D0003	StandardSpeaker	Speakers			22.00	ea	Stock
		T0001	SpeakerCable / Speaker cable 10	Accessories			61.00	ea	Stock
		D0004	HighEndSpeaker / High End Spe...	Speakers			20.00	ea	Stock
		T0004	TelevisionM120377 / Television ...	Television			61.00	ea	Stock
		T0002	ProjectorTelevision	Television			37.00	ea	Stock
		T0005	TelevisionHDTVX59052 / Televisi...	Television			25.00	ea	Stock
		T0003	SurroundSoundReceive	Receivers			37.00	ea	Stock

The Help pane on the right contains a search bar and a list of help topics, including 'Create sales orders', 'Prospect to cash', 'Generate and process customer rebates', 'Credit card setup, authorization, and capture', 'Confirm sales orders', 'Working with serialized items', 'Create a purchase order from a sales order', and 'Manage order holds'. It also includes a 'RESOURCES' section with links to 'Help', 'Ask the community', and 'CustomerSource'.

Help on docs.microsoft.com

The docs.microsoft.com site (docs.microsoft.com/dynamics365) is the default source for product documentation for the previously listed apps. This site offers the following features:

- **Access to the most up-to-date content** – The site gives Microsoft a faster and more flexible way to create, deliver, and update product documentation. Therefore, you have easy access to the latest technical information.
- **Content that is written by experts** – Content on the site is open to contributions by community members both inside and outside Microsoft.

You can find content on docs.microsoft.com by using any search engine. For the best results, we recommend that you use a site search, such as `site:docs.microsoft.com dynamics 365 "search term"`.

Get notified about changes through an RSS feed

To subscribe to a Really Simple Syndication (RSS) feed of all updates that are to the content on docs.microsoft.com, use the following link:

[RSS feed](#)

Leave us feedback



If you have feedback or questions about a topic, leave us a comment at the bottom of the page.

1. Select **Feedback** to get to the comments at the bottom of the page. Then, select either **Product feedback** or **Sign in to give documentation feedback**.
2. Start typing your comments, and then select **Submit feedback**.

Feedback

We'd love to hear your thoughts. Choose the type you'd like to provide:

Our new feedback system is built on GitHub Issues. Read about this change in [our blog post](#).

Title

Leave a comment

NOTE

If you want to submit documentation feedback, you must sign in by using a GitHub account. For more information, see [Setting up and managing your GitHub profile](#).

Contribute to the documentation

You can contribute and make edits to the documentation. To get started, select the **Edit** button (pencil symbol) on a topic. The following video shows how you can contribute to our documentation.

The [How to contribute to the Microsoft Dynamics 365 documentation](#) video (shown above) is included in the Microsoft Dynamics 365 channel on YouTube.

For more information, see the [Docs contributor guide](#), which is published by the team that built the docs.microsoft.com site.

NOTE

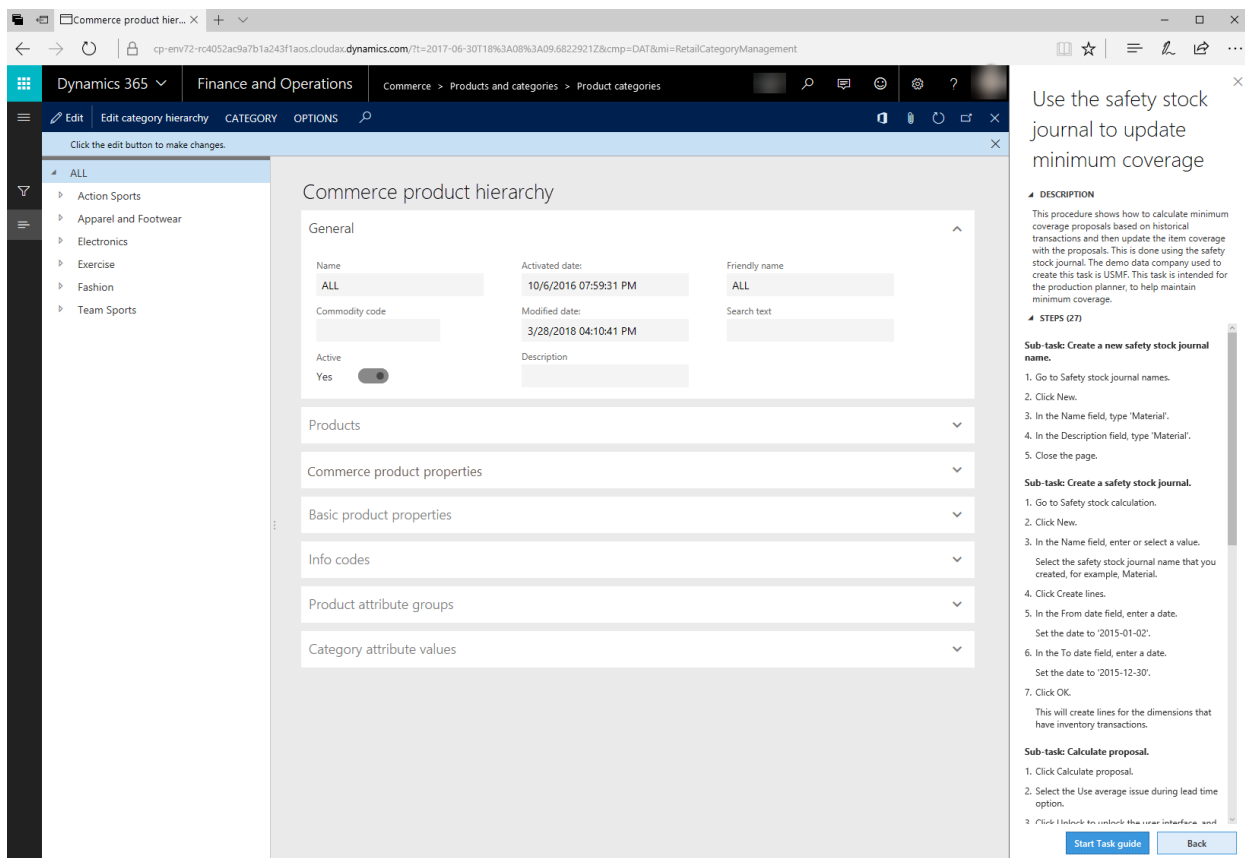
We only accept contributions to our English content at this time.

Task guides

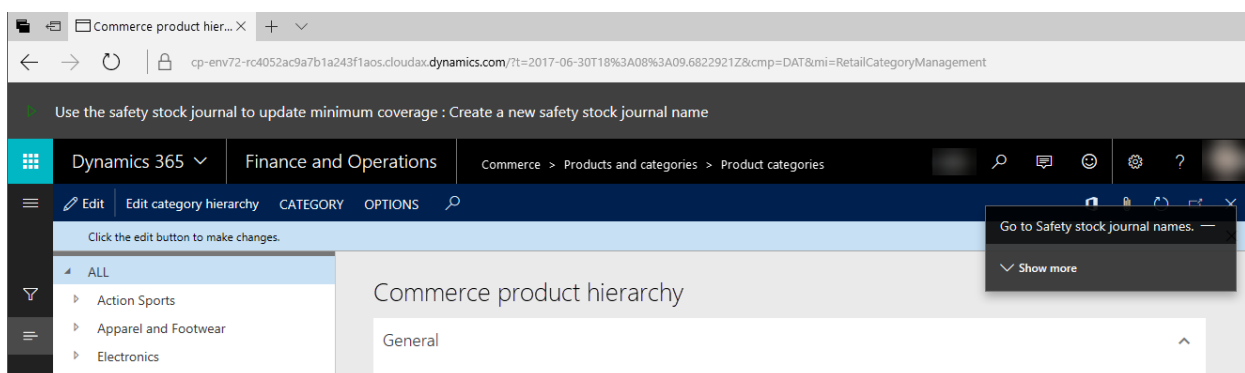
A task guide is a controlled, guided, interactive experience that leads you through the steps of a task, or business process. You can open (play) a task guide from the **Help** pane. When you first select a task guide, the **Help** pane

will show the step-by-step instructions for the task. Localized task guides are available.

Microsoft released task guide libraries for product versions through the December 2017 release of Dynamics 365 for Finance and Operations. The [Accessing task guides from the Help pane](#) section of this topic explains how to find the correct task guides for your product.



To begin the guided, interactive experience, select **Start task guide** at the bottom of the Help pane. A black pointer shows you where to go first. Follow the instructions that appear in the user interface (UI), and enter data as directed.



IMPORTANT

The data that you enter when you play a task guide is real. If you're in a production environment, the data will be entered in the company that you're currently using.

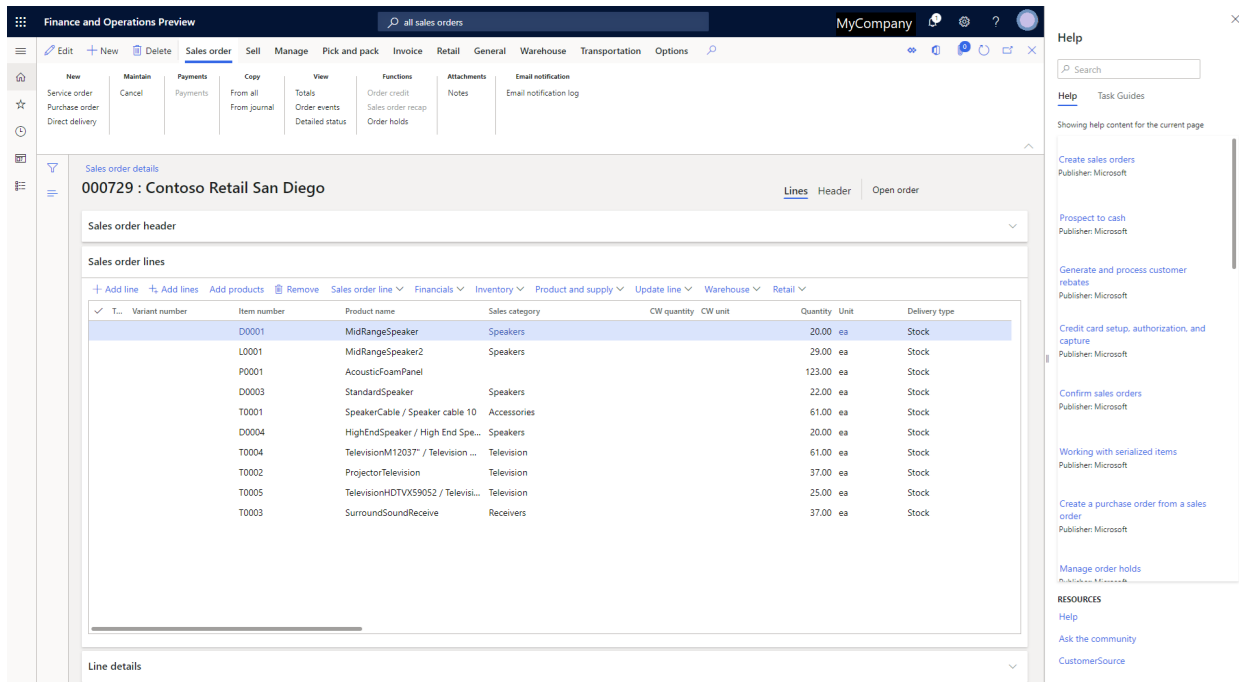
You can use Task recorder to create your own custom task guides. For more information, see [Create documentation or training with Task Recorder](#).

In-product Help

Some fields have field descriptions to help users get unblocked when they are uncertain about the data that the

field contains, for example. Additionally, the in-product **Help** pane provides context-sensitive access to content that can help users get started, get unblocked, and learn more.

To access Help content, select the **Help** button (?), and then select **Help**. Alternatively, press **Ctrl+Shift+?**. In both cases, the **Help** pane appears. From the **Help** pane, you can access conceptual topics or task guides that are relevant to the area of the product that you're currently in.



Accessing Help topics from the Help pane

From the **Help** pane, you can access topics that apply to the client. When you first open the **Help** pane, the **Help** tab shows the topics that apply to the page that you're currently on. If no topics are found, you can enter keywords to refine your search. When you select a topic in the **Help** pane, it's opened on a new tab in your browser.

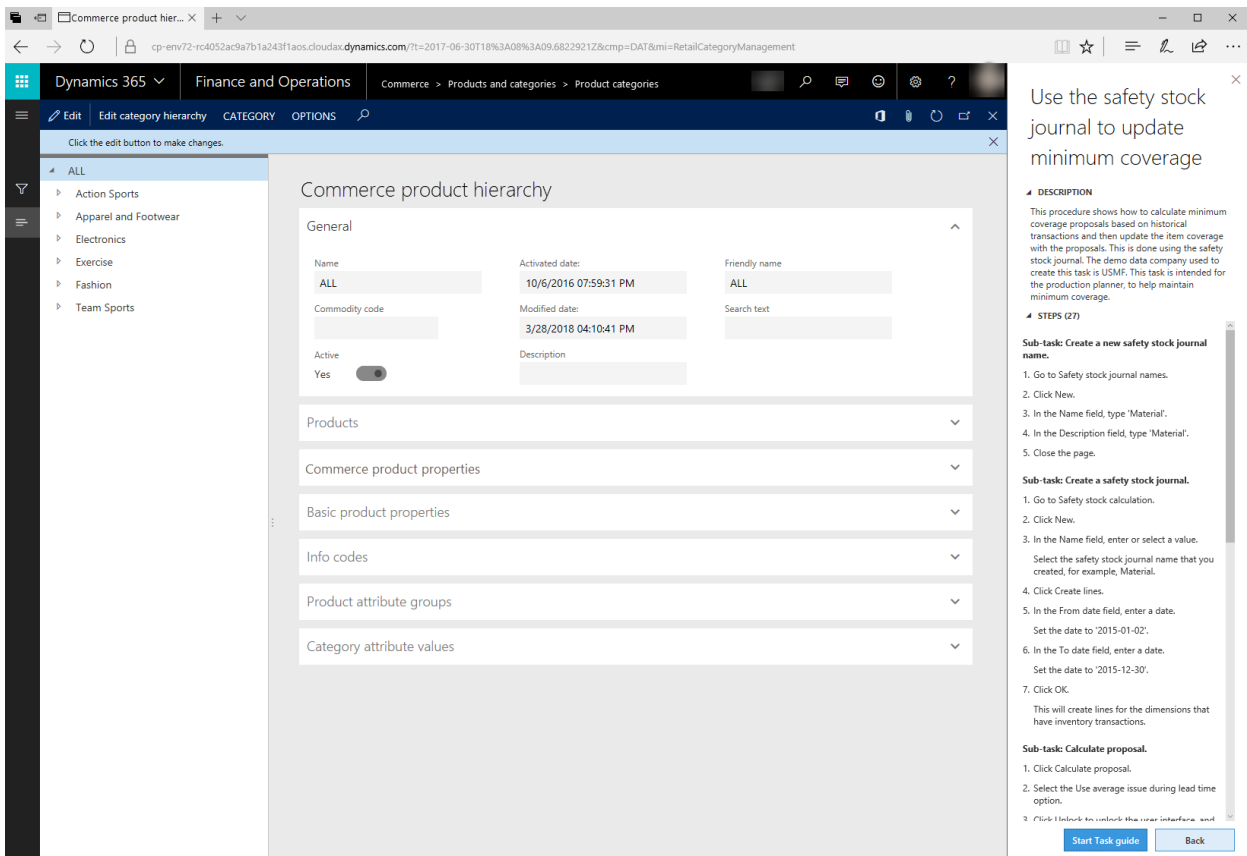
IMPORTANT

This section does not apply to Dynamics 365 Human Resources. The Help system for Human Resources is automatically connected to task guides for the product. Also, you cannot create custom task guides for Human Resources.

Accessing task guides from the Help pane

Before you can access task guides from the **Help** pane, a system admin must configure some settings on the **System parameters** page in Finance, Supply Chain Management, or Commerce. For more information, see [Adding task guides](#).

After a System administrator has completed these steps, you can open the **Help** pane and select the **Task guides** tab. You'll now see the task guides that apply to the page that you're currently on. If no task guides are found, you can enter keywords to refine your search. After you select a task guide in the **Help** pane, the **Help** pane shows the step-by-step instructions, and you can play the task guide.



Where are the translated task guides for Microsoft libraries?

Translated task guides are released in libraries that have "All languages" in the title. To view localized task guide Help, make sure that you're connected to an appropriate library. Each user can change the language that a task guide appears in by changing the language settings under **Options > Preferences**.

- If a task guide has been translated, when you open that task guide all the text of the task guide will appear in your selected language.
- If a task guide has not yet been translated, when you open it, only the text of the controls will appear in your chosen language.

Creating custom Help

You can create Help for your users by creating custom task guides or connecting your own website to the **Help** pane. For more information, see the following topics:

- [Task recorder resources](#)
- [Custom Help overview](#)

Additional resources

The following table lists our websites. Sites that have an asterisk (*) next to the name require that you sign in by using an account that is associated with a service plan.

SITE	DESCRIPTION
Docs.microsoft.com	This site hosts or links to all product documentation for Dynamics 365.
Microsoft Learn	This site is the free Microsoft eLearning site.

SITE	DESCRIPTION
Microsoft Dynamics Lifecycle Services (LCS)*	This site provides a cloud-based collaborative workspace that customers and partners can use to manage projects from pre-sales to implementation and operations. It's useful in all phases of an implementation.
Support blog	This site provides tips and tricks that are posted by the Support team.
Docs.microsoft.com/previous versions	This site hosts content from previous releases.
Dynamics Community	This site hosts blogs, forums, and videos.
Microsoft.com/dynamics365	This site provides evaluation and sales information.
CustomerSource*	This site hosts training resources, downloadable reports, and white papers, and is the primary support site for service plan holders. Access to some resources on this site might require a service plan.

NOTE

Can you tell us about your documentation language preferences? [Take a short survey.](#)

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

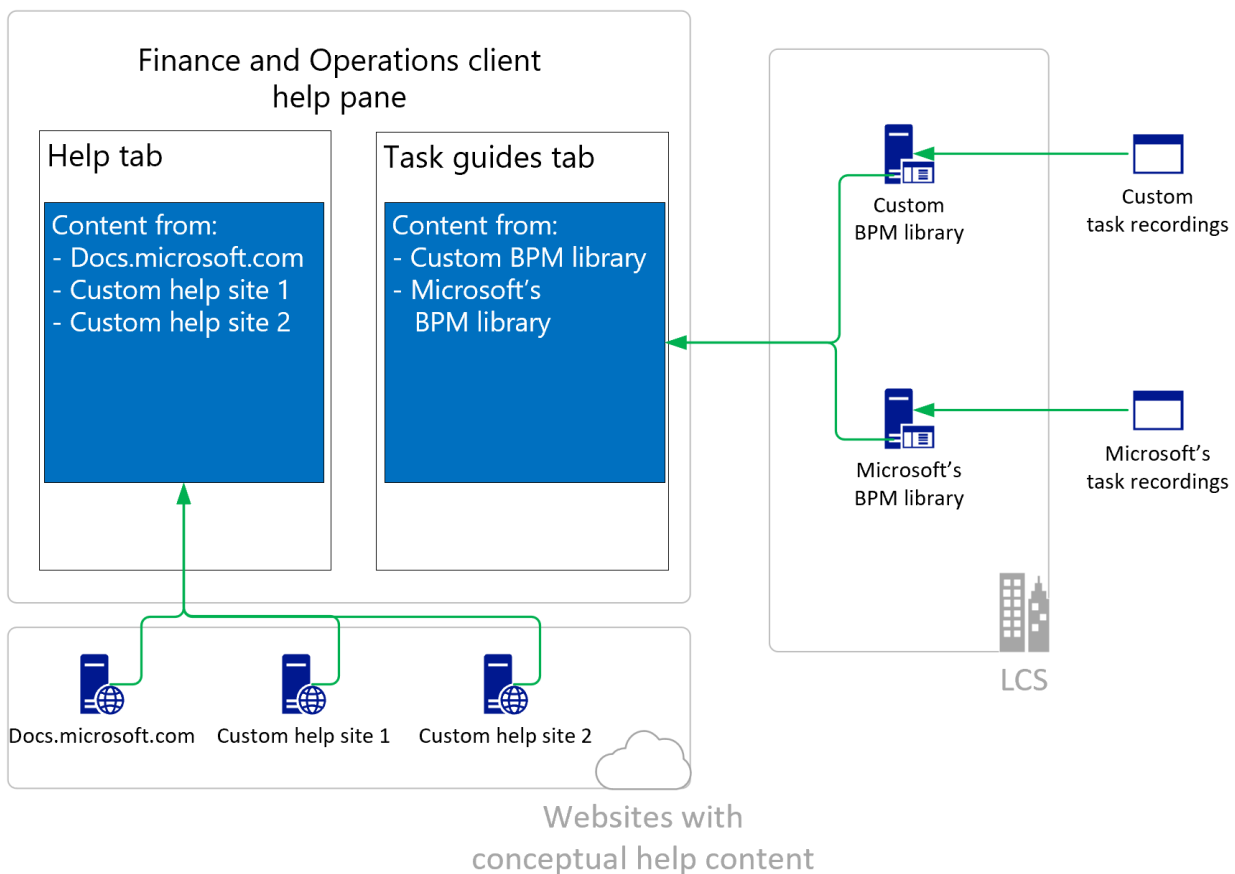
Configure the Help experience for Finance and Operations apps

2/18/2021 • 4 minutes to read • [Edit Online](#)

In this topic, you will find an overview of the components of the Help system for Finance and Operations apps, such as Microsoft Dynamics 365 Finance, Dynamics 365 Supply Chain Management, Dynamics 365 Commerce, and Dynamics 365 Human Resources. The topic also explains how to connect these components and provides a summary of the process for creating custom Help.

Help architecture

Finance and Operations apps include conceptual overviews and other topics that are published to the <https://docs.microsoft.com/dynamics365> site. This content can then be accessed from the in-product **Help** pane. The following illustration shows the parts of the Help system.



The in-product Help system pulls articles from docs.microsoft.com and other connected websites. It also pulls in task guides that are stored in Business process modeler (BPM) in Microsoft Dynamics Lifecycle Services (LCS).

Adding task guides

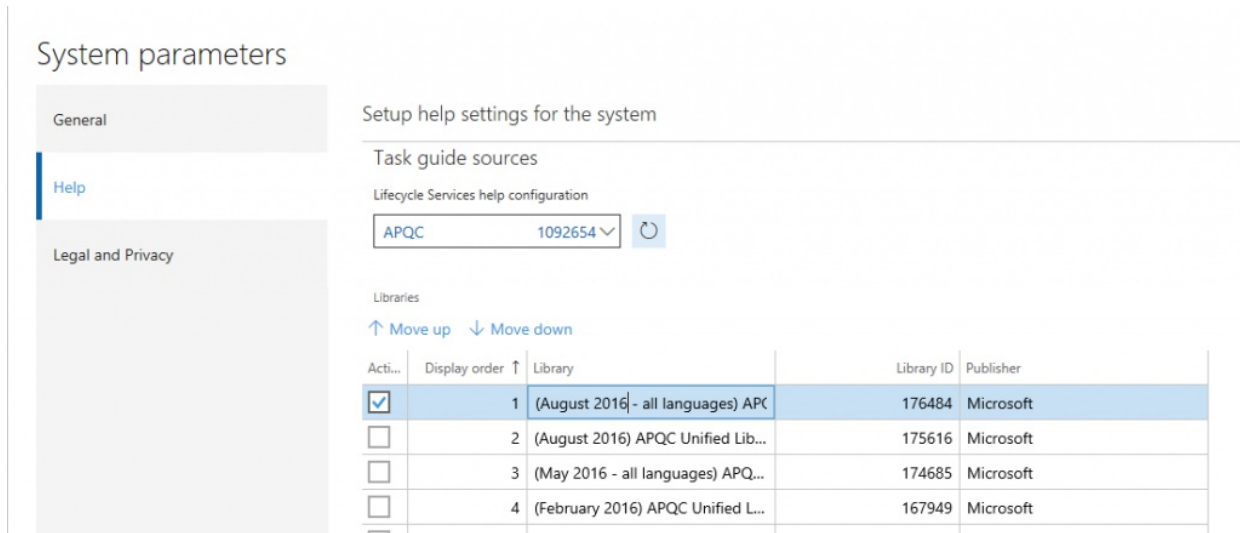
NOTE

The **Task guides** tab isn't currently available in Human Resources or Commerce. However, the task guides in the Getting Started experience in Human Resources remain available to cover basic functionality. For both Human Resources and Commerce, procedural Help is available on the <https://docs.microsoft.com/dynamics365> site.

On the **System parameters** page, system admins can configure access to the relevant task guide libraries for an implementation.

NOTE

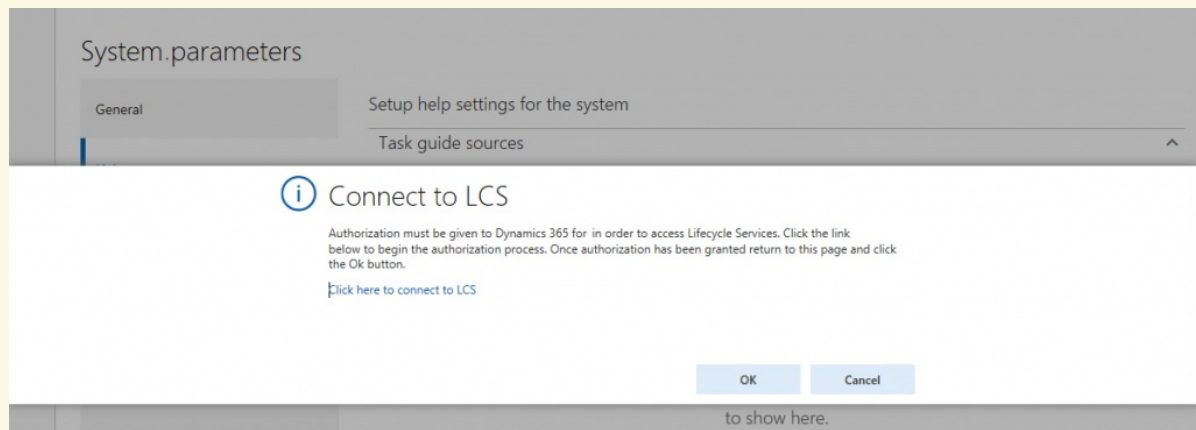
- To configure Help, you must sign in by using an account in the same tenant as the tenant where the app is deployed.
- An LCS library can't be connected from an instance of the app that is running on a local virtual hard drive (VHD).



To configure task guides for a solution, follow these steps on the **System parameters** page.

IMPORTANT

The first time that you open the **Help** tab, you must connect to Lifecycle Services. Be sure to select the link in the middle of the form, wait for the connection, close the dialog box, and then select **OK** to get to the **System Parameters** page.



1. Select the Lifecycle Services project to connect to.
2. Select the BPM libraries (within the selected project) to retrieve task recordings from.
3. Set the display order of the BPM libraries. The display order defines the order in which task recordings from the libraries will appear in the **Help** pane.

After you complete these steps, you can open the **Help** pane and select the **Task guides** tab. You'll now see the task guides that apply to the page that you're currently on in Finance and Operations apps. If no task guides are found, you can enter keywords to refine your search.

Showing translated task guides

Translated task guides were first released in the May 2016 APQC Unified Library and in the Getting Started library. To view localized task guide Help, make sure that your Dynamics 365 solution is connected to the May

2016 library. Users can change the language that a task guide appears in by changing the language settings under **Options > Preferences**.

NOTE

Although many task guides have been translated, the client doesn't currently show the translated task guide names. Additionally, in the May 2016 library, translations are available only for the task guides that were released in February 2016. Microsoft will release an updated library that includes additional translations.

- If a task guide has been translated, when you open that task guide all the text of the task guide will appear in your selected language.
- If a task guide has not yet been translated, when you open it, only some of the text (the text of the controls) will appear in your selected language.

Adding custom Help

You can use task guides to create custom Help, or you can connect a custom Help website to the **Help** pane.

Create custom Help by using task guides

You can create custom Help for the supported apps by creating task recordings that reflect your implementation and then saving them to a Business process library in LCS. You can't create custom task guides for Human Resources.

If you're a partner, and you promote a library to a corporate library and include it in a solution, it will be available to your customers. You can also make a copy of the APQC Unified Library, and then open the task recordings in the copy, edit them, and save your changes. For more information, see [Task recorder resources](#).

Connect a custom Help site

Finance and Operations apps are rarely used in their out-of-box form. Instead, the solution is customized and extended to fit the organization's needs. You can also customize and extend the Help experience. For example, you can add custom Help to the in-product **Help** pane.

Microsoft has provided a toolkit to help you deploy and connect custom Help to the **Help** pane. For information about how you can set up a custom Help solution that is connected to the **Help** pane, see [Custom Help overview](#).

If you want to collaborate with Microsoft on tools and processes for customizing Help, fill in the form at <https://aka.ms/customhelpfeedback>.

See also

[Help system](#)

[Custom Help overview](#)

[Task recorder resources](#)

[Create documentation or training with Task Recorder](#)

[Custom Help GitHub repository](#)

NOTE

Can you tell us about your documentation language preferences? [Take a short survey](#).

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Custom Help overview

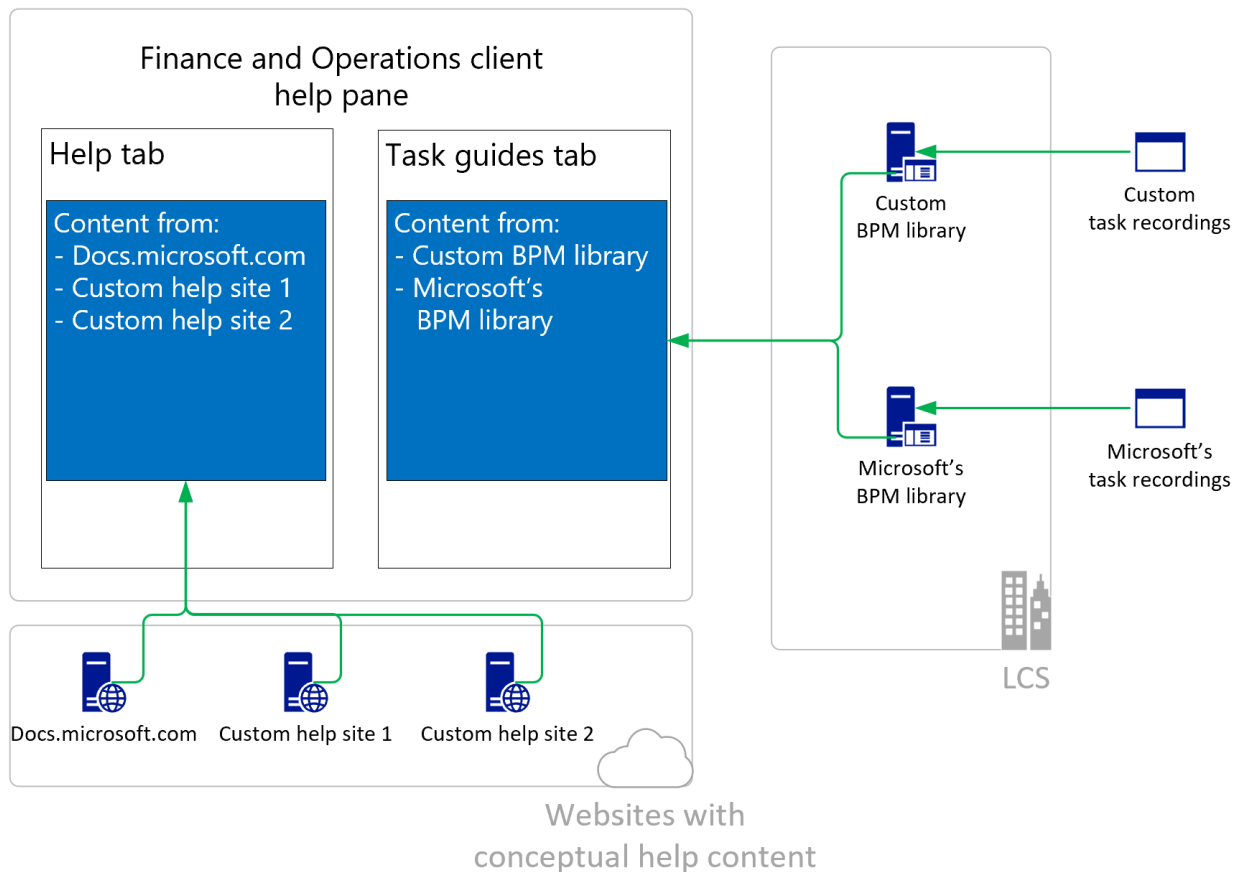
2/18/2021 • 4 minutes to read • [Edit Online](#)

Finance and Operations apps are often customized and extended to fit an organization's needs. If your solution is based on Microsoft Dynamics 365 Finance, Dynamics 365 Supply Chain Management, or Dynamics 365 Commerce, you can connect solution-specific and customer-specific Help content to the [Help pane](#) in the Finance and Operations client. This topic describes the main steps and decision points.

NOTE

Users of Finance and Operations apps can create custom task guides to supplement conceptual content that describes the functionality of their solution. These conceptual descriptions are also referred to as Help and can be provided by Microsoft, partners, and an organization itself. For more information, see [Help system](#).

The following illustration, and this topic in general, use the term *Help* for conceptual descriptions that either include or exclude how-to guides. The term *task guides* refers to in-product task guides.



Custom Help content

Custom Help content typically originates from one of three sources:

- Microsoft documentation repositories (repos)

You can use the [HTMLFromRepoGenerator](#) tool from the Custom Help Toolkit to clone content from any of the Finance and Operations repositories and generate corresponding HTML files. Those files can then be updated with content that is specific to your solution.

- Existing customized Dynamics AX content

You can [convert Dynamics AX custom Help content so that it can be used in Dynamics 365](#).

- HTML files that are created specifically for your solution

[Learn more about the metadata](#) that must be added to your HTML files for context-sensitive Help and search to work correctly.

Process

The end-to-end process depends on the actual customer solution and the users' expectations. A typical process involves the following steps:

1. Create the custom Help content.
2. Publish the content on a website.
3. Index the content by using a search service.
4. Connect the custom **Help** pane to the website and the search service.

Microsoft provides a [toolkit](#) that can help you generate HTML files from the Microsoft Help repositories, generate JavaScript Object Notation (JSON) files for search services, and change the locale of HTML files so that it matches the locale of your solution.

You're welcome to share your knowledge by contributing to this documentation through the link at the bottom of the page or by joining the [Dynamics 365 community](#).

The following table outlines the main objectives that admins typically have for configuring the Help experience.

OBJECTIVE	LEARN MORE
I want to give my users a customized in-product Help experience that reflects their actual solution.	See the Custom Help websites section of this topic and Create documentation or training with Task Recorder .
I want to use the Microsoft Help content as a baseline for Help content that is specific to my solution.	See Custom Help Toolkit: The HtmlFromRepoGenerator tool .
I want to contribute to the Microsoft Help content.	See Extend, customize, and collaborate on the Help .
I want to reuse my existing Dynamics AX content.	See Convert Dynamics AX custom Help for use in Dynamics 365 .
I want to set up a website for my Help content.	See the Custom Help websites section of this topic.
I want to add my content to the Help pane.	See Connect a custom Help website to the Help pane .
Our technical writers want guidance that will help them convert our earlier content into Markdown so that it becomes easier for them to customize the Microsoft content.	See Moving to Markdown .

Custom Help websites

Before the product can connect to your Help content, you must customize the in-product **Help** pane so that it shows your content. The following conditions must be met:

- Your content must be available on a website.

You can deploy your content to an existing website, or you can set up a dedicated website to host your

content. The website can be private or public, but we recommend that users **not** be required to sign in to access your content.

- Your content must be indexed by a search service.

If you use the [AzureSearchCustomHelp](#) solution that is part of the [Custom Help Toolkit](#) for context-sensitive Help, the **Help** pane will generate a query that must be run against the search service's index. The query depends on specific metadata in the Help topics. For more information, see [Metadata requirements for custom Help topics](#).

The [Deploy custom Help to Azure](#) topic describes an approach for hosting content on Azure. It includes information about how to set up a search service that indexes your content so that it can be found by the in-product **Help** pane. If you don't have an [Azure subscription](#), create an account before you begin. You can start with a free account for 12 months. For more information, see [Create your Azure free account today](#).

See also

[Connect a custom Help website to the Help pane](#)

[Deploy custom Help to Azure](#)

[Custom Help Toolkit](#)

[Language and locale descriptors in the product and in Help](#)

[Configure the Help experience for Finance and Operations apps](#)

[Help system](#)

NOTE

Can you tell us about your documentation language preferences? [Take a short survey](#).

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

View and export field descriptions

2/18/2021 • 4 minutes to read • [Edit Online](#)

This article describes how to view field descriptions and how to use the Field descriptions page to export descriptions.

Some of the more complex fields have field descriptions. These descriptions appear when you hover over a field. You can also view and export descriptions on the **Field descriptions** page.

Not all pages have field descriptions. We want to provide descriptions only for the more complex fields, not where the use of the field is obvious. Therefore, some pages don't have any field descriptions, some pages have a few descriptions, and some of the more complex pages, such as many of the parameters pages, have many descriptions.

If you have access to the development environment, you can add new field descriptions and customize existing descriptions. For example, you can add company-specific information to a field description. For more information, see [Customize field descriptions](#).

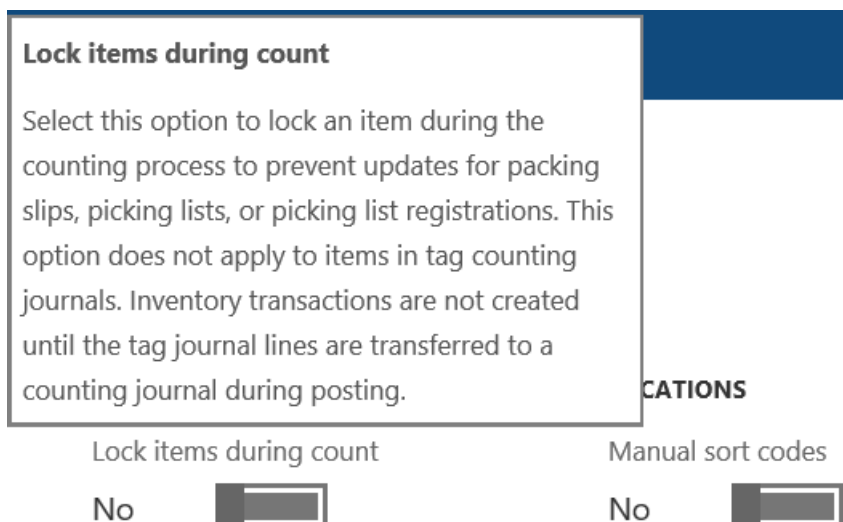
See field descriptions in the user interface

You can view field descriptions by hovering over a field. If no description is available, you see the field name when you hover over the field.

NOTE

In Dynamics AX 7.0 (February 2016), field descriptions can be viewed only on the **Field descriptions** page.

The following illustration shows the field description that appears when you hover over the **Lock items during count** field.



Use the Field descriptions page to view and export field help

The **Field descriptions** page lets you view and export field descriptions. You can see the descriptions that are available for one page at a time.

View the descriptions for a page

To view the descriptions for a page, follow this step.

- In the **Select a page** field, type the name of the page. Alternatively, click the arrow to open a list of all the pages, and then browse or filter the list.

You can use either the name of the page that is shown in the user interface (UI) (for example, **Customers**) or the code name (AOT name) that's available when you right-click a page (for example, **CustTable**).

For information about the various ways to filter the list of pages, see the "Searching for a page" section later in this article.

If you set the **Include fields without a description** option to **Yes**, all the fields on the page are shown, even if they don't have a field description.

Export the descriptions for a page

To export the descriptions for a page, follow these steps.

1. In the **Select a page** field, select a page.
2. Click the **Open in Microsoft Office** button in the upper-right corner, and then click **FieldDescriptionTmp**.

Searching for a page

There are several ways to search for a page in the **Select a page** field. In many cases, you must click the arrow in the **Select a page** field to open the drop-down list, and then select from a filtered list of pages.

- Type part of the name, and then open the drop-down list to select from a filtered list of pages.
- Open the drop-down list, and then click either the **Page name** heading at the top of the list or the **Page AOT name** heading. A dialog box appears, where you can use advanced filtering options, such as **Page name begins with**.
- Type the full name of the page. When you use this option, it's best to open the drop-down list and see what else is in the list, even if field descriptions are shown.
 - If there is a single exact match to the name, the field descriptions for that page are shown.
 - If there is more than one exact match, no descriptions are shown. You must open the drop-down list and select the page that you want.
 - If the name that you typed is part of the name of another page, you see the descriptions for your page. However, if you open the drop-down list, you see additional pages that contain that name.

For example, no descriptions are shown when you type **Counting** in the **Select a page** field. You open the drop-down list, and see that there are two pages that have the name **Counting** and several pages that contain the word "Counting" in the name. If you select the page that has the AOT name **InventJournalCount**, the field descriptions are shown for that page. However, if you open the drop-down list again, you will see that the list now contains all pages that have "InventJournalCount" as part of their AOT name.

Troubleshooting

This section provides information to help you troubleshoot issues that you might encounter when you use field descriptions.

I can't find a field description

We're in the process of adding descriptions for the more complex fields. If you require help for a particular field, let us know by adding a comment for this topic.

The field description isn't helpful

Let us know by adding a comment for this topic. If you can, describe the additional information that you require.

I can't find a field on the Field descriptions page

To show all the fields on a page, set the **Include fields without a description** option to **Yes**. Click the **Select a page** field to verify that you've selected the correct page. If the name that you typed is part of another field name, you might have selected the page that has the longer name.

I can't find a page on the Field descriptions page

For information about the various way to find pages, see the "Searching for pages" section earlier in this article. If you've typed the exact name of the page, the field descriptions might not be shown if more than one page has the same name. Click the arrow in the **Select a page** field to open a filtered list of the pages that are available.

Additional resources

[Customize field descriptions](#)

NOTE

Can you tell us about your documentation language preferences? [Take a short survey](#).

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Task recorder resources

2/18/2021 • 33 minutes to read • [Edit Online](#)

This topic describes how to use Task recorder to record business processes.

Overview

Task recorder

Task recorder for Finance and Operations apps is a utility that lets users record business processes for several different use cases. Here are some examples:

- Step-by-step guided tours of a specific business process in the application itself
- Documentation of a business process as a Microsoft Word document that can optionally include screenshots
- Regression tests for a business process
- Automatic playback of a business process in the application

Task recorder for Finance and Operations apps boasts high responsiveness, a flexible extensibility application programming interface (API), and seamless integration with consumers of business process recordings. Task recorder is also integrated with the [Business process modeler \(BPM\)](#) tool in Microsoft Dynamics Lifecycle Services (LCS), so that users can continue to organize their recordings. However, users can no longer produce business process diagrams from recordings.

Task recorder can automatically generate application regression tests from business process recordings and play back previously recorded processes. These features also include test-specific gestures that let users take full advantage of Task recorder.

Architecture

Task recorder can record user actions in the client with exact fidelity, because every control is instrumented to notify Task recorder about the execution of user actions. The control notifies Task recorder that an event has occurred and passes all the relevant information about the corresponding user action in real time. From this information, Task recorder can capture the type of user action (for example, a button click, value entry, or navigation) and any data that is related to the user action (for example, the input data value and type, form context, or record context). Task recorder persists the information with enough detail to ensure that a playback of the recording can run the recorded actions exactly as they were performed by the user.

Basic configuration

Task recorder is included with every Finance and Operations app, and lets users begin to record business processes immediately after they open the client for the first time.

IMPORTANT

The **Task guides** tab is currently not available in Commerce or Human Resources. We are currently working to enable this functionality in a future release. Task guides in the Getting Started experience in Human Resources remain available to cover basic functionality. Procedural help is also available on the docs.microsoft.com site (<https://docs.microsoft.com/dynamics365/>) for both Commerce and Human Resources.

Start a new recording

The following steps show how to use Task recorder to start a new recording.

1. Open the product, and sign in. It's a good practice to refresh the browser before each new recording. A refresh creates a new user session and restarts Task recorder. Therefore, it provides the most stable recording experience.
2. Select the company that you want to use while recording. If this is your first time using Task recorder, you can follow along as this tutorial creates a sample recording based on a Fleet Management business process. You will need to load the Fleet demo data to follow along:
 - a. Go to **Dashboard > Fleet Management > Fleet setup**.
 - b. Click **Load demo data**.
 - c. When the data is finished loading, click **Close**.
 - d. Go back to the **Dashboard** by clicking the product name in the navigation bar.
3. Go to **Settings > Task recorder**.
4. The **Task recorder** pane is opened. You can click the **Close** button (X) in the upper-right corner to close the **Task recorder** pane before you begin a new recording. You can reopen the pane by following the previous steps.
5. Click **Create recording**.
6. Enter a name for the recording and click **Start**. Recording begins the moment **Start** is clicked. For the Fleet example in this tutorial, we'll use the name "Create a new rental reservation."

While you're recording, you can click the **Close** button (X) in the upper-right corner to hide the **Task recorder** pane without stopping the recording. You can reopen the pane by clicking the **Task recorder** button that appears at the top of the page. This button appears only while recording is in progress.

NOTE

If the **Saved views** feature is turned on, recordings should be created by using either published views or the standard view, to ensure that recordings work reliably for users.

7. Task recorder enters **recording mode**. The pane shows information and controls that are related to the process of recording.

Now you're ready to record a business process using Task recorder. If you're following this guide as a first-time user, you may complete the following Fleet Management scenario as an example. Otherwise, you can record your own application scenario.

Record a Fleet Management scenario

1. In the **Task recorder** pane, click **Start sub-task**.
2. Set **Name** to "Create a new rental customer". Leave the **Comment** field blank.
3. Click **OK**. The task is added to the step list.
4. Go to **Dashboard > Fleet Management > Reservation Management**.
5. Go to **All customers** under the **Summary** tab.
6. In the Action Pane, click **New**.
7. Enter a first and last name for the customer.
8. Click **Save**.
9. In the **Task recorder** pane, click **End sub-task**.
10. Return to the **Reservation Management** workspace by clicking the browser back button twice.
11. In the **Task recorder** pane, click **Start sub-task**. Name the task "Rent a vehicle to the new customer". Click **OK**.
12. Click (+) **Rental** under **Summary**.

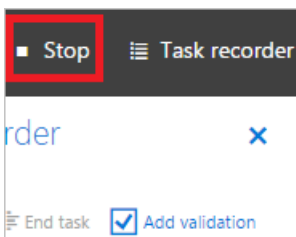
13. Under **Information**, select a "1975 Litware McKinley" as the vehicle.
14. Under **Information**, set the customer to the one just created.
15. Expand the **Discounts** section.
16. Click **Add** under **Discounts** and add the Frequent Customer discount. Click **OK**.
17. In the Action Pane, click **Start Rental**.
18. Set the return date to some date in the future.
19. Click **OK**.
20. In the **Task recorder** pane, click **End sub-task**.
21. Click **Stop** at the very top of the page.

Recording a business process

After you've started your recording, you can perform your business process just as you would typically perform it by using the web client. As you interact with the product, new steps are added to the step list in the **Task recorder** pane. In this section, you will learn about other actions that you can perform while you're recording a business process, to take full advantage of Task recorder's capabilities.

Stop

Stop is used to end the recording session. Before you click **Stop**, you should make sure that the recording is completed, because this action isn't reversible. When you click **Stop**, you're taken to the download options screen.



Start/End sub-task

Start/End sub-task lets a user specify the beginning and end of a set of grouped steps in a recording. Click the **Start sub-task** button to add a "Sub-task" step to the end of the current list of recorded steps. The sub-task will include all steps that you perform from this point until you click the **End sub-task** button. When you click the **End sub-task** button, an "End sub-task" step is also added to the list of recorded steps.

NOTE

You must start a sub-task before you perform/record the steps that you want to include in the task. Then, after you've performed/recorded all the steps that you want to include in the task, you must end the sub-task.

Sub-tasks are purely an organization tool, and consumers of business process recordings can interpret the task groupings in useful ways. Because tasks can be nested inside other tasks, they provide the flexibility to organize very long and complex business processes.

Delete/Restore step

Delete/Restore step enables a user to remove steps from the recording, or undo the removal of a step from the recording. You must first select the step in the Steps list that you want to delete/restore, and then click the **Delete/Restore step** button.

NOTE

The behavior of the **Delete** button changes when you play back a recording. In playback mode, a deleted step can't be restored after playback has passed the point where it would have run the deleted step. For example, you load a recording that contains three steps, and then you delete step 2 before you start playback. You can restore step 2 only as long as playback hasn't run step 3. After you start playback, and playback has "skipped" step 2 (because you deleted it) and run step 3, you won't be able to restore step 2. Because step 2 wasn't run and therefore wasn't recorded, it can't be retroactively added back into the recording at its previous position.

Add developer placeholder

Add developer placeholder lets the user add a placeholder step to the list of recorded steps. This placeholder step doesn't appear when the task guide is viewed, and it isn't run during maintenance of a recording. It's used only by the [Regression suite automation tool \(RSAT\)](#) or the X++ code generator that enables an X++ test to be created from a task recording. When the code generator creates an X++ test, it automatically adds a method stub to the generated code. The developer can then add X++ code into this method stub. The automated code will call the validation when the generated test is run at the point in the recording where this placeholder was added.

Enriching steps in a recording

There are various options for enriching a step in a recording. For example, you can adjust the text that is associated with a step and add information about a specific step. This section describes the step enrichment capabilities that are available. To access these options, click the **Edit step** button on a specific step of a recording.

Step instruction

The **Step instruction** is the primary text that is displayed for this step in the task guide. There are usually 2-3 alternative options for step instructions, and they appear in the following order when editing the annotation.

Step instruction

- In the First name field, type 'John'.
- In the First name field, type a value.
- In the First name field, { your example text }.

This image shows the annotation options for changing a step.

- **Preferred value instruction** This type of instruction will direct the user to enter the same data that was used when the step was recorded. *Example:* In the First name field, enter 'John'.
- **Example value label** This type of instruction will direct the user to enter their own data, indicating that the data that was used when the step was recorded was only *Example* data. *Example:* In the First name field, enter a value.

If users click the **See more** button on this step when they play the recording as a task guide, they will be able to see the data that was used when the step was recorded. This recorded data value will be labeled as an *Example* data value.

NOTE

Steps that are not related to fields, such as clicking buttons, opening forms, or selecting records from a lookup, do not set *Example value label* as an option when annotating.

- **User-supplied value label** This step instruction contains placeholder text, which the author can fill in with their own text. For steps which have an **Example value label** option, the placeholder allows substituting the text which normally specifies the data to enter. This is useful for scenarios where neither the **Preferred value label** nor the **Example value label** sufficiently express the data that should be used for this step.
 - *Example label:* In the First name field, enter *{your example text}*.
 - *Example label after supplying the placeholder text:* In the First name field, enter the customer's name.
- For steps which do not have an **Example value label** option, the placeholder allows substituting all of the label text. Steps associated with buttons, for example, do not have **Example value labels**, so you may replace the entire label text with your own text.
- *Example label before replacement:* Click Post.
 - *Example label after replacement:* To post the order, click Post.

Titles and notes

Titles and notes provide places for user-specified text to be associated with a step in a task guide.

- **Title** – The title lets you specify the text that appears above the step instruction for this step in the task guide. The title a good place to put text that you want users to read before they complete the action that is indicated by the step instruction.
- **Note** – You can use a note to specify text that appears in the expandable section of the pop-up for this step in the task guide. A note is a good place to put optional reading material or other information that might be useful to users, but that they aren't required to read to complete the action that is indicated by the step instruction.

Change recorded values

Starting in version 10.0.12, you can adjust the values that are recorded in basic input controls (for example, simple text, numeric, date, and picklist fields), without having to re-record those steps. Note that lookup controls and reference groups aren't currently supported.

Hide from task guide

The **Hide this step** option lets the author prevent specific steps from appearing in the task guide. This option is useful for hiding steps that are required for the task recording to run in playback mode, but that should not be seen by users. Examples of these steps include copy steps, system-generated steps, and data clean-up steps. If you hide a sub-task, all the steps that are recorded inside that sub-task will also be hidden.

Using control gestures

The basic recording capability lets a user record an end-to-end business process by using Task recorder, but without adding overhead to the process. In some circumstances, more advanced recording features can be used to create even richer business process recordings. Each of the following gestures is found under the **Task recorder** option on the shortcut menu (also known as a right-click menu or context menu) for a control and causes a step to be added to the recording. If the gesture isn't supported for a control, it won't appear on the shortcut menu for that control.

Copy

The **Copy** gesture lets you copy the value for the current control to the Task recorder "clipboard." That value can then be used later as part of a **Paste** or **Validate** gesture. Because values from multiple controls might have to be pasted, the Task recorder clipboard maintains a list of all control values that have been copied in the recording.

Paste

The **Paste** gesture lets you paste a value from a previous **Copy** gesture in the same recording. The Task recorder

paste function works like the standard paste function that users might be familiar with, but it has an additional benefit when it's used during recordings. Because Task recorder will replay the recorded **Copy** and **Paste** commands during playback, if the copied control has a different value than it had during recording, Task recorder will paste the current value instead of the value that the copied control had during recording. This feature is useful in scenarios where the copied control has a value that can change between environments (for example, reclD values or number sequences).

There is an additional benefit from using the **Copy** and **Paste** gestures when test code is generated. For any control where the value is set via the **Paste** command, Task recorder doesn't have to create a parameterized input variable for that control's value, because it's set based on another control's value. This feature can be very useful in scenarios where an entity such as a customer is created, and an identifier for that entity is frequently entered during the recording. Instead of manually re-entering the customer name or ID throughout the scenario, and causing Task recorder to generate a parameterized input variable for each entry, the user can copy the customer name or ID one time, and then repeatedly paste it. In this case, Task recorder will generate a single parameterized input variable to represent the customer name or ID. This feature can make it much easier to change the input data for a generated test.

Validate

The **Validate** gesture lets you insert a step that validates the value of the targeted control. This gesture always uses equality to validate the control value. *Validations aren't currently run during recording playback.* Instead, they are run only when the generated test code is run. Two kinds of validation are available:

- **Current value validation** will capture the targeted control's value at the time of recording and use it to generate an assertion in the test code. In the list of validation options on the shortcut menu, **Current value** is always first.
- **Reference value validation** will use the value of a previously copied control when generating an assertion in the test code. This allows creating assertions that are resilient to changes in the data, since the value is not hardcoded into the test code. In the list of validation options on the shortcut menu, **Reference value validation** follows the format [AOT name of copied control: current copied value].

Additional options are available in version 10.0.13 and later. Here are some examples:

- **Enabled/Disabled** validates that the targeted control's state is enabled (or disabled), and then uses that validation step to generate an assertion in the test code.
- **Read-only/Editable** validates that the targeted control's state is read-only (or editable), and then uses that validation step to generate an assertion in the test code.

Add info step

The **Add info step** gesture lets you insert a step and supply your own text for it. This feature is useful primarily for creating task guides. An **informational step** (or **info step** for short) is a task guide step where the instruction text for the step is user-specified. Info steps are useful for describing actions that are a part of the scenario but must occur outside the client. For example, a scenario might require the user to search for item inventory or check an email for information.

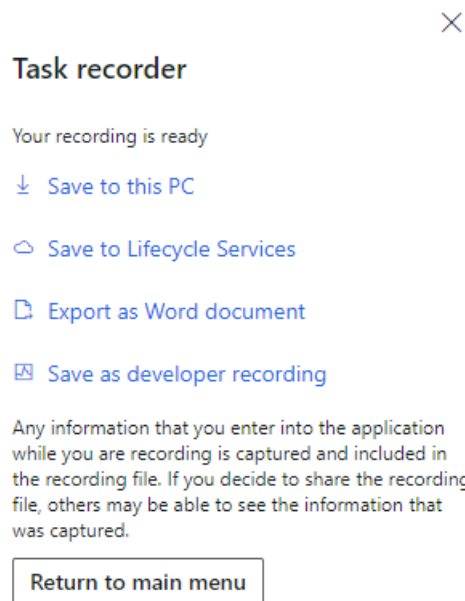
You can specify where an info step should appear in the task guide. The info step can point to a control on the page, if the step is associated with the control. Alternatively, the info step can appear in the upper right of the page, if the step is external to the client, or if it's an explanation that applies to the whole page.

NOTE

Because info steps are manually specified steps and are not automatically recorded by Task recorder when the user takes an action on a control, the info step does not have the capability to automatically progress when a user completes the step in the task guide. Because the info step is not associated with taking an action in the client, there is no action for a task guide to detect that the user has completed in order to automatically progress to the next step.

Options after a recording is completed

After you click **Stop** to end your recording session, several options are shown so that you can save the files that are related to the completed recording. Select **Save to this PC**, and save the task recording package to your desktop. You will use this file later.



Save to this PC

One option after you finish your recording is to download the task recording package (an .axtr file) to your computer. This file can be loaded later via the **Task recorder** pane, so that the recording can be played as a task guide or edited.

Save to Lifecycle Services (LCS)

When you save your recording to an LCS library, it's published on the specified business process in a BPM library. If the selected LCS library is set as a Help library, you will be able to find the task guide for the recording by searching the **Help** menu.

NOTE

To be able to save a recording to an LCS library, the user must be in the Azure Active Directory (Azure AD) tenant that the environment was deployed from.

Export as Word document

The Microsoft Word document for your recording contains the recorded steps as well as any screenshots that were captured.

Save as developer recording

The raw recording file (developer recording) is useful for developer scenarios, such as test code generation and scenarios where **RSAT** is used.

Playing back a recording

The **playback** functionality of Task recorder can automatically run the steps of an existing recording by using the pages and values that were originally recorded. Playback mode can be used to update an existing recording if changes were made to the underlying application, and those changes altered the business process steps that are required for the scenario. It's important to remember that, in this mode, Task recorder simultaneously re-

records the steps and plays them back. When the playback is completed, a new recording is produced that reflects both the steps that were run from the existing recording and any new steps that the user manually performed. Any steps that aren't run either by the user or automatically by Task recorder aren't included in this new recording.

To play back an existing recording, follow these steps.

1. Refresh the browser tab.

NOTE

It's a good practice to refresh the browser before each new recording.

2. Open the **Task recorder** pane.
3. Click **Playback recording**.
4. Click **Open from this PC** to load a recording from a previously downloaded Task recorder package (.axtr file).
 - If you're reading this guide for the first time and following along, choose the "Create a new rental reservation" file that you downloaded previously.
5. Click **Start**.

When you play back a recording, additional actions are available in the **Task recorder** pane.

Play next pending step

Play next pending step runs the next step in the recording. This action is useful because it gives you more control over the playback speed when you want to analyze the effects of a single step. This action has a side-effect that it's important to be aware of. When you click **Play next pending step**, any open lookups, drop-down dialog boxes, or Action Pane tabs might be dismissed, because this action removes focus from those elements. For these situations, we recommend that you use **Play all pending steps** instead.

Play all pending steps

Play all pending steps begins sequential execution of the remaining steps in the recording, and continues until either playback is paused or all steps have been run. During playback, the **Play all pending steps** button is replaced by a **Pause** button that can be used to pause playback. If playback can't successfully run a step for any reason (for example, because it can't find a button that has been renamed), Task recorder will skip that step, and playback will automatically be paused. In this way, the user has an opportunity to replace the obsolete step by completing the new steps in the client. Task recorder will record the new steps and ignore the step that was skipped. The user can then click **Play all pending steps** to continue playback for the remaining steps. After the recording is completed, the user can download the updated recording. This recording will contain all the steps of the original recording, but will exclude any skipped steps and include any new steps.

Play to selected step

Play to selected step behaves like **Play all pending steps**, but it lets you play only a subset of the steps instead of all the steps. In the list, select the step that you want playback to stop at, and then click **Play to selected step**. Task recorder will begin to run the steps in the list and will stop when it has run the step that you selected.

Editing a recording

Although you can edit a recording through the playback functionality, there is also a mode that lets you make simple edits to a recording without having to replay the whole recording. To access this feature, click **Edit recording** after you open the **Task recorder** pane. You can use this feature to make the following edits:

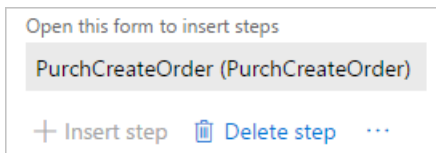
- Insert steps into a recording without re-recording the whole file.
- Move steps under a sub-task without re-recording the whole file.
- Adjust the name and description of the recording.

Insert steps without re-recording the entire file

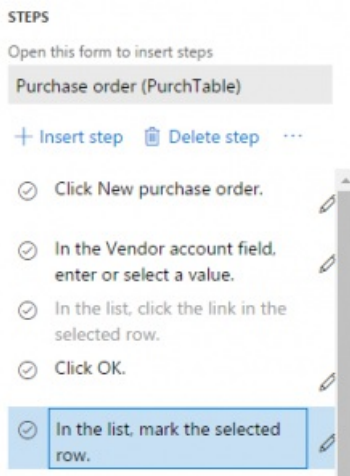
You can add a step anywhere in a task recording without playing back or re-recording the whole file.

1. Select the step after which you want the new step to be inserted. Make sure the step is highlighted.

In order for task recorder to insert a step, you must have the correct page open. The correct page is the page on which the new step occurs. Task recorder has a mechanism that determines what the active page is, and will disable the functionality if the correct page isn't open.



When you are on the correct page, **Insert step** becomes available.



2. Click **Insert step**.

When you click **Insert step**, Task recorder switches to recording mode. Any action that is performed in the user interface (UI) will now be recorded and inserted into the recording as steps.

3. Click **Stop**.

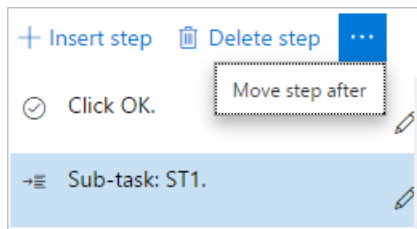
Recording mode is stopped, and you can now continue to edit the recording. For example, you can repeat this process to insert steps in other places in the recording, or you can move sub-tasks as described in the next section.

4. When you've finished editing the task recording, click **Done editing**, and then select one of the options to save or publish the recording.

Move steps under a sub-task without re-recording the entire file

You can move steps under a sub-task without playing back or re-recording the entire file. You can also move the sub-task step or the end sub-task step if you want to group an existing block of steps.

1. Select the step or sub-task step that you want to move. Make sure that the step is highlighted.
2. Click **Move step after**. To access this command, you might have to select the ellipsis (...) button.



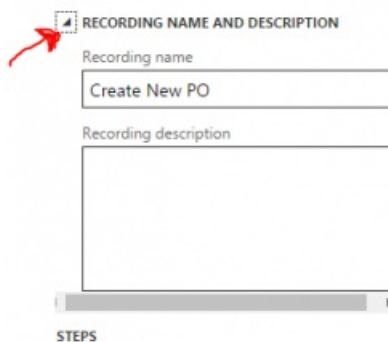
3. Select the step or sub-task step that you want to move the step or sub-task step after. Task recorder will move the step.
4. To move the end sub-task step, select it, click **Move step after**, and then select the step that you want the end sub-task step to be after.

If you want the first step in the task guide to be within a sub-task, create a sub-task step as the second step, and then move the first step into it. You can add or move as many steps or sub-tasks as needed.

5. When you've finished editing the task recording, click **Done editing**, and then select one of the options to save or publish the recording.

Adjust the recording name and description

You can adjust values of the **Recording name** and **Recording description** fields. If you want to see more steps in the Task recorder editing pane, you can also collapse the section that shows the recording name and description.



Playing a task guide

A **task guide** is a user-focused experience that lets the user follow a guided step-by-step set of instructions to complete a business scenario by using a task recording. The user is instructed to complete each step through an animated pop-up prompt that will move across the page and point to the UI element that the user should interact with. The prompt will also tell the user how to interact with the element. For example, it might state, "Click here" or "In this field, enter data." Each step that the user is instructed to complete is based on a step that was originally recorded in the task recording. Because the task recording file contains the data that describes the step that was originally recorded, the task guide can automatically determine when the user has completed the step as expected. It then automatically moves on to the next step.

NOTE

One way that the task guide determines that a user has completed a step is by detecting when the value in a field has changed. Although the task guide doesn't require that a specific value be set, it does require that the field value be changed in order to determine that the step was completed. The user must change the field value, and then press the **Tab** key or click in an area outside the UI element. Only at that point does the client detect that the field value has changed, and it can then proceed to run any required application validation or business logic. Therefore, before the task guide can determine that the step was completed by the user, it relies on the client to detect that the field value has changed.

What can a task guide allow a user to do?

When a user is completing a task guide, the client behaves in the same manner, with the same data, security, and validation rules as it does when the user is not completing a task guide. There is no difference of behavior in the client that would allow a user to take an action that they cannot otherwise take when they are not completing a task guide. When a user is completing a task guide:

- Any data the user enters is subject to the same data validation rules as when not playing the task guide.
- Any data the user enters may be saved, and the user may modify data according to the same restrictions and rules as when not playing the task guide.
- Any security mechanisms the user encounters behave the same as when the user is not playing the task guide.
- Any forms or controls the user accesses are subject to the same security and access mechanisms as when the user is not playing the task guide.

The "On-rails" feature of task guides

By default, when a user begins a task guide, they are placed "on-rails". These "rails" prevent the user from *clicking* on elements other than the element the task guide is pointing to. When the user tries to click on something outside of the UI element that the task guide is pointing to, the task guide pop-up will animate to let the user know that they cannot progress until they complete the current step of the task guide.

While a user is prohibited from *clicking* on other elements, the user is not prevented from tabbing through the other controls on the form, and the user is not prevented from using keyboard shortcuts. This is by design, as the "on-rails" feature is designed for and targeted at first-time users, who are expected to primarily use the mouse as they become familiar with the application.

More advanced or experienced users can turn off the "on-rails" feature when they complete a task guide. At any point during the task guide, these users can turn off the rails by clicking the **Unlock** button that appears on the Task recorder toolbar at the top of the page. This button can also be used to restore the rails at any point during the task guide. In some situations, the task guide might automatically turn off the "on-rails" feature. When the rails are turned off, the user can click UI elements just as they do when the task guide isn't running. The "on-rails" feature might be automatically turned off in the following situations:

- The user is being directed to go to a page by using the navigation pane or navigation search.
 - Because the user can use either entry point, the task guide doesn't point to a specific entry point, and it doesn't prevent the user from using either entry point.
- The task guide enters an error state (see the next section for a list of error states).
- The task guide is showing an info step.

Error detection

An *error state* occurs when the task guide is not able to point to the UI element that is associated with the current step because the UI element is not visible on the screen. When the task guide detects that the current step requires the user to interact with a UI element that is not visible, then the task guide pop-up will move to the upper-right side of the screen. These causes of an error state can be simplified into two categories.

The control is not visible on the form

This error state usually occurs when the user has opened or closed the incorrect tab, FastTab, collapsible section, FactBox, or pop-out menu.

Because the UI element that is needed for the current step is somewhere on the current form, but it is not visible on the screen, the task guide pop-up will simply move to the upper-right side of the screen while displaying the same instruction that informs the user of the action they need to take.

Because the task guide can't find the UI element on the screen, the user must manually determine what is causing the UI element to be hidden and then make the element visible on the screen. The task guide pop-up will automatically detect that the UI element is visible and will reposition itself so that it's pointing at the now-

visible element.

The control is not on the form

This error state usually occurs when the user has gone to the wrong form, either by navigating to the wrong form or by leaving the correct form.

Because the UI element is not visible on the screen, the task guide pop-up will move to the upper-right side of the screen. In addition, when the task guide detects the user is on the wrong form, the task guide pop-up text will change to inform the user of the form they should navigate to.

In some cases, the task guide pop-up will not mention the form by name. This is because the user may need to navigate to a dynamic form. A dynamic form is a form that is not modeled, frequently known as a runtime-generated form. These sorts of forms do not have a proper name. Some examples of runtime-generated forms include simple and custom lookups. The way for a user to navigate to a lookup form is to re-open the lookup.

Next step and Previous step

The **Next step** and **Previous step** buttons appear in the task guide pop-up and let a user manually control the flow of the task guide. When these buttons are clicked, the task guide will go to the next or previous step. The task guide doesn't verify that the user has completed a step before it goes to the next or previous step.

The task guide **never** automatically completes any step for the user, even when the **Next step** and **Previous step** buttons are used. Use of these buttons can cause an error state if the previous or next step refers to a UI element that isn't on the current page. When the user is completing an info step, the only way to proceed is to use the **Next step** button. This action is required because an info step doesn't represent an action that was recorded on any UI element. Because no action was recorded in the task recording, the task guide doesn't have the necessary information to determine what action it should expect the user to complete.

The See more button

When the **See more** button is clicked, the task guide pop-up expands to show additional information that is related to the step. The additional information is often optional reading material that isn't required for the user to successfully complete the step. The following information might be included:

- **An Example value**
 - The Example value is the value that was originally used when the task recording was created.
 - Example values appear only for steps that use non-lookup fields. These fields include text fields, number fields, date fields, combo boxes, and check boxes.
- **A Note**
 - A Note may contain scenario-specific information that will help provide context to the user about the current step of the task guide.

Taking screenshots in Task recorder

By using a **pre-release** Chromium browser extension that works for both the new (Chromium-based) Microsoft Edge browser and Google Chrome, Task recorder can take screenshots of the browser as a user records a business process. After the user completes the recording, Task recorder can use these screenshots to generate Microsoft Word documents. To turn on this functionality, follow these steps to install the pre-release Chromium extension that enables Task recorder to take screenshots during recording.

1. Download the **FMLabTaskRecorderScreenshot** folder that contains the extension from GitHub, at <https://github.com/Microsoft/FMLab>.
2. **On-premises deployments only:** Adjust the manifest for the extension so that it matches the following code. Replace <hostname> with the base URL for your environment.


```

...
"content_scripts": [
  {
    "matches": ["https://*.dynamics.com/*", "<hostname>"],
    "js": ["screenshot.js"]
  }
]
...

```

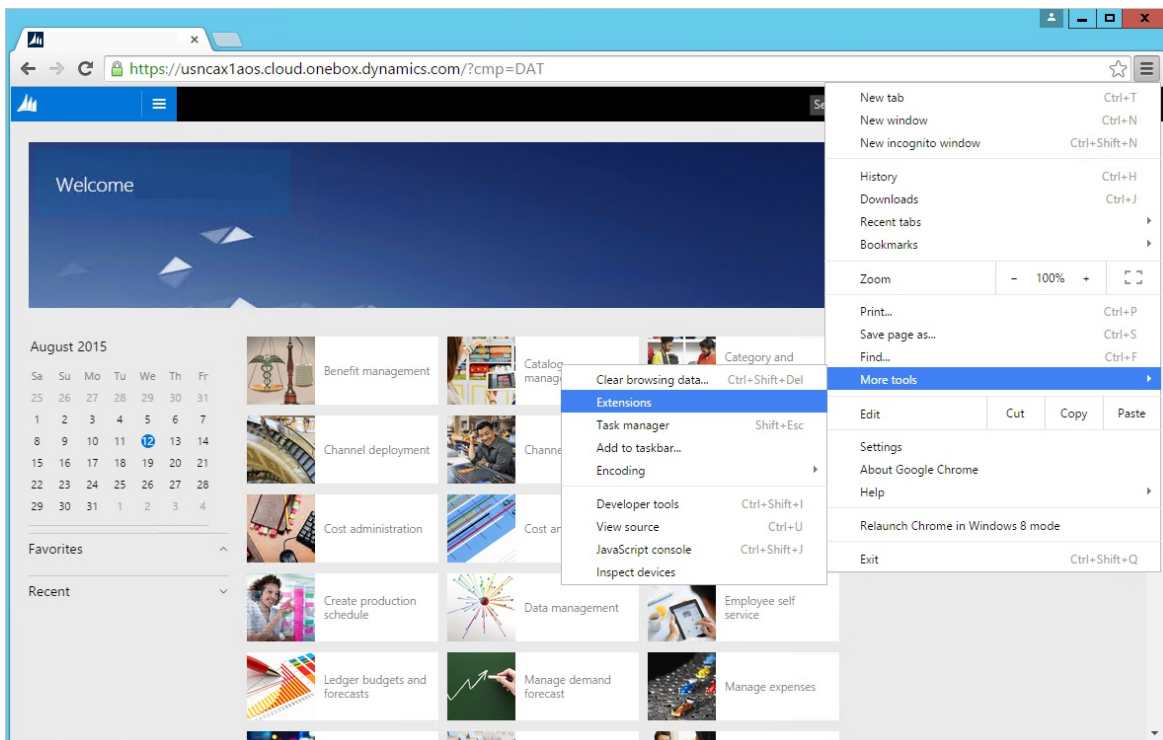
3. **21Vianet deployments only:** Adjust the manifest for the extension so that it matches the following code. Replace `.com` with `.cn`

```

...
"content_scripts": [
  {
    "matches": ["https://*.dynamics.cn/*"],
    "js": ["screenshot.js"]
  }
]
...

```

4. Open the latest Microsoft Edge browser or Google Chrome.
5. Select **Settings and more > Extensions** in Microsoft Edge (or **Customize and control Google Chrome > More tools > Extensions** in Google Chrome).



6. Select **Developer mode**.
7. Click **Load unpacked extension**.
8. Browse to the folder that contains the Task recorder extension by using the path **FMLab-master > FMLab > TaskRecorderScreenshot**, and then select **Select Folder**.
9. Make sure that **Enabled** is selected so that extension is turned on.
10. Restart the browser.

Task recorder will now take screenshots of the tab where the client is running. These screenshots are available for one week after the recording has been played. (If you're running a platform version that is earlier than

Platform update 16, the screenshots are available for only 15 minutes.) If the screenshots have expired, you can regenerate them by playing the task recording again.

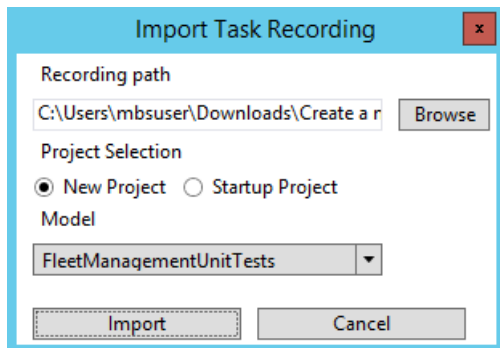
Note that Task recorder **does not** capture screenshots from other tabs or of the user's desktop.

Generating tests from a recording

After a business process recording has been completed by using Task recorder, a developer can import the raw developer recording file (.xml file) into Visual Studio to create an X++ test. The import tool generates a human-readable X++ test from the recording, and translates any control gestures, validations, or tasks into the appropriate test code.

Import a recorded test

1. Open Visual Studio by using the Finance and Operations development tools.
2. Go to **Dynamics 365 > Addins > Import task recording**.
3. In the **Import task recording** menu, use the **Browse** button to locate a previously downloaded recording file.
4. Optionally, choose to have the generated test code be added to the startup project. This requires that a solution containing a project is set as the startup project. This will place the generated X++ test into the same model as the project.
5. If you're creating a new project, select the model for the project. The generated X++ test will be put in this model. For the generated test to be successfully built, the model must have references to the **TestEssentials** model.
6. Click **Import**.



7. In the **New Project** dialog box, provide a name for the project.
8. After the project is created, the user can open and inspect the generated code.
9. To run the test, build the project.
10. Go to **Test > Windows > Test Explorer**.

Appendix

Controls that are known to have incomplete support for Task recorder

- Table
- Filter pane, which is the filter that pops out from the left side
 - When adding filters to the filter pane, the steps are delayed. The steps do not get recorded until the user clicks "Apply" on the Filter pane.
- Enhanced previews
 - No planned support for recording gestures inside of enhanced previews. While recording, enhanced

previews will be disabled.

- No extensible controls are supported out of the box, except Segmented Entry.
 - Extensible control owners need to individually build support for Task recorder.

Controls that can be recorded, but have limited support for the Copy/Paste/Validate gestures

- Date/Time
 - Doesn't support copy/pasting "Never" as a value.
- Image
 - No ability to copy/paste/validate an image value.
- Filter pane
 - Copy/Paste works, but the UI will not show the pasted data. You can proceed as if it pasted correctly.
- Message box
 - You cannot validate the text in the message box.

Controls that are known to have incomplete support for being used in a task guide

- Quick Filter, which is the filter control that appears above lists
 - Does not support displaying a "generic value" during the task guide. Currently displays the value that was used during recording.
- Filter pane, which is the filter that pops out from the left side
 - The task guide does not point to the individual elements within the Filter pane that need to be clicked on.

NOTE

Can you tell us about your documentation language preferences? [Take a short survey.](#)

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Create documentation or training with Task Recorder

2/18/2021 • 8 minutes to read • [Edit Online](#)

This topic explains what Task recorder and task guides are, how to create task recordings, and how to customize Microsoft task guides and include them in your Help.

IMPORTANT

You can record your own task guides for Dynamics 365 Human Resources, but you won't be able to save them to a Business Process Modeler (BPM) library or open them from the Help pane at this time. You can save them locally or to a network location, and then open and replay them using Task recorder.

Learn about Task recorder

Task recorder is a tool that you can use to record actions that you take in the product user interface (UI). When you use Task recorder, all of the events that you perform in the UI that are executed against the server—including adding values, changing settings, removing data—are captured. The steps that you record are collectively called a *task recording*. Task recordings can be used in many ways:

- **Task recordings can be played as task guides.** Task guides are an integral piece of the Help experience. A task guide is a controlled, guided, interactive experience through the steps of a business process. The user is instructed to complete each step by way of a pop-up prompt (or "bubble"), which will animate across the UI and point to the UI element that the user should interact with. The "bubble" also provides information about how to interact with the element, such as "Click here" or "In this field, enter a value." A task guide runs against the user's current data set and the data that is entered is saved in the user's environment.
- **Task recordings can be saved as Word documents.** This allows you to easily produce printable training guides.

You can create your own task recordings, play task recordings provided by Microsoft, or modify Microsoft-provided task recordings to reflect your configuration. For more information about Task recorder, see [Task recorder](#).

Plan your task recording

Whether you're creating a new task recording or basing your recording on a Microsoft task recording, keep the following information in mind.

- Plan your recording like you would a video. Make all your decisions ahead of time.
- Walk through the business process once or twice without recording it to understand the steps.
- When you walk through the process before you record, notice where you use shortcut keys or the **Enter** key, so that you can avoid using them during the actual recording.
- Identify the following:
 - Do you want to group steps together into sub-tasks? Sub-tasks visually set apart sections of a process. For example, if you are creating a recording for "Creating and releasing a product," you may want to group together the steps that are required to create a product, and then group together the steps that are required to release the product. Sub-tasks also make longer processes easier to read.

- Do you want to add annotations, and if so, where? See "Understand the different types of annotations" below for more information.
- What values will you add in the various fields as you complete the steps of the business process? It is a good idea to know what you'll select or enter as you proceed so that you don't backtrack or fix mistakes as you're recording.

Write your description and annotations ahead of time

- At the beginning of each task recording, there's a description field that allows you to enter an introduction to the recording. It is a good idea to write and save the description ahead of time in a separate document so you can copy and paste it into the task recording when you are recording. That way, you can spend time refining the text when you aren't in the process of recording. Cutting and pasting the text makes the recording process go more quickly and smoothly.
- For each step in a task recording, you can create annotations. During playback of a task guide, annotations appear in the "bubble" as notes above or below the text for the step. When viewed as text in the Help pane, annotations appear as text inline in the step. As with the description, it is a good idea to write and save your annotations in a separate document. When you're recording the task recording, cut and paste the annotations in from that document.

Understand the different types of annotations All annotations are optional. Only add them when they'll provide helpful information to the user.

- **Title:** A title annotation will appear before the step text that task recorder automatically generates. In the task guide, the title annotation appears above the automatically generated text. Use this type of annotation to explain why the user is doing the step or to give additional context.

This is the editing pane that you see when you add an annotation as you create your recording. Enter a title annotation in the **Title** box.

Task recorder ×

Hide from task guide
No

Step instruction

Click OK.
 { standard example text }
 { your example text }

Title

Double-check the information before proceeding. You are about to commit the new product to the system.

Notes

This is what the title annotation looks like in the "bubble" in the task guide.

New product

Product type: Product name:

Product subtype: Search name:

IDENTIFICATION

Product number: Retail category:

CATCH WEIGHT

No

Double-check the information before proceeding. You are about to commit the new product to the system.

Click OK.

[Previous step](#) [Next step](#)

- **Notes:** A notes annotation will appear after the step text that task recorder automatically generates. In the task guide it will only be visible if the user clicks the **Show more** link in the task guide bubble. Use this type of annotation to describe anything that a user needs to know to complete the step.

This is the editing pane that you see when you add an annotation as you create your recording. Enter a notes annotation in the **Notes** box.

Task recorder ✕

Hide from task guide
No

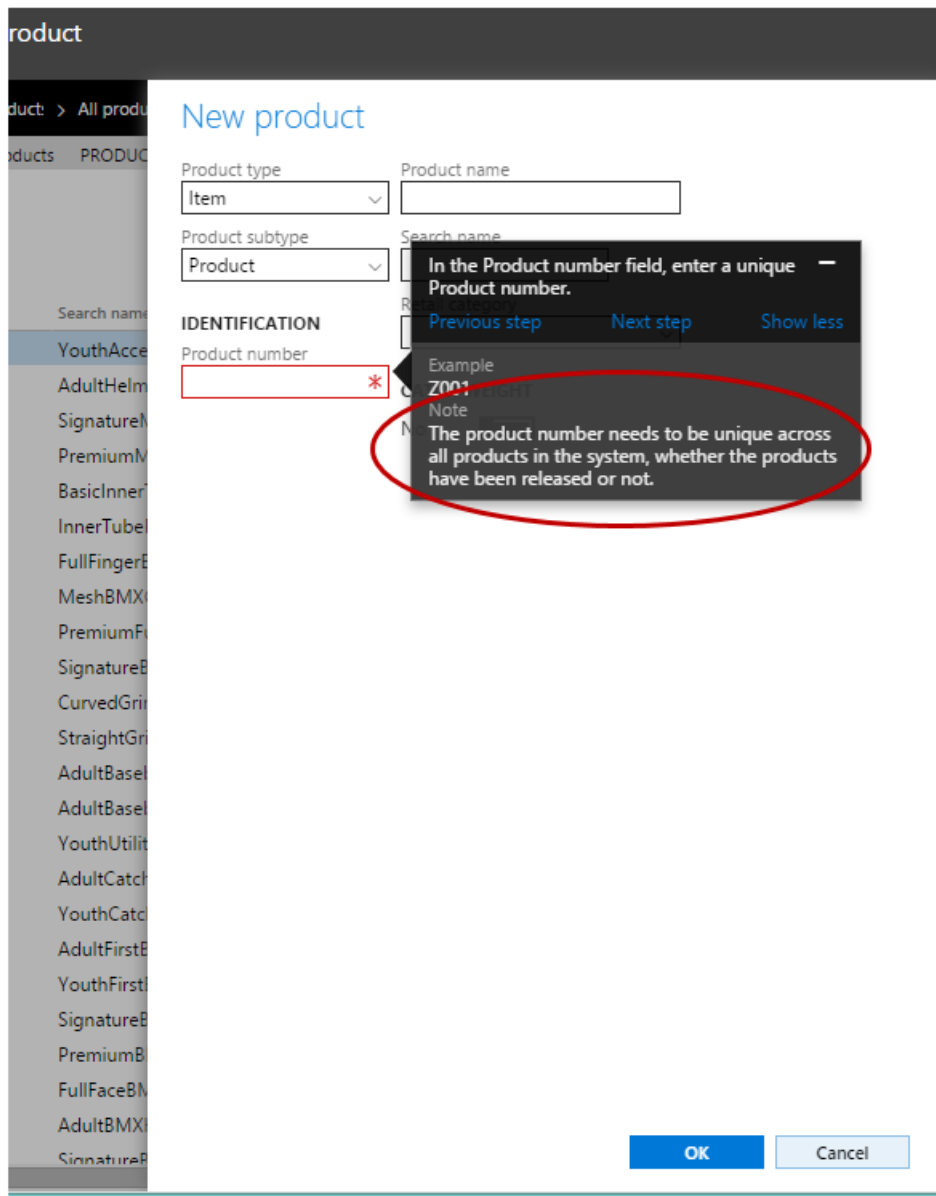
Step instruction

- In the Product number field, ...
- In the Product number field, ...
- In the Product number field, ...

Title

Notes
The product number needs to be unique across all products in the system, whether the products have been released or not.

This is what the notes annotation looks like in the "bubble" in the task guide.



- **Info step:** These annotations are created by right clicking on a control or anywhere on a form < **Task recorder** < **Add info step**. Info steps appear as a numbered step at whatever point you insert it, even though no action was recorded in the UI. You can add a form-level info step or an info step associated with a control. When an info step is associated with a form, the task guide “bubble” will appear someplace on the form, with no pointer; when the task guide is played. When an info step is associated with a control, the task guide “bubble” will point to the control when the task guide is played. In the Help pane, an info step annotation will appear as a numbered step with whatever text you entered. Use info steps to prepare the user for the next steps, to describe steps that need to be done outside of the application, or to refer to other recordings (although you cannot create hyperlinks in annotations).

Determine how long to make your recording

- The user will generally either read or play the recording from start to finish, so don't combine steps or tasks that are better done separately.
- Try not to record a long scenario that spans multiple sub-processes. For example, “Operate in-store customer service desk” is too broad; break it up into shorter tasks such as “Accept returns” and “Add to gift card.”
- If a task can be carried out as part of several different business processes, create a separate recording for it, and you can refer to it in the other recordings.
- If the process involves multiple tasks that the person likely does all at once, you can keep the tasks in one

recording, for example, "Set up and assign functionality profiles."

- If it is something someone does once (such as configuration) and then another task that they can do immediately afterward but may do repeatedly, and on its own, break them up into two task recordings.

Decide where, in the UI, to start a recording The page that you are on when you start recording a task recording affects which page the task guide is displayed for. For example, if you want your task recording to be listed in the Help pane when a user clicks Help on the General ledger parameters page, you must start your recording on the General ledger parameters page. **Save recordings as .axtr files** When you are done creating or editing a task recording, you are presented with several options for how you want to download, or save the recording. You can download the file as a task recording package (.axtr), download it as a raw recording file (.xml), download it as a Word document, or save the file to an LCS library. It is a good idea to always save your task recording as a task recording package file (.axtr). This will help make maintenance of the file easier if procedures or annotations need to change later. If you want to download the file as a Word document, also save it as a task recording package file.

Create your task recording

For detailed walk-through steps, see [Task recorder resources](#).

Copy and customize Microsoft's task recordings

You can download and edit Microsoft's task recordings to use them for your own Help documentation or training materials. To download a Microsoft task recording, follow these steps:

1. Open Task recorder. Task recorder is located in the **Settings** menu.
2. In the Task recorder pane, click **Maintain a recording**.
3. Under **Where is the recording**, click **It is in an LCS library**.
4. Click **Select the LCS library**.
5. Select the Microsoft global library.
6. In the tree, select the business process library node that the task recording is associated with.
7. Click **OK**.
8. Click **Start**.
9. At this point, step through the recording, changing any steps as you go to re-record it. **Note:** If you only need to change the text of a recording, you can open the recording in **Edit a recording's annotations** mode, and then save it.
10. After the recording has played to the end, click **Stop** in the task recorder bar at the top of the screen.
11. Choose how you want to save the task recording.

Additional resources

[Help system](#)

[Connect the Help system](#)

[Task Recorder](#)

[Create Rich Help Topics with Task Recorder \(external link\)](#)

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Videos

2/18/2021 • 2 minutes to read • [Edit Online](#)

On the [Microsoft Dynamics 365 YouTube channel](#), you can find videos created by Microsoft that demonstrate a wide range of business solutions for Dynamics 365 products. This section lists the "how-to" videos for Finance and Operations apps that are hosted on the channel.

NOTE

Some of the videos listed were published under a previous product name, but are still applicable.

Videos for Finance and Operations development and administration

Data integration

- [Prospect to cash integration](#)
- [Synchronize a work order between Dynamics 365 for Field Service and Finance and Operations apps](#)

Data management

- [Use data entities and data packages](#)

Development

- [How to resolve conflicts in Visual Studio](#)
- [Optimization advisor](#)
- [Setting up a development branch and build](#)
- [Setting up a development machine](#)
- [Azure DevOps integration with Lifecycle Services](#)

Intelligence

- [How to edit an embedded report in an analytical workspace](#)
- [How to embed PowerBI.com reports in Finance and Operations apps](#)
- [Bring your own database \(BYOD\) to Finance and Operations apps](#)
- [How to use cost management Power BI content in Dynamics 365](#)

Lifecycle Services (LCS)

- [Asset library in Lifecycle Services](#)
- [Cloud-hosted environments](#)
- [Creating support tickets from Dynamics 365 for Operations](#)
- [Deploying environments](#)
- [Getting started with Lifecycle Services](#)
- [Deploying code to a sandbox environment](#)
- [Deploying code to a production environment](#)
- [Implementation projects in Lifecycle Services](#)
- [Manage the code upgrade and tool process](#)
- [Managing business process libraries in Lifecycle Services](#)
- [Methodologies in Lifecycle Services](#)
- [Request a production environment](#)

- [Refreshing data in a production environment](#)
- [Uptake a new platform release after Platform update 3](#)
- [Use telemetry to monitor key performance counters in Dynamics Lifecycle Services](#)

Regression suite automation tool (RSAT)

- [How to use task recorder to create a test case for the Regression suite automation tool \(RSAT\)](#)
- [How to create a test plan in Azure DevOps to use with the Regression suite automation tool \(RSAT\)](#)
- [How to use the Regression suite automation tool \(RSAT\)](#)
- [The improved Excel experience in Regression Suite Automation Tool \(RSAT\) 2.0](#)

Videos for Dynamics 365 Finance

Customize the app

- [Add custom fields](#)
- [Embed Power Apps](#)

Financial reporting

- [Find the version of Report designer](#)

Help system

- [How to contribute to the Microsoft Dynamics 365 documentation](#)

Office integration

- [Create an Excel template for header and line patterns](#)

Organization administration

- [Document management](#)

Revenue recognition

- [How to use revenue recognition](#)

Tax engine

- [Tax engine overview](#)

Videos for Dynamics 365 Supply Chain Management

Costs

- [Cost control mobile workspace](#)
- [Get started with Cost accounting](#)
- [Use Excel for cost analysis](#)

Customer portal

- [Overview of the Customer portal template](#)
- [Invite customers to register and use your customer portal](#)

Help system

- [How to contribute to the Microsoft Dynamics 365 documentation](#)

Master planning

- [Master planning setup wizard](#)

Office integration

- [Create an Excel template for header and line patterns](#)

Organization administration

- [Document management](#)

Procurement and sourcing

- [Approve purchase orders on a mobile device](#)
- [Onboard a new vendor](#)

Product information management

- [Change management capabilities](#)

Production control

- [Batch balancing](#)
- [Enhancements to the production order release process](#)
- [Visual scheduling with Gantt chart for production and batch orders](#)

Warehouse management

- [Release production picking to the warehouse in batch](#)
- [Use warehouse template to copy configuration](#)

FastTrack Tech Talks

[FastTrack Tech Talks](#) focus on providing technical depth and best practices that provide customers and partners with detailed knowledge that's specific to the subject areas.

NOTE

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Glossary

2/18/2021 • 15 minutes to read • [Edit Online](#)

This glossary defines key terms and concepts in Finance and Operations apps.

A

accounting journal

A journal that is used to record the financial consequences of accounting events in an accounting system.

accounting rule

A rule in an accounting system that controls the principles, methods, and procedures for classifying, recording, and reporting the financial consequences of accounting events.

ACH (Automated Clearing House)

An electronic funds transfer system available in the United States that facilitates the transfer of funds between receiving party and originating party bank accounts.

actual quantity

The measured quantity that is input into or output from an activity.

address verification

The service that is provided by a credit card processor that validates that the billing address provided by a card holder matches the information on file with the issuing bank.

aging

The process of classifying time periods by age.

aging period

The number of days in a time period used to report an overdue customer payment balance.

B

balance sheet

A statement of the financial position of an organization that reports the state of assets, liabilities, and equity on a specified date.

balance sheet account

An account that describes the changes in value reported on a balance sheet.

bank reconciliation

A practice of reconciling a ledger account that represents a bank account by matching ledger account entries to bank statement entries.

batch attribute

A product attribute of a process batch or a transfer batch.

best-before date

A recommended date for obtaining the optimum quality or characteristic of a product.

best-before period

The time period in which to obtain the optimum quality or characteristic of a product.

bill of exchange

A source document that documents an unconditional request for a third-party to pay a second party on demand.

blocking

The action of placing a document or product on hold.

BOM (bill of materials)

A list of products and their quantities that are required to produce one product.

budget control

A practice of authorizing expenditure only when budget funds can be reserved to meet future payment commitments.

budget control dimension

A combination of active financial dimensions values used to allocate budget funds to pay for planned activities.

budget control rule

The encoding of a business decision to check committed and actual expenditure against available budget funds allocated for detailed or aggregate activities defined by valid budget control dimension value combinations.

budget cycle time span

A time period specified as a number of fiscal calendar periods. The budget period can be different from the accounting period.

budget group

A set of financial dimension values in a budget dimension hierarchy that is used to calculate aggregate budget funds allocated to superordinate financial dimension values by summing budget funds allocated to subordinate financial dimension values.

budget model

A planning structure used to schedule budget fund allocations and expenditures.

bulk item

A formula item input into a product delivery activity.

bundle

The combination of a number of products for sale as one unit.

business unit

A semi-autonomous operating unit that is created to meet strategic business objectives.

C

capacity load

The maximum amount of scheduled work that a work center can perform at a required capacity level.

capacity planning

A procedure for determining the resource capacity requirements that meet the demand of future output during specific time periods.

carry-forward budget

The budget that is transferred from one fiscal year to the next and that is reserved for open purchase orders in the new fiscal year.

cash-generating unit

The smallest group of classifiable assets that generates cash independently of other assets within an organization. These groups of assets are used to measure impairment losses that will be incurred.

catch weight

The actual or nominal weight of a sales item or inventory item.

chart of accounts

A list of main accounts.

COGS (cost of goods sold)

An accounting category used to sum the financial consequences of manufacturing products and carrying inventory.

contractor

A role assumed by a person who participates in a contractor-employer relationship with a legal entity.

co-product

An item produced jointly with another item.

cost center

An operating unit whose managers are accountable for budgeted and actual expenditures.

cost variance

The difference between an expected cost and an actual cost.

costing

The process of calculating, assigning, and allocating the cost of economic resources acquired, produced, or delivered by an organization.

CTP (capable-to-promise)

The portion of product output from available operations resources and available input product required to fulfill a specific customer requirement.

currency code

An alphanumeric identifier that represents a currency unit.

cycle time

The time taken to complete an activity.

D

dashboard

The typical start page in Finance and Operations apps. On the dashboard, users see a section for each workspace that they have access to. Each section displays the tiles from the summary sections in the related workspace. The dashboard consists of a name and sections with tiles.

data entity

An information structure that represents the data characteristic of an entity.

delegate

A delegate is a type that represents references to methods with a particular parameter list and return type.

delivery note

A business document that documents the delivery of products between two parties.

demand forecast

A prediction of future product demand.

demand forecasting

A business process that estimates future demand and creates demand forecasts based on historical transaction data.

deployable package

The vehicle used for deployment on User Acceptance Test (UAT) and production environments.

designer

A Visual Studio tool that you used to create, update, and inspect your model elements.

dimension-based product configuration

A configuration technology used to create product variants by selecting values for product dimensions.

distinct product

A uniquely identifiable product.

document management system

An application service for storing and handling an organization's documents.

duty

In the security model, a set of application access privileges that are required for a user to carry out their responsibilities.

E

EFT (electronic funds transfer)

A networked system for transferring funds from one bank account to another.

event

An event lets a class or object to notify other classes or objects when something of interest occurs.

EPE (Every Product Every)

A lean concept that is used to establish a regular repeating production cycle.

extension

Customizing an application by adding functionality to existing code.

F

financial dimension

A financial data classifier created from the parties, locations, products, and activities in an organization and used for management reporting.

financial dimension value

A data element in the domain of a financial dimension.

financial statement

A report that documents the financial information and financial position of an organization.

fixed cost

A cost that does not vary with changes in product delivery throughput or output.

fixed currency

A currency that has a fixed exchange rate in relation to another currency.

fixed quantity kanban

A type of kanban that is used when the number of kanbans that are assigned to a kanban rule is constant.

formula

A numeric relationship among production process inputs and production process outputs.

formula item

An output of a batch process controlled by a formula.

G

general budget reservation

A document that is often used by public sector entities to set aside or earmark budgeted funds so that those funds are not available for other purposes.

grace period

The time period beyond a specified date during which an obligation can be fulfilled without penalty.

GST (goods and services tax)

A value-added tax levied in some countries/regions.

I

intercompany

Occurring between or relating two or more legal entities that are part the same organization that consolidates the accounts of all legal entities.

invoice matching

A practice of matching vendor invoice prices and product quantities to purchase orders and product receipts.

item allocation key

A product family grouping that is used for forecast and demand scheduling.

item relation

A reference to the item allocation group or the item and its product dimensions in a kanban rule.

K

kanban

A signal that communicates a requirement for a quantity of product.

kanban flow

Defines the sequence of activities that are performed for kanbans that are created for a kanban rule.

kanban job

A process or transfer activity in a production flow that is triggered by a Kanban.

kanban job consumption

The withdrawal of product components from inventory in order to complete the kanban production jobs.

kanban rule

A rule in a lean manufacturing system that realizes material planning and replenishment policies by controlling

how process and transfer activities are coordinated in production flows.

L

lean manufacturing

A philosophy in which manufacturing operations promote lean production flows and business activities.

lean schedule group

A way in which to aggregate items for production, for example, based on a setup group, shipping group, or transport group.

ledger account

A classifier created from the combination of main account value and other financial dimension values listed in a chart of accounts and used to classify the financial consequences of economic activity.

license code

An alphanumeric key that grants a party the right to use software or software components as prescribed in the terms of the license agreement, and that activates and inactivates software modules, software capabilities, and software functions.

liquidity

The ability of a party to use current assets to settle current liabilities.

M

master scheduling

The process for generating a timetable for matching supply with demand.

model

A model contains code elements and reference metadata. It is created and inspected in Visual Studio.

model element

A model is a group of elements (source files and metadata) that constitutes a distributable software solution. The model is a design-time concept.

N

NBV (net book value)

The value of a fixed asset calculated as the difference between the original cost of the fixed asset minus its accumulated depreciations.

O

object permission

A permitted create, read, update, delete, or execute operation on a securable object.

operating unit

An organization that divides the control of economic resources and operational processes among people who have a duty to maximize the use of scarce resources, to improve processes, and to account for their performance.

output product

The physical products that result from an activity.

overlaying

A method of customizing source code by providing new source code that overrides the default source code.

P

package

A package is a compilable and deployable unit of one or more models.

party

A person or organization that participates in economic activities.

pegging

The process of tracing the quantity of a required item to its source.

pegging event

A resource flow event that signals the demand for a product.

planned intercompany demand

Predicted demand for a product by a legal entity that assumes the role of a vendor. The planned demand is generated from planned demand for the product from a downstream legal entity.

post

To record the monetary value of an economic event in a specific account, or to summarize and reclassify general and subsidiary journal account entries into general and subsidiary ledger account entries.

preparer

The person who creates a source document to initiate a request for economic resources.

procurement catalog

A listing of product offerings that are grouped by procurement category. A procurement catalog is used to request products for internal use by an organization.

product dimension

The size, color, or configuration product attributes that are used for dimension-based product configuration.

product family

A unique grouping of items, services, or rights that either participates in the same production or delivery activities or that are offered to the same market segments. The grouping is represented by using a forecast allocation key.

product master

A standard or functional product representation that is the basis for configuring product variants.

product receipt

A source document that documents the receipt of products ordered, the receipt of products returned, or the receipt of products received on consignment.

product variant

A configuration of a product master.

production flow

A production process designed using Lean principles.

production flow model

A representation of the production capacity provided by a group of work cells in a production flow process.

production order

A source document that documents the requirements for producing items to meet a demand.

production schedule

A schedule to produce a specific item and item quantity at a specific time and by specific human and operational resources.

prospect

A participant that has the existing and potential ability to provide a service or probable future economic benefit to a legal entity.

purchase agreement policy

A policy that authorizes parties to modify purchase agreement terms.

purchase order policy

A policy that authorizes parties to modify purchase order terms and to control order processing.

purchase quotation

A source document that documents an offer to purchase a quantity of product for a specified price and by a specified date in response to a request for quotation in a procurement process.

purchase requisition

A source document that documents product requests so that they can be submitted for review and be used to authorize purchasing by a purchasing organization.

Q

quantity variance

The difference between an ordered product quantity and a received product quantity when no more receipts are expected.

R

receipt advice

A business document that documents a summary of the products a buyer receives from a vendor.

reconciliation

A practice of adjusting two or more accounts or statements so that the figures agree.

reduction key

A method that is used to increase or decrease forecast requirements in master planning, based on user defined percentages that are applied during specific periods.

register

A record that is used to record the operational, legal, and financial consequences of resource flow events in an accounting system.

RFQ (request for quotation)

A source document that documents an invitation to bid on supplying a quantity of product for a specified price and by a specified date.

requester

The person who requests the economic resources.

S

sales agreement

A source document that documents an agreement between two or more parties based on an understanding that a selling party will commit to selling a specific quantity or value of product over a period of time in exchange for favorable prices and discounts.

sales agreement policy

A policy that authorizes parties to modify sales agreement terms.

sales order policy

A policy that authorizes parties to modify sales order terms and to control order processing and payment processes.

sales quotation

A source document that documents an offer to supply a quantity of product for a specified price and by a specified date in response to a request for quotation in a sales process.

security role

A defined set of application access privileges. The security role assigned to a user determines which tasks the user can perform and which parts of the user interface the user can view. All users must be assigned at least one security role in order to access the system.

segregation of duties

A design principle used to reduce the risk of fraud, irregularities, and errors that separates the recording, verification, authorization, custody of assets, and periodic review duties of people who participate in, document, or record the financial consequences of economic transactions.

sequencing

The order in which jobs are processed or operations are performed at a manufacturing facility to achieve objectives.

shared asset

An asset that is used by more than one cash-generating unit (CGU). An example is a distribution center that is used to store items before they are transported to different markets that share that same distribution center.

single use kanban

A type of kanban that is used with a fixed quantity kanban rule to meet exceptionally high demand. A single use kanban does not trigger a new kanban when it is discarded.

smart rounding

A marketing practice to use odd numbers that are marginally less than their nearest round number to set prices.

source requirement

The product quantity documented on a source document line that creates a pegging requirement.

statistical baseline forecast

An estimate of future demand that is created by applying a forecasting algorithm to historical transaction data.

T

takt time

The time that it takes to produce one unit of a product.

Task guide

A controlled, guided experience through the steps in a Task recording. A Task guide leads the user through the experience that was recorded. All security, data, and application behaviors are the same when completing a Task guide as they are without the Task guide. The Task guide uses the same instrumentation as Task recorder to know when a user has completed the intended step, so that it can prompt the user to take the next step in the recording.

Task recorder

A tool that is pre-installed in Finance and Operations apps. When recording, it records all events that the user enters in the user interface that get executed against the server—including values added, settings changed, data removed, etc.

Task recording

A file that contains the actions and annotations that are captured when Task recorder is run.

three-way matching policy

A matching policy that requires one or more vendor invoice prices to match with one or more purchase order prices and that requires one or more vendor invoice quantities to match with one or more product receipt quantities.

transfer batch

The quantity of one or more items that is transferred or that can be transferred.

two-way matching policy

A matching policy that requires one or more vendor invoice prices to match with one or more purchase order prices.

V

value stream

An operating unit that controls one or more production flows.

variant configuration technology

A method of modeling product masters and searching for product variant configurations.

VAT (value-added tax)

A tax on products at each stage of their production based on the value added during that stage.

vendor catalog

A listing of product offerings that are available for purchase from a vendor.

vendor invoice

A source document that documents a vendor payment request. A vendor invoice can refer to one or more purchase orders. When the vendor invoice is authorized, a payment can be made to the vendor.

W

work cell

A resource group that participates in a production flow activity.

worker

A person who assumes the role of an employee or a contractor and is paid in exchange for services.

workspace

A page that provides an overview of one of the activities that the user performs. The page uses tiles, lists, and charts to display pending work and related data from multiple sources, and the page surfaces frequent tasks related to this data. Tiles shown in the summary section of the workspace are also displayed in the related section in the dashboard.

NOTE

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Learning catalog for Dynamics 365 Supply Chain Management

2/18/2021 • 2 minutes to read • [Edit Online](#)

Find the right online training, in person workshops, and events for your role as a user of the Dynamics 365 Supply Chain application.

Business and Technical Decision Makers

Do you decide whether to invest in new technologies?

[Business and Technical Decision Makers Learning Catalog](#)

[Get started](#)

[Exam](#)

Business users

Did you just get a new application to use?

[Business Users Learning Catalog](#)

[Get Started](#)

[Core platform knowledge](#)

[Supply chain management](#)

[Manufacturing](#)

[Exam](#)

Implementation Project Managers

Are you in charge of making sure your company's implementation goes smoothly?

[Implementation Project Manager Learning Catalog](#)

[Get started](#)

[Core platform knowledge](#)

[Supply chain management](#)

[Manufacturing](#)

[Exams](#)

Administrators

Do you need to keep systems and data flowing, provisioned, and secure round-the-clock?

[Administrators Learning Catalog](#)

[Get started](#)

[Core platform knowledge](#)

[Core development](#)

[Migration and upgrade](#)

[Servicing](#)

[Testing](#)

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Developers

Do you need to write code to integrate with other data sources, extend core system functionality, or build a complex application?

[Developer Learning Catalog](#)

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[Core development concepts](#)

[Servicing](#)

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Functional consultants

Are you an implementation expert for a business domain?

[Functional Application Consultant Learning Catalog](#)

[Get started](#)

[Core platform knowledge](#)

[Manufacturing](#)

[Supply chain management](#)

[Exams](#)

Partner Sales and Marketing

Are you responsible for helping your customers buy the right solution?

[Microsoft Partner Sales and Marketing Learning Catalog](#)

[Get started](#)

[Exam](#)

Solution architects

Do you design solutions that meet your customers' needs and budgets?

[Solution Architects Learning Catalog](#)

[Get started](#)

[Core platform knowledge](#)

[Core development concepts](#)

[Migration and upgrade](#)

[Servicing](#)

Testing

Exam

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Learning catalog for business decision makers considering Dynamics 365 Supply Chain Management

2/18/2021 • 2 minutes to read • [Edit Online](#)

Do you decide whether to invest in new technologies?

The following catalog is organized from core knowledge to specific domains, and from most basic to most advanced. If content exists in multiple formats, we'll let you know, so that you can choose the training format that best meets your needs.

Get started

CONTENT	DESCRIPTION	FORMAT	LENGTH
Learn the business value of Microsoft Dynamics 365 and the Power Platform	Are you interested in learning about business applications? Perhaps you don't know where to begin with Microsoft Dynamics 365 and Power Platform applications? Learn how the power of business applications can help transform your business.	Free, self-paced online learning path	7 hours
Dynamics 365 and Power Platform Fundamentals	Are you interested in learning about business applications? Start with this learning path to see how Dynamics 365 apps are used. Learn about cloud concepts, Power Platform, and how to get started with Dynamics 365 apps.	Free, self-paced online learning path	5.5 hours
Get started with Finance and Operations apps	Learn how Finance and Operations apps support businesses to manage their global financial systems, operational business processes, and streamlined supply chains to empower people to make fast, informed decisions. As the first step in your career of working with Finance and Operations apps, you must familiarize yourself with its features and functionality, whatever your desired role.	Free, self-paced online learning path	2 hours

CONTENT	DESCRIPTION	FORMAT	LENGTH
Course MB-900T01-A: Dynamics 365 fundamentals	This course will familiarize the learner with Dynamics 365 functionality and business value. The course will cover Dynamics 365 applications, the Power Platform, cloud concepts, the security model, and licensing considerations.	Instructor-led in person or online training, cost varies by region and partner	1 day
Get started with Asset Management for Dynamics 365 Supply Chain Management	Asset Management is a module for managing assets and maintenance jobs in Dynamics 365 Supply Chain Management. Asset Management enables you to efficiently manage and carry out tasks related to managing and servicing many types of equipment in your company, for example, machines, production equipment, and vehicles. Asset Management supports solutions across numerous industries.	Free, self-paced online learning module	1 hour

Exam

CONTENT	DESCRIPTION	FORMAT
Dynamics 365 Fundamentals	Prove that you understand Microsoft Dynamics 365, the Power Platform, cloud concepts, licensing options, and deployment and release options.	Exam, cost varies by region

NOTE

Can you tell us about your documentation language preferences? [Take a short survey.](#)

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Learning catalog for users of Dynamics 365 Supply Chain Management

2/18/2021 • 6 minutes to read • [Edit Online](#)

Did you just get a new application to use?

The following catalog is organized from core knowledge to specific domains, and from most basic to most advanced. If content exists in multiple formats, we'll let you know, so that you can choose the training format that best meets your needs.

Get started

CONTENT	DESCRIPTION	FORMAT	LENGTH
Learn the business value of Microsoft Dynamics 365 and the Power Platform	Are you interested in learning about business applications? Perhaps you don't know where to begin with Microsoft Dynamics 365 and Power Platform applications? Learn how the power of business applications can help transform your business.	Free, self-paced online learning path	8 hours
Dynamics 365 and Power Platform Fundamentals	Are you interested in learning about business applications? Start with this learning path to see how Dynamics 365 apps are used. Learn about cloud concepts, Power Platform, and how to get started with Dynamics 365 apps.	Free, self-paced online learning path	5.5 hours
Get started with Finance and Operations apps	Learn how Finance and Operations apps support businesses to manage their global financial systems, operational business processes, and streamlined supply chains to empower people to make fast, informed decisions. As the first step in your career of working with Finance and Operations apps, you must familiarize yourself with its features and functionality, whatever your desired role.	Free, self-paced online learning path	2 hours

CONTENT	DESCRIPTION	FORMAT	LENGTH
Course MB-900T01-A: Dynamics 365 fundamentals	This course will familiarize the learner with Dynamics 365 functionality and business value. The course will cover Dynamics 365 applications, the Power Platform, cloud concepts, the security model, and licensing considerations.	Instructor-led in person or online training, cost varies by region and partner	1 day

Core platform knowledge

CONTENT	DESCRIPTION	FORMAT	LENGTH
Configure your organization in Finance and Operations apps	As a functional consultant who works with Finance and Operations apps, you must understand how to set up an organization for your customer. This learning path shows you, amongst other tasks, how to set up legal entities, implement security settings, personalize the user interface for users, design, and build mobile apps, and implement common integrations.	Free, self-paced online learning path	12 hours
Configure and work with analytics and reporting in Finance and Operations apps	Business leaders can make important decisions in their company if they have accurate insight into the underlying financial and operational data. A business user can also configure, and use the electronic reporting tool without a single line of code, to adopt new regulatory requirements and generate business documents in the required format to electronically exchange information with government bodies, banks, and other parties.	Free, self-paced online learning path	4 hours

Supply chain management

CONTENT	DESCRIPTION	FORMAT	LENGTH
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CONTENT	DESCRIPTION	FORMAT	LENGTH
<p>Configure and manage products and inventory in Dynamics 365 Supply Chain Management</p>	<p>Product information is the pillar of supply chain and retail applications across all industries. In the various modules of a business solution, product-specific information and configuration are required to manage the business processes that are related to products, product families, bills of materials, and product categories. Inventory reports show you in a variety of ways how much inventory you have and explain how to be more effective in your inventory investments. Master planning helps you streamline your planning based on predetermined factors, so you can efficiently plan what materials need to be purchased, transferred, or manufactured.</p>	<p>Free, self-paced online learning path</p>	<p>14 hours</p>
<p>Configure and manage procurement and vendors in Dynamics 365 Supply Chain Management</p>	<p>The process of finding and working with vendors, purchasing products, and ensuring the quality of goods and services are all important factors that impact a company's reputation and success.</p>	<p>Free, self-paced online learning path</p>	<p>14 hours</p>
<p>Configure and manage sales, and customers in Dynamics 365 Supply Chain Management</p>	<p>The process of working with customers, understanding the life cycle of the sales process, and setting up sales agreements are all important factors that impact a company's success.</p>	<p>Free, self-paced online learning path</p>	<p>7 hours</p>

CONTENT	DESCRIPTION	FORMAT	LENGTH
Master planning in Dynamics 365 Supply Chain Management	Master planning allows companies to identify and balance the raw materials and capacity required to meet their future goals. Master planning assesses which raw materials and capacities are currently available, and which raw materials and capacities are required to complete production. For example, it identifies what must be manufactured, purchased, transferred, or set aside as safety stock before you can complete production..	Free, self-paced online learning path	5 hours
Configure and work with warehouse management in Dynamics 365 for Finance and Operations	Warehouse management in Dynamics 365 Supply Chain Management helps optimize and streamline warehouse processes according to your individual needs and provides the insight into your inventory and the tools to help increase customer satisfaction and reduce costs.	Free, self-paced online learning path	8.5 hours
Configure and work with transportation management in Dynamics 365 Supply Chain Management	The Transportation management module in Dynamics 365 Supply Chain Management helps you find the most efficient way to deliver goods to your customers. Transportation management calculates the least expensive and fastest way of delivering goods and lets you identify vendor and routing solutions for inbound and outbound orders.	Free, self-paced online learning path	3 hours
Work with Asset Management for Dynamics 365 Supply Chain Management	Asset Management is an add-in to Dynamics 365 Supply Chain Management, that is used to manage assets that are used in the daily operation of your company. Some examples of these types of assets are machinery, production equipment, and fork lifts.	Free, self-paced online learning path	12.5 hours

Manufacturing

CONTENT	DESCRIPTION	FORMAT	LENGTH
<p>Configure and use discrete manufacturing in Dynamics 365 Supply Chain Management</p>	<p>If a company only produces simple products, production can be scheduled manually with the correct bill of materials (BOM) parts arriving on the production floor, at the correct time, and at the proper resource. As a functional consultant for manufacturing, you need to know how to configure Dynamics 365 Supply Chain Management for discrete manufacturing, so your customer can perform and control the production lifecycle.</p>	<p>Free, self-paced online learning path</p>	<p>16.5 hours</p>
<p>Configure and use lean manufacturing in Dynamics 365 Supply Chain Management</p>	<p>Lean manufacturing is a journey of continuous improvement. The goal is to produce exactly what the customer wants, when the customer wants it, and to do it economically. You can use lean manufacturing in a unified (mixed-mode) manufacturing environment that combines various supply, production, and sourcing strategies. These strategies include production orders, batch orders for process industries, purchase orders, and transfer orders. The lean manufacturing architecture in Dynamics 365 Supply Chain Management consists of production flows, activities, and Kanban rules.</p>	<p>Free, self-paced online learning path</p>	<p>12.5 hours</p>
<p>Configure and use process manufacturing in Dynamics 365 Supply Chain Management</p>	<p>Process manufacturing is associated with formulas and manufacturing recipes, in contrast with discrete manufacturing, which uses discrete units, and bills of materials. Process manufacturing is used in manufacturing environments where production is completed in batch or semi-continuous processes.</p>	<p>Free, self-paced online learning path</p>	<p>10.5 hours</p>

CONTENT	DESCRIPTION	FORMAT	LENGTH
Use warehouse management in manufacturing in Dynamics 365 for Finance and Operations	Using warehouse management in manufacturing processes in Dynamics 365 Supply Chain Management helps optimize and streamline warehouse processes in your manufacturing environment, according to your company's needs	Free, self-paced online learning path	10.5 hours

Exam

CONTENT	DESCRIPTION	FORMAT
Dynamics 365 Fundamentals	Prove that you understand Microsoft Dynamics 365, the Power Platform, cloud concepts, licensing options, and deployment and release options.	Exam, cost varies by region

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Learning catalog for implementation project managers working with Dynamics 365 Supply Chain Management

2/18/2021 • 16 minutes to read • [Edit Online](#)

Are you in charge of making sure your company's implementation goes smoothly?

The following catalog is organized from core knowledge to specific domains, and from most basic to most advanced. If content exists in multiple formats, we'll let you know, so that you can choose the training format that best meets your needs.

Get started

CONTENT	DESCRIPTION	FORMAT	LENGTH
Learn the business value of Microsoft Dynamics 365 and the Power Platform	Are you interested in learning about business applications? Perhaps you don't know where to begin with Microsoft Dynamics 365 and Power Platform applications? Learn how the power of business applications can help transform your business.	Free, self-paced online learning path	7 hours
Dynamics 365 and Power Platform Fundamentals	Are you interested in learning about business applications? Start with this learning path to see how Dynamics 365 apps are used. Learn about cloud concepts, Power Platform, and how to get started with Dynamics 365 apps.	Free, self-paced online learning path	5.5 hours
Get started with Finance and Operations apps	Learn how Finance and Operations apps support businesses to manage their global financial systems, operational business processes, and streamlined supply chains to empower people to make fast, informed decisions. As the first step in your career of working with Finance and Operations apps, you must familiarize yourself with its features and functionality, whatever your desired role.	Free, self-paced online learning path	2 hours

CONTENT	DESCRIPTION	FORMAT	LENGTH
Before you buy	Check out the step-by-step guidance whether you're still evaluating Finance and Operations or ready to make a purchase.	Documentation	
Release plan	Find out about the latest capabilities and enhancements in Dynamics 365	Documentation	
Get started with Asset Management for Dynamics 365 Supply Chain Management	Asset Management is a module for managing assets and maintenance jobs in Dynamics 365 Supply Chain Management. Asset Management enables you to efficiently manage and carry out tasks related to managing and servicing many types of equipment in your company, for example, machines, production equipment, and vehicles. Asset Management supports solutions across numerous industries.	Free, self-paced online learning module	1 hour

Core platform knowledge

CONTENT	DESCRIPTION	FORMAT	LENGTH
Use Lifecycle Services to design and plan an implementation of Finance and Operations apps	Lifecycle Services (LCS) is a collaborative workspace that customers and their partners use to manage Finance and Operations apps projects from pre-sales to the implementation phase and finally to the production environment. It provides checklists and tools that help you manage the project, including pre-build methodologies to help with implementation and regularly updated services.	Free, self-paced online learning path	2 hours

CONTENT	DESCRIPTION	FORMAT	LENGTH
<p>Configure your organization in Finance and Operations apps</p>	<p>As a functional consultant who works with Finance and Operations apps, you must understand how to set up an organization for your customer. This learning path shows you, amongst other tasks, how to set up legal entities, implement security settings, personalize the user interface for users, design, and build mobile apps, and implement common integrations.</p>	<p>Free, self-paced online learning path</p>	<p>12 hours</p>
<p>Migrate data and go live with Finance and Operations apps</p>	<p>As a functional consultant, you must understand how to prepare your customer's data for migration, work with data management, and perform user acceptance testing to go live with Finance and Operations apps.</p>	<p>Free, self-paced online learning path</p>	<p>4 hours</p>
<p>Configure and work with analytics and reporting in Finance and Operations apps</p>	<p>Business leaders can make important decisions in their company if they have accurate insight into the underlying financial and operational data. A business user can also configure, and use the electronic reporting tool without a single line of code, to adopt new regulatory requirements and generate business documents in the required format to electronically exchange information with government bodies, banks, and other parties.</p>	<p>Free, self-paced online learning path</p>	<p>4 hours</p>

CONTENT	DESCRIPTION	FORMAT	LENGTH
Finance and Operations: Onboarding to Dynamics 365 (DYN542PAL2)	<p>FastTrack offers an Onboarding service to every Dynamics 365 for Finance and Operations project. In this TechTalk, we will explain the Onboarding process, walk through the content of the Onboarding session with you, and unveil how we are making Onboarding more efficient and convenient in the near future. This session is especially relevant to everybody who works with customers in the early stages of a project, between closing the license deal and initiation of the implementation project.</p>	Tech Talk (recorded webinar)	62 minutes
On-Premises (Local Business Data) Deployment (DYN382PAL2)	<p>Please join this tech talk for an overview of the on-premises deployment option for Dynamics 365 for Finance and Operations, Enterprise Edition. In this session, we will look at the solution architecture of an on-premises deployment, ALM aspects, system requirements, and how to provision the Life Cycle Services project.</p>	Tech Talk (recorded webinar)	48 minutes
Go-live Planning (DYN458PAL2)	<p>We will discuss the go-live process in detail, and how best to prepare for it, in order to make it as smooth as possible for the customer, partner and Microsoft.</p>	Tech Talk (recorded webinar)	60 minutes
Environment Planning (DYN450PAL2)	<p>Please join us for this tech talk on Environment Planning. Learn about the standard environments, what other environments you might need, the options and timing for acquiring and deploying them, and the expected code and data flows between environments.</p>	Tech Talk (recorded webinar)	53 minutes

CONTENT	DESCRIPTION	FORMAT	LENGTH
Finance and Operations: Feature Management (DYN641PAL2)	<p>Tech Talk on the Feature management experience. It provides a workspace where you can view, enable, disable, and schedule features that have been delivered in each release. By default, new features are turned off. You can use the workspace to turn them on and view the documentation for them. Attend this meeting to see what is delivered in 10.0.3 and our plans for future releases.</p>	<p>Tech Talk (recorded webinar)</p>	<p>47 minutes</p>
Finance And Operations: Microsoft Managed Continuous Updates (DYN610PAL)	<p>The Continuous Update cadence for Finance and Operations has started! Please join us during this hour to discuss Microsoft Managed Continuous updates, the user experience already available in Lifecycle Services, and forthcoming updates.</p>	<p>Tech Talk (recorded webinar)</p>	<p>61 minutes</p>
Microsoft Managed Continuous Updates: What's new (DYN543PAL2)	<p>During this hour we will explain what is new since our initial announcements about Microsoft Managed Continuous updates. We will discuss the cadence of updates, how we have responded to your valuable feedback on the process, and take a look at the forthcoming Lifecycle Services user experience, through which you will be able to manage your updates.</p>	<p>Tech Talk (recorded webinar)</p>	<p>56 minutes</p>
Monitoring, Optimization Advisor & Critical KBs (DYN456PAL2)	<p>We will discuss monitoring capabilities and what Microsoft monitors for you in your production environment, the optimization advisor and how it can be extended, the "Critical X++ updates" experience in LCS, and best practices for the "Report production outage" option in LCS.</p>	<p>Tech Talk (recorded webinar)</p>	<p>40 minutes</p>

CONTENT	DESCRIPTION	FORMAT	LENGTH
Visual Studio Team Services (VSTS) Setup (VIR782PAL)	<p>This Tech Talk will walk thru the necessary steps to configure a VSTS instance and project to connect to LCS implementation project for Dev/Test environment configuration.</p>	<p>Tech Talk (recorded webinar)</p>	<p>41 minutes</p>
Copy Into Legal Entity (DYN383PAL)	<p>In this session, we will discuss a new feature in the data management framework, Copy into legal entity. We will first briefly review the new features added to the data management framework in platform 8 for the workspace, templates, and data projects and then discuss the additional functionality added for Copy into legal entity.</p>	<p>Tech Talk (recorded webinar)</p>	<p>54 minutes</p>
Regression Suite Automation Tool (DYN480PAL)	<p>We will discuss the Regression Suite Automation Tool. It significantly reduces the time and cost of user acceptance testing, when taking a Microsoft update, or before applying custom code and configurations to your Dynamics 365 for Finance and Operations production environment. It enables functional power users to record business tasks, using the Finance and Operations task recorder, and convert them into a suite of automated tests, without the need to write source code.</p>	<p>Tech Talk (recorded webinar)</p>	<p>61 minutes</p>
Finance and Operations: Regression Suite Automation Tool -- Background & Setup (DYN646PAL)	<p>This is the first of a two-part series on Regression Suite Automation Testing (RSAT). In this session, we will cover how to keep pace with continuous updates using automated testing via RSAT. Learnings and recommendations on creating task recordings and executing tests using RSAT will be covered, along with a step-by-step walkthrough of the installation and setup.</p>	<p>Tech Talk (recorded webinar)</p>	<p>70 minutes</p>

CONTENT	DESCRIPTION	FORMAT	LENGTH
Finance and Operations: Regression Suite Automation Tool -- Testing Lifecycle Demo (DYN647PAL)	<p>This is the second of a two-part series on Regression Suite Automation Testing (RSAT). This session will cover a demo of the whole cycle of creating and saving task recordings from Finance and Operations to the BPM library in LCS, synchronizing the BPM library to create test cases in Azure DevOps, grouping the test cases into test suites, and loading and executing the test suites in RSAT.</p>	Tech Talk (recorded webinar)	70 minutes
Performance Testing Approach (DYN449PAL2)	<p>Please join us for this tech talk on how to approach Performance Testing. Learn about the fundamentals, best practices for testing, available tools and techniques for executing tests and measuring performance, and how to use the results for optimization.</p>	Tech Talk (recorded webinar)	45 minutes
How to upgrade to 7.2 (July 2017) from 7.0 (RTW)/7.1 (Release 1611) (DYN338PAL2)	<p>In this session we will explain how to upgrade from Dynamics 365 Finance and Operations application v7.0 (RTW) and v7.1 (1611) to v7.2 (July 2017). We make a clear differentiation between Live customers and ongoing projects (not live yet).</p>	Tech Talk (recorded webinar)	58 minutes
Finance and Operations: Upgrading from 7.x to 8+ (DYN519PAL2)	<p>Please join us for our next TechTalk, during which we will cover the 7.X to 8.X upgrade process. We will discuss various scenarios and steps to execute for code upgrade and data upgrade. We will also cover extensibility request scenarios and how to raise them where appropriate. Part 1 of 2.</p>	Tech Talk (recorded webinar)	61 minutes
AX2012 to Dynamics 365 for Operations Upgrade (VIR817PAL2)	<p>This Tech Talk will provide an overview on how to upgrade code and data from Dynamics AX 2012 to Dynamics 365 for Operations.</p>	Tech Talk (recorded webinar)	45 minutes

CONTENT	DESCRIPTION	FORMAT	LENGTH
Analytics & Reporting Options: Printing and the Document Routing Agent	Please join us for this tech talk on two related topics. First we will discuss Analytics and Reporting solution patterns and tools for Dynamics 365 for Finance and Operations, Enterprise Edition. Secondly, we will discuss printing scenarios and the Document Routing Agent.	Tech Talk (recorded webinar)	45 minutes
Course MB-300T01-A: Core common features of Dynamics 365 for Finance and Operations	This course discusses core common features of Microsoft Dynamics 365 for Finance and Operations.	Instructor-led in person or online training, cost varies by region and partner	1 day
Course MB-300T02-A: Core configuration in Dynamics 365 for Finance and Operations	This course discusses core configuration tasks for Microsoft Dynamics 365 for Finance and Operations.	Instructor-led in person or online training, cost varies by region and partner	1 day
Course MB-300T03-A: Data migration and preparing for go-live with Dynamics 365 for Finance and Operations	This course discusses data migration and go-live preparation for Microsoft Dynamics 365 for Finance and Operations.	Instructor-led in person or online training, cost varies by region and partner	1 day
Implementation Lifecycle home page	These topics describe the programs, tools, and processes available related to the implementation lifecycle of your Microsoft Dynamics 365 for Finance and Operations project.	Documentation	

Supply chain management

CONTENT	DESCRIPTION	FORMAT	LENGTH
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CONTENT	DESCRIPTION	FORMAT	LENGTH
<p>Configure and manage products and inventory in Dynamics 365 Supply Chain Management</p>	<p>Product information is the pillar of supply chain and retail applications across all industries. In the various modules of a business solution, product-specific information and configuration are required to manage the business processes that are related to products, product families, bill of materials, and product categories. Inventory reports will show how much inventory you have in variety of different ways, and will explain how to be more effective in your inventory investments.</p>	<p>Free, self-paced online learning path</p>	<p>6 hours</p>
<p>Configure and manage procurement and vendors in Dynamics 365 Supply Chain Management</p>	<p>The process of finding and working with vendors, purchasing products, and ensuring the quality of goods and services are all important factors that impact a company's reputation and success.</p>	<p>Free, self-paced online learning path</p>	<p>6 hours</p>
<p>Configure and work with warehouse management in Dynamics 365 for Finance and Operations</p>	<p>Warehouse management in Dynamics 365 for Finance and Operations helps optimize and streamline warehouse processes according to your individual needs and provides the insight into your inventory and the tools to help increase customer satisfaction and reduce costs.</p>	<p>Free, self-paced online learning path</p>	<p>5 hours</p>
<p>Configure and work with transportation management in Dynamics 365 Supply Chain Management</p>	<p>The Transportation management module in Dynamics 365 Supply Chain Management helps you find the most efficient way to deliver goods to your customers. Transportation management calculates the least expensive and fastest way of delivering goods and lets you identify vendor and routing solutions for inbound and outbound orders.</p>	<p>Free, self-paced online learning path</p>	<p>3 hours</p>

CONTENT	DESCRIPTION	FORMAT	LENGTH
Warehousing Mobile App (VIR816PAL)	This Tech Talk will discuss the Advanced Warehousing system in Dynamics 365 for Operations and what the future holds for the advanced warehousing mobile interface. We will examine the new mobile application that has been released and how it compares to the legacy WMDP. We will learn what is required to install, configure, and operate this mobile application and how it can be used to benefit your implementations.	Free recording of a web conference	54 minutes
Vendor Collaboration (DYN327PAL)	This Tech Talk will provide a walk through on the Vendor Collaboration feature including the Consumption of Response from Vendor feature that is included in the July (spring) release.	Free recording of a web conference	58 minutes
Item And Warehouse Migration Process To Use Advanced Warehouse Management (DYN316PAL)	In this Tech Talk, we will teach you how to migrate existing warehouse setup and items with open transactions to the advanced warehouse management, by using the new capabilities to change the storage dimension group for items and enable warehouses to use the advanced warehouse management processes.	Free recording of a web conference	54 minutes
Supply chain management home page	This topic provides a list of the help topics and other resources for the supply chain management features in Microsoft Dynamics 365 for Finance and Operations.	Documentation	
Demand Replenishment for Raw Material Picking (DYN333PAL2)	This TechTalk will cover raw material picking and demand replenishment for raw material picking.	Free recording of a web conference	38 minutes
Course MB-330T01-A: Configure and use supply chain management in Dynamics 365 for Finance and Operations	This course discusses how to configure and use supply chain management in Dynamics 365 for Finance and Operations.	Instructor-led in person or online training, cost varies by region and partner	2 days

CONTENT	DESCRIPTION	FORMAT	LENGTH
Course MB-330T02-A: Use quality management, Intercompany trading and master planning in Dynamics 365 for Finance and Operations	This course discusses how to use quality management, intercompany trading and master planning in Dynamics 365 for Finance and Operations.	Instructor-led in person or online training, cost varies by region and partner	1 day
Course MB-330T03-A: Configure and use warehouse, and transportation management in Dynamics 365 for Finance and Operations	This course discusses how to configure and use warehouse and transportation management in Dynamics 365 for Finance and Operations.	Instructor-led in person or online training, cost varies by region and partner	1 day

Manufacturing

CONTENT	DESCRIPTION	FORMAT	LENGTH
Configure and use discrete manufacturing in Dynamics 365 Supply Chain Management	If a company only produces simple products, production can be scheduled manually with the correct bill of materials (BOM) parts arriving on the production floor, at the correct time, and at the proper resource. As a functional consultant for manufacturing, you need to know how to configure Dynamics 365 for Finance and Operations for discrete manufacturing, so your customer can perform and control the production lifecycle.	Free, self-paced online learning path	9 hours

CONTENT	DESCRIPTION	FORMAT	LENGTH
Configure and use lean manufacturing in Dynamics 365 Supply Chain Management	<p>Lean manufacturing is a journey of continuous improvement. The goal is to produce exactly what the customer wants, when the customer wants it, and to do it economically. You can use lean manufacturing in a unified (mixed-mode) manufacturing environment that combines various supply, production, and sourcing strategies. These strategies include production orders, batch orders for process industries, purchase orders, and transfer orders. The lean manufacturing architecture in Dynamics 365 for Finance and Operations consists of production flows, activities, and Kanban rules.</p>	<p>Free, self-paced online learning path</p>	<p>6.5 hours</p>
Configure and use process manufacturing in Dynamics 365 Supply Chain Management	<p>Process manufacturing is associated with formulas and manufacturing recipes, in contrast with discrete manufacturing, which uses discrete units, and bills of materials. Process manufacturing is used in manufacturing environments where production is completed in batch or semi-continuous processes.</p>	<p>Free, self-paced online learning path</p>	<p>6 hours</p>
Use warehouse management in manufacturing in Dynamics 365 for Finance and Operations	<p>Using warehouse management in manufacturing processes in Dynamics 365 for Finance and Operations helps optimize and streamline warehouse processes in your manufacturing environment, according to your company's needs.</p>	<p>Free, self-paced online learning path</p>	<p>6 hours</p>
Course MB-320T01-A: Configure and use discrete manufacturing in Dynamics 365 for Finance and Operations	<p>This course discusses how to configure and use discrete manufacturing in Dynamics 365 for Finance and Operations.</p>	<p>Instructor-led in person or online training, cost varies by region and partner</p>	<p>2 days</p>

CONTENT	DESCRIPTION	FORMAT	LENGTH
Course MB-320T02-A: Configure and use lean manufacturing in Dynamics 365 for Finance and Operations	This course discusses how to configure and use lean manufacturing in Dynamics 365 for Finance and Operations.	Instructor-led in person or online training, cost varies by region and partner	1 day
Course MB-320T03-A: Configure and use process manufacturing in Dynamics 365 for Finance and Operations	This course discusses how to configure and use process manufacturing in Dynamics 365 for Finance and Operations.	Instructor-led in person or online training, cost varies by region and partner	1 day

Exams

CONTENT	DESCRIPTION	FORMAT
Microsoft Certified: Dynamics 365 for Finance and Operations, Supply Chain Management Functional Consultant Associate	Microsoft Certified: Dynamics 365 for Finance and Operations, Supply Chain Management Functional Consultants streamline cost accounting, inventory management, master planning, and warehouse management for their clients.	Certification, cost varies by region
Microsoft Certified: Dynamics 365 for Finance and Operations, Manufacturing Functional Consultant Associate	Microsoft Certified: Dynamics 365 for Finance and Operations, Manufacturing Functional Consultants integrate digital and physical systems; improve visibility, manufacturing efficiency and flexibility; and lower costs for their clients.	Certification, cost varies by region
Exam MB-300: Microsoft Dynamics 365 Unified Operations Core	This exam measures your ability to accomplish the following technical tasks: use common functionality and implementation tools; configure security, processes, and options; perform data migration; and validate and support the solution.	Exam, cost varies by region
Exam MB-320: Microsoft Dynamics 365 for Finance and Operations, Manufacturing	This exam measures your ability to accomplish the following technical tasks: set up and configure manufacturing; create and manage production and lean orders; and create, process, and manage production batch orders.	Exam, cost varies by region
Exam MB-330: Microsoft Dynamics 365 for Finance and Operations, Supply Chain Management	This exam measures your ability to accomplish the following technical tasks: implement product information management; implement inventory management; implement and manage supply chain processes; and implement warehouse management and transportation management and perform business processes.	Exam, cost varies by region

NOTE

Can you tell us about your documentation language preferences? [Take a short survey.](#)

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Learning catalog for Dynamics 365 Supply Chain Management administrators

2/18/2021 • 8 minutes to read • [Edit Online](#)

Do you need to keep systems and data flowing, provisioned, and secure round-the-clock?

The following catalog is organized from core knowledge to specific domains, and from most basic to most advanced. If content exists in multiple formats, we'll let you know, so that you can choose the training format that best meets your needs.

Get Started

CONTENT	DESCRIPTION	FORMAT	LENGTH
Dynamics 365 and Power Platform Fundamentals	Are you interested in learning about business applications? Start with this learning path to see how Dynamics 365 apps are used. Learn about cloud concepts, Power Platform, and how to get started with Dynamics 365 apps.	Free, self-paced online learning path	5.5 hours
Get started with Finance and Operations apps	Learn how Finance and Operations apps support businesses to manage their global financial systems, operational business processes, and streamlined supply chains to empower people to make fast, informed decisions. As the first step in your career of working with Finance and Operations apps, you must familiarize yourself with its features and functionality, whatever your desired role.	Free, self-paced online learning path	2 hours
Course MB-900T01-A: Dynamics 365 fundamentals	This course will familiarize the learner with Dynamics 365 functionality and business value. The course will cover Dynamics 365 applications, the Power Platform, cloud concepts, the security model, and licensing considerations.	Instructor-led in person or online training, cost varies by region and partner	1 day

Core platform knowledge

CONTENT	DESCRIPTION	FORMAT	LENGTH
<p>Use Lifecycle Services to design and plan an implementation of Finance and Operations apps</p>	<p>Lifecycle Services (LCS) is a collaborative workspace that customers and their partners use to manage Finance and Operations apps projects from pre-sales to the implementation phase and finally to the production environment. It provides checklists and tools that help you manage the project, including pre-build methodologies to help with implementation and regularly updated services.</p>	<p>Free, self-paced online learning path</p>	<p>2 hours</p>
<p>Configure your organization in Finance and Operations apps</p>	<p>As a functional consultant who works with Finance and Operations apps, you must understand how to set up an organization for your customer. This learning path shows you, amongst other tasks, how to set up legal entities, implement security settings, personalize the user interface for users, design, and build mobile apps, and implement common integrations.</p>	<p>Free, self-paced online learning path</p>	<p>12 hours</p>
<p>Migrate data and go live with Finance and Operations apps</p>	<p>As a functional consultant, you must understand how to prepare your customer's data for migration, work with data management, and perform user acceptance testing to go live with Finance and Operations apps.</p>	<p>Free, self-paced online learning path</p>	<p>4 hours</p>
<p>Work with analytics and reporting in Finance and Operation</p>	<p>Business leaders can make important decisions in their company if they have accurate insight into the underlying financial and operational data. Without data visibility, business leaders are challenged with a nearly impossible task. By using analytics and reporting in Finance and Operations apps, you can empower every business user, depending on their security rights, to get the insights they need to make those important decisions.</p>	<p>Free, self-paced online learning path</p>	<p>1.5 hours</p>

CONTENT	DESCRIPTION	FORMAT	LENGTH
Manage an implementation project for Finance and Operations	<p>Learn the most important elements and the best practices to manage a successful Finance and Operations implementation project. From the first step where you are planning and designing your project methodology, the use of FastTrack services, the development strategy, data management and more, to the best ways for maintaining and monitoring your operations after Go-live.</p>	<p>Free, self-paced online learning path</p>	<p>11.5 hours</p>
System administration home page	<p>This topic points to content for system administrators of Microsoft Dynamics 365 for Finance and Operations. This content will help you configure the system so that it works smoothly and effectively for your organization.</p>	<p>Documentation</p>	
Finance and Operations: Onboarding to Dynamics 365 (DYN542PAL2)	<p>FastTrack offers an Onboarding service to every Dynamics 365 for Finance and Operations project. In this TechTalk, we will explain the Onboarding process, walk through the content of the Onboarding session with you, and unveil how we are making Onboarding more efficient and convenient in the near future. This session is especially relevant to everybody who works with customers in the early stages of a project, between closing the license deal and initiation of the implementation project.</p>	<p>Free recording of a web conference</p>	<p>62 minutes</p>

CONTENT	DESCRIPTION	FORMAT	LENGTH
On-Premises (Local Business Data) Deployment (DYN382PAL2)	Please join this tech talk for an overview of the on-premises deployment option for Dynamics 365 for Finance and Operations, Enterprise Edition. In this session, we will look at the solution architecture of an on-premises deployment, ALM aspects, system requirements, and how to provision the Life Cycle Services project.	Free recording of a web conference	48 minutes
Copy Into Legal Entity (DYN383PAL)	In this session, we will discuss a new feature in the data management framework, Copy into legal entity. We will first briefly review the new features added to the data management framework in platform 8 for the workspace, templates, and data projects and then discuss the additional functionality added for Copy into legal entity.	Free recording of a web conference	54 minutes

Core development

CONTENT	DESCRIPTION	FORMAT	LENGTH
Data Management (DYN757PAL2)	Please join us for this TechTalk on Data Management. Learn about the options available and the scenarios for which they are recommended. We will cover the Data Management framework, templates, database copying, cross-company data sharing, and performance considerations.	Free recording of a web conference	58 minutes

Migration and upgrade

CONTENT	DESCRIPTION	FORMAT	LENGTH
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CONTENT	DESCRIPTION	FORMAT	LENGTH
Finance and Operations: Upgrading from 7.x to 8+ (DYN519PAL2)	Please join us for our next TechTalk, during which we will cover the 7.X to 8.X upgrade process. We will discuss various scenarios and steps to execute for code upgrade and data upgrade. We will also cover extensibility request scenarios and how to raise them where appropriate.	Free recording of a web conference	61 minutes
How to upgrade to 7.2 (July 2017) from 7.0 (RTW)/7.1 (Release 1611) (DYN338PAL2)	In this session we will explain how to upgrade from Dynamics 365 Finance and Operations application v7.0 (RTW) and v7.1 (1611) to v7.2 (July 2017). We make a clear differentiation between Live customers and ongoing projects (not live yet).	Free recording of a web conference	58 minutes
AX2012 to Dynamics 365 for Operations Upgrade (VIR817PAL2)	This Tech Talk will provide an overview on how to upgrade code and data from Dynamics AX 2012 to Dynamics 365 for Operations.	Free recording of a web conference	45 minutes
AX2009 Migration Tool	This session will cover tooling available to assist you with migrating from AX2009 to D365 for Operations.	Free recording of a web conference	55 minutes

Servicing

CONTENT	DESCRIPTION	FORMAT	LENGTH
Finance and Operations: Feature Management (DYN641PAL2)	Tech Talk on the Feature management experience. It provides a workspace where you can view, enable, disable, and schedule features that have been delivered in each release. By default, new features are turned off. You can use the workspace to turn them on and view the documentation for them. Attend this meeting to see what is delivered in 10.0.3 and our plans for future releases.	Free recording of a web conference	47 minutes

CONTENT	DESCRIPTION	FORMAT	LENGTH
Finance and Operations: Servicing, Supporting and Maintaining Production (DYN651PAL2)	Tech Talk on how to efficiently support, maintain and service your Dynamics 365 for Finance and Operations production environment.	Free recording of a web conference	53 minutes
Finance And Operations: Microsoft Managed Continuous Updates (DYN610PAL)	The Continuous Update cadence for Finance and Operations has started! Please join us during this hour to discuss Microsoft Managed Continuous updates, the user experience already available in Lifecycle Services, and forthcoming updates.	Free recording of a web conference	61 minutes
Microsoft Managed Continuous Updates: What's new (DYN543PAL2)	During this hour we will explain what is new since our initial announcements about Microsoft Managed Continuous updates. We will discuss the cadence of updates, how we have responded to your valuable feedback on the process, and take a look at the forthcoming Lifecycle Services user experience, through which you will be able to manage your updates.	Free recording of a web conference	56 minutes
Microsoft Managed Continuous Updates (DYN474PAL2)	We will discuss Microsoft's plans for keeping your system up-to-date with the latest release. We will cover timelines, the cadence for major and minor updates, the planned procedures, the implications, and what you should do for optimal results.	Free recording of a web conference	62 minutes
Monitoring, Optimization Advisor & Critical KBs (DYN456PAL2)	We will discuss monitoring capabilities and what Microsoft monitors for you in your production environment, the optimization advisor and how it can be extended, the "Critical X++ updates" experience in LCS, and best practices for the "Report production outage" option in LCS.	Free recording of a web conference	40 minutes

Testing

CONTENT	DESCRIPTION	FORMAT	LENGTH
Finance and Operations: Regression Suite Automation Tool -- Background & Setup (DYN646PAL)	<p>This is the first of a two-part series on Regression Suite Automation Testing (RSAT). In this session, we will cover how to keep pace with continuous updates using automated testing via RSAT. Learnings and recommendations on creating task recordings and executing tests using RSAT will be covered, along with a step-by-step walkthrough of the installation and setup.</p>	Free recording of a web conference	70 minutes
Finance and Operations: Regression Suite Automation Tool -- Testing Lifecycle Demo (DYN647PAL)	<p>This is the second of a two-part series on Regression Suite Automation Testing (RSAT). This session will cover a demo of the whole cycle of creating and saving task recordings from Finance and Operations to the BPM library in LCS, synchronizing the BPM library to create test cases in Azure DevOps, grouping the test cases into test suites, and loading and executing the test suites in RSAT.</p>	Free recording of a web conference	70 minutes
Finance and Operations: Performance Troubleshooting Tools for Dynamics 365 (DYN541PAL2)	<p>In this Tech Talk, we will present the different tools that can be used to troubleshoot Microsoft Dynamics 365 for Finance and Operations performance issues. This session will contain some scenario-based demonstrations and initial guidance on how to approach typical performance issues.</p>	Free recording of a web conference	64 minutes

Exam

CONTENT	DESCRIPTION	FORMAT
Dynamics 365 Fundamentals	<p>Prove that you understand Microsoft Dynamics 365, the Power Platform, cloud concepts, licensing options, and deployment and release options.</p>	Exam, cost varies by region

NOTE

Can you tell us about your documentation language preferences? [Take a short survey.](#)

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Learning catalog for Dynamics 365 Supply Chain Management developers

2/18/2021 • 11 minutes to read • [Edit Online](#)

NOTE

Effective November 2020:

- Common Data Service has been renamed to Microsoft Dataverse. For more information, see [Power Automate Blog](#).
- Some terminology in Microsoft Dataverse has been updated. For example, *entity* is now *table* and *field* is now *column*. For more information, see [Terminology updates](#).

This topic will be updated soon to reflect the latest terminology.

Do you need to write code to integrate with other data sources, extend core system functionality, or build a complex application?

The following catalog is organized from core knowledge to specific domains, and from most basic to most advanced. If content exists in multiple formats, we'll let you know, so that you can choose the training format that best meets your needs.

Get started

CONTENT	DESCRIPTION	FORMAT	LENGTH
Get started with Finance and Operations apps	Learn how Finance and Operations apps support businesses to manage their global financial systems, operational business processes, and streamlined supply chains to empower people to make fast, informed decisions. As the first step in your career of working with Finance and Operations apps, you must familiarize yourself with its features and functionality, whatever your desired role.	Free, self-paced online learning path	2.2 hours

Core development concepts

CONTENT	DESCRIPTION	FORMAT	LENGTH
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CONTENT	DESCRIPTION	FORMAT	LENGTH
Introduction to developing with Finance and Operations apps	<p>As a developer working with Finance and Operations apps, it's important to have a firm grasp of the main architecture components of the Dynamics 365 ecosystem and Finance and Operations apps. Knowledge of core developer concepts, including technical capabilities, source code, testing frameworks, and reporting tools, will support your further efforts in building development skills that you can apply to Finance and Operations apps.</p>	<p>Free, self-paced online learning path</p>	<p>7.75 hours</p>
Build Finance and Operations apps	<p>Developing in Finance and Operations apps requires a basic understanding of the tasks required to build new elements and customize Finance and Operations apps. The tasks include understanding X++ code and Visual Studio, as well as being able to create and modify the basic elements of the system.</p>	<p>Free, self-paced online learning path</p>	<p>13 hours</p>
Extend Finance and Operations apps	<p>Extensions allow developers to make changes to the user experience in Finance and Operations apps by implementing modifications to the code that do not affect the base code. Among other benefits, extensions let developers update Finance and Operations apps to adhere to business processes and required changes.</p>	<p>Free, self-paced online learning path</p>	<p>2.5 hours</p>

CONTENT	DESCRIPTION	FORMAT	LENGTH
Connect to Finance and Operations apps	<p>Integration and the ability to access your data in Finance and Operations apps are important capabilities. Developers who have learned to build and extend code in Finance and Operations apps can enhance their knowledge of development by learning about data integration and how connecting to data can have positive impacts on users.</p>	<p>Free, self-paced online learning path</p>	<p>5.75 hours</p>
Migrate data and go live with Finance and Operations apps	<p>As a functional consultant, you must understand how to prepare your customer's data for migration, work with data management, and perform user acceptance testing to go live with Finance and Operations apps.</p>	<p>Free, self-paced online learning path</p>	<p>4 hours</p>
Finance And Operations: Development ALM (DYN766PAL)	<p>This TechTalk discusses Development Application Lifecycle Management concepts, tools and the best practices we recommend. We cover how Lifecycle Services, Visual Studio, and Azure DevOps work together to enable business-process focused continuous delivery of your solution's code base, and servicing of your environments.</p>	<p>Free recording of a web conference</p>	<p>52 minutes</p>
Finance and Operations: Extending Dynamics 365 for Finance and Operations with PowerApps (DYN558PAL2)	<p>Understand the simplicity of Microsoft PowerApps and how it can integrate with Dynamics 365 for Finance and Operations to digitally transform businesses and increase user productivity.</p>	<p>Free recording of a web conference</p>	<p>43 minutes</p>

CONTENT	DESCRIPTION	FORMAT	LENGTH
Finance and Operations: Extensibility (DYN518PAL2)	We will provide an overview and update on Microsoft's extensibility plans. We will discuss in detail the various ways of extending a solution, looking deep into the metadata extensibility features as well as the ability to augment and extend code, including via the powerful Chain of Command feature.	Free recording of a web conference	50 minutes
Visual Studio Team Services (VSTS) Setup (MIR782PAL)	This Tech Talk will walk thru the necessary steps to configure a VSTS instance and project to connect to LCS implementation project for Dev/Test environment configuration.	Free recording of a web conference	41 minutes
Dataverse Data Integrator (DYN451PAL2)	Please join us for this tech talk on the capabilities of Microsoft Dataverse Data Integrator. We will discuss integration options between Dynamics 365 Customer Engagement and Dynamics 365 Finance and Operations, as well as integrating with other, third-party solutions.	Free recording of a web conference	61 minutes
Integration Between Dynamics 365 for Sales and Dynamics 365 for Finance & Operations via Dataverse (DYN340PAL)	In this Tech talk we will introduce the integration scenario known as Prospect to cash, with sales and marketing activities in Dynamics 365 for Sales and fulfillment in Dynamics 365 for Finance and Operations. We will also take a look at the Data integrator and how to modify the integration.	Free recording of a web conference	54 minutes
Data Management (DYN757PAL2)	Please join us for this TechTalk on Data Management. Learn about the options available and the scenarios for which they are recommended. We will cover the Data Management framework, templates, database copying, cross-company data sharing, and performance considerations.	Free recording of a web conference	58 minutes

CONTENT	DESCRIPTION	FORMAT	LENGTH
Azure Integration Tools for Dynamics 365 for Finance and Operations (DYN386PAL)	This TechTalk will cover the types of tools one might consider while integrating with Dynamics 365 for Finance & Operations and when to choose which integration tool. The session will also walk-through some of integration scenarios orchestrated using Azure integration services.	Free recording of a web conference	63 minutes
Integration Frameworks within Dynamics 365 for Finance & Operations (DYN385PAL)	This session will provide an overview of the integration frameworks within Dynamics 365 for Finance & Operations and discuss the consideration under which these frameworks could be used.	Free recording of a web conference	64 minutes
Copy Into Legal Entity (DYN383PAL)	In this session, we will discuss a new feature in the data management framework, Copy into legal entity. We will first briefly review the new features added to the data management framework in platform 8 for the workspace, templates, and data projects and then discuss the additional functionality added for Copy into legal entity.	Free recording of a web conference	54 minutes
How To Extend or Build New Analytical Workspaces (DYN321PAL)	This Tech Talk will provide a walk through on how to extend or build new Analytical Workspaces.	Free recording of a web conference	59 minutes
Mobile Framework (VIR824PAL)	This tech talk will walk through the mobile framework capabilities for building apps in Dynamics 365 for Operations. The session will also demonstrate some recently built apps.	Free recording of a web conference	58 minutes

Servicing

CONTENT	DESCRIPTION	FORMAT	LENGTH
Finance and Operations: Servicing, Supporting and Maintaining Production (DYN651PAL2)	<p>Tech Talk on how to efficiently support, maintain and service your Dynamics 365 for Finance and Operations production environment.</p>	<p>Free recording of a web conference</p>	<p>53 minutes</p>
Finance and Operations: Feature Management (DYN641PAL2)	<p>Tech Talk on the Feature management experience. It provides a workspace where you can view, enable, disable, and schedule features that have been delivered in each release. By default, new features are turned off. You can use the workspace to turn them on and view the documentation for them. Attend this meeting to see what is delivered in 10.0.3 and our plans for future releases.</p>	<p>Free recording of a web conference</p>	<p>47 minutes</p>
Finance And Operations: Microsoft Managed Continuous Updates (DYN610PAL)	<p>The Continuous Update cadence for Finance and Operations has started! Please join us during this hour to discuss Microsoft Managed Continuous updates, the user experience already available in Lifecycle Services, and forthcoming updates.</p>	<p>Free recording of a web conference</p>	<p>61 minutes</p>
Microsoft Managed Continuous Updates: What's new (DYN543PAL2)	<p>During this hour we will explain what is new since our initial announcements about Microsoft Managed Continuous updates. We will discuss the cadence of updates, how we have responded to your valuable feedback on the process, and take a look at the forthcoming Lifecycle Services user experience, through which you will be able to manage your updates.</p>	<p>Free recording of a web conference</p>	<p>56 minutes</p>

CONTENT	DESCRIPTION	FORMAT	LENGTH
Microsoft Managed Continuous Updates (DYN474PAL2)	We will discuss Microsoft's plans for keeping your system up-to-date with the latest release. We will cover timelines, the cadence for major and minor updates, the planned procedures, the implications, and what you should do for optimal results.	Free recording of a web conference	62 minutes

Migration and upgrade

CONTENT	DESCRIPTION	FORMAT	LENGTH
Finance and Operations: Upgrading from 7.x to 8+ (DYN519PAL2)	Please join us for our next TechTalk, during which we will cover the 7.X to 8.X upgrade process. We will discuss various scenarios and steps to execute for code upgrade and data upgrade. We will also cover extensibility request scenarios and how to raise them where appropriate. Part 1 of 2.	Free recording of a web conference	61 minutes
AX2012 to Dynamics 365 for Operations Upgrade (VIR817PAL2)	This Tech Talk will provide an overview on how to upgrade code and data from Dynamics AX 2012 to Dynamics 365 for Operations.	Free recording of a web conference	45 minutes
AX2009 to Dynamics 365 for Operations Migration Tools (VIR809PAL)	This session will cover tooling available to assist you with migrating from AX2009 to D365 for Operations.	Free recording of a web conference	55 minutes

Testing

CONTENT	DESCRIPTION	FORMAT	LENGTH
Finance and Operations: Acceptance Test Library (DYN650PAL2)	Tech Talk on how to efficiently support, maintain and service your Dynamics 365 for Finance and Operations production environment.	Free recording of a web conference	61 minutes

CONTENT	DESCRIPTION	FORMAT	LENGTH
<p>Finance and Operations: Regression Suite Automation Tool -- Background & Setup (DYN646PAL)</p>	<p>This is the first of a two-part series on Regression Suite Automation Testing (RSAT). In this session, we will cover how to keep pace with continuous updates using automated testing via RSAT. Learnings and recommendations on creating task recordings and executing tests using RSAT will be covered, along with a step-by-step walkthrough of the installation and setup.</p>	<p>Free recording of a web conference</p>	<p>70 minutes</p>
<p>Finance and Operations: Regression Suite Automation Tool -- Testing Lifecycle Demo (DYN647PAL)</p>	<p>This is the second of a two-part series on Regression Suite Automation Testing (RSAT). This session will cover a demo of the whole cycle of creating and saving task recordings from Finance and Operations to the BPM library in LCS, synchronizing the BPM library to create test cases in Azure DevOps, grouping the test cases into test suites, and loading and executing the test suites in RSAT.</p>	<p>Free recording of a web conference</p>	<p>70 minutes</p>
<p>Finance and Operations: Performance Benchmark for Dynamics 365 (DYN550PAL2)</p>	<p>In this Tech Talk, we will describe an approach for preparing and delivering a performance benchmark on Microsoft Dynamics 365 for Finance and Operations. We will present the process, main concepts and tools before illustrating a simple case with a demonstration.</p>	<p>Free recording of a web conference</p>	<p>68 minutes</p>
<p>Finance and Operations: Performance Key Patterns and Anti-patterns for Dynamics 365 (DYN549PAL)</p>	<p>In this Tech Talk, we will present efficient performance patterns that we have seen project teams implement successfully. We will also describe anti-patterns that can lead to serious performance degradation of the Microsoft Dynamics 365 for Finance and Operations environment.</p>	<p>Free recording of a web conference</p>	<p>58 minutes</p>

CONTENT	DESCRIPTION	FORMAT	LENGTH
Finance and Operations: Performance Troubleshooting Tools for Dynamics 365 (DYN541PAL2)	<p>In this Tech Talk, we will present the different tools that can be used to troubleshoot Microsoft Dynamics 365 for Finance and Operations performance issues. This session will contain some scenario-based demonstrations and initial guidance on how to approach typical performance issues.</p>	<p>Free recording of a web conference</p>	<p>64 minutes</p>
Task Automation Framework for Data Management (DYN447PAL2)	<p>Please join us for this tech talk on the new Task Automation Framework for Data Management. Learn how the framework facilitates testing of data entities & integrations, validation of the resulting data, and automation of other tasks in the Data Management Framework.</p>	<p>Free recording of a web conference</p>	<p>55 minutes</p>
Finance and Operations: Warehouse App Task Validation Framework	<p>This talk will introduce and explain the new Warehouse App Task Validation Framework, which is designed to allow for the automation of warehouse tasks within the standard Dynamics 365 Warehousing application. This new framework bridges the gap between the Regression Suite Automation Tool (RSAT) and the warehouse functionality so that end-to-end regression tests can be built, including both core Dynamics workflows as well as distribution scenarios utilizing the advanced warehousing module. The talk will walk through the setup and configuration of the framework and show how it can be utilized to automate a warehouse process through RSAT.</p>	<p>Free recording of a web conference</p>	<p>66 minutes</p>

Exam

CONTENT	DESCRIPTION	FORMAT
Exam MB-500: Microsoft Dynamics 365: Finance and Operations Apps Developer	This exam measures your ability to accomplish the following technical tasks: plan architecture and solution design; apply developer tools; design and develop AOT elements; develop and test code; implement reporting; integrate and manage data solutions; and implement security and optimize performance.	Exam, cost varies by region

NOTE

Can you tell us about your documentation language preferences? [Take a short survey.](#)

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Learning Catalog for Microsoft Partner Sales and Marketing roles for Dynamics 365 Supply Chain Management

2/18/2021 • 2 minutes to read • [Edit Online](#)

Are you responsible for helping your customers buy the right solution?

The following catalog is organized from core knowledge to specific domains, and from most basic to most advanced. If content exists in multiple formats, we'll let you know, so that you can choose the training format that best meets your needs.

Get started

CONTENT	DESCRIPTION	FORMAT	LENGTH
Learn the business value of Microsoft Dynamics 365 and the Power Platform	Are you interested in learning about business applications? Perhaps you don't know where to begin with Microsoft Dynamics 365 and Power Platform applications? Learn how the power of business applications can help transform your business.	Free, self-paced online learning path	7 hours
Dynamics 365 and Power Platform Fundamentals	Are you interested in learning about business applications? Start with this learning path to see how Dynamics 365 apps are used. Learn about cloud concepts, Power Platform, and how to get started with Dynamics 365 apps.	Free, self-paced online learning path	5.5 hours
Get started with Finance and Operations apps	Learn how Finance and Operations apps support businesses to manage their global financial systems, operational business processes, and streamlined supply chains to empower people to make fast, informed decisions. As the first step in your career of working with Finance and Operations apps, you must familiarize yourself with its features and functionality, whatever your desired role.	Free, self-paced online learning path	2 hours

CONTENT	DESCRIPTION	FORMAT	LENGTH
Course MB-900T01-A: Dynamics 365 fundamentals	This course will familiarize the learner with Dynamics 365 functionality and business value. The course will cover Dynamics 365 applications, the Power Platform, cloud concepts, the security model, and licensing considerations.	Instructor-led in person or online training; cost varies by region and partner	1 day

Exam

CONTENT	DESCRIPTION	FORMAT
Dynamics 365 Fundamentals	Prove that you understand Microsoft Dynamics 365; the Power Platform; cloud concepts; licensing options; and deployment and release options.	Exam; cost varies by region

NOTE

Can you tell us about your documentation language preferences? [Take a short survey](#).

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Learning Catalog for Dynamics 365 Supply Chain Management functional consultants

2/18/2021 • 17 minutes to read • [Edit Online](#)

Are you an implementation expert for a business domain?

The following catalog is organized from core knowledge to specific domains, and from most basic to most advanced. If content exists in multiple formats, we'll let you know, so that you can choose the training format that best meets your needs.

For functional consultants, our job-task analysis research showed that everyone must understand the core content set as well as a domain area.

Get started

CONTENT	DESCRIPTION	FORMAT	LENGTH
Learn the business value of Microsoft Dynamics 365 and the Power Platform	Are you interested in learning about business applications? Perhaps you don't know where to begin with Microsoft Dynamics 365 and Power Platform applications? Learn how the power of business applications can help transform your business.	Free, self-paced online learning path	7 hours
Dynamics 365 and Power Platform Fundamentals	Are you interested in learning about business applications? Start with this learning path to see how Dynamics 365 apps are used. Learn about cloud concepts, Power Platform, and how to get started with Dynamics 365 apps.	Free, self-paced online learning path	5.5 hours
Get started with Finance and Operations apps	Learn how Finance and Operations apps support businesses to manage their global financial systems, operational business processes, and streamlined supply chains to empower people to make fast, informed decisions. As the first step in your career of working with Finance and Operations apps, you must familiarize yourself with its features and functionality, whatever your desired role.	Free, self-paced online learning path	2 hours

CONTENT	DESCRIPTION	FORMAT	LENGTH
Before you buy	Check out the step-by-step guidance whether you're still evaluating Finance and Operations or ready to make a purchase.	Documentation	
Release plan	Find out about the latest capabilities and enhancements in Dynamics 365	Documentation	

Core platform knowledge

CONTENT	DESCRIPTION	FORMAT	LENGTH
Use Lifecycle Services to design and plan an implementation of Finance and Operations apps	Lifecycle Services (LCS) is a collaborative workspace that customers and their partners use to manage Finance and Operations apps projects from pre-sales to the implementation phase and finally to the production environment. It provides checklists and tools that help you manage the project, including pre-build methodologies to help with implementation and regularly updated services.	Free, self-paced online learning path	2 hours
Configure your organization in Finance and Operations apps	As a functional consultant who works with Finance and Operations apps, you must understand how to set up an organization for your customer. This learning path shows you, amongst other tasks, how to set up legal entities, implement security settings, personalize the user interface for users, design, and build mobile apps, and implement common integrations.	Free, self-paced online learning path	12 hours
Migrate data and go live with Finance and Operations apps	As a functional consultant, you must understand how to prepare your customer's data for migration, work with data management, and perform user acceptance testing to go live with Finance and Operations apps.	Free, self-paced online learning path	4 hours

CONTENT	DESCRIPTION	FORMAT	LENGTH
Configure and work with analytics and reporting in Finance and Operations apps	<p>Business leaders can make important decisions in their company if they have accurate insight into the underlying financial and operational data. A business user can also configure, and use the electronic reporting tool without a single line of code, to adopt new regulatory requirements and generate business documents in the required format to electronically exchange information with government bodies, banks, and other parties.</p>	<p>Free, self-paced online learning path</p>	<p>4 hours</p>
Implement Finance and Operations apps	<p>Learn the most important elements and the best practices to manage a successful Finance and Operations implementation project. From the first step where you are planning and designing your project methodology, the use of FastTrack services, the development strategy, data management and more, to the best ways for maintaining and monitoring your operations after Go-live.</p>	<p>Free, self-paced online learning path</p>	<p>11.5 hours</p>
Finance and Operations: Onboarding to Dynamics 365 (DYN542PAL2)	<p>FastTrack offers an Onboarding service to every Dynamics 365 for Finance and Operations project. In this TechTalk, we will explain the Onboarding process, walk through the content of the Onboarding session with you, and unveil how we are making Onboarding more efficient and convenient in the near future. This session is especially relevant to everybody who works with customers in the early stages of a project, between closing the license deal and initiation of the implementation project.</p>	<p>Tech Talk (recorded webinar)</p>	<p>62 minutes</p>

CONTENT	DESCRIPTION	FORMAT	LENGTH
On-Premises (Local Business Data) Deployment (DYN382PAL2)	<p>Please join this tech talk for an overview of the on-premises deployment option for Dynamics 365 for Finance and Operations, Enterprise Edition. In this session, we will look at the solution architecture of an on-premises deployment, ALM aspects, system requirements, and how to provision the Life Cycle Services project.</p>	<p>Tech Talk (recorded webinar)</p>	<p>48 minutes</p>
Go-live Planning (DYN458PAL2)	<p>We will discuss the go-live process in detail, and how best to prepare for it, in order to make it as smooth as possible for the customer, partner and Microsoft.</p>	<p>Tech Talk (recorded webinar)</p>	<p>60 minutes</p>
Environment Planning (DYN450PAL2)	<p>Please join us for this tech talk on Environment Planning. Learn about the standard environments, what other environments you might need, the options and timing for acquiring and deploying them, and the expected code and data flows between environments.</p>	<p>Tech Talk (recorded webinar)</p>	<p>53 minutes</p>
Finance and Operations: Feature Management (DYN641PAL2)	<p>Tech Talk on the Feature management experience. It provides a workspace where you can view, enable, disable, and schedule features that have been delivered in each release. By default, new features are turned off. You can use the workspace to turn them on and view the documentation for them. Attend this meeting to see what is delivered in 10.0.3 and our plans for future releases.</p>	<p>Tech Talk (recorded webinar)</p>	<p>47 minutes</p>

CONTENT	DESCRIPTION	FORMAT	LENGTH
Finance And Operations: Microsoft Managed Continuous Updates (DYN610PAL)	<p>The Continuous Update cadence for Finance and Operations has started! Please join us during this hour to discuss Microsoft Managed Continuous updates, the user experience already available in Lifecycle Services, and forthcoming updates.</p>	<p>Tech Talk (recorded webinar)</p>	<p>61 minutes</p>
Microsoft Managed Continuous Updates: What's new (DYN543PAL2)	<p>During this hour we will explain what is new since our initial announcements about Microsoft Managed Continuous updates. We will discuss the cadence of updates, how we have responded to your valuable feedback on the process, and take a look at the forthcoming Lifecycle Services user experience, through which you will be able to manage your updates.</p>	<p>Tech Talk (recorded webinar)</p>	<p>56 minutes</p>
Monitoring, Optimization Advisor & Critical KBs (DYN456PAL2)	<p>We will discuss monitoring capabilities and what Microsoft monitors for you in your production environment, the optimization advisor and how it can be extended, the "Critical X++ updates" experience in LCS, and best practices for the "Report production outage" option in LCS.</p>	<p>Tech Talk (recorded webinar)</p>	<p>40 minutes</p>
Visual Studio Team Services (VSTS) Setup (VIR782PAL)	<p>This Tech Talk will walk thru the necessary steps to configure a VSTS instance and project to connect to LCS implementation project for Dev/Test environment configuration.</p>	<p>Tech Talk (recorded webinar)</p>	<p>41 minutes</p>

CONTENT	DESCRIPTION	FORMAT	LENGTH
Copy Into Legal Entity (DYN383PAL)	<p>In this session, we will discuss a new feature in the data management framework, Copy into legal entity. We will first briefly review the new features added to the data management framework in platform 8 for the workspace, templates, and data projects and then discuss the additional functionality added for Copy into legal entity.</p>	<p>Tech Talk (recorded webinar)</p>	<p>54 minutes</p>
Regression Suite Automation Tool (DYN480PAL)	<p>We will discuss the Regression Suite Automation Tool. It significantly reduces the time and cost of user acceptance testing, when taking a Microsoft update, or before applying custom code and configurations to your Dynamics 365 for Finance and Operations production environment. It enables functional power users to record business tasks, using the Finance and Operations task recorder, and convert them into a suite of automated tests, without the need to write source code.</p>	<p>Tech Talk (recorded webinar)</p>	<p>61 minutes</p>
Finance and Operations: Regression Suite Automation Tool -- Background & Setup (DYN646PAL)	<p>This is the first of a two-part series on Regression Suite Automation Testing (RSAT). In this session, we will cover how to keep pace with continuous updates using automated testing via RSAT. Learnings and recommendations on creating task recordings and executing tests using RSAT will be covered, along with a step-by-step walkthrough of the installation and setup.</p>	<p>Tech Talk (recorded webinar)</p>	<p>70 minutes</p>

CONTENT	DESCRIPTION	FORMAT	LENGTH
Finance and Operations: Regression Suite Automation Tool -- Testing Lifecycle Demo (DYN647PAL)	<p>This is the second of a two-part series on Regression Suite Automation Testing (RSAT). This session will cover a demo of the whole cycle of creating and saving task recordings from Finance and Operations to the BPM library in LCS, synchronizing the BPM library to create test cases in Azure DevOps, grouping the test cases into test suites, and loading and executing the test suites in RSAT.</p>	Tech Talk (recorded webinar)	70 minutes
Performance Testing Approach (DYN449PAL2)	<p>Please join us for this tech talk on how to approach Performance Testing. Learn about the fundamentals, best practices for testing, available tools and techniques for executing tests and measuring performance, and how to use the results for optimization.</p>	Tech Talk (recorded webinar)	45 minutes
How to upgrade to 7.2 (July 2017) from 7.0 (RTW)/7.1 (Release 1611) (DYN338PAL2)	<p>In this session we will explain how to upgrade from Dynamics 365 Finance and Operations application v7.0 (RTW) and v7.1 (1611) to v7.2 (July 2017). We make a clear differentiation between Live customers and ongoing projects (not live yet).</p>	Tech Talk (recorded webinar)	58 minutes
Finance and Operations: Upgrading from 7.x to 8+ (DYN519PAL2)	<p>Please join us for our next TechTalk, during which we will cover the 7.X to 8.X upgrade process. We will discuss various scenarios and steps to execute for code upgrade and data upgrade. We will also cover extensibility request scenarios and how to raise them where appropriate. Part 1 of 2.</p>	Tech Talk (recorded webinar)	61 minutes
AX2012 to Dynamics 365 for Operations Upgrade (VIR817PAL2)	<p>This Tech Talk will provide an overview on how to upgrade code and data from Dynamics AX 2012 to Dynamics 365 for Operations.</p>	Tech Talk (recorded webinar)	45 minutes

CONTENT	DESCRIPTION	FORMAT	LENGTH
Analytics & Reporting Options: Printing and the Document Routing Agent	This session will discuss various printing scenarios in D365 for Operations, including tips and tricks for Document Routing Agent.	Tech Talk (recorded webinar)	60 minutes
Course MB-300T01-A: Core common features of Dynamics 365 for Finance and Operations	This course discusses core common features of Microsoft Dynamics 365 for Finance and Operations.	Instructor-led in person or online training, cost varies by region and partner	1 day
Course MB-300T02-A: Core configuration in Dynamics 365 for Finance and Operations	This course discusses core configuration tasks for Microsoft Dynamics 365 for Finance and Operations.	Instructor-led in person or online training, cost varies by region and partner	1 day
Course MB-300T03-A: Data migration and preparing for go-live with Dynamics 365 for Finance and Operations	This course discusses data migration and go-live preparation for Microsoft Dynamics 365 for Finance and Operations.	Instructor-led in person or online training, cost varies by region and partner	1 day
Implementation Lifecycle home page	These topics describe the programs, tools, and processes available related to the implementation lifecycle of your Microsoft Dynamics 365 for Finance and Operations project.	Documentation	

Manufacturing

CONTENT	DESCRIPTION	FORMAT	LENGTH
Configure and use discrete manufacturing in Dynamics 365 Supply Chain Management	If a company only produces simple products, production can be scheduled manually with the correct bill of materials (BOM) parts arriving on the production floor, at the correct time, and at the proper resource. As a functional consultant for manufacturing, you need to know how to configure Dynamics 365 Supply Chain Management for discrete manufacturing, so your customer can perform and control the production lifecycle.	Free, self-paced online learning path	16.5 hours

CONTENT	DESCRIPTION	FORMAT	LENGTH
Configure and use lean manufacturing in Dynamics 365 Supply Chain Management	<p>Lean manufacturing is a journey of continuous improvement. The goal is to produce exactly what the customer wants, when the customer wants it, and to do it economically. You can use lean manufacturing in a unified (mixed-mode) manufacturing environment that combines various supply, production, and sourcing strategies. These strategies include production orders, batch orders for process industries, purchase orders, and transfer orders. The lean manufacturing architecture in Dynamics 365 Supply Chain Management consists of production flows, activities, and Kanban rules.</p>	<p>Free, self-paced online learning path</p>	<p>12.5 hours</p>
Configure and use process manufacturing in Dynamics 365 Supply Chain Management	<p>Process manufacturing is associated with formulas and manufacturing recipes, in contrast with discrete manufacturing, which uses discrete units, and bills of materials. Process manufacturing is used in manufacturing environments where production is completed in batch or semi-continuous processes.</p>	<p>Free, self-paced online learning path</p>	<p>10.5 hours</p>
Master planning in Dynamics 365 Supply Chain Management	<p>Master planning allows companies to identify and balance the raw materials and capacity required to meet their future goals. Master planning assesses which raw materials and capacities are currently available, and which raw materials and capacities are required to complete production. For example, it identifies what must be manufactured, purchased, transferred, or set aside as safety stock before you can complete production.</p>	<p>Free, self-paced online learning path</p>	<p>5 hours</p>

CONTENT	DESCRIPTION	FORMAT	LENGTH
Use warehouse management in manufacturing in Dynamics 365 Supply Chain Management	Using warehouse management in manufacturing processes in Dynamics 365 Supply Chain Management helps optimize and streamline warehouse processes in your manufacturing environment, according to your company's needs.	Free, self-paced online learning path	10.5 hours
Course MB-320T01-A: Configure and use discrete manufacturing in Dynamics 365 for Finance and Operations	This course discusses how to configure and use discrete manufacturing in Dynamics 365 for Finance and Operations.	Instructor-led in person or online training, cost varies by region and partner	2 days
Course MB-320T02-A: Configure and use lean manufacturing in Dynamics 365 for Finance and Operations	This course discusses how to configure and use lean manufacturing in Dynamics 365 for Finance and Operations.	Instructor-led in person or online training, cost varies by region and partner	1 day
Course MB-320T03-A: Configure and use process manufacturing in Dynamics 365 for Finance and Operations	This course discusses how to configure and use process manufacturing in Dynamics 365 for Finance and Operations.	Instructor-led in person or online training, cost varies by region and partner	1 day
Microsoft Certified: Dynamics 365 for Finance and Operations, Manufacturing Functional Consultant Associate	Microsoft Certified: Dynamics 365 for Finance and Operations, Manufacturing Functional Consultants integrate digital and physical systems; improve visibility, manufacturing efficiency and flexibility; and lower costs for their clients.	Certification, cost varies by region	

Supply chain management

CONTENT	DESCRIPTION	FORMAT	LENGTH
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CONTENT	DESCRIPTION	FORMAT	LENGTH
<p>Configure and manage products and inventory in Dynamics 365 Supply Chain Management</p>	<p>Product information is the pillar of supply chain and retail applications across all industries. In the various modules of a business solution, product-specific information and configuration are required to manage the business processes that are related to products, product families, bills of materials, and product categories. Inventory reports show you in a variety of ways how much inventory you have and explain how to be more effective in your inventory investments. Master planning helps you streamline your planning based on predetermined factors, so you can efficiently plan what materials need to be purchased, transferred, or manufactured.</p>	<p>Free, self-paced online learning path</p>	<p>14 hours</p>
<p>Configure and manage procurement and vendors in Dynamics 365 Supply Chain Management</p>	<p>The process of finding and working with vendors, purchasing products, and ensuring the quality of goods and services are all important factors that impact a company's reputation and success.</p>	<p>Free, self-paced online learning path</p>	<p>14 hours</p>
<p>Configure and manage sales, and customers in Dynamics 365 Supply Chain Management</p>	<p>The process of working with customers, understanding the life cycle of the sales process, and setting up sales agreements are all important factors that impact a company's success.</p>	<p>Free, self-paced online learning path</p>	<p>7 hours</p>

CONTENT	DESCRIPTION	FORMAT	LENGTH
Master planning in Dynamics 365 Supply Chain Management	<p>Master planning allows companies to identify and balance the raw materials and capacity required to meet their future goals. Master planning assesses which raw materials and capacities are currently available, and which raw materials and capacities are required to complete production. For example, it identifies what must be manufactured, purchased, transferred, or set aside as safety stock before you can complete production.</p>	<p>Free, self-paced online learning path</p>	<p>5 hours</p>
Configure and work with warehouse management in Dynamics 365 for Finance and Operations	<p>Warehouse management in Dynamics 365 Supply Chain Management helps optimize and streamline warehouse processes according to your individual needs and provides the insight into your inventory and the tools to help increase customer satisfaction and reduce costs.</p>	<p>Free, self-paced online learning path</p>	<p>8.5 hours</p>
Configure and work with transportation management in Dynamics 365 Supply Chain Management	<p>The Transportation management module in Dynamics 365 Supply Chain Management helps you find the most efficient way to deliver goods to your customers. Transportation management calculates the least expensive and fastest way of delivering goods and lets you identify vendor and routing solutions for inbound and outbound orders.</p>	<p>Free, self-paced online learning path</p>	<p>3 hours</p>

CONTENT	DESCRIPTION	FORMAT	LENGTH
Warehousing Mobile App (VIR816PAL)	This Tech Talk will discuss the Advanced Warehousing system in Dynamics 365 for Operations and what the future holds for the advanced warehousing mobile interface. We will examine the new mobile application that has been released and how it compares to the legacy WMDP. We will learn what is required to install, configure, and operate this mobile application and how it can be used to benefit your implementations.	Free recording of a web conference	54 minutes
Vendor Collaboration (DYN327PAL)	This Tech Talk will provide a walk through on the Vendor Collaboration feature including the Consumption of Response from Vendor feature that is included in the July (spring) release.	Free recording of a web conference	58 minutes
Item And Warehouse Migration Process To Use Advanced Warehouse Management (DYN316PAL)	In this Tech Talk, we will teach you how to migrate existing warehouse setup and items with open transactions to the advanced warehouse management, by using the new capabilities to change the storage dimension group for items and enable warehouses to use the advanced warehouse management processes.	Free recording of a web conference	54 minutes
Supply chain management home page	This topic provides a list of the help topics and other resources for the supply chain management features in Microsoft Dynamics 365 for Finance and Operations.	Documentation	
Demand Replenishment for Raw Material Picking (DYN333PAL2)	This TechTalk will cover raw material picking and demand replenishment for raw material picking.	Free recording of a web conference	38 minutes
Course MB-330T01-A: Configure and use supply chain management in Dynamics 365 for Finance and Operations	This course discusses how to configure and use supply chain management in Dynamics 365 for Finance and Operations.	Instructor-led in person or online training, cost varies by region and partner	2 days

CONTENT	DESCRIPTION	FORMAT	LENGTH
Course MB-330T02-A: Use quality management, intercompany trading and master planning in Dynamics 365 for Finance and Operations	This course discusses how to use quality management, intercompany trading and master planning in Dynamics 365 for Finance and Operations.	Instructor-led in person or online training, cost varies by region and partner	1 day
Course MB-330T03-A: Configure and use warehouse, and transportation management in Dynamics 365 for Finance and Operations	This course discusses how to configure and use warehouse and transportation management in Dynamics 365 for Finance and Operations.	Instructor-led in person or online training, cost varies by region and partner	1 day
Configure Asset Management for Dynamics 365 Supply Chain Management	Asset Management is an add-in for Dynamics 365 Supply Chain Management, that is used to manage assets that are used in the daily operation of your company. Some examples of these types of assets are machinery, production equipment, and fork lifts.	Free, self-paced online learning path	7 hours
Work with Asset Management for Dynamics 365 Supply Chain Management	Asset Management is an add-in to Dynamics 365 Supply Chain Management, that is used to manage assets that are used in the daily operation of your company. Some examples of these types of assets are machinery, production equipment, and fork lifts.	Free, self-paced online learning path	12.5 hours
Microsoft Certified: Dynamics 365 for Finance and Operations, Supply Chain Management Functional Consultant Associate	Microsoft Certified: Dynamics 365 for Finance and Operations, Supply Chain Management Functional Consultants streamline cost accounting, inventory management, master planning, and warehouse management for their clients.	Certification, cost varies by region	

Exams

CONTENT	DESCRIPTION	FORMAT
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CONTENT	DESCRIPTION	FORMAT
Exam MB-300: Microsoft Dynamics 365 Unified Operations Core	This exam measures your ability to accomplish the following technical tasks: use common functionality and implementation tools; configure security, processes, and options; perform data migration; and validate and support the solution.	Exam, cost varies by region
Exam MB-330: Microsoft Dynamics 365 for Finance and Operations, Supply Chain Management	This exam measures your ability to accomplish the following technical tasks: implement product information management; implement inventory management; implement and manage supply chain processes; and implement warehouse management and transportation management and perform business processes.	Exam, cost varies by region
Exam MB-320: Microsoft Dynamics 365 for Finance and Operations, Manufacturing	This exam measures your ability to accomplish the following technical tasks: set up and configure manufacturing; create and manage production and lean orders; and create, process, and manage production batch orders.	Exam, cost varies by region

NOTE

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Learning catalog for Dynamics 365 Supply Chain Management solution architects

2/18/2021 • 12 minutes to read • [Edit Online](#)

NOTE

Effective November 2020:

- Common Data Service has been renamed to Microsoft Dataverse. For more information, see [Power Automate Blog](#).
- Some terminology in Microsoft Dataverse has been updated. For example, *entity* is now *table* and *field* is now *column*. For more information, see [Terminology updates](#).

This topic will be updated soon to reflect the latest terminology.

Do you design solutions that meet your customers' needs and budgets?

The following catalog is organized from core knowledge to specific domains, and from most basic to most advanced. If content exists in multiple formats, we'll let you know, so that you can choose the training format that best meets your needs.

Get started

CONTENT	DESCRIPTION	FORMAT	LENGTH
Dynamics FastTrack Architect Bootcamp	The Dynamics FastTrack Architect Bootcamps are EXCLUSIVELY for solution integrator partners commencing customer implementations that are governed by the Microsoft Dynamics 365 FastTrack customer success program. The FREE intensive Bootcamps are SPECIFICALLY for solution integrator partner architects assigned to FastTrack engagements and are led by senior architects from the Dynamics 365 engineering team.	Free instructor-led in-person training. Qualifications apply.	5 days

CONTENT	DESCRIPTION	FORMAT	LENGTH
Becoming a Solution Architect for Dynamics 365 and Power Platform	A Solution Architect is responsible for the successful design, implementation, deployment, and adoption of an overall solution. A Solution Architect ensures that the solution meets the customer's needs now and in the future. While the Solution Architect may not "click the buttons" during a deployment, they are ultimately responsible for the solution and work closely with the deployment team.	Free, self-paced online learning path	4 hours

Core platform knowledge

CONTENT	DESCRIPTION	FORMAT	LENGTH
Implement Finance and Operations apps	Learn the most important elements and the best practices to manage a successful Finance and Operations implementation project. From the first step where you are planning and designing your project methodology, the use of FastTrack services, the development strategy, data management and more, to the best ways for maintaining and monitoring your operations after Go-live.	Free, self-paced online learning path	11.5 hours
Go-live Planning (DYN458PAL2)	We will discuss the go-live process in detail, and how best to prepare for it, in order to make it as smooth as possible for the customer, partner, and Microsoft.	Free recording of a web conference	60 minutes
Environment Planning (DYN450PAL2)	Join us for this tech talk on Environment Planning. Learn about the standard environments, what other environments you might need, the options and timing for acquiring and deploying them, and the expected code and data flows between environments.	Free recording of a web conference	53 minutes

CONTENT	DESCRIPTION	FORMAT	LENGTH
Demo Data Packages (DYN443PAL)	Join us for this tech talk on the recently released demo data packages. You can use them to customize the demo data you need for your scenarios, and then load just what you need into an environment.	Free recording of a web conference	40 minutes
On-Premises (Local Business Data) Deployment (DYN382PAL2)	Join this tech talk for an overview of the on-premises deployment option for Dynamics 365 for Finance and Operations, Enterprise Edition. In this session, we will look at the solution architecture of an on-premises deployment, ALM aspects, system requirements, and how to provision the Life Cycle Services project.	Free recording of a web conference	48 minutes
Reduce Data Import and Export Time Using Configurations (DYN315PAL)	In this Tech Talk, we will discuss the new configuration feature in Dynamics 365 for Finance and Operations, Enterprise edition. We will show how you can set up configurations using predefined templates, copy configuration data from a legal entity to a data project and export it, and then import it into another legal entity.	Free recording of a web conference	52 minutes
Reporting Options in Dynamics 365 for Operations (VIR810PAL)	This session will discuss various printing scenarios in D365 for Operations, including tips and tricks for Document Routing Agent.	Free recording of a web conference	60 minutes
Analytics & Reporting Options: Printing and the Document Routing Agent	Join us for this tech talk on two related topics. First we will discuss Analytics and Reporting solution patterns and tools for Dynamics 365 for Finance and Operations, Enterprise Edition. Secondly, we will discuss printing scenarios and the Document Routing Agent.	Free recording of a web conference	45 minutes

Core development concepts

CONTENT	DESCRIPTION	FORMAT	LENGTH
Finance and Operations: Acceptance Test Library (DYN650PAL2)	<p>Microsoft recently made the Acceptance Test Library (ATL) publicly available. ATL is a library of around 5,000 classes that helps you author readable, performant, quality X++ tests and consistent test data, while hiding the complexity of setting up prerequisites. These are the same classes Microsoft uses internally for testing. The ATL framework's fluent API facilitates the Test Driven Development and Specification By Example software engineering approaches. Join us for this Tech Talk to learn more about it.</p>	<p>Free recording of a web conference</p>	<p>61 minutes</p>
Finance and Operations: Extending Dynamics 365 for Finance and Operations with PowerApps (DYN558PAL2)	<p>Tech Talk that discusses in detail and demonstrates extending talent applications using Microsoft PowerApps and Flow.</p>	<p>Free recording of a web conference</p>	<p>43 minutes</p>
Data Management (DYN757PAL2)	<p>Join us for this TechTalk on Data Management. Learn about the options available and the scenarios for which they are recommended. We will cover the Data Management framework, templates, database copying, cross-company data sharing, and performance considerations.</p>	<p>Free recording of a web conference</p>	<p>58 minutes</p>
Azure Integration Tools for Dynamics 365 for Finance and Operations (DYN386PAL)	<p>This TechTalk will cover the types of tools one might consider while integrating with Dynamics 365 for Finance & Operations and when to choose which integration tool. The session will also walk through some of integration scenarios orchestrated using Azure integration services.</p>	<p>Free recording of a web conference</p>	<p>63 minutes</p>

CONTENT	DESCRIPTION	FORMAT	LENGTH
Extensibility (DYN384PAL2)	<p>This session will provide an overview of the extensibility plans Microsoft has announced and the recommended path forward for partners and customers who have overlaid code. We will discuss the various methods of extending a solution, looking deep into the metadata extensibility features as well as the ability to augment and extend code. The powerful new Chain of Command feature will be demonstrated, and we will show how many extensibility features are unblocked by this technology.</p>	<p>Free recording of a web conference</p>	<p>55 minutes</p>
Integration Frameworks within Dynamics 365 for Finance & Operations (DYN385PAL)	<p>This session will provide an overview of the integration frameworks within Dynamics 365 for Finance & Operations and discuss the consideration under which these frameworks could be used.</p>	<p>Free recording of a web conference</p>	<p>64 minutes</p>
Integration Between Dynamics 365 for Sales and Dynamics 365 for Finance & Operations via Dataverse (DYN340PAL)	<p>In this Tech talk we will introduce the integration scenario known as Prospect to cash, with sales and marketing activities in Dynamics 365 for Sales and fulfillment in Dynamics 365 for Finance and Operations. We will also take a look at the Data integrator and how to modify the integration.</p>	<p>Free recording of a web conference</p>	<p>54 minutes</p>
Mobile Framework (VIR824PAL)	<p>This tech talk will walk through the mobile framework capabilities for building apps in Dynamics 365 for Operations. The session will also demonstrate some recently built apps.</p>	<p>Free recording of a web conference</p>	<p>58 minutes</p>
Integration (VIR806PAL)	<p>This Tech Talk will discuss different integration options for Dynamics 365 for Operations including code samples and demonstrations.</p>	<p>Free recording of a web conference</p>	<p>58 minutes</p>

CONTENT	DESCRIPTION	FORMAT	LENGTH
Visual Studio Team Services (VSTS) Setup (VIR782PAL)	This Tech Talk will walk through the necessary steps to configure a VSTS instance and project to connect to LCS implementation project for Dev/Test environment configuration.	Free recording of a web conference	41 minutes

Migration and upgrade

CONTENT	DESCRIPTION	FORMAT	LENGTH
Updates and upgrades for Finance and Operations apps	The world of enterprise resource planning (ERP) is continuously evolving and helping customers scale up in productivity and streamline their operations. The evolution of Finance and Operations encourages customers to upgrade their previous Microsoft Dynamics AX versions to the Finance and Operations cloud service.	Free, self-paced online learning module	1 hour
Finance and Operations: Upgrading from 7.x to 8+ (DYN519PAL2)	Join us for our next TechTalk, during which we will cover the 7.X to 8.X upgrade process. We will discuss various scenarios and steps to execute for code upgrade and data upgrade. We will also cover extensibility request scenarios and how to raise them where appropriate. Part 1 of 2.	Free recording of a web conference	61 minutes
How to upgrade to 7.2 (July 2017) from 7.0 (RTW)/7.1 (Release 1611) (DYN338PAL2)	In this session, we will explain how to upgrade from Dynamics 365 Finance and Operations application v7.0 (RTW) and v7.1 (1611) to v7.2 (July 2017). We make a clear differentiation between Live customers and ongoing projects (not live yet).	Free recording of a web conference	44 minutes
AX2012 to Dynamics 365 for Operations Upgrade (VIR817PAL2)	This Tech Talk will provide an overview on how to upgrade code and data from Dynamics AX 2012 to Dynamics 365 for Operations.	Free recording of a web conference	45 minutes

CONTENT	DESCRIPTION	FORMAT	LENGTH
AX2009 Migration Tool	This Tech Talk will cover the installation, configuration, estimation, migration methodology, and customization aspects of AX2009 Data Migration Tool.	Free recording of a web conference	57 minutes

Servicing

CONTENT	DESCRIPTION	FORMAT	LENGTH
Finance and Operations: Servicing, Supporting and Maintaining Production (DYN651PAL2)	Tech Talk on how to efficiently support, maintain, and service your Dynamics 365 for Finance and Operations production environment	Free recording of a web conference	53 minutes
Finance and Operations: Feature Management (DYN641PAL2)	Tech Talk on the Feature management experience. It provides a workspace where you can view, enable, disable, and schedule features that have been delivered in each release. By default, new features are turned off. You can use the workspace to turn them on and view the documentation for them. Attend this meeting to see what is delivered in 10.0.3 and our plans for future releases.	Free recording of a web conference	47 minutes
Finance And Operations: Microsoft Managed Continuous Updates (DYN610PAL)	The Continuous Update cadence for Finance and Operations has started! Join us during this hour to discuss Microsoft Managed Continuous updates, the user experience already available in Lifecycle Services, and forthcoming updates.	Free recording of a web conference	61 minutes
Finance And Operations: Microsoft Managed Continuous Updates: What's new - November 1, 2018 (DYN533cust)	During this hour, we will discuss updates to the Microsoft Managed Continuous update cadence as well as take a look at the user experience in Lifecycle Services.	Free recording of a web conference	59 minutes

CONTENT	DESCRIPTION	FORMAT	LENGTH
Microsoft Managed Continuous Updates: What's new (DYN543PAL2)	During this hour, we will explain what is new since our initial announcements about Microsoft Managed Continuous updates. We will discuss the cadence of updates, how we have responded to your valuable feedback on the process, and take a look at the forthcoming Lifecycle Services user experience, through which you will be able to manage your updates.	Free recording of a web conference	56 minutes
Microsoft Managed Continuous Updates (DYN474PAL2)	We will discuss Microsoft's plans for keeping your system up to date with the latest release. We will cover timelines, the cadence for major and minor updates, the planned procedures, the implications, and what you should do for optimal results.	Free recording of a web conference	62 minutes
Monitoring, Optimization Advisor & Critical KBs (DYN456PAL2)	We will discuss monitoring capabilities and what Microsoft monitors for you in your production environment, the optimization advisor and how it can be extended, the "Critical X++ updates" experience in LCS, and best practices for the "Report production outage" option in LCS.	Free recording of a web conference	40 minutes
Microsoft Managed Continuous Updates (DYN474PAL2)	This Tech Talk will provide a walk-through on punch out functionality and will cover the setup of an external catalog via purchase requisition scenario.	Free recording of a web conference	42 minutes

Testing

CONTENT	DESCRIPTION	FORMAT	LENGTH
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CONTENT	DESCRIPTION	FORMAT	LENGTH
Microsoft Managed Continuous Updates (DYN474PAL2)	<p>After all customer requirements have been handled by either configuration, customization, and integration, you need to know how to perform user acceptance testing (UAT) in Finance and Operations apps to validate the solution. User acceptance testing is an important step in the go-live preparation.</p>	<p>Free, self-paced online learning module</p>	<p>1 hour</p>
Finance and Operations: Regression Suite Automation Tool - Background & Setup (DYN646PAL)	<p>This is the first of a two-part series on Regression Suite Automation Testing (RSAT). In this session, we will cover how to keep pace with continuous updates using automated testing via RSAT. Learnings and recommendations on creating task recordings and executing tests using RSAT will be covered, along with a step-by-step walkthrough of the installation and setup.</p>	<p>Free recording of a web conference</p>	<p>70 minutes</p>
Finance and Operations: Regression Suite Automation Tool - Testing Lifecycle Demo (DYN647PAL)	<p>This is the second of a two-part series on Regression Suite Automation Testing (RSAT). This session will cover a demo of the whole cycle of creating and saving task recordings from Finance and Operations to the BPM library in LCS, synchronizing the BPM library to create test cases in Azure DevOps, grouping the test cases into test suites, and loading and executing the test suites in RSAT.</p>	<p>Free recording of a web conference</p>	<p>70 minutes</p>
Finance and Operations: Performance Benchmark for Dynamics 365 (DYN550PAL2)	<p>In this Tech Talk, we will describe an approach for preparing and delivering a performance benchmark on Microsoft Dynamics 365 for Finance and Operations. We will present the process, main concepts, and tools before illustrating a simple case with a demonstration.</p>	<p>Free recording of a web conference</p>	<p>68 minutes</p>

CONTENT	DESCRIPTION	FORMAT	LENGTH
Finance and Operations: Performance Key Patterns and Anti-patterns for Dynamics 365 (DYN549PAL)	In this Tech Talk, we will present efficient performance patterns that we have seen project teams implement successfully. We will also describe anti-patterns that can lead to serious performance degradation of the Microsoft Dynamics 365 for Finance and Operations environment.	Free recording of a web conference	58 minutes
Regression Suite Automation Tool (DYN480PAL)	We will discuss the Regression Suite Automation Tool. It significantly reduces the time and cost of user acceptance testing, when taking a Microsoft update, or before applying custom code and configurations to your Dynamics 365 for Finance and Operations production environment. It enables functional power users to record business tasks, using the Finance and Operations task recorder, and convert them into a suite of automated tests, without the need to write source code.	Free recording of a web conference	61 minutes
Performance Testing Approach (DYN449PAL2)	Join us for this tech talk on how to approach Performance Testing. Learn about the fundamentals, best practices for testing, available tools, and techniques for executing tests and measuring performance, and how to use the results for optimization.	Free recording of a web conference	45 minutes

Exam

CONTENT	DESCRIPTION	FORMAT
Exam MB-700: Microsoft Dynamics 365: Finance and Operations Apps Solution Architect	This exam measures your ability to accomplish the following technical tasks: identify solution requirements; design solution components; and define solution testing and management strategies.	Exam, cost varies by region

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

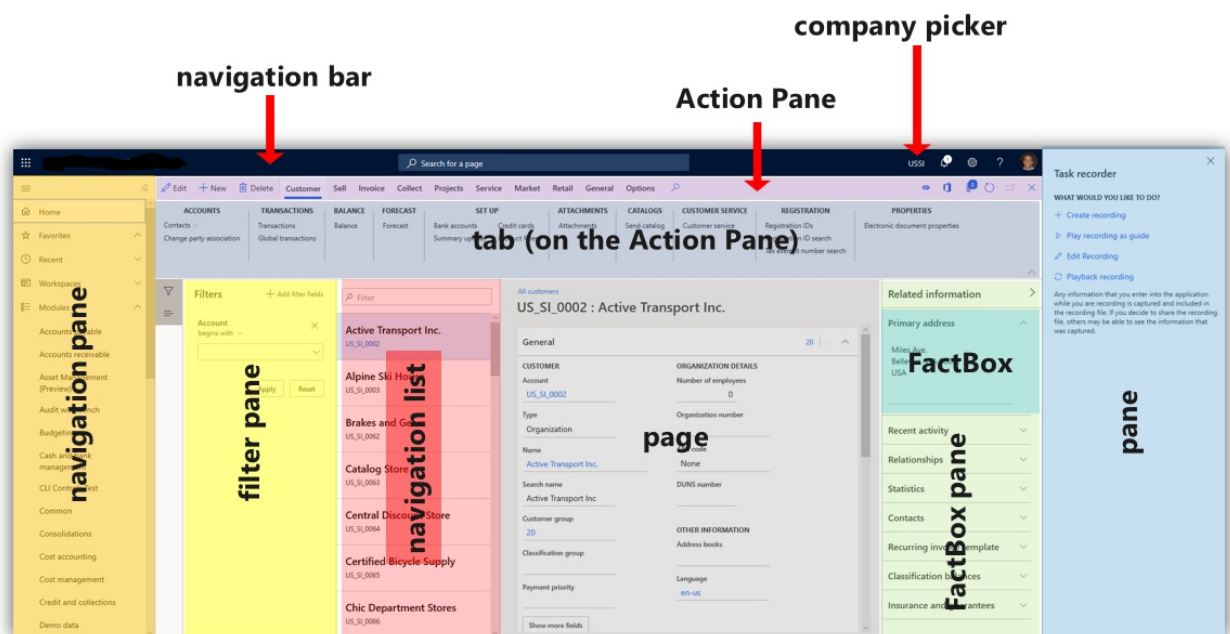
User interface elements

2/18/2021 • 3 minutes to read • [Edit Online](#)

This topic describes the user interface (UI) elements used in the app. Before users can navigate the interface, it's important to know the names and functions of the elements that make up the interface.

Overview

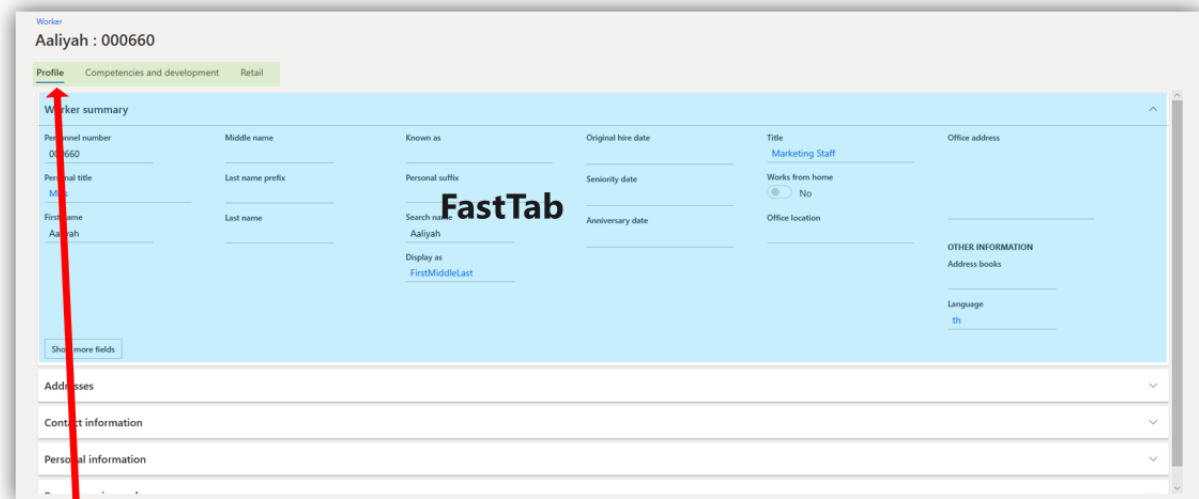
- **Action Pane** - The bar beneath the navigation bar. Here, you can select tabs to change records shown in the page. You can edit and save the records here.
- **FactBox** - You can see information and follow the activities of certain records in this pane.
- **FactBox pane** Here, you can scroll through different aspects of a record to view in the FactBox.
- **Filter pane** - On some pages, you can select **Show filters** to open this pane. It allows you to narrow the results visible to you on the page.
- **Navigation bar** - The bar at the top of the interface. It contains the **Dynamics 365 portal**, **Search**, **company picker**, **Action center**, **Settings**, **Help & Support**, and the user profile.
- **Navigation list** - On some pages, you can scroll through this pane to find a specific record. When selected, the details of the record will appear in the page.
- **Navigation pane** - The left-most pane. From here, you can find any page in the product.
- **Page** - The central focus of the interface. Selections made on the other UI components will affect what records are shown here.
- **Pane** - The right-most pane. This will open in some cases when aspects of a record need to be changed and saved.
- **Tab** - When referring to the Action Pane, it's a menu of options that appears when you select a given option in the Action Pane.



Tabs, fields, and sections

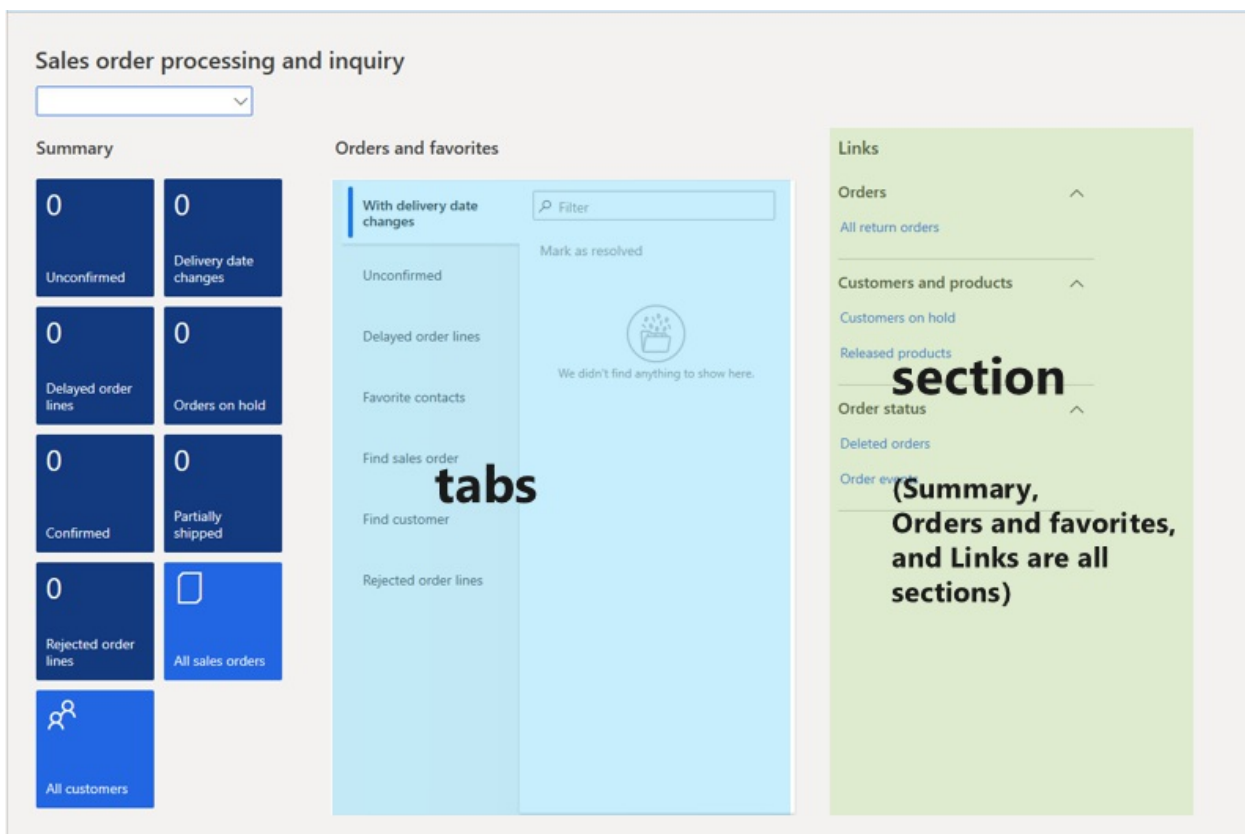
A *tab* is a selection made on the page that opens a different aspect of a record on the same page. Often, it will allow you to change certain *fields*, or UI elements that allow typed input.

A *FastTab* is a tab with the added benefit of allowing multiple tabs to be visible at the same. You can expand a FastTab by selecting the downward-pointing arrow on the right end of it.



tabs

A *section* is similar to a tab. The word "section" is often used to describe any area of a page that organizes a specific category of information. In the following image, Summary, Orders and favorites, and Links are all examples of sections.



Dialog boxes and drop-down menus

A *dialog box* is a pane that opens when certain selections are made to change or create a record. Dialog boxes contain fields that allow you to enter typed input. Sometimes, a given field will allow you to select a downward facing arrow that opens a list of options to choose from. This is called a *drop-down menu*. In the following image, the **Type** and **Customer group** fields contain the option to open a drop-down menu.

In some cases, a dialog box will open near a given button when you select it. This is called a *drop-down dialog box*. In the following image, the **As of date** button was selected, which opened a drop-down dialog box.

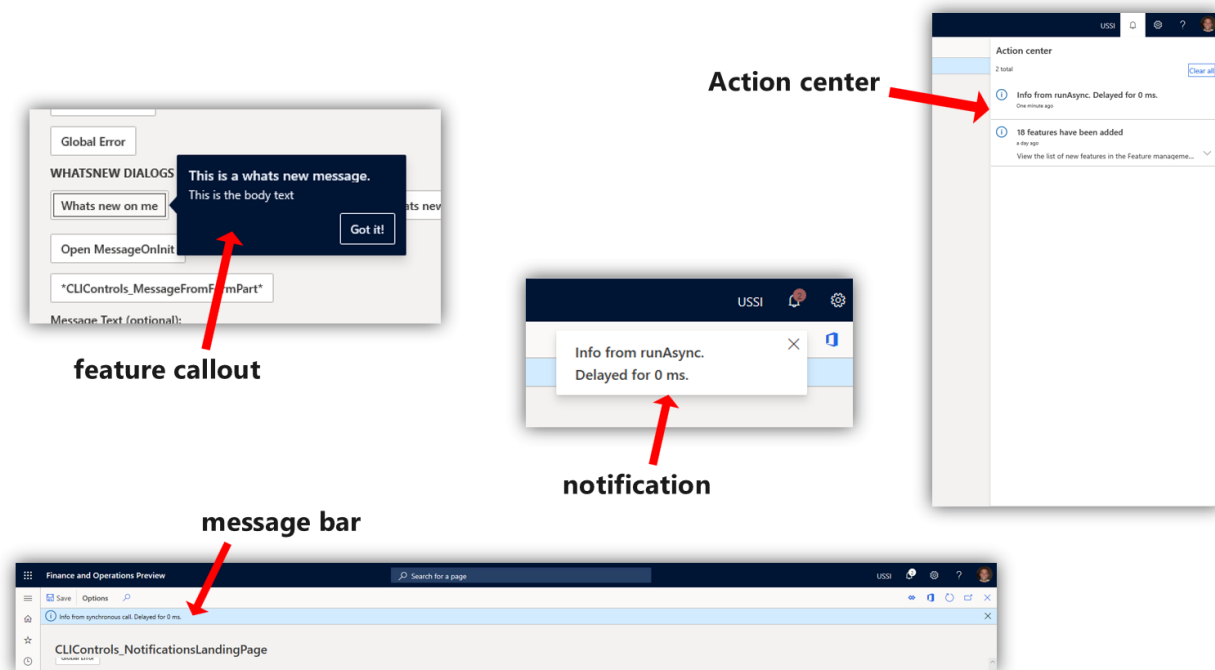
Notifications

Certain changes to the objects you oversee will appear as *notifications*. Notifications may notify you when a specific customer's information has been changed, or it may alert you when the system can't accept inputs you've added in certain fields. You can learn how to customize what you receive notifications about in the [Alerts overview](#).

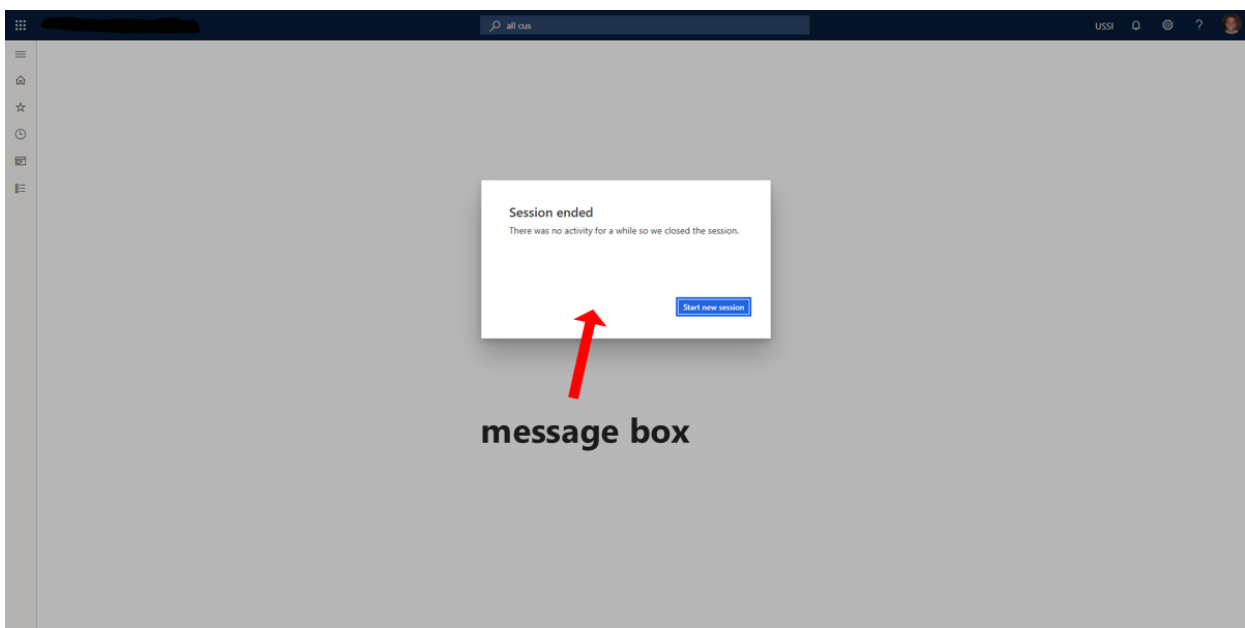
Notifications appear in a variety of ways.

- **Feature callout** - This will appear next to a field, tab, or other button to offer an explanation of what the feature is used for.
- **Action center** - A box that contains the notification will appear next to the Action center button on the navigation bar. You can see details about the notification by selecting **Action center**.
- **Message bar** - This will appear beneath the Action Pane.

The following image shows examples of these types of notifications.



- **Message box** - This will appear over the interface and must be interacted with before you can continue to use the product.



Toolbars, grids, and lists

A *toolbar* contains tools, such as the ability to add fields or remove records. Sometimes, a toolbar will appear on the page above a *grid*. This area, *grid*, is a name given to rows of records with various columns of data. Not all grids have toolbars above them.

A *list* is the name given to a collection of records that you can scroll through. You can bring these records into the page by selecting them. Often, this will open a grid.

toolbar

The screenshot displays the Dynamics 365 Finance and Operations Preview interface. At the top, there is a navigation bar with various menu items like 'Edit', 'New', 'Delete', 'Sales order', 'Sell', 'Manage', 'Pick and pack', 'Invoice', 'Retail', 'General', 'Warehouse', 'Transportation', and 'Options'. Below this is a secondary navigation bar with categories such as 'NEW', 'MAINTAIN', 'PAYMENTS', 'COPY', 'VIEW', 'FUNCTIONS', 'ATTACHMENTS', and 'EMAIL NOTIFICATION'. The main content area shows a sales order for '000768 : Contoso Retail San Diego'. On the left, there is a list of other sales orders, with the word 'list' overlaid on it. The central part of the screen features a table of sales order lines with columns for 'Item number', 'Product name', 'Sales category', 'Quantity', 'Unit', and 'Delivery type'. The word 'grid' is overlaid on this table. At the bottom, there is a section for 'Line details'. A red arrow points from the word 'toolbar' above to the top navigation bar.

T.	Variant number	Item number	Product name	Sales category	CW quantity	CW unit	Quantity	Unit	Delivery type
		T0001	SpeakerCable / Speaker cable 10	Accessories			-58.00	ea	Stock
		T0004	TelevisionMT2037 / Television ...	Television			-58.00	ea	Stock
		T0002	ProjectorTelevision	Television			-35.00	ea	Stock
		T0005	TelevisionHDTVXS9052 / Televis...	Television			-23.00	ea	Stock
		T0003	SurroundSoundReceive	Receivers			-35.00	ea	Stock

NOTE

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Accessibility features

2/18/2021 • 4 minutes to read • [Edit Online](#)

This topic describes the functionality that is designed to help users who have various disabilities use this app. For example, there are features for people who use sight-assistive technologies such as Microsoft Windows Narrator.

Windows Narrator and keyboard-only access

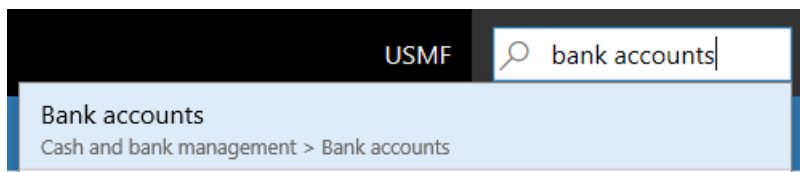
Every field and control has a label and a description of applicable shortcuts. A screen reader can read the label and description.

Shortcuts for the most frequently performed actions

For most users, everyday system use involves lots of data entry and keyboard interaction. To enhance the user experience, we have created shortcuts to help you "jump" around the screen and shortcuts for specialized actions. For more information, see [Keyboard shortcuts](#).

Navigation search

Any page that is accessed by using the Navigation pane menu, the left-most pane, is also available from the Search box. Press Alt+G to move focus to the Search box, and then type the name or description of the page.



For more information, see [Navigation search](#).

NOTE

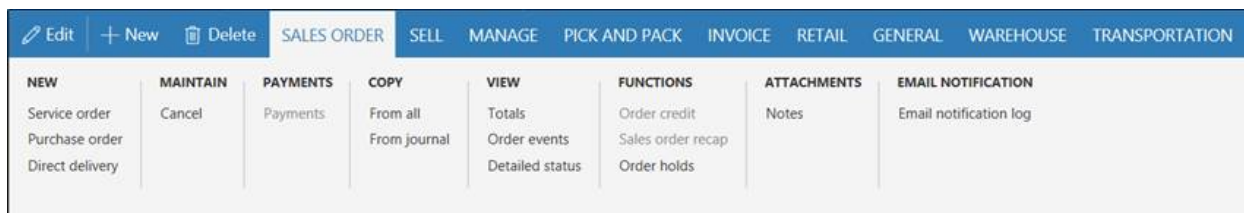
You can navigate directly to top-level pages only. Secondary pages rely on information or context from their parent page.

Action search for keyboard-only users or for heads-down data entry

Every action that is provided on a page can be accessed from a keyboard, via the tab sequence. Information about the tab sequence is provided later in this topic. To run actions more directly, you can use the action search functionality.

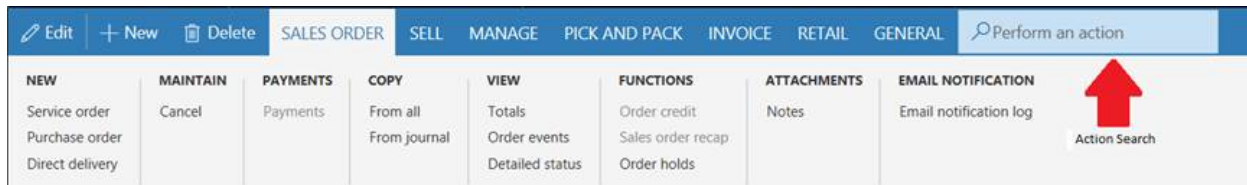
Example

You want to run the **Email notification log** action that appears in the **Email notification** group on the **Sales order** tab on the Action Pane.

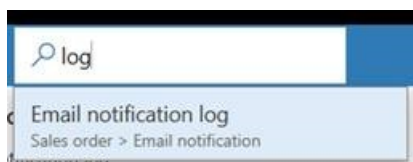
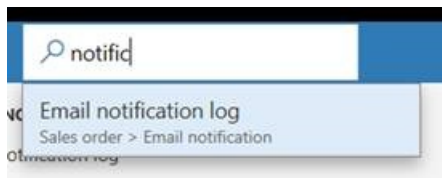
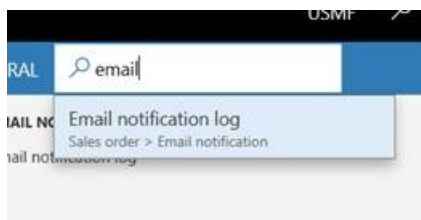


One option is to use your keyboard. Press Ctrl+F6 to move focus to the Action Pane, and then press Tab repeatedly to move through all the tabs and actions, until the **Email notification log** action has focus.

However, you can also run the action more directly. From anywhere on the page, press Ctrl+Apostrophe (') to show the search box for actions.



In the search box, type words that describe the action. The action is made available to you, and you can run it directly. For example, by typing **email**, **notific** (a partial word), or **log**, you can "jump" to the Email notification log functionality.



When you've finished, you can press Ctrl+Apostrophe again to return focus to the field that you were working with before you ran the action search.

For more information, see [Action search](#).

Tab sequence

In everyday system use, not every field is required in order to perform typical tasks. Therefore, by default, the tab sequence is "optimized." Tab stops are set only on those fields that are essential for typical scenarios.

However, you might find that some fields that you often use to perform tasks aren't included in the default tab sequence. In this case, if you use Windows Narrator, you can use Windows Narrator's keyboard actions to access those fields and inspect their content. Alternatively, you can turn on the **Enhanced tab sequence** option on the **Options** page. This option makes all editable and read-only fields part of the tab sequence. You can then use page personalization to create a custom tab sequence and omit fields that don't have to be part of the tab sequence. For more information about personalization, see [Personalize the user experience](#).

Accessibility

Enhanced tab sequence
Yes

Form patterns

Almost 90 percent of the pages in the app are based on a small set of patterns. These patterns are referred to as *form patterns*. Each form pattern is used to provide the actions that are most often performed on the page. A form pattern helps guarantee familiarity and ease of understanding, because frequently used actions and data are always presented in the same location on different pages. Because of the small number of form patterns, users can easily learn the system, regardless of the number of pages in it, and can confidently use it after they recognize the form patterns.

To learn more about form patterns, see [Form styles and patterns](#).

Responsive layout

The product is designed to work on various devices and form factors, from the smallest screens to large screens that have the highest resolution. Our responsive layout engine lets users zoom in to a magnification level of 200 percent (or, in some scenarios, more than 200 percent).

On smartphones and other small screens, the controls and the form layout will responsively adapt to ensure that the core data is favored. These responsive behaviors can also include reducing the number of columns in groups and tabs to a single column, hiding shell elements, and collapsing the Action Pane.

Guidance to help developers and customers incorporate accessible thinking in their customizations

To learn more about Microsoft best practices for enabling accessibility, see [Accessibility in forms, products, and controls](#).

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Feature management overview

2/18/2021 • 13 minutes to read • [Edit Online](#)

Features are added and updated in every release. The Feature management experience provides a workspace where you can view a list of features that have been delivered in each release. By default, new features are turned off. You can use the workspace to turn them on and view the documentation for them.

The Feature management workspace

You can open the **Feature management** workspace by selecting the appropriate tile on the dashboard. You will see a page that shows a list of features for all releases that are supported by the Feature management experience. Over time, Microsoft will enhance the Feature management experience so that it includes more functionality to help you manage features.

The feature list includes the following information:

- **Feature name** – A description of the feature that was added.
- **Enabled status** – A symbol indicates whether a feature has been turned on (check mark), hasn't been turned on (blank), is scheduled to be turned on (clock), is mandatorily turned on (lock), requires attention before you turn it on (warning), or can't be enabled (X). The setting that is shown is used for all legal entities. Note that even when a feature has been turned on, it's still controlled by security. Therefore, the feature will be available only to users who have access to it, based on their security role. It will also be available only in legal entities that the user has access to.
- **Enable date** – The date when the feature was turned on or is scheduled to be turned on.
- **Feature added** – The date when the feature was added to your environment. This date is automatically entered when you update your environment during the monthly release cycles.
- **Module** – The module that is affected by the new feature.

When you select a feature, more information appears in the details pane to the right of the feature list. At the top of the pane, you will see the feature name, the date when the feature was added, the module that is affected by the feature, and a **Learn more** link. Select this link to view the documentation for the feature. If documentation isn't available, you're taken to a temporary page. The details pane also includes a **Comments** field where you can add your own comments about the feature.

The **Feature management** workspace also has several tabs, each of which shows a list of features.

- **New** – This tab shows all features that have been added since the last monthly update. If you've skipped any monthly updates, the tab shows all the new features that have been added since the last time that you updated. The newest features appear at the top of the list. The total number of new features is also shown on a tile at the top of the page.
- **Not enabled** – This tab shows all features that haven't been turned on. The newest features appear at the top of the list. The total number of new features that haven't been turned on is also shown on a tile at the top of the page.
- **Scheduled** – This tab shows all features that have been scheduled to be turned on in the future. The features that have the earliest scheduled date appear at the top of the list. The total number of schedule new features is also shown on a tile at the top of the page.
- **All** – This tab shows all features. The newest features appear at the top of the list.

Turn on a feature

If a feature hasn't been turned on, an **Enable Now** button appears in the details pane. You can use this button to

turn on the feature.

- Select the feature to turn on, and then, in the details pane, select **Enable Now**. The feature is turned on.

Some features can't be turned off after you turn them on. If the feature that you're trying to turn on can't be turned off, you receive a warning. At that point, you can select **Cancel** to cancel the operation and leave the feature turned off. However, if you select **Enable** to turn on the feature, you won't be able to turn it off later.

Some features will display a message that provides additional information before you turn them on. These features are indicated by a yellow warning symbol. You should read the additional information carefully to better understand what will happen when the feature is enabled. However, you can still select **Enable** to turn on the feature.

Some features will display a message that the feature can't be enabled until an action is taken. These features are indicated by a red X symbol. You must take the actions described in the description before the feature is enabled. For example, if you can't use a feature until a configuration key is disabled, then you must disable the configuration key first and then return to Feature management to enable the feature.

After a feature is turned on, a message appears below the **Learn more** link in the details pane. This message either states that the feature was turned on or it indicates that the future date when the feature is scheduled to be turned on. It appears every time that you select the feature in the feature list.

Features that are scheduled to be turned on in the future appear on the **Scheduled** tab. A batch process will turn them on at midnight on the specified date, based on the time zone that is represented by the system date.

Reschedule a feature

If a feature has been scheduled to be turned on in the future, a **Schedule** button appears in the details pane. You can use this button to change the **Enable date** value to a different date.

1. Select the scheduled feature to reschedule, and then, in the details pane, select **Schedule**.
2. In the dialog box that appears, in the **Enable date** field, specify the new date when the feature should be turned on.
3. Select **Enable** to reschedule the feature or **Disable** to cancel the schedule.

Turn off a feature

If a feature has already been turned on, a **Disable** button appears in the details pane. You can use this button to turn off the feature. The **Disable** button isn't available if the feature can't be turned off after it's turned on.

- Select the feature to turn off, and then, in the details pane, select **Disable**. The feature is turned off, and the **Enable date** field is cleared.

After a feature is turned off, a message appears below the **Learn more** link in the details pane. This message states that the feature hasn't yet been turned on. It appears every time that you select the feature in the feature list. Features that haven't been turned on appear on the **Not enabled** tab.

Features that must be turned on

Sometimes, a critical feature is delivered that must be turned on automatically when you do an update. These features will be turned on automatically on the date that is specified in the **Enable date** field. For these features, a message appears below the **Learn more** link in the details pane. This message either states that the feature was turned on or indicates the future date when the feature will be turned on. It appears every time that you select the feature in the feature list.

Enable all features

By default, all features that are added to your environment are turned off. You can enable all features by

selecting the **Enable all** button.

When you select **Enable all**, an option will appear where you need provide the following information:

- A list of all features that require confirmation before they can be enabled. If you want to enable the features in the list, select **Yes** for the **Enable features requiring confirmation** button.
- A list of all features that can't be enabled will be shown. Those features will not be enabled.

All features that can be enabled will be enabled. If a feature is already scheduled to be enabled in the future, the schedule will not change.

Turn on all features automatically

By default, all features that are added to your environment are turned off, unless they are mandatory features. However, if you want to automatically turn on all new features, you can use the drop-down list under the workspace title to change what occurs when new features are added.

- Select `Enable new features automatically` to automatically turn on all new features when they are added to your environment.
- Select `Do not enable new features automatically` to default all new features to off when they are added to your environment.

When you enable all feature automatically, it will enable all of the features that would be enabled when you click the **Enable all** button. It will not enable the features that require confirmation or the features that can't be enabled until an action is taken.

Check for updates

Features are added to your environment after each update. However, you can manually check for updates by clicking on the **Check for updates** button. Any feature that was added to the system after the update will be added to the list of features. For example, if a flighted feature is enabled after a release, then you can check for updates and the feature will be added to your list.

Assigning roles

The **Feature management** workspace can be opened by system admins, and also by users who are assigned to the Feature manager role or the Feature viewer role. These two roles were created to support the Feature management experience. Users in the Feature manager role can turn any feature on or off. They can also update the **Comments** field for the feature. Users in the Feature viewer role can only view the **Feature management** workspace. They can't turn features on or off.

The Feature manager role and Feature viewer role don't override the existing security that a user has. They just control whether the user can turn features on and off. They don't provide access to the features themselves.

Features that use configuration keys

If a feature uses a configuration key, but the configuration key isn't turned on, the **Feature management** workspace doesn't show the feature in the list of available features. After you turn on the configuration key, you must update the feature list by using the **Check for update** menu item. The feature then appears in the feature list.

If you turn off the configuration key, the feature isn't removed from the feature list.

Data entities

A data entity that is named **Feature management** lets you export the Feature management settings from one environment and then import them into another environment. This entity updates only existing features. The

business logic in the entity also helps guarantee that the same rules that are used on the **Feature management** workspace will be applied when the import is done. For example, you can't override a mandatory feature setting by removing the date during import.

The following examples describe what occurs when you use the **Feature management** entity to import data.

- If you change the value of the **Enabled** field to **Yes**, the feature is turned on, and the **Enable date** field is set to the current date.
- If you change the value of the **Enabled** field to **No** or leave the **EnableDate** field blank, the feature is turned off, and the **Enable date** field is cleared. You can't turn off a mandatory feature or a feature that can't be turned off after it's turned on.
- If you change the value of the **EnableDate** field to a future date, the feature is scheduled for that date.
- If you change the value of the **Enabled** field to **Yes** and change the value of the **EnableDate** field to a future date, the feature is scheduled for that date.
- If you change the value of the **Enabled** field to **No**, but you also change the value of the **EnableDate** field to a future date, the feature is scheduled for that date.
- If a feature is turned on, and you add an **EnableDate** field that is set to a future date, the feature remains turned on. To reschedule the feature, you must change the **Enabled** field to **No**.

Feature management and flighting

Feature management lets you control the features that are delivered in each release. Flighting lets Microsoft teams release features to a limited number of customers, so that those features can be tested and validated without affecting all customers. Feature management doesn't control the flighting of any features.

New features are optional for 12 months

When a new non-critical feature is installed, it will be optional for a 12-month period. This allows you and your organization time to plan ahead for when to uptake a feature and have it tested against your daily operations. For more information, see [One Version service updates FAQ](#).

Using Feature management to turn on ISV features or custom features

Feature management is currently unavailable for features from independent software vendors (ISVs) and custom features. However, Microsoft is adding more functionality to enhance Feature management. After those enhancements are completed, Microsoft will make Feature management available to all features and provide instructions for updating your features to use it.

Frequently asked questions (FAQ)

When are features added, removed, or changed?

Features are added, removed, and changed through code changes. Environments need to be updated to receive those changes.

Does a feature become mandatory automatically?

No, a feature becoming mandatory is not an automatic action. The product teams need to make a code change.

When do features become mandatory?

The policy is that all new features will be opt-in for a 12-month period and will not require any change management until you enable the feature. The product teams can choose whether to make a feature mandatory after that period has ended.

Why isn't there a specific 'mandatory-enabled date'?

Update release timing is variable, environment update timing is variable, and customers can opt to skip some updates. As a result, specific dates are difficult to determine.

Where's the documentation for features that are being made mandatory?

This documentation comes from the application teams. Often, these will be mentioned in [Removed or deprecated features](#).

Is there an in-product notification or signal that a feature is going to be mandatory-enabled?

A notification mechanism related to making a feature mandatory does not exist today.

Do features ever get enabled without the customer knowing about it?

Yes, if features don't have a functional impact then they can be enabled by default.

What is feature flighting and how does it relate to feature management?

Feature flights are real-time on/off switches that Microsoft controls. They are separate from the customer control provided by Feature Management.

- Private Preview features will not be listed in Feature Management until they are flighted on. In production, the customer needs to agree to be part of a special program for that to occur.
- Public Preview and Released (generally available) features will be listed in Feature Management unless they are flighted off. Flighting a feature off is considered a last resort option for product teams if a critical issue is found and would usually be a per-customer operation.

Do features ever get flighted off without the customer knowing about it?

Yes, if a feature is impacting the functioning of an environment that doesn't have a functional impact then they can be enabled by default.

How can feature enablement be checked in code?

Use the `isFeatureEnabled` method on the `FeatureStateProvider` class, passing it an instance of the feature class. Example:

```
if (FeatureStateProvider::isFeatureEnabled(BatchContentionPreventionFeature::instance()))
```

How can feature enablement be checked in metadata?

The `FeatureClass` property can be used to indicate that some metadata is associated with a feature. The class name used for the feature should be used, such as `BatchContentionPreventionFeature`. This metadata is visible only in that feature. The `FeatureClass` property is available on menus, menu items, enum values, and table/view fields.

What is a feature class?

Features in Feature Management are defined as *feature classes*. A feature class implements `IFeatureMetadata` and uses the feature class attribute to identify itself to the Feature Management workspace. There are numerous examples of feature classes available that can be checked for enablement in code using the `FeatureStateProvider` API and in metadata using the `FeatureClass` property. Example:

```
[ExportAttribute(identifierStr(Microsoft.Dynamics.ApplicationPlatform.FeatureExposure.IFeatureMetadata))]  
internal final class BankCurrencyRevalGlobalEnableFeature implements IFeatureMetadata
```

What is the IFeatureLifecycle implemented by some feature classes?

`IFeatureLifecycle` is a Microsoft-internal mechanism for indicating the feature lifecycle stage. Features can be:

- `PrivatePreview` - Needs a flight to be visible.
- `PublicPreview` - Shown by default but with a warning that the feature is in preview.
- `Released` - Fully released.

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Client FAQ

2/18/2021 • 2 minutes to read • [Edit Online](#)

This article provides answers to frequently asked questions about the Finance and Operations client.

Why aren't symbols loaded?

The security settings on your browser might prevent the symbols from being loaded correctly. To resolve this issue, try the following steps:

- If you're experiencing this issue in Internet Explorer, click **Tools**, and then click **Internet Options**. In the Internet Options dialog box, on the **Privacy** tab, click **Custom level**, and make sure the **Font download** option is selected.
- Otherwise, you might have to add the app site to the list of trusted sites.

I miss the ribbon from Dynamics AX 2012. Can I keep Action Pane tabs open all the time?

We are planning to implement this feature soon. Users will then be able to choose to keep the tabs on Action Panes open all the time. Otherwise, the tabs will be collapsed when they aren't being used, to gain more screen space for the page.

Why do I sometimes see different shortcut menus when I right click?

If you right-click in an editable field (or if text is selected), the browser's shortcut menu is displayed. This menu gives you access to the **Cut**, **Copy**, and **Paste** commands. We can't embed these commands into the shortcut menus because, for security reasons, browsers don't allow us to programmatically access the system clipboard.

If you right-click a field label or the value of a read-only control, you'll see the shortcut menu.

To make keyboard access easier, we plan to implement a keyboard shortcut in the future that will open the shortcut menu.

Where is the View details functionality?

The **View details** option is available in a couple of ways:

- If a control has **View details** capabilities, and if the control has a value, that value is displayed as a hyperlink. You can click the hyperlink to open a page that contains additional details.
- **View details** is also an option on shortcut menus. For more information about when shortcut menus are displayed when you right-click, see the previous section.

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

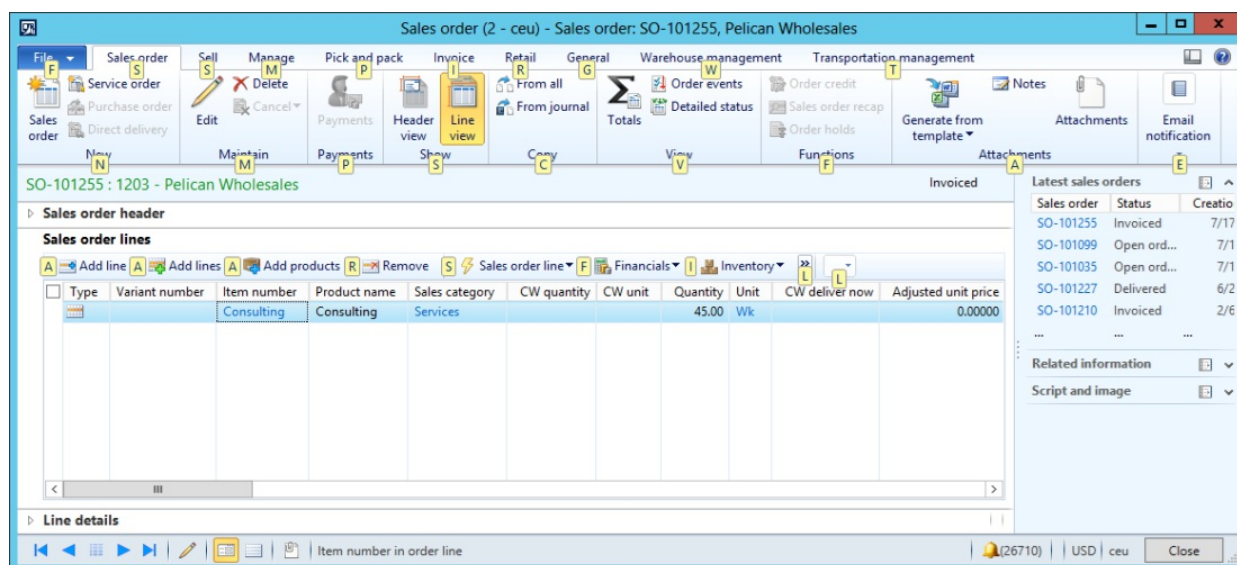
Action search

2/18/2021 • 3 minutes to read • [Edit Online](#)

This article describes the action search functionality. Action search will help you find and run actions on a page.

Introduction

Pages primarily expose commands on Action Panes, both the standard Action Pane that appears at the top of a page and the toolbars that appear in various sections of the page. In previous versions, a Key Tips feature let you quickly access any button on an Action Pane by pressing the Alt key and then a series of letters.



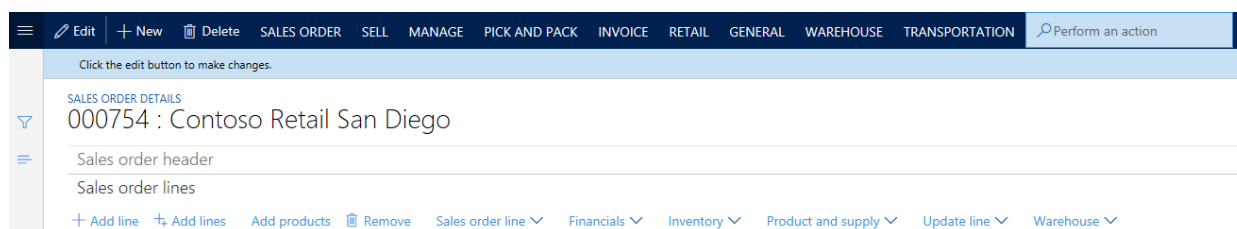
The action search feature replaces Key Tips, which are no longer available. This new feature lets you quickly search for and run a button from any visible Action Pane.

Using action search

To use the action search feature, follow these steps.

1. On the Action Pane, click in the **action search** field. (The **action search** field contains a magnifying glass icon.)
2. Type all or part of the name of the button that you want to run. You can also search by using words from the button's "path." (For more information, see the next section of this article.) Typically, a button will appear near the top of the results list after you've typed two to four characters.
3. Find and run the button in the results list (by using your mouse or keyboard).

After the button is run, the focus is returned to your last position on the page, so that you can continue to work.



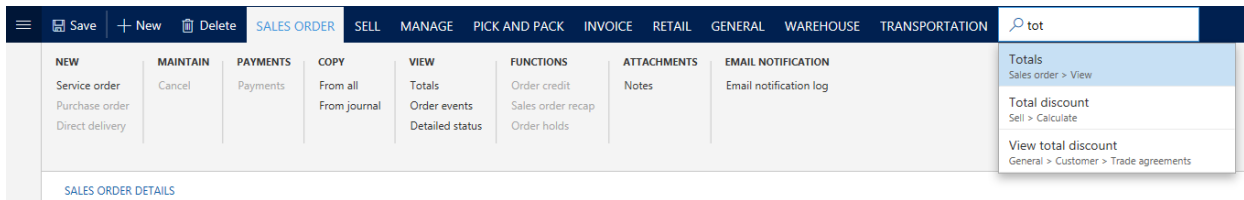
You can also start action search by pressing Ctrl+/, or Alt+Q. Press the keyboard shortcut again to return the focus to your last position on the page.

Understanding the results list

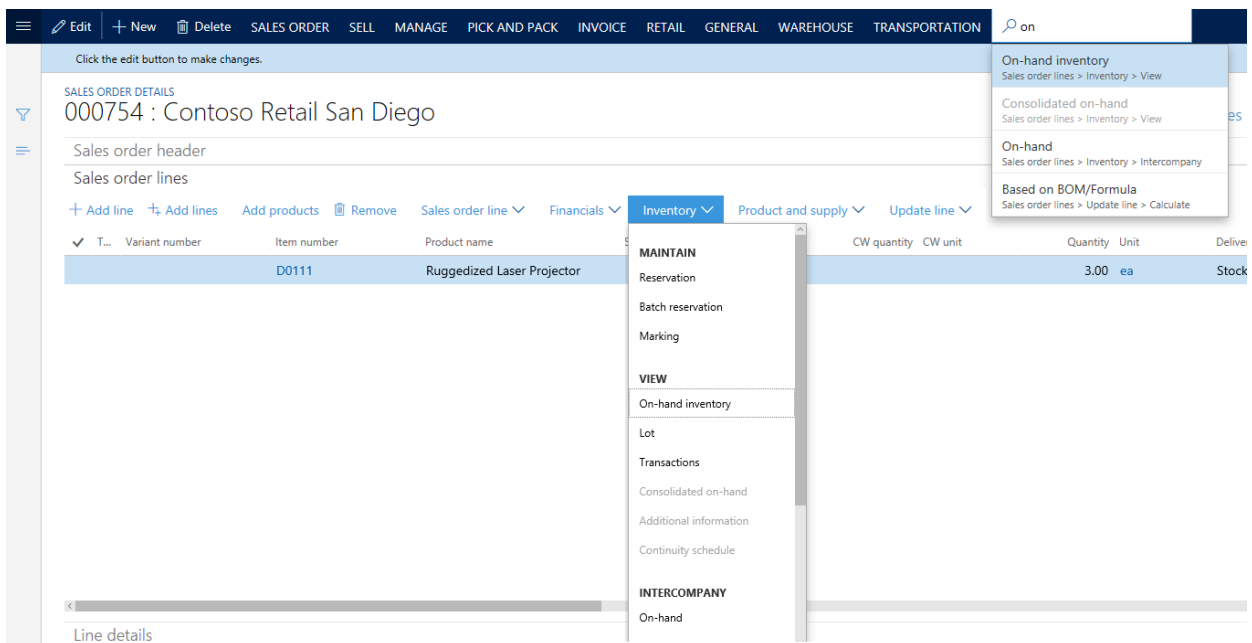
Often, you must know both the location and the context of a button to fully understand the purpose of that button. Therefore, the results list shows additional information to help you understand exactly which buttons appear in the list. In particular, the "path" of the button is shown. This path might include the labels of the following UI elements, as relevant:

- Action Pane tab
- Button group
- Menu button (if the button is inside a menu button)
- Menu separator (if the button is inside a named group inside a menu button)
- Group or tab on the page (for example, the name of a FastTab)

For example, you typed **tot** in the **action search** field and are now examining the results list. The first entry, for a button that is named **Totals**, is highlighted. A button path of **Sales order > View** is also shown. The **Sales order** part of the path corresponds to the **Sales order** tab on the Action Pane, and the **View** part of the path corresponds to the **View** group on that tab. Similarly, the path of the **Total discount** button (**Sell > Calculate**) informs you that this button is located in the **Calculate** group on the **Sell** tab of the Action Pane. Therefore, this information helps you understand exactly which button will be triggered by action search (if you select that button in the results list).



In the previous example, action search showed results from the standard Action Pane at the top of a page. However, action search also shows results from visible toolbars that are in other places on the page. For example, you're searching for the **On-hand inventory** button that is on the **Sales order lines** FastTab. In this case, the button path in the results list (**Sales order lines > Inventory > View**) informs you that this button is under the **View** heading on the **Inventory** menu button on the **Sales order lines** FastTab.



NOTE

There are some buttons that do not show up in Action search. These include drop dialog buttons and buttons from subforms.

Action search vs. Navigation search

Whereas action search is intended to find and run actions on a page, there is a separate search mechanism for finding and navigating to pages. For more information about that feature, see the [Navigation search](#) article.

NOTE

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Advanced filtering and query syntax

2/18/2021 • 4 minutes to read • [Edit Online](#)

This topic describes the filtering and query options that are available when you use the Advanced filter/sort dialog or the **matches** operator in the Filter pane or grid column header filters.

Advanced query syntax

SYNTAX	CHARACTER DESCRIPTION	DESCRIPTION	EXAMPLE
<i>value</i>	Equal to the value that is entered	Type the value to find.	Smith finds "Smith".
! <i>value</i> (exclamation point)	Not equal to the value that is entered	Type an exclamation point and then the value to exclude.	!Smith finds all values except "Smith".
<i>from-value..to-value</i> (double period)	Between the two values that are separated by double periods	Type the from-value, then two periods, and then the to-value.	1..10 finds all values from 1 through 10. However, in a string field, A..C finds all values that start with "A" and "B", and values that are exactly equal to "C". For example, this query won't find "Ca". To find all values from "A" <i>through</i> "C", type A..D .
<i>..value</i> (double period)	Less than or equal to the value that is entered	Type two periods and then the value.	..1000 finds any number that is less than or equal to 1000, such as "100", "999.95", and "1,000".
<i>value..</i> (double period)	Greater than or equal to the value that is entered	Type the value and then two periods.	1000.. finds any number that is greater than or equal to 1000, such as "1,000", "1,000.01", and "1,000,000".
> <i>value</i> (greater than sign)	Greater than the value that is entered	Type a greater than sign (>) and then the value.	> 1000 finds any number that is greater than 1000, such as "1000.01", "20,000", and "1,000,000".
< <i>value</i> (less than sign)	Less than the value that is entered	Type a less than sign (<) and then the value.	< 1000 finds any number that is less than 1000, such as "999.99", "1", and "-200".
<i>value*</i> (asterisk)	Starting from the value that is entered	Type the starting value and then an asterisk (*).	S* finds any string that starts with "S", such as "Stockholm", "Sydney", and "San Francisco".

SYNTAX	CHARACTER DESCRIPTION	DESCRIPTION	EXAMPLE
* <i>value</i> (asterisk)	Ending with the value that is entered	Type an asterisk and then the ending value.	*east finds any string that ends with "east", such as "Northeast" and "Southeast".
* <i>value</i> * (asterisk)	Containing the value that is entered	Type an asterisk, then a value, and then another asterisk.	*th* finds any string that contains "th", such as "Northeast" and "Southeast".
? (question mark)	Having one or more unknown characters	Type a question mark at the position of the unknown character in the value.	Sm?th finds "Smith" and "Smyth".
<i>value,value</i> (comma)	Matching the values that are separated by commas	Type all your criteria, and separate them by using commas.	A, D, F, G finds exactly "A", "D", "F", and "G". 10, 20, 30, 100 finds exactly "10, 20, 30, 100".
"" (two double quotes)	Matching a blank value	Type two consecutive double quotes to filter for blank values in that field.	Two consecutive double quotes ("") finds rows with no value for the current column.
(Finance and Operations query) (Finance and Operations query between parentheses)	Matching a defined query	Type a query as an SQL statement between parentheses using the Finance and Operations query language.	((AccountNum LIKE "US*") && (DirPartyTable.Name LIKE "Cont*")) as an example of syntax for a filter condition on a field from the root datasource as well as a field from a different datasource (for the All customers page)
T	Today's date	Type T.	T matches today's date.

SYNTAX	CHARACTER DESCRIPTION	DESCRIPTION	EXAMPLE
(methodName(parameters)) (SysQueryRangeUtil method between parentheses)	Matching the value or range of values that are specified by the parameters of the SysQueryRangeUtil method	Type a SysQueryRangeUtil method that has parameters that specify the value or range of values.	<ol style="list-style-type: none"> 1. Click Accounts receivable > Invoices > Open customer invoices. 2. Press Ctrl+Shift+F3 to open the Inquiry page. 3. On the Range tab, click Add. 4. In the Table field, select Open customer transactions. 5. In the Field field, select Due date. 6. In the Criteria field, enter (yearRange(-2,0)). 7. Click OK. The list page is updated and lists the invoices that match the criterion that you entered. For this example, invoices that were due in the previous two years are listed. <p>See the table in the next section for additional details about SysQueryRangeUtil date methods, and several examples.</p>

Advanced date queries that use SysQueryRangeUtil methods

METHOD	DESCRIPTION	EXAMPLE
Day (_relativeDays=0)	Find a date relative to the session date. Positive values indicate future dates, and negative values indicate past dates.	<ul style="list-style-type: none"> • Tomorrow – Enter (Day(1)). • Today – Enter (Day(0)). • Yesterday – Enter (Day(-1)).
DayRange (_relativeDaysFrom=0, _relativeDaysTo=0)	Find a range of dates relative to the session date. Positive values indicate future dates, and negative values indicate past dates.	<ul style="list-style-type: none"> • Last 30 days – Enter (DayRange(-30,0)). • Previous 30 days and next 30 days – Enter (DayRange(-30,30)).
GreaterThanDate (_relativeDays=0) GreaterThanUtcDate (_relativeDays=0)	Find all dates after the specified relative date.	<ul style="list-style-type: none"> • More than 30 days from now – Enter (GreaterThanDate(30)).

METHOD	DESCRIPTION	EXAMPLE
GreaterThanOrEqualTo ()	Find all date/time entries after the current time.	<ul style="list-style-type: none"> • All future date/times – Enter (GreaterThanOrEqualTo()).
LessThanDate (_relativeDays=0) LessThanOrEqualToDate (_relativeDays=0)	Find all dates before the specified relative date.	<ul style="list-style-type: none"> • Less than seven days from now – Enter (LessThanDate(7)).
LessThanOrEqualTo ()	Find all date/time entries before the current time.	<ul style="list-style-type: none"> • All past date/times – Enter (LessThanOrEqualTo()).
MonthRange (_relativeFrom=0, _relativeTo=0)	Find a range of dates, based on months relative to the current month.	<ul style="list-style-type: none"> • Previous two months – Enter (MonthRange(-2,0)). • Next three months – Enter (MonthRange(0,3)).
YearRange (_relativeFrom=0, _relativeTo=0)	Find a range of dates, based on years relative to the current year.	<ul style="list-style-type: none"> • Next year – Enter (YearRange(0, 1)). • Previous year – Enter (YearRange(-1,0)).

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

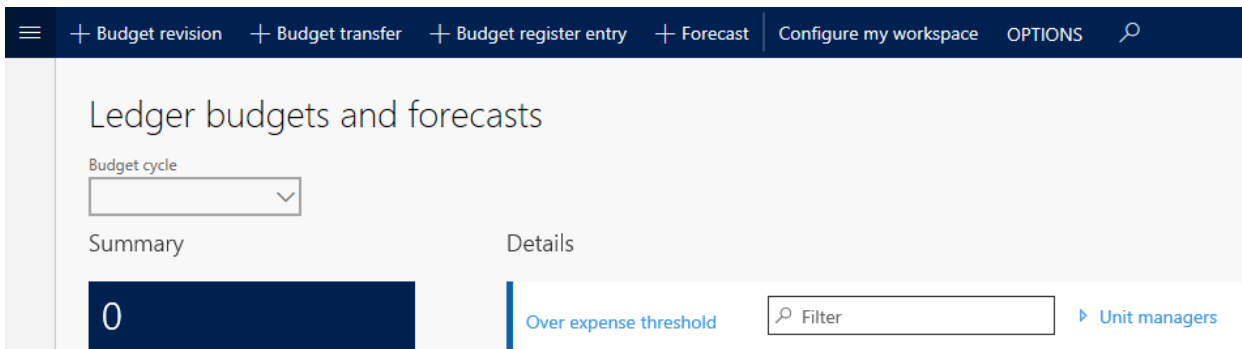
Configure and filter workspaces

2/18/2021 • 2 minutes to read • [Edit Online](#)

This article provides an overview about how to configure and filter workspaces.

Configuring a workspace

You can change the appearance and behavior of some workspaces by updating settings that apply to the whole workspace. When a workspace can be configured, the Action Pane includes a button that instructs you to click it to make configuration changes. For example, in the following illustration, the button is named **Configure my workspace**.



When you click the button, a dialog appears, where you can modify the predefined settings for the workspace. The specific settings that you see in this dialog vary by workspace, and depend on the specific controls and business data that are available in the workspace.

Configure my workspace

[Restore default values](#) [View default values](#)

WHICH DATA DO YOU WORK WITH?

Show amounts

Organization hierarchy

Budget model

Active forecasting process

WHAT INFORMATION WOULD YOU LIKE TO SEE IN THE DETAIL

Expense dimension set

Expense budget threshold percent

Revenue dimension set

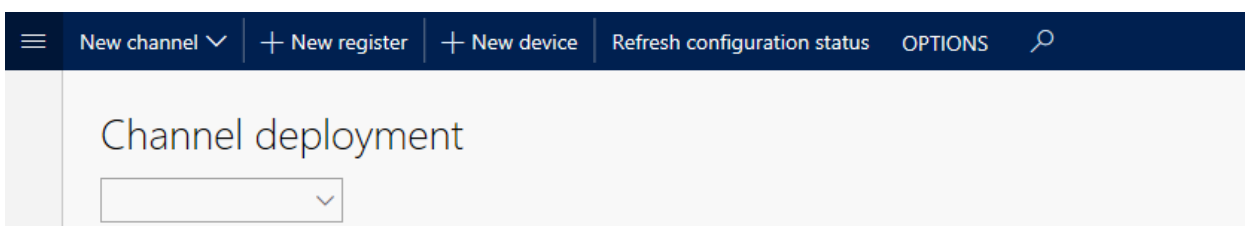
Revenue budget threshold percent

Filtering a workspace

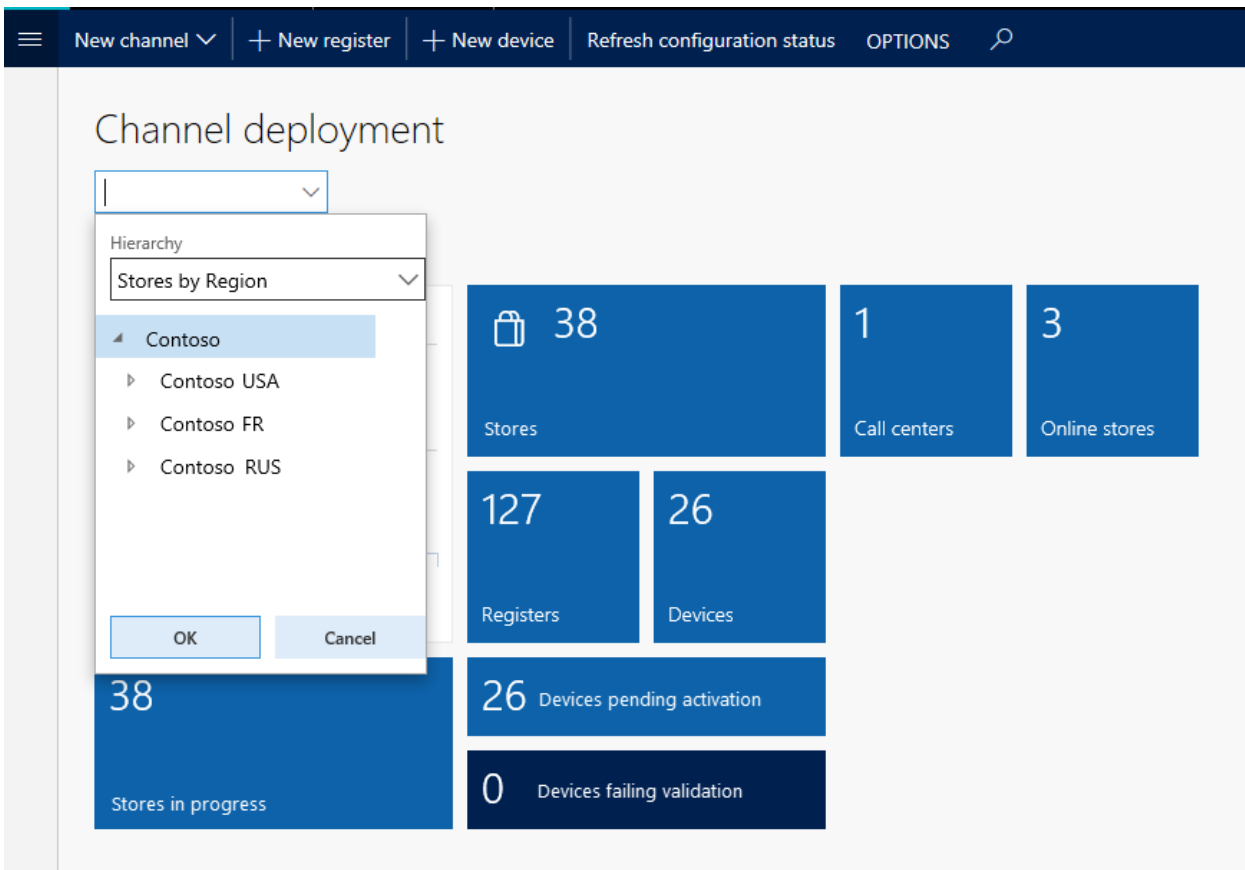
Many workspaces let you filter the content that appears in them. The controls that are available might let you filter all the content in the workspace or only the content in a specific section of the workspace. The filters on workspaces can be lookups, combo boxes, free-form text fields, or other types of controls. However, every type of filter has the same effects, as described in the following sections.

Workspace-wide filters

You can filter the whole workspace by using a workspace-wide filter. A workspace-wide filter appears in the upper-left corner of the workspace. When you select a specific value in the drop-down list, the contents of the workspace are filtered based on that selection.



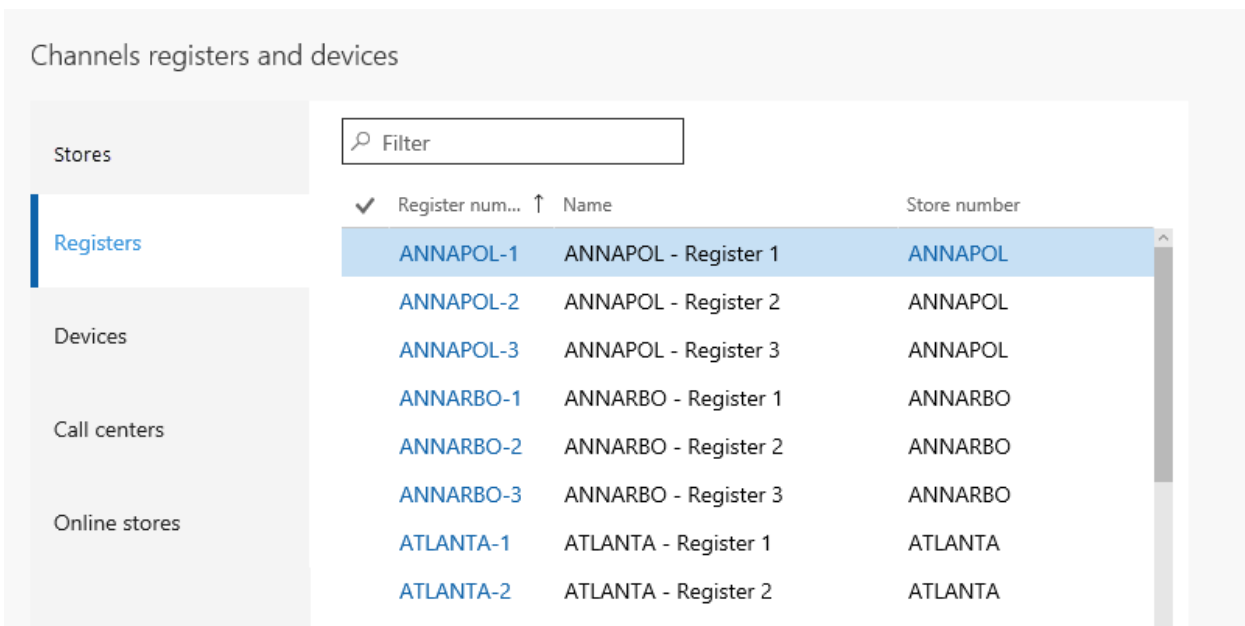
When you click to open the filter, you're presented with several options.



Select an option to filter the workspace based on that option.

Workspace section filters

If individual sections of the workspace have filters, you can filter each section separately. In the following illustration, the filter (the field that contains the text "Filter") is an example of a free-form text field filter.



As with a workspace-wide filter, select or enter a value in the field to filter the contents of the section.

NOTE

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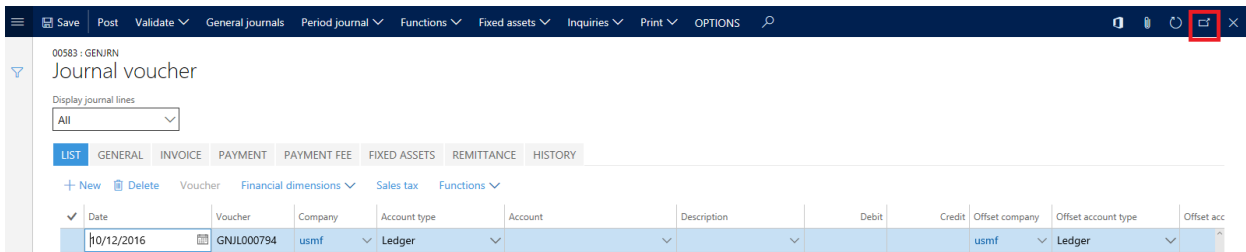
Show pages side-by-side using the Open in new window feature

2/18/2021 • 2 minutes to read • [Edit Online](#)

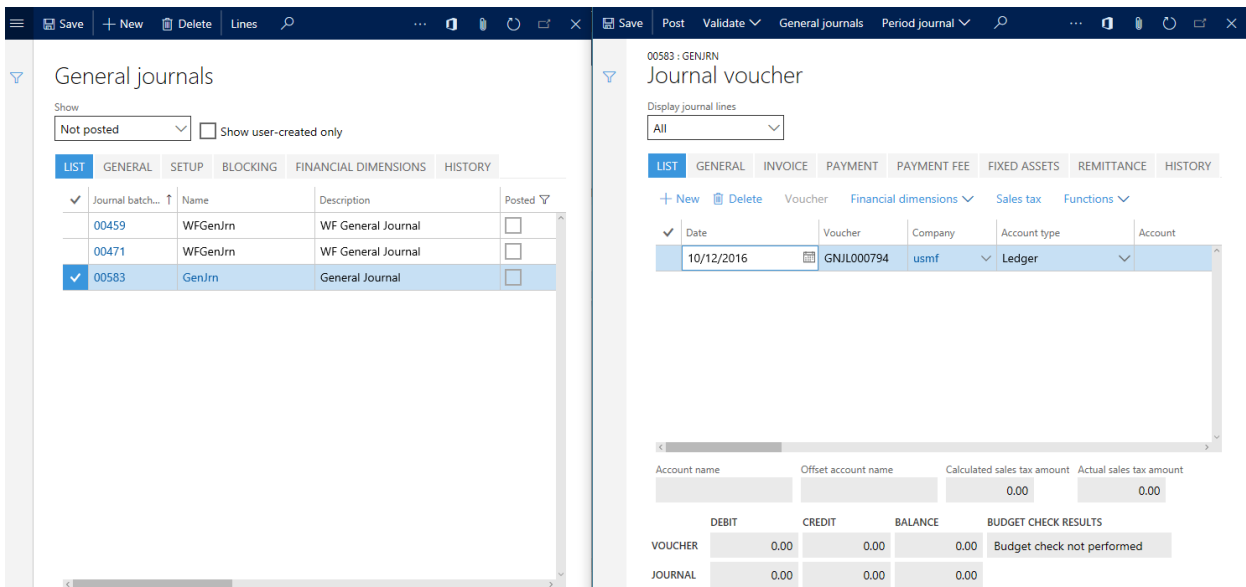
This article explains how to display pages side by side.

You may want to view multiple pages side by side to complete tasks quickly. As an example, you might want to validate or enter lines in more than one journal. Typically, to validate or enter lines in more than one journal, you would have to go back and forth between the page that displays a list of journals, and the page that displays lines for a given journal. However, the **Open in new window** feature enables you to display these pages side-by-side so that you can perform your tasks quickly.

Continuing with the example mentioned above, when viewing the lines, you can click the **Open in new window** icon.



Clicking the **Open in new window** icon opens the lines page in a new, pop-up browser, and then navigates the original browser back in history to the page that displayed the list of journals. You can then display both pages side by side. After viewing a journal, you can change the selected journal on the journal list page, and the lines page in the pop-up window will automatically display the lines of the newly selected journal.



The dynamic linking and refreshing happens due to the relations that exist between the data that is backing these pages. If the system is not aware of the relation between the data, the pop-up window will not refresh automatically in response to a change in the window it originated from.

Some pages have multiple views such as the Grid view, Header view, and Details view. The **Open in new window** icon causes the entire page to open in the new browser window. Therefore, you cannot keep two views of the same page side by side using the **Open in new window** feature. Almost all such pages have a

navigation list that you can use to switch between records and achieve a similar experience.

Before using the **Open in new window** feature, you should configure your browser's pop-up blocker to allow pop-ups from the URL of the site. As an example, you could allow pop-ups from "*.dynamics.com".

The **Open in new window** feature is only available when there is more than one page open in the window. Also, the pop-up window automatically closes when there are no more pages open (that is, when you close the last page in that window). The system also closes open pages when you navigate to a different area in the application. Therefore, if you have pop-up windows open and navigate to a different area in the application, the pop-up windows close automatically because the system closed the pages in those windows.

The top bar in the pop-up windows displays information about the company the page was opened in and is read-only. The pop-up windows also rely on the main browser window. If the main window is closed or refreshed, all open pop-up windows will become read only. If this situation occurs, you can still view the information in these windows, but you will not be able to interact with it.

NOTE

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Keyboard shortcuts

2/18/2021 • 9 minutes to read • [Edit Online](#)

The following keyboard shortcuts can help you quickly and efficiently enter data in Finance and Operations apps

NOTE

The keyboard shortcuts described here refer to the United States keyboard layout. Keys on other keyboard layouts might not correspond exactly to the keys on a US keyboard.

Some of the shortcuts on this page are *key chords*, meaning they require two consecutive sets of key combinations (separated by a comma) that need to be independently pressed to trigger the required action. For example, the shortcut "Alt+M,A" requires the user to first press "Alt+M", release the keys, and then press "A".

Finding a shortcut

As of Platform update 11, users can discover currently available shortcuts directly from the user interface. Simply right-click on a control and select **View shortcuts**. This will open a dialog box showing the shortcuts you can use based on where you are on the page.

Action shortcuts

TO DO THIS	PRESS
Open action search	Ctrl+' or Alt+Q
Move to the standard Action Pane	Alt+M,A or Ctrl+F6
Open a tab on the Action Pane or a menu	Enter or Space or Alt+Down arrow
Move to next/previous option in a menu	Down arrow / Up arrow
Close a tab on the Action Pane or a menu	Esc
Simulate a right-click	Shift+F10
Open the context menu	Ctrl+F10
Execute the default button on a form/dialog box	Alt+Enter
Click a button or tile	Enter or Space
View refresh information for a count tile	Alt+Up arrow
View currently available shortcuts	Alt+Shift+K

Date picker shortcuts

TO DO THIS	PRESS
Open the date picker	Alt+Down arrow
Move between dates in the date picker	Ctrl+Arrow keys
Move to the next/previous month	Page down / Page up
Move to the next/previous year	Ctrl+Shift+Page down / Ctrl+Shift+Page up
Move to today	Ctrl+Home
Pick today's date	T
Clear the selected date	C
Pick Never (or the max date)	N

FactBox shortcuts

TO DO THIS	PRESS
Open the FactBox pane (or move focus to the FactBox pane if it is already open)	Alt+M,B or Ctrl+F2
Close the FactBox pane (with focus in the FactBox pane)	Esc
Move to the next/previous FactBox (with focus in the FactBox pane)	Alt+Shift+Down arrow / Alt+Shift+Up arrow
Move to the <n>th FactBox (with focus in the FactBox pane)	Alt+<n> (<n> = 1-9)
Expand a FactBox (with focus on the FactBox header)	Space or Enter
Collapse the current FactBox	Alt+0

Filtering shortcuts

TO DO THIS	PRESS
Open grid filtering for the current column	Ctrl+G
Close grid filtering for the current column	Esc
Open the Filter pane (or switch focus between the Filter pane and the main form if the Filter pane is already open)	Alt+M,F or Ctrl+F3
Close the Filter pane (with focus in the Filter pane)	Esc
Open advanced filtering/sort	Ctrl+Shift+F3

Form shortcuts

TO DO THIS	PRESS
Create a new record	Alt+N
Delete a record	Alt+Del or Alt+F9
Save record	Alt+S or Ctrl+S
Revert (restore)	Ctrl+Shift+F5
Data refresh	Shift+F5
Move to the visible first field on the form	Alt+Shift+F
Toggle edit mode	F2
Attach a document	Ctrl+Shift+A
Export to Excel	Ctrl+Shift+E
Move to the previous record (outside a grid)	Ctrl+Up arrow
Move to the next record (outside a grid)	Ctrl+Down arrow
Move to the first record (outside a grid)	Ctrl+Home
Move to the last record (outside a grid)	Ctrl+End
Close the form (click Back)	Esc
Close the form with explicit save	Shift+Esc
Close the form discarding any unsaved changes	Alt+Shift+Q

Form navigation shortcuts

TO DO THIS	PRESS
Move to the next/previous field	Tab / Shift+Tab
Move to the next/previous tab	Alt+Shift+Right arrow / Alt+Shift+Left arrow
Move to the <n>th tab	Alt+Shift+<n> (<n> = 1-9)
Move to the next/previous FastTab	Alt+Shift+Down arrow / Alt+Shift+Up arrow
Move to the <n>th FastTab	Alt+<n> (<n> = 1-9)
Move to the next/previous blade (vertical tab)	Alt+Shift+Right arrow / Alt+Shift+Left arrow

TO DO THIS	PRESS
Move to the <n>th blade (vertical tab)	Alt+Shift+<n> (<n> = 1-9)
Expand a FastTab (with focus on the FastTab header)	Space or Enter
Collapse the current FastTab	Alt+0
Switch to grid view	Ctrl+Shift+G
Switch to details view	Ctrl+Shift+D
Switch to header view	Ctrl+Shift+H
Switch to lines view	Ctrl+Shift+L

Grid shortcuts

TO DO THIS	PRESS
Move to the next/previous column	Tab / Shift+Tab
Move to the next/previous row	Down arrow / Up arrow
Move to the next/previous row without selecting <div style="border: 1px solid #ccc; padding: 2px; margin-top: 5px;"> <p>[!NOTE] This shortcut applies to multi-select scenarios only.</p> </div>	Ctrl+Up arrow / Ctrl+Down arrow
Select/clear the current row <div style="border: 1px solid #ccc; padding: 2px; margin-top: 5px;"> <p>[!NOTE] This shortcut applies to multi-select scenarios only.</p> </div>	Ctrl+Space / Ctrl+Click
Add the next/previous row to the selected set <div style="border: 1px solid #ccc; padding: 2px; margin-top: 5px;"> <p>[!NOTE] This shortcut applies to multi-select scenarios only.</p> </div>	Shift+Space
Add a range of rows to the selected set <div style="border: 1px solid #ccc; padding: 2px; margin-top: 5px;"> <p>[!NOTE] This shortcut applies to multi-select scenarios only.</p> </div>	Shift+Click
Go to the next/previous page of data	Page up / Page down
Create a new row at the bottom of the grid	Down arrow (from the last row)
Move to the first record	Ctrl+Home

TO DO THIS	PRESS
Move to the last record	Ctrl+End
Select or clear all rows	Ctrl+Shift+M
Move to the first marked row	Alt+Shift+M, F
Move to the next marked row	Alt+Shift+M, L
Move to the previous marked row	Alt+Shift+M, P
Moved to the last marked row	Alt+Shift+M, N
Execute the default action in a grid <div style="border: 1px solid gray; padding: 5px; margin: 5px 0;"> <p>[!NOTE] This shortcut is enabled when focus is on a cell containing a hyperlink and all cells in that column have hyperlinks.</p> </div>	Enter
Toggle focus between the selected row and the header row	Alt+Shift+H
Make the current column larger/smaller (with focus in the header row)	Right arrow / Left arrow
Open grid filtering for the current column (with focus in the header row)	Enter

Input control shortcuts

TO DO THIS	PRESS
Open the hyperlink	Ctrl+Enter
Enter the session date in a date field	D
Enter the current date in a date field	T
Open lookup, combo box, date picker, drop dialog box	Alt+Down arrow
Close lookup, combo box, date picker, drop dialog box	Esc
Move focus into a lookup (when the lookup is already open)	Alt+Down arrow
Open the control's enhanced preview	Alt+Up arrow
Select text in the current field	Ctrl+A
Enter/leave the text area in an HTML editor control	Alt+Down arrow / Alt+Up arrow
Switch focus between the text area and the toolbar in an HTML editor control	F6

Messaging shortcuts

TO DO THIS	PRESS
Go to the Message Center	Ctrl+Shift+F7
Go to the Message Bar	Ctrl+F7

Navigation shortcuts

TO DO THIS	PRESS
Go to the dashboard	Alt+Shift+Home
Move to the navigation bar	Alt+M,N or Alt+Shift+F1
Move to the company picker	Ctrl+Shift+O
Search for a page	Ctrl+/ or Alt+G
Open the help pane	Ctrl+?
Open the trace parser	Alt+Shift+T
Move to the navigation pane	Alt+F1
Add/remove form as a favorite (with focus on a form in the navigation pane)	Shift+F
Move to the standard Action Pane	Alt+M,A or Ctrl+F6
Move to the Filter pane (which may include opening it)	Alt+M,F or Ctrl+F3
Move focus to the page content (with focus in the Filter pane)	Alt+M,M or Ctrl+F3
Move to the navigation list on Details form (which may include opening it)	Alt+M,S or Ctrl+F8
Move focus to the page content (with focus in the navigation list)	Alt+M,M or Ctrl+F8
Close the navigation list on Details form (with focus in the navigation list)	Esc
Move to the main page content (with focus in another pane)	Alt+M,M
Move to the FactBox pane (which may include opening it)	Alt+M,B or Ctrl+F2

Personalization shortcuts

TO DO THIS	PRESS
Transition the page into personalization mode	Ctrl+Shift+P
Use the Select tool (when in personalization mode)	S
Open the selected control's quick personalization dialog box (when using the Select tool)	Space or Enter
Use the Move tool (when in personalization mode)	M
Select the current control as the one to move (when using the Move tool and no control has been selected to move yet)	Space or Enter
Clear the control to move (when using the Move tool)	Esc
Move to the next position for the selected control (when using the Move tool)	Tab or Right arrow or Down arrow
Move to the previous position for the selected control (when using the Move tool)	Shift+Tab or Left arrow or Up arrow
Use the Hide tool (when in personalization mode)	H
Switch whether the current control is visible or hidden (when using the Hide tool)	Space or Enter
Use the Skip tool (when in personalization mode)	K
Switch whether the current control is in the tab sequence (when using the Skip tool)	Space or Enter
Use the Edit tool (when in personalization mode)	E
Switch whether the current control is editable or read-only (when using the Edit tool)	Space or Enter
Use the Summary tool (when in personalization mode)	U
Switch whether the current control is a summary field in the current fast tab (when using the Summary tool)	Space or Enter
Use the Add tool (when in personalization mode)	A
Select the control whose container will be used to insert the new fields (when using the Add tool)	Space or Enter
Import a personalization (when in personalization mode)	I
Export a personalization (when in personalization mode)	X
Clear this page's personalizations (when in personalization mode)	Ctrl+C

TO DO THIS	PRESS
Move focus between the personalization toolbar and the page (when in personalization mode)	T
Exit personalization mode (when in personalization mode)	Esc

Segmented entry shortcuts

TO DO THIS	PRESS
Open the drop-down list (when the drop-down list is closed)	Alt+Down arrow
Move focus into the input field for the current segment in the drop-down list (when the drop-down list is already open)	Alt+Down arrow
Close the drop-down list	Alt+Up arrow
Close/open the right portion of the drop-down list	Alt+Left arrow / Alt+Right arrow
Switch between "Show valid" and "Show all" modes	Alt+W
Select the value from drop-down list and move to the next segment	Enter
Move to the next/previous control on the page (when focus is in input control)	Tab / Shift+Tab
Move to the next/previous input field in the flyout (when focus is in the drop-down list)	Tab / Shift+Tab
Move up/down a row in the lookup	Up arrow / Down arrow
Move up/down a page in the lookup	Page up / Page down
Move to the top/bottom of the lookup	Home / End

Task recorder shortcuts

TO DO THIS	PRESS
Stop the recording (while recording)	Alt+R,S
Toggle the visibility of the Task recorder pane (while recording)	Alt+R,T
Toggle Rails mode (while playing a task guide)	Alt+R,L
Go to the previous step (while playing a task guide)	Alt+R,P
Go to the next step (while playing a task guide)	Alt+R,N

TO DO THIS	PRESS
Toggle focus between the page and the animated pop-up prompt (while playing a task guide)	Alt+R,F
Expand/collapse the animated pop-up prompt (while playing a task guide)	Alt+R,C
Show more/less information in the animated pop-up prompt (while playing a task guide)	Alt+R,M

Additional resources

[Keyboard shortcuts for missing account analysis](#)

NOTE

Can you tell us about your documentation language preferences? [Take a short survey](#).

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Change the banner or logo

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The following procedure lists the steps that system administrators can use to update the banner or logo image that is displayed for a legal entity. The demo data company used to create this procedure is USMF.

1. Go to **Navigation pane > Modules > Organization administration > Organizations > Legal entities**.
2. In the list on the left, select the legal entity for which you want to update the banner or logo. If it is already selected, go to the next step.
3. Expand **Dashboard image** tab.
4. Select **Change**.

The ideal resolution for a banner image is 1920 x 281 pixels. The ideal width for a logo image is 350 pixels.

5. Select **Save**.
6. Go to **Navigation pane > Modules > Common > Common > Default dashboard**. You should see the new banner or logo image on the dashboard.

You may need to change your company, using the company picker, to the one you uploaded the banner for.

NOTE

Can you tell us about your documentation language preferences? [Take a short survey](#).

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Navigation search

2/18/2021 • 2 minutes to read • [Edit Online](#)

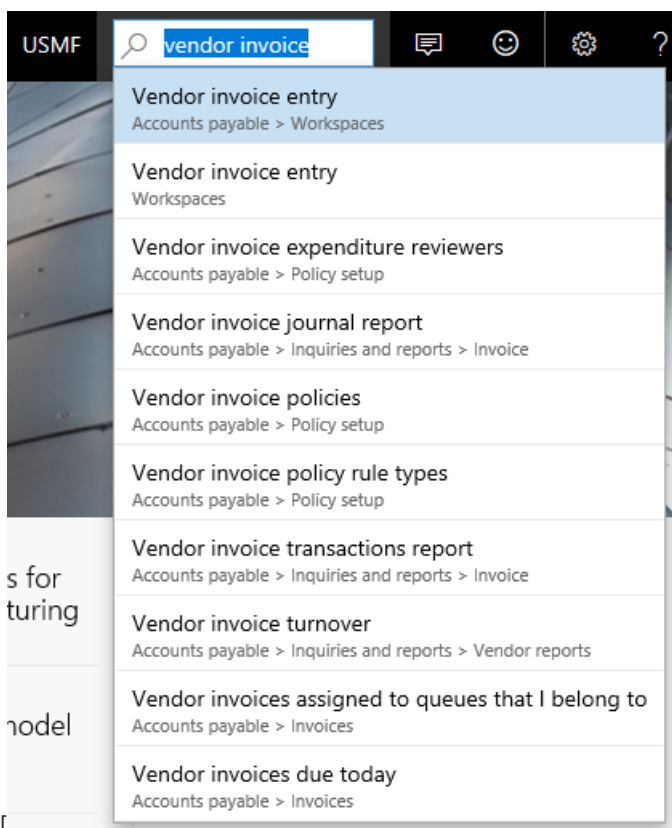
This topic explains how to use the search functionality to navigate to pages.

The application includes a number of areas and pages to help you perform various tasks. To quickly find the pages that you need to complete your tasks, use the navigation search feature.

To use this feature, click the **Search** icon to display the **Search** box. You can then type one or more words in the box. The system instantly searches for relevant pages in the application that match the words that you entered. For example, you could type "vendor invoice" as the input, and then the system displays results that match that input.

NOTE

The **Search** box helps you find and navigate to pages. It will not help you find specific data or actions.



Quickly navigate to a particular page

The navigation search feature also serves as a great way for you to quickly navigate to a particular page. For example, if you are an accounts payable clerk who frequently uses the **Payment journal** page, you could enter "payment journal" in the **Search** box. Because the input is an exact match for the page title, the page is listed at the top of the search results, and you can quickly navigate to it.

The search results list displays the page title as well as the navigation path. This shows the location of the page in the application. It also helps you differentiate between two or more similar pages in the results.

When you search for a page, your input is matched against the page title, as well as its navigation path. For

example, if you enter "receivable" in the **Search** box, you will see results for the pages available to you in the Accounts receivable area – even though the page titles do not include the word "receivable."

Quickly navigate to a page based on the technical form name

The navigation search functionality also includes a much-requested feature for power users: the ability to quickly navigate to a page based on the technical form name. Many users are so familiar with the system that they know the exact form names they work with. If you are one of these users, you can enter **form:** followed by the name of the form you are looking for. For example, if you enter **form: vendinvoice**, the search results will show all pages where the form name starts with **vendinvoice**.

Administration and security

From an administration and security perspective, the navigation search functionality only surfaces two types of results:

- Pages that are enabled in the current configuration (via configuration keys).
- Pages that the user has access to based on the user's role.

The list of search results is limited to 10 items. If you do not find what you're looking for in the results, you should try refining or updating the input.

Development

From a development perspective, the navigation search functionality is easy to leverage because there is virtually no delay between the deployment of menu items and their ability to show up in search results. As long as the menu items are linked to from either the navigation pane or the dashboard, they will automatically become searchable.

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Personalize the user experience

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This topic explains how you can personalize the app and covers the following subjects:

- **System-wide options** – These personalization options are made on a setup page and are available to all users. Examples include the color theme and time zone.
- **Restricted personalization access** – At this access level, user actions that are associated with typical page usage are automatically saved by the app and restored the next time that you visit the page. For example, the app stores the width of grid columns if you adjust them, and the expanded or collapsed state of FastTabs.
- **Full personalization access** – At this access level, users have access to all personalization capabilities in the app. In particular, they have access to the **Personalization** toolbar.
- **Sharing personalizations** – Users who have full personalization access can export their page personalizations and share them with other users.
- **Administration of personalizations** – Privileged users can access the **Personalization** administration page to manage all personalizations at an organizational level.

System-wide options for the current user

The **User options** page contains several system-wide settings for the current user. These options are available to all users, even users who haven't been given any access to personalization. To open the **User options** page, select the **Settings** button on the navigation bar, and then select **User options**. The **User options** page has four tabs that contain various user settings:

- **Visual** – Select a color theme and the default size of elements on pages.
- **Preferences** – Select default values that are used every time that you open the system. These values include the default company, the initial page, and the default view/edit mode. (The view/edit mode determines whether a page is locked for viewing or opened for editing every time that you open it.) This tab also includes options for the language, the time zone, and date, time, and number formats. Finally, this tab includes several miscellaneous preferences that vary from release to release.
- **Account** – View or adjust your user name and other account-related options.
- **Workflow** – Select workflow-related options.

In addition to changing your user settings, you can also view and delete your usage data and personalizations from the **User options** page. To see your usage data, select **Usage data** on the Action Pane. On the **Personalization** tab, you can view and manage the personal changes that you've made to pages in the system. On this tab, you can also reset feature callouts (that is, the pop-up windows that introduce new system features). You will then be alerted again about previously encountered features.

NOTE

If the [Saved views](#) feature is turned on, you can view and manage your personalizations by selecting **Personalization** on Action Pane on the **User options** page.

Restricted personalization access (formerly implicit personalizations)

At the **restricted personalization access** level, user actions that are associated with typical page usage are automatically saved by the app and restored the next time that you visit the page. No explicit save action is required.

Here is a list of the actions that fall under typical page usage and are covered by restricted personalization access:

- **Grid column widths** – You can adjust the width of a column in a grid by selecting the sizing bar to the left or right of the column header, and then sliding it left or right until the column is the desired width. The app stores the width that you set for a column. Then, the next time that you open that page, the column will be resized to that width.
- **Grid footer and column totals** – (*Available only when the new grid control is turned on*) You can decide whether a total should be shown at the bottom of any numeric column in a grid, and whether the grid footer should be visible. The app stores these preferences and applies them the next time that you open the page. For more information, see [Grid capabilities](#).
- **FastTabs** – Some pages have expandable sections that are known as *FastTabs*. The app stores information about the FastTabs that you've expanded or collapsed. The next time that you open the page, the same FastTabs will be either expanded or collapsed, based on your last interaction with the page. In some cases, you can help improve system performance by collapsing a FastTab, because the app doesn't have to retrieve the information for FastTabs until they are expanded. As is explained later in this topic, you can also change the order of the FastTabs on a page.
- **FactBoxes** – Some pages have a **Related information** pane that shows read-only information that is related to the current subject of the page. Each section in the **Related information** pane is known as a *FactBox*. You can expand or collapse the **Related information** pane, and you can also expand or collapse individual FactBoxes. The app stores these preferences. The next time that you open the page, the **Related information** pane and the individual FactBoxes will be either expanded or collapsed, based on your last interaction with the page. In some cases, you can help improve system performance by collapsing the **Related information** Pane or a FactBox, because the app doesn't have to retrieve the information for FactBoxes until they are expanded.
- **Action Panes** – An *Action Pane* appears near the top of most pages. The Action Pane contains buttons for many of the actions that you can perform on the current page. These buttons are often organized on tabs. You can *pin* the whole Action Pane open, or you can have it collapsed by default. The next time that you open the page, the Action Pane will be either open or collapsed, based on your last interaction with the page. If you pinned the Action Pane open, the last tab that you were using will be shown.
- **QuickFilters** – A *QuickFilter* appears above many grids. The QuickFilter lets you filter the grid based on a single column that you select. The app stores the column that you filtered on. Then, the next time that you open that page, the grid will use that same column for filtering by default. However, you can still select a different column to filter the grid on.
- **Column header filters** – When you filter a grid by using *column header filters*, you can change the filter operator as you require to find the data that you want. For example, you can change the operator from **begins with** to **is exactly**. Every time that you use a column header filter and change the filter operator, the app stores the change. Then, the next time that you filter on that column, the filter operator will be restored.
- **Navigation pane** – You can open the *navigation pane* by selecting the **Expand the navigation pane** button in the upper left of any page. (This button is sometimes referred to as the *Menu button*, *hamburger*, *hamburger menu*, or *hamburger button*.) You can pin the navigation pane open, or you can have it collapsed by default. After you pin the navigation pane open, the app will keep it open until you collapse it.

Full personalization access (formerly explicit personalizations)

At the **full personalization access** level, users have access to all the personalization capabilities that the app provides. Because different people and companies have different needs when they interact with the app, especially in terms of utilized fields, personalization provides tools that let users and organizations tailor the way that information is ordered and interacted with in the app. These capabilities are key to providing simplified, optimized experiences in the app that are tailored to you and your organization.

If the [Saved views](#) feature is turned on, an explicit save is required to persist these changes to the user

experience for a specific view. When the **Saved views** feature is turned off, these changes are automatically saved.

The following sections cover the extent of personalization capabilities that are available to users at the **full personalization access** level. Here are some of these capabilities:

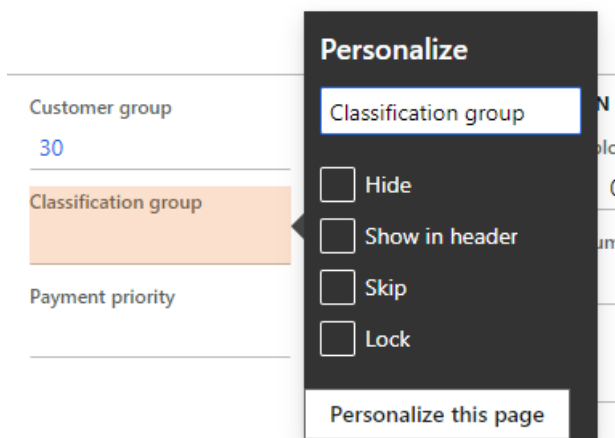
- Shortcut menu options
- The **Personalization** toolbar
- Adding tiles, lists, and links to workspaces
- Adding a summary from a workspace to a dashboard
- Personalizing the dashboard

Shortcut menu options

Shortcut menus provide one way to change a page's interface so that it better meets your requirements or the requirements of your organization. (A shortcut menu is also known as a *right-click menu* or a *context menu*.)

Some of the most typical and important changes that can be made to a page are available directly as options on a shortcut menu. For example, if you want to add or hide columns in a grid, just right-click a column header, and then select **Insert columns** or **Hide this column**.

Additionally, the most basic types of personalizations are available by right-clicking an element and then selecting **Personalize**. (Note that not all elements on your page can be personalized.) When you use this personalization method, the element's *property window* appears.



You can use the property window to personalize an element in the following ways:

- Change the element's label.
- Hide the element so that it isn't shown on the page. The data in the field isn't deleted or modified. The information just isn't shown on the page any longer.
- Include the information in the FastTab's summary section (if the element is on a FastTab).
- Skip the field so that it never receives focus when you tab through the page.
- Prevent data in the field from being edited (for any record).
- Designate a field to be required for data entry. If no value has been entered in this field, it will appear with a red border and an asterisk to indicate this state. This option is only available starting in version 10.0.11 when the [Saved views](#) and **Designate fields as required using personalization** features are turned on.

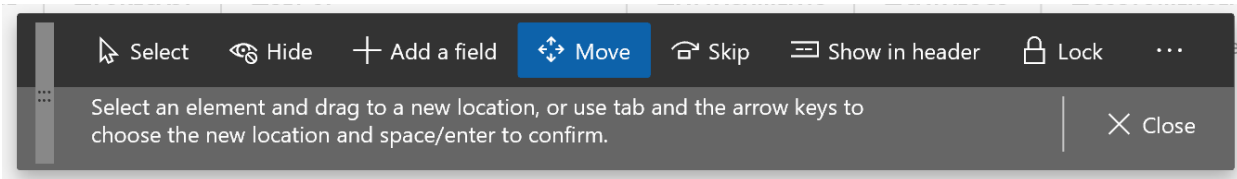
The property window might include other personalization capabilities, depending on the element. For example, the property window for a tile might let you promote that tile to a dashboard, and property windows for elements on the default dashboard might let you create a new custom workspace.

The Personalization toolbar

If you want to make multiple changes to a page, or changes that aren't available through other mechanisms (for

example, if you want to reorder elements), you can use the **Personalization** toolbar. To open the **Personalization** toolbar, follow one of these steps:

- Select **Ctrl+Shift+P** from any element on the page.
- Select **Personalize this page** in an element's property window.
- Select **Personalize this page** in the **Personalize** group on the **Options** tab of any page's Action Pane.
- Select the **Settings** button (the gear symbol) on the navigation bar, and then select **Personalize**.



Navigating the page

When the **Personalization** toolbar is open, the underlying page is read-only (in other words, you can't edit data), but it's still interactive. Specifically, you can expand or collapse the **Related information** pane, switch tabs, and expand or collapse sections, just as you would usually perform those actions on the page. To apply a personalization to a collapsible section or tab (for example, to hide a FastTab), you just have to select the button that appears next to that section or tab when it gains keyboard focus or when you hover over it.

Personalization tools

The following tools are available on the **Personalization** toolbar:

- Use the **Select** tool to select and change the properties of an element. To use this tool, select the **Select** button on the toolbar, and then select the desired element. The element's property window appears, where you can change any of the properties of that element. You can repeat the process for other elements that can be personalized on the page. Note that some personalization properties might not be available in some scenarios. For example, you can't lock a field that is required.
- Use the **Hide** tool to hide an element on the page. To use this tool, select the **Hide** button on the toolbar, and then select the element to hide. When you use the **Hide** tool, all elements that are currently hidden are made visible, but they are shown in a shaded container. You can then make an element visible by selecting it. To see how the page will look when elements are hidden, switch to another personalization tool or close the personalization toolbar.
- Use the **Add fields** tool to add fields to your page. When you use this tool, you can add only fields that are part of the page definition. For information about how to create new fields that aren't part of the current page definition, see [Create and work with custom fields](#). After you select the **Add fields** button on the toolbar, you must first select the grid or section where you want to add a field. A dialog box will show the list of fields that are related to the selected grid or section. In the dialog box, select one or more fields to add, and then select **Update**. To remove a field that you previously added, repeat the process, but clear the selection of the field in the dialog box.
- Use the **Move** tool to move an element to a different location in the current group of elements. Note that you can't move an element outside its parent group. To use this tool, select the **Move** button on the toolbar, and then select the element to move. When you select an element, the app determines the locations where the element is allowed to be moved. These locations are known as *drop zones*. As you drag the element around in the current group, each drop zone is shown as a colored, bold line next to the area where the element can be dropped.
- Use the **Skip** tool to remove an element from the page's keyboard tab sequence. When you select the **Skip** button on the toolbar, all elements that are currently skipped are shown in a shaded container. You can interactively remove or add fields to the tab sequence.
- Use the **Show in header** tool when you want a field to appear in the FastTab's summary section. When

you select the **Show in header** button on the toolbar, all fields that have been selected as summary fields are shown in a shaded container. You can interactively add fields to the FastTab summary and remove fields from the summary by selecting the fields.

- Use the **Require** tool to designate an element as required for data entry. When you select the **Require** button on the toolbar, all elements that have been personalized to make them required are shown in a shaded container. You can then make them not required again. This option is available in version 10.0.12 and later when the **Designate fields as required using personalization** feature is turned on.
- Use the **Lock** tool to mark an element as either editable or noneditable. When you select the **Lock** button on the toolbar, all elements that are currently noneditable are shown in a shaded container. You can then make them editable again. Note that some fields are required and can't be made noneditable. A padlock symbol appears next to those fields.
- Use the **Add an app from Power Apps** tool to embed an app that was created by using Microsoft Power Apps into the page. For detailed information about how to embed an app from Power Apps into a page, see [Embed apps from Power Apps](#). This option is available only when the [Saved views](#) feature is turned off.
- Use the **Add an app** button to embed an app, either one created from Microsoft Power Apps or a third-party, into the page. This option is only available when the [Saved views](#) feature is turned on.
- Use the **Clear** tool to reset the page to its default, installed state. All personalizations on the current page will be cleared. You can't undo this action. Therefore, use this tool only if you're sure that you want to reset the page. When the **Saved views** feature is turned on, this tool clears the personalizations for the current view.
- Use the **Import** tool to load a personalization from a file that you or someone else previously created.
 - When the **Saved views** feature is turned off, you can choose whether to add or replace your existing personalizations with the personalizations that are being imported for the page. You can't undo this action. Therefore, after you import personalizations, you must manually clear or undo any changes that you don't want.
 - When the **Saved views** feature is turned on, the imported personalizations will become a view on the page. If the view already exists, you will have the option to skip the import, replace the current view that has the same name, or rename the imported view.
- Use the **Export** tool to save your personalizations for the page to a file. You can then share your personalizations with other users. Those users just have to import the file that contains your personalizations for the page. When the **Saved views** feature is turned on, this tool saves your current view to a file for sharing.
- Select the **Close** button to close the **Personalization** toolbar and return the page to its previous interactive state.

Traditionally, when the **Personalization** toolbar is used, your personalizations take effect as soon as you make them. However, if the [Saved views](#) feature is turned on, you must explicitly save personalizations to a view that you choose.

In some cases, when you select a tool, a padlock symbol appears next to an element. This symbol indicates that you can't modify the element properties that are related to the selected tool, because changes to those properties will prevent the page from working correctly.

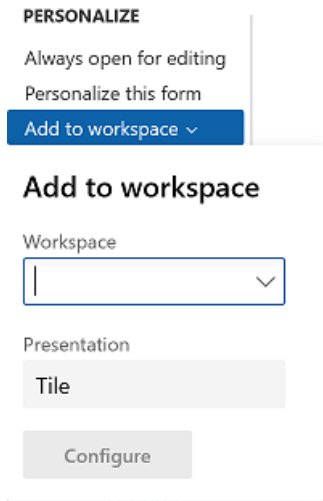
Adding tiles, lists, and links to a workspace

For some pages that include lists, the **Add to workspace** personalization feature is available in the **Personalize** group on the **Options** tab of the Action Pane. This feature lets you push relevant information from the current list to a specific workspace. The information that appears in the workspace can be based on either

the whole list, or a filtered and sorted version of the list. You can also specify whether the information appears in the workspace as a list, a summary tile that can show the number of items in the list, or a link.

NOTE

If the [Saved views](#) feature is turned on, the content that you push to a workspace is directly linked to a view. The view's query is used to retrieve data into the workspace, and the corresponding tile or link in the workspace opens the page to that view, so that the view's query and personalizations are applied to it. If the view is updated, the corresponding workspace elements will be adjusted to the new view definition.



- To add a list to a workspace, first sort or filter the list on the page so that it shows the information as you want it to appear in the workspace. (If the **Saved views** feature is turned on, you can't continue until you save a view that has these conditions.) Then select **Add to workspace**. Select a workspace, and then, in the **Presentation** field, select **List**. After you select **Configure**, a dialog box appears, where you can select the columns that should appear in the list in the workspace. You can also specify the label that is used for the list in the workspace.
- To add a tile to a workspace, first filter the list on the page so that it shows the data that should be summarized or that you want quick access to. (If the **Saved views** feature is turned on, you can't continue until you save a view that has these conditions.) Then select **Add to workspace**. Select a workspace, and then, in the **Presentation** field, select **Tile**. After you select **Configure**, a dialog box appears, where you can specify the label that should be used for the tile in the workspace. You can also specify whether the tile should show a count. After the tile is added to the workspace, you can select it to open the current page from the workspace. You can then view the filtered list that is associated with the tile.
- To add a link to a workspace, first filter the list on the page so that it shows the data that you're interested in. (If the **Saved views** feature is turned on, you can't continue until you save a view that has these conditions.) Then select **Add to workspace**. Select a workspace, and then, in the **Presentation** field, select **Link**. After you select **Configure**, a dialog box appears, where you can specify the label that should be used for the link. You can also optionally specify a label for a new section that contains this link.

After you've added a list, tile, or link to a workspace, you can open that workspace and rearrange the elements in it as you want.

Adding a summary from a workspace to a dashboard

Some workspaces contain count tiles (that is, tiles that have numbers on them), and you might want those tiles to appear on your dashboard too. In a workspace, right-click a count tile, select **Personalize**, and then, in the tile's property window, select **Pin to dashboard**. The next time that you open and refresh the dashboard, the count will appear below the navigation tile for that workspace. You can select that count to go directly to the data that it represents.

Personalizing your dashboard

The dashboard is often the first page that you see when you open the app. It can be personalized like any other page in the system, by using the same mechanisms that are described earlier in this topic.

WARNING

Currently, when you hide content on the dashboard, it's important that you directly target a tile, not the space around it. If you hide the group around a tile, there could be unexpected results if more tiles are added later, or if the system is switched to a different language.

One unique personalization capability that is available on the dashboard is the ability to add tiles.

- If the **Full-page apps** feature is turned off, you add a new tile by right-clicking an element on the dashboard and then selecting **Add a workspace**. A new workspace tile is created at the bottom of the dashboard. You can rename this new workspace tile as you want. You can also add lists, tiles, and links to the workspace, as described in the [Adding tiles, lists, and links to a workspace](#) section of this topic.
- If the **Full-page apps** feature is turned on, you add a new tile by right-clicking an element on the dashboard and then selecting **Add an app**. In the dialog box, select whether you want to add a tile for a new workspace or a tile that has content from Power Apps or a website. Then follow the steps to configure the option that you selected. A new tile is created at the bottom of the dashboard.

Sharing personalizations

After you personalize a page, you can share your personalizations with other users by exporting the personalized page. You can then ask other users to import the personalization file. Alternatively, you can give your personalizations to a user who has admin privileges. That user can then apply your personalization file to many users at the same time by using the **Personalization** administration page.

Administration of personalizations

The **Personalization** page is the central hub for managing personalizations at an organizational level. The content and capabilities on this page depend on whether the **Saved views** feature has been turned on.

For customers who have turned on the **Saved views** feature, see the "Managing views globally" section in the [Saved views](#) topic.

For customers who haven't yet turned on the [Saved views](#) feature, this page has four tabs:

- **Apply** – You can import or select a personalization for one or more users. To apply a personalization to one or more users, first select a role and users who have that role. Then either select an existing personalization to apply to the selected users, or import a personalization file. The personalization is validated and will be applied to all the selected users the next time that they open the selected page.
- **Clear** – You can clear all personalizations for a page or workspace for one or more users. First select a page or workspace to see a list of the users who have personalized it. Then select the users who should have personalizations for that page or workspace cleared, and select **Clear**. All personalizations that the selected users have applied to the selected page or workspace are deleted. This action can't be undone. However, if a personalization was saved for the page or workspace, that personalization can be reimported.
- **Users** – Select a user to see a list of the pages that the user has personalized. You can then turn that user's ability to use personalizations for specific pages, or for the whole system, on or off. You can also import, export, or clear a personalization for the user. In addition, you can reset feature callouts for the user. In this case, if the user previously dismissed any pop-up windows that introduce new features, they will appear again the next time that the user encounters those features.
- **System** – You can temporarily turn off personalization for all users in the system. In this case, all

personalizations are deleted for all users, and all pages are reset to their default state. If you turn personalization back on later, all personalizations are reapplied. You can also permanently delete all personalizations for all users in the system. Personalizations that have been deleted can't be recovered. Therefore, before you perform this task, be sure to export any personalizations that you might want later.

Personalizing inventory dimensions

When you personalize the setup of inventory dimensions on a page, consider the settings that have been created by using the **Display dimension** option. For example, you use personalization to hide a column for the Batch number inventory dimension, but the column appears the next time that the page is opened. This behavior occurs because the **Dimension display** settings control the inventory dimension columns that are shown. The **Dimension display** settings apply across all pages and override any personalized setup of inventory dimension fields on individual pages.

Therefore, in the preceding example, if you don't want the column for the Batch number inventory dimension to appear on a page, you must clear that dimension as part of the **Display dimensions** option for that page.

NOTE

Can you tell us about your documentation language preferences? [Take a short survey.](#)

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Saved views

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IMPORTANT

Some or all of the functionality noted in this topic is available as part of a preview release. The content and the functionality are subject to change. For more information about preview releases, see [Service update availability](#).

Introduction

Personalization plays an important role in allowing users and organizations to optimize the user experience to meet their needs. For more details on personalization, see [Personalize the user experience](#).

Traditional personalization let users have only one set of personalizations per page. The **Saved views** feature expands on personalization in several important ways:

- Views permit users to have multiple named sets of personalizations per form, which they can quickly switch between as needed. This allows a user to create multiple optimized views of a page, where each view has been tailored to fit the needs of performing a particular business task.
- Views created for particular page types can also include user-added filters or sorts, which allows users to quickly return to commonly filtered datasets. See the [What pages support views](#) section for more details.
- Views can be published to users in specific security roles and specific legal entities. Therefore, any user who has a specified role and access to a specified legal entity can access and use that view, even if that user doesn't not have permission to personalize. This publish capability lets organizations define corporate, standard views that are optimized for their business. For more information, see the [Managing personalizations at an organizational level with views](#) section.
- Unlike traditional personalization, views aren't automatically saved when a user performs personalizations or filters a list. Explicit saves are required to give users the flexibility to create a view before or after the changes that are associated with that view have been made. This requirement also ensures that view definitions aren't unintentionally changed by filters or personalizations that aren't intended for long-term use. Items that the system automatically stores as part of typical page usage (for example, column widths, or the expanded or collapsed state of sections) will be saved per view.
- Views can be added to workspaces as tiles, lists, or links. Therefore, a filtered data set can be surfaced in a workspace, and users can associate a set of personalizations that is relevant to that data set with a tile or link.

Switching between views

After views have been made available for an environment, the top of any page that supports views will include a collapsed view selector control that shows the name of the current view.

There are two size variations to the view selector:

- **Large view selectors** – Pages that prominently feature a list will have a larger view selector for a few reasons. Most importantly, the larger view selector indicates the pages where the view can include user-defined filters. Because filters are included in the views, the larger selector size is also warranted as the view names will often be the best description of the data shown on the screen and the expectation is that users will switch between views more often on these page types.
- **Small view selectors** – All other full-screen pages (except workspaces and the dashboard) have a smaller view selector that appears next to the page caption. Views on these pages include only personalizations, not

user-defined filters. On these pages, the caption or record title is often the most important information at the top of the page. The smaller size of the view selector also reflects the lower frequency of view switching that is expected on these pages.

If you select the view name, the view selector is opened and shows the list of available views for the page.

- **Standard view** – The **Standard** view is the out-of-box view of the page, where no personalizations are applied.
- **Personal views** – The views without padlocks represent your personal views. These are views that either you have created or that an administrator has given to you.
- **Locked views** – Some views (such as the **Standard** view and any views that are published to your role) have a padlock symbol next to them in the view selector. This symbol indicates that you can't edit those views. However, changes that reflect page usage are automatically saved. These changes include changes to the width of a grid column, and changes to the expanded or collapsed state of a FastTab. Nevertheless, if you have personalization privileges, you can use the **Save as** action to make a personal view that is based on a locked view.
- **New views** – Published views that haven't yet been opened have a spark symbol to the left of the view name.

To switch to a different view, first open the view selector and then select the view that you want to load.

Creating and modifying views

Unlike traditional personalization, views aren't automatically saved when a user personalizes the page, or when a user applies a filter to a list or sorts it. An explicit action is required to save these changes to a view. This requirement gives users the flexibility to create a view before or after the changes that are associated with that view have been made. It also ensures that view definitions aren't unintentionally changed by one-time filters or personalizations. Note that typical page usage items (for example, column widths, or the expanded or collapsed state of sections) are automatically saved to the current view, even for locked views.

To ensure that the current state of the view is known, when you start to change a view by personalizing or filtering it, an asterisk (*) appears next to the current view name. This symbol indicates that you're looking at an unsaved, modified version of that view.

If you want to save those changes, follow these steps.

1. Select the view name to open the view selector.
2. To modify the existing view, select **Save**. Note that this action isn't available for locked views.
3. To create a new view:
 - a. Select **Save as**.
 - b. Enter a view name and (optionally) a description.
 - c. Select **Save**.

Changing the default view

The default view is the view that the system tries to open when you first open the page. You should set the default view to the view that you expect to use most often.

NOTE

There is a single, global default view across companies. If you change the default view, that view will be opened by default, regardless of the legal entity that you're currently in.

To change the default view for a page, follow these steps:

1. Switch to the view that you use as the default.
2. Select the view name to open the view selector.
3. Select **More** and then **Pin as default**.

Alternatively, when you create a new view (by using the **Save as** action), you can make that new view the default view by setting the **Pin as default** option before you save the view.

Note that, in some cases, the query that is associated with the default view isn't run when you first open a page. For example, if you open the page through a tile, the tile's query will be run, regardless of the query that is associated with the default view. Additionally, if you open a page that has a **Standard** view that already has a defined query, the original query will be run instead of the default view's query. In this case, you will receive an informational message when the view is loaded. If you switch views after the page has been loaded, the view query should be able to be run as expected. In version 10.0.10 and later, the informational message that you receive will have an embedded action that lets you load the default view's query directly.

Managing personal views

The **Manage my views** dialog box gives you basic maintenance capabilities over your personal views and the order of views in the view selector. To open this page, select the view name to open the view selector drop-down menu, select **More**, and then select **Manage my views**.

For a list of available views for that page, the following set of actions are available.

- **Change the default view** – Use the **Pin as default** action to make the currently selected view the default view for this page.
- **Reorder your views** – Use the **Move up** and **Move down** actions to rearrange your views in a specific order.
- **Rename a view** – Use the **Rename** action to change the name of the currently selected personal view. This action is turned off for locked views.
- **Delete a view** – Use the **Delete** action to permanently delete the currently selected view from the page. There is no way to recover a view after you remove it.

Any changes made in this dialog box will take effect after you select the **Save** button.

Managing personalizations at an organizational level with views

To help you understand how saved views help improve management of personalizations at an organizational level, this section describes some differences in personalization management with and without the **Saved views** feature.

Without views, administrators would apply a set of personalizations for a page to a user or a group of users via the Personalization page. If those users had personalization rights, the personalizations would be applied to that page. However, there was no ability to prevent users from further personalizing the page, which meant the organization could not ensure that its users had a consistent user interface. If any of those users didn't have personalization rights, the personalizations given to them by an administrator were not loaded. Further, if new users were hired into an organization, administrators needed to manually load a set of personalizations for the user. There was no automatic mechanism for specifying that a certain set of personalizations should be available for users in that role.

The **Saved views** feature makes organizational management of personalizations much easier, primarily because views can be published to groups of users. After a view has been published, any user who has one of the defined security roles and access to one the specified legal entities can see and use the view, even if that user doesn't have access to personalization. Although every user has a copy of the published view, where page usage

items are automatically applied, no user can save personalizations or query updates to a published view. In other words, published views are locked. Additionally, if new users are assigned to roles in legal entities that views were published to, they will automatically see the views that are associated with their roles and legal entities. No additional action is required by the admin. Likewise, if users change roles in an organization or are given access to different legal entities, they might no longer be able to access the views that were previously published to them. Again, no additional action is required by the admin.

Updates to a published view can easily be distributed to users by republishing the view to the appropriate security roles and legal entities.

The publish capability allows organizations to define corporate standard views that are optimized for their business, targeted at users in specific security roles.

Publishing views

During the publishing process, views can be assigned to one or more security roles for one or more legal entities. Therefore, any user who has access to a legal entity and is assigned to one of those roles can access and use the views. However, the user can't edit the views. By default, system admins have access to the **Publish** action in the view selector drop-down menu. However, other trusted users in your organization can also be given access to view publishing via the new **Saved views administrator** role.

To publish a view, follow these steps:

1. Create and save a personal copy of the view that you want to publish.
2. With that view currently loaded, select the view name to open the view selector drop-down menu.
3. Select the **More** button and then select **Publish**. The Publish dialog box will open.
4. Enter a name for the view. The name that you enter is the name that users who receive this view will see in their view selectors. The names of published views for a page must be unique. No duplicate names are allowed, even if the list of roles or legal entities that the views are applied to differ.
5. **Update 10.0.17 or later:** If the **(Preview) Translation support for organization views** feature is turned on, you can add translations for your view name in as many languages as your organization requires by selecting the **Translations** button next to the **Name** field. The view name will then be shown to users in their current language. You can also set the default language to specify the translation that will be shown to users who are running languages that no translation is defined for.
6. Optional: Enter a description for the view, so that users who receive this view can better understand its purpose.
7. Determine whether the view should be published as the default view for the selected users. When a view is made the default view, users will see it the next time that they open the target page. The single, global default view of every targeted user will be changed. However, users can still change their default view after publishing has occurred.
8. Add the security roles that correspond to the users who are being targeted by this view.
9. Determine whether you want to publish the view to the child roles of each security role that is selected. If you do, select the **Include child roles** check box in the row for the appropriate security roles. Note that this check box isn't available for roles that don't have child roles.
10. Add the legal entities that this view should be available for.
11. Select **Publish**.

Note that in some environments, it may take some time (up to an hour) before users see the published view.

NOTE

Be aware of the following expectations when you publish a view to a legal entity, or when you publish a view as the default view.

- If you publish a view as the default view to all or some legal entities, you change the single, global default view of every targeted user. If a user has roles where multiple views are published as the default view, the last view that was published will be used as the user's default view.
- If you publish a view to a legal entity, but you don't publish it as the default view, users will initially see the view in the view selector only for the specified legal entities. However, after the view is loaded for the first time, it will always be in the user's view selector for that page, regardless of the legal entity.

Modifying a published view

After you publish a view, you might find that you want to change it. Although you can't make live changes to a published view, because these views are locked for editing for all users (including publishers), you can republish a view to update it.

If the changes that you want to make to a published view only involve the publish parameters (the name and description of the view, or the security roles the view is published to), do the following:

1. Switch to the published view for the parameters that you want to update.
2. On the view selector drop-down menu, select **Republish**. If you're using version 10.0.12 or earlier, you must select **Publish** and then **Yes** to update the existing view.
3. Update the name, description, security roles, and legal entities for the view.
4. Select **Publish**. If you originally selected this published view as the default view, it will be the default view for users again after you republish it.

If the changes to the published view involve modifications of the personalizations or filters that are associated with the view, follow these steps.

1. Load the published view that you want to change.
2. Make the required changes to the local draft.
3. On the view selector drop-down menu, select **Republish**.
4. Select **Yes** to indicate that you want to publish the view together with its unsaved changes.
5. Adjust any publishing parameters that require adjustment, and then select **Publish**.

Managing published views

Like managing personal views, the **Manage my views** dialog box gives users with publish privileges basic maintenance capabilities over that page's published views (in addition to their own personal views). To open this page, select the view name to open the view selector drop-down menu, select **More**, and then select **Manage my views**.

Although all users have a **My views** tab that show their personal views, users who have publish privileges also have an **Organization views** tab that shows all the published and unpublished views for that page. Because several users might be publishing views, it's important that you be able to manage the full list of published views, even if you aren't the user who published a given view.

For the list of all published views for the page, the following set of actions are available.

- **Republish** – Use the **Republish** action to republish a view after publishing parameters (name, description, security roles, or legal entities) are changed.
- **Publish** – Use the **Publish** action to publish a view that is currently unpublished.

- **Unpublish** – Use the **Unpublish** action to make a view inactive. The view will still be available in the system, but users won't see it in the view selector until the view is published again.
- **Save as personal** – Use the **Save as personal** action to create a personal draft copy of the published view. This capability can help you understand the contents of a view that wasn't published to you or that hasn't yet been published. You can also use it to edit and then republish a view.
- **Delete** – Use the **Delete** action to permanently delete a published or unpublished view. This action also removes the view for all users in the system. The removal of published views takes effect after the **Save** button is selected. After a view is deleted, it can't be recovered.

Managing views globally

Although some management capabilities are surfaced on every page, as indicated in this topic, **system administrators** and **saved view administrators** can manage views more holistically for the system via the **Personalization** page. In particular, this page has the following sections and capabilities:

- **Published views** – This section lists all views that have been published for your organization. From here, you can republish a view after you adjust the security roles or legal entities that the view targets. You can also export, delete, or unpublish views. You can use the **Save as personal** action to create a personal copy of a view, so that you can update the view or gain a better understanding of its contents.
- **Unpublished views** – This section lists all the organization views in your system that aren't currently published. These views most often come into the system through the import capability. You can publish, export, or delete these views. The **Quick publish** action that was added in version 10.0.12 enables multiple views from this section to be published in one action, by using the existing security role and legal entity configurations. You can use the **Save as personal** action to create personal copies of these views, so that you can gain a better understand their contents.
- **Personal views** – This section lists all views that have been created by users in the system. From here, you can publish a personal view to the organization, or copy one or more of these views to other users. You can also export or delete these views as required.
- **User settings** – Select a user to view, or adjust the user's ability to use personalization either for the whole system or for specific pages that the user has visited. You can view and interact with the user's personalizations in the system. You can also delete all personalizations for that user or reset feature callouts for the user. If feature callouts are reset, any pop-up windows that introduced new features and that the user previously dismissed will appear again the next time that the user encounters those features.
- **System settings** – You can temporarily turn off personalization for all users in the system. In this case, no personalizations are applied for any user, and all pages are reset to their default state. If you turn personalization back on later, all personalizations are reapplied. You can also permanently delete all personalizations for all users in the system. Personalizations that have been deleted can't be recovered. Therefore, before you perform this task, be sure to export any personalizations that you might want later.

Users who have access to the **Personalization** page can also import personal or organization views by using the **Import views** button on the Action Pane. For organization views, you can select **Publish immediately** to make the views available to users without an additional explicit publish.

Known issues

For a list of known issues with saved views, please see [Build forms that fully utilize saved views](#).

Frequently asked questions

How do I enable saved views in my environment?

NOTE

The **Saved views** feature requires the Personalization system in Finance and Operations to be enabled. If personalization is turned off for the entire environment, views will be disabled even if you follow steps below.

You can turn the **Saved views** feature on and off through Feature management in any environment. After it's turned on, saved views will be enabled in all subsequent user sessions.

What happens to existing personalizations when views are enabled?

When views are enabled, any existing personalizations for a user and form are saved into a new view called **My view** that is automatically set as the default view. This is meant to ensure that there is a consistent user experience before and after views are enabled, except for the view selector control appearing on forms.

What pages support views?

Views are available on most, but not all pages. Specifically, views are currently available on all full-screen pages except for dashboards and workspaces. Non-full-screen pages, which include dialog boxes, drop-down dialogs, lookups, enhanced previews, currently do not support views. View support for additional page types, such as workspaces and dialog boxes, may be considered for a future update.

Who is allowed to publish views?

Only system admins and users who have been assigned to the **Saved views administrator** role have the rights to publish views.

Why am I not able to save filters with this view?

There are a few reasons why a filter may not appear to save with a view:

- The page may not support saving filters as part of the view definition. Note that only pages with large view selectors allow personalizations and query modifications to be saved as a view. See the **Switching views** section for more information.
- The page in question may not properly support views, as it may ignore the view query completely or may operate on a temporary table whose data is not persistent.

What data will I see when I visit a page?

For pages that have small view selectors (only personalizations can be saved to the view), you will see the same data as you always have when you visit the page.

For pages that have large view selectors (both personalizations and queries can be saved to the view), you will typically see the data that is linked to the query that is associated with your default view. There are two main exceptions:

- If you navigate to a page from a tile, the tile query will execute regardless of the query associated with the default view. If you created that tile after views have been enabled, selecting a tile will open the page with the view associated with that tile.
- If you navigate to a page and that entry point includes a query, the original query will execute originally in place of the default view's query. You should be alerted when this occurs via an informational message when the view is loading. You can also confirm by switching to this view after the page loads, as that should allow the view query to execute regardless.

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Standard saved views for Supply Chain Management

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Microsoft Dynamics 365 Supply Chain Management includes several saved views that you can enable and use as needed. Some of these standard saved views are optimized and named for a specific role or task (for example, "Quality control" or "Receiving"). Others are optimized so that they include only the fields and settings that Microsoft usage statistics indicate are most often used by customers. These saved views are typically referred to as *simplified* views. This topic describes the standard saved views that are available, and explains how to enable and customize them.

For complete details about how to work with saved views, including the standard saved views, after you enable them, see [Saved views](#).

Customizing the standard saved views

You can customize the standard saved views, just as you can customize your own saved views. However, when you customize a standard saved view, we strongly recommend that you save your custom version under a new name. Otherwise, your customizations could be overwritten when you update Supply Chain Management.

For more information about how to customize and rename saved views, see [Saved views](#).

Available saved views and how to enable them

To use the saved views feature, regardless of whether you will use the standard saved views, you must turn on the *Saved views* feature in [Feature management](#).

The remaining sections of this topic provide tables that describe the standard saved views that are currently available for each relevant module. Each table shows the name of each saved view, the page where you can find it, and a description of it. Each table also shows the name of the feature that includes the saved view. To see a standard saved view in your system, you must turn on the specified feature in [Feature management](#).

Saved views for the Inventory management module

The following table describes the saved views available for the Inventory management module.

PAGE	VIEW NAME	VIEW DESCRIPTION	FEATURE NAME
On-hand list	Financials	This simplified view lets you focus on financial information while you manage on-hand inventory.	Saved views for Inventory management
On-hand list	Quality control	This simplified view lets you focus on quality control while you manage on-hand inventory.	Saved views for Inventory management

PAGE	VIEW NAME	VIEW DESCRIPTION	FEATURE NAME
On-hand list	Receiving	This simplified view lets you focus on receiving operations while you manage on-hand inventory.	Saved views for Inventory management
On-hand list	Shipping	This simplified view lets you focus on shipping operations while you manage on-hand inventory.	Saved views for Inventory management
Transactions	Simplified	This simplified view lets you review inventory status without being distracted by financial information and other fields that are used less often.	Saved views for Inventory management
Transfer orders	Shipping	This simplified view lets you focus on shipping operations while you manage transfer orders.	Saved views for Inventory management
Transfer orders	Receiving	This simplified view lets you focus on receiving operations while you manage transfer orders.	Saved views for Inventory management
Transfer orders	Quality control	This simplified view lets you focus on quality control while you manage transfer orders.	Saved views for Inventory management
Transfer orders	Financials	This simplified view lets you focus on financial information while you manage transfer orders.	Saved views for Inventory management

Saved views for the Master planning module

The following table describes the saved views available for the Master planning module.

PAGE	VIEW NAME	VIEW DESCRIPTION	FEATURE NAME
Planned orders: Planned order details page	Simplified	This simplified view includes only the fields that are most often used to work with the details of a single planned order. In this way, it provides a quicker overview and a streamlined work process.	Saved views for planned orders

PAGE	VIEW NAME	VIEW DESCRIPTION	FEATURE NAME
Planned orders: Planned orders list page	Simplified	This simplified view includes only the fields that are most often used to work with the list of planned orders. In this way, it provides a quicker overview and a streamlined work process.	Saved views for planned orders

Saved views for the Procurement and sourcing module

The following table describes the saved views available for the Procurement and sourcing module.

PAGE	VIEW NAME	VIEW DESCRIPTION	FEATURE NAME
Purchase order details	Order creation	This simplified view is optimized for creating new purchase orders.	Saved views for purchase orders
Purchase order details	Inventory management	This simplified view is optimized for performing inventory-related activities, such as following up on inventory that has been received, receiving inventory, checking net requirements, and adjusting order quantities.	Saved views for purchase orders
Purchase order details	Financial management	This simplified view is optimized for performing finance-related activities, such as invoicing and checking prices, totals, and charges.	Saved views for purchase orders
Purchase order details	Order approval	This simplified view is optimized for approving purchase orders.	Saved views for purchase orders

Saved views for the Production control module

The following table describes the saved views available for the Production control module.

PAGE	VIEW NAME	VIEW DESCRIPTION	FEATURE NAME
Production order BOM page	Simplified	This simplified view includes only the fields that are most often used. In this way, it provides a quicker overview and a streamlined work process.	Saved views for production control

PAGE	VIEW NAME	VIEW DESCRIPTION	FEATURE NAME
Production order details page	Simplified	This simplified view includes only the fields that are most often used. In this way, it provides a quicker overview and a streamlined work process.	Saved views for production control
Production order picking list page	Simplified	This simplified view includes only the fields that are most often used. In this way, it provides a quicker overview and a streamlined work process.	Saved views for production control
Production orders list page	Simplified	This simplified view includes only the fields that are most often used. In this way, it provides a quicker overview and a streamlined work process.	Saved views for production control

Saved views for the Sales and marketing module

The following table describes the saved views available for the Sales and marketing module.

PAGE	VIEW NAME	VIEW DESCRIPTION	FEATURE NAME
Packing slip journal	Journal review	This simplified view includes only the fields that are most often used to review packing slip journals.	Saved views for sales and marketing
Sales order	Order creation	This simplified view includes only the fields that are most often used to create sales orders.	Saved views for sales and marketing
Sales order	Order review	This simplified view includes only the fields that are most often used to review sales orders.	Saved views for sales and marketing
Sales quotation	Quote creation	This simplified view includes only the fields that are most often used to create sales quotations.	Saved views for sales and marketing

Saved views for the Warehouse management module

The following table describes the saved views available for the Warehouse management module.

PAGE	VIEW NAME	VIEW DESCRIPTION	FEATURE NAME
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PAGE	VIEW NAME	VIEW DESCRIPTION	FEATURE NAME
All loads	Inbound processing	This simplified view includes only the fields that are most often used to process inbound loads.	Saved views for load processing
All loads	Outbound processing	This simplified view includes only the fields that are most often used to process outbound loads.	Saved views for load processing
All shipments	Inbound processing	This simplified view includes only the fields that are most often used to process inbound shipments.	Saved views for shipment processing
All shipments	Outbound processing	This simplified view includes only the fields that are most often used to process outbound shipments.	Saved views for shipment processing
All waves	Simplified	This simplified view includes only the fields that are most often used. In this way, it provides a quicker overview and a streamlined work process.	Saved view for wave processing
Load planning workbench	Simplified	This simplified view includes only the fields that are most often used. In this way, it provides a quicker overview and a streamlined work process.	Saved view for the work planning workbench
Work details	Simplified	This simplified view includes only the fields that are most often used. In this way, it provides a quicker overview and a streamlined work process.	Saved view for the work details page

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Grid capabilities

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IMPORTANT

Some or all of the functionality noted in this topic is available as part of a preview release. The content and the functionality are subject to change. For more information about preview releases, see [Service update availability](#).

The new grid control provides several useful and powerful capabilities that you can use to enhance user productivity, construct more interesting views of your data, and get meaningful insights into your data. This article will cover the following capabilities:

- Calculating totals
- Typing ahead of the system
- Evaluating math expressions
- Grouping tabular data (enabled separately using the **(Preview) Grouping in grids** feature)
- Freezing columns

Calculating totals

In Finance and Operations apps, users have the ability to see totals at the bottom of numeric columns in grids. A footer section at the bottom of the grid shows these totals.

Showing the grid footer

There is a footer area at the bottom of every tabular grid in Finance and Operations apps. The footer can show valuable information that is related to the data that appears in the grid. Here are some examples of this information:

- The number of selected rows in the table (when you select more than one record)
- Grand totals at the bottom of configured, numeric columns
- The number of rows in the dataset

This footer is hidden by default but you can turn it on. To show the footer for a grid, right-click on a column header in the grid and select the **Show footer** option. After you turn on the footer for a particular grid, that setting will be remembered until the user opts to hide the footer. To hide the footer, right-click on a column header and select **Hide footer**. (The placement of the **Show footer/Hide footer** action might move to a new location in a future update.

Specifying columns with totals

Currently, no columns show totals by default. Instead, this is considered a one-time setup activity, similar to adjusting the widths of columns in grids. Once you specify that you want to see totals for a column, that setting will be remembered the next time you visit the page.

There are two ways to configure a column to show a total:

- Right-click in the column that you want to see a total for, and then select **Total this column**. This action causes three events to occur:
 1. The footer becomes visible.
 2. Your preference for seeing a total for this column is saved.

3. A calculation of totals is initiated for this column and any other columns that you previously configured to see totals for. The time that is required to show a total depends on the size of the dataset that you're totaling.
- After the footer is visible, select **Show total** in the footer area at the bottom of the column that you want to see a total for. If there are no configured columns, the **Show total** button will be available for all numeric columns.

After at least one column is configured for totals, the **Show total** buttons will be available only on hover or focus. The action of selecting **Show total** just saves your preference for seeing a total in this column, so that the preference is applied during future visits to the page. In the footer, this state is indicated by a dash that appears in the column. (Alternatively, if the dataset is small enough, a total is immediately shown.)

If you make a mistake and no longer want to see a total in a particular column, right-click on the column and select **Hide total** or select the **Hide total** button in the footer in that column. This preference will also be saved for future visits to the page.

Calculating totals

When you come to a page with the footer visible and columns already configured for totals, totals may or may not be shown in the footer. The behavior is dependent on the size of the dataset on the page. If the dataset is sufficiently small, totals will be shown automatically, along with the number of rows in the dataset. If there are dashes in the footer under the columns you configured for totals, then the dataset is too large for the system to show totals immediately, and an explicit action is needed to calculate the totals. To do this, click the **Calculate** button in the footer, or right-click on a column you want a total for and select **Total this column**.

If the calculation is taking too long, you can cancel the operation by selecting the **Cancel** button. Sometimes, however, the dataset will be too large to calculate totals (a limit imposed by your organization), and you will instead be notified to filter your data more.

Totals will update automatically as you update, delete, or create rows in the dataset.

Typing ahead of the system

In many business scenarios, the ability to quickly enter data into the system is very important. Before the new grid control was introduced, users could change data only in the current row. Before they could create a new row or switch to a different row, they were forced to wait for the system to successfully validate any changes. In an attempt to reduce the amount of time that users wait for these validations to be completed, and to improve user productivity, the new grid adjusts these validations so that they are asynchronous. Therefore, the user can move to other rows to make changes while previous row validations are pending.

To support this new behavior, a new column for the row status has been added to the right of the row selection column when the grid is in edit mode. This column indicates one of the following statuses:

- **Blank** – No status image indicates that the row has been successfully saved by the system.
- **Processing pending** – This status indicates that the changes in the row haven't yet been saved by the server but are in a queue of changes that must be processed. Before you take action outside the grid, you must wait for all the pending changes to be processed. Additionally, the text in these rows is italicized to indicate the unsaved status of the rows.
- **Invalid state** – This status indicates that some warning or message was triggered during the processing of the row, and it might have prevented the system from saving the changes in that row. In the old grid, if the save operation was unsuccessful, you were forced back into the row to fix the issue immediately. However, in the new grid, you're notified that a validation issue was encountered, but you can decide when you want to fix any issues in the row. When you're ready to fix an issue, you can manually move focus back to the row. Alternatively, you can select the **Fix this issue** action. This action immediately moves focus back to the row that has the issue, and lets you make edits inside or outside the grid. Note that the processing of subsequent

pending rows is stopped until this validation warning is resolved.

- **Paused** – This status indicates that processing by the server is paused because validation of the row triggered a pop-up dialog box that requires user input. Because the user might be entering data in some other row, the pop-up dialog box isn't immediately presented to that user. Instead, it will be presented when the user chooses to resume processing. This status is accompanied by a notification that informs the user about the situation. The notification includes a **Resume processing** action that will trigger the pop-up dialog box.

When users are entering data ahead of the place where the server is processing, they can expect a few degradations in the data entry experience, such as a lack of lookups, control-level validation, and entry of default values. Users who need a drop-down list to find a value are encouraged to wait for the server to catch up to the current row. Control-level validation and entry of default values will also occur when the server processes that row.

Pasting from Excel

Users have always been able to export data from grids in Finance and Operations apps to Excel by using the **Export to Excel** mechanism. However, the ability to enter data ahead of the system enables the new grid to support copying tables from Excel and pasting them directly into grids in Finance and Operations apps. The grid cell that the paste operation is initiated from determines where the copied table begins to be pasted in. The contents of the grid are overwritten by the contents of the copied table, except in two cases:

- If the number of columns in the copied table exceeds the number of columns that remain in the grid, starting from the paste location, the user is notified that the extra columns have been ignored.
- If the number of rows in the copied table exceeds the number of rows in the grid, starting from the paste location, the existing cells are overwritten by the pasted content, and any extra rows from the copied table are inserted as new rows at the bottom of the grid.

Evaluating math expressions

As a productivity booster, users can enter mathematical formulas in numeric cells in a grid. They don't have to do the calculation in an app outside the system. For example, if you enter $=15*4$ and then press the **Tab** key to move out of the field, the system will evaluate the expression and save a value of **60** for the field.

To make the system recognize a value as an expression, start the value with an equal sign (=). For more information about the supported operators and syntax, see [Supported math symbols](#).

Grouping tabular data

Business users often need to perform ad-hoc analysis of data. While this can be done by exporting data to Microsoft Excel and using pivot tables, the **Grouping in grids** feature, which is generally available in version 10.0.16/Platform update 40 and is dependent on the new grid control feature, allows users to organize their tabular data in interesting ways within Finance and Operations apps. Because this feature extends the **Totals** feature, **Grouping** allows you to get meaningful insights into the data by providing subtotals at the group level.

To use this feature, right-click the column that you want to group by, and select **Group by this column**. This action will sort the data by the selected column, add a new **Group by** column to the beginning of the grid, and insert "header rows" at the beginning of each group. These header rows provide the following information about each group:

- Data value for the group
- Column name (this information is especially useful when you have multiple levels of grouping)
- Number of data rows in this group
- Subtotals for any column configured to show totals

With [Saved views](#) enabled, this grouping can be saved by personalization as part of a view for quick access the next time you visit the page.

Multiple levels of grouping

After you've grouped data by a single column, you can group the data by a different column by selecting **Group by this column** on the desired column. This process can be repeated until you have 5 nested levels of grouping, which is the maximum supported depth. At this point, you will no longer be able to group by additional columns.

At any point, you can remove the grouping on any column by right-clicking that column and selecting **Ungroup**. You can also remove the grouping from all columns by selecting **Grid options** and then **Ungroup all**.

Note, prior to version 10.0.16/Platform update 40, only one level of grouping is supported. In these versions, if the data is grouped and you select **Group by this column** for a different column, the original grouping is replaced.

Expanding and collapsing groups

The initial grouping of data will have all groups expanded. You can create summarized views of the data by collapsing individual groups, or you can use group expanding and collapsing to assist in navigating through the data. To expand or collapse a group, select the chevron (>) button in the corresponding group header row. Note that the expand/collapse state of individual groups is **not** saved in personalization.

Selecting and unselecting rows at the group level

In the same way that you can select (or unselect) all rows in the grid by selecting the check box at the top of the first column in the grid, you can also quickly select (or unselect) all the rows in a group by selecting the check box in the corresponding group header row. The check box in the group header row will always reflect the current selection state of rows in that group, regardless of whether all rows are selected, no rows are selected, or only some rows are selected.

Hiding column names

When grouping data, the default behavior is to show the column name in the group header row. Starting in version 10.0.14/Platform update 38, you can choose to suppress the column name in group header rows by selecting **Grid options > Hide group column name**.

Freezing columns

Some columns in a grid might be important enough for context that you don't want them to scroll out of view. Instead, you want the values in those columns always to be visible. In version 10.0.17, the **Freeze columns in grid** feature provides this flexibility to users.

To freeze a column, right-click in the column's header, and then select **Freeze column**. The first time that you complete this step, the selected column becomes the first column and will no longer scroll out of view. Any subsequent column that you freeze will be added to the right of the last frozen column. You can use the standard Move functionality to reorder frozen columns as you require. However, frozen columns can't be moved so that they appear among the set of unfrozen columns. Likewise, unfrozen columns can't be moved so that they appear among the set of frozen columns.

To unfreeze a column, right-click in the frozen column's header, and then select **Unfreeze column**.

Note that the row selection and row status columns in the new grid are always frozen as the first two columns. Therefore, when these columns are included in a grid, they will always be visible to users, regardless of the horizontal scroll position in the grid. These two columns can't be reordered.

Frequently asked questions

How do I enable the new grid control in my environment?

10.0.9 / Platform update 33 and later

The **New grid control** feature is available directly in Feature management in any environment. Like other public preview features, enabling this feature in production is subject to the [Supplemental Terms of Use Agreement](#).

10.0.8 / Platform update 32 and 10.0.7 / Platform update 31

The **New grid control** feature can be enabled in Tier 1 (Dev/Test) and Tier 2 (Sandbox) environments in order to provide additional testing and design changes by following the steps below.

1. **Enable the flight:** Execute the following SQL statement:

```
INSERT INTO SYSFLIGHTING (FLIGHTNAME, enabled, FLIGHTSERVICEID, PARTITION)
VALUES('CLIRectGridEnableFeature', 1, 0, 5637144576);
```

2. **Reset IIS** to flush the static flighting cache.

3. **Find the feature:** Go to the **Feature management** workspace. If **New grid control** does not appear in the list of all features, select **Check for updates**.

4. **Enable the feature:** Find the **New grid control** feature in the list of features, and select **Enable now** on the details pane. Note that a browser refresh is required.

All subsequent user sessions will start with the new grid control enabled.

[Developer] Opting out individual pages from using the new grid

If your organization discovers a page that has some issues utilizing the new grid, an API is available starting in version 10.0.13/Platform update 37 to allow an individual form to use the legacy grid control while still permitting the rest of the system to utilize the new grid control. To opt out an individual page from the new grid, add the following call post `super()` in the `run()` method for the form.

```
this.forceLegacyGrid();
```

This API will be honored until the October 2021 release, when the new grid control becomes mandatory. If any issues require that this API be used, report them to Microsoft.

[Developer] Size-to-available-width columns

If a developer sets the **WidthMode** property to **SizeToAvailable** for columns inside the new grid, those columns initially have the same width that they would have if the property were set to **SizeToContent**. However, they stretch to use any extra available width inside the grid. If the property is set to **SizeToAvailable** for multiple columns, all those columns share any extra available width inside the grid. However, if a user manually resizes one of those columns, the column becomes static. It will remain at that width and will no longer stretch to take up extra available grid width.

Known issues

This section maintains a list of known issues for the new grid control.

Open issues

- After enabling the **New grid control** feature, some pages will continue to utilize the existing grid control. This will happen in the following situations:
 - A card list exists on the page that is rendered in multiple columns.
 - A grouped card list exists on the page.

- A grid column with a non-react extensible control.

When a user first encounters one of these situations, a message will display about refreshing the page. After this message appears, the page will continue to utilize the existing grid for all users until the next product version update. Better handling of these scenarios, so that the new grid can be utilized, will be considered for a future update.

- [KB 4582758] Records are blurry when you change zoom from 100 to any other percentage
- [KB 4592012] Unexpected client error in IE11 when pasting multiple lines from Excel
 - Microsoft is not pursuing a fix for this issue

Fixed as part of 10.0.16

- [KB 4598335] Multi-line string controls do not respect their DisplayHeights in lists/cards
- [KB 4591891] Invoice proposal lines disappear when unmarking lines
- [KB 4592104] Unable to edit records after clicking "Fix issue" and moving to a different row without fixing the validation issue
- [KB 4594449] "Never" and "Clear" buttons missing inside the date picker
- [KB 4594448] Entering time is treated differently with the new grid
- [KB 4600059] Unexpected client error with email throttling
- [KB 4574584] Expense attachment preview not available when hovering over the receipt icon

Fixed as part of 10.0.15

- (Quality update) [KB 4594444] Unexpected client error with preview for segmented entry control
- [KB 4582723] Display options not showing when done later in the form life cycle
- [KB 4591988] Issues using the keyboard to select a value from a ReferenceGroup lookup
- [KB 4588958] Regression Suite Automation Tool (RSAT) test fails with error: TypeError: Cannot read property 'text' of undefined
- [KB 4591970] Unexpected client error when pasting from Excel was done immediately after clicking into the grid
- [KB 4591904] Data changes are not saved if after editing a control the user immediately clicked and opened the lookup of a different control
- [KB 4584752] Unexpected client error with Project invoice proposals page
- [KB 4584540] Unable to leave the grid after pasting a single row into a journal line
- [KB 4591908] When creating a new row, focusing is staying in the column you were in

Fixed as part of 10.0.14

- (Quality update) [KB 4584752] Unexpected client error with Project invoice proposals page
- [KB 4583880] Regression Suite Automation Tool (RSAT) tests fail on OpenLookup action with "Cannot read property RowIndex of undefined"
- [KB 4583847] Unexpected client error when navigating through lookups

Fixed as part of 10.0.13

- (Quality update) [KB 4584752] Unexpected client error with Project invoice proposals page
- (Quality update) [KB 4583880] Regression Suite Automation Tool (RSAT) tests fail on OpenLookup action with "Cannot read property RowIndex of undefined"
- (Quality update) [KB 4583847] Unexpected client error when navigating through lookups
- (Quality update) [Bug 471777] Cannot select fields in a grid to edit or create a mobile app
- [KB 4582727] Grid freezes after user gets dialog for items with multiple quantities
- [Bug 474851] Hyperlinks in reference group controls don't work
- [Bug 474848] Enhanced previews with grids do not display

- [KB 4582726] The RotateSign property isn't being respected
- [Bug 470173] Check boxes in inactive rows toggle when the whitespace in the cell is clicked
- [Bug 474848] Enhanced previews with grids do not display
- [Bug 474851] Hyperlinks in reference group controls don't work
- [Bug 471777] Cannot select fields in a grid to edit or create a mobile app
- [KB 4569441] Issues with rendering multi-column card lists, tooltips on images, and display options on some fields
- [KB 4575279] Not all marked rows are deleted in General Journal
- [KB 4575233] Display options are not restored after moving to another row
- [Bug 477884] Lookups return wrong value/record if new grid control is activated
- [KB 4571095] Product receipt posting occurs when accidentally pressing Enter (correct handling of a page's default action)
- [KB 4575437] Lookups with editable controls close unexpectedly
- [KB 4569418] Duplicate line created in delivery schedule form
- [KB 4575435] Enhanced preview sometimes persists even when the mouse pointer isn't near the field
- [KB 4575434] Lookup isn't filtering when the field has been modified
- [KB 4575430] Values in password fields aren't masked in the grid
- [KB 4569438] "Processing has stopped because of a validation issue" displays after marking lines while settling supplier transactions
- [KB 4569434] Refreshing the Legal entities form results in fewer records
- [KB 4575297] Focus keeps moving to the task recorder pane when editing and tabbing through a grid
- [KB 4566773] Correction transactions not showing as negative on voucher transactions inquiry
- [KB 4575288] Focus resets to the active row when selecting the border between rows in a simple list
- [KB 4575287] Focus doesn't return to the first column when using the down arrow to create a new row in journals
- [KB 4564819] Cannot delete lines in a free text invoice (because the datasource ChangeGroupMode=ImplicitInnerOuter)
- [KB 4563317] Tooltips/enhanced previews aren't shown for images

Fixed as part of 10.0.12

- [KB 4558545] Table controls don't update the contents of displayed items.
- [KB 4558570] Items are still shown on the page after the record has been deleted.
- [KB 4558572] Styling that is associated with the List Panel **ExtendedStyle** isn't applied.
- [KB 4558573] Validation errors can't be fixed when the required change is outside the grid.
- [KB 4558584] Negative numbers aren't rendered correctly.
- [KB 4560726] An "unexpected client error" occurs after swapping between lists is done by using a List View control.
- [KB 4562141] Grid indices are off after a new record is added.
- [KB 4562151] The **Validate** and **Copy** task recorder options aren't available for date/number controls.
- [KB 4562153] Multi-select check boxes aren't visible on list/card grids.
- [KB 4562646] You sometimes can't click outside the grid after you multi-select rows in the grid.
- [KB 4562647] Focus is reset to the first control in the **Publish** dialog box after a new row is added in the security roles grid.
- [KB 4563310] The enhanced preview isn't closed after a row is changed.
- [KB 4563313] An "unexpected client error" occurs in Internet Explorer when a value is selected in a lookup.
- [KB 4564557] Lookups and drop-down menus won't open in Internet Explorer
- [KB 4563324] Navigation doesn't work after the **Personnel management** workspace is opened.

Fixed as part of 10.0.11

- [Issue 432458] Empty or duplicated lines are shown at the beginning of some child collections.
- [KB 4549711] Lines in a payment proposal can't be removed correctly after the new grid control is enabled.
- [KB 4558374] Records that require a polymorphic selector dialog box can't be created.
- [KB 4558375] Help text isn't shown on columns in the new grid.
- [KB 4558376] List Panel grids aren't rendered at the correct height in Internet Explorer.
- [KB 4558377] Combo box columns that have **SizeToAvailable** width aren't rendered on some pages.
- [KB 4558378] Drill-through sometimes opens the wrong record.
- [KB 4558379] An error occurs when lookups are opened where **ReplaceOnLookup=No**.
- [KB 4558380] The available space in the grid isn't filled immediately after part of the page is collapsed.
- [KB 4558381] Negative numbers aren't rendered correctly / Users sometimes become stuck after validation issues are encountered.
- [KB 4558382] Unexpected client errors occur.
- [KB 4558383] Controls outside the grid aren't updated after the last record is deleted.
- [KB 4558587] Reference groups that have combo boxes for replacement fields don't show values.
- [KB 4562143] Fields aren't updated after a row change / Grid processing becomes stuck after row deletion.
- [KB 4562645] An exception occurs when a lookup is opened while Regression Suite Automation Tool (RSAT) tests are running.

Fixed as part of 10.0.10

- [Issue 414301] Some data from previous lines disappears when new lines are created.
- [Bug 417044] There is no empty grid message for list-style grids.
- [KB 4539058] Some grids (typically on FastTabs) sometimes aren't rendered (but they will be rendered if you zoom out).
- [KB 4549734] Active rows aren't treated as marked if the marking column is hidden.
- [KB 4549796] Values can't be edited in a grid when it's in view mode.
- [KB 4558367] Text selection is inconsistent when rows are changed.
- [KB 4558368] Multi-select via the keyboard is allowed in single-select scenarios.
- [KB 4558369] Status images disappear in the hierarchical grid.
- [KB 4558370] A new row isn't scrolled into view.
- [KB 4558372] The new grid becomes stuck in processing mode if the number of columns in content that is pasted in exceeds the number of remaining columns in the grid.
- [KB 4562631] Time values aren't formatted correctly.

Quality update for 10.0.9/Platform update 33

- [KB 4550367] Time values aren't formatted correctly.

NOTE

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Create and work with custom fields

2/18/2021 • 7 minutes to read • [Edit Online](#)

While there is an extensive set of fields out-of-the-box for managing a broad range of business processes, sometimes there is a need for a company to track additional information in the system. While programmers can be used to add those fields as extensions in the developer tools, the custom fields feature allows fields to be added directly from the user interface, thereby allowing you to tailor the application to fit your business using your web browser.

The ability to add custom fields is available in platform update 13 and later. Only users with special permissions have access to this feature.

This video shows how easy it is to add a custom field to a page: [Adding custom fields](#).

Creating custom fields

After you've identified additional information that you would like to track in the application, you can create the custom field on the appropriate table and expose that new field on a page.

The following steps describe the process for creating a custom field and placing that field on a form.

1. Navigate to the form where the new field is needed.
2. Because the end goal is to expose the custom field on a form, the entry point for creating custom fields exists inside the personalization experience. Open the personalization toolbar by selecting **Options**, and then **Personalize this form**.
3. Click **Insert** and then **Field**.
4. Select the region of the form where you want to expose the new field. After selection, the **Insert fields** dialog box will display a list of existing fields that can be inserted into the selected region of the form.
5. Ensure that the field you are interested in does not already exist in the list. If it does, you can simply select that field in the list and click **Insert**.
6. Click the **Create new field** button above the list to initiate the process of creating a custom field. This will open the **Create new field** dialog box.

If you do not see the **Create new field** button, you do not have the necessary permissions to use this feature.

7. In the **Create new field** dialog box, enter the following information.
 - a. Select the database table where this field should be added. Note that only tables that support custom fields will appear in the drop-down list. See the section below for technical details on supported tables.
 - b. Select the data type for the new field. The available data types are checkbox, date, date time, decimal, number, picklist, and text.
 - If you choose the text data type, you can also specify the maximum length of the text that can be entered in this field.
 - If you choose the picklist data type, you can also select the set of valid values for the field.
 - c. Provide a name, label, and help text for the field. The name corresponds to the physical field name

in the database, whereas the label and help text are the text used to represent this field in the user interface.

8. If this is the only field that you need to create for this form, click **Save**. If you need to create additional fields, click **Save and new** and go back to step 7. Note that there is currently a limit of **20 custom fields per table**.
9. Leaving the **Create new field** dialog box will return you to the **Insert fields** dialog box. Any custom fields that were just added will be automatically marked in the field list to be inserted into the form.
10. Click **Insert** to insert the marked fields into the selected region of the form.
11. **Optional:** Enable **Move** mode from the personalization toolbar to move the new fields to their desired location in the selected region. See [Personalize the user experience](#) for more information about how to use the various personalization capabilities to optimize a form for your personal usage.

Sharing custom fields with other users

After you have created a custom field and exposed it on a form, you might want to provide this updated page view that includes the new field to other users in the system. This can be accomplished in two different ways using the personalization capabilities of the product:

- The recommended route is through the system administrator, who can push a personalization to all users or a subset of users. See [Personalize the user experience](#) for more details.
- Alternatively, you can export your changes (called *personalizations*), send them to one or more users, and have each of those users import your changes. The **Manage** option on the personalization toolbar enables you to export and import personalizations.

Managing custom fields

Management of all the custom fields in the system can be accomplished through the **Custom fields** page in the System administration module. This page allows users access to many capabilities, including:

- Viewing a list of all custom fields in the system.
- Limited editing of existing custom fields.
- Deleting custom fields.
- Exposing custom fields on data entities.
- Providing translations of custom field labels and help text.

Viewing all custom fields

The **Custom fields** page provides visibility to all the custom fields that have been defined in the system. Simply select the table that you are interested in, and the page will update to show a list of the custom fields associated with that table. Choosing a custom field from the list will allow you to view all the details about the field.

Editing custom fields

After a custom field has been created, only certain pieces of information about the custom field can be modified on the **Custom fields** page.

You *can* modify these attributes:

- Label
- Help text
- Length, for Text fields

You *cannot* edit the following attributes:

- Field name
- Data type

Additionally, for picklist fields, the set of valid values for the custom field can be reordered, and new values can be added; however, existing values for the picklist field cannot be removed. Remember to click **Apply changes** when you are done editing fields for a particular table so the changes are saved.

Exposing custom fields on data entities

It may also be important to allow custom fields to be visible on data entities. Data entities are utilized in the [Office integration overview](#) feature, as well as for data import/export scenarios.

Follow these steps to expose a custom field on a data entity:

1. Select the custom field on the **Custom fields** form.
2. Expand the **Entities** section to view the set of relevant entities.
3. Click the **Edit** button.
4. Modify the **Enabled** field to be selected for each entity that should expose this field.
5. Click **Apply changes** to save your selections.

Allowing custom fields to be displayed in other languages

Because custom fields may need to be accessed by users in a variety of languages, the **Custom fields** page provides a mechanism to allow the label and help text for a custom field to be translated into other languages.

The following steps describe the process for translating custom fields in other languages:

1. Select the custom field on the **Custom fields** page.
2. Select the **Translations** button in the Action Pane. This will open a drop-down menu with existing translations for this field.
3. The **Language** drop-down menu shows the set of languages for which translations have already been provided.

If you want to edit an existing translation, select the desired language from the menu and modify the values for the label and help text.

Otherwise, click the **Add language** button, select the desired language from the menu, and then provide translated values for the label and help text.

4. Click **OK** when you are finished.

Deleting custom fields

In some rare cases, you may decide that a custom field is no longer needed. When this occurs, a system administrator can choose to delete the field from the **Custom fields** page. To do this, ensure the correct field is selected, click **Delete**, click **Yes** to confirm the deletion, and finally click **Apply changes**.

NOTE

This action cannot be undone, and will result in the data associated with the field being permanently deleted from the database.

Appendix

Who can create custom fields?

As a safeguard to the system, only system administrators are able to create custom fields by default. However, those power users whom the organization deems necessary can be given rights to create custom fields by a

system administrator using the **Runtime customization power user** security role. Users without this security role will not be able to create custom fields, but will still be able to see and interact with custom fields added by other users in the system.

What tables support custom fields?

For performance and technical reasons, only tables that meet the following conditions currently allow custom fields to be added.

- The table must be tagged as one of these groups:
 - Group
 - WorksheetHeader
 - Main
 - Miscellaneous
 - Parameter
 - Reference
 - TransactionHeader
- The table cannot extend another table.
- The table cannot be marked as a system table.
- The table cannot be a temporary table.

Can I reference custom fields from the developer tools?

Custom fields can only be managed through the user interface and cannot be referenced by code.

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Embed canvas apps from Power Apps

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Microsoft Power Apps is a service that lets developers and non-technical users build custom business apps for mobile devices, tablets, and the web without writing code. Finance and Operations apps support integration with Power Apps. Canvas apps that you, your organization, or the broader ecosystem develop can be embedded into Finance and Operations apps to augment the product's functionality. For example, you might build a canvas app from Power Apps to supplement a Finance and Operations app with information that is retrieved from another system.

To learn more about embedding Power Apps, watch the short [How to embed Power Apps](#) video.

Adding an embedded canvas app from Power Apps to a page

Overview

Before you embed a canvas app from Power Apps into the client, you must find or build an app that has the desired visuals or functionality. This topic doesn't include a detailed description of the process for building apps. If you're new to Power Apps, see the [Power Apps documentation](#).

There are two ways to access a specific canvas app on a page when you're ready to embed the app. You can choose whichever approach fits your scenario better. The first approach uses the **Power Apps** button that has been added to the standard Action Pane. Apps that you add by using this approach appear as items on the **Power Apps** menu button. When you select one of these items, a side pane that contains the embedded app appears. Alternatively, you can embed an app directly on a page as a new tab, FastTab, or blade, or as a new section in a workspace.

When you configure your embedded canvas app, you can select a single field that you want to send as context to the app. This step enables the app to be responsive, based on the data that you're currently viewing.

NOTE

You can't currently use this mechanism to embed modeled apps.

Details

The following procedure shows how to embed a canvas app from Power Apps into the web client.

1. Go to the page where you want to embed the canvas app. This page will be the page that contains data that must be passed to the app as input.
2. Open the **Add an app from Power Apps** pane:
 - Click **Options**, and then select **Personalize this page**. Under the **Insert** menu, choose **Power Apps**. Finally, select the region where you would like to add the app. If you want to embed the app under the Power Apps menu button, choose the Action Pane. If you want to embed the app directly onto the page, choose the appropriate tab, FastTab, blade, or section (if you're on a workspace).
 - If the app will be accessed using the Power Apps menu button, you can alternatively click the **Power Apps** menu button in the standard Action Pane, and then select **Add an app**.
3. Configure the embedded app:
 - The **Name** field indicates the text shown for the button or tab that will contain the embedded app. Oftentimes, you may want to repeat the name of the app in this field.

- The **App ID** field indicates the globally unique identifier (GUID) for the canvas app that you want to embed. To retrieve this value, find the app on make.powerapps.com, and then look in the **App ID** field under **Details**.
 - For **Input context for the app**, you can optionally select the field that contains the data that you want to pass to the app as input. See the section later in this topic titled [Building an app that leverages data sent from Finance and Operations apps](#) for details on how the app can access the data sent from Finance and Operations apps.
 - Choose the **Application size** that matches the type of app that you're embedding. Select **Thin** for apps built for mobile devices, and **Wide** for apps built for tablets. This ensures a sufficient amount of space is allotted for the embedded app.
 - The **Legal entities** FastTab provides the ability to choose which legal entities the app is available for. The default is to make the app accessible to all legal entities. This option is only available when the [Saved views](#) feature is disabled.
4. After confirming that the configuration is correct, click **Insert** to embed the Power App on the page. You will be prompted to refresh the browser in order to see the embedded app.

Sharing an embedded app

After you've embedded a canvas app on a page and confirmed that it's working correctly with any data context that is passed from that page, you might want to share the app with other users in the system. To share an embedded canvas app, follow these steps.

1. [Share the canvas app](#) with the appropriate users, so that they can access the app in Power Apps.
2. Make sure that the targeted users have the appropriate personalizations, so that the embedded app appears when those users view the page. You can use either of the following approaches:
 - Recommended: Use the [Saved views](#) feature to create and publish a view that includes the embedded app. This approach ensures that all users who have the security roles that are targeted by the published view will see the app in Finance and Operations apps.
 - If you don't have the Saved views feature turned on, you can have the system admin push a personalization that includes the embedded app to all users or a subset of users. Alternatively, you can export your page's personalizations, and send them to one or more users. Each of those users can then import the personalizations. The personalization toolbar has actions that let you export and import personalizations.

NOTE

If the canvas app has been shared with external users, those users can't use the embedded app inside Finance and Operations apps. However, they can access the app directly inside Power Apps. External users include guests and users who don't belong to the Microsoft 365 Azure Directory where the Finance and Operations app is deployed.

See [Personalize the user experience](#) for more details about the personalization capabilities in the product and how to use them.

Building a canvas app that uses data that is sent from Finance and Operations apps

When you build a canvas app that will be embedded in a Finance and Operations app, one important part of the process is to use the input data from that Finance and Operations app. From the Power Apps development experience, the input data that is passed from a Finance and Operations app can be accessed by using the `Param("EntityId")` variable.

For example, in the OnStart function of the app, you could set the input data from Finance and Operations apps to a variable like this:

```
If(!IsBlank(Param("EntityId")), Set(FinOpsInput, Param("EntityId")), Set(FinOpsInput, ""));
```

Viewing a canvas app

To view an embedded canvas app on a page in Finance and Operations apps, just go to a page that has an embedded app. Remember that apps can be accessed by using the **Power Apps** button on the standard Action Pane. Alternatively, they can appear directly on the page as a new tab, or FastTab, or blade, or as a new section in a workspace. When users first try to load an app on a page, they will be prompted to sign in. This step ensures that the users have the appropriate permissions to use the app.

Editing an embedded app

After an app has been embedded onto a page, you may need to make some changes to the configuration of the app. For example, perhaps you want to modify the label associated with the embedded app or a new version of the app has been created and you need to update the App ID to point at the latest.

Follow these steps to edit the configuration of an embedded app:

1. Go to the **Edit the app** pane.
 - If the embedded app is accessed through the Power Apps menu button, right-click on the Power Apps menu button and select **Personalize**. Select the app that you want to configure from the **Select an app** drop-down menu.
 - If the embedded app appears directly on the page, select **Options**, and then select **Personalize this page**. Using the **Select** tool, click the embedded app.
2. Make the needed modifications to the app configuration, and then click **Save**.

Removing an app

After an app has been embedded onto a page, there are two ways to remove it if needed:

- Go to the **Edit an app** pane using the instructions from the [Editing an embedded app](#) section earlier in this topic. Confirm that the pane displays information for the embedded app that you would like to remove, and then click the **Delete** button.
- Because the embedded app is saved as personalization data, clearing your page's personalization will also remove any embedded apps on that page. Note that clearing the page's personalization is permanent and cannot be undone. To remove your personalizations on a page, select **Options**, and then **Personalize this page**, and finally the **Clear** button. After refreshing your browser, all the previous personalizations for this page will be removed. See [Personalize the user experience](#) for more information about how to optimize pages using personalization.

Appendix

[Developer] Specifying where an app can be embedded

By default, users can embed apps on any page, either under the Power Apps menu button or directly on the page as a tab, FastTab, blade or as a new section in a workspace. However, if required, developers can also configure this feature to only allow embedding of apps on certain pages by implementing the following methods:

- **isPowerAppPersonalizationEnabled** – If this method returns false for a specific page, then the Power

Apps menu button will not be shown, and users will not be able to embed apps anywhere on this page, including as a tab.

- **isPowerAppTabPersonalizationEnabled** – If this method returns false for a specific page, then users will not be able to embed apps directly on the page as a tab, FastTab, or panorama section. Users will still be able to embed apps through the Power Apps menu button if embedding is allowed on the page.

The following example shows a new class with the two methods needed to configure where apps can be embedded.

```
[ExtensionOf(classStr(FormRunConfigurationPowerAppsConfiguration))]  
  
public final class ClassTest_Extension  
{  
    public static boolean isPowerAppPersonalizationEnabled(str pageName)  
    {  
        var result = next isPowerAppPersonalizationEnabled(pageName);  
        return result;  
    }  
  
    public static boolean isPowerAppTabPersonalizationEnabled(str pageName)  
    {  
        var result = next isPowerAppTabPersonalizationEnabled(pageName);  
        return result;  
    }  
}
```

NOTE

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Find information by using lookups

2/18/2021 • 4 minutes to read • [Edit Online](#)

Many fields have lookups that can help you easily find the correct or desired value. Several enhancements have been added to lookups that make these controls more usable and make users more productive. In this topic, you will learn about these new lookup features and will receive some helpful tips to get the optimal use out of lookups in the system.

Responsive lookups

In previous versions, when interacting with a lookup control, a user would have to take an explicit action to open the drop-down menu. This may have been by typing an asterisk (*) in the control to filter the lookup based on the current value of the control, clicking the drop-down button, or by using the **Alt+Down arrow** keyboard shortcut. Lookup controls have been modified in the following ways to better align with current web practices:

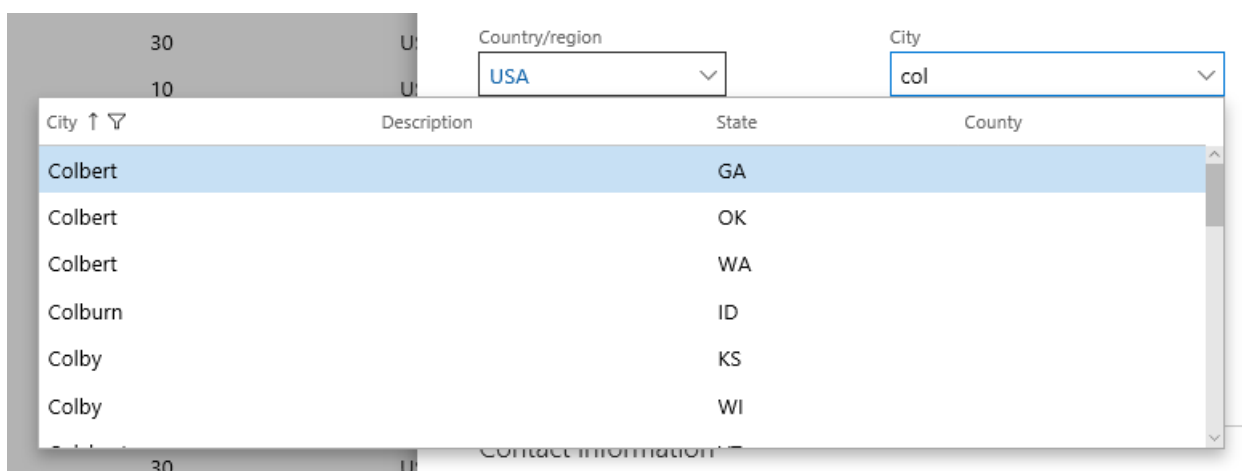
- Lookup drop-down menus will now open automatically after a slight pause in typing, with the drop-down menu contents filtered based on the lookup control's value.

Note that the old behavior of automatic opening of the dropdown after typing an asterisk (*) has been deprecated.

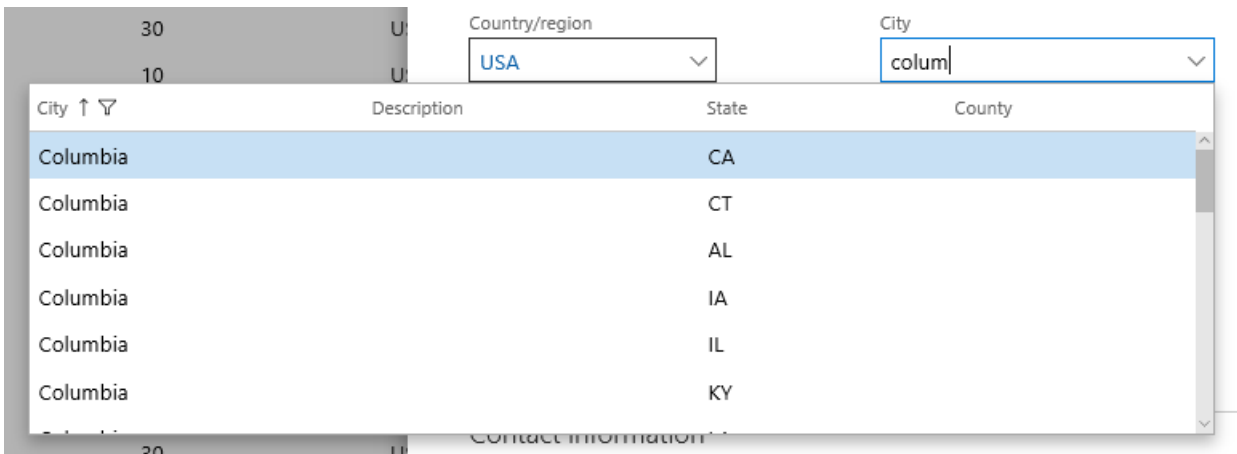
- After the lookup drop-down menu has opened, the following will occur:
 - The cursor will stay in the lookup control (instead of focus moving into the drop-down menu) so you can continue to make modifications to the control's value. However, the user can still use the **Up arrow** and **Down arrow** to change rows in the drop-down menu, and enter to select the current row in the drop-down menu.
 - The contents of the drop-down menu will adjust after any modifications are made to the lookup control's value.

For example, consider a lookup field called **City**.

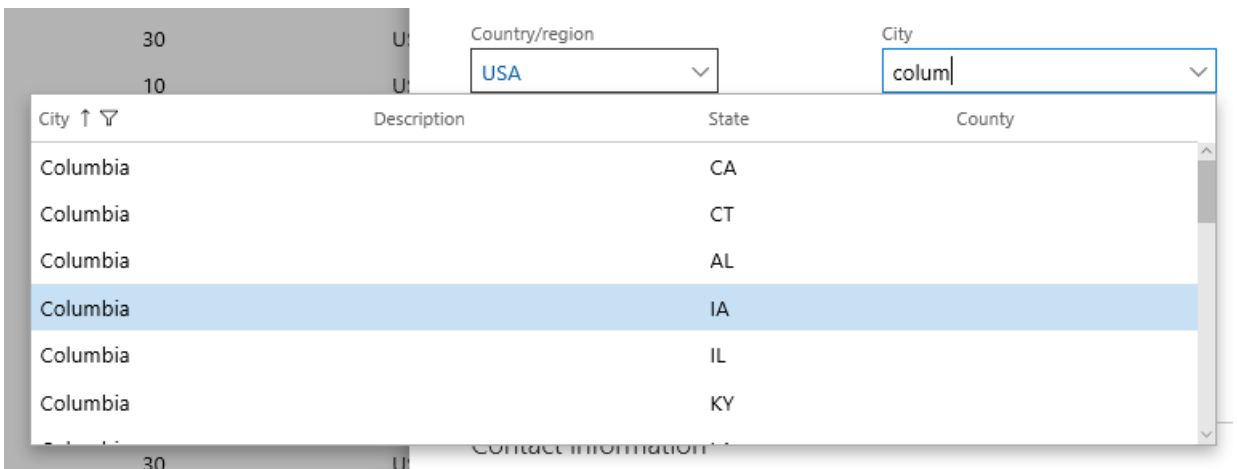
When focus is in the **City** field, you can start looking for the city that you want by typing a few letters, like "col." After you stop typing, the lookup will open automatically, filtered to those cities that begin with "col".



At this point, the cursor is still in the lookup field. If you continue typing so the value is "colum," the lookup contents adjust automatically to reflect the latest value in the control.



Even though focus is still in the lookup control, you can also use the **Up arrow** or **Down arrow** keys to highlight the row that you want to select. If you press **Enter** the highlighted row will be selected from the lookup and the control's value will be updated.

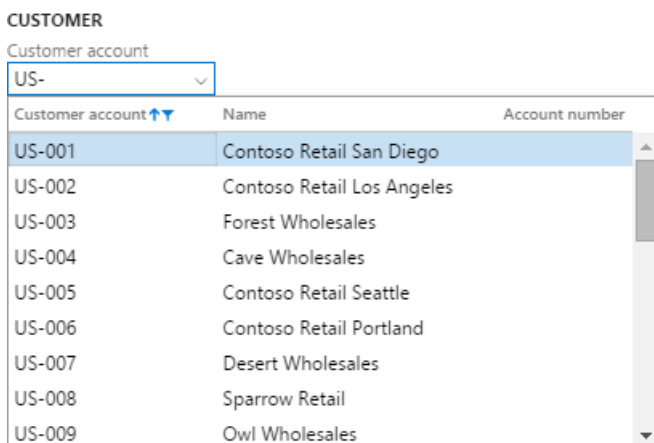


Typing in more than IDs

When entering data, it's natural for users to attempt to identify an entity, such as a customer or vendor, in terms of the name rather than an identifier representing the entity. Many (but not all) lookups now allow contextual data entry. This powerful feature allows the user to type the ID or the corresponding name into the lookup control.

For example, consider the **Customer account** field when creating a sales order. This field shows the **Account ID** for the customer, but a user would typically prefer to enter an **Account name** instead of an **Account ID** for this field when creating a sales order, such as "Forest Wholesales" instead of "US-003."

If the user started to enter an **Account ID** into the lookup control, the drop-down menu would automatically open as described in the previous section and the user would see the lookup as shown below.



However, the user can also now enter the beginning of an **Account name** as well. If this is detected, then the user will see the following lookup. Notice how the **Name** column is moved to be the first column in the lookup, and how the lookup is sorted and filtered based on the **Name** column.

CUSTOMER

Customer account

Conto

Name ↑	Customer account	Account number
Contoso Europe	DE-001	
Contoso Retail Chicago	US-015	
Contoso Retail Dallas	US-011	
Contoso Retail Detroit	US-018	
Contoso Retail Los Angeles	US-002	
Contoso Retail Miami	US-028	
Contoso Retail New York	US-012	
Contoso Retail Portland	US-006	
Contoso Retail San Diego	US-001	

Using grid column headers for more advanced filtering and sorting

The lookup enhancements discussed in the previous two sections greatly improve a user's ability to navigate the rows in a lookup based on a "begins with" search of the ID or **Name** field in the lookup. However, there are situations in which more advanced filtering (or sorting) is needed to find the correct row. In these situations, the user needs to use the filtering and sorting options in the grid column headers inside the lookup. For example, consider an employee entering a sales order line who needs to locate the right "cable" as the product. Typing "cable" into the **Item number** control isn't helpful, as there are no product names that begin with "cable."

Sales order lines

+ Add line + Add lines Add products Remove Sales order line Financials Inventory Product and supply Update line Warehouse

✓ T...	Variant number	Item number	Product name	Sales category	CW quantity	CW unit	Quan
✓		▼ cable		▼			

Search name Item number ↑ Product name Item group Item type

We didn't find anything to show here.

Line details

GENERAL SETUP ADDRESS

ORDER LINE Product name EXTERNAL REFERENCES INTERCOMPANY Preve

Instead, the user needs to clear the value of the lookup control, open the lookup drop-down menu, and filter the drop-down menu using the grid column header, as shown below. A mouse (or touch) user can simply click (or touch) any column header to access the filtering and sorting options for that column. For a keyboard user, the user simply needs to press **Alt+Down arrow** a second time to move focus into the drop-down menu, after which the user can tab to the correct column, and then press **Ctrl+G** to open the grid column header drop-down menu.

Sales order lines

+ Add line + Add lines Add products Remove Sales order line Financials Inventory Product and supply Update line Warehouse

✓ T...	Variant number	Item number	Product name	Sales category	CW quantity	CW unit	Quant
✓							

Item number ↑	Search name	Product name	Item group	Item type
1000	1001		consume	Item
4401	Proseware 50W Car Ra			Item
4402	Northwind Traders 50			Item
4403	A. Datum 50W Car Rad		dio	Item
A0001	HDMI 6' Cables		&Video	Item
A0002	HDMI 12' Cables		&Video	Item

Line details

GENERAL SETUP ADDRESS

ORDER LINE Product name EXTERNAL REFERENCES INTERCOMPANY

After the filter has been applied (see the image below), the user can find and select the row as usual.

Sales order lines

+ Add line + Add lines Add products Remove Sales order line Financials Inventory Product and supply Update line Warehouse

✓ T...	Variant number	Item number	Product name	Sales category	CW quantity	CW unit	Quant
✓							

Item number ↑	Search name	Product name	Item group	Item type
A0001	HDMI 6' Cables	HDMI 6' Cables	TV&Video	Item
A0002	HDMI 12' Cables	HDMI 12' Cables	TV&Video	Item
M0023	Banana Plugs 24K	Speaker Cable Banana Plugs 24...	AudioRM	Item
M0024	Speaker Cable In-wal	Speaker Cable In-wall 50 Ft	AudioRM	Item
T0001	SpeakerCable	SpeakerCable	Audio	Item

Line details

GENERAL SETUP ADDRESS

ORDER LINE Product name EXTERNAL REFERENCES INTERCOMPANY

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Change the date for a session

2/18/2021 • 2 minutes to read • [Edit Online](#)

This topic explains how to change the date for a session. By default, the current date is used when entering and posting journal entries or source documents. You can change the date that is used for your current session. Use this feature to back-date journal entries or source documents, as necessary.

1. In the navigation pane, go to **Modules > Common > Common > Session date and time**.
2. In the **Date** field, enter a date.
3. Select **OK**.

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Set a user's preferred time zone

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The following topic explains how a user in the System Administrator role can set the time zone for a user.

1. Go to **Navigation pane > Modules > System administration > Users > Users**.
2. In the list, find and select the desired record.
3. Select **User options**.
4. Select the **Preferences** tab.
5. In the **Time zone** field, select an option from the drop-down list.
6. Select **Save**.

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Lifecycle Services (LCS) for Finance and Operations apps customers

2/18/2021 • 4 minutes to read • [Edit Online](#)

This topic is intended for customers who have signed up for the current versions of Finance and Operations apps. Partners who are working with customers to help them move through the lifecycle of their Lifecycle Services (LCS) project will also find this information useful.

LCS workspace for the current versions of the Finance and Operations apps

When you sign up for the current versions of Finance and Operations apps, your subscription includes an Implementation project workspace. After you activate the service, the tenant administrator must sign in at <https://lcs.dynamics.com> by using the tenant account. The project workspace is automatically created for your organization. The workspace includes the following elements:

- Enabled features, based on the offer that you selected
- Environments that are deployed and managed by Microsoft
- Guidance that is provided through the Action center to help you complete required actions
- A new methodology experience that includes tasks that lock as you move through the implementation
- A more complete history that specifies who completed each methodology phase and task
- Milestones that you can use to track critical project dates
- Various services to help you with your implementation

Methodologies

As a customer, you must complete the steps that are outlined in the methodology to gain access to the production environment. Before a phase can be marked as completed, you must complete the specified mandatory tasks. Locked tasks, such as tasks 1.6 and 1.9 in the following screenshot, are unlocked after you've completed the required actions. To learn which actions must be completed before a specific task can be unlocked, click the lock icon for that task.

Dynamics Demo Project

ACTION CENTER



Subscription estimate is not complete.
The number of users estimated in the active subscription estimate does not match the number of enterprise seats purchased.

Subscription estimator

METHODOLOGY



Phase history

Complete phase

- 1.1 Complete LCS project configuration *
- 1.2 Invite your project team
- 1.3 Deploy demo environment
- 1.4 Publish Plan and Milestone Dates *
- 1.5 Capture Business processes and requirements *
- 1.6 Perform Fit/Gap analysis *
- 1.9 Sign off requirements and business processes *
- 1.10 Upload first iteration of setup and configurati...

This task cannot be completed until estimator
1.5 is completed.

Task history

Action	User	Date
Reopened	administrator Dyna...	5/2/2016 2:51 PM
Closed	administrator Dyna...	5/2/2016 2:50 PM
Reopened	administrator Dyna...	5/2/2016 2:47 PM
Closed	TestCustomer1@Dy...	3/15/2016 6:35 AM
Reopened	TestCustomer1@Dy...	3/15/2016 6:35 AM
Closed	Shefy Manayil Kare...	2/18/2016 7:12 PM
Created	Shefy Manayil Kare...	2/18/2016 7:10 PM

Description

After you have captured the business processes and requirements, a thorough analysis of the each requirement is required to assess if it can be met by the standard product.

In the case of prerequisites, after you complete the required tasks, you can mark the dependent tasks as completed. For example, in the following screenshot, tasks 1.6 and 1.9 depend on task 1.5. Because task 1.5 has now been completed, the two dependent tasks can be marked as completed.

METHODOLOGY



Phase history

Complete phase

- 1.1 Complete LCS project configuration *
- 1.2 Invite your project team
- 1.3 Deploy demo environment
- 1.4 Publish Plan and Milestone Dates *
- 1.5 Capture Business processes and requirements *
- 1.6 Perform Fit/Gap analysis *
- 1.7 Complete subscription estimator *
- 1.8 Download templates
- 1.9 Sign off requirements and business processes *
- 1.10 Upload first iteration of setup and configurati...

Task history

Action	User	Date
Closed	Kuntal Mehta	3/29/2016 2:56 PM
Reopened	Raji Ramesh	3/23/2016 10:06 AM
Closed	TestCustomer1@Dy...	3/15/2016 6:35 AM
Reopened	TestCustomer1@Dy...	3/15/2016 6:30 AM
Closed	Shefy Manayil Kare...	2/18/2016 7:11 PM
Created	Shefy Manayil Kare...	2/18/2016 7:10 PM

Description

Before kicking off, complete the required configuration for LCS to ensure the best experience. This includes to key areas, Sharepoint and Visual Studio Team Services.

Visual Studio Team Services :

Milestones

High-level milestones must be defined for a project. Milestones can help you track the deliverables that must be completed and your progress toward the milestone goals. Color indicators help you quickly learn whether you're behind schedule. For example, in the following screenshot, the milestones are yellow. To enter or update the milestone dates, click the diamond shape in the methodology, and then click the Edit button (pencil icon). You can change milestone dates at any time.

Dynamics Demo Project

ACTION CENTER



Subscription estimate is not complete.
The number of users estimated in the active subscription estimate does not match the number of enterprise seats purchased.

Subscription estimator



Phase history

Complete phase

✓	1.1	Complete LCS project configuration	*
✓	1.2	Invite your project team	
✓	1.3	Deploy demo environment	
✓	1.4	Publish Plan and Milestone Dates	*
○	1.5	Capture Business processes and requirements	*
🔒	1.6	Perform Fit/Gap analysis	*
✓	1.7	Complete subscription estimator	*
✓	1.8	Download templates	
🔒	1.9	Sign off requirements and business processes	*
✓	1.10	Upload first iteration of setup and configurati...	

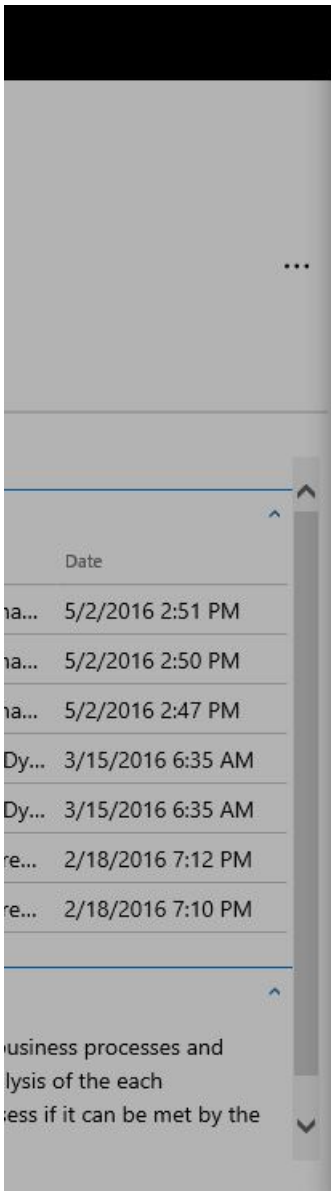
Task history

Action	User	Date
Reopened	administrator Dyna...	5/2/2016 2:51 PM
Closed	administrator Dyna...	5/2/2016 2:50 PM
Reopened	administrator Dyna...	5/2/2016 2:47 PM
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Closed	Shefy Manayil Kare...	2/18/2016 7:12 PM
Created	Shefy Manayil Kare...	2/18/2016 7:10 PM

Description

After you have captured the business processes and requirements, a thorough analysis of the each requirement is required to assess if it can be met by the standard product.

When you've finished entering milestones, the **Publish plan and milestone** task opens, and you can mark it as completed.



Set up milestones

Select the date on which each milestone must be completed. These dates will enable and disable capabilities in Lifecycle Services.

Milestone	End date
Analysis	1/6/2016
Design	2/9/2016
Test	3/17/2016

Save Cancel

When you've completed all the required tasks in a phase, you can click **Complete phase** to mark the phase as completed. After you mark a phase as completed, next steps become available in Microsoft Dynamics Lifecycle Services (LCS).

METHODOLOGY

Phase history

Complete phase

- ✓ 1.1 Complete LCS project configuration *
- ✓ 1.2 Invite your project team
- ✓ 1.3 Deploy demo environment
- ✓ 1.4 Publish Plan and Milestone Dates *
- ✓ 1.5 Capture Business processes and requirements *
- ✓ 1.6 Perform Fit/Gap analysis *
- ✓ 1.7 Complete subscription estimator *
- ✓ 1.8 Download templates
- ✓ 1.9 Sign off requirements and business processes *
- ✓ 1.10 Upload first iteration of setup and configurati...

Task history

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Closed	Kuntal Mehta	3/29/2016 2:56 PM
Reopened	Raji Ramesh	3/23/2016 10:06 AM
Closed	TestCustomer1@Dy...	3/15/2016 6:35 AM
Reopened	TestCustomer1@Dy...	3/15/2016 6:30 AM
Closed	Shefy Manayil Kare...	2/18/2016 7:11 PM
Created	Shefy Manayil Kare...	2/18/2016 7:10 PM

Description

Before kicking off, complete the required configuration for LCS to ensure the best experience. This includes to key areas, Sharepoint and Visual Studio Team Services.

Visual Studio Team Services :

Methodology description and history

Descriptions can help you understand what is expected of you for a specific methodology task or phase. You can expand the methodology description to learn more about each task, and then collapse the description when you've finished. The task and phase history can tell you when a task or phase was completed or reopened. If you're a project manager, this information can help you stay on top of the high-level tasks that are required for your implementations.

METHODOLOGY

Phase history

Complete phase

- 1.1 Complete LCS project configuration *
- 1.2 Invite your project team
- 1.3 Deploy demo environment
- 1.4 Publish Plan and Milestone Dates *
- 1.5 Capture Business processes and requirements *
- 1.6 Perform Fit/Gap analysis *
- 1.7 Complete subscription estimator *
- 1.8 Download templates
- 1.9 Sign off requirements and business processes *
- 1.10 Upload first iteration of setup and configurati...

Task history

Action	User	Date
Reopened	administrator Dyna...	5/2/2016 2:51 PM
Closed	administrator Dyna...	5/2/2016 2:50 PM
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Closed	Shefy Manayil Kare...	2/18/2016 7:12 PM
Created	Shefy Manayil Kare...	2/18/2016 7:10 PM

Description

After you have captured the business processes and requirements, a thorough analysis of the each requirement is required to assess if it can be met by the standard product.

Subscription estimator

You can use the Subscription estimator tool to evaluate your subscription requirements for the current versions of the Finance and Operations apps. To use Subscription estimator, download the usage profile, which is a Microsoft Excel workbook. Then, in the workbook, complete the following worksheets:

- Deployment details
- Instance Characteristics
- Retail & Commerce

After you've completed the worksheets, enter the data from the summary sheet into Subscription estimator by clicking + **New estimate**. You must make one estimate the active estimate. Make sure that the estimate that you mark as active is same as the offer that you bought through the VL or CSP channel.

New deployment experience

To provision your environment, you must to complete a configuration checklist. As you make progress through the methodology, environments become available to you. Click **Configure** to add deployment information.

The screenshot displays a project management interface. At the top, a sprint timeline shows Sprints 2, 3, and 4, with dates 1/11/2016, 2/21/2016, and 7 respectively. Below the timeline is a 'Task history' section with a 'Description' of project planning sessions. A 'Task history' dropdown menu is also visible. On the right side, there is a list of environments under the heading 'ENVIRONMENTS'. The environments listed are:

- PRODUCTION:** Environment Prod-1 is deployed (Full details)
- SANDBOX: PREMIER PERFORMANCE TEST (ADD-ON):** Configure
- SANDBOX: STANDARD PERFORMANCE TEST (ADD-ON):** Configure
- SANDBOX: PREMIER ACCEPTANCE TEST (ADD-ON):** Configure
- SANDBOX: PREMIER ACCEPTANCE TEST (ADD-ON):** Configure
- SANDBOX: STANDARD ACCEPTANCE TEST:** Configure
- SANDBOX: STANDARD ACCEPTANCE TEST (ADD-ON):** Configure
- SANDBOX: DEVELOP AND TEST:** Environment kranthi is deploying... (Full details)
- SANDBOX: DEVELOP AND TEST (ADD-ON):** Configure

Because the information that you enter determines your experience, carefully review your input. After you've entered all the required information, sign-off is required for the deployment request. The user who completes the sign-off becomes the system administrator on the instance. Verify that the correct user completes the sign-off for the deployment. After the sign-off is completed, the Microsoft site reliability engagement team reviews the request. After the team has reviewed the information that you entered, it initiates the provisioning. If the information isn't correct, the team will contact you. After the provisioning is completed, the status is updated to indicate that the environment has been deployed, as shown in the following screenshot. If the provisioning takes longer than expected, the Microsoft site reliability engagement team reviews the status and takes appropriate actions. These actions might include contacting you. After the environment is provisioned, click **Full details** to open the **Detailed environment** page, where you can sign in to the system, view the monitoring status, or view relevant updates.

SANDBOX: DEVELOP AND TEST

✓ Environment DynDemoDevTest is deployed

[Full details](#)

NOTE

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Implementation lifecycle management home page

2/18/2021 • 2 minutes to read • [Edit Online](#)

These topics describe the programs, tools, and processes available related to the implementation lifecycle of your Finance and Operations project.

Programs

[Microsoft FastTrack](#)

Tools

[Microsoft Dynamics Lifecycle Services](#)

[Lifecycle Services \(LCS\) for Finance and Operations apps customers](#)

Processes

[Onboard an implementation project](#)

[Prepare for go-live](#)

Frequently asked questions

[Go-live for implementation projects FAQ](#)

NOTE

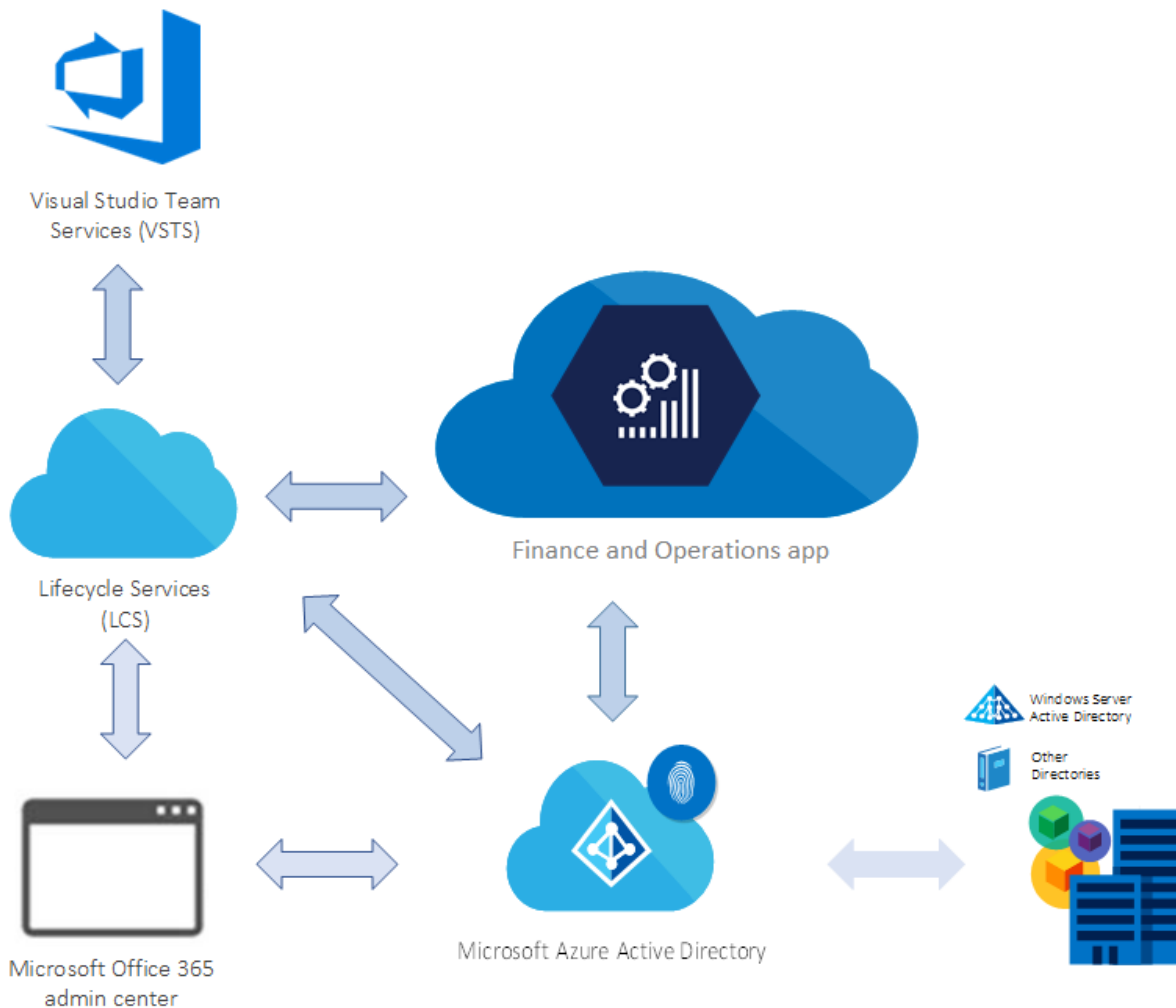
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Finance and Operations application architecture

2/18/2021 • 4 minutes to read • [Edit Online](#)

The Finance and Operations application cloud architecture contains all the elements that are common to all Microsoft cloud offerings, as described in [Subscriptions, licenses, accounts, and tenants for Microsoft's cloud offerings](#). Beyond this, it also includes services that automate software deployment and provisioning, operational monitoring and reporting, and seamless application lifecycle management.



The cloud architecture consists of these conceptual areas:

- **Subscription** – A subscription to Finance and Operations apps gives you an online cloud environment (or multiple environments) and experience.
- **Licenses** – Customers must purchase subscription licenses (SLs) for their organization, or for their affiliates' employees and on-site agents, vendors, or contractors who directly or indirectly access Finance and Operations apps. These apps are licensed through Microsoft Volume Licensing and the Microsoft Cloud Solution Provider (CSP) program. For more information, download the latest [Microsoft Dynamics 365 Licensing Guide from Dynamics 365 pricing](#).
- **Tenant** – In Microsoft Azure Active Directory (AAD), a tenant represents an organization. It's a dedicated instance of the AAD service that an organization receives and owns when it creates a relationship with Microsoft (for example, by signing up for a Microsoft cloud service, such as Azure, Microsoft Intune, or Microsoft 365). Every AAD tenant is distinct and separate from other AAD tenants. For more information

about AAD tenants, see [How to get an Azure Active Directory Tenant](#).

A tenant houses the company's user information. This information includes passwords, user profile data, permissions, and related information. The tenant also contains groups, applications, and other information that pertains to an organization and its security.

The tenant is created when customers sign up for their first subscription to any Microsoft online service, such as Microsoft 365, Microsoft Dynamics 365, or Azure. Any later subscriptions to the same online services or other online services can be grouped within the same tenant.

An organization can have multiple AAD tenants. If there are multiple tenants, make sure that any subscriptions for Finance and Operations apps are associated with the correct tenant.

- **Azure Active Directory (AAD)** – AAD is the multi-tenant, cloud-based directory and identity management service from Microsoft that combines core directory services, application access management, and identity protection in a single solution. For more information, see [Azure Active Directory](#). Finance and Operations apps use AAD as the store for identity. Access to AAD is provided as part of a subscription to Finance and Operations apps.
- **Microsoft 365 admin center** – Microsoft 365 admin center is the subscription management portal that Microsoft 365 provides for administrators. It's used to provide management functions for users (AAD) and subscriptions. As part of these management functions, it provides information about service health. For more information, see [About the Microsoft 365 admin center](#).

NOTE

You don't have to have an Microsoft 365 license to deploy Finance and Operations apps. However, you might require a license for specific Office integration scenarios. For more information, see [Office integration overview](#).

- **Microsoft Dynamics Lifecycle Services (LCS)** – LCS is a collaboration portal that provides an environment and a set of regularly updated services that can help you manage the application lifecycle of your implementations. For more information, see [Lifecycle Services resources](#). After you purchase and activate a subscription for a Finance and Operations app, an **Implementation project** workspace is provisioned in LCS when the tenant administrator signs in for the first time.

NOTE

An implementation project is an LCS project for the cloud service. As a Microsoft partner, you can also provision non-implementation LCS projects for your own purposes. For more information, see [Lifecycle Services \(LCS\) for Finance and Operations apps partners](#).

- **Finance and Operations apps** – Finance and Operations apps are deployed through LCS. Various topologies are available: development/test/build, acceptance test, performance test, and high-availability production. For more information about the various topologies, download the [latest Microsoft Dynamics 365 Licensing Guide from Dynamics 365 pricing](#).
- **Microsoft Azure DevOps** – Azure DevOps is used primarily for code version control, development, and to deploy a build environment. Azure DevOps is also used to track support incidents, such as work items in Azure DevOps that are submitted to Microsoft through Cloud-powered support, and to integrate the Business process modeler (BPM) library hierarchy into your Azure DevOps project as a hierarchy of work items. Azure DevOps is also used during code upgrade.

"Under the hood," Finance and Operations apps use many features of the Azure platform, such as Azure Storage, networking, monitoring, and Azure SQL Database, to name just a few. Shared services put into operation and orchestrate the application lifecycle of the environments for participants. Together, Azure functionality and LCS

offer a robust cloud service.

NOTE

Although many features of the Azure platform are used, you don't have to have an Azure subscription to deploy Finance and Operations apps in the Microsoft-managed cloud. You must have an Azure subscription only if you want to deploy Finance and Operations apps cloud-hosted environments in your own Azure subscription.

NOTE

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Onboard an implementation project

2/18/2021 • 3 minutes to read • [Edit Online](#)

This topic describes how to onboard a Finance and Operations project by using Microsoft Dynamics Lifecycle Services (LCS).

Microsoft 365 Admin Center

After your organization has purchased a subscription to Finance and Operations, it must be activated on your organization's Azure Active Directory (Azure AD) tenant by your Tenant Administrator, who completes the following steps:

1. Open an InPrivate/Incognito browser session and go to the [Microsoft 365 Admin Center](#).
2. Sign in with the Tenant Administrator credentials.
3. Go to **Billing > Products & services** and confirm that there is an active subscription for the application that you want to deploy.

NOTE

If you do not see an active subscription, consult with your Licensing Partner to confirm the status of the subscription transaction as well as the tenant for the subscription. By default, all Microsoft Online Services should be running on the same Azure AD tenant.

4. If the subscription in question is shown as active, proceed to the next step by signing in to LCS to trigger the Implementation Project creation flow.
5. Open another private browser tab and go to [Lifecycle Services](#). Select **Login** to access LCS with your current Tenant Admin credentials.
6. Accept and confirm any other prompts displayed to complete the Implementation Project provisioning.
7. The Tenant Administrator is assigned the Project Owner security role in the provisioned Implementation Project.

NOTE

If the Tenant Administrator will not be a participant in the implementation, at least one additional Project Owner must be assigned to the implementation project.

For an overview of LCS user management, including the security roles that can be assigned to users, see [Configure Lifecycle Services \(LCS\) security](#).

LCS implementation project workspace

After the Tenant Administrator has completed the Finance and Operations subscription activation and added additional project owners as appropriate, those team members can access the **Implementation project** workspace.

The first step to be completed in LCS is **Project onboarding**. This step is required for all LCS implementation projects that are created **on or after August 22, 2019, PST**, prior to deploying any of the Microsoft-managed

environments. You can access the **Project onboarding** feature using the action center notification or the LCS Implementation project menu. You must be assigned to the Project owner security role to access **Project onboarding** in LCS.

To get started with LCS, see [Lifecycle Services \(LCS\) for Finance and Operations apps customers](#).

FastTrack onboarding services

After the LCS **Implementation project** workspace is provisioned, the Microsoft FastTrack team will monitor your onboarding progress. If project onboarding is not completed within a few weeks after creating an LCS **Implementation project**, a reminder will be sent to the project team.

For more information about the FastTrack program and the services provided, see [Microsoft FastTrack](#).

For more information about LCS project onboarding, see [LCS project onboarding](#).

NOTE

All onboarding-related emails from the FastTrack team will originate from Dynamics 365 Onboarding (ond365@microsoft.com), so please ensure that any spam blocker/filter allows email from this address.

Key data to keep current in LCS

We recommend that you add key project members (such as project managers) from the customer and partner teams to the LCS implementation project. Be sure to include each person's work email address. In this way, you help us work best with you and help ensure that project members don't miss important communication from us.

Be sure to keep the milestone dates in your LCS project current. In this way, you help us connect with you at different project stages. When you're closer to your go-live date, we will contact you for a project Go-live assessment before we deploy your production environment.

Milestone dates are stored in the LCS implementation methodology. For more information, see the [Methodologies](#) section of the "LCS for Customers" topic.

NOTE

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Environment planning

2/18/2021 • 8 minutes to read • [Edit Online](#)

This topic provides an overview of various aspects that you must consider while you plan for your project's environment. To help guarantee a successful cloud implementation, it's important that you discuss and plan your environment early in the project.

Environment planning overview

To begin, here are a few important concepts:

- **Environment purpose** – The reasons why the environment exists. Examples include development, system testing, user acceptance testing (UAT), and operations.
- **Environment topology** – The composition of the environment and the purpose. Examples include **Develop** and **Build and Test** for Tier-1 environments.
- **Environment tier** – The type or category of the environment. Examples include Tier-1 environments and Tier-2 environments.

For more information, about the various environments and tiers, see [Cloud deployment overview](#) and download the latest *Microsoft Dynamics 365 Licensing Guide* from [Dynamics 365 pricing](#).

Environment types

You can use the following environment types for your project:

- **Standard** – This environment is included in the standard offer and is managed by Microsoft in a Microsoft subscription. Standard environments include the production environment and a Tier-2 Standard Acceptance Test environment.
- **Add-on** – The add-on environments are in a Microsoft-managed subscription that the customer has purchased in addition to the standard offer. For example, an add-on environment might be an additional Tier-4 environment for performance testing.
- **Cloud-hosted** – Cloud-hosted environments are additional environments that are managed by the customer or partner in a customer or partner Microsoft Azure subscription. A cloud-hosted environment can include a Tier-1 demo environment.
- **Environment image (VHD)** – These additional Tier-1 environments are hosted on-premises by using a virtual hard disk (VHD) that can be downloaded from [Microsoft Dynamics Lifecycle Services \(LCS\)](#).

IMPORTANT

In a *customer or partner Azure subscription*, the customer or partner brings its own Azure subscription, and deploys environments to that subscription for evaluation and development purposes only. The customer or partner pays for the resources that are deployed to its Azure subscription. The amount that the customer or partner pays is based on the Azure price list. By contrast, in a *Microsoft subscription*, the customer purchases licenses that allow the customer to deploy environments to an Azure subscription that is managed by Microsoft. Therefore, the customer has no separate Azure billing.

Tier-1 vs. Tier-2 and higher

TIER-1	TIER-2 AND HIGHER
Single-box environment	Multi-box environment

TIER-1	TIER-2 AND HIGHER
All components are installed on the same server. These components include Application Object Server (AOS), the database, Dynamics 365 Commerce, and Management Reporter.	Components are installed on multiple servers.
Microsoft SQL Server is used.	Azure SQL Database is used.
The architecture differs from the architecture of the production environment to maximize efficiency and cost of the development team.	The architecture is the same as the architecture of the production environment, even though this type of environment has a different sizing and isn't enabled for disaster recovery.
The environment can be cloud-hosted, or it can be deployed as an environment image (VHD).	The environment can be deployed only as a standard environment or an add-on environment. It can't be cloud-hosted.
The environment isn't suitable for UAT or performance testing.	The environment is suitable for UAT and performance testing.

Standard cloud offer

The standard cloud offer includes two environments:

- **Tier-2 environment: Standard Acceptance Testing** – One Standard Acceptance Testing (UAT) instance is provided for the duration of the subscription. This instance is a non-production multi-box instance that customers can use for UAT, integration testing, and training. Additional sandbox/staging instances can be purchased separately as an optional add-on.
- **Production environment** – One production instance is provided per tenant. The production multi-box instance includes disaster recovery and high availability. It will be provisioned when the implementation approaches the Operate phase, after the required activities in the Microsoft Dynamics Lifecycle Services (LCS) methodology and a successful go-live assessment are completed. Additionally, some file storage and database storage are included in the offer:
 - **File storage:** Every customer receives a certain amount of file/Azure blob cloud storage for files and binary data. Additional file/blob storage can be purchased.
 - **Database storage:** Every subscription includes a certain amount of Azure SQL Database storage per customer at no additional charge. Additional storage capacity is provided at no charge as an organization increases the number of user and device service licenses. For more information about the various environments and the various types of storage, as well as the currently included free file and storage capacity, download the latest *Microsoft Dynamics 365 Licensing Guide* from [Dynamics 365 pricing](#).

IMPORTANT

Microsoft promises service and data high availability as well as minimal servicing downtime guarantees as part of the Dynamics 365 software license agreement (SLA) for production environments. The SLA goals do not apply to non-production environments.

Provisioning of standard environments

The standard environments are provisioned at different times. The following table shows the suggested timing for the environments in the standard cloud offer.

ENVIRONMENT	WHEN DOES PROVISIONING OCCUR?	IS IT SELF-SERVICE?
Tier-2 Standard Acceptance Test	Immediately after project onboarding has been completed in LCS	Yes
Production	At production system readiness	A Go-live assessment must be completed prior to configuring the production deployment request in LCS.

IMPORTANT

Always deploy environments by using an **unnamed** account. This account must be from the customer domain, such as `dynadmin@customer.com` or `dynadmin@customer.onmicrosoft.com`. We strongly recommend using the same dedicated environment admin account on all environments. ISV licenses must be issued to the domain of the account used for environment deployment, therefore using both `dynadmin@customer.com` and `dynadmin@customer.onmicrosoft.com` on different environments can lead to problems with ISV licenses.

Production system readiness

The production environment can be deployed when the project is ready for the initial go-live. For more information, see [Prepare for go-live](#).

Production system readiness includes, but isn't limited to, the following conditions:

- An up-to-date subscription estimate is activated, as described in [Subscription estimator in Lifecycle Services \(LCS\)](#).
- Code, configuration, and data are ready for cutover.
- An engineering process is in place to manage critical fixes.
- The customer has signed off on the solution and UAT.
- A cutover plan is in place.

Customers should use the production environment to **operate** the solution, not build it. The production environment is sized to run your business. The sizing is based on the subscription estimate and diagnostic data from performance testing. After deployment, customers can and should do a mock cutover and a final round of validation on the production environment. Before the final cutover, customers can request a Point in time restore to restore the production environment to a clean snapshot (maximum 28 days in the past).

To select the appropriate data center for the production environment, consider the latency from the geographic locations where the business operates. Use tools such as [PsPing](#) and [Azure Speed Test](#) to test latency to Azure data centers.

The following illustrations shows the environment planning process.



Additional environments

Additional environments can be purchased as add-ons, or they can be deployed as cloud-hosted environments. The following illustration shows a *sample* overview of standard and additional environments, based on the complexity of the implementation.

Environment purpose	Tier	Standard project	Medium complexity project	Complex project
Build	1	X	X	X
Test (e.g. system integration testing or UAT)	2	X	X	X
Production	Based on the sizing	X	X	X
Development	1	X	X	X
Golden configuration	1 or 2		X	X
Pre-production / data migration	2		X	X
Performance testing	4 or 5			X
Training	2 or 3			X
System integration testing	2 or 3			X
Other / ad-hoc	...			X

IMPORTANT

Always deploy environments by using an **unnamed** account, such as `dynadmin@customer.com`. Assign the environments an owner who will be responsible for their status and maintenance. We strongly recommend using the same dedicated environment admin account on all environments. After go-live, if you plan to work on new releases, get an additional Tier-2 or higher environment to support production.

Deployment considerations for development environments

For development environments, there are two deployment options:

- **Cloud-hosted** – The environments are managed by the customer/partner in a customer/partner Azure subscription.
- **Environment image (downloadable VHD)** – The environments are hosted on-premises.

NOTE

You must allocate one development environment per developer.

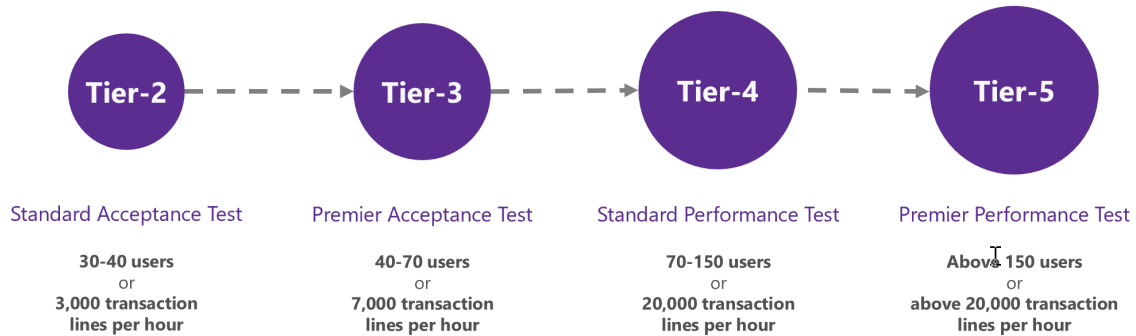
The following table compares the deployment options.

CAPABILITY	CLOUD-HOSTED	ENVIRONMENT IMAGE
Public URL	✓	Not supported
Integration development	✓	Extra setup is required. (For example, run the admin user provisioning tool.)
Azure DevOps	✓	Extra setup is required. (For example, rename the computer.)
Applying deployable packages from LCS	Automated	Command line runbooks (AxUpdateInstaller.exe tool)
Deploying data packages from LCS	✓	Not supported
Maintenance	Managed by the customer/partner	Managed by the customer/partner

CAPABILITY	CLOUD-HOSTED	ENVIRONMENT IMAGE
Cost model	Pay as you go (If the environment is on for eight hours, you pay for eight hours.). Cost is based on selected Virtual Machine size, disk size and settings, and premium storage settings	Hardware-related
Limitations	None. You have full control over VM specs, disk size and storage settings. You have administrator access to the VM.	None

Selecting the correct Tier-2 or higher environment

It's important that you select the correct Tier-2 or higher environment, depending on the purpose of the environment. The guidance that is provided in the following illustration is a *baseline*. You must work with your implementation partner to adjust this guidance, based on your specific business scenarios and factors such as type of users, complexity, and volumes.



After a subscription estimate is activated, you can view transaction lines per hour in LCS, as shown in the following illustration.

Subscription estimator

What is subscription estimator?
Subscription estimator provides an automated estimate of the subscription needed for your production instance. It uses the subscription licenses and transaction details to infer your subscription needs. While you can have multiple estimates, you need to mark one estimate as 'Active'.

The active estimate is currently locked because there is a production environment that is active or has been signed off for deployment. To mark a different estimate as active, please clear the signoff or contact support.

[+ New estimate](#) [Delete estimate](#) [Mark active](#) [Subscription\(s\)](#) [Sample usage profile](#)

Name	Estimated by	Created on
80	SA Solutions Architect	7/14/2018 1:25 AM

80

Specifications

The subscription license(s) are recorded at the time of an estimate's creation. If the subscription licenses have changed recently, please create a new estimate to refresh this data.

[Usage profile](#)

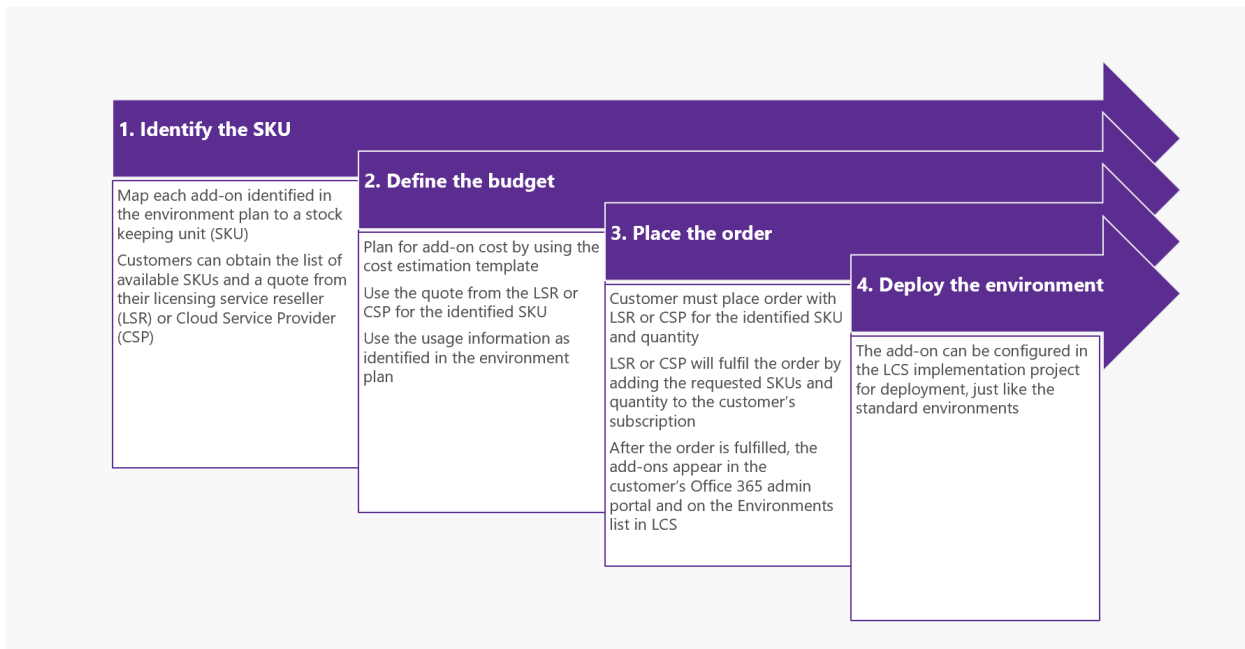
Operations user count: 32

Transaction lines per hour (Non-POS): 7327

Purchasing add-on environments

If you want to purchase add-on environments, we recommend that you work closely with your Cloud Solution Provider or License Service Reseller. Consider the potential lead time that occurs between the time when the order is placed and the time when the environment is deployed.

The following illustration shows the process for purchasing add-on environments.



IMPORTANT

If you have a Microsoft Volume Licensing agreement, you can subscribe to add-on environments on a monthly basis through the Microsoft Products and Services Agreement (MPSA) licensing program. Alternatively, you can subscribe to them through the Microsoft Cloud Solution Provider (CSP) program. For more information about the various environments and tiers, download the latest *Microsoft Dynamics 365 Licensing Guide* from [Dynamics 365 pricing](#).

Environments plan

Create the environments plan early in your implementation.

1. Identify the project activities that require an environment. These activities include, but aren't limited to, development of customizations and maintenance of golden configuration data.
2. Determine the *activities lifecycle* to determine the *environments lifecycle*. Here are some examples of the questions that you should ask during this step:
 - When and for how long do you require the environment?
 - Do you require the environment before or after go-live?
3. Determine the type and topology of the required environments.
4. Summarize the list of required environments in a matrix.

After you've identified the environments, the environments plan can be used to structure the Application Lifecycle Management (ALM) flows. For example, after you finalize your environments plan, you can define the flows for building and moving the code and the data across environments.

NOTE

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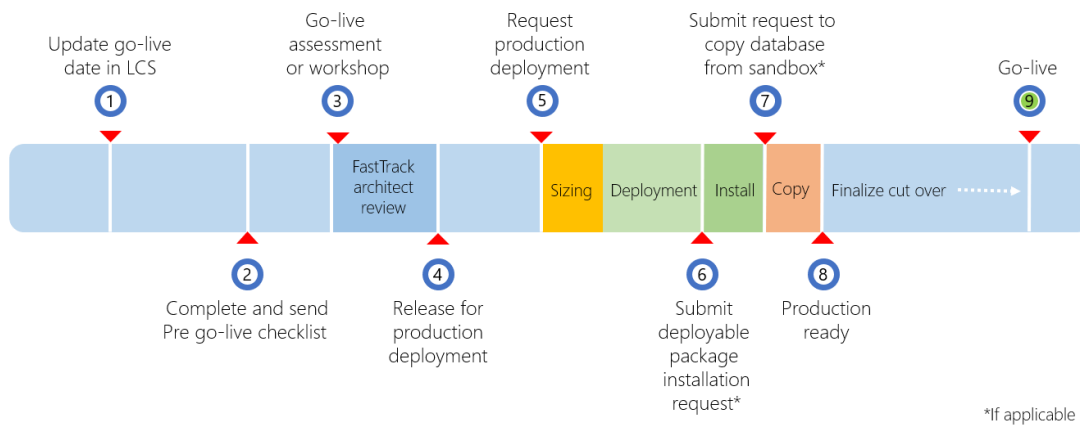
Prepare for go-live

2/18/2021 • 9 minutes to read • [Edit Online](#)

This topic describes how to prepare to go live with a project by using Microsoft Dynamics Lifecycle Services (LCS).

Production and Sandbox can only be deployed in two different [types of environments](#): Microsoft Managed or Self-Service. Both follow the same preparation for go-live, but the service level agreements (SLA) and some of the process steps are different.

This graphic and the following table list the phases of the go-live process, the environment type to which each phase applies with the expected duration, and who is responsible to take the action.



PHASE	ACTION	ENVIRONMENT TYPE	DURATION/WHE N	WHO	NOTES
1	Update Go-live date in LCS	Both	At the latest 2-3 months in advance	Customer/Partner	The milestone dates should be kept up to date on an ongoing basis.
2	Complete and send pre go-live checklist	Both	After user acceptance testing (UAT) complete	Customer/Partner	Follow the instructions provided in the "FastTrack Go-live Assessment" section later in this topic.

PHASE	ACTION	ENVIRONMENT TYPE	DURATION/WHEE N	WHO	NOTES
3	Project Go-Live assessment (FastTrack Essentials)	Both	3-business days for initial report, plus additional time for mitigation, if required	Microsoft-FastTrack Solution Architect	Solution Architect delivers assessment after checklist is received and continues review until questions are clarified and mitigations are in place, if applicable.
	Go-live Assessment workshop (FastTrack)	Both	To coordinate with architect assigned	Microsoft-FastTrack Solution Architect	
4	Release for production deployment	Microsoft Managed	Immediate upon successfully completed assessment	Microsoft-FastTrack Solution Architect	Do not submit production request until the assessment is successfully completed.
		Self-Service	Immediate upon successfully completed assessment and Configure button is enabled	Microsoft-FastTrack Solution Architect	For Self-Service deployment, the Configure button remains disabled until the assessment is complete.
5	Production deployment request	Microsoft Managed	Self-service	Customer/Partner	The production deployment request should only be submitted after the FastTrack Architect has finished the assessment.
		Self-Service	Self-service	Customer/Partner	After the assessment is complete, the Configure button will be enabled and customer will be able to request the production deployment.

PHASE	ACTION	ENVIRONMENT TYPE	DURATION/WHE N	WHO	NOTES
	Sizing	Both	Immediate in case of automatic sizing. Could require further clarifications of the subscription estimate.	Microsoft-Dynamic Service Engineering (DSE)	Automatic sizing based on subscription estimate by default, manual sizing by exception.
	Deployment	Microsoft Managed	48 hours	Microsoft-Dynamic Service Engineering (DSE)	Status in LCS reflects the deployment progress. If there are any questions about your request, they will be posted as Comments on the service request.
		Self-Service	An average of 30 minutes	Microsoft-FastTrack Solution Architect	The deployment could take an average of 30 minutes after the assessment has completed and the production environment has been requested. For more information, see Deploy a new environment .
6	Deployable package installation request	Both	Self-service	Customer/Partner	Follow the instructions in Apply updates . The packages must contain all the models and binaries consolidated in an All-in-one deployable package.

PHASE	ACTION	ENVIRONMENT TYPE	DURATION/WHE N	WHO	NOTES
	Package installation	Both	Minimum 5 hours lead time and 4 hours downtime	Microsoft-Dynamic Service Engineering (DSE)	Generally, 95% of updates are applied in less than one hour, however we still recommend that you provide a downtime window of four hours in case a rollback is required for any reason. When the package deployment succeeds, the environment will be available as soon as the package deployment has finished, which means that the longer downtime window does not have any negative effect on the availability of the system.
7	Database copy from Sandbox request (if applicable)	Both	Self-service	Customer/Partner	Follow the instructions Self-service database refresh . If you have a golden configuration you can review Golden configuration promotion .
	Copy database	Both	Five hours lead time and four hours downtime	Microsoft-Dynamic Service Engineering (DSE)	Generally, the database copy is completed in less than one hour. We still recommend that you provide a downtime window of four hours in case a rollback is required for any reason.

PHASE	ACTION	ENVIRONMENT TYPE	DURATION/WHE N	WHO	NOTES
8	Production ready	Both	After all previous steps have been completed	Customer/Partner	Customer can take control of the production environment.
	Cutover activities	Both	Depends on the project	Customer/Partner	
9	Go live	Both	Depends on the project	Customer/Partner	

Completing the LCS methodology

A major milestone in each implementation project is the cutover to the production environment.

To ensure that the production environment is used for live operations, Microsoft will provision the production instance only when the implementation is approaching the **Operate** phase, after the required activities in the LCS methodology are complete. For more information about the environments in your subscription, see the [Licensing guide](#).

Customers must complete the **Analysis, Design and Develop**, and **Test** phases in the LCS methodology before the **Configure** button that is used to request the production environment becomes available.

NOTE

For Self-Service environments, the **Configure** button will only become available after the Solution Architect has signed off on the assessment.

To complete a phase in LCS, you must first complete every required step in that phase. When all the steps in a phase are completed, you can complete the whole phase. You can always reopen a phase later if you must make changes. If you require more help, see [Lifecycle Services \(LCS\) for Finance and Operations apps customers](#).

The process of completing a step has two parts:

- Do the actual work, such as a fit-gap analysis or user acceptance testing (UAT).
- Mark the corresponding step in the LCS methodology as completed.

It's good practice to complete the steps in the methodology as you make progress with the implementation. Don't wait until the last minute. Don't just click through all the steps so that you can get a production environment. It's in the customer's best interest to have a solid implementation.

UAT completion and solution sign off

During the UAT phase, you must test all the business processes that you've implemented, and any customizations that you've made, in a Sandbox, or Standard Acceptance Test, environment in the implementation project. To help ensure a successful go-live, you should consider the following as you complete the UAT phase:

- Test cases cover the entire scope of requirements.
- Test by using migrated data. This data should include master data and opening balances, even if they aren't yet final.
- Test by using the correct security roles (default roles and custom roles) that are assigned to users.

- Make sure that the solution complies with any company-specific and industry-specific regulatory requirements.
- Run the [Customization Analysis Report \(CAR\)](#) and resolve critical issues.
- Complete performance testing.
- Document all features, and obtain approval and sign-off from the customer.

Regardless of whether the environment is a cloud-hosted environment or a downloaded virtual hard disk (VHD), testing can't be considered complete when you test only in an environment that is a developer or demo topology. Here are the reasons:

- The topology of the Tier-1 environments differs from the topology of your production environment. It's important that you test all functionality on a Tier-2 or higher sandbox environment in the Microsoft-managed subscription. It's especially important that you test integrations, printing functionality, workflow functionality, and warehouse and commerce devices in the sandbox environment.
- System performance can't be measured when you do the UAT on local virtual machines (VMs) or VMs that are privately hosted.
- To prevent delays during the cutover process, it's important that the team experience the servicing in LCS during the implementation. This servicing includes the processes of applying deployable packages, creating service requests, and moving database between environments.

FastTrack Go-live assessment

All customers must complete a go-live review with the Microsoft FastTrack team before their production environment can be deployed. This assessment should be successfully completed before you request your production environment. If you aren't familiar with Microsoft FastTrack, see [Microsoft FastTrack](#).

About eight weeks before go-live, the FastTrack team will ask you to fill in a go-live checklist.

You can download the checklist from [Dynamics 365 Community](#) on the [Go-live Planning TechTalk](#) page.

The project manager or a key project member must complete the go-live checklist during the pre-go-live phase of the project. Typically, the checklist is completed four to six weeks before the proposed go-live date, when UAT is completed or almost completed.

When you've completed the go-live checklist, email it to **Dynamics 365 FO Go-Live** d365fogl@microsoft.com. Always include a key stakeholder from the customer and the implementation partner on the email.

After the checklist is submitted, a Microsoft solution architect will review the project and provide an assessment that describes the potential risks, best practices, and recommendations for a successful go-live of the project. In some cases, the solution architect might highlight risk factors and ask for a mitigation plan. When the assessment is completed, the solution architect will indicate that you're ready to request the production environment in LCS.

For Microsoft Managed environments, if you request the production environment before the assessment is completed, the deployment will remain in the **Queued** state until the assessment is successfully completed. For Self-Service environments, the **Configure** button to request production will be only enabled after the assessment is completed.

You can cancel an environment deployment request while it is in a **Queued** state by following these steps:

1. Select **Queued**.
2. On the **Customer sign-off** tab, select **Clear sign-off**.

This will set the environment back into a state of **Configure** and allow you to make changes to the configuration, such as selecting a different data center or environment topology.

Requesting the production environment

NOTE

The production environment is used exclusively for running your business operations and shouldn't be used for testing. You will be able to perform the cutover, and if planned, to mock the cutover in production. To test the solution, you must use a UAT environment, which is designed with the necessary elements and services for testing.

After you've completed the analysis, design and develop, and test phases in the LCS methodology, and the go-live assessment has concluded that the project is ready, you can request your production environment.

We recommend that you select a service account, for example a generic user account, as the Admin user of the environments that you deploy. If you use a named user account, you might not be able to access an environment if that user isn't available. Here are some scenarios where the Admin user must access an environment:

- **First sign-in to any environment after initial deployment** – In this case, the Admin user is the only user who can access the environment.
- **First sign-in to a sandbox environment after a database refresh from the production environment** – In this case, all user accounts except the Admin account are unable to sign in.

Your production environment should be deployed to the same datacenter where your sandbox environments are deployed.

After you've signed off on the request for the production environment, Microsoft is responsible for deploying the production environment for you. For **Microsoft Managed** environments, the Microsoft service level agreement (SLA) for deployment of a production environment is 48 hours. The production environment can be deployed at any time within 48 hours after you submit the request, provided that your usage profile doesn't require additional information. For **Self-Service** environments, the deployment will take around 30 minutes after the production request has been submitted. You can view the progress of the deployment in LCS. Typically, the status of the production environment request remains **Queued** for a few hours before it's changed to **Deploying**.

When you submit the deployment request, a service request for the Microsoft Dynamics Service Engineering (DSE) team is automatically created. You can view this service request in the **Service requests** list in LCS. If the DSE team has questions that prevent them from deploying the production environment, they will add a comment to the service request. For example, the DSE team might ask that you update the subscription estimate or change the datacenter. In some cases, you might have to clear the sign-off from the production deployment request to make changes.

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Go-live for implementation projects FAQ

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This topic lists frequently asked questions about how to go live with an implementation project.

When can I configure and request my production environment?

Typically, a production environment is deployed after all customizations are code-complete, user acceptance testing (UAT) is completed, the customer has signed off on the solution, and there are no blocking issues for go-live.

When you're at this stage, the Microsoft FastTrack team will work with the project team to do a Go-live assessment/review.

What are the prerequisites to deploy a production environment?

For a list of the prerequisites, see [Prepare for go-live](#).

What is a Go-live assessment/review, and why is it required?

The Go-live assessment/review is part of the [Microsoft FastTrack program](#). During this review, a solution architect assesses whether an implementation project is ready for a successful cutover and go-live. This review is mandatory for every implementation project before you can request to go live in a production environment.

I want to request my production environment. Who do I contact for a Go-live assessment/review?

If a FastTrack solution architect is assigned to your project, contact him or her directly. Otherwise, based on the go-live date that is specified in Microsoft Dynamics Lifecycle Services (LCS), you will receive an email that instructs you to fill out the Pre-go-live checklist and send it to d365fogl@microsoft.com a few weeks before the go-live date. If you haven't received an email, and you're ready for go-live, you can download the checklist from [Dynamics 365 Community](#) on the [Go-live Planning TechTalk](#) page, complete it, and send it to d365fogl@microsoft.com.

The Production button isn't available in LCS. How do I request my production environment?

The **Production** button in LCS is available only after you've completed the **Analysis, Design & develop**, and **Test** phases of the LCS implementation methodology. For more information about how to complete these phases, see [Lifecycle Services \(LCS\) for Finance and Operations apps customers](#).

NOTE

Your production environment won't be deployed until the Go-live assessment/review has been completed.

My sandbox environment is currently on an update that is set to expire in two months. Can I request a production environment that has the latest update?

No. We will deny any request for a production environment that is on a different version than your sandbox environment. When you configure a production environment, the versions that you select must match the versions of the sandbox environment where you signed off on your solution. Therefore, you must first apply the latest update to your sandbox environment, test it, and sign off.

For more information, see [Software lifecycle policy and cloud releases](#).

Our sandbox environments are deployed in the Central US datacenter, but we want our production environments to be deployed in the West US datacenter. Can I select West US as the datacenter in my production configuration?

No. We will deny any request for a production environment that is in a different datacenter than your sandbox environment. We require that all your environments reside in the same datacenter. If you want your production environment to reside in the West US datacenter, you must first redeploy your sandbox environments to the West US datacenter, test them, and sign off.

For information that can help you select the correct datacenter, see the [Network requirements](#) section of the "System requirements" topic.

How will my production environment be sized?

Your production environment will be sized based on the current user license count and the information in the subscription estimate that is active when you request the production environment.

NOTE

If you add additional users later, you must create a support ticket to activate a new subscription estimate. Your production environment might have to be resized, depending on the number of users, the type of user licenses, and the expected peak transaction volume. Downtime is required in order to resize a production environment.

I submitted the request for a production environment, but I made a mistake. Can I still change it?

Yes. As long as the status of the production environment is **Queued**, you can clear the sign-off flag, make changes, and then sign off again.

How long does it take to deploy my production environment?

After the Go-live assessment with the Microsoft FastTrack team is completed and the production request is submitted, deployment of the production environment should be completed within 48 hours.

What level of access do I have in my production environment? Can I sign in to the VM?

No. Access to the production environment is limited. You can't access the virtual machine (VM) or Microsoft Internet Information Services (IIS). You also can't access the database through Microsoft SQL Server Management Studio.

How often is my production database backed up?

Databases are protected by automatic backups. Full database backups are done weekly, differential database

backups are done hourly, and transaction log backups are done every five minutes. Automatic backups are retained for 35 days.

For more information, see [Learn about automatic SQL Database backups](#).

Can I request a copy of the backup of my production database?

No. However, you can submit a database refresh service request to copy your production database to your Tier 2 and higher sandbox environment. After the copy request is completed, you can back up your sandbox environment.

My golden configuration database is in a Tier 1 sandbox environment. How can I copy and restore it to my production environment?

To copy and restore your database, follow the instructions in the topic, [Golden configuration promotion](#).

NOTE

If your golden configuration is in data packages, you must manually import the data packages to the production environment.

After go-live, can I apply new code changes to the production environment?

Yes. In LCS, you can submit a service request to apply a deployable package to your production environment. Application of one deployable package to a production environment involves a lead time of five hours and downtime of approximately five hours.

For more information, see [Apply updates to cloud environments](#).

What should I do if my production environment is down?

To report a production outage, follow the process described in the topic, [Report a production outage](#).

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Submit service requests to the Dynamics Service Engineering team

2/18/2021 • 7 minutes to read • [Edit Online](#)

A service request is a ticket that you use to request that the Dynamics Service Engineering (DSE) team perform a predefined set of tasks on your environments.

NOTE

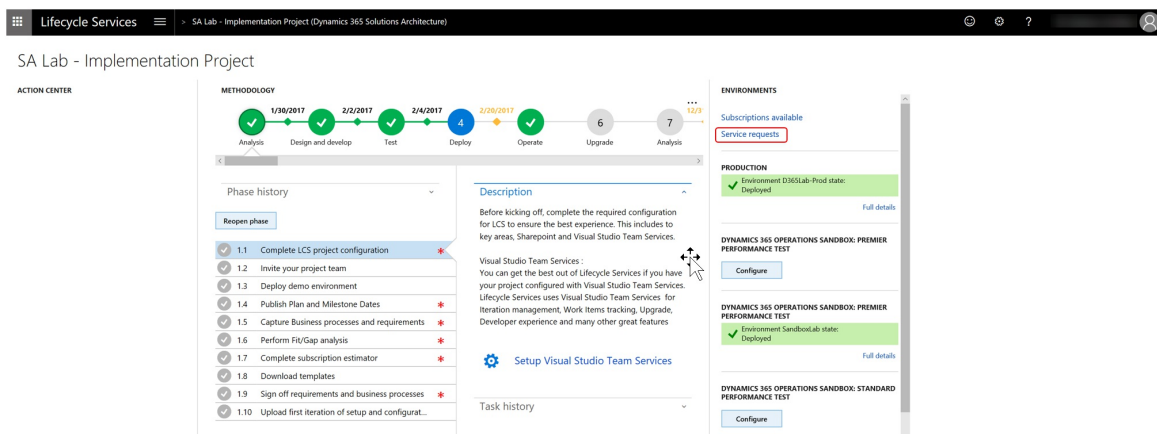
Don't use service requests for product issues. If you encounter a situation that doesn't fit into any of the tasks that are described in this topic, submit a support ticket instead. For more information about support tickets, see [Get support for Finance and Operations apps](#) or [Lifecycle Services \(LCS\)](#).

You can use Microsoft Dynamics Lifecycle Services (LCS) to submit service requests directly to the DSE team. You can also view which requests have been submitted, executed, and canceled for your environments.

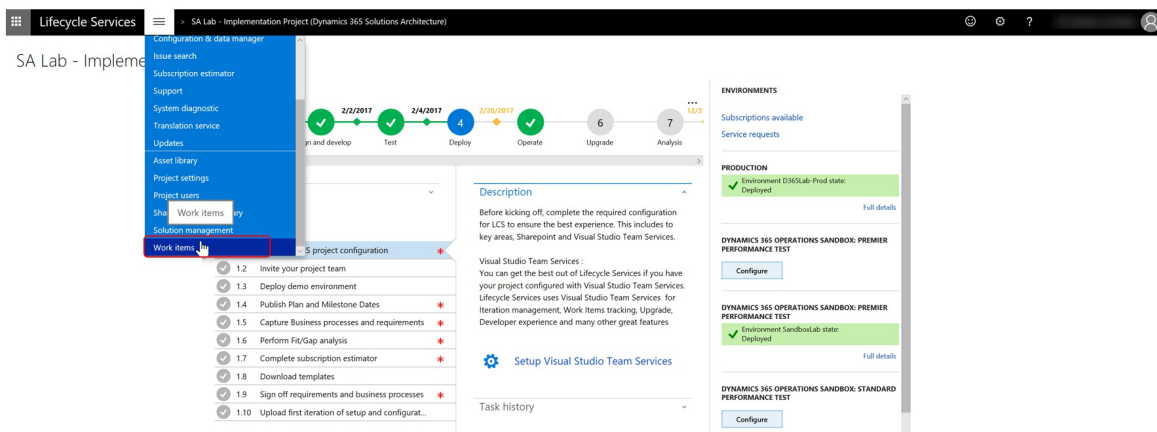
View service requests

There are two ways to view service requests:

- On the project dashboard, in the **Environments** section, select **Service requests**.



- Select the **Menu** button and select **Work items**. On the **Work items** page select the **Service requests** tab.



By default, the **Service requests** tab on the **Work items** page lists all requests that are currently active and requests that have been denied. However, you can use the filter options to show canceled and finished requests too.

Work items

Open work items: + Add, View environment details, Reschedule, Cancel

Support issues: Filter

Service requests: Show cancelled requests (No), Show finished requests (No)

ID	Service request type	Environment name	Service request status	Actionable by	Downtime start date	Downtime end date	Created by	Modified by	Created at	Modified at
34679	New deployment	D36580PU15Lab	Requested	Microsoft	4/3/2018 4:37:41 AM (UTC +02:00)		SA Solutions Architect	SA Solutions Architect	4/3/2018 4:37 AM	4/4/2018 1:59 AM
27563	Other	D36572UAT	Request denied	Customer / Partner	4/1/2018 5:30:00 AM (UTC +02:00)	4/2/2018 8:00:00 AM (UTC +02:00)	SA Solutions Architect	Microsoft SRE Tier1 gr...	2/1/2018 12:16 AM	4/1/2018 5:45 AM
24209	Upgrade environment	D36572PUAT	Request denied	Microsoft	3/20/2018 2:00:00 AM (UTC +02:00)	3/21/2018 2:00:00 AM (UTC +02:00)	SA Solutions Architect	SA Solutions Architect	1/3/2018 1:33 PM	3/2/2018 9:12 PM

After you submit a request, it has a status of **Requested**. Before the DSE team acts on the request, it might ask for clarification by entering a comment in the **Comment** field. For example, you might receive a comment from the DSE team if you request deployment of a production environment, but the data center differs from the data center where your sandbox environments are deployed. Carefully review the comments, and provide any required clarification in your own comment. To view the details of a specific request, or to submit comments for a service request, select the request ID.

If you signed up for LCS notifications, you receive an email when the status of a service request changes or a comment is entered.

If you submit a service request to the DSE team, and the action is outside the team's scope, the service request will be denied. In this case, the reason for the denial and suggestions for further action are provided. For some typical examples of service requests that the DSE team will deny, see the "Denied service requests" section later in this topic.

Create service requests

There are two ways to create a service request: automatically and on demand.


- **Automatically** – A service request is automatically created when you request deployment of an environment, or an application of a package.
- **On demand** – A service request is manually created when you enter a request for a database point-in-time restore, and some other services.

Automatically create a service request

- **Environment deployment** – To set up deployment options and submit a request to the DSE team to deploy a new environment, in the **Environments** section, select **Configure**.
- **Package application** – To apply a package to the production environment, on the **Environment details** page, select **Maintain**, select the package to apply, and then select **Schedule**. For more information, see [Apply updates to cloud environments](#).

IMPORTANT

If your scheduled time overlaps with a [planned maintenance window](#), you will receive the following warning message.

 **There is a high likelihood that maintenance activity may be scheduled for this environment during this time. Overlapping environment operations with maintenance activity will cause issues and possibly cause extended downtime. Would you like to proceed with this operation?**

[Show diagnostic information](#)

Yes

No

If you choose to continue deploying the package, the package deployment operation will be rolled-back in the event of conflict, as planned maintenance takes priority.

This restriction is applicable to **Microsoft-managed IAAS environments** only.

Create a service request on demand

Service requests that are created on demand aren't explicitly accepted by the DSE team. They will be addressed during the specified downtime window unless the DSE team has entered a comment in the request or has had to deny the request. For details, review the comments in the service request.

Microsoft frequently reviews all incoming service requests. By selecting the correct type of service request for your scenario, you help the DSE team handle the request in a timely manner.

1. On the **Work items** page, on the **Service requests** tab, select **Add**.
 2. In the **Create request** dialog box, select the type of service request to create. The options on the page then reflect the specific type of request that you selected.
- **Sandbox point-in-time restore request** – Select this request type to restore a *non-production* database to a specific point in time. For more information, see [Database movement operations home page](#).

NOTE

If you need to restore a *production* database to a previous point-in-time during the cutover phase, select the **Production point-in-time restore request** type. If you need to restore a production database when you're already live in operations, submit a support ticket through LCS.

- **Database refresh request** – Select this request type to refresh a database from a production environment to a sandbox environment, or from one sandbox environment to another. For more information, see [Refresh database](#). *This request type is being retired on January 31, 2019.*

NOTE

If you need to refresh a database from a sandbox environment to a production environment during the cutover phase, select the **Sandbox to Production** type.

- **Sandbox to Production** - Perform a database refresh of your configuration data to a production

environment during the cutover phase. For more information, see [Database movement operations home page](#).

- **Other request** – You need to use the **Other request** type exactly as described here. If you word a request in a way that isn't clear to the DSE team, the team will enter a comment to ask for clarification, and your request will be delayed. If you use the **Other request** type for any request that isn't listed below, the request will be denied. Select this request type to request that the DSE team perform one of the following actions:
 - Turn on maintenance mode in a production environment. For more information, see [Maintenance mode](#).
 - Tenant move of a live Production environment. Request the Microsoft Service Engineering team to move the Production database and Azure Blob Storage from the old tenant to the new tenant if you are moving tenant on a live Production environment. Make sure that you only request this service when you are ready with all prerequisites. For more details, see [Move LCS implementation projects to different Azure AD tenants](#).
 - Define explicit Internet Protocol (IP) safe list rules in a production environment.

NOTE

Support for explicit safe list rules is deprecated for self-service environments. For more information, see [Removed or deprecated platform features](#).

- Request that Microsoft Power BI Embedded be activated in a sandbox environment, Standard Acceptance Test environment, or production environment if you receive the following message: "Power BI embedded isn't enabled. Please contact your system administrator."

Commonly denied service requests

Here are some typical examples of service requests that will be denied:

- You submit a request of the **Other request** type for one of the following actions, but you should have submitted a support ticket instead:
 - You want to activate a new subscription estimate after you're live in production or after you've requested a production environment.
 - You want to reset the Financial reporting data mart in a release that is earlier than Microsoft Dynamics 365 for Finance and Operations Financial reporting release 7.2.6.0.
 - You want to restore a production database after go-live.
 - You encountered an issue after the DSE team did an application upgrade.
- You submit a request of the **Other request** type for an action that you should have requested through a different request type. Examples include a database refresh in a non-production environment.
- You submit a request of the **Other request** type for an action that you should perform yourself. Examples include a database upgrade in a development environment.

Service request types and SLAs

SERVICE REQUEST TYPE	APPLICABLE ENVIRONMENTS	REQUESTED SERVICE	LEAD TIME	DOWNTIME
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SERVICE REQUEST TYPE	APPLICABLE ENVIRONMENTS	REQUESTED SERVICE	LEAD TIME	DOWNTIME
Environment deployment	Any	Environment deployment	Service level agreement (SLA): within two business days	
Package application	Production	Deployable package application	Five hours	Five hours
Sandbox point-in-time restore	Any Tier 2 or higher sandbox	Database point-in-time restore	Five hours	Four hours
Production point-in-time restore	Production	Database point-in-time restore	Based on data volume	Based on data volume
Sandbox to Production	Tier 2 or higher sandbox to Production	Sandbox to Production	Five hours	Four hours
Other	Production	Maintenance mode	Five hours	Not applicable, because the customer indicates in the service request when the environment should be taken out of maintenance mode again
	Production	IP safe list rules	Five hours	Two hours
	Production	Power BI Embedded	Five hours	Two hours

NOTE

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Subscriptions, LCS projects, and Azure Active Directory tenants FAQ

2/18/2021 • 3 minutes to read • [Edit Online](#)

When customers subscribe through a Microsoft Volume Licensing agreement or a Microsoft Cloud Solution Provider (CSP) agreement, they usually have one Microsoft Azure Active Directory (Azure AD) tenant, one Microsoft Dynamics Lifecycle Services (LCS) Implementation project and any number of sandbox environments that are deployed to one data center of the customer's choice, and one production environment. For more information about these core concepts, see [Finance and Operations application architecture](#). Although this setup works well for most projects, more advanced scenarios are sometimes required, or changes during the implementation lifecycle must be accommodated.

This topic provides answers to frequently asked questions about subscriptions and licenses, Azure AD tenants, and LCS Implementation projects.

For more information, see the following topics:

- [Move environments between data centers](#)
- [Move licenses between agreement types](#)
- [Move LCS implementation projects to different Azure AD tenants](#)
- [Multiple LCS projects and production environments on one Azure AD tenant](#)

Do I have to move Azure AD tenants when I move from a CSP agreement to a Volume Licensing agreement?

No. You can keep the existing Azure AD tenant, but you must make sure that the Volume Licensing subscriptions are purchased against the same Azure AD tenant as the CSP subscriptions.

Do I get a new LCS Implementation project when I move from a CSP agreement to a Volume Licensing agreement?

No. The LCS project remains the same.

Can I keep the existing LCS Implementation project when I move to different Azure AD tenant?

No. A new LCS project will be created.

How long does it take to move from a CSP agreement to a Volume Licensing agreement?

For a Volume Licensing purchase, it can take a few days for the order to be processed and the subscriptions to be activated. Redeployment of add-on environments has a service level agreement (SLA) of two business days. It takes a few hours to deallocate and delete old add-on environments.

What if I forget to delete the existing environments before I suspend the existing subscription?

If you don't deallocate and delete the existing environments before you suspend the subscriptions, the environments will remain in a **Deployed** state. However, if you try to access the full details of these environments, you will receive an error message.

Can I have a CSP agreement and a Volume Licensing agreement in parallel?

Yes. However, you must maintain the minimum required number of licenses under each program.

How can I find the Tenant name and Tenant ID within LCS?

1. Go to project home page in LCS.
2. In the **Environments** section, select **Subscriptions available**.
3. On the **Subscriptions available** page, you will find the **Tenant name** and the **Tenant ID**.

How can I find the subscription status?

1. Go to the project home page in LCS.
2. In the **Environments** section, select **Subscriptions available**.
3. On the **Subscriptions available** page, you'll find all **Service plans** available to the tenant.
4. The **Assigned date** indicates the date that service plan status was changed.

How would the subscription status impact the environment?

Some of the environment's operations may be impacted by the subscription status:

- **Active** - Your subscription is in an operative state. You should be able to perform all environment operations.
- **In Grace Period** - Your subscription has expired, but is within the grace period. You should renew your subscription soon. The subscription status won't impact your license quantity, ability to deploy a new environment, or to perform environment operations.
- **Suspended** - Your subscription has expired beyond the grace period. This subscription status may reduce the license quantity, impact your ability to deploy a new environment, or impact your ability to perform environment operations.
- **Deleted** - Your subscription has been deleted. This will impact your ability to deploy a new environment or perform environment operations.

NOTE

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Move environments between data centers

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Occasionally, you must move environments that are managed by Microsoft to a different Microsoft Azure data center. Here are some scenarios where this move might be required:

- The data center that you planned to use wasn't available when the environments were originally deployed.
- The project creators didn't do enough research to determine the best data center before the environments were originally deployed.
- The customer moves the physical location of its operations, and the wide area network (WAN) connection is now closer to a data center that provides lower latency.

Microsoft asks that you keep all your environments in the same data center. When you move environments to a different data center, you should plan to eventually have all environments deployed in the same data center.

You can verify the data center that an environment is deployed to on the **Manage environments** page in Microsoft Dynamics Lifecycle Services (LCS).

To change the data center, you must redeploy all environments. The process differs for sandbox environments (sandbox standard acceptance test environments, and sandbox develop and test environments) and production environments.

Move sandbox environments

Because this move is a self-service action, the partner and/or customer must move the existing sandbox environments without Microsoft involvement. Although this action requires little effort on the part of the partner or customer resources, completion of the end-to-end process might require a few days. To streamline the data movement between environments, you should develop a plan to determine the best sequence before you begin the move.

Save data

Before you begin the move, you must save your data.

- **Tier 1 environment database that is based on Microsoft SQL Server:** Make a backup of the database.
- **Tier 2 and higher environments that are based on Azure SQL Database:** Choose one of the following options:
 - **Option 1:** Review the processes that are listed in the [Database movement operations home page](#) topic.
 - **Option 2:** If you have an Azure subscription, save a copy of the Azure SQL database under that subscription.
 - **Option 3:** If you have multiple Azure SQL database environments, redeploy one environment, leave the remaining environments in the old data center, and then request a database refresh between the environments.
 - **Option 4:** Save data as data packages, and then import the packages after the redeployment is completed.

Move the environments

After you've saved your data, follow these steps.

1. Verify that all code packages have been uploaded to the Asset library in LCS.
2. For each environment, follow these steps:
 - a. In LCS, select **Full details**.
 - b. Stop the environment, and then, when the environment has stopped, select **Deallocate**.
 - c. After the deallocation is completed, select **Delete**.
 - d. After the environment is deleted, select **Configure** to redeploy the environment.
 - e. In the **Geography/location** field, select the data center to use.
 - f. After the environment is deployed, apply the code packages.
 - g. If the redeployed environment is used as the build environment, complete the required configurations that are described in [Deploy and use an environment that supports continuous build and test automation](#).
 - h. Restore the data.

NOTE

- The movement of files that are stored in Azure Blob Storage isn't supported in sandbox environments.
- Commerce customers should be aware that extra steps are required for components to work correctly after a move. For more information, see [Data management overview](#).

Move production environments

If you already have a production environment deployed, you must open a Support request to move the production environment to another data center after you've finished moving all the sandbox environments. This scenario is rare, and there is no automated/self-service action to complete the move. In this scenario, files that are stored in Azure Blob Storage will also be moved. For information about the maintenance window and downtime that are required in order to move a production environment to a different data center, see [Service Description](#) and the related service-level agreement (SLA) documents.

NOTE

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Move licenses between agreement types

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Sometimes, a customer who originally purchased subscriptions through a Microsoft Cloud Service Provider (CSP) agreement decides to change to a Microsoft Volume Licensing agreement with Microsoft after the Microsoft Dynamics Lifecycle Services (LCS) Implementation project has been created. The customer can make this change even after the project has gone live in production.

Less often, a customer who originally purchased the subscriptions through a Volume Licensing agreement with Microsoft decides to change to a CSP agreement. In this case, the change must align with the renewal date of the Volume Licensing agreement.

The process of moving subscriptions from one type of agreement to another is primarily a commercial process. The technical implications for the LCS Implementation project are minimal.

NOTE

The movement of subscriptions between agreement types isn't the same as the movement of an Azure Active Directory (Azure AD) tenant. If the contractual changes in the agreements require that an Azure AD tenant be moved, you must also follow the process that is described in [Move LCS implementation projects to different Azure AD tenants](#).

Subscriptions come with two standard environments: a production environment and a Tier-2 Standard Acceptance Test environment. These environments aren't affected by the movement of subscriptions between agreement types. Action might be required in LCS only if the customer has additional add-on environments. In this case, action that is related to the add-on environments requires minimal effort on the part of partner or customer resources. To streamline the movement of data between environments, you should plan in advance to determine the best sequence.

The customer has only default environments

If the customer has only the two standard environments that come with the Microsoft-managed subscription, and didn't purchase any add-on environments through the original CSP agreement or Volume Licensing agreement, the activities that are required are purely commercial.

1. The customer places the order for subscriptions under the new agreement with the Volume Licensing reseller or the CSP.

IMPORTANT

Make sure that the subscriptions are purchased against the same Azure AD tenant that is used on the original agreement.

2. The customer activates the subscriptions.
3. In Microsoft 365 Admin center, the customer verifies that both the new and subscriptions and the existing subscriptions are active.
4. When the new subscriptions are active, the customer requests that the Volume Licensing reseller or the CSP suspend the existing subscriptions. Typically, there is an overlap to help guarantee continuity and avoid disruption of service.

The customer has add-on environments

If the customer purchased add-on environments through the original CSP agreement or Volume Licensing agreement, those environments should be redeployed.

Prerequisites

Before you begin the move, you must complete the following tasks:

- Save the data from your existing environments. Follow one of the options described in [Database movement operations home page](#).
- Verify that all code packages have been uploaded to the Shared asset library in LCS.

Commercial activities

1. The customer places the order for the subscriptions under the new agreement with the Volume Licensing reseller or the CSP. These subscriptions include the subscriptions for the add-on environments.

IMPORTANT

Make sure that the subscriptions are purchased against the existing Azure AD tenant.

2. The customer activates the subscriptions.
3. In Microsoft 365 Admin center, the customer verifies that both the new subscriptions and the existing subscriptions are active.

Deploy new environments

1. When the new subscriptions are active, additional add-on environments that you can configure appear in LCS. Deploy the add-on environments, and configure them as appropriate.
2. Apply the deployable packages, and restore the data.

Delete environments under the obsolete agreement

Follow these steps for every environment that was deployed under the old agreement. After you've deleted the environments, don't use or redeploy them again.

1. In LCS, on the **Environment details** page, select **Full details**.
2. Stop the environment, and when the environment has stopped, select **Deallocate**.
3. When the deallocation is completed, select **Delete**.
4. When the environment has been deleted, select **Configure**.

Update environments

1. The Volume Licensing reseller or the CSP suspends the existing subscriptions.
2. Any original add-on environments no longer appear in LCS.

NOTE

Until physical redeployment of the add-on environments is completed, both existing subscriptions and new subscriptions must be kept in an active state.

- The movement of files that are stored in Azure Blob storage isn't supported in sandbox environments.
- Commerce customers should be aware that extra steps are required in order for components to work correctly after the move. For more information, see [Data management overview](#).

NOTE

Can you tell us about your documentation language preferences? [Take a short survey.](#)

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Move LCS implementation projects to different Azure AD tenants

2/18/2021 • 10 minutes to read • [Edit Online](#)

You can move your subscriptions and your Microsoft Dynamics Lifecycle Services (LCS) Implementation project to a different Microsoft Azure Active Directory (Azure AD) tenant. Here are some scenarios where this move might be required:

- Subscriptions were accidentally purchased against the incorrect Azure AD tenant.

NOTE

If you're a cloud service provider, and you sell subscriptions for Finance and Operations apps to an existing customer, you must request a reseller relationship with that customer to put the subscriptions on the customer's existing Azure AD tenant. If you create a new customer record for the customer in Microsoft Partner Center, you create a new Azure AD tenant for the customer.

- The customer changes the structure of the Azure AD tenant after the subscription is purchased.

The process for moving your subscriptions and all related artifacts has four main steps, as shown in the following illustration.



Activate subscriptions on the new tenant

Work with your cloud service provider or volume license reseller to activate the subscriptions against the new Azure AD tenant. All subscriptions for users, and for add-on environments, must be activated.

Cloud service provider

If you're licensed through a Microsoft Cloud Solution Provider (CSP) agreement, purchase the required subscriptions against the new tenant from your cloud service provider. If the new tenant already exists, the cloud service provider must request a reseller relationship. Alternatively, in Partner Center, the cloud service provider must create a new customer that has the desired default domain name, *.onmicrosoft.com (for example, contoso.onmicrosoft.com).

Ask the cloud service provider not to suspend the existing subscriptions at this time.

Volume Licensing

If you're licensed through a Microsoft Volume Licensing agreement, you must call the [Volume Licensing support center](#) and ask that the subscriptions be remapped from the old tenant to the new tenant. You can contact Volume Licensing Support through Microsoft 365 Admin center. Request a grace period, when the subscriptions will be active on both tenants. Because of customer privacy concerns, this request must be made by the customer. You should have the following information available:

- Public customer number.
- Enrollment number.
- The current tenant domain that the subscriptions are currently provisioned on.
- The destination tenant domain that the customer wants the subscriptions provisioned under.
- A detailed explanation of why the customer must have its Volume Licensing subscriptions migrated to a different tenant.
- The total number of paid subscriptions that must be moved to the new tenant, together with the subscription type and seat count.

IMPORTANT

It's crucial that the subscriptions be active on both tenants in parallel for a few weeks, until you've finished decommissioning LCS on the old tenant.

Configure LCS on the new tenant

On the new tenant, you will get a new LCS project that you must initiate and set up.

1. Complete the Project Onboarding wizard. For more information, see [LCS project onboarding](#). When completing the wizard, you must indicate on the **Project Overview** page that you are **Moving existing LCS project from another tenant** and provide the source LCS project ID.
2. Fully configure LCS. As part of this configuration, you must:
 - a. Upload and activate a subscription estimator. If you are already live in the source LCS project, you need to ensure that the estimates match.
 - b. Add your deployable package to the asset library.
 - c. Update your Business process modeler (BPM) library.

IMPORTANT

During this period, you will have two parallel LCS projects. You can verify the name and ID of the Azure AD tenant that is associated with an LCS project on the [Subscriptions available](#) page in LCS.

Move your sandbox environments to the new tenant

1. Deploy the non-production environments in the new LCS project.
2. Apply the required code packages to the environments. Make sure that the target is running the same application version as the source. We recommend using [All-in-one deployable packages](#) and include any ISV licenses, if applicable.
3. Upload data to the environments. You can move the data through data packages or by restoring the database. If you restore the database, additional steps are required in order to remap some properties to the new tenant.
4. Update your user information.
 - a. Remove all user accounts except the admin user.
 - b. Fix the admin user record in USERINFO.


```
UPDATE USERINFO
SET SID='mysid', NETWORKALIAS='myalias/email', NETWORKDOMAIN='https://sts.windows.net'
WHERE ID = 'Admin'
...
```

5. Re-import all other users that have the correct security identifier (SID) and identity provider.
6. Run the following commands to update the tenant ID in the appropriate tables. You can verify the Azure AD tenant ID that is associated with an LCS project on the **Subscriptions available** page in LCS.

```
Update POWERBICONFIG set TENANTID = 'newtenantid' where TENANTID = 'oldtenantid'
Update PROVISIONINGMESSAGETABLE set TENANTID = 'newtenantid' where TENANTID = 'oldtenantid'
Update B2BINVITATIONCONFIG set TENANTID = 'newtenantid' where TENANTID = 'oldtenantid'
Update RETAILSHAREDPARAMETERS set TENANTID = 'newtenantid' where TENANTID = 'oldtenantid'
```

7. Fully configure the environments. As part of this step, configure the integration endpoints.
8. Perform smoke tests on the user acceptance testing (UAT) environment in the new LCS project. These tests should focus on user sign-in, integrations, workflows, printing, reporting, and similar processes that depend on configuration and user information.

Depending on your solution and scope, you might have to perform additional steps on the new Azure AD tenant. These steps might include registering applications (for recurring integrations and warehouse management), adding domains, and setting up directory synchronization to enable single sign-on (SSO).

Note that calls to web services are allowed only from the **home** tenant for the environment. For example, the original tenant was `companya.com`, and integration ran as `services\@companya.com`. In this case, when you switch tenants to `companyb.com`, you can no longer use `services\@companya.com` for web service calls, even if you update `userInfo.networkdomain` to `https://sts.windows.net/companyb.com`.

IMPORTANT

On your sandbox environments, you will lose any document handling attachments that are stored in Azure Blob storage. Blob storage will be moved by Microsoft only for production environments.

Move your production environment to the new tenant

If you do not have a production environment deployed already on the old tenant, you can skip this section.

If you already had a production environment deployed on the old tenant, Microsoft will move your database and Azure Blob storage from your old production environment to the new one. As a pre-requisite, you must complete the additional steps below after you've finished moving all the sandbox environments and completed UAT. The process of moving a production environment to a new tenant requires a downtime.

Before requesting the production environment, ensure that all pre-requisites are completed:

1. Get all required licenses that are needed to correctly license all users on the production environment.
2. When the licenses are in place, upload a subscription estimator to the new LCS project. It should match the subscription estimator that is active in the source LCS project, and it must correctly reflect peak transaction volumes.
3. Send an email to Dynamics 365 FO Go-Live (d365fogl@microsoft.com) stating that your new LCS project is ready for Microsoft to move your production database and Azure Blob Storage. To ensure that the process will run smoothly, provide the following details in the email. We suggest that copy the following list to your email, and then answer all of the information line by line.

Lifecycle Services

- Provide the LCS IDs (number in the LCS project URL) for source and target LCS project.
- Confirm that the go-live date is set correctly in the target LCS project.
- Confirm that the update schedules are set in the target LCS project (**LCS > Menu > Project settings > Update settings**).
- Confirm if you are using Azure Blob Storage for document attachments.
- Confirm that your project is identified as a tenant move in the Project Onboarding wizard.

Testing

- Confirm that the smoke testing is completed on the sandbox environment (Tier-2 or higher) in the target LCS project.

Code Management

- Confirm that your deployable package is marked as a release candidate in the target LCS project.
- List the ISV solutions you are using.
- Confirm which version your old production environment is running on.
- Confirm that non-standard code to be applied in the new production environment will be exactly the same as the non-standard code present in the old production environment in order to prevent database copy issues.
- Confirm if there were any non-typical actions taken on your old production environment which need to be considered on the new production environment, like installation of a custom font or environment upscale.

Environment

- Share which environment version you plan to deploy your new production environment.
 - Describe how you will conduct your cut over.
 - Confirm the dates when the source LCS environments and project will be deallocated and deleted.
4. The Dynamics 365 FO Go-Live team will reply to you within 2 business days and a FastTrack Solution Architect will work with you on the assessment of the project readiness for production deployment.
 5. When the tenant move assessment is successfully completed, the FastTrack Solution Architect will approve your production request for deployment.
 6. Create the production deployment request on the new LCS project.
 - It is not possible to select the same name for the new production environment, as it is in use for your old production environment. You will need to choose a new environment name so that a new URL will be generated.
 - Make sure you select the same application version that is used by your current production environment.
 - In the Production configuration wizard, select a generic user account, not a named user, as Environment Administrator.
 7. After the production environment has been deployed, verify that source and target environments have exactly the same code, otherwise migration will fail. If necessary, deployable packages must be installed on the target production environment.
 8. Request to copy database and blob storage from the old production environment to the new production environment.
 - **Cloud deployment to self-service deployment:** [Submit a service request](#) of type **Other** to request that the Microsoft Service Engineering team copy the database and blob storage, if applicable, from the old production environment to the new production environment. Be sure to include LCS IDs and environment IDs from source and target projects in the service request.

- **Both projects (old and new) are self-service deployments:** Submit a **support ticket** requesting a copy of the database and blob storage, if applicable, from the old production environment to the new production environment. Be sure to include LCS IDs and environment IDs from source and target projects in the support ticket.
 - a. This process will require interaction between Microsoft and the implementing project team. Ensure that you follow the email notifications or notifications directly in the service request.
 - b. After Microsoft has completed the activity and provided you with updated information, you will need to validate the new production environment.
 - c. If you encounter an issue after the migration, file a support ticket.

Tear down the LCS project on the old tenant

After the new LCS project on the new Azure AD tenant is fully functional, you must stop, deallocate, and delete the environments on the old LCS project. When you've finished, the **Configure** button becomes available for each environment. If you already had a production environment on the old tenant, you must file a support ticket to have it deleted.

You should save any remaining artifacts from the Asset library that you might require later.

After all environments have been deleted and all artifacts saved, an Organization Administrator on the old tenant must delete the LCS project. Microsoft reserves the right to disable the customer's account and delete the customer data after the service has been suspended for an extended period.

Suspend subscriptions on the old tenant

After all the environments have been deleted, and you've saved the LCS artifacts that you require, work with your cloud service provider or Volume Licensing Support to suspend all the licenses on the old Azure AD tenant.

- **Cloud service provider** - Suspend the existing subscriptions against the old tenant.
- **Volume Licensing Support** - Call Volume Licensing Support to confirm that you've completed the work and that the subscriptions can now be suspended against the old tenant.

NOTE

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Move LCS implementation projects from on-premises to the cloud

2/18/2021 • 9 minutes to read • [Edit Online](#)

This topic explains how to move your Microsoft Dynamics 365 Finance + Operations (on-premises) environments that are hosted on your own infrastructure to the Azure cloud.

Cloud subscription licenses

If you don't already have cloud subscription licenses, work with your cloud service provider or volume license reseller to get and activate the required subscriptions on your Azure Active Directory (Azure AD) tenant. All subscriptions for users and add-on environments must be activated.

Configure LCS cloud implementation project

If no Finance and Operations cloud-named user subscription licenses have previously been activated on the Azure AD tenant, a new Microsoft Dynamics Lifecycle Services (LCS) cloud implementation project is automatically provisioned. Otherwise, you must open a support request to have an LCS cloud implementation project created. For more information, see [Multiple LCS projects and production environments on one Azure AD tenant](#).

After your LCS cloud implementation project has been created, you must fully configure it. As part of this configuration, you must add users, an Azure DevOps association, and subscription estimates, fill in the Asset library and Business process modeler (BPM), and more.

NOTE

While you're onboarding your project, you must select **AX 2012 Upgrade** as the source system, so that a singleton Azure SQL database will be used for your sandbox instead of an elastic pool. Eventually, a more appropriate option will be available, such as **On-premises Finance and Operations**.

Complete development and testing of updated integrations

You will probably have to make some changes to the integration design patterns that you used for interfaces with your Finance + Operations (on-premises) environment. These changes can be substantial, and a detailed discussion of them is beyond the scope of this topic. Nevertheless, you must evaluate all your interfaces and make the appropriate changes to them.

You should consider developing your updated interfaces in such a way that they can coexist in the same code base as the original interfaces. This approach will simplify code lifecycle management during the period of your transition from on-premises to cloud. If this approach isn't possible, you must manage a new development branch through your cloud go-live. To simplify management of this new branch during the transition period, we recommend that you freeze other code changes as much as you can. Additionally, in your detailed cut-over plan, you should carefully document the steps for inactivating your old interfaces and activating the new interfaces.

Do a trial migration and resolve issues

1. Deploy a tier-2 environment.

2. Apply the same code package that is applied in your on-premises production environment (or, as appropriate, in the current build from the cloud integration development branch that was discussed in the previous section). This code package should be a single, complete deployable package that includes any independent software vendor (ISV) solutions and licenses.
3. In SQL Server Management Studio (SSMS), run the following Transact-SQL (T-SQL) commands against the sandbox database to preserve the current Admin account, Azure AD tenant ID information, and Data management framework (DMF) shared working directory in that database. Save the results.

```
SELECT SID,NETWORKKALIAS,NETWORKDOMAIN,IDENTITYPROVIDER from USERINFO WHERE ID = 'Admin'  
SELECT VALUE from SYSSERVICECONFIGURATIONSETTING where name = 'TENANTID'  
SELECT TENANTID from POWERBICONFIG  
SELECT TENANTID from PROVISIONINGMESSAGETABLE  
SELECT TENANTID from B2BINVITATIONCONFIG  
SELECT TENANTID from RETAILSHAREDPARAMETER  
SELECT SHARED_FOLDERPATH from DMFPARAMETERS
```

4. Copy the database from on-premises to online. The export and import process that you use is the same process that is described in the [Golden configuration promotion](#) database movement tutorial. However, in this case, the source database is the existing on-premises production SQL database, and you must use the sqlpackage.exe approach that is described for importing into a developer environment. If you use the LCS self-service database import option instead, some data won't be imported, as noted in the warnings about data elements that are cleaned up. The target database information that is available in the LCS environment details must be used instead of the placeholders that are shown in the following code.

```
SqlPackage.exe /a:import /sf:D:\BacpacToImport\my.bacpac /tsn:<Azure SQL database server> /tdn:  
<target database name> /tu:<axdbadmin user from LCS> /tp:<axdbadmin password from LCS>  
/p:CommandTimeout=1200
```

5. Restore the Admin account, Azure AD tenant ID, and DMF shared directory values. Also remove the SF schema and its tables, if they are present.

```
UPDATE USERINFO SET SID='<preserved SID>', NETWORKKALIAS='<preserved NETWORKKALIAS>',  
NETWORKDOMAIN='<preserved NETWORKDOMAIN>', IDENTITYPROVIDER='<preserved IDENTITYPROVIDER>' WHERE ID =  
'Admin'  
UPDATE SYSSERVICECONFIGURATIONSETTING set VALUE='<preserved VALUE>' where name = 'TENANTID'  
UPDATE POWERBICONFIG SET TENANTID='<preserved TENANTID>'  
UPDATE PROVISIONINGMESSAGETABLE SET TENANTID='<preserved TENANTID>'  
UPDATE B2BINVITATIONCONFIG SET TENANTID='<preserved TENANTID>'  
UPDATE RETAILSHAREDPARAMETER SET TENANTID='<preserved TENANTID>'  
UPDATE DMFPARAMETERS SET SHARED_FOLDERPATH='<preserved SHARED_FOLDERPATH>'  
DROP TABLE IF EXISTS SYNCLOG  
DROP TABLE IF EXISTS SYNCLOCK  
DROP SCHEMA IF EXISTS SF
```

6. Reimport all other users, and assign the appropriate security roles.
7. Direct printing in a cloud environment is done via the Document Routing Agent (DRA). Set up sandbox DRAs as described in [Install the Document Routing Agent to enable network printing](#), so that regression testing can include your printing scenarios.
8. Copy document handling attachments to the cloud. Document handling attachments aren't stored in the database. If they must be preserved, you must move them separately. For instructions, see the [Migrate document handling attachments to your sandbox](#) section later in this topic.
9. Run a complete regression test cycle. This cycle should include testing of integrations.

10. Resolve any issues that are discovered during testing. For each issue, document and keep track of the correcting adjustments that you make in the sandbox, and repeat them in the on-premises source. If any change must not be made in the on-premises environment, because it's incompatible with the correct functioning of that environment, we recommend that you create a DMF data package for it instead of manually applying it for each iteration of the migration process.
11. Repeat steps 2 through 10 until all tests have been passed, and no further changes are being made to code or the configuration.

Repeat the migration to production

1. Deploy the new production environment. Note that the regular prerequisites apply. For example, you must have an active subscription estimator, complete the LCS methodology phases before the operate phase, and complete the FastTrack readiness review. For more information, see [Prepare for go-live](#).
2. Apply the final version of the software deployable package to production.
3. Stop making data changes to the on-premises production environment.
4. Repeat steps 3 through 6 in the [Do a trial migration and resolve issues](#) section to copy the final/up-to-date on-premises production database to the cloud sandbox.
5. Repeat step 8 in the [Do a trial migration and resolve issues](#) section to copy the final/up-to-date document handling attachments to the cloud sandbox.
6. Request a database refresh from sandbox to production. (The process is the same as the process that is used to promote a golden configuration database to production.)
7. Open a support request to have Dynamics Support Engineering copy the document handling attachments from the sandbox storage account to the production storage account and update the references in the production database's DocuValue and DocuDeletedValue tables. After the request has been completed, validate that the attachments are available for a sample of document handling records.
8. Set up DRAs for production. If you're reusing any of the DRAs that were previously installed as part of your trial migration, remember to update their configuration so that they connect to the production URL instead of the sandbox URL.
9. Reconcile your cloud and on-premises production environments, as detailed in your cut-over plan.
10. Obtain sign-off for the go-live.
11. Activate cloud production interfaces, batch jobs, and so on.
12. Start to transact in your cloud production environment.

Migrate document handling attachments to your sandbox

Document handling attachments for Finance + Operations (on-premises) environments are stored in a file share. However, the cloud version doesn't support this file share. You can use the following procedure to copy the attachments to the Azure storage account for your sandbox environment and update the corresponding metadata in the database. For subsequent promotion to production, you can request that Dynamics Support Engineering copy the attachments from your sandbox to production.

1. Upload a copy of the document handling attachment files from the on-premises production file share to a temporary folder on one of the sandbox instances of Application Object Server (AOS). For example, you can upload a zip file of the attachments and unpack it on the target. If you don't have remote desktop access (for example, for a self-service environment), you can use a different virtual machine (VM) instead. For reasonable conversion performance, this VM should be in the same Azure datacenter as the target sandbox. If you aren't using the AOS instance, you must add the VM to an allow list for access to the sandbox's SQL database instance.
2. Open a support request to get the name of the sandbox Azure storage account and a time-limited shared access signature token for the documents container. Update the corresponding placeholders in the Windows PowerShell script that is run in the next step. Also update the placeholders for your temporary

folder, and for your Finance and Operations transactional database, by using the environment details in LCS.

3. Run the following Windows PowerShell script on the sandbox AOS instance or other VM to upload the document handling files to the storage account and create the required metadata for each file.

```
#Upload F&O on-prem document handling attachments to Azure storage account
#
$filePath = "<TEMP_ATTACHMENTS_FOLDER_PATH>"
$dbHostName = "<DATABASE_SERVER>.database.windows.net"
$dbName = "<DATABASE_NAME>"
$dbUsername = "<DATABASE_USER>"
$dbPassword = "<DATABASE_PASSWORD>"
$storageAccountName = "<STORAGE_ACCOUNT_NAME>"
$sasToken = "<SAS_TOKEN>"

[Reflection.Assembly]::LoadWithPartialName("System.Security.Cryptography") #Load crypto
$cryptoObj = [System.Security.Cryptography.SHA256]::Create()
$storageContext = New-AzStorageContext -StorageAccountName $storageAccountName -SasToken $sasToken
foreach ($file in Get-ChildItem $filePath)
{
    try
    {
        $blob = (Set-AzStorageBlobContent -Context $storageContext -Container documents -File
$file.FullName -Blob "$($file.Name)" -Force).ICloudBlob
    }
    catch
    {
        Write-Host "Could not upload $($file.Fullname) to blob"
        Write-Host $_
    }
    if($blob)
    {
        #Write-Host "Processing $($file.Fullname)..."
        #FileHash:
        $fileBytes = [System.IO.File]::ReadAllBytes($file.FullName)
        $hashBytes = $cryptoObj.ComputeHash($fileBytes)
        $encodedHash = [System.Convert]::ToBase64String($hashBytes)
        #FullFileName:
        $origFileName = (Invoke-Sqlcmd -Query "SELECT ORIGINALFILENAME FROM DOCUVALUE WHERE FILEID =
'$($file.Name)'" -ServerInstance $dbHostName -Database $dbName -Username $dbUsername -Password
$dbPassword).ORIGINALFILENAME
        if ($origFileName.Length -eq 0)
        {
            $origFileName = (Invoke-Sqlcmd -Query "SELECT ORIGINALFILENAME FROM DOCUDELETEDVALUE
WHERE FILEID = '$($file.Name)'" -ServerInstance $dbHostName -Database $dbName -Username $dbUsername -
Password $dbPassword).ORIGINALFILENAME
        }
        if ($origFileName.Length -eq 0)
        {
            Write-Host "Missing DOCUVALUE $($file.Name)"
        }
        else
        {
            $nameBytes = [System.Text.Encoding]::UTF8.GetBytes($origFileName)
            $encodedName = [System.Convert]::ToBase64String($nameBytes)
            #Write-Host "Base64 encoded original filename $encodedName."
            $blob.Metadata["FileHash"] = $encodedHash
            $blob.Metadata["FileSize"] = $file.Length
            $blob.Metadata["FullFileName"] = $encodedName
            $blob.SetMetadata()
            Write-Host "Uploaded $($file.Fullname)"
        }
    }
}
}
```

4. In SSMS, run the following T-SQL commands to update the DocuValue and DocuDeletedValue records so that they reference the target storage location.

```
update DOCUVALUE
set ACCESSINFORMATION = replace(ACCESSINFORMATION, 'file://<SOURCE_PREFIX>/documents/',
'https://<STORAGE_ACCOUNT>.blob.core.windows.net/documents/'), STORAGEPROVIDERID = 1
where STORAGEPROVIDERID = 4 --4 for LBD filesystem, 1 for Azure blob
and ACCESSINFORMATION like 'file://<SOURCE_PREFIX>/documents/%'

update DOCUDELETEDVALUE
set ACCESSINFORMATION = replace(ACCESSINFORMATION, 'file://<SOURCE_PREFIX>/documents/',
'https://<STORAGE_ACCOUNT>.blob.core.windows.net/documents/'), STORAGEPROVIDERID = 1
where STORAGEPROVIDERID = 4 --4 for LBD filesystem, 1 for Azure blob
and ACCESSINFORMATION like 'file://<SOURCE_PREFIX>/documents/%'
```

5. Test a sample of the document handling attachments to make sure that they can now be accessed in the sandbox environment.

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Multiple LCS projects and environments on one Azure AD tenant

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For any new cloud project, one Microsoft Dynamics Lifecycle Services (LCS) Implementation project is instantiated on a Microsoft Azure Active Directory (Azure AD) tenant that provides access to one production instance. In rare cases, to handle the requirements of a specific implementation, you might require multiple production instances that run in parallel. By creating multiple LCS projects against the same Azure AD tenant, you can have multiple production instances. Here are the most common scenarios where multiple production instances might be required:

- A global implementation's requirements for data residency, latency, or data volume can't be met by one instance.
- Different business units in an organization are implementing the product separately as independent applications.

Manual intervention by the Microsoft Dynamics Service Engineering (DSE) team is required in order to create additional LCS projects on a shared Azure AD tenant. This approach should be used only if a single-instance strategy truly isn't feasible. Before additional LCS projects can be created, customers must provide the business justification and confirm that they understand all the implications of the approach. This process should be started as early in the implementation lifecycle as possible. Customers who decide to proceed should inform the FastTrack solution architect who is assigned to their project that they require additional LCS projects. If no solution architect is assigned to their project, customers should open a support ticket.

Licensing requirements

Every LCS Implementation project that runs on the same Azure AD tenant must satisfy the minimum licensing requirements. For example, if there are three LCS Implementation projects on the same Azure AD tenant, a customer must purchase no less than three times the minimum number of subscription licenses. Currently, the minimum license requirement is 20 full user licenses. Therefore, to run three LCS Implementation projects on the same Azure AD tenant, the customer must purchase at least 60 licenses.

Because the licenses are associated with the Azure AD tenant, the **Subscriptions available** page for every LCS project will show the total number of licenses, even though a given LCS project can use only the portion of licenses that has been allocated to it. This allocation of license to LCS projects must be documented outside the system.

Users who access multiple environments in parallel must be licensed separately for each environment. A user can only be assigned one license for each product for each Azure AD tenant. This allocation of licensing requirements for LCS projects for specific users must be documented outside the system. For additional information about licensing, download the [Licensing guide](#).

Disadvantages of multiple LCS projects

There are some disadvantages to having multiple LCS projects. Here are some of them:

- Master data isn't shared.
- Intercompany transactions aren't supported.
- Integrations must be configured in each LCS project.
- Each LCS project requires a separate Bring your own database (BYOD) instance

- User acceptance testing (UAT) must be done on each instance, even if the code is the same. UAT is required on each instance, because differences can occur across the LCS projects, even if they share a code base. One source of differences can be the integration setup and BYOD configuration that must be done separately in each LCS project and therefore must be tested in each LCS project. Additionally, there might be data variations, different application configurations per region might affect functionality, and different data centers might support a different set of Azure services.
- Microsoft Azure DevOps must be configured in each LCS project. When customizations and code are shared, it makes sense to use the same Azure DevOps project.

Advantages of multiple LCS projects

There are also advantages to having multiple LCS projects. Here are some of them:

- Data centers can be selected per LCS project to provide the best latency experience.
- Data centers can be selected per LCS project to satisfy statutory requirements for data residency.
- There is more flexibility to schedule servicing operations, such as code deployments and upgrades.

Requesting multiple LCS projects on the same Azure AD tenant

If your solution requires multiple LCS projects on the same Azure AD tenant, all LCS projects except the original project must be provisioned on demand by the DSE team. You should inform the DSE team about this requirement as early as possible, ideally when the project is being onboarded. For more information, see [Onboard an implementation project](#). To request additional LCS Implementation projects, the customer must create a support request by using the Support portal in LCS. In this request, the customer must provide the following information:

- The business justification.
- The enterprise and project structure. This information includes the following details:
 - The name of the Implementation project
 - The breakdown of licenses per LCS project
- Confirmation that the customer understands the implications of multiple LCS projects on the same Azure AD tenant.

Online deployments in China sovereign cloud

If your implementation includes China deployment/rollout, be informed that Dynamics 365 Finance online deployment became available in Mainland China starting in April 2019. For more information, see [Finance and Operations apps - operated by 21Vianet in China](#). This deployment is designed to comply with regulatory requirements in China and the services include a physically separated instance of a cloud service with a different tenant (Azure Active Directory) that is operated and transacted by 21Vianet.

This is a single organization in multiple clouds with different tenant (Azure Active Directory). The advantages and disadvantages of multi-Lifecycle Services projects or production environments described above are still applicable, but the licensing requirement and requesting procedure are different. Work with your Microsoft Account Executive or your implementation partners for any process assistance.

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Globalization resources

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Local and regional deployments

If your government regulations require data to be stored differently or serviced differently than is required for other countries/regions, there might be country/region requirements you must consider during deployment. Consider the following resources that might be relevant to you:

[Finance and Operations apps operated by 21Vianet in China](#)

Localization and regulatory features

Finance and Operations apps include functionality for the country/regions documented in the [Product localization and translation availability guide](#). This functionality is enabled based on the primary address of the active legal entity.

This topic includes lists of resources that can help you do the following:

- Learn more about developing country/region-specific solutions.
- Get country/region specific updates.
- Submit and review regulatory alerts.
- Learn how to use country/region specific functionality.

Developing localized solutions

The following resources provides guidance and information that can help developers and ISVs who are creating country/region-specific customizations or are creating a solution for a country that Microsoft does not support.

- [Separation of localization models](#)
- [Apply country/region context](#)
- [Regulatory certification information in feature titles](#)
- [Classification of localization features](#)
- [Country Codes - ISO 3166](#)

Regulatory updates and communication

The following resources provide information about planned and new localization features.

Regulatory updates

- [Regulatory updates](#)
- [Localization portal](#) (Updated weekly)
- [Issue search in Lifecycle Services \(LCS\)](#) (Updated daily)

Communication and alerts

- [Regulatory watch and communication of regulatory updates](#)
- [Submit alerts about country/region-specific regulatory features](#)

Dynamics 365 release plans

The [Dynamics 365 release plans](#) provide descriptions of new and enhanced capabilities that are planned for Dynamics 365 business applications and application platforms.

Finance and Operations apps what's new

The [What's new or changed in Finance and Operations home page](#) lists the features that are included in specific

releases of the Finance and Operations apps.

Electronic reporting

The Electronic reporting (ER) tool allows you to configure formats for electronic documents in accordance with the legal requirements of various countries/regions. ER lets you manage these formats during their lifecycle. For more information, refer to one of the following topics:

- [Electronic reporting \(ER\) overview](#)
- [Manage the Electronic reporting \(ER\) configuration lifecycle](#)
- [Create Electronic reporting \(ER\) configurations](#)
- [Extend the list of Electronic reporting \(ER\) functions](#)
- [Electronic reporting \(ER\) destinations](#)
- [Download Electronic reporting configurations from Lifecycle Services](#)
- [Import Electronic reporting \(ER\) configurations](#)
- [Configure Electronic reporting \(ER\) to pull data into Power BI](#)
- [Generate electronic documents and update application data by using ER](#)

Task guides

Task guides are available from the product help pane and they provide a guided walk-through of key business processes. You can open a task guide to read the steps of a business process or you can play a task guide to walk through a business process and enter data.

To find task guides, navigate to a page in the application and click Help. Task guides that use the page are listed in the help pane. You can also use the help pane to search for task guides by title.

To learn more, see [Help system](#).

Country/region specific help content

- [Australia](#)
- [Austria](#)
- [Belgium](#)
- [Brazil](#)
- [China](#)
- [The Czech Republic](#)
- [Estonia](#)
- [Europe](#)
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Regulatory updates

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This topic lists the regulatory updates that are planned and released in Dynamics 365 Finance supported localizations. Delivery timelines might change, and projected functionality might be different or might not be released. For more information, see [Microsoft policy](#).

Regulatory updates are features that are implemented to support new or changed country-specific legislation. For additional information about planned and released country-specific features, refer to the [Dynamics 365 and Power Platform release plans](#).

Microsoft strives to implement new regulatory requirements as early as possible. The actual delivery date depends on the law announcement date, availability of the requirement details from the local authorities, the availability of the validation tools, and on the size and complexity of the change.

We plan to deliver regulatory updates in One Version service updates that are released in time for customers to update and be ready for the enforcement date (for transactional regulatory updates), or for the first mandatory reporting deadline (for regulatory updates related to reporting). Customers and partners can preview the new regulatory updates in the Preview Early Adoption Program (PEAP).

In case of late announcement dates, late availability of requirement details or validation tools, or exceptionally large and complex changes, it might not be possible to make a regulatory update available by the General Availability date of a monthly update. In these cases, the regulatory update will be shipped as hot fixes for relevant available monthly updates.

Regulatory updates that are released as part of the monthly updated are indicated by release version only. Regulatory updates that are delivered either as hot fixes or as part of a release preview can be identified through the abbreviations HF and PEAP, respectively.

For the latest regulatory update plans, refer to the following table.

COUNTRY	RELEASE DATE	RELEASE VERSION	REGULATORY UPDATE
Austria	September 2020	10.0.15	VAT declaration format U30 has been updated for 2020 reporting
Belgium	December 2020	10.0.16	Belgium: "Export ledger transactions" report performance improvement in Dynamics 365 Finance
Brazil	November 2020	10.0.15HF	SPED Fiscal ICMS/IPI - Record C176 - RS state
Brazil	October 2020	10.0.16, 10.0.15HF	NF-e NT2019.001 v1.51 - Adoption of the validation rules upon Benefit code by Distrito Federal
Brazil	October 2020, November 2020	10.0.16, 10.0.15HF	SPED Fiscal - Layout 015

COUNTRY	RELEASE DATE	RELEASE VERSION	REGULATORY UPDATE
Brazil	October 2020	10.0.16	DRCST declaration SC - SEF 262/2020
Brazil	October 2020	10.0.16	SPED Fiscal ICMS / IPI record C176
Brazil	December 2020	10.0.17, 10.0.16HF, 10.0.15HF	NF-e NT2020.006 - Identification of the digital platform intermediary (Layout and validation rules updates)
Europe	January 2021	10.0.17, 10.0.16HF, 10.0.15HF	Brexit - Northern Ireland Protocol impact to Intra-community trade reporting in EU countries
Germany	January 2021	10.0.16HF	ELSTER UstVA VAT advance notification format was extended with two new boxes 37,50 for unrecoverable debts writing off
Germany	January 2021	10.0.17	Changes in ELSTER VAT advance notification XML structure (UstVA)
Global	January 2021	10.0.16	Enable reverse charge mechanism for VAT/GST scheme
India	December 2020	10.0.16, HF, 10.0.15HF	TCS on Sales of Goods Section 206 9(1H) change based on CBDT press release
Latvia	December 2020	10.0.17	Intrastat format is updated starting from 2021
Mexico	December 2020	10.0.17, 10.0.16, 10.0.15	Attribute "Monto" Update
Netherlands	October 2020	10.0.16	Intrastat format is updated starting from 2021
Netherlands	December 2020	10.0.167	New version of Dutch taxonomy NT15
Poland	September 2020	10.0.15	Voluntarily split payment enhancements
Poland	November 2020	10.0.16, 10.0.15	JPK-V7M (VDEK) - Sales document type FP and RO for Retail transactions

COUNTRY	RELEASE DATE	RELEASE VERSION	REGULATORY UPDATE
Poland	September 2020	10.0.15	Poland: JPK-V7M (VDEK) - unlock possibility to run the report generation by parts
Poland	October 2020	10.0.16	JPK-V7M (VDEK) report - 'Voluntarily split payment' parameter uptake
Poland	November 2020	10.0.16, 10.0.15HF	Retail - Issue invoice for retail customer per request
Poland	January 2021	10.0.17, 10.0.16HF , 10.0.15HF	Poland: JPK_KR (SAF Accounting books) clarifications, effective from January 2021
Russia	November 2020	10.0.16	VAT declaration format is updated to version 5.07 starting from the reporting for Q4 2020
Russia	October 2020	10.0.16	Changes in PBU18 for accounting reporting for 2020
Russia	January 2021	10.0.17	A new format of the property tax declaration (technical version 5.07 instead of 5.06) for the 2020 reporting
Spain	November 2020	10.0.17	SII update validation and errors v.2.1(bis) from January 1, 2021
United Kingdom	December 2020	10.0.17, 10.0.16, 10.0.15	Company tax registration in customer invoices (Brexit - Northern Ireland Protocol)
United Kingdom	December 2020	10.0.17, 10.0.16HF. 10.0.15HF	Brexit - Northern Ireland Protocol impact on companies trading goods in both GB and NI locations

Additional resources

- Find all planned and released regulatory updates on [Lifecycle Service - Issue search](#) (sign in required).
- For a list of the localizations that are supported, see the [International availability guide](#).

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Stock transfer orders for India

2/18/2021 • 6 minutes to read • [Edit Online](#)

You can use transfer orders to process inventory transfers between warehouses. In India, if the shipping and receiving branches of the organization have different tax registration numbers, the India Goods and Services Tax (GST) should be calculated and posted for the transfer order. The tax base may be defined as the current cost price of the item being transferred or a special transfer price. The tax amount should be posted as GST payable for the transfer shipment and as GST recoverable upon the transfer receipt. An **Interim transit** account is used as an offset account for the posting and is nullified when the transfer order is fully received.

The **Stock transfer** functionality that is available for India supports this process.

Set up stock transfers

Enable stock transfer functionality

Enable the following features in the **Feature management** workspace:

- (India) Improvements in unit price and cost price handling in Stock transfer orders
- (Stock transfer for India) Set up the default transfer type and price type for transfer orders created from Master planning
- Enable uniform tax amount and GST transaction ID for both shipment and receipt transaction of a stock transfer order

For more information, see [Feature management overview](#).

You also need to configure the India GST functionality to enable GST calculation for stock transfer orders. For more information, see [India Goods and Services Tax \(GST\) overview](#).

Set up default transfer type and price type for transfer orders

You can define a default transfer order type and a default price type for transfer orders that are created manually. On the **Inventory and warehouse management parameters** page, on the **Transfer orders** tab, select **Stock transfer** in the **Transfer type** field to enable the **Stock transfer** functionality for all newly created transfer orders. In the **Price type** field, select a default price type for newly created stock transfer orders:

- **Cost price** – The cost price, or the on-hand price, of the item will be used for stock transfer orders.
- **Transfer price** – The transfer price that is set up for the item will be used for stock transfer orders.

Configure Master planning parameters

You can define a default transfer order type and a default price type for transfer orders that are created when confirming planned orders in the **Master planning** module. On the **Master planning parameters** page, on the **Standard update** tab, select **Transfer type** and **Price type** in the **Firm - Transfer** group.

NOTE

These parameters are only available if the "(Stock transfer for India) Set up the default transfer type and price type for transfer orders created from Master planning" feature is enabled in the **Feature management** workspace. Otherwise, default transfer type and price type are defined by corresponding parameters on the **Inventory and warehouse management parameters** page.

Set up item master parameters

To calculate GST for an item in a stock transfer order, you need to configure certain parameters on the **Released product details** page, such as **HSN codes** and **Tax rate type**. For more information, see [Assign HSN codes and SACs to products](#).

Configure transfer pricing

You can configure the prices that will be used when processing stock transfers for an item. To do this, open the **Transfer price** page from the **Released product details** page.

Configure stock transfer posting

You must configure the **Interim transit** account, which is done on the following pages:

- In the **Inventory management** module, on the **Posting** page, on the **Transfer order** tab, specify the **Interim transit** account.
- On the **Tax setup** page, click **Setup**, and on the **Setup** page specify the **Interim transit for stock transfer** account for all GST components that may be created for GST on stock transfer. For more information, see [Define main accounts](#).

NOTE

The accounts that are used to post interim transit amounts should have **Interim transit** specified in the **Posting type** field on the **Posting validation** tab of the **Main accounts** page.

You must also set up main accounts to post inventory cost for transfer orders to. Specify the following accounts from the **Inventory** tab on the **Posting** page in **Inventory management**:

- **Inventory issue**
- **Inventory receipt**
- **Inter-unit payable**
- **Inter-unit receivable**
- **Inventory expenditure, loss**

NOTE

The **Inventory expenditure, loss** account is required to post the scrap amount when receiving a transfer order with scrap.

Create and post a stock transfer order

1. Go to **Inventory management > Outbound orders > Transfer order** and create a new transfer order.
2. In the **From warehouse** field, select the supply warehouse that the items are dispatched from.
3. In the **To warehouse** field, select the receiving warehouse that the items are delivered to.
4. In the **Transfer type** field, select **Stock transfer** to apply GST to the transfer of items.

NOTE

If you select **Transfer order** in the **Transfer type** field, the transfer order will be posted based on the standard transfer order process.

5. In the **Price type** field, select a default price type for transfer order lines.

6. On the **Transfer order lines** tab, create a new line and in the **Item number** field, select the item to transfer.
7. In the **Transfer quantity** field, enter the quantity of the items to transfer, and in the **Unit** field, modify the default unit of measurement, if required.
8. In the **Price type** field, select the price type for the transfer order line, from the following options:
 - **Cost price** – The cost price, or the on-hand price, of the item is used for the transfer order line.
 - **Transfer price** – The transfer price that is set up for the item is used for the transfer order line.

NOTE

If the **Price type** is set to **Transfer price**, the quantity of the items that are defined for the combination of item and dimension on the **Transfer price** page is displayed in the **Transfer quantity** field, but it can be modified.

9. In the **Unit price** field, enter the cost price or the transfer price for one unit of the item.
10. Select the **Tax information** tab to set up taxes for the transfer order and enter details. You can change the default information that is displayed in the fields.
11. Select **Ship** > **Ship transfer order**, and on the **Shipment** page, post the transfer order shipment.
12. Select **Receive** > **Receive**, and on the **Receive** page, post the transfer order receipt.

NOTE

If the "Enable uniform tax amount and GST transaction ID for both shipment and receipt transaction of a stock transfer order" feature is enabled in the **Feature management** workspace, it is only possible to receive a previously posted shipment. You need to select **Shipment** in the **Update** field when posting a receipt and select a previously posted shipment in the **Shipment voucher** field.

You can also cancel a previously posted stock transfer order shipment if no receipts have been posted for this order. On the **Transfer orders** page, select **Transfer order** > **Transfer order history**. On the **Transfer order history** page, select a previously posted shipment. Select **Cancel**, and confirm the cancellation of the shipment. The shipment will be canceled, and all inventory movements and GST that was posted for the shipment will be reversed. The "Transfer Order Cancellation" feature in the **Feature management** workspace must be enabled to cancel transfer order shipments.

NOTE

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Russia overview

2/18/2021 • 2 minutes to read • [Edit Online](#)

This topic provides information about functionality that supports Russian regulations.

General ledger

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Not valuable fixed assets, and working clothes

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Additional resources

- [Electronic reporting overview](#)
- [Download Electronic reporting configurations from Lifecycle Services](#)
- [Microsoft Dynamics Localization Portal: Russia report \(requires CustomerSource account\)](#)

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Goods in transit from vendor (Russia)

2/18/2021 • 6 minutes to read • [Edit Online](#)

The item counting process (INV-6) is used to identify the quantity and value of inventory items that are in transit when inventory is counted.

The item counting process is done in the context of nomenclatures, shipping documents, and vendors.

Set up an inventory profile for a transferable item

To reflect the goods and materials that are in transit, you can set the kind of inventory for the **Basic** kind of activity. The **Kind of inventory** field can have the following values:

- Common
- Purchased items in route

1. Go to **Inventory management > Setup > Dimensions > Inventory profiles**.
2. Select **New** to create an inventory profile for an item.
3. In the **Inventory profile** field, enter the name of the inventory profile.
4. In the **Name** field, enter a description of the inventory profile.
5. On the **Setup** FastTab, in the **Kind of activity** field, select **Basic**.
6. Set the **Don't match** option to **Yes** to prevent on-hand inventory that uses this inventory profile from being automatically matched with a compatible inventory profile.
7. In the **Kind of inventory** field, select **Purchased items in route**. The **Initialize dimension** and **Control dimension in purchase order** options are automatically set to **Yes**.

NOTE

The **Kind of inventory** field is available only if you select **Basic** in the **Kind of activity** field.

8. On the **Matching priority** FastTab, select **Up** or **Down** to change the order of the inventory profile.
9. Select **Save**, and close the page.

The screenshot displays the 'Inventory profiles' setup page in Dynamics 365 Finance and Operations. The page is divided into several sections:

- Inventory profiles:** A table with columns for 'Inventory profile' and 'Name'. The profile name is 'For a transferable item'.
- Setup:** A grid of configuration options:
 - Kind of activity:** Basic
 - Kind of inventory:** Purchased items in route
 - Prohibit cost adjustment:** No
 - Initialize dimension:** Yes
 - Control dimension in purchase order:** Yes
 - Tax receivable processing:** Standard
 - Don't match:** Yes
 - Alcohol activity type:** None
 - Prohibit misc. charges on customer/...:** No
 - Split customer invoice:** No
 - Control dimension in sales order:** No
 - Tax payable processing:** Standard
- Matching priority:** A table with columns for 'Inventory profile', 'Name', and 'Kind of activity'. It contains one entry: 'For a transferable item' with 'Basic' as the kind of activity.
- Compatible inventory profiles:** A section for defining compatible profiles, currently empty.

Set up a number sequence for the Counting act (INV-6) report

1. Go to **Inventory management > Setup > Inventory and warehouse management parameters**.

2. On the **Number sequences** tab, in the **Number sequence code** field, select a number sequence for the **Counting act (INV-6)** reference.
3. Select **Save**, and close the page.

Set up an inventory journal name for the Counting act (INV-6) report

1. Go to **Inventory management > Setup > Journal names > Inventory**.
2. Create a journal name.
3. In the **Name** field, enter the inventory journal name.
4. In the **Description** field, enter a description.
5. In the **Journal type** field, select **Counting**.
6. On the **Reports** FastTab, in the **Available** field, select **Counting act (INV-6)**, and then select the left arrow button to move the report to the **Selected** field.

NOTE

If the **Available** field is blank, select **Update** on the Action Pane to update the list of available reports.

7. Select **Save**, and close the page.

The screenshot displays the 'Inventory Journal Names' configuration page. On the left, a list of journal names includes 'Инвент', 'Коррект', 'Перенос', 'Проводка', and 'Специф'. The main area shows the configuration for the 'Инвент' journal name. The 'Name' field contains 'Инвент', the 'Description' is 'Журнал инвентаризации', and the 'Journal type' is 'Counting'. The 'General' section includes fields for 'VOUCHER' (Voucher series: Проводка), 'Posting' (Selection by: Posting, Detail level: Details), 'Delete lines after posting' (No), 'INVENTORY' (Reservation: Manual), 'BLOCKING' (Private for user group), and 'COUNTING' (Counting status registration policy: Enable counting status regist...). The 'Reports' section shows a list of available reports on the left, including 'Counting list (INV-5)', 'Counting list (INV-3)', 'Collation statement', 'Requirement slip', and 'Certificate of unservice...'. The 'Counting act (INV-6)' report has been moved to the 'SELECTED' list on the right.

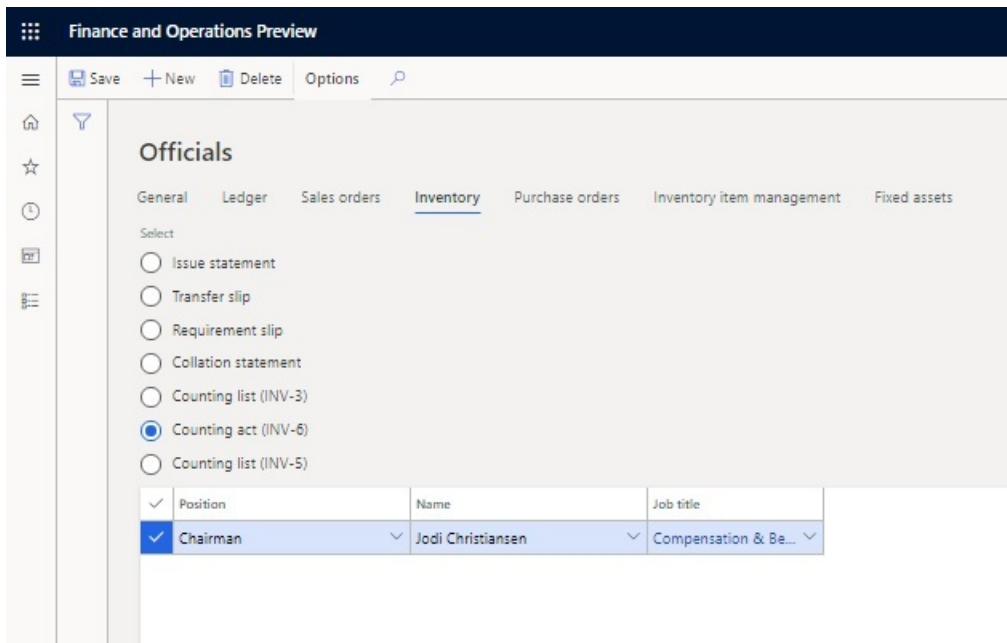
Add officials to the Counting act (INV-6) report

You can specify the company officials who are involved in the item counting process for the **Counting act (INV-6)** report.

1. Go to **Organization administration > Setup > Contacts > Officials**.
2. On the **Inventory** tab, select the **Counting act (INV-6)** option.
3. Select **New** to create an official for the **Counting act (INV-6)** report.
4. In the **Position** field, select the designation of the official.
5. In the **Name** field, enter the name of the official.
6. In the **Job title** field, select the job title of the official.

NOTE

By default, the job title is copied from the selected employee's record.



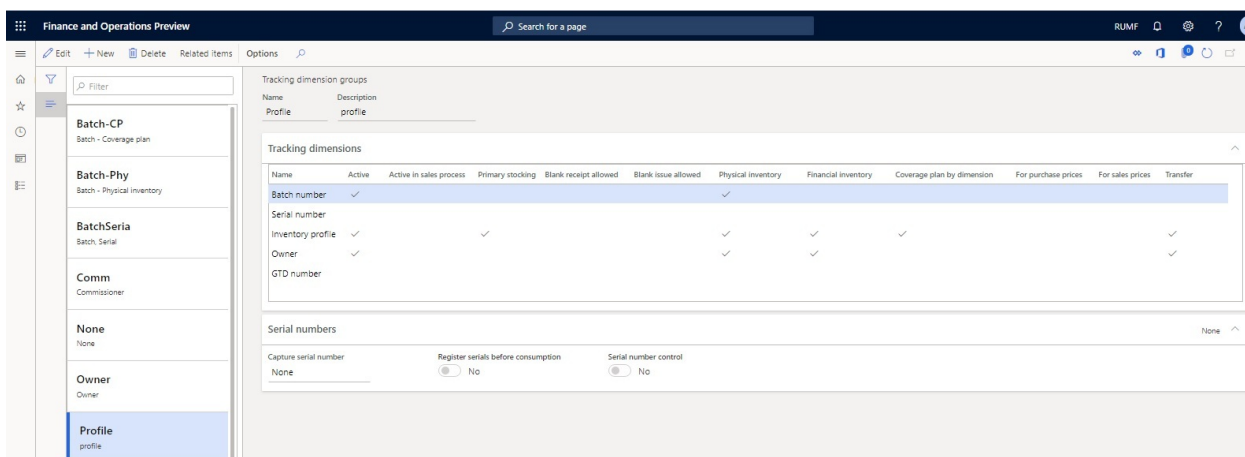
7. Select **Save**, and close the page.

Create an inventory tracking dimension group for the Counting act (INV-6) report

1. Go to **Product information management > Setup > Dimension and variant groups > Tracking dimension groups**.
2. Select **New** to create a dimension group.
3. In the **Name** field, enter the name of the dimension group.
4. In the **Description** field, enter a description.
5. On the **Tracking dimensions** FastTab, on the **Inventory profile** line, select the **Active**, **Primary stocking**, **Physical inventory**, **Financial inventory**, **Coverage plan by dimension**, and **Transfer** check boxes.
6. On the **Owner** line, select the **Active**, **Physical inventory**, **Financial inventory**, and **Transfer** check boxes.

NOTE

To make the report reflect the details of shipping and payment documents, on the **Batch number** line, select the **Active** and **Physical inventory** check boxes.



7. Select **Save**.

Create a purchase agreement

1. Go to **Accounts payable > Purchase orders > Purchase agreements**.

2. Select **New** to open the **Create purchase agreement** dialog box.
3. On the **Vendor** FastTab, in the **Vendor account** field, select the vendor account.
4. In the **Purchase agreement classification** field, select **Blanket purchase agreement**.
5. On the **General** FastTab, in the **Document** section, in the **Purchase agreement** field, enter the ID of the purchase agreement.
6. Specify other details, and then select **OK**.
7. On the **Purchase agreements** page, switch to the **Header** view, and then, on the **Financial** FastTab, in the **Inventory profile** section, set the following fields:
 - In the **Kind of activity** field, select **Basic**.
 - In the **Inventory profile** field, select the inventory profile that you created earlier.

8. On the Action Pane, on the **Purchase agreement** tab, in the **Generate** group, select **Confirmation** to update the status of the purchase agreement to **Effective**.

Add an inventory owner to the Counting act (INV-6) report

1. Go to **Inventory management > Setup > Dimensions > Inventory owners**.
2. Select **New** to add an inventory owner.
3. In the **Owner** field, enter the owner code.
4. In the **Account type** field, select **Vendor**.
5. In the **Account** field, select the principal code. The **Name** field is filled in automatically.
6. In the **Agreement ID** field, select the purchase agreement that you created earlier. In this way, you associate the new owner with the agreement.

Finance and Operations Preview

Search for a page

Edit New Delete On-hand list Transactions Trace Options

Personalize Page options Share

Always open for editing Personalize this form Add to workspace

Security diagnostics Record info Get a link Create a custom alert

Advanced filter or sort Change view Manage my alerts

Filter

Inventory owners

vend02

General

IDENTIFICATION ACCOUNT

Owner vend02 Account type Vendor

Account RUMF-000002

AGREEMENT

Agreement ID RUMF-000062

Name Корпорация Я.Дата ООО

Document title

Associated account

cust001
Customer: Корпорация Я.Дата ООО
RUMF-000001

cust003
Customer: Северо-западная звуковая к...
RUMF-000003

RUMF
Contoso Entertainment System Russia

vend0004
Vendor: Городские осветительные оист...
RUMF-000004

vend002
Vendor: Корпорация Я.Дата ООО
RUMF-000002

vend004
Vendor: Городские осветительные оист...
RUMF-000004

vend02
Я.Дата ООО, Agree...
RUMF-000002

7. Select **Save**.

Register goods and materials that are in transit

1. Create a new purchase order. In the **Purchase agreement** field, select the purchase agreement that you created earlier, and then, on the purchase order line, in the **Item number** field, select the item number.

NOTE

The **Tracking dimension** field for the item should be set to the inventory profile that you created earlier.

2. On the **Line details** FastTab, on the **Product** tab, in the **Tracking dimension** section, validate that the **Inventory profile** field is set to the inventory profile that you created earlier.
3. In the **Owner** field, select the record that you created earlier.

Finance and Operations Preview

Search for a page

Save New Delete Purchase order Purchase Manage Receive Invoice Retail Warehouse Transportation General Options

Generate Invoices Pro forma invoice Pro forma invoice Payment schedule Cash flow forecasts Planned payments Open transactions Invoices Pending invoices Invoice Facture

All purchase orders

RUMF-000211 : RUMF-000002 - Корпорация Я.Дата ООО

Lines Header Open order Approved

Purchase order header

DELIVERY Delivery date 8/28/2019

DISCOUNTS Total discount % 0.00

VENDOR Contact

REPLENISHMENT Service category

CROSS DOCKING DATES Delivery date 8/28/2019

Cross docking date

Local delivery date

Sales date

PRODUCT/ORDER CREATION Auto created NO

Origin Purchase

Purchase order lines

Line	Budget check	Line number	Item number	Product name	Procurement category	Variant number	CW quantity	CW unit	Quantity	Unit	Unit price	Adjusted unit p...	Discount	Discount percent	Net amount	Adjusted net a...
1			Item6	Item6					10.00	шт	100.00	0.00000			1,000.00	0.00

Line details

General Setup Address Product Delivery Picking Price and discount Project Product packages Variants Foreign trade Fixed assets Financial dimensions Loads

PRODUCT DIMENSIONS Color

Configuration

Style

Size

TRACKING DIMENSIONS Batch number 0001

Inventory profile Profile

Owner vend02

STORAGE DIMENSIONS Site Склад1

Warehouse Склад1

Location

License plate

Inventory status

PLANNED-ORDER REFERENCE Number

Master plan

ITEM REFERENCE Reference type

Reference number

Reference list

4. Post the invoice in the usual way.

Generate a Counting act (INV-6) report

You can use the **Print of counting act (INV-6)** dialog box to generate a **Counting act (INV-6)** report as a Microsoft Excel file. You must generate this report to track items that are transferred between warehouses and to create a counting list of the items in the transfer that have been purchased. The counting list can contain on-hand inventory holdings.

1. Go to **Inventory management > Journal entries > Item counting > Counting**.
2. Select **New** to open the **Dimensions display** dialog box.
3. On the **Overview** FastTab, validate that the **Name** field is set to the inventory journal name that you created earlier.
4. In the **Store inventory** section, set the **Site** and **Warehouse** fields.
5. On the **Counting by** FastTab, validate that the **Inventory profile** and **Owner** options are set to **Yes**.

NOTE

You can also set the **Batch number** and **Warehouse** options to **Yes**, if those dimensions are applicable.

?

Create inventory journal

Overview

IDENTIFICATION	Journal	STORE INVENTORY
Name <input type="text" value="Инвент"/>	<input type="text" value="RUMF-00132"/>	Site <input type="text" value="Общий"/>
	Description <input type="text" value="Журнал инвентаризации"/>	Warehouse <input type="text" value="Общий"/>

Counting by

FIXED VIEW	Site	Batch number
Configuration <input type="checkbox"/> Yes	<input checked="" type="checkbox"/> Yes	<input checked="" type="checkbox"/> Yes
Size <input type="checkbox"/> Yes	Warehouse	Serial number <input type="checkbox"/> No
Color <input type="checkbox"/> Yes	<input checked="" type="checkbox"/> Yes	GTD number <input type="checkbox"/> No
Style <input type="checkbox"/> Yes	Inventory status	Owner
	<input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes
	Location	Inventory profile
	<input type="checkbox"/> No	<input type="checkbox"/> Yes
	License plate	
	<input type="checkbox"/> No	

General

VOUCHER	POSTING	Offset account
Voucher series <input type="text" value="Проводка"/>	Detail level <input type="text" value="Details"/>	<input type="text"/>
Selection by <input type="text" value="Posting"/>	Delete lines after posting <input checked="" type="checkbox"/> No	Storno <input type="checkbox"/> No
New voucher by <input type="text" value="Change date"/>		

Setup

INVENTORY	COUNTING	EMPLOYEE
Reservation <input type="text" value="Manual"/>	Counting status registration policy <input type="text" value="Enable counting status regist..."/>	Worker <input type="text"/>

6. Select **OK** to create an inventory counting journal for the items in the transfer.
7. On the **Counting** page, in the **Journal lines** FastTab, create a line, and select the item number that you created earlier.
8. On the **Line details** FastTab, on the **Inventory dimensions** tab, in the **Inventory profile** and **Owner** fields, select the records that you created earlier. The **On-hand** field on the journal line is automatically updated.
9. On the **Journal lines** FastTab, select **Functions > Create counting list** to create a counting list. For each line, the **Counted** field is updated with the value that is specified in the **On-hand** field.

10. On the Action Pane, select **Print > Counting act (INV-6)** to open the **Print of counting act (INV-6)** dialog box.
11. In the **Date of act completion** field, select the date when the counting process is scheduled to be completed.
12. In the **Start date** and **End date** fields, select the start and end dates of the inventory counting period.
13. In the **Order number** field, enter the order number that you're generating the **Counting act INV-6** report for.
14. In the **Resolution date** field, select the transaction date of the order that you're generating the **Counting act INV-6** report for.

NOTE

The values in the **Journal**, **Dimension number**, and **Kind of inventory** fields are based on the inventory counting transactions. To change the values of these fields, select **Filter**. For example, you can modify these values to generate the report for a different journal or a different dimension.

Print of counting act (INV-6)

Parameters

COUNTING STATEMENT

Date of act completion
8/28/2019

REASON TO CONDUCT COUNTING

Order number
1010

COUNTING PERIOD

Start date
8/1/2019

Resolution date
8/31/2019

End date
8/31/2019

Records to include

Filter

INVENTORY JOURNAL LINES

Journal

INVENTORY PROFILES

Kind of inventory
Purchased items in ro...

INVENTORY DIMENSIONS

Dimension number

Run in the background

OK Cancel Officials

15. Select OK to generate the Counting act (INV-6) report.

1															Унифицированная форма № ИНВ-6					
2															Утверждена постановлением Госкомстата					
3															России от 18.08.98 № 88					
5															Код					
6															Форма по ОКУД		0317007			
7	Contoso Entertainment System Russia														по ОКПО		71200			
8																				
9																				
10																				
11															Вид деятельности					
12	Основание для проведения инвентаризации:														приказ, постановление, распоряжение		номер		1010	
13																	дата		31/08/2019	
14																	Дата начала инвентаризации		01/08/2019	
15																	Дата окончания инвентаризации		31/08/2019	
16																	Вид операции			
17																				
18																				
19															Номер документа		Дата составления			
20															АКТ		RUMF-00132		28/08/2019	
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NOTE

Can you tell us about your documentation language preferences? [Take a short survey.](#)

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Cloud and edge scale units for manufacturing and warehouse management workloads

2/18/2021 • 9 minutes to read • [Edit Online](#)

IMPORTANT

Some or all of the functionality noted in this topic is available as part of a preview release. The content and the functionality are subject to change. For more information about preview releases, see [One version service updates FAQ](#).

Cloud and edge scale units enable distribution of shop floor and warehouse execution workloads among different environments. This functionality can help improve performance, prevent service interruptions, and maximize uptime. It's provided by the following add-ins:

- Cloud Scale Unit Add-in for Dynamics 365 Supply Chain Management
- Edge Scale Unit Add-in for Dynamics 365 Supply Chain Management

Companies that work with manufacturing and distribution must be able to run key business processes 24/7, without interruption and at scale. Cloud and edge scale units enable companies to run key mission-critical manufacturing and warehouse processes without interruption, even when faced with occasional network connectivity or latency issues.

Public preview information

The preview provides one environment that functions as a cloud-based hub of your Dynamics 365 Supply Chain Management environment and one environment that functions as a cloud scale unit.

Preview availability

The preview for cloud and edge scale units becomes available for existing customers of Supply Chain Management in October 2020.

To access the October preview release 10.0.15/Platform update 39 for deployment in your [Microsoft Dynamics Lifecycle Services \(LCS\)](#) environment, you must be part of the preview early access program (also known as PEAP) for Supply Chain Management. You can join PEAP if you're already a member of the broader [Dynamics Insider Program](#). Just select the specific program that is named "Finance & Operations: Preview early access program (PEAP)."

IMPORTANT

The scale unit capability for Supply Chain Management is made available only if you agree to the [Cloud + Edge Preview for Finance and Operations terms](#).

Data processing for the preview

During the public preview, some management services will only be hosted in the United States. However, when the feature becomes generally available, these management services will be available in all geographies supported by Supply Chain Management. This affects the transfer and storage of administrative information used by the scale unit manager, including:

- Your tenant names and IDs
- Your LCS project IDs

- Administrator emails used to sign in
- Environment IDs for hub and scale units
- Workload configurations
- Collected metrics (such as latency and throughput) which are displayed on the map analysis page

Data transferred to and stored in the US data centers will be deleted when your preview environments are shut down.

Sign up for the preview

To sign up for the cloud and edge preview for Supply Chain Management, your organization must already have a live Supply Chain Management cloud environment.

The scale unit capabilities are currently in public preview. When you sign up, you must use a user account on the specific tenant. You must also be a project owner or an environment admin in LCS for an active Dynamics 365 LCS project in that tenant.

When you sign up for the preview, you will select a tenant and go through the sign-up steps. As soon as Microsoft can allocate preview capacity, we will send you an email that includes the provisioning details and the promotion (promo) codes for two environments (a hub and a scale unit) for the appropriate LCS project. You will then be able to deploy the two environments as tier-2 sandbox environments. Those environments will be valid 60 days from the creation date of the promo codes. You should not use the two environments until the step that is described in the next paragraph is completed.

After you confirm with Microsoft that the two environments have been deployed by using the promo codes, one of the environments will be configured to work as a hub, and the other will be configured to work as a scale unit. You can then configure the scale units and deploy selected warehouse management and manufacturing workloads by using the [Scale Unit Manager portal](#).

Preview environments will automatically be deleted after 60 days. However, they might be deleted sooner if it appears that they aren't being used. After your preview environments have been deleted, you can sign up and queue up for a new preview deployment.

To sign up for the preview, go to the [Scale Unit Manager portal](#).

Limitations that apply during the preview period

IMPORTANT

For the initial phase of the preview program for this feature, Microsoft is supporting only hubs that have cloud scale units, not hubs that have edge scale units. Edge scale units are installed on-premises and are expected to become available during an upcoming phase of the program.

Because cloud and edge scale units are a preview feature, services that are related to them are currently available in limited countries and regions. By enabling cloud and edge scale units, you affirm that you understand that some data that is related to the configuration and processing of cloud and edge scale units might be stored in a data center that is located in the United States. By enabling cloud and edge scale units, you also agree to the [Cloud + Edge Preview for Finance and Operations terms](#). To learn more about cloud and edge scale units, see the [documentation](#).

Your privacy is important to Microsoft. To learn more, read our [Privacy Statement](#).

IMPORTANT

Some business functionality isn't fully supported in the public preview when workloads are used on scale units. For more information about the functional workloads, see the sections later in this topic.

Scale units and dedicated workloads



Scale units extend your central Supply Chain Management hub environment by adding dedicated processing capacity. Scale units can run in the cloud. Alternatively, they can run on the edge at your local facility premises. Scale units can temporarily be disconnected from the hub environment. When they are connected, scale units receive all the information that is required to run the dedicated processing for assigned workloads.



For the public preview, you can configure a hub environment with selected workloads on a cloud scale unit by using the Scale Unit Manager portal. Preview participants who have access to a Local Business Data (LBD) on-premises environment can also configure the LBD environment as an edge scale unit.

A workload is a defined set of business functionality that can be factored out and delegated to a scale unit. Currently, the preview features two types of workloads:

- Manufacturing execution
- Warehouse management

You can assign one of each type of workload per scale unit.

Dedicated manufacturing execution workload capabilities in a scale unit

For manufacturing execution, cloud and edge scale units deliver the following capabilities, even when the edge units aren't connected to the cloud:

- Machine operators and shop floor supervisors can access the operational production plan.
- Machine operators can keep the plan up to date by running discrete and process manufacturing jobs.
- The shop floor supervisor can adjust the operational plan.
- Workers can access time and attendance for clock-in and clock-out on the edge, to ensure correct worker pay

calculation.

For more information, see the [manufacturing scale unit workload details](#).

Dedicated warehouse management workload capabilities in a scale unit

For warehouse management, cloud and edge scale units deliver the following capabilities, even when edge units aren't connected to the cloud:

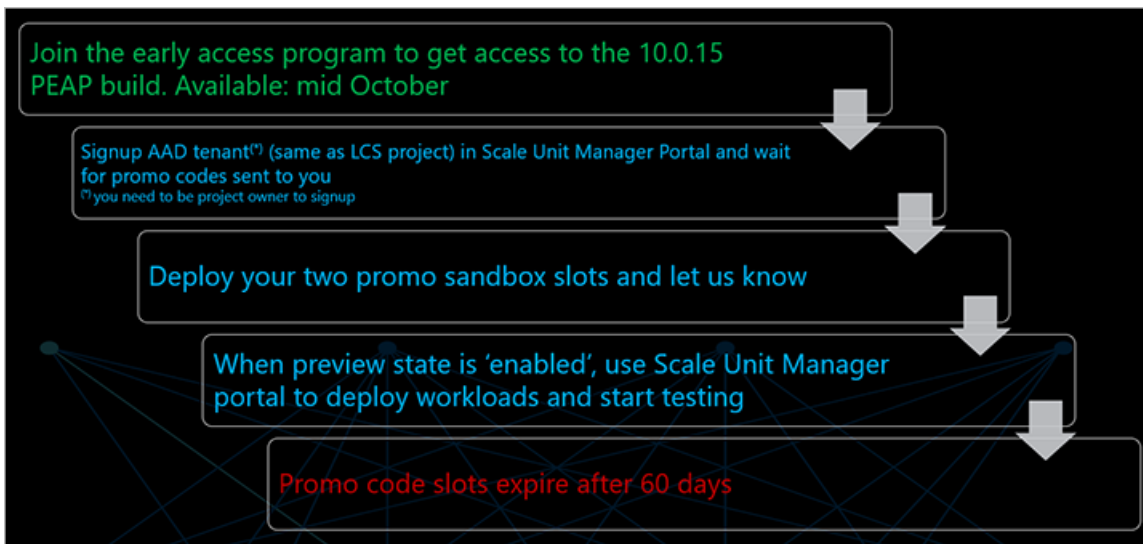
- Processing of selected wave methods is enabled for sales orders and demand replenishment.
- Warehouse workers can run sales and demand replenishment warehouse work by using the warehouse app.
- Warehouse workers can inquire into on-hand inventory by using the warehouse app.
- Warehouse workers can create and run inventory movements by using the warehouse app.
- Warehouse workers can register purchase orders and do putaway by using the warehouse app.

For more information, see the [warehouse scale unit workload details](#).

Onboard scale units for your Supply Chain Management environment

Deploy the preview for cloud and edge scale units

The following illustration shows the sign-up and provisioning flow for the public preview for cloud scale units.



Select your LCS project tenant and the detailed preview process

In the public preview, the [Scale Unit Manager portal](#) shows the list of tenants that your account is part of, and where you're an owner or environment admin for an LCS project.

If the tenant that you're looking for isn't in this list, go to [LCS](#), and make sure that you're either an environment admin or a project owner of the LCS project for that tenant. Note that only Azure Active Directory (Azure AD) accounts from the selected tenant are authorized to complete the sign-up experience.

NOTE

After you apply changes to LCS, it might take up to 30 minutes for the list of tenants to reflect the changes.

For each tenant, the list shows the sign-up status.

Scale Unit Manager for Dynamics 365 Supply Chain Management | Dynamics 365 Tenants

Your Dynamics 365 Tenants

Filter by name

Tenant	Status
Contoso Pharmaceuticals	Enabled
Contoso Ltd.	Click here to sign up
Contoso Headquarters	Sign up required. Only users from this tenant can sign up.
Contoso Suites Management	Pending

If you do not find the tenant you want, return to Microsoft Dynamics Lifecycle Services (LCS) and confirm you are either an environment admin or a project owner for a LCS project of that tenant. Only user accounts from the tenant are authorized sign up for the preview.

Select the **Click here to sign up** link to sign up your LCS tenant to participate in the preview. You must accept the terms. You must also supply a business email address where Microsoft can send communications that are related the preview sign-up process.

Scale Unit Manager for Dynamics 365 Supply Chain Management | Dynamics 365 Tenants

Sign up for public preview

Tenant: Contoso, Ltd.

By clicking this box, I agree to the Microsoft [Preview Terms](#) and [Privacy Statement](#).

To learn more about cloud and edge scale units please consult the [documentation](#).

Please enter one or more email addresses for users in your organization (separated by ';') for us to send them information about your preview project.

[Sign up](#) [Back](#)

Microsoft will review your request and inform you about the next steps by sending an email to the address that you supplied on the sign-up form.

After you've been granted access to the preview program, you will receive two promo codes for your LCS project. You can now use those promo codes to deploy two environments in LCS. The environments must use PEAP release 10.0.15 or later. When you've finished applying the promo codes, notify Microsoft (as instructed), so that we can finish enabling the environments for the preview features. Microsoft will let you know when this configuration step is completed.

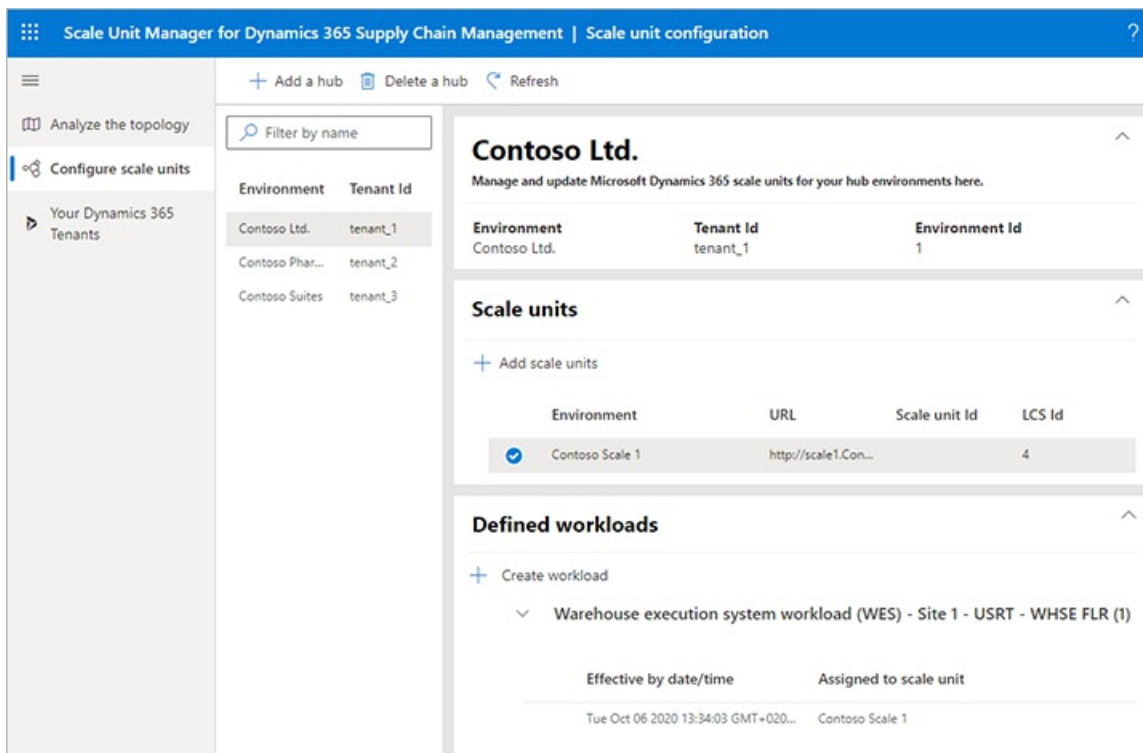
You can now start to configure scale units and workloads in your preview environment.

IMPORTANT

When you configure cloud scale units, you can [do all the required steps in the Scale Unit Manager portal](#).

Manage cloud scale units and workloads by using the Scale Unit Manager portal

Go to the [Scale Unit Manager portal](#), and sign in by using your tenant account. On the **Configure scale units** page, you can add a hub environment if it isn't already listed. You can then select the hub that you want to configure with scale units and workloads.



To add one or more scale units that are available in your topology, select **Add scale units**. In the preview, you should see the cloud scale unit that you deployed from one of the promo codes that you received as part of the preview program.

On the **Defined workloads** tab, use the **Create workload** button to add a warehouse management or manufacturing execution workload to one of your scale units. For each workload, you must specify the context of the processes that will be owned by the workload. For warehouse management workloads, the context is a specific warehouse in a specific site and legal entity. For manufacturing execution workloads, the context is a specific site in a legal entity.

Define workloads

Select the type of workload you want to define. Based on the selection you might see different configuration options.

Environment *
Contoso Scale 1

Workload type *
Warehouse execution system workload (WES)

Site *
Select

Legal Entity *
Select

Warehouse *
Select

Add **Cancel**

IMPORTANT

The Scale Unit Manager portal in the preview doesn't let you remove workloads from scale units or unassign a scale unit from a hub after the assignment is made. If you must remove an assignment, reach out to your contact person for preview program management.

NOTE

Can you tell us about your documentation language preferences? [Take a short survey.](#)

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Manufacturing execution workloads for cloud and edge scale units

2/18/2021 • 5 minutes to read • [Edit Online](#)

IMPORTANT

Some or all of the functionality noted in this topic is available as part of a preview release. The content and the functionality are subject to change. For more information about preview releases, see [One version service updates FAQ](#).

WARNING

Some business functionality isn't fully supported in the public preview when workload scale units are used.

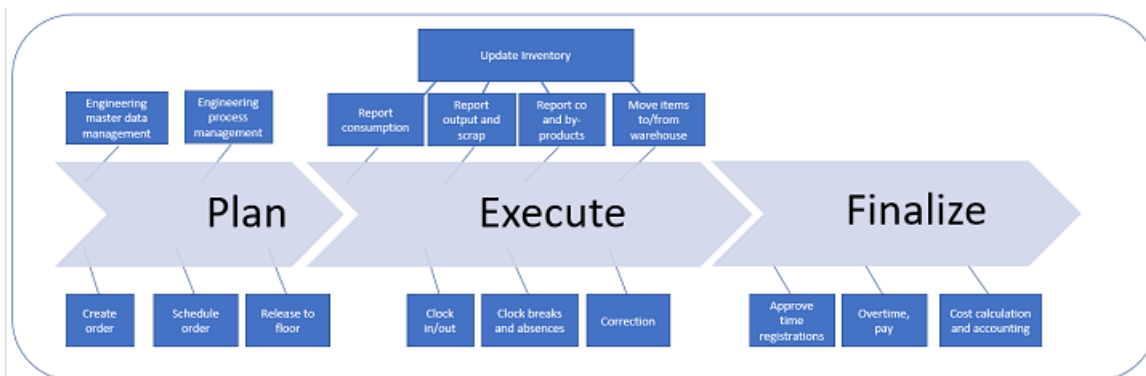
In manufacturing execution, cloud and edge scale units deliver the following capabilities, even when edge units aren't connected to the hub:

- Machine operators and shop floor supervisors can access the operational production plan.
- Machine operators can keep the plan up to date by running discrete and process manufacturing jobs.
- The shop floor supervisor can adjust the operational plan.
- Workers can access time and attendance for clock-in and clock-out on the edge, to ensure correct worker pay calculation.

This topic describes how manufacturing execution workloads work with cloud and edge scale units.

The manufacturing lifecycle

As the following illustration shows, the manufacturing lifecycle is divided into three phases: *Plan*, *Execute*, and *Finalize*.

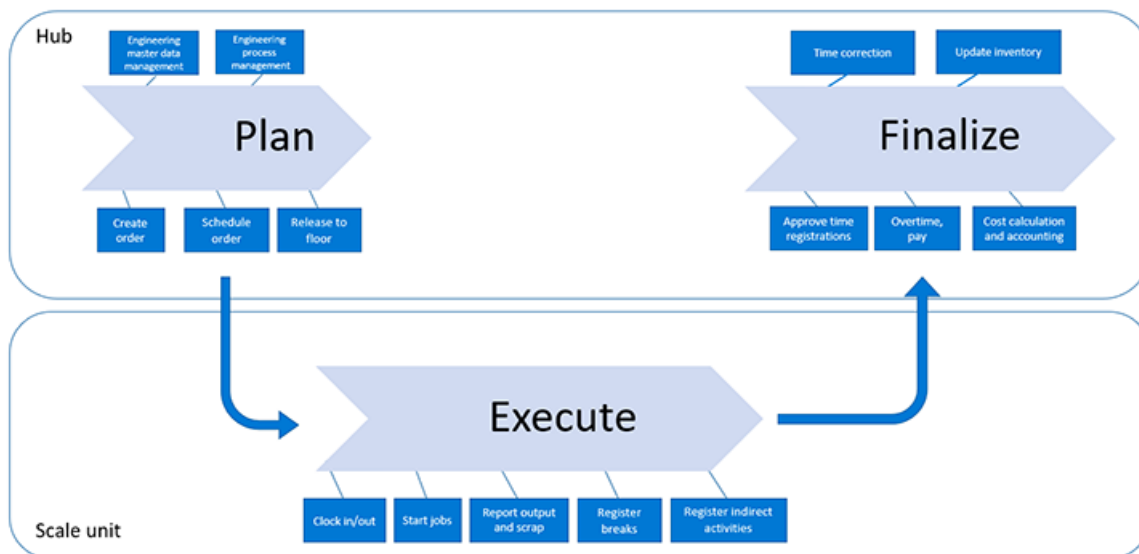


The *Plan* phase includes product definition, planning, order creation and scheduling, and release. The release step indicates the transition from the *Plan* phase to the *Execute* phase. When a production order is released, the production order jobs will be visible on the production floor and ready for execution.

When a production job is marked as completed, it moves from the *Execute* phase to the *Finalize* phase. In the *Finalize* phase, the registrations from the *Execute* phase go through an approval workflow, where they are calculated, approved, and transferred. At that point, the production order is completed. Therefore, the basis for the workers' pay is generated.

Splitting the Execute phase into a separate workload

As the following illustration shows, when scale units are used, the *Execute* phase is split out as a separate workload.



The model now goes from a single-instance installation to a model that is based on the hub and scale units. The *Plan* and *Finalize* phases run as back-office operations on the hub, and the manufacturing execution workload runs on the scale units. Data is transferred asynchronously between the hub and scale units.

When a production order is released on the hub, all data that is required to process production jobs is transferred to the scale unit. This data includes production orders, production routes, bills of materials, and products. Data that isn't related to a production order (such as indirect activities, absence codes, and production parameters) is also transferred from the hub to the scale unit. As a rule, data that originates from the hub and that is transferred to the scale unit can be created or updated only on the hub. For example, a new absence code or indirect activity can't be created on the scale unit—they can be used only for registration. The registrations that are made on the scale unit during execution are then transferred to the hub, where time and attendance approval, inventory, and financial updates are processed.

Manufacturing execution tasks that can be run on workloads

The following manufacturing execution tasks can currently be run on workloads when scale units are used:

- Clock-in, log-in, clock-out, and absence
- Start job
- Bundle jobs
- Report progress
- Report scrap
- Indirect activity
- Break

Working with manufacturing execution workloads on the hub

Usually, the processes that are required to run manufacturing execution workloads run automatically to keep the hub and all the scale units in sync, as needed. However, if you're having trouble, you can manually trigger the processing of raw registrations that are received from workloads and/or check the registration processing log.

Manually process raw registrations

A batch job in Supply Chain Management runs automatically to process all the registrations that have been

received from the workloads. This job creates the required production journals and logbook entries when a registration is processed for a completed job on the workload.

Although the job usually runs automatically, you can run it manually at any time by signing in to the hub and going to **Production control > Periodic tasks > Backoffice workload management > Process raw registrations**.

Check the raw registration processing log

To review the registration processing log, sign in to the hub, and go to **Production control > Periodic tasks > Backoffice workload management > Raw registration processing log**. The **Raw registration processing log** page shows a list of processed raw registrations and the status of each registration.

The screenshot shows the 'Raw registration processing log' page. It features a table with columns: Message state, Type of registration, Created date and time, Job, Operation/A..., Description, Production unit, and Resource group. Below the table is a 'Processing details' section with columns: StartDateTime, EndDateTime, Processing result, and Created by.

Message state	Type of registration	Created date and time	Job	Operation/A...	Description	Production unit	Resource group
Processed	Stop job	9/25/2020 11:45:20 AM	005847	Packing	Packing	120	1220
Processed	Start job	9/25/2020 11:44:47 AM	005847	Packing	Packing	120	1220
Processed	Stop job	9/25/2020 11:42:57 AM	005846	TestOpr	Operating the speaker test an...	120	1220
Processed	Start job	9/25/2020 11:42:34 AM	005846	TestOpr	Operating the speaker test an...	120	1220
Processed	Stop job	9/25/2020 11:40:38 AM	005844	Assembly	Speaker assembly	120	1210
Processed	Start job	9/25/2020 11:39:35 AM	005844	Assembly	Speaker assembly	120	1210

StartDateTime	EndDateTime	Processing result	Created by
9/29/2020 10:53:36 AM	9/29/2020 10:59:10 AM	Failed	Admin
9/29/2020 10:53:26 AM	9/29/2020 10:56:16 AM	Failed	Admin
9/29/2020 10:46:50 AM	9/29/2020 10:52:31 AM	Failed	Admin
9/29/2020 10:46:01 AM	9/29/2020 10:49:22 AM	Failed	Admin
9/29/2020 10:38:51 AM	9/29/2020 10:44:54 AM	Failed	Admin
9/29/2020 10:38:45 AM	9/29/2020 10:41:52 AM	Failed	Admin
9/29/2020 10:34:43 AM	9/29/2020 10:37:38 AM	Failed	Admin

You can work on any registration in the list by selecting it and then selecting one of the following buttons on the Action Pane:

- **Process** – Manually process the selected registration. This action can be useful if the *Process raw registrations* job hasn't run, or if it failed.
- **Cancel** – Cancel the selected registration.

Working with manufacturing execution workloads on a scale unit

Usually, the processes that are required to run manufacturing execution workloads run automatically to keep the hub and all the scale units in sync, as needed. However, if you're having trouble, you can check the history of orders that have been processed on a scale unit or manually run the *Manufacturing hub to scale unit message processor* job.

View the history of manufacturing jobs that have been processed on a scale unit

To review the history of manufacturing jobs that have been processed on a scale unit, sign in to the scale unit machine, and go to **Production control > Periodic tasks > Backoffice workload management > Manufacturing jobs processing history**. The **Manufacturing jobs processing history** page shows the processing history of the production orders on the scale unit. You can work on any production order in the list by selecting it and then selecting one of the following buttons on the Action Pane:

- **Process** – Manually process the selected production order.
- **Cancel** – Cancel the selected production order.

Manufacturing hub to scale unit message processor job

The *Manufacturing hub to scale unit message processor* job processes data from the hub to the scale unit. This job is automatically started when the manufacturing execution workload is deployed. However, you can run it manually at any time by going to **Production control > Periodic tasks > Backoffice workload**

management > Manufacturing hub to scale unit message processor.

NOTE

Can you tell us about your documentation language preferences? [Take a short survey.](#)

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Warehouse management workloads for cloud and edge scale units

2/18/2021 • 13 minutes to read • [Edit Online](#)

IMPORTANT

Some or all of the functionality noted in this topic is available as part of a preview release. The content and the functionality are subject to change. For more information about preview releases, see [One version service updates FAQ](#).

WARNING

Not all warehouse management business functionality is fully supported for warehouses running a workload on a scale unit. Be sure to use only the processes that this topic explicitly describes as supported.

Warehouse execution on scale units

This feature enables scale units to run selected processes from the warehouse management capabilities. Cloud scale units run their workloads in the cloud by using dedicated processing capacity in your selected Microsoft Azure region. For edge scale units, you can run some workloads independently on premises, even while the scale units are temporarily disconnected from the cloud.

In this topic, warehouse management executions in a warehouse that is defined as a scale unit are known as a *Warehouse execution system (WES)*.

Prerequisites

You must have a Dynamics 365 Supply Chain Management hub and a scale unit that has been deployed with the warehouse management workload. For more information about the architecture and deployment process, see [Cloud and edge scale units for manufacturing and warehouse management workloads](#).

How the WES workload works on scale units

For the processes in the warehouse management workload, the data is synced between the hub and the scale units.

A scale unit can maintain only the data that it owns. The data ownership concept for scale units helps prevent multi-master conflicts. Therefore, it's important that you understand which processes are owned by the hub and which are owned by the scale units.

The scale units own the following data:

- **Wave processing data** – Selected wave process methods are handled as part of the scale unit wave processing.
- **Work processing data** – The following types of work order processing are supported:
 - **Inventory movements** (manual movement and movement by template work)
 - **Purchase orders** (putaway work via a warehouse order when purchase orders are not associated with loads)

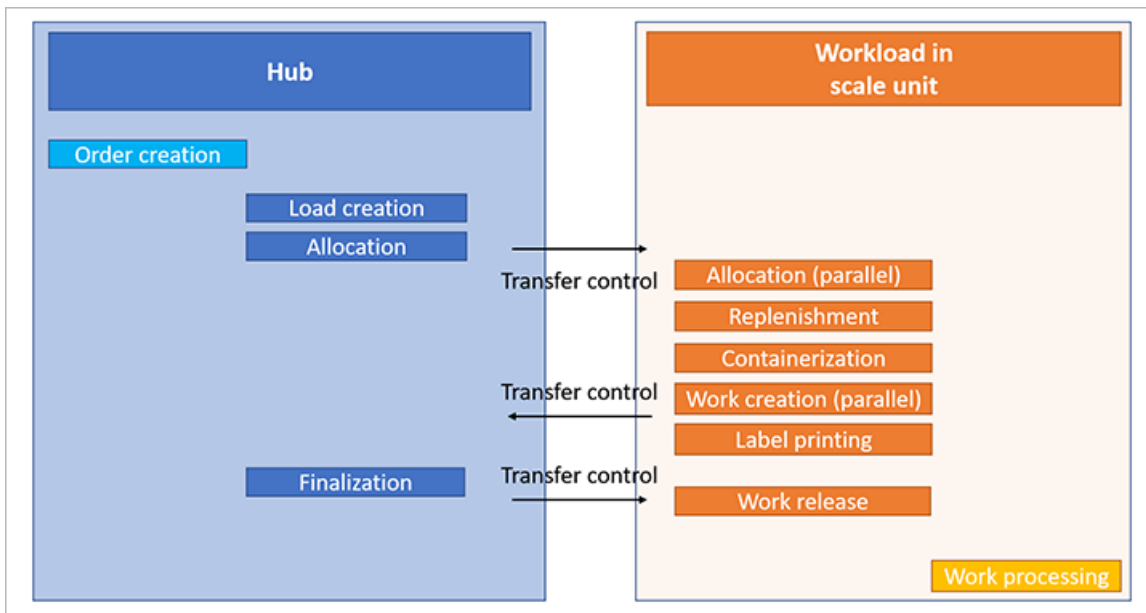
- **Sales orders** (simple picking and loading work)
- **Transfer orders** (only outbound with simple picking and loading work)
- **Warehouse order receipt data** – This data is used only for purchase orders that are manually released to a warehouse.
- **License plate data** – License plates can be created on the hub and the scale unit. Dedicated conflict handling has been provided. Note that this data isn't warehouse-specific.

Outbound process flow

The hub owns the following data:

- All source documents, such as sales orders and transfer orders
- Order allocation and outbound load processing
- The release to warehouse, shipment creation, wave creation, and wave finalization processes

The scale units own the actual wave processing (such as work allocation, replenishment work, and demand work creation) after the release of the wave. Therefore, warehouse workers can process outbound work by using a warehouse app that is connected to the scale unit.



Inbound process flow

The hub owns the following data:

- All source documents, such as purchase orders and sales return orders
- Inbound load processing
- All cost and financial updates

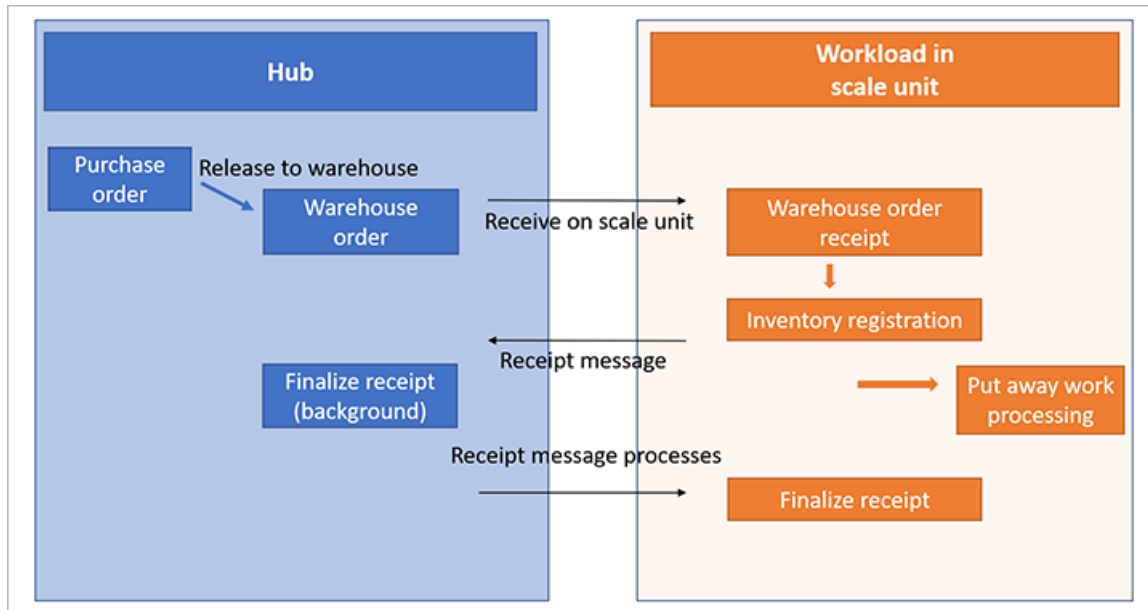
NOTE

The inbound purchase order flow is conceptually different from the outbound flow. You can operate the same warehouse on either the scale unit or the hub depending on whether the purchase order has been released to warehouse or not. Once you have released an order to the warehouse, you can only work with that order while signed in on the scale unit.

If you're using the *release to warehouse* process, *warehouse orders* are created, and ownership of the related receiving flow is assigned to the scale unit. The hub won't be able to register inbound receiving.

The worker can run the receiving process by using a warehouse app that is connected to the scale unit. The data is then recorded by the scale unit and reported against the inbound warehouse order. The creation and processing of the subsequent putaway will also be handled by the scale unit.

If you aren't using the *release to warehouse* process, and therefore aren't using *warehouse orders*, the hub can process warehouse receiving and work processing independently from scale units.



Supported processes and roles

Not all warehouse management processes are supported in a WES workload on a scale unit. Therefore, we recommend that you assign roles that match the functionality that is available to each user.

To facilitate this process, a sample role that is named *Warehouse manager on workload* is included in the demo data at **System administration > Security > Security configuration**. The purpose of this role is to enable warehouse managers to access the WES on the scale unit. The role grants access to the pages that are relevant in the context of a workload that is hosted on a scale unit.

User roles on a scale unit are assigned as part of the initial data synchronization from the hub to the scale unit.

To modify the roles that are assigned to a user, go to **System administration > Security > Assign users to roles**. Users who act as warehouse managers only on scale units should be assigned only the *Warehouse manager on workload* role. This approach will ensure that those users have access only to the supported functionality. Remove any other roles that are assigned to those users.

Users who act as warehouse managers on both the hub and scale units should be assigned the existing *Warehouse worker* role. Be aware that this role grants warehouse workers access to features (such as transfer order receiving processing) that appear in the user interface (UI) but aren't currently supported on scale units.

Supported WES processes

The following warehouse execution processes can be enabled for a WES workload on a scale unit:

- Selected wave methods for sales and transfer orders (allocation, demand replenishment, containerization, work creation, and wave label printing)
- Processing sales and transfer order warehouse work using the warehouse app (including replenishment work)
- Querying on-hand inventory by using the warehouse app
- Creating and running inventory movements by using the warehouse app

- Registering purchase orders and doing putaway work by using the warehouse app

The following work order types are currently supported for WES workloads on scale unit deployments:

- Sales orders
- Transfer issue
- Replenishment
- Inventory movement
- Purchase orders (linked to warehouse orders)

No other types source-documents processing or warehouse work are currently supported on scale units. For example, for a WES workload on a scale unit, you can't perform a transfer order receiving process (transfer receipt) or process cycle counting work.

NOTE

Mobile device menu items and buttons for unsupported functionalities aren't shown in the *warehouse app* when it is connected to a scale unit deployment.

WARNING

When you run a workload on a scale unit, you can't run unsupported processes for that specific warehouse on the hub. The tables provided later in this topic document the supported capabilities.

Selected warehouse work types can be created both on the hub and on scale units, but can only be maintained by the owning hub or scale unit (the deployment which created the data).

Even when a specific process is scale unit supported, be aware that all the needed data might not get synchronized from the hub to the scale unit, or from the scale unit to the hub, which risks resulting in unexpected system processing.

Examples being:

- If you use a location directive query that joins a data table record that only exists at the hub deployment.
- If you use location status and/or location volumetric load functionalities. This data will not get synchronized between the deployments and will therefore only work when updating location inventory on-hand on one of the deployments.

The following warehouse management functionality isn't currently supported for scale unit workloads:

- Inbound processing of purchase order lines assigned to a load
- Inbound processing of purchase orders for a project
- Inbound and outbound processing for items that have active tracking dimensions **Owner** and/or **Serial number**
- Processing of inventory that has a blocking status value
- Changing of an inventory status during any work movement process
- Order-committed flexible warehouse-level dimension reservations
- Use of *Warehouse location status* functionality (the data isn't synced between the deployments)
- Use of *Location license plate positioning* functionality
- Use of *Product filters* and *Product filter groups*, including the **Number of days to mix batches** setting
- Integration with quality management
- Processing with catch-weight items
- Processing with items only enabled for Transportation management (TMS)
- Processing with negative on-hand inventory
- Warehouse work processing with custom work types
- Warehouse work processing with shipment notes

- Warehouse work processing with cycle counting threshold triggering
- Warehouse work processing with material handling/warehouse automation
- Use of product master data image (for example, on the warehouse app)

WARNING

Some warehouse functionality won't be available for warehouses running the warehouse management workloads on a scale unit, and also isn't supported on the hub or on the scale unit workload.

Other capabilities can get processed on both, but will require careful use in some scenarios, such as when inventory on-hand gets updated for the same warehouse on both the hub and scale unit due to the asynchronous data update process.

Specific functionalities (such as *block work*) which are supported on both the hub and scale units will only be supported for the owner of the data.

Outbound (supported only for sales and transfer orders)

The following table shows which outbound features are supported, and where they are supported, when the warehouse management workloads are used in cloud and edge scale units.

PROCESS	HUB	WES WORKLOAD ON A SCALE UNIT
Source document processing	Yes	No
Load and transportation management processing	Yes	No
Release to warehouse	Yes	No
Planned cross docking	No	No
Shipment consolidation	Yes	No
Shipment wave processing	Yes, but only initialization and finalization of the wave is handled in the hub. This means that outbound transfer and sales order processing only can get handled by the scale unit.	No, initialization and finalization gets handled by the hub and the Load building and sorting are not supported Note: Access to the hub is required to finalize the wave status as part of the wave processing.
Maintain shipments for wave	Yes	No
Warehouse work processing (incl. license plate print)	No	Yes, but only for the above mentioned supported capabilities.
Cluster picking	No	Yes

PROCESS	HUB	WES WORKLOAD ON A SCALE UNIT
Manual packing processing, incl. 'Packed container picking' work processing	No Some processing can be done after a initial picking process handled by a scale unit, but not recommended due to following blocked operations.	No
Remove container from group	No	No
Outbound sorting processing	No	No
Printing of load related documents	Yes	No
Bill of lading and ASN generation	Yes	No
Shipment confirm	Yes	No
Shipment confirmation with "Confirm and transfer"	No	No
Packing slip and invoicing processing	Yes	No
Short picking (sales and transfer orders)	No	No
Over picking (sales and transfer orders)	No	No
Change of work locations (sales and transfer orders)	No	Yes
Complete work (sales and transfer orders)	No	Yes
Print work report	Yes	No
Wave label	No	Yes
Work split	No	Yes
Work processing - Directed by 'Transport loading'	No	No
Reduce picked quantity	No	No
Reverse work	No	No
Reverse shipment confirmation	Yes	No

Inbound

The following table shows which inbound features are supported, and where they are supported, when the warehouse management workloads are used in cloud and edge scale units.

PROCESS	HUB	WES WORKLOAD ON A SCALE UNIT (ITEMS MARKED "YES" APPLY ONLY FOR WAREHOUSE ORDERS)
Source document processing	Yes	No
Load and transportation management processing	Yes	No
Inbound shipment confirmation	Yes	No
Purchase order release to warehouse (warehouse order processing)	Yes	No
Cancellation of warehouse order lines Note that this only is supported when no registration has happened against the line	Yes	No
Purchase order item receiving and put away	Yes, when there isn't a warehouse order No, when there is a warehouse order	Yes, when a purchase order isn't part of a <i>load</i>
Purchase order line receiving and put away	Yes, when there isn't a warehouse order No, when there is a warehouse order	Yes, when a purchase order isn't part of a <i>load</i>
Return order receiving and put away	Yes	No
Mixed license plate receiving and put away	Yes, when there isn't a warehouse order No, when there is a warehouse order	No
Load item receiving	Yes, when there isn't a warehouse order No, when there is a warehouse order	No
License plate receiving and put away	Yes, when there isn't a warehouse order No, when there is a warehouse order	No
Transfer order item receiving and put away	Yes	No

PROCESS	HUB	WES WORKLOAD ON A SCALE UNIT (ITEMS MARKED "YES" APPLY ONLY FOR WAREHOUSE ORDERS)
Transfer order line receiving and put away	Yes	No
Cancel work (inbound)	Yes, when there isn't a warehouse order No, when there is a warehouse order	Yes, but only when the Unregister receipt when canceling work option (on the Warehouse management parameters page) is cleared
Purchase order product receipt processing	Yes	No
Purchase order receiving with underdelivery	Yes, when there isn't a warehouse order No, when there is a warehouse order	No, because you can only cancel the full warehouse order line quantities
Purchase order receiving with overdelivery	Yes, when there isn't a warehouse order No, when there is a warehouse order	Yes
Receiving with creation of <i>Cross docking</i> work	Yes, when there isn't a warehouse order No, when there is a warehouse order	No
Receiving with creation of <i>Quality order</i> work	Yes, when there isn't a warehouse order No, when there is a warehouse order	No
Receiving with creation of <i>Quality item sampling</i> work	Yes, when there isn't a warehouse order No, when there is a warehouse order	No
Receiving with creation of <i>Quality in quality check</i> work	Yes, when there isn't a warehouse order No, when there is a warehouse order	No

PROCESS	HUB	WES WORKLOAD ON A SCALE UNIT (ITEMS MARKED "YES" APPLY ONLY FOR WAREHOUSE ORDERS)
Receiving with quality order creation	Yes, when there isn't a warehouse order No, when there is a warehouse order	No
Work processing - Directed by <i>Cluster putaway</i>	Yes	No
Work processing with <i>Short pick</i>	Yes	No
License plate loading	Yes	No

Warehouse operations and exception handling

The following table shows which warehouse operations and exception handling features are supported, and where they are supported, when the warehouse management workloads are used in cloud and edge scale units.

PROCESS	HUB	WES WORKLOAD ON A SCALE UNIT
License plate inquire	Yes	Yes
Item inquire	Yes	Yes
Location inquire	Yes	Yes
Change warehouse	Yes	Yes
Movement	Yes	Yes
Movement by template	Yes	Yes
Warehouse transfer	Yes	No
Create transfer order from warehouse app	Yes	No
Adjustment (in/out)	Yes	No
Inventory status change	Yes	No
Cycle counting and Counting discrepancy processing	Yes	No
Reprint label (license plate printing)	Yes	Yes
License plate build	Yes	No
License plate break	Yes	No

PROCESS	HUB	WES WORKLOAD ON A SCALE UNIT
Pack to nested license plates	Yes	No
Driver check in	Yes	No
Driver check out	Yes	No
Change batch disposition code	Yes	Yes
Display open work list	Yes	Yes
Consolidate license plates	Yes	No
Min/max and zone threshold replenishment processing	Yes Recommendation is not to include the same locations as part of the queries	Yes
Slotting replenishment processing	Yes	Yes Note that the setup must be done on the scale unit
Block and unblock work	Yes	Yes
Change user	Yes	Yes
Change work pool on work	Yes	Yes
Cancel work	Yes	Yes

Production

Warehouse management production scenarios aren't currently supported on scale unit workloads, as indicated in the following table.

PROCESS	HUB	WES WORKLOAD ON A SCALE UNIT
<p>All warehouse management processes that are related to production. Here are some examples:</p> <ul style="list-style-type: none"> • Release to warehouse • Production wave processing • Raw material picking • RAF and finished goods put away • Co-product and by-product put away • Kanban put away • Kanban picking • Start production order • Production scrap • Production last pallet • Register material consumption • Empty kanban 	Yes	No

Maintaining scale units for WES

Several batch jobs run on both the hub and scale units.

On the hub deployment, you can manually maintain the batch jobs. You can manage the following batch jobs at **Warehouse management > Periodic tasks > Back-office workload management**:

- Process work status update events
- Scale unit to hub message processor
- Register source order receipts
- Complete warehouse orders
- Process quantity update responses for warehouse order lines

On the workload in scale units, you can manage the following batch jobs at **Warehouse management > Periodic tasks > Workload management**:

- Process wave table records
- Warehouse hub to scale unit message processor
- Process quantity update requests for warehouse order lines

NOTE

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Warehouse orders for cloud and edge scale units

2/18/2021 • 3 minutes to read • [Edit Online](#)

IMPORTANT

Some or all of the functionality noted in this topic is available as part of a preview release. The content and the functionality are subject to change. For more information about preview releases, see [One version service updates FAQ](#).

WARNING

Not all business functionality is fully supported in the public preview when scale unit workloads are used. If you're using scale units, be sure to use only those processes that this topic explicitly describes as supported.

What are warehouse orders?

Warehouse orders are a type of order that was created to support hub and scale unit warehouse deployments. They let you receive inventory when you're running a warehouse workload on a scale unit. They are currently used only with purchase orders.

Warehouse orders are used as part of warehouse management processing, such as when the warehouse app is used to register physical on-hand inventory during processing of an inbound purchase order. Warehouse orders are created as part of the *Release to warehouse* process that is available for purchase orders that specify a scale unit warehouse and items that are enabled to use warehouse management processes.

IMPORTANT

Warehouse orders are available only in deployments that use [warehouse management workloads for cloud and edge scale units](#).

Create a warehouse order

To create a warehouse order, follow these steps.

1. Sign in to the instance of Microsoft Dynamics 365 Supply Chain Management that is running on the hub. (You must initiate the *Release to warehouse* process while you're signed in on the hub.)
2. Go to **Procurement and sourcing > Purchase orders > All purchase orders**.
3. On the Action Pane, on the **Warehouse** tab, in the **Actions** group, select **Release to warehouse**.
4. To view the related warehouse order lines, open the relevant purchase order, select a line in the **Purchase order lines** section, and then, on the toolbar, select **Warehouse > Warehouse order lines**. To view all the lines, go to **Warehouse management > Inquiries and reports > Warehouse order lines**.

Cancel a warehouse order

As part of the *Release to warehouse* process, purchase order inventory transactions are linked to warehouse orders and locked from being updated by the hub. If you released to the warehouse by mistake, or if you have some other reason to reverse the creation of warehouse order lines, you can request to cancel warehouse order lines.

To cancel warehouse order lines, follow these steps.

1. Sign in to the Supply Chain Management instance that is running on the hub.
2. Go to **Warehouse management > Inquiries and reports > Warehouse order lines**.
3. Select the relevant line.
4. On the Action Pane, select **Cancel warehouse order lines**.

NOTE

The request to cancel lines will be denied for any lines that are already pending cancellation or that are actively being processed at a warehouse that is running its workload on a scale unit.

Monitor a warehouse order

In the **Warehouse order lines** view, you can monitor the progress of inbound receiving by reviewing the values in the **Quantity left to receive** column. To view details that are related to work that is done by using the warehouse app, follow one of these steps.

- Go to **Warehouse management > Inquiries and reports > Warehouse order lines**, and use the filter to find the lines that you're looking for.
- Go to **Procurement and sourcing > Purchase orders > All purchase orders**, and open the relevant purchase order. In the **Purchase order lines** section, select one or more lines, and then, on the toolbar, select **Warehouse > Warehouse receipt entries**.

NOTE

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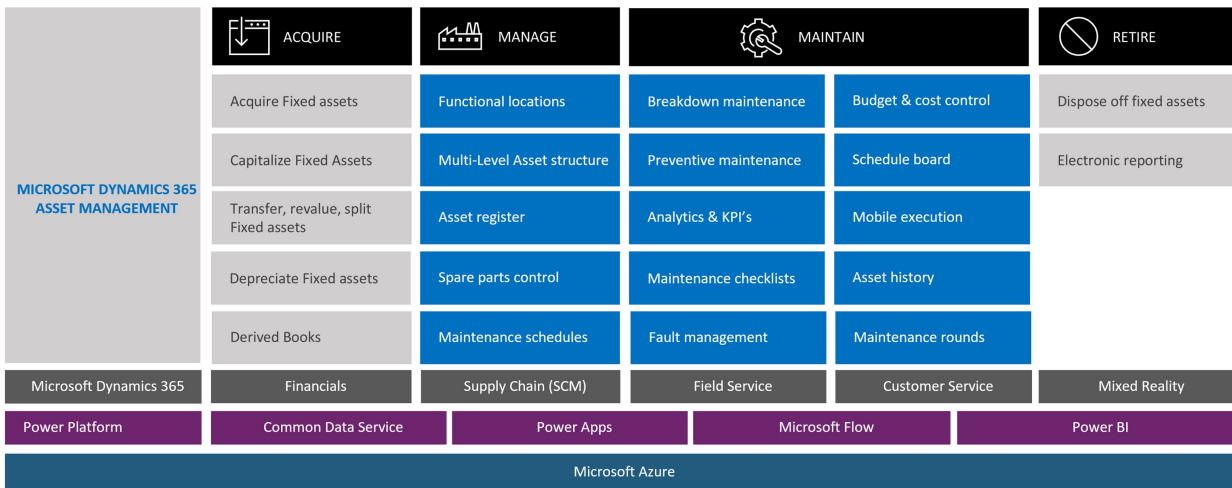
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Asset management overview

2/18/2021 • 2 minutes to read • [Edit Online](#)

Asset Management is an advanced module for managing assets and maintenance jobs in Dynamics 365 Supply Chain Management. Asset Management integrates seamlessly with several modules in Finance and Operations apps.

The image below is an illustration of the interfaces to other modules in Finance and Operations.



Asset Management enables you to efficiently manage and carry out tasks related to managing and servicing many types of equipment in your company, for example, machines, production equipment, and vehicles. Asset Management supports solutions across numerous industries.

NOTE

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Functional locations and assets

2/18/2021 • 2 minutes to read • [Edit Online](#)

This topic describes functional locations and assets in Asset Management. Asset Management is an advanced module for managing assets and maintenance jobs in Dynamics 365 Supply Chain Management.

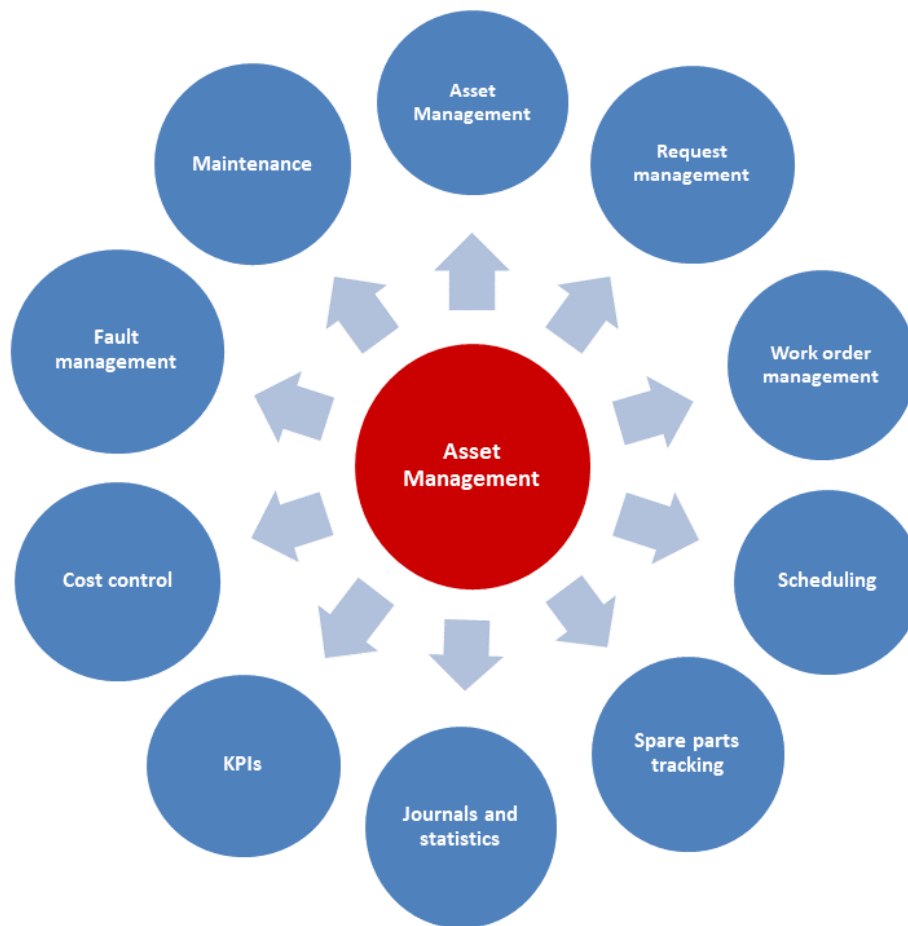
Overview

Asset Management is integrated seamlessly with several modules with other Finance and Operations apps. The following illustration shows the interfaces with other modules.



Asset Management lets you efficiently manage and perform all tasks that are related to managing and servicing many types of equipment in your company. This equipment includes machines, production equipment, and vehicles. Asset Management also supports solutions across numerous industries.

The following illustration shows an overview of the main functionality that is covered by Asset Management.



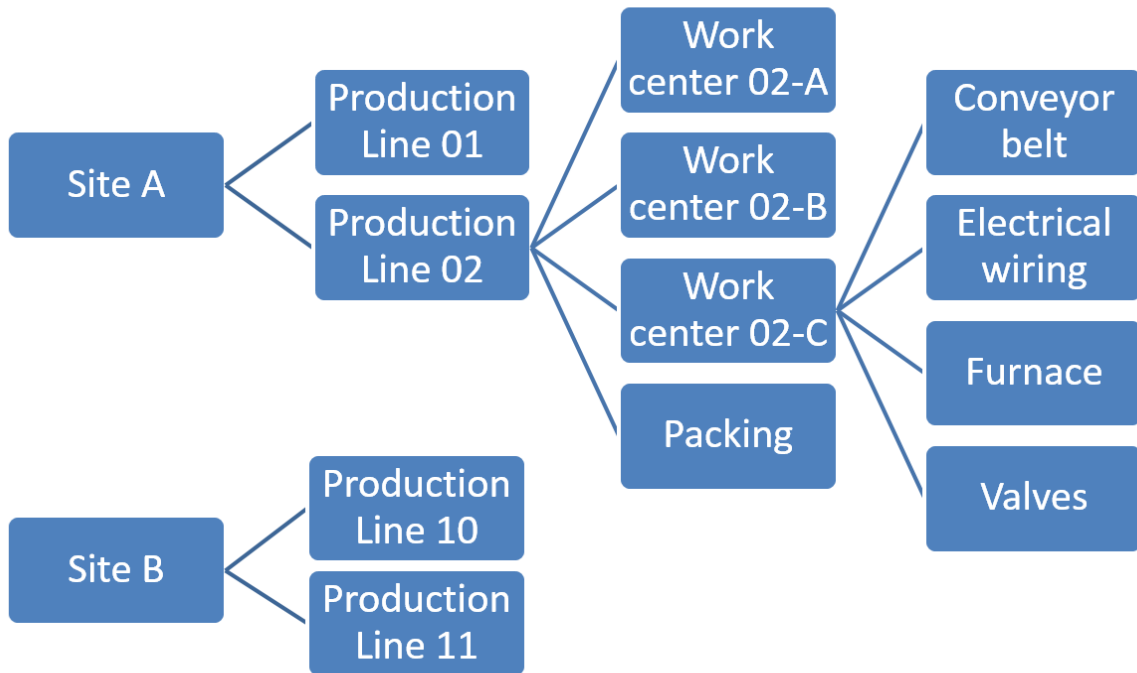
Functional locations and assets

Functional locations are used to manage assets on locations. This management includes tracking of asset costs on functional locations. Functional locations are structured hierarchically, and locations can have sub-locations. The structure of functional locations is static. In other words, locations can't change place. Assets can be installed on functional locations and, as required, can be installed on other functional locations later.

Asset costs always follow the location of the asset. In other words, if you install an asset on a new functional location, the asset automatically uses the financial dimensions that are related to the new functional location. Therefore, asset costs are always related to the functional location that the asset is currently installed on. This automatic handling of financial dimensions helps guarantee complete tracking of costs when your company does project controlling and reporting on functional locations.

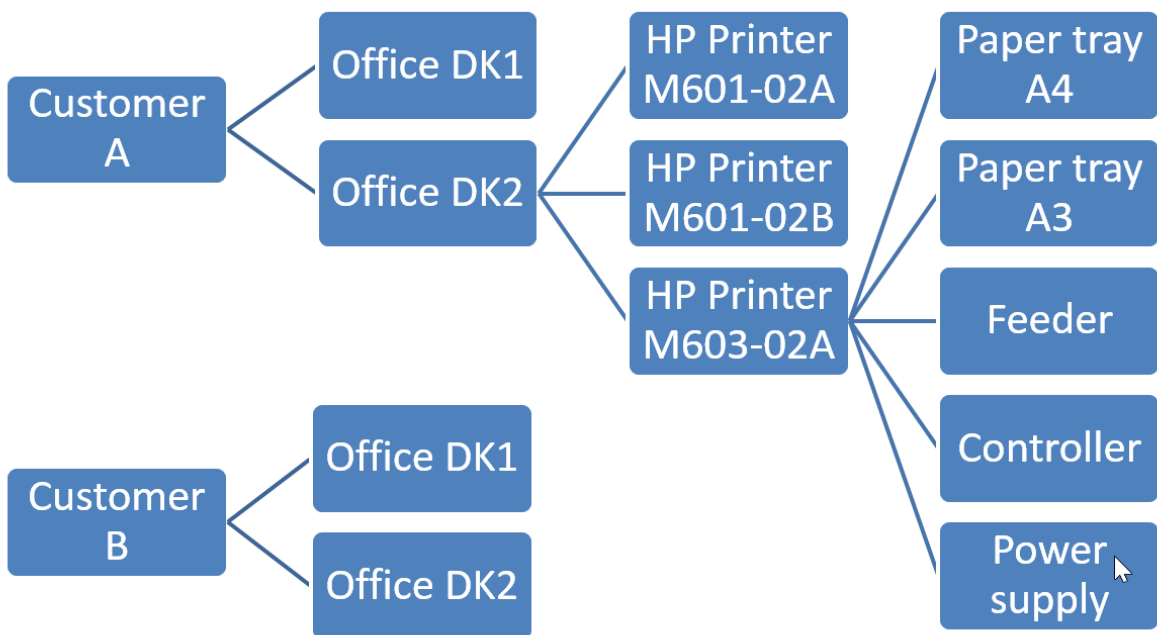
The way that you build your hierarchy of functional locations depends on your company's requirements for maintaining internal equipment or servicing customer equipment. The following figure shows an example of functional locations that are based on geographical locations.

Functional location based on sites



The following figure shows an example of functional locations that are based on customers.

Functional location based on customers



NOTE

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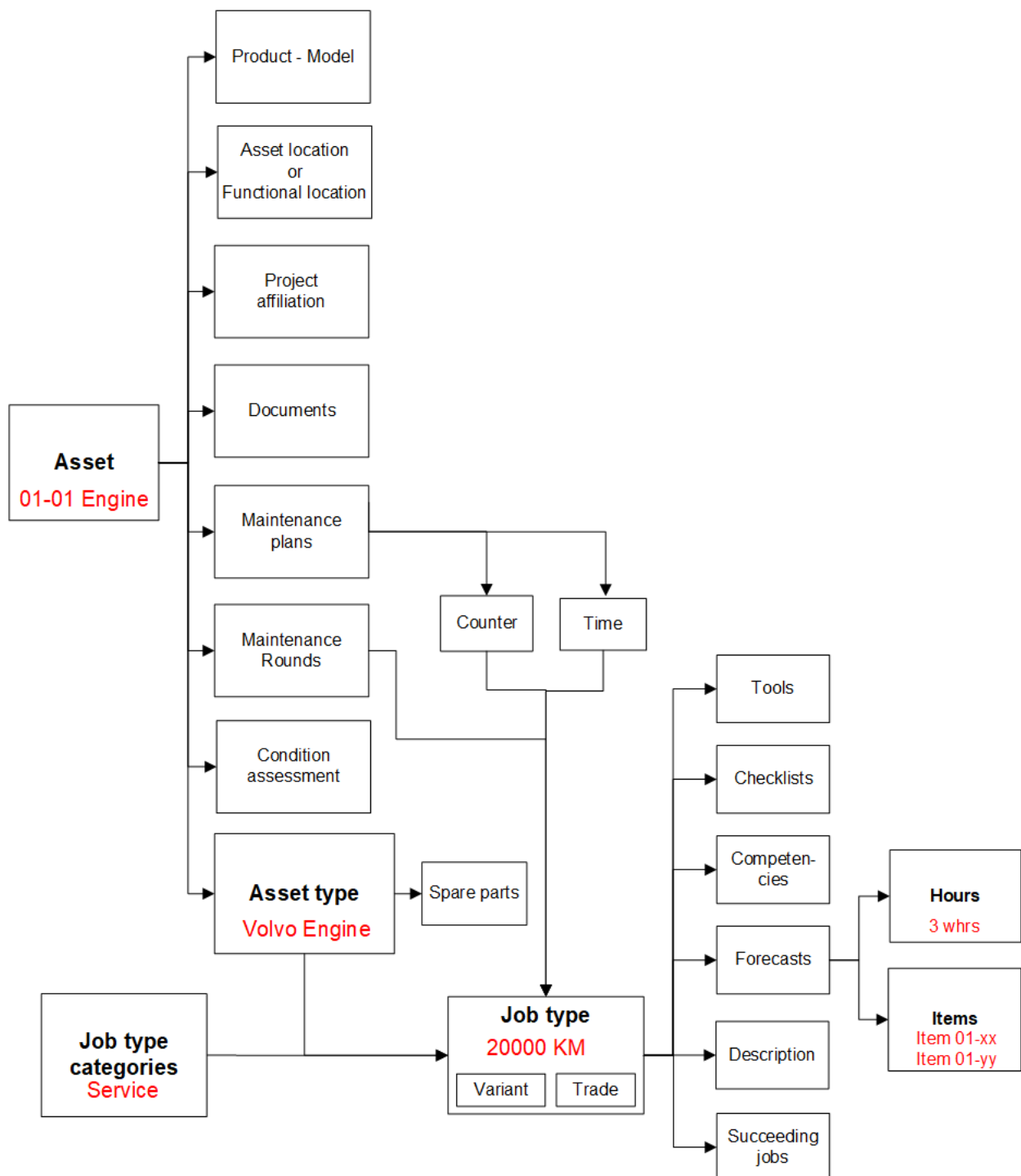
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Assets and work orders

2/18/2021 • 2 minutes to read • [Edit Online](#)

This topic describes assets and work orders in Asset Management. Assets and work orders are the central parts of Asset Management. An *asset* is a machine or machine part that requires continuous maintenance and service. Assets can be created in a hierarchical structure, and they can be related to functional locations. Maintenance jobs can be planned at all levels in the asset structure.

Various data, such as product information and asset specification, and required maintenance plans are set up on each asset. The following illustration shows an overview of asset data and the affiliation of assets to job types. Red text is used for examples that show inheritance and dependencies.

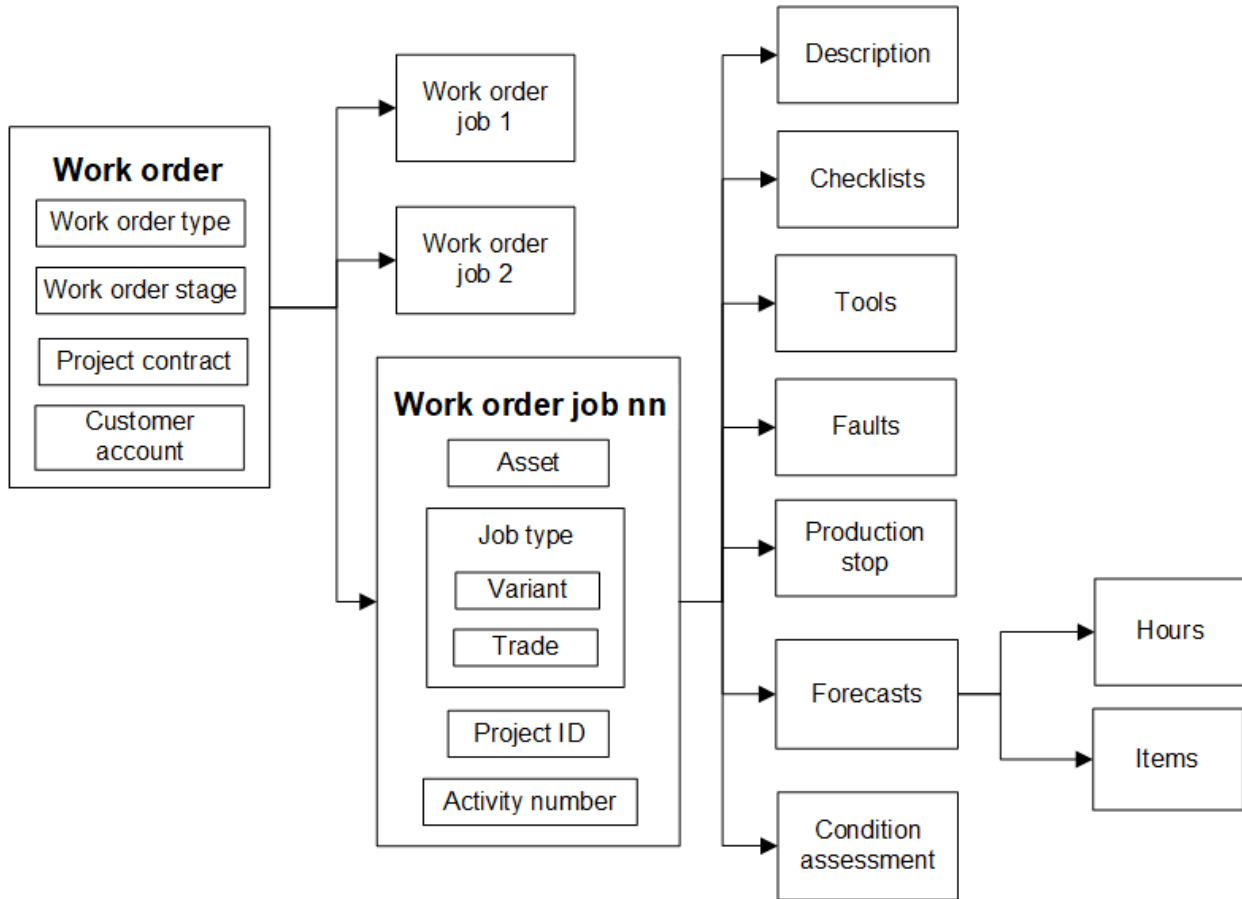


Every work order has a work order type, such preventive maintenance, corrective maintenance, or inspection.

The work order contains one or more work order jobs. Every work order job defines a job that must be performed on an asset and a related job type. Examples of related job types include 10,000 km, 50,000 km, 1-year overhaul, and safety inspection. One work order can be related to multiple assets.

The following illustration shows an overview of the key data in a work order.

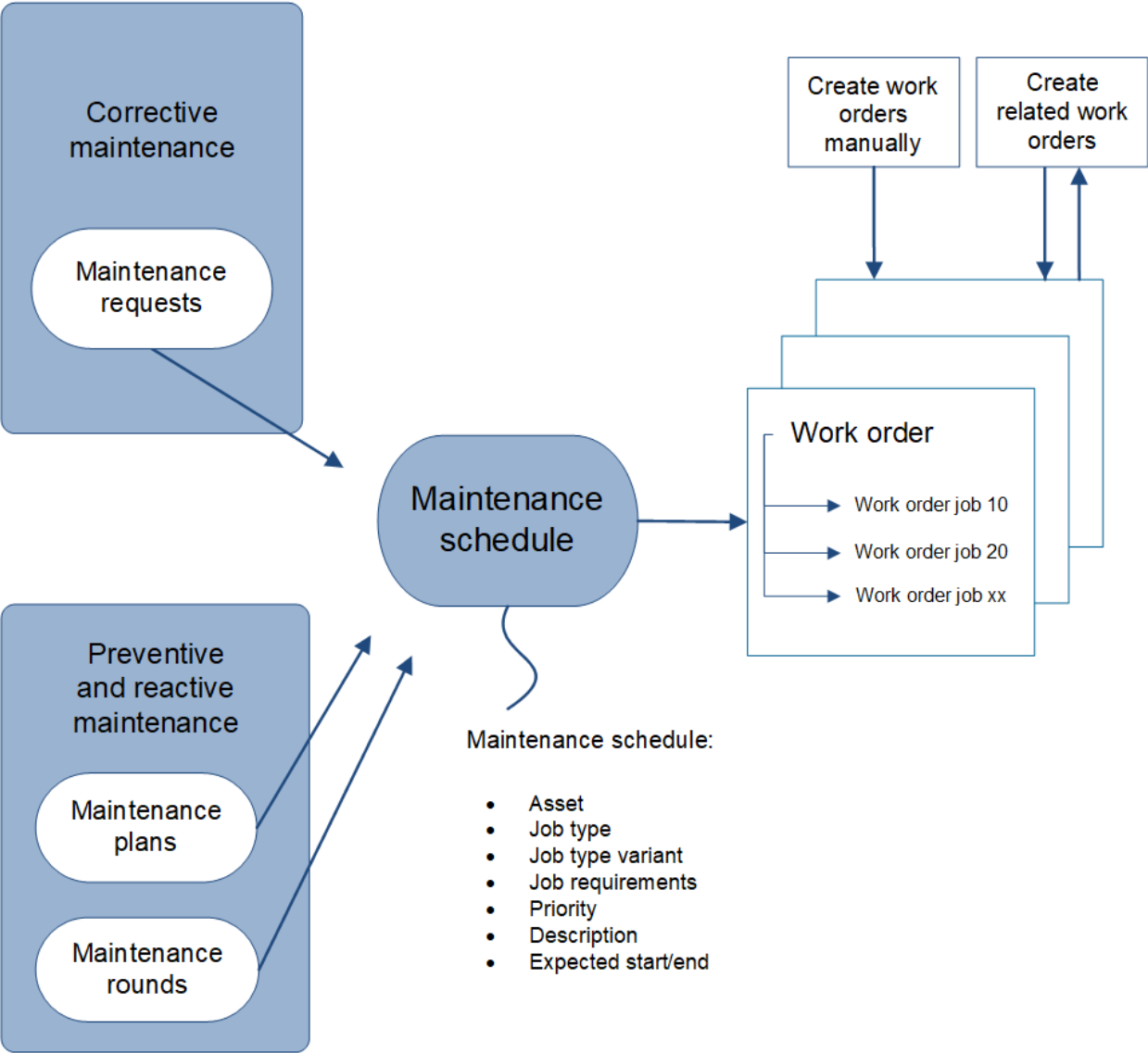
Work Order: Overview



A work order can be related to another work order, and job types can contain succeeding jobs that create a work order. In general, there are no dependencies between work orders. Therefore, they can change their work order lifecycle state and can be scheduled independently of each other.

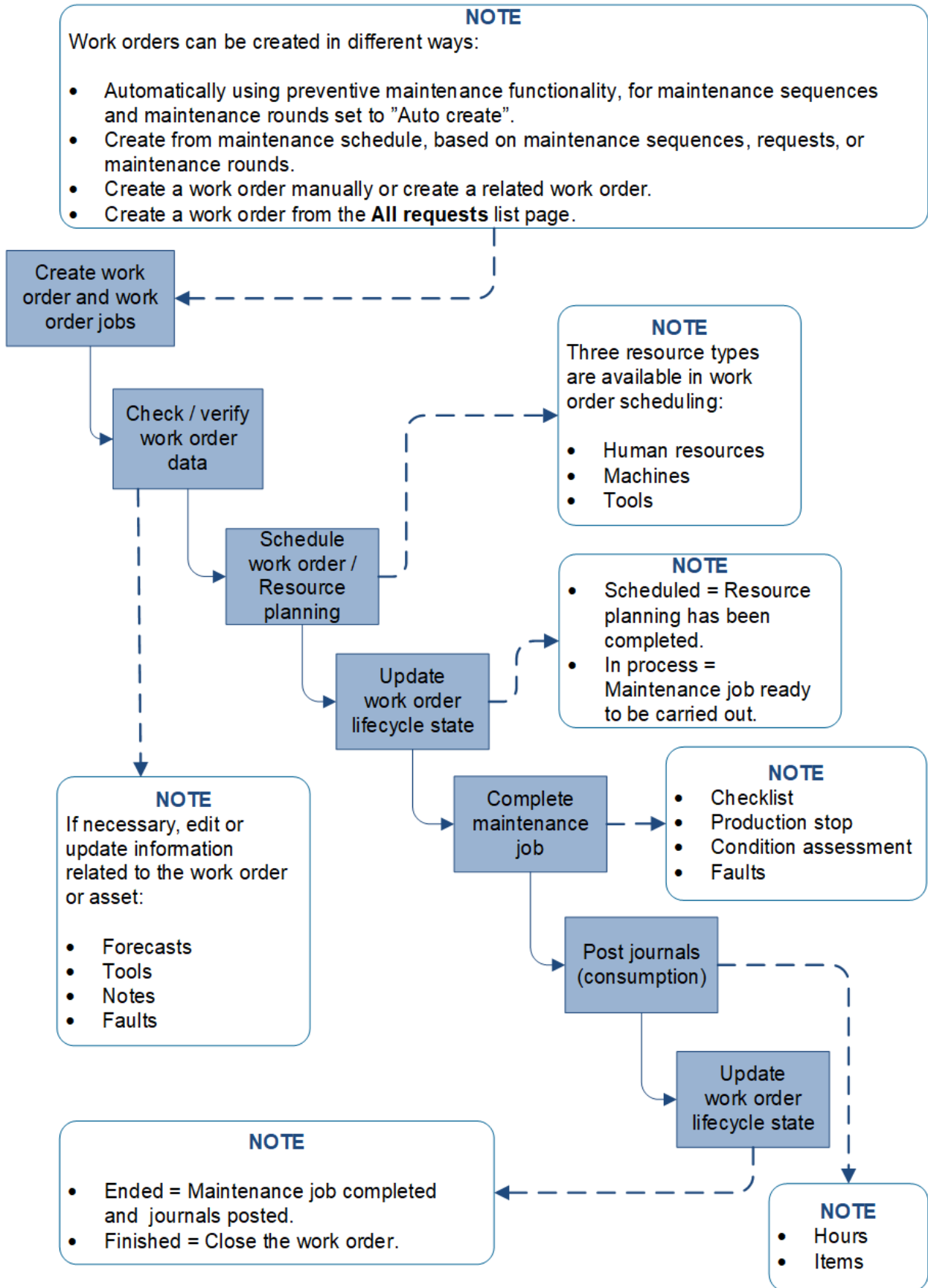
Work orders can be created in various ways that are related to corrective, preventive, or reactive maintenance. You can also create work orders manually. The following illustration shows an overview of the process for automatic or manual creation of work orders.

Process flow – Creating work orders



Several steps must be completed when you want to schedule and run a maintenance job on a work order. The following illustration shows an overview of the processing for a work order.

Work Order - Flow Diagram



NOTE

In general, when you work in Dynamics 365 Supply Chain Management and the **Asset Management** module, you select **New** to create a new record, you select **Edit** to update an existing record, and you select **Save** to save new or edited data.

NOTE

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Functional location lifecycle states

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This topic describes how to set up functional location lifecycle states and lifecycle models in Asset Management. Functional location lifecycle states define the states that a functional location can go through, for example, created, active, and ended. You are able to view all functional locations, regardless of their lifecycle state, in the **All functional locations** list page. You can change the state of a functional location by selecting it in the **All functional locations** list page and selecting **Update functional location state**.

Set up functional location lifecycle states

1. Select **Asset management > Setup > Functional locations > Lifecycle states**.
2. Select **New** to create a new functional location state.
3. Insert the state ID in the **Lifecycle state** field and a name for the functional location state in the **Name** field. In the **Lifecycle models** field, you can see the number of functional location lifecycle models that uses the functional location state.
4. On the **General** FastTab, select "Yes" on the **Active** toggle button if the functional location should be active at this state.
5. Select "Yes" on the **Create assets** toggle button if it should be possible to automatically create an asset with the same name as the functional location and install it on the functional location at this state.

NOTE

This toggle button relates to the **Asset type** field on the **General** FastTab in the **Functional location types** form (**Asset management > Setup > Functional locations > Functional location types**). 6. Select "Yes" on the **Rename location** toggle button if it should be possible to change the name of the functional location at this state. 7. Select "Yes" on the **New sub locations** toggle button if it should be possible to add new sub locations to the functional location at this state. 8. Select "Yes" on the **Install assets** toggle button if it should be possible to install assets on the functional location at this state. 9. Select "Yes" on the **Delete functional location** toggle button if it should be possible to delete the functional location at this state. 10. Select an asset state in the **Lifecycle state** field if you want the asset lifecycle state for all assets installed on the functional location to be automatically updated at this state. Example: If you close down a functional location, and set the functional location lifecycle state to "Ended", you may want to automatically change the lifecycle state of the assets installed on that functional location to "Not in use".

NOTE




Functional location lifecycle states, lifecycle models, and types are related and used in the same way as work order lifecycle states, work order lifecycle models, and work order types.

Set up functional location lifecycle models

When you have created the lifecycle states required for your functional locations, they can be divided into groups. This is done to create the lifecycle model flow that may be used for different types of functional locations. As a minimum, one standard functional location lifecycle model should be created.

1. Select **Asset management > Setup > Functional locations > Lifecycle models**.
2. Select **New** to create a new lifecycle model.
3. Insert the lifecycle model ID in the **Lifecycle model** field and a name for the lifecycle model in the **Name**

field. In the **Functional location types** and **Lifecycle states** fields, you can see the number of functional location types that uses the lifecycle model and the number of states selected in the lifecycle model.

4. On the **Lifecycle states** FastTab, select the states that should be included in the model. This is done by clicking on a state in the **Lifecycle states remaining** section and clicking the  button.
5. If you want to select all the available states for a model, click the  button. All states are transferred to the **Lifecycle states selected** section.
6. If you want to remove a selected state from the model, select the state in the **Lifecycle states selected** section and then select the  button.
7. Select **Lifecycle state updates** to define which lifecycle states can follow a selected state.

NOTE

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Maintenance attribute types

2/18/2021 • 2 minutes to read • [Edit Online](#)

This topic explains how to create attribute types in Asset Management. Attributes are used to describe the properties of various elements. You can set up attributes on the following elements:

- [Functional location types](#)
- [Create functional locations](#)
- [Asset types](#)
- Assets

The attributes that you can set up vary, depending on the element. For example, for a functional location, you can set up attributes for the configuration and physical size of the location. For an asset type or an asset, you can set up attributes for engine volume, power consumption, and maximum load capacity under different conditions.

Create attribute types

You can create your own attribute types. Additionally, you can transfer product dimensions to the **Attribute types** page.

1. Select **Asset management > Setup > Attribute types**.
2. The first time that you set up attribute types, select **Create product dimensions** to automatically transfer standard product dimensions.
3. Select **New** to create a new attribute type.
4. In the **Attribute type** field, enter a name for the attribute type.
5. In the **Description** field, enter a description.
6. In the **Unit** field, select the relevant attribute unit, as required.
7. In the **Data type** field, select a data type for the unit.
8. If you selected **String** as the data type, follow these steps to create values for the attribute type:
 - a. Select the attribute type, and then select **Values**.
 - b. In the **Attribute values** field, select **New**.
 - c. In the **Attribute type** field, select an attribute type (dimension).
 - d. In the **Value** field, enter a related value.
 - e. In the **Description** field, enter a description.
 - f. Save the record.
 - g. Return to the **Attribute types** page.
9. Save the record.

The **Functional location types** field shows the number of functional locations that are using the attribute type. The **Asset types** field shows the number of asset types that are using it.

NOTE

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Functional location types

2/18/2021 • 4 minutes to read • [Edit Online](#)

This topic describes how to create functional location types in Asset Management. Functional location types are used to manage requirements for functional locations, including how assets are installed on a functional location. You can set up asset types, maintenance plans, functional location attributes, and asset attribute requirements to be used on a functional location that uses the specific functional location type. When you create a functional location, the functional location type is mandatory.

NOTE

In order to work with functional locations, you must create a default functional location to be used only for the purpose of creating new assets. For that default functional location, you should create a default functional location type that is really simple and allows multiple assets to be installed on the default functional location. See [Create functional locations](#) for more information on how to set up functional locations.

Create a default functional location type

This procedure shows how to create a default functional location type to be used for a default functional location.

1. Select **Asset management** > **Setup** > **Functional locations** > **Functional location types**.
2. Select **New** to create a functional location type.
3. Insert a functional location type ID in the **Functional location type** field, for example, "Default", and a name in the **Name** field.
4. Select a lifecycle model in the **Functional location lifecycle model** field.
5. Select "Yes" on the **Multiple assets** toggle button to allow more assets to be installed on a functional location (the default functional location) using this type.

Now, the default functional location type to be used only on a default functional location is created. You should not add any more requirements or restrictions to this default functional location type.

Create Functional Location Types

1. Select **Asset Management** > **Setup** > **Functional locations** > **Functional location types**.
2. Select **New** to create a functional location type.
3. Insert a functional location type ID in the **Functional location type** field and a name in the **Name** field.
4. Select a lifecycle model in the **Functional location lifecycle model** field. Refer to [Functional location lifecycle states](#) for more information on functional location lifecycle states and lifecycle models.
5. Select "Yes" on the **Multiple assets** toggle button if it should be possible to install several assets on a functional location using this functional location type. If you select "No", you can only install *one* asset on a functional location using this functional location type.
6. Select "Yes" on the **Update asset dimension** toggle button if you want assets installed on a functional location of this type to automatically use the financial dimensions related to the functional location. This means that if you change financial dimensions in the [Create functional locations](#) form, and the functional location uses a functional location type with this toggle button set to "Yes", financial dimensions are automatically updated on all assets installed on that functional location.
7. The **Asset type** field is used if you want to automatically create *one* asset for the functional location with the

same ID and name as the functional location you are creating. For example, this may be relevant if you create a static functional location, such as a building or a pipeline. In that case, select the asset type you want to use for the automatically created asset. Remember that if you make a selection in this field, the **Multiple assets** toggle button must be set to "No".

8. On the **Asset types** FastTab, select the asset types to be related to the functional location type. Select **Add line** and select the asset types. If you add asset types here, only assets using those asset types can be installed on a functional location using this functional location type. If no asset types are selected on the **Asset types** FastTab, all asset types may be installed.
9. On the **Maintenance plans** FastTab, select the maintenance plans that should automatically be set up on new functional locations using this functional location type. Select **Add line** and select the maintenance plans. If you add maintenance plans here, only those plans can be used on a functional location using this functional location type.
10. On the **Asset attribute requirements** FastTab, set up the asset attributes that should automatically be set up on new functional locations using this functional location type. Select **Add line** and select the attribute. These attribute requirements function as guidelines. They are not validated against attributes set up on an asset (**Asset management > Common > Assets > All assets > select asset in the list page > General tab > Attributes** button). The attribute requirements are shown when you install assets on functional locations.
11. On the **Permitted types** FastTab, select the functional location types that should be valid for sub functional location types related to a parent functional location type, which uses the selected functional location type.
12. On the **Attributes** FastTab, select the functional location attributes that should automatically be set up on functional locations using this functional location type. Select **Add line** and select the attribute.

NOTE

On the **General** FastTab, you can get an overview of the number of asset types, maintenance plans, asset attribute requirements, permitted types, attributes, and functional locations set up on the functional location type. The **Functional locations** field shows the number of functional locations that use the functional location type. You can use the **Copy** button to copy settings from a functional location type to the selected functional location type.

NOTE

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Introduction to functional locations

2/18/2021 • 3 minutes to read • [Edit Online](#)

This topic provides an overview of functional locations in Asset Management. Functional locations are elements of a technical structure, such as the functional units in a system. Functional locations are created hierarchically, and you install assets on them. The setup of functional locations in your company depends on the company's requirements.

Here are some examples of how you can use functional locations:

- **Functional** – The functional locations can be user-oriented and used to manage assets that have similar behavior.
- **Process-related** – The functional locations can be workflow-oriented.
- **Spatial** – The functional locations can represent geographical locations or sites.

Each functional location is managed independently in Asset Management. Here are some of the useful features of functional locations:

- Set up functional location specifications.
- Set up asset specification requirements.
- Set up maintenance sequences for preventive and reactive maintenance.
- Manage installed assets.
- Track active requests and work orders that are related to installed assets.
- Track faults that are registered on assets.
- Track maintenance costs on the assets that are related to a functional location at any given time.

Functional locations provide traceability of assets in relation to requests, work orders, fault registrations, condition assessments, production stop registrations, and asset counter registrations.

NOTE

Even if an asset is installed on various functional locations during its lifetime, the costs can be related to each location. In other words, asset costs are always related to the functional location that the asset was installed on at a given time.

Functional locations are **not** flexible. Therefore, after you set up a functional location hierarchy, you can't move locations around in it.

After you create a functional location hierarchy, the next step is to install assets on it. For more information, see [Install assets on functional locations](#).

All functional locations

Select **Asset management > Common > Functional locations > All functional locations** to open the **All functional locations** list page. This page shows all functional locations and some of the information that is related to each. To view only active functional locations, select **Active functional locations**. To view only the functional locations that you're related to as a worker, select **My active functional locations**. (This relation is set up on the **Workers** page. For more information, see [Maintenance workers and worker groups](#).)

On the **All functional locations** list page, select a link in the **Functional location** column to view the details of the selected record. To edit the functional location, select the **Edit** button. The details view shows detailed

information that is related to the location. It also includes a **Related information** pane on the right. This pane shows the functional location hierarchy. You can expand and collapse the **Related information** pane.

The buttons on the Action Pane are organized on tabs. The following table briefly describes the buttons that are related to Asset Management.

BUTTON NAME	DESCRIPTION
Edit	Switch between edit mode and view mode for the page.
New	Create a new functional location.
Delete	Delete the selected functional location.
Rename	Rename the selected functional location.
Copy functional location structure	Copy the functional location hierarchy.
Install asset	Install an asset, including child assets, on the functional location.
Replace asset	Replace the asset hierarchy with another asset hierarchy on the functional location.
Cost control	Open the Functional location cost control page, where you can do a cost calculation for the selected functional location.
Hour control	Open the Functional location hour control page, where you can do a cost calculation for the selected functional location.
Assets	Open the All assets page, where you can view a list of assets that are related to the selected functional location.
Requests	Open the Active requests page, where you can view a list of requests that are related to the selected functional location.
Work orders	Open the Active work orders page, where you can view a list of work orders that are related to the selected functional location.
Faults	Open the Asset faults page, where you can view a list of asset fault registrations that are related to the selected functional location.
Update functional location state	Update the stage of the selected functional location.
Lifecycle state log	View a log that shows the stages of the selected functional location.

NOTE

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Create functional locations

2/18/2021 • 7 minutes to read • [Edit Online](#)

This topic explains how to create a functional location in Asset Management.

When you create a functional location structure, be aware once you have created a functional location, you cannot move it from the original location. This means that you should carefully consider the structure of your functional locations before you start creating them in Asset Management. If you regret a functional location, you can delete it, provided that it has not yet been taken into use.

To be able to work with functional locations, you start by creating two "categories" of functional locations:

- Create *one* default functional location with not sub locations. This functional location is used only as the standard location for assets when you create new assets.
- Create the functional location structures required for managing maintenance jobs in your company.

Create a default functional location

When you use functional locations, start by creating one default location to be used when you create new assets. This functional location is the one you select in **Asset management > Setup > Asset management parameters > Assets link > Default functional location** field. The default functional location can be used when you create new assets, and you have not yet set up a functional location structure for those assets.

1. Select **Asset management > Common > Functional locations > All Functional locations**.
2. In **All functional locations**, select **New**.
3. Insert an ID in the **Functional location** field, for example, "0000" or "Default", to indicate that this is a special functional location.
4. Insert name for the default functional location in the **Name** field.
5. Do *not* select a parent in the **Parent** field – leave this field blank.
6. In the **Functional location type** field, select the functional location type to be used for the default functional location. See [Functional location types](#) for more information on how to set up functional location types.
7. Select **OK**. You should not add further data to this functional location as it is only used as a temporary location for new assets until you install the assets on the functional locations used by your company.

Create functional locations

The following procedure describes how you create the functional locations required for maintenance management in your company.

1. Select **Asset management > Common > Functional locations > All Functional locations**. You can create a functional location from grid view or details view.
2. Select the **New** button.
3. Insert an ID in the **Functional location** field.
4. Insert a name for the functional location in the **Name** field.
5. If the functional location is a sub location in a structure, select the parent location in the **Parent** field.
6. Select a type in the **Functional location type** field.
7. Select **OK**.
8. Select the functional location and click the **Edit** button to add further information.

NOTE

Depending on your setup of functional location lifecycle states, you may have to create all sub locations for a functional location, and then change the functional location lifecycle state before you can start installing assets. See [Install assets on functional locations](#) for more information on asset installation. See [Functional location lifecycle states](#) to learn more about setup of functional location lifecycle states.

In Details view, you will see FastTabs on which you can add and edit information about the functional location.

General Information

This section provides an overview of parent and child information in the functional location structure. In the **Details** section, you can see the number of asset attributes, maintenance plans, and assets related to the functional location. In the **Inventory** section, you can select the site and warehouse to which the functional location is related. Site and warehouse is used in connection with work order item forecasts. When creating an item forecast, site and warehouse information from the functional location of the asset is automatically used. In the **Lifecycle state** section, information about the functional location lifecycle state is displayed.

Installed assets

Refer to [Install assets on functional locations](#) for more information on asset installation. You can use the **View** button on this FastTab to show more fields on the FastTab. The **Valid from** and **Sub asset** fields can be shown in the grid.

Asset attribute requirements

On this FastTab you can add specific attribute requirements for the assets that you install on the functional location. These requirements are for information purposes only. They do not prevent you from installing assets with other attribute requirements. Select **Add line** and select the attribute type. Then you insert the relevant **Value**, select a threshold in the **Threshold criteria** field and save the record.

Maintenance plans and Maintenance rounds

Here you can add maintenance plans and maintenance rounds to the functional location, including a start date. The assets installed on a functional location may have other maintenance plans set up. All maintenance plans and maintenance rounds can be used for scheduling asset calendar entries for a functional location and its currently installed assets.

NOTE

If you update the setup of asset types, asset brands, and asset models on maintenance plans in **All functional locations** detail view > **Maintenance plans** FastTab after you have scheduled maintenance plans, existing maintenance schedule entries related to that functional location are automatically deleted. In order to create new schedule entries, which correspond with the updated maintenance plan setup on the functional location, you must run a new maintenance plan schedule for that functional location.

Address

Insert the functional location address on the **Address** FastTab. Addresses on functional locations are inherited, meaning if a sub location has no address defined, the address of the parent location is used.

Workers

On this FastTab, you can add workers affiliated with the functional location, and you can select a functional location as primary for the worker.

Attributes

On this FastTab, you can set values for functional location attributes. These attributes can be used to describe properties or characteristics pertinent to the functional location, for example, structural properties, building type, area descriptions, or location above or under ground.

Select **Add line** and select the attribute type. Next, insert the **Value** related to the attribute type and save the record.

Financial dimensions

You can select financial dimensions for the functional location. [Functional location types](#) can be set up to allow for automatic update of financial dimensions from a functional location. This means that assets installed on a financial dimension automatically get the financial dimensions for the functional location. This is useful if you want different cost centers, depending on locations.

When data regarding **Site, Warehouse, Address, and Financial dimensions** are updated on a parent functional location, the related sub functional locations can be updated accordingly if you make that selection during the update. A dialog opens, providing you with the update options.

Copy a functional location structure

If your company has several functional locations with similar location structures, you can use the copy function in Asset Management to quickly create a number of similar location hierarchies. When you copy a specific functional location or an entire structure, the new location or structure has the same name as the one you copied. After the copy procedure is done, you can easily change the name or other settings on the new functional location, provided that the functional location lifecycle state selected for the new functional location allows it.

1. In **All functional locations**, select the functional location you want to copy. For example, you select a top location (parent) if you want to copy the entire functional location structure including sub locations.
2. Select the **Copy functional location structure** button. The location you selected in the list page is shown in the **Copy from** field.
3. Insert the name of the new location in the **New functional location** field.
4. In the **Parent to paste under** field, you should only insert a parent ID if the location you are creating should be part of an existing functional location structure.
5. Click **OK**. The new functional location structure is shown in **All functional locations**.

NOTE

When you copy a functional location structure, functional location lifecycle states in the new structure are set to the "first state" that you have created for functional locations. Whether you can rename or delete a functional location using the **Rename** and **Delete** buttons in **All functional locations**, depends on the current lifecycle state of the functional location.

Delete a Functional Location

A functional location with related sub locations can be deleted if no assets have been installed on any of the functional locations you are trying to delete, and if the current functional location lifecycle state allows it.

1. In **All functional locations**, select the functional location you want to delete.

2. If required, update the functional location to a functional location lifecycle state that allows deletion of a functional location.
3. Select **Delete**.

NOTE

If you cannot delete a functional location, instead you can handle deletion by setting up a functional location lifecycle state for this purpose. For example, you can set up a "Scrapped" or "Deleted" stage, which should not be an active stage, in the **Functional location lifecycle states** form.

NOTE

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Install assets on functional locations

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After you've created functional location structures, the next step is to install assets on the relevant functional locations. This topic explains how to install assets on those functional locations in Asset Management. For information about how to create assets, see [Introduction to assets](#).

If you've created an asset structure, the whole asset structure must be installed on a functional location. Therefore, only parent assets (top-level assets that have no parent asset) can be selected on a functional location. All related child assets (sub-assets) will also be installed on the functional location. When you install assets on a functional location, the financial dimensions of the functional location might be automatically transferred to them, depending on the setup on the functional location type that is selected for the functional location. For more information about how to set up functional location types, see [Functional location types](#).

NOTE

You can set up asset types on the functional location type that is used for a functional location. In this case, when you install assets on the functional location, only parent assets that have the same asset type are shown in the list of assets that can be installed on the functional location.

After you've installed assets on a functional location, you can replace a parent asset or an asset structure as you require. As when you install assets, you select a parent asset to replace. All related child assets will also be replaced.

Install an asset structure on a functional location

1. Select **Asset management** > **Common** > **Functional locations** > **All Functional locations** or **Active functional locations**.
2. Select the functional location to install an asset on.
3. Select **Install asset**.

The **Attributes** section shows a list of the asset attribute requirements that are set up on the functional location type that is selected for the functional location. The attributes are for informational purposes only. The system doesn't validate the attributes against the asset attributes that are set up on the asset that you're installing. You must do that validation after you select an asset in the **Asset** field.

4. In the **Asset** field, select the parent asset to install. All related child assets are automatically included in the installation.

The **Asset attributes** section to the right of the asset list shows the asset attributes that are related to the selected asset.

5. In the **Effective** field, select the date and time that the asset installation is valid from. After that date and time, costs for the asset and related sub-assets will be related to the functional location.

NOTE

The asset attributes that are set up on the asset are added to the **Attributes** section. For example, the **Weight** attribute requirement has been added as a requirement on both the asset and the functional location. If the asset has attribute requirements of the same type as the functional location, the values of the asset's attribute requirements are entered in the **Value** fields. Therefore, you can validate the asset values against the attribute requirements that are set up on the functional location. The attribute requirements that are set up on the functional location are marked with a check mark.

6. Select OK.

NOTE

To change the installation of an asset by installing it on a new functional location, follow steps 1 through 6 of this procedure. When you install an asset on a new functional location, the asset is automatically uninstalled from the previous functional location. Any active maintenance requests or work orders that were created on the asset before you installed it on a new functional location are **not** automatically transferred to the new functional location. If those maintenance requests and work orders are still required for the asset, you must manually re-create them after the asset is installed on the new location.

7. To view a list of all the assets, including sub-assets, that are installed on the functional location, select the functional location on the **All Functional locations** page, and then select **Assets**.
8. To view a list of active maintenance requests, active work orders, or fault registrations that are related to the assets that are installed on a functional location, select the functional location on the **All Functional locations** page, and then select **Requests**, **Work orders**, or **Faults**.

NOTE

When asset-related data is changed, it's automatically updated on the functional location that the asset is installed on. This automatic update pertains to changes to maintenance requests, work orders, asset fault registrations, maintenance downtime registrations, and asset measure registrations.

Automatically create one asset on a functional location

You can set up functional location stages and functional location types to handle the automatic creation of *one* asset on a functional location. The asset gets the same ID and name as the functional location. This functionality might be useful when you're handling maintenance on a large, static asset, such as a building.

Before you can automatically create an asset on a functional location, the following setup data must be available:

- Create a functional location type to handle the automatic creation of an asset. In the **Asset type** field, select an asset type. For more information, see [Functional location types](#).
- Create a functional location lifecycle state to handle the automatic creation of an asset. Set the **Create asset** option to **Yes**. For more information, see [Functional location lifecycle states](#).

After the setup data is available, you're ready to create an asset.

1. On the **All Functional locations** page, make sure that the functional location where you want the asset to be automatically created uses the functional location type that you created for this purpose.
2. Select the functional location in the list.
3. Select **Update functional location state**, and then select the lifecycle state that you created for this purpose. One asset is now automatically installed on the functional location. This asset has the same name as the functional location.

NOTE

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Asset types




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This topic explains how to create asset types. It also describes the elements that are related to asset types. Asset types are used as general categories for assets. Examples include CNC machines, measuring equipment, and truck engines. Asset types are used to manage the maintenance job types (maintenance tasks), asset lifecycle states, counters, asset attributes, condition assessment templates, and asset models that can be selected for an asset. When you create an asset, you must specify the asset type.

For each asset type, variations of the asset type setup can be created. For example, if you have an asset type that is named **Trucks**, you can create variations of that asset type for different asset manufacturers and asset models. To each asset type setup, you can add the required spare parts and maintenance plans.

First, you set up the required asset types. Next, you create the asset models that should be related to the asset types. Finally, on the **Asset type defaults** page, you create all the variations of asset types that are required for your equipment.

Create an asset type

1. Select **Asset management > Setup > Asset types > Asset types**.
2. Select **New** to create an asset type.
3. In the **Asset type** field, enter an asset type ID.
4. In the **Name** field, enter a name.
5. In the **Asset lifecycle model** field, select an asset lifecycle model. For more information about asset lifecycle states and asset lifecycle models, see [Asset lifecycle states](#).
6. Set the **Total** option to **Yes** if summarized key performance indicator (KPI) values should be calculated for assets that have this asset type.
7. Select **Save**.
8. On the **Maintenance job types** FastTab, select the maintenance job types that should be related to the asset type:
 - To select a maintenance job type, select it in the **Maintenance job types remaining** field, and then select the right arrow button  to move it to the **Maintenance job types selected** section.
 - To select all available maintenance job types, select the  button. All maintenance job types are transferred from the **Maintenance job types remaining** field to the **Maintenance job types selected** field.
 - To cancel the selection of a maintenance job type, select it in the **Maintenance job types selected** field, and then select the left arrow button  to move it to the **Maintenance job types remaining** field.
9. You can also select the counters that should be related to the asset type. On the **Counters** FastTab, make your selections by using the methods that are described for maintenance job types in step 8. For more information about the setup of counters, see [Counters](#).
10. You can also select the attribute types that should be related to the asset type. On the **Attribute types** FastTab, make your selections by using the methods that are described for maintenance job types in step

8. Then, to create the preferred sequence of attribute types, select an attribute type in the **Attribute types selected** field, and use the up arrow and down arrow buttons to move it. The sequence of attribute types will be shown on assets that use this asset type. For more information about asset attributes, see [Maintenance attribute types](#).

NOTE

When you add new attribute types on the **Attribute types** FastTab, existing assets are automatically updated with that information.

11. You can also select the condition assessment templates that should be related to the asset type. On the **Condition assessments** FastTab, make your selections by using the methods that are described for maintenance job types in step 8. For more information about condition assessment templates and registrations, see [Condition assessment](#).
12. The **Asset model** FastTab shows all the combinations of asset manufacturers and models that are set up on the selected asset type. To see the combinations divided according to manufacturer, select **Asset model** to open the **Asset model** page.

On the **Asset model** page, you can add asset model–asset type relations. Additionally, on the **Asset types** page, you can add asset manufacturer–asset model relations directly to an asset type. Finally, on the **Asset model** page (**Asset management > Setup > Assets > Asset model**), you can create new asset manufacturer–asset model–asset type relations. Therefore, there are three ways to set up and edit asset manufacturer–asset model–asset type relations. All the available combinations are shown from different perspectives, and you can select your preferred point of entry when you work with the setup.

NOTE

- If you select counters on an asset type, the selections are automatically updated on the **Counters** page (**Asset management > Setup > Assets > Asset types > Counters**).
- The fields in the **Details** section on the **General** FastTab show the number of maintenance job types, counters, attributes, and so on, that are set up on the selected asset type.

Typically, work orders that are manually created are related to corrective maintenance, whereas work orders that are automatically created are related to preventive maintenance. When you manually create work orders, only the maintenance job types that are selected on the **maintenance job types** FastTab of the **Asset types** page can be used. However, automatically created work orders can use all the maintenance job types you create on the **Maintenance job types** page (**Asset management > Setup > Jobs > Maintenance job types**).

Create asset type setup lines

1. Select **Asset management > Setup > Assets > Asset types > Asset type setup**. Alternatively, select **Asset management > Setup > Assets > Asset types > Asset types**, select an asset type, and then select **Asset type setup**.
2. The first time that you use the **Asset type setup** page, you might find the **Create combinations** button useful. You can use this button to quickly create all combinations of an asset model on an asset type. Select **Create combinations**, select the asset type to create combinations for, and then select **OK**.

NOTE

If you won't use all the asset type setup combinations that were automatically created, you can delete a setup by selecting it and then selecting **Delete**.

3. Select **New** to manually create an asset type setup.
4. Depending on how specific the asset type setup should be, make selections in the **Asset type**, **Manufacturer**, and **Model** fields.
5. If a warranty agreement is related to the asset type, select the agreement in the **Vendor warranty** and **Customer warranty** fields.
6. On the **Spare parts** FastTab, select **Add** to add spare parts to the selected asset type setup.
7. To approve a spare part, select the spare part line, and then select **Approve**. You can select multiple lines for approval.
8. To see whether a spare part is used somewhere else in Asset Management (for example, in relation to assets and work orders), select the spare part line, and then select **Item where used** to open the **Item where used** page. To see all active spare parts in the list, select the **Active** check box. To see only approved spare parts, select the **Approved** check box.
9. On the **Maintenance plans** FastTab, select **Add** to add maintenance plans to the selected asset type setup.
10. To copy an asset type setup to another setup, you can use the Copy function. Select the asset type setup to copy a setup to, select **Copy setup**, and select the asset type setup to copy the setup from. The settings of the various options determine how much information is included. When you've finished, select **OK** to copy the setup.

NOTE

If you have many spare part lines and maintenance plan lines that you will reuse, the Copy function lets you quickly and easily set up data for many asset type setup combinations.

Spare parts on the asset type setup

As was described in the "Create asset type setup lines" section, spare parts are set up on asset models on the **Asset type setup** page. Therefore, when you open the **Asset type setup** page, you see only the spare parts that are related to the selected combination of an asset type, asset manufacturer, and asset model. To see a list of all spare part records, open the **Spare parts** page (**Asset management** > **Inquiries** > **Spare parts**).

On the **Spare parts** page, you can also create new spare parts for existing combinations of an asset type, asset manufacturer, and asset model. You can decide whether you prefer to create spare part records on the **Asset type setup** page or the **Spare parts** page. The **Asset type setup** page provides an overview of data on the selected combination of an asset type, asset manufacturer, and asset model, whereas the **Spare parts** page provides a complete overview of all asset type setup lines. If the **Spare parts** page contains many records, the **Asset type setup** page might give you a better overview.

To see whether the spare part on the selected line is used anywhere else in Asset Management (for example, in relation to assets and work orders), select **Item where used** to open **Item where used** page.

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Condition assessment

2/18/2021 • 3 minutes to read • [Edit Online](#)

This topic explains how to create a condition assessment template and registration on an asset in Asset Management. Condition assessment is performed at regular intervals, and the primary objective is to create and maintain condition data on assets. Seen from a preventive maintenance perspective, it is important to monitor key information such as current condition, and remaining life span. Furthermore, if you carry out condition assessment at regular intervals, you will be able to monitor and compare conditions on the machinery in your factory.

Condition assessment can be used to measure and monitor many conditions on your equipment. Example: You could measure vibrations on your machinery. After you have registered vibration measurements in Asset Management on various types of equipment, you can search for the latest registered assessment and view vibration measurements.

Condition assessment is created on assets. You set up a condition assessment template on an asset type before you carry out the condition assessment procedure. The reason for using templates for condition assessment is to avoid variation of condition data on similar assets. The sequence for setting up and using condition assessment in Asset Management is: First you set up the required condition assessment templates. Next, you associate templates with asset types in the **Asset types** form. Finally, you can create condition assessment registrations on an asset in the **Asset** form.

Create a condition assessment template

1. Select **Asset management > Setup > Asset types > Condition assessment**.
2. Select **New** to create a new template.
3. Insert an ID for the template in the **Template** field.
4. Insert a name for the template in the **Name** field.
5. On the **Condition assessment lines** FastTab, add the lines required for the condition assessment, including selection of the appropriate condition type and measurement unit.
6. On the **Asset types** FastTab, add the asset types that should use the condition assessment template.
7. In the **Lines** and **Asset types** fields in the **Details** group at the top of the screen, you will see the number of assessment lines and asset types related to the selected condition assessment template.

Create condition assessment registration on an asset

1. Select **Asset management > Common > Assets > All Assets**.
2. In the list, select the asset for which you want to create a condition assessment registration.
3. On the **General** tab, click **Condition assessment**.
4. Click **New** to make a new registration.
5. Select the date for the condition assessment in the **Date** field.
6. Select the name of the worker who carried out the assessment registration in the **Worker** field.
7. In the **Lines** field, you see the number of assessment lines set up on the condition assessment.
8. Select a template for the condition assessment in the **Template** field. The name of the template is automatically inserted in the **Name** field, and the related registration lines are inserted on the **Condition assessment lines** FastTab.
9. You can insert notes relating to the selected condition assessment on the **Notes** FastTab.
10. For each condition assessment line, insert measurement data in the **Value** field.

11. You can insert a comment relating to the selected registration line on the **Condition assessment lines** FastTab > **Comments** field. If you add a comment on a line, the **Comment** check box is automatically selected.

After you have made a condition assessment registration on an asset, you can print a condition assessment report.

NOTE

You can also register condition assessment on a work order (**Asset management > Common > Work orders > All Work orders > Condition assessment** button.)

NOTE

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Asset manufacturers and models

2/18/2021 • 2 minutes to read • [Edit Online](#)

This topic explains how to set up asset manufacturers and related models in Asset Management. Models can be related to asset types.

Set up product-model relations

1. Select **Asset management > Setup > Assets > Manufacturer and model**.
2. Select **New** to create a new product.
3. In the **Manufacturer** field, enter a name for the asset manufacturer.
4. In the **Description** field, enter a description.
5. On the **Models** FastTab, select **Add** to create an asset model that should be related to the asset manufacturer.
6. In the **Model** field, enter a name for the asset model.
7. In the **Description** field, enter a description.
8. In the **Asset type** field, select the asset type that the manufacturer model should be related to.

NOTE

You can also set up relations for asset types, manufacturers, and models in the **Asset types** lookup. For more information, see [Asset types](#).

In the **Details** FastTab, the **Models** field shows the number of asset models that are set up on the selected asset manufacturer. The **Assets** field shows the number of assets that are using the selected manufacturer.

The **Assets** field shows the number of objects that are using the manufacturer model.

NOTE

An asset type can have no asset manufacturer model relations, it can be related to one asset manufacturer model, or it can be related multiple asset manufacturer models. If an asset type is related to at least one manufacturer model, only the combinations that are set up in the **Manufacturer model** lookup can be selected on those Asset Management pages where a combination of an asset type, manufacturer, and model can be set up. These pages include **All assets**, **Asset service levels**, **Job type defaults**, and **Maintenance budget lines**. If some asset types aren't related to any manufacturer model, only those asset types, and manufacturer models that also have no relation to asset types, are shown on the pages.

Select a manufacturer and model on an object

1. Select **Asset management > Common > Assets > All assets**.
2. In the **Asset** column, select the link for the asset. The **Details** page appears.
3. Select **Edit**.
4. On the **General** FastTab, select values in the **Manufacturer** and **Model** fields.

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Counters

2/18/2021 • 3 minutes to read • [Edit Online](#)

The topic explains how to create counter types in Asset Management. Counter types are used to make counter registrations on assets, for example, regarding number of production hours, or quantity produced on the asset. Asset types are related to the counter types. This means that a counter can only be used on an asset if the counter is set up on the asset type used on the asset.

Before you can make counter registrations on assets, you first create the counter types you want to use in **Counters**. Next, you can create counter registrations on assets in **Counters**.

Counters can be used on maintenance plans. A maintenance plan line can be of type "Counter", for example, relating to number of production hours or quantity produced.

A counter registration can be updated manually or automatically based on production hours or quantity produced. A counter can be set up to use one of three update methods (selected in the **Update** field in **Counters**):

- Manual - you must manually register counter values.
- Production hours - the counter is automatically updated based on number of production hours.
- Production quantity - the counter is automatically updated based on number of quantity produced.

NOTE

If quantity produced is used, *all* registered items are included in the counter registration, good quantity as well as error quantity. It is always possible to make manual counter registrations, if required.

Create counter types for asset counter registrations

1. Select **Asset management > Setup > Asset types > Counters**.
2. Select **New** to create a new counter type.
3. Insert an ID in the **Counter** field, and a counter name in the **Name** field.
4. On the **General** FastTab, select a counter unit in the **Unit** field.
5. In the **Update** field, select the update method to be used for the counter.
6. Select "Yes" on the **Inherit counter values** toggle button if child assets in an asset structure should automatically inherit counter registrations made on the parent asset.
7. In the **Total aggregate** field, select the summation method to be used for a counter using this counter type. "Sum" is the standard selection used to continuously add registered values to the total value. "Average" can be used if a counter is set up to monitor a threshold, for example, regarding temperature, vibrations, or wear and tear on an asset.
8. In the **Deviation over** field, insert the upper level in percent for validating if manual counter registrations are within an expected range. The validation is based on a linear increase in existing counter registrations.
9. In the **Deviation under** field, insert the lower level in percent for validating if manual counter registrations are within an expected range. The validation is based on a linear decrease in existing counter registrations.
10. In the **Type** field, select the type of message (information, warning, error) to be shown if deviations outside the defined range occur when you make manual counter registrations.
11. On the **Asset types** FastTab, add the asset types that should be able to use the counter.
12. On the **Related asset counters** FastTab, add the counter that you want to be automatically updated when

this counter is updated.

NOTE

A related counter is automatically updated only if the related counter has the asset type, to which it is related, in the counter setup. For example: You set up a counter for "Production hours" and add the asset type "Truck Engine". When that counter is updated, a related counter "Oil" is also updated with the same counter values. The setup in **Counters** includes the setup on "Hours". Also, on the "Oil" counter, the asset type "Truck Engine" should be added to the **Asset types** FastTab to ensure the counter relation. See the screenshots below for an example of the setup on the Hours and Oil counters.

When asset types are added to a counter type in **Counters**, that counter is automatically added to the asset types on the **Counters** FastTab in **Asset types**.

The screenshot displays the Dynamics 365 Finance and Operations interface. The top navigation bar shows 'Finance and Operations' and a search bar. The left sidebar contains a list of counter types: Celsius (Temperature - °C), Fahrenheit (Temperature - °F), Hertz (Frequency - Hertz), Kelvin (Temperature - °K), Kilohertz (Frequency - Kilo hertz), Kilometers (Length - Kilometers), Miles (Length - Miles), ProdCl (Production liquid volume centiliter), and ProdCm (Production length centimeter). The main area shows the 'Celsius' counter setup. The 'General' tab is active, displaying the following information:

Counter	Name	Asset types
Celsius	Temperature - °C	2

The 'General' tab includes the following sections:

- SETUP**: Unit (°C), Update (Manual), Inherit asset counter values (Yes), Total aggregate (Average).
- VALIDATION**: Deviation over (0.00), Deviation under (0.00), Type (Information).
- Asset types**: A list of asset types with 'Car Engine' and 'Truck Engine' selected.

NOTE

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Asset Management parameters

2/18/2021 • 11 minutes to read • [Edit Online](#)

In Asset Management, general parameters relating to assets, work orders, and work order scheduling must be set up. This topic explains how to set them up. Select **Asset management > Setup > Asset management parameters** to open the page.

NOTE

If you'd like to set up a system that includes demo data for testing Asset Management features, see [Deploy a demo environment](#) for instructions.

The Assets tab

The **Assets** tab provides the following settings:

- **Default functional location** is the standard functional location, which is automatically selected on assets when you create new assets.
- In the **Standard calendar** field, select a calendar to be used for calculating asset KPIs if no resource is selected on an asset.
- In the **View** field, select the standard view that is shown when you open **Asset view (Asset management > Common > Assets > Asset view)**.
- **Default request type** is the standard maintenance request type, which is automatically selected when you create a new request.
- Forecasts on job types are stored on the project selected in the **Forecast project** field. For each job type, a new activity is automatically created on the forecast project. Forecasts on the job type are then saved on the forecast project.
- In the **Model** field, select the forecast model used on job type and work order forecasts.

The Work orders tab

The **Work orders** tab provides the following settings:

- **Default work order type** defines standard settings when creating a work order.
- **Preventive work order type** defines the work order type used when creating work orders from maintenance plans. If this field is left blank, the work order type in the **Default work order type** field is used.
- In the **Related work order mask** field, you define the maximum number of work orders that can be related to a work order. For example, **##** allows you to have up to 99 work orders related. If you define a mask as described here, related work orders will be numbered [work order ID of the work order to which a work order is related] -01, -02, -03, and so on. If you do not define a mask in this field, a related work order will get the next sequential work order ID.
- Select **Yes** for **Copy faults** if you want to automatically copy faults registered on work orders to related maintenance requests.
- In the **Level** field, you define the functional location level that is automatically inserted on a work order if all related work order jobs refer to the same functional location. If the work order jobs do not all relate to the same functional location on the defined level, the **Functional location** field is left blank on the work order. For example, if you insert the number "1" in this field, that is the top level in a functional location structure. If

you insert the number "0" in this field, you have not defined a specific functional location level, only that all work order jobs on a work order must be related to the same functional location for that functional location to be added to the work order.

- Journals used when posting consumption on a work order can be selected on the **General** FastTab in the **Hour**, **Item**, and **Expense** fields.
- In the **Product language source** field, select which language to use for product names in Asset management reports. You can select the language set up on the company account, or the language set up for the user currently logged in.
- Select **Yes** for **Real time update** if you want to automatically update changes to job type defaults, maintenance plans, and maintenance rounds.
 - If you select **No**, changes to job type defaults, maintenance plans, and maintenance rounds are not updated automatically in Asset Management.
 - Select **No** if you have large amounts of data being synchronized, for example, many assets or functional locations set up on maintenance plans or maintenance rounds, or a large number of maintenance plans or rounds.
 - If you make changes to job type defaults or maintenance plans or maintenance rounds, and you have selected **No** to real time update, a warning may not be shown if the changes influence:
 - Functional locations set up on maintenance plans or rounds
 - Objects set up on maintenance plans or rounds
 - Maintenance plans setup
 - Maintenance rounds setup
- On the **Category** FastTab, default categories relating to consumption on work orders can be defined.

The Work order scheduling tab

The **Work order scheduling** tab provides the following settings on the **General** FastTab:

- **Schedule time fence** defines period in days, calculated from the expected start date of the work order, during which work order jobs are planned.
- The **Master plan** relates to resources in the **Organization administration** module. If you select a master plan in this field, you will be able to see capacity reservations related to work orders in **Capacity reservations** (**Organization administration** > **Resources** > **Resources** > select resource > **Resource** tab > **Capacity reservations** button). If you leave this field blank, you will be able to see capacity load related to work orders in **Capacity load** (**Organization administration** > **Resources** > **Resources** > select resource > **Resource** tab > **Capacity load** button).

NOTE

The selection regarding using a master plan in the **Asset management** module, and the related form used to get an overview of capacity reservations or capacity load is the standard setup. Depending on your setup in the **Master plan** field, you will be able to access capacity information in either **Capacity reservations** or **Capacity load** in the **Organization administration** module. It is not possible to create a setup in which capacity reservations are shown in both views.

The fields described in the following list all relate to calculated rating scores, which are used to calculate work order priority during work order scheduling.

- **Priority** - A rating score calculated together with the rating score in the **Criticality** and **Start date** fields. The number in this field is divided by the number in the **Priority** field on a work order. For example, if the value "5.00" is inserted in this field, and a work order has priority "20", the rating score for priority is 0.25.
- **Criticality** - A rating score calculated together with the rating score in the **Priority** and **Start date** fields. The number in this field is multiplied by the number in the **Criticality** field on a work order. For example, if

the value "10.00" is inserted in this field, and a work order has criticality "5", the rating score for criticality is 50.

- **Start date** - A rating score calculated together with the rating score in the **Priority** and **Criticality** fields. This field indicates daily score as a negative value and is compared to the **Expected start** field on a work order. For example, if the value "10.00" is inserted in this field, and the expected start date of a work order is three days from now, the rating result is minus 30.00. Adding the results of 0.25 and 50 from the examples in the **Priority** and **Criticality** fields described above provides a total of plus 20.25. That number is compared to all other work order rating scores during work order scheduling, and the highest rating scores are then planned first.
- **Responsible worker** - A rating score calculated together with the **Responsible worker group**, **Preferred worker**, **Preferred worker group**, **Asset location**, and **Start date** rating score values. If the value "50.00" is inserted in this field, and a responsible worker has been selected on a work order, the worker gets 50 points in the overall worker calculation during work order scheduling.
- **Responsible worker group** - A rating score calculated together with the **Responsible worker**, **Preferred worker**, **Preferred worker group**, **Asset location**, and **Start date** rating score values. If the value "50.00" is inserted in this field, and a responsible worker has been selected on a work order, the worker gets 50 points in the overall worker calculation during work order scheduling.
- **Limit to responsible** - This limits the number of workers available for work order scheduling. Select **No** if you want to calculate a score for all workers, regardless if they are set up as responsible workers or part of a responsible worker group. Select **Yes** if you want to calculate a score for workers who are set up as responsible worker on the work order, and/or included in a responsible worker group selected on the work order.
- **Preferred worker** - A rating score calculated together with the **Responsible worker**, **Preferred worker**, **Preferred worker group**, **Asset location**, and **Start date** rating score values. The four rating scores are calculated and added together to provide a score used for selecting which worker should be assigned to which work order during work order scheduling. If the value "10.00" is inserted in this field, and a worker has been selected as preferred worker on a work order, that worker gets 10 points in the overall worker calculation during work order scheduling.
- **Preferred worker group** - A rating score calculated together with the **Responsible worker**, **Preferred worker**, **Preferred worker group**, **Asset location**, and **Start date** rating score values. If the value "10.00" is inserted in this field, and a worker has been assigned to a preferred worker group selected on a work order, that worker gets 10 points in the overall worker calculation during work order scheduling.
- **Limit to preferred** - This limits the number of workers available for work order scheduling. Select **No** if you want to calculate a score for all workers, whether they are set up as preferred workers or part of a preferred worker group. Select **Yes** if you only want to calculate a score for workers who are set up as preferred workers, and/or included in a preferred worker group.
- **Location** - A rating score calculated together with the **Responsible worker**, **Preferred worker**, **Preferred worker group**, **Asset location**, and **Start date** rating score values. If the value "3,000.00" is inserted in this field, a worker gets 3,000 points in the calculation if the worker is located in the same factory or facility as the asset on which a job is to be scheduled.
 - If your company uses functional locations, workers get full score if they are located on the functional location related to the asset. If the functional location of the asset has a parent asset, workers on that functional location get 1/2 score. If that location also has a parent, workers on that location get 1/3 score. If that location also has a parent, workers on that location get 1/4 score, and so on.
 - If your company uses asset location, which we do not recommend, location, area, and zone are used to calculate location scores. Workers get full score if they are located in the location and area and zone related to the asset. If worker location only matches location and area, the rating score for the worker is 2/3 of the full score. If worker location only matches location, the rating score for the worker is 1/3 of the full score.
- **Limit to location** - This limits the number of workers available for work order scheduling. Select **No** if you want to calculate a score for all workers across all functional locations. Select **Yes** if you only want to

calculate a score for workers who are associated with the work order's functional location.



NOTE

The three "Limit to" fields increase the speed of work order scheduling by limiting the number of scores calculated for workers.

Worker's start date - A rating score calculated together with the **Responsible worker**, **Preferred worker**, **Preferred worker group**, **Asset location**, and **Start date** rating score values. This field indicates daily score as a negative value and is compared to the **Expected start** field on a work order. If the value "10.00" is inserted in this field, and the expected start date of a work order is tomorrow, the rating result is minus 10.00.

- Assuming that no responsible worker and responsible worker group have been selected on a work order to be scheduled - you add and subtract the rating score values in the examples in the **Preferred worker**, **Preferred worker group**, **Asset location**, and **Start date** fields above, you get a total of 3,010.00. This means a high score for the worker who is already selected as preferred worker as well as included in the preferred worker group on the work order, and the worker is also located in the same facility as the asset for which a job needs to be scheduled. This means there is a good chance that the worker in question will be selected to complete the job during work order scheduling.
- If the value "0.00" is inserted in one of the eight fields above, that rating score will not be used during work order scheduling.

The Document types tab

Select the document types that should be available for printing attachments related to a work order report. This is done by selecting a document type in the **Available** section and selecting . If you want to remove a selected document type, select the document type in the **Selected** section and select .

The Number sequences tab

Select the required number sequences in this section. There are two number sequences for assets: one for manually created assets and one for assets created through pending assets.

NOTE

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Asset lifecycle states

2/18/2021 • 3 minutes to read • [Edit Online](#)

This topic explains asset lifecycle states and lifecycle models in Asset Management. Asset lifecycle states are used to define whether an asset is active or inactive. For example, you can set up asset lifecycle states such as **Created**, **Active**, and **Terminated**.

NOTE

- Request lifecycle states are linked to asset lifecycle states. Therefore, when a request is changed to a new request lifecycle state, the asset that is attached to the request is changed to a new asset lifecycle state. For example, if the lifecycle state of a request is changed to **Inbound**, the lifecycle state of the attached asset is changed to the lifecycle state that is selected in the **Inbound lifecycle state** field on the **Asset lifecycle state** FastTab of the **Asset lifecycle state models** page.

Asset lifecycle states can be set up in asset lifecycle models, where you can define the required lifecycle states for various types of assets. You first set up lifecycle states. You then create a lifecycle model and select lifecycle states for it.

1. Select **Asset management** > **Setup** > **Assets** > **Lifecycle states**.
2. Select **New** to create a new asset lifecycle state.
3. In the **Lifecycle state** field, enter the lifecycle state ID.
4. In the **Name** field, enter a description.

The **Lifecycle models** field shows the number of asset lifecycle models that use the asset lifecycle state.

5. Set the **Active** option to **Yes** if this lifecycle state should be an active lifecycle state (in other words, if work orders can be created for assets that are in this lifecycle state).
6. Set the **Delete open calendar lines** option to **Yes** if open asset calendar lines that have an asset lifecycle state of **Created** should be deleted when they are in this lifecycle state. This setting is useful if you want to clean up any open maintenance schedules that are no longer relevant for the asset (for example, if the asset is no longer active).




NOTE

Asset lifecycle states, asset lifecycle models, and asset types are related. They are used in the same way as work order lifecycle states, work order lifecycle models, and work order types.

After you've created the required asset lifecycle states, you can set up lifecycle states in asset lifecycle models.

1. Select **Asset management** > **Setup** > **assets** > **lifecycle models**.
2. Select **New** to create a new asset lifecycle model.
3. In the **Lifecycle model** field, enter the lifecycle model ID.
4. In the **Name** field, enter a description.

The **Lifecycle states** field shows the number of asset lifecycle states that are selected in the asset lifecycle model. The **Asset types** field shows the number of asset types that use the lifecycle model.

5. On the **Lifecycle states** FastTab, select the asset lifecycle states that should be included in the asset lifecycle model:
 - To use a lifecycle state for the model, select it in the **Lifecycle states remaining** section, and then select the right arrow button  to move it to the **Lifecycle states selected** section.
 - To use all the available lifecycle states for the model, select the **All available lifecycle states** button . All lifecycle states are transferred to the **Lifecycle states selected** section.
 - To remove a lifecycle state from the model, select it in the **lifecycle states selected** section, and then select the left arrow button  to move it to the **Lifecycle states remaining** section.
6. Select **Lifecycle state updates** to define the asset lifecycle states that can follow a selected lifecycle state.
7. You use the **Asset state** FastTab if you handle assets that you receive for repair. In the **Inbound/outbound** section, you can select asset lifecycle states to indicate the workflow of an asset that you receive for repair. If you offer loan assets to customers or departments, in the **Loan** section, you can select lifecycle states for loan assets.

NOTE

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Asset service levels

2/18/2021 • 2 minutes to read • [Edit Online](#)

This topic explains asset service levels in Asset Management. Asset service levels are related to assets, and are transferred to maintenance requests and work orders. They are used to calculate the priority of work orders during work order scheduling. Asset service levels can be changed, if changes are required.

For more information about the setup that is related to the calculation of rating scores for work order scheduling, see [Asset Management parameters](#). You must set up at least one default record for the asset service level. This default record is used if no other match is found during work order scheduling.

Example 1: The default service level that is used if no other match is found. In this record, you select only a service level.

Example 2: A high service level that is used to schedule jobs for a Volvo truck engine. In this record, you select a relevant asset type (such as **Truck Engine**), a manufacturer (**Volvo**), and a service level.

Set up asset service levels

1. Select **Asset management > Setup > Asset service levels**.
2. Select **New** to create a record.
3. Depending on the detail level that is required for the asset service level, make relevant selections in the **Functional location, Asset type, Manufacturer, Model, Asset, Work order type, and Service level** fields.

NOTE

When the asset service level is used for maintenance requests and work orders, Asset Management goes through all asset service level records to check for a possible match. It always checks the most specific combination first. In other words, Asset Management first checks for a match for the **Work order type** field. If no match is found, it checks for a match for the **Asset** field, and so on. As you can see in the layout of the **Asset service levels** page, this behavior means that, to find the most specific combination, Asset Management checks each record from right to left for a match. If no match is found, the default record that has no selections in those fields is used.

4. In the **Service level** field, select a number that indicates the service level (priority).

NOTE

If you change an asset service level record on the **Asset service levels** page after you've already used it on a work order, the service level on maintenance requests and work orders isn't updated accordingly.

NOTE

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Asset criticality types

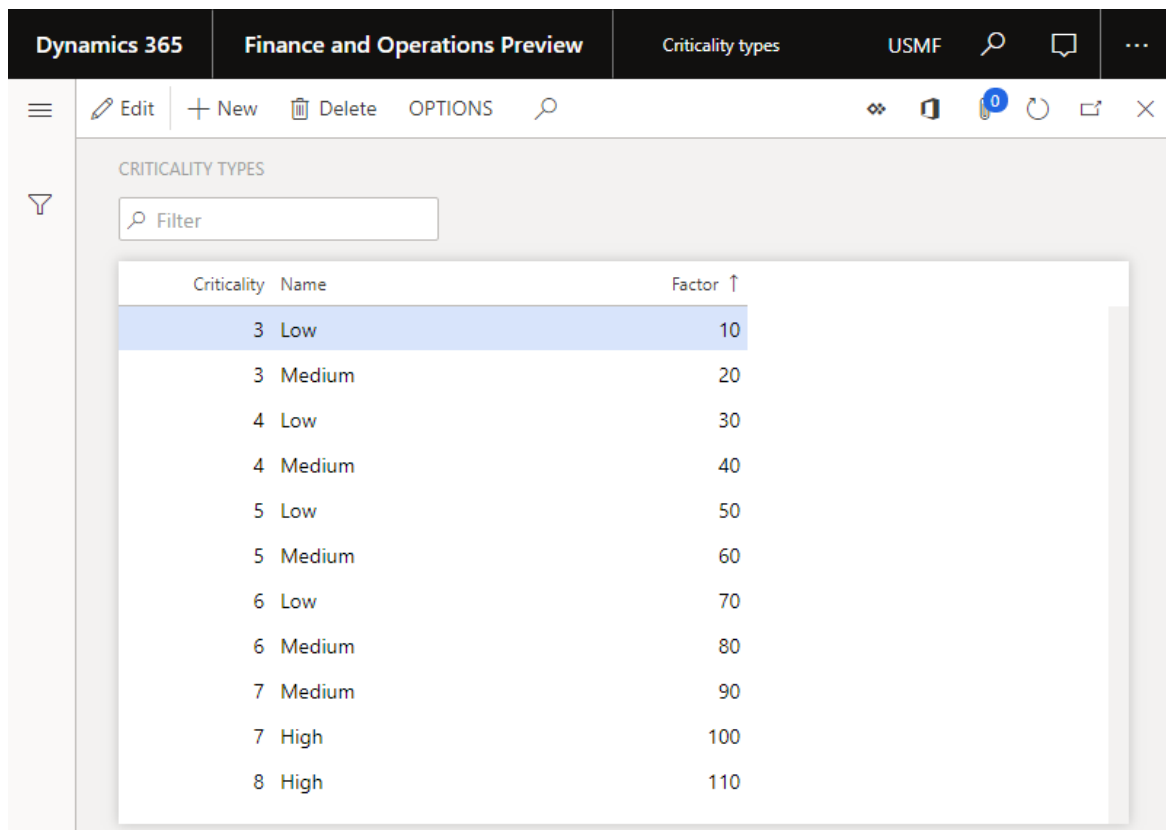
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The topic explains asset criticality types in Asset Management. Asset criticality is related to assets and is transferred to work orders. It can't be changed on a work order. Asset criticality is used to calculate work order criticality during work order scheduling. In other words, it's used to calculate the extent to which a maintenance job on an asset affects the production schedule and productivity in your company. For more information about the setup that is related to the calculation of rating scores for work order scheduling, see [Asset Management parameters](#).

To set up criticality, you first create the criticality types that should be used in the asset setup. You then set up asset criticalities.

Set up criticality types

1. Select **Asset management > Setup > Assets > Criticality types**.
2. Select **New** to create a record.
3. In the **Criticality** field, enter a number that indicates the criticality.
4. In the **Name** field, enter a name for the criticality type.
5. In the **Factor** field, enter a factor. This factor is used during the calculation of work order scheduling to determine the criticality record that should be used. (The record that has the highest factor is always used.) This setting is relevant if, as shown in the following illustration, criticality lines are created that have the same criticality value.



The screenshot shows the Dynamics 365 Finance and Operations Preview interface for the 'Criticality types' entity. The table displays the following data:

Criticality	Name	Factor ↑
3	Low	10
3	Medium	20
4	Low	30
4	Medium	40
5	Low	50
5	Medium	60
6	Low	70
6	Medium	80
7	Medium	90
7	High	100
8	High	110

Set up asset criticalities

1. Select **Asset management > Setup > Asset criticalities**.
2. Select **New** to create a record.
3. Depending on the required level of detail for asset criticality, make relevant selections in the **Functional location, Asset type, Manufacturer, Model, Asset, Job type category, Job type, Job type variant, and Job requirement** fields.

NOTE

When an asset criticality is selected, Asset Management goes through all asset criticality records to check for a possible match. It always checks the most specific combination first. In other words, Asset Management first checks **Job requirement**. If no match is found, it checks **Job type variant**. If no match is found, it checks **Job type**, and so on. As you can see in the layout of the page, this behavior means that, to find the most specific combination, Asset Management checks each record from right to left for a match. If no match is found, the "default" record that has no selections is used.

4. In the **Criticality** field, select one of the criticality values that you created in the previous procedure.

Notes about criticality setup

- If you change an asset criticality in this setup after you've already used it on a work order, the criticality on the work order isn't updated accordingly.
- The criticality on a work order is recalculated every time that a work order line is added to or deleted from the work order.
- If a work order contains several work order jobs, the highest criticality, according to the **Factor** field on the **Criticality types** page, is always used on the work order.
- Generally, asset criticality can change over a period. Criticality can be affected by the purchase of new equipment, refurbishments, and so on. Consider reevaluating your asset criticalities at regular intervals (for example, once per year or every other year) to make sure that your criticality definitions match your current production setup.

NOTE

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Asset documents

2/18/2021 • 2 minutes to read • [Edit Online](#)

This topic explains asset documents in Asset Management.

In Asset Management, you can set up documents so that they are automatically related to job types, asset manufacturers, asset types, or assets, for example. This functionality is useful when updated document versions are released. In that case, you just have to put the updated document in the standard location that you use for your Supply Chain Management documents, and attach the document to the asset document record that you've created. The updated document can then be accessed from the **All assets**, **Active assets**, **My active assets**, **All work orders**, and **Active work order jobs** menu items. The process for attaching documents to an asset document record uses the standard document handling system.

Example 1: A document that is related to a job type might describe a procedure for that job type.

Example 2: A document that is related to a combination of an asset type, manufacturer, and model might be the standard manual for the selected asset manufacturer model.

Create asset document relation

1. Select **Asset management** > **Setup** > **Asset documents**.
2. Select **New** to create an asset document record.
3. Depending on how specific you want the document relation to be, make relevant selections in one or more of the following fields: **Asset type**, **Manufacturer**, **Model**, **Asset**, **Job type category**, **Job type**, **Job type variant**, and **Job requirement**. The options that are available in the **Job type variant** and **Job requirement** fields depend on your selection in the **Job type** field.

NOTE

When the system searches for documents that should be related to an asset or a work order, Asset Management goes through all asset document records to check for a possible match. It always checks the most specific combination first. In other words, Asset Management first checks for a match for the **Job requirement** field. If no match is found, it checks for a match for the **Job type variant** field. If no match is found, it checks for a match for the **Job type** field, and so on. As you can see in the layout of the **Asset documents** page, this behavior means that, to find the most specific combination, Asset Management checks each record from right to left for a match. Several documents might be related to an asset or a work order. You can edit the service level on a maintenance request or a work order as you require.

4. Select **Attachments**. The standard **Document handling** page appears.
5. Set up the documents or notes that should be attached to the asset document record. After you attach documents, the **Attachments** field shows the number of documents that are related to the record.

NOTE

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Maintenance workers and worker groups

2/18/2021 • 3 minutes to read • [Edit Online](#)

This topic explains maintenance workers and worker groups in Asset Management. In Asset Management, you can connect maintenance workers to functional locations. (For more information about functional locations, see [Create functional locations](#).) This functionality might be useful if, for example, you're scheduling a maintenance job on a machine that is located in functional location 01, and you want to allocate maintenance workers from the same location to perform the job.

You can also create maintenance worker groups and associate maintenance workers with them. This functionality is useful when you do simple work order scheduling, and you want to schedule a group of maintenance workers on a work order. You can use maintenance workers and maintenance worker groups to set up preferred maintenance workers and responsible maintenance workers.

Create workers

1. Select **Asset management > Setup > Workers > Workers**.
2. Select **New** to add a worker to the list.
3. In the **Worker** field, select the worker.
4. Set the **Active** option to **Yes** to schedule the worker on work orders.

On the **General** FastTab, the **Resource** and **Description** fields are automatically filled in if a resource has been selected for the worker. The **Calendar** field is also automatically filled in, provided that you've set up the worker as a resource and allocated a calendar to that resource on the **Resources** page (**Organization administration > Resources > Resources**).

5. On the **Groups** FastTab, select **Add**, and then select a maintenance worker group for the worker. A worker can be affiliated with more than one group.
6. In the standard setup, a worker's affiliation with a group is effective from the date when you add the group, and it never expires. This date is shown in the **Effective** field. To see the **Effective** field, select **View > All**. If the worker's affiliation with a group should be limited to a specific period, use the **Effective** and **Expiration** fields to define the period.
7. On the **Functional locations** FastTab, select **Add**, and then select a functional location for the maintenance worker. Also specify which location is the primary functional location for the worker.

NOTE

When you add functional locations to a worker, all active assets that are related to those functional locations appear on various menu items, such as **My active assets** and **My active functional locations**. They also appear in the asset lookups that are shown when you create a new asset, maintenance request, or work order.

The fields on the **Details** FastTab show the number of maintenance worker groups and functional locations that the selected maintenance worker is related to.

Create worker groups

1. Select **Asset management > Setup > Workers > Maintenance worker groups**.

2. Select **New** to add a worker group to the list.
3. In the **Maintenance worker group** field, enter a group ID.
4. In the **Name** field, enter a name.
5. On the **Workers** FastTab, select **Add**, and then select a maintenance worker for the worker group. For information about the **Effective** and **Expiration** fields, see step 6 in the previous procedure.
6. If a resource group should be related to the selected maintenance worker group, select **Copy from resource group**. In the **Group** field, select the resource group to copy calendar settings from. Then, in the **Worker group** field, select the worker group to copy the resource group's calendar settings to. This step is relevant only if you want maintenance workers to use the calendar that is related to a resource (work center) during work order scheduling.

The field on the **Details** FastTab shows the number of maintenance workers that have been set up on the selected maintenance worker group.

NOTE

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Introduction to assets

2/18/2021 • 3 minutes to read • [Edit Online](#)

This topic provides an overview of assets in Asset Management. An *asset* is any type of equipment, such as a machine or a machine part, that requires maintenance, service, or repair.

An asset is automatically updated with related information. For example, this related information might be about new or updated work orders. You can create assets by using either the **All assets** menu item or the **Pending assets** menu item. This topic explains how to create assets by using the **All assets** menu item. For information about how to create assets by using the **Pending assets** menu item, see [Create assets based on purchase orders](#).

All assets

Select **Asset management > Common > Assets > All assets**. The **All assets** list page shows all assets and some of the information that is related to them. To view only active assets, select **Active assets**. To view only assets that are installed on the functional locations that you're related to as a maintenance worker, select **My active assets**. (This relation is set up on the **Workers** page. For more information, see [Maintenance workers and worker groups](#).)

In the **All assets** grid view, select a link in the **Asset** column to view the details of the selected record. To edit the record, select the **Edit** button. The details view shows detailed information that is related to the asset. A **Related information** pane on the right contains additional asset-related information. Expand the pane to show the related information for the selected asset.

The buttons on the Action Pane are organized on tabs. The following table briefly describes the buttons that are related to Asset Management.

BUTTON NAME	DESCRIPTION
Edit	Edit the selected asset.
New	Create a new asset.
Delete	Delete the selected asset.
Move asset	Move assets to another asset structure, or to another location in the same asset structure.
Replace asset	Replace one child asset in an asset hierarchy with another asset.
Install asset	Install an asset on a functional location.
Copy asset	Copy an asset hierarchy to another asset.
Requests	Open the Active requests list page, where you can view maintenance requests that have been created for the selected asset.

BUTTON NAME	DESCRIPTION
Event history	View an overview of the various registrations that have been made on the asset.
Asset BOM	View a list of all items (spare parts and other items) that are used on an asset.
Work orders	Open the Active work orders list page, where you can view work orders for the asset.
Checklist	View an overview of maintenance checklists and measurements that have been registered on the asset.
Maintenance downtime	Create or view maintenance downtime registrations on the asset.
Project transactions	View all posted transactions that are related to work orders that have been created for the asset.
Asset measures	Create or view asset measures on the asset.
Maintenance schedule	Open the Open maintenance schedule list page, where you can view maintenance plans, maintenance requests, and maintenance rounds that are associated with the asset, and that have a status of Created .
Update asset state	Update the asset lifecycle state. You can select multiple assets on the All assets list page and then update the asset lifecycle state for all of them at the same time.
Lifecycle state log	Open a log that shows the lifecycle states of the selected asset.
Asset documents	View a list of the documents that are attached to an asset. These documents are set up at Asset management > Setup > Asset documents .
Attributes	Create or view asset attributes.
Image	Select an image for the asset.
Parent assets	View parent asset history for the selected asset.
Functional locations	View functional location history for the selected asset.
Condition assessment	Register condition assessment measurements on the asset.
Faults	Open the Asset faults list page, where you can view faults that have been registered on the asset.
Cost control	Compare budget costs and actual costs on the asset.
Hour control	Compare forecast hours and actual hours on the asset.

BUTTON NAME	DESCRIPTION
Asset KPIs	Calculate and view key performance indicators (KPIs) for the asset.
Job types	View an overview of the current default job types for the asset.
Criticality types	View or update asset criticality types.
Spare parts	View a list of approved and alternative spare parts that can be used on the asset.
Asset consumption	Print a report that shows consumption registrations on the asset.
Asset fault	Print a report that shows fault registrations on the asset.

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Create an asset

2/18/2021 • 6 minutes to read • [Edit Online](#)

This topic describes how to create an asset in Asset Management.

1. Click **Asset management** > **Common** > **assets** > **All assets** or **Active assets**.
2. Click the **New** button.
3. In the **Create assets** dialog, insert data regarding **Asset** (the asset ID) and the asset name. Select date and time for the asset in the **Effective** field. From that date, you are able to install the asset on a functional location as well as move and replace the asset in an asset structure.
4. In the **Asset type** field, select the asset type for the asset (mandatory field). If required, select **Asset manufacturer** and **Asset model** for the asset. If only one product has been set up, that product is automatically selected in the **Asset manufacturer** field. The selections available in the **Asset manufacturer** and **Asset model** fields depend on the setup in [Asset manufacturers and models](#).
5. In the **Parent asset** group, the **Asset** field is blank as default. If required, you can select a parent asset, and then all fields in the **Parent asset** group will automatically be filled out.

NOTE

When you select a parent asset, two or three tabs are available: The **My assets** tab contains assets related to the functional locations to which you (the maintenance worker who is logged on the system) may be allocated. If no functional locations are set up on a maintenance worker in the [Maintenance workers and worker groups](#) form, the **My assets** tab will not be visible. The **Active assets** tab contains a list of all assets with asset lifecycle state "Active". The **Asset view** tab displays a tree view of functional locations and assets installed on those locations.

6. The default functional location you have set up is suggested for the asset in the **Asset** group > **Functional location** field. Select another functional location, if required.

NOTE

After you have created an asset, you can install it on another functional location, if required. Only top-level assets (assets without a current parent asset) can be installed on a functional location. This means that you install the top level as well as any child assets on the selected functional location. Read more about installing assets on functional locations in [Introduction to functional locations](#).

7. Click **OK**.
8. Select the asset in the **All Assets** list and click the **Edit** button to add further information to the asset.

General information

The functional location to which the asset is related is shown in the **Functional location** field. If the asset is a parent asset, the number of children related to the asset is shown in the **Children** field. If the asset is a sub asset to an existing asset, the ID of the parent asset is shown in the **Parent** field.

You can edit **Asset manufacturer** and **Asset model** information on the asset, which is used to manage spare parts, alternative spare parts, and job type defaults. Refer to [Asset manufacturers and models](#) for more information. You can also add information about **Model year** and **Serial number**, if required.

Current lifecycle state is used to define if the asset is active or inactive. When creating an asset, the stage is always set to the first stage in the asset stage group. When you are ready to activate an asset, click **Update asset state**, and select the lifecycle state that you have defined as "asset active", and click **OK**.

Note: When an asset is set to "inactive", it is no longer possible to create work orders for the asset. Also, you cannot schedule preventive maintenance jobs for an inactive asset.

The **Service level** and **Criticality** fields relate to work orders created for the asset. The fields show the **Service level** and **Criticality** numbers calculated for the current setup for the asset. Refer to [Asset service levels](#) and [Asset criticality types](#) regarding setup of those values.

Asset

You can select a **Resource** for the asset. The resource selection determines which calendar is used for work order scheduling. Resource selection is often used for fixed assets. Resources and resource groups are set up in **Organization administration > Resources > Resource groups** or **Resources**.

In the **Fixed assets number** field, you can select a fixed asset to be related to the asset. This is relevant if your asset is related to an investment project.

- If the asset is related to a fixed asset, you can create a work order type to be used for work orders related to an investment project.
- Information about fixed assets for an asset is related to the **Fixed assets** module in Dynamics 365 Supply Chain Management. This means that in **Fixed assets > Fixed assets > Fixed assets**, you can get an overview of the Asset Management projects that may be related to a fixed asset by selecting the asset in the list and viewing the contents in the **Related information** pane > **Associated projects** section.

Details

In the **Active from** field, the date on which you updated the asset lifecycle state to an active state (refer to [Asset lifecycle states](#) regarding setup of asset lifecycle states), is shown. If the asset is no longer active, and you have updated the asset lifecycle state to an inactive lifecycle state, the date from which the asset is inactive is shown in the **Active to** field. If required, you can manually change those dates.

If required, you can insert an expected date for replacement of the asset in the **Replacement date** field. An estimated value for replacing the asset can be inserted in the **Replacement value** field. Example: You can use replacement information to compare it with the costs of maintaining an asset, and subsequently make a decision for purchasing a new asset if maintenance costs on the existing asset increase rapidly.

Notes

You can add notes related to the asset on the **Notes** FastTab. Click the **Add timestamp** button before you write the note, if you want to add user information and a date/timestamp to the note.

Attributes

On this FastTab, you can set values for asset attributes. These attributes can be used to describe properties or characteristics pertinent to the asset, for example, size, weight, or machine configuration.

Click **Add line** and select the attribute type. Next, insert the **Value** related to the attribute type and save the record.

NOTE

You can get an overview of asset attribute types and their relation to the assets in **Asset attribute** and **Asset attribute overview**. Refer to [Asset attribute overview](#) for more information.

Vendor

On the **Vendor** FastTab, select a vendor account for the asset. Also, if a vendor warranty has been granted, you can insert warranty information here.

Address

On the **Address** FastTab, you can insert the address of the equipment. If no address is inserted on the asset, the asset uses the address of a parent asset, if the parent asset has an address. If no address is related to the asset or any parents in the asset hierarchy, the address of the functional location on which the asset is installed may be used. If that functional location does not have an address related to it, the address of the parent functional location is used on the asset.

Asset management plans

Maintenance plans are used for scheduling preventive maintenance jobs at regular intervals on the asset. On this FastTab, you can set up maintenance plan lines for the selected asset. Maintenance rounds can be set up for various assets, on which you need to carry out a similar task at regular intervals. On the **Functional location maintenance plans** tab, you see the maintenance plans related to the functional location on which the asset is installed.

NOTE

If you delete a maintenance plan line or a maintenance round related to an asset in **All Asset**, you also automatically delete all maintenance schedules with status "Created" that have been created based on that maintenance plan or maintenance round.

Functional location maintenance plans

On this FastTab, you get an overview of the maintenance plans related to the functional location on which the asset is installed.

Maintenance rounds

On this FastTab, you can add or remove maintenance rounds, which are related to the asset.

Financial dimensions

You can select financial dimensions for the asset.

NOTE

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Multi-level assets

2/18/2021 • 2 minutes to read • [Edit Online](#)

This topic explains how to create and delete multi-level assets. You can create assets and related sub-assets in a hierarchical tree structure. In this way, you can show relations and dependencies among assets. Maintenance jobs can be related to all levels of the tree structure. Statistics can also be created for an individual level or as a sum of all sub-asset levels.

On the **All Assets** list page (**Asset management > Common > Assets > All assets**), the **Asset** column lists assets in hierarchical order. The **Parent** column shows the related parent. Additionally, if assets and sub-assets have already been created, the **Asset tree** section in the **Related information** pane shows the assets in a tree structure.

For information about how to create an asset, see [Create an asset](#). To create a sub-asset, select the parent asset in the **Parent** field on the **General** FastTab.

Copy an asset or asset structure

If your company has several similar asset structures, you can use the Copy function in Asset Management to quickly create them.

1. Select **Asset management > Common > Assets > All assets**.
2. On the **All assets** list page, select the asset to copy. For example, if you want to copy the whole asset structure, including sub-assets, select a parent asset.
3. Select **Copy asset**. In the **Copy from** section, the **Asset** field is set to the asset that you selected on the list page.
4. In the **Copy to** section, in the **Asset** field, enter the name of the new asset.
5. If the asset that you're creating should be part of an existing asset structure, in the **Parent asset** section, in the **Asset** field, select a parent ID.
6. Select **OK**. The new asset structure is shown on the **All assets** list page. All asset attributes, maintenance plans, and maintenance rounds that are related to the asset that you copied are transferred to the new asset or asset structure.

When you copy an asset structure, the sub-assets in the new structure have the same name as the sub-assets that you copied. After the copy procedure is completed, you can easily change the name and other settings for an asset. Select the asset on the **All assets** list page, and then select the **Edit** button.

NOTE

When you copy an asset or asset structure, the lifecycle state of the new assets is reset to whatever state you defined as the initial lifecycle state for assets. The functional location is reset to the default functional location.

Delete an asset or asset structure

If an asset has related sub-assets, you can delete it only if no maintenance requests, work order jobs, fault registrations, or condition assessments are registered on any of the assets.

1. On the **All assets** list page, select the asset to delete.
2. Select **Delete**.

NOTE

If you can't delete an asset by using this procedure, another way to handle deletion is to set up an asset lifecycle state for this purpose. For example, you can set up a **Scrapped** or **Deleted** lifecycle state on the **Asset lifecycle states** page.

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Move, replace, and install assets

2/18/2021 • 4 minutes to read • [Edit Online](#)

This topic explains how to move, replace, and install assets in Asset Management. You can create individual assets that have no relations to other assets, or you can create an asset structure that includes a parent asset (top-level asset) and related child assets (sub-assets). In Asset Management, there are three approaches to moving and changing the location of an asset:

- **Move** – Move an asset either to another asset structure or to another location in the same asset structure.
- **Replace** – Temporarily remove an asset from an asset structure so that it can be repaired or refurbished, and then add the refurbished asset back to the asset structure later. Alternatively, permanently replace a used asset with a new asset.
- **Install** – Install a parent asset and any related child assets on a functional location.

NOTE

The asset that you move, replace, or install might be related to another functional location. In that case, the asset might use financial dimensions of the functional location. On the **Functional location types** page, you set up the handling of financial dimensions on functional locations.

Move asset

Use the **Move asset** function to move an asset either to another asset structure or to another location in the same asset structure. You can also move an asset out of an asset structure so that it becomes a standalone asset that has no structure relations.

NOTE

Don't use this function if assets are being repaired or temporarily replaced. Instead, use the **Replace asset** functionality that is described later in this topic.

1. Select **Asset management > Common > Assets > All assets** or **Active assets**.
2. In the list, select the asset to move. If the asset has child assets, you also move those assets.
3. Select **Move asset**.
4. To move the asset so that it becomes part of an asset structure, select the new parent asset in the **Parent asset** field. If you're moving a child asset, and you want to make it a standalone asset that has no structure relations, leave the **Parent asset** field blank.
5. By default, the **Effective** field is set to the current date and time. However, you can select a different date and time that the asset move is valid from.
6. Select **OK**.

Replace asset

Use the **Replace asset** function in connection with repairs, refurbishment, or permanent replacement of a worn-out asset by a new asset. This function is used to replace child assets in an asset structure. For parent assets (that is, assets that don't currently have a parent asset), this replacement is done on a functional location. For more information about how to replace parent assets on a functional location, see [Install assets on functional locations](#).

NOTE

If a repair shop is related to your production department, you can create functional locations such as **Repair**, **Scrap**, and **Storage** to handle the repair and replacement of assets.

1. Select **Asset management > Common > Assets > All assets** or **Active assets**.
2. In the list, select the child asset to replace. If the asset has child assets, you also replace those assets.
3. Select **Replace asset**.

The **Structure change** field shows the last date and time that the selected asset and related child assets were moved in the asset structure.

4. In the **Selected asset** section, in the **Target functional location** field, select the functional location to move the asset to. For example, select the **Repair** or **Scrap** location.

In the **Parent asset** section, the **Effective** field shows the last date and time that the parent asset and related child assets were installed or moved on the current functional location.

5. In the **New asset** section, in the **Asset** field, select the asset to insert as a temporary or permanent replacement for the selected asset. This asset might currently be located on another functional location, such as **Storage**.
6. In the **Effective from** section, the **Effective** field is set to the current date and time by default. However, you can select a different date and time that the asset replacement is valid from.
7. Select **OK**.

Install asset

Use the **Install asset** function to install an asset structure on a functional location.

NOTE

Always select a parent asset. The parent asset and related child assets will be moved to the selected functional location.

1. Select **Asset management > Common > Assets > All assets** or **Active assets**.
2. In the list, select the parent asset to install on another functional location.
3. Select **Install asset**.

The **Attributes** section shows the asset attributes that are set up on the parent asset.
4. In the **Functional location** field, select the new location.
5. By default, the **Effective** field is set to the current date and time. However, you can select a different date and time that the installation on the asset structure is valid from.
6. Select **OK**.

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Create assets based on purchase orders

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This topic explains how you can create a list of asset items that can be used as a basis for creating assets for maintenance jobs in Asset Management. Based on the asset items, you are able to view a list of the purchase order lines that have been created on those items. The purpose of this functionality is to easily create an asset in Asset Management based on a purchase order.

First, you set up the items to be used for creating assets from a purchase order in **Asset items**. After creating a purchase order line, you create the assets in **Pending assets**. It is possible to decide at which stage of the purchase order the asset should be created.

Select asset items

1. Click **Asset management > Setup > Assets > Items**.
2. Click **New** to create a new asset item.
3. Select the item in the **Item number** field. When you leave that field, the item name is automatically inserted in the **Product name** field.
4. On the **General** FastTab, select an asset type for the item.
5. Select asset manufacturer and model for the item.
6. Save the item.

Create assets from pending assets

1. Click **Asset management > Common > Assets > Pending Assets**.
2. You will see an updated list of the purchase orders based on the items selected in **Asset items**.
3. You can filter the status of purchase orders to select at which lifecycle state the asset should be created. For example, you may only want to create assets when a product receipt has been posted on a purchase order.
4. Select the **Reference number** link on a purchase order line to view detailed information about the item.
5. If you want to edit which dimensions are displayed on the **Inventory dimensions** FastTab, click the **Display Dimensions** button, and make your selections.
6. If you want to create an asset based on a purchase order line, select the check box in the **Mark** column for that line on the list page, and click **Create assets**. A message will be displayed informing you of the asset ID.
7. Select the asset in the **All assets** list and click **Edit** to add more information to the asset.
8. In **Pending assets**, if you want to delete a line because you don't want to create an asset, select the check box in the **Mark** column for that line, and click **Discard pending assets**. A message will be displayed informing you of the asset ID. You are not deleting the purchase order or sales order, just the record from which you could have created an asset in **Asset Management**.

NOTE

All product dimensions (size, color, configuration etc.) are automatically transferred to the asset attributes. Tracking dimensions (serial number) are stored directly on the asset when the asset is created.

Find pending assets

You can run a **Pending asset count** to check for pending assets. For example, this function can be used for receiving a notification each time a pending asset is ready to be created as an asset.

1. Click **Asset management** > **Periodic** > **Assets** > **Pending asset count**.
2. Click **OK** to run the job and update the list in **Pending assets**.
3. You can set up this job to run as a batch job, for example, once each day.

Caution: If data is changed on a purchase order *after* you have created an asset based on the appertaining item, those changes will not be reflected on the asset.

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Asset BOMs

2/18/2021 • 4 minutes to read • [Edit Online](#)

This topic describes asset bills of materials (BOMs) in Asset Management. The **Asset BOM** page shows a list of all items (spare parts and other items) that are used on an asset during its whole lifetime. When you create a new asset, you should consider setting up an asset BOM as a part of the setup procedure. In this way, you can track item history for the asset from the creation date.

After you've completed a maintenance job, and item consumption has been registered on a work order, you can track consumption of spare parts and other items that are used on the asset. This functionality lets you keep a complete item consumption record for all your assets. For example, you can use the record to monitor whether a specific spare part is often replaced, or to keep track of the spare parts or other items that are currently used on an asset.

NOTE

On a work order, item consumption might include both spare parts and other, additional items, such as lubricants, bolts, and gaskets.

An asset BOM can be automatically updated based on the setup in Asset Management. If a work order lifecycle state has been created to handle finished or completed work orders, and if the **Update asset BOM** option for that work order lifecycle state is set to **Yes** on the **Work order lifecycle states** page, all items that are used on the work order will be automatically updated on the **Asset BOM** page when the work order is updated to that lifecycle state.

You can also manually update an asset BOM by creating new item lines on the **Asset BOM** page.

On the **Asset BOM** page, you can track spare parts history for assets after item consumption is registered on a work order. To use this functionality, you must select the item groups that should be used for spare parts registration on the **Spare parts item groups** page.

To use asset BOM functionality, you must first set up the required spare parts items groups. Then, if you want the asset BOM to be automatically updated when a work order is completed, you can set up a work order lifecycle state to handle that update.

Set up spare parts item groups

The setup of spare parts history is based on item groups that are created in the **Inventory and warehouse management** module. In Asset Management, you set up item groups so that you can track spare parts history for the items in the selected item groups.

1. Select **Asset management > Setup > Asset > Spare parts item groups**.
2. Select **New** to set up an item group.
3. In the **Item group** field, select the group. The name of the group is automatically entered in the **Name** field.

View and update asset BOMs

After you post item consumption on a work order, you can view the registered item consumption on the **Asset BOM** page.

1. Select **Asset management > Common > Assets > Active assets**. Select the asset in the list, and then

select **Asset BOM**.

NOTE

To view all item consumption registrations on all assets, select **Asset management > Inquiries > Assets > Asset BOM**.

2. Select **Update asset BOM**. You can add assets, asset types, and resources to the update as you require by selecting **Select**. Select **OK** to start the update. You can also set up the Update function as a batch job.
3. If you want to see more information that is related to the items, you can add inventory dimensions. Select **Inventory > Dimensions display**, and then select the check boxes for the dimensions that you want to see. To keep this setup for all assets on the **Asset BOM** page, set the **Save setup** option to **Yes**.
4. To get an overview of where in Asset Management the item on the selected line is used, in relation to assets, job type defaults, spare parts, and work orders, select **Item where used**.
5. If you want to see only active item lines, select **View > Current**. To see all item lines, including lines where the expiration date is earlier than the current date, select **View > All**.

NOTE

When you've completed a work order, if some items or spare parts that are related to the related asset have expired or have been replaced by other items or spare parts, we recommend that you update the asset BOM accordingly.

Create a new item line in an asset BOM

You can manually create item lines for assets.

1. On the **Asset BOM** page, select **New**.
2. In the **Asset** field, select the asset to add an item line for.
3. In the **Line number** field, enter a sequential line number.
4. In the **Effective** field, enter a start date for the item.
5. If the item will expire, in the **Expiration** field, enter an end date.
6. In the **Item number** field, select the item. The name is automatically entered in the **Product name** field.
7. In the **Quantity** field, enter the quantity that is used. The **Unit** field is automatically updated.

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Asset event history

2/18/2021 • 2 minutes to read • [Edit Online](#)

This topic explains how to access asset event history in Asset Management. The **Asset event history** page shows the registration history that has been made during the lifetime of an asset. You can access this page from the **All assets**, **Active assets**, and **My active assets** menu items. Select an asset, and then select **Event history**.

On the **Details** FastTab of the **Asset event history** page, you can do a search on all the available information. For example, you can use the asset event history to find the following information:

- When a job type was last used on an asset
- When a specific worker entered a remark on a work order job

The timeline is updated every time that the page is opened. It contains the following information:

- Changes that have been made on the asset: asset location, asset ID, name, and vendor warranty
- Asset parent
- Asset bill of materials (BOM)
- Asset lifecycle state log
- Functional location
- Maintenance requests
- Work orders, including posted item and notes
- Faults
- Condition assessments

NOTE

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Asset view

2/18/2021 • 2 minutes to read • [Edit Online](#)

This topic describes the asset view in Asset Management. The **Asset view** page shows active assets and functional locations in a tree view. Therefore, you can easily get an overview of asset relations to functional locations. Additionally, you can view detailed information about functional locations, assets, and related bills of materials (BOMs). You can also get a quick overview of active maintenance requests and work orders that are related to an asset.

1. Select **Asset management > Common > Assets > Asset view**.
2. To change the view that is shown on the page, select a new value in the **View** field.

NOTE

The default view that is shown when you open the **Asset view** page depends on the value that is selected in the **View** field on the **Assets** tab of the **Asset management parameters** page (**Asset management > Setup > Asset management parameters**).

On the right side of the page, FastTabs shows details of the selected view.

The breadcrumb trail that appears above the tree view shows the current selection in the tree view. This breadcrumb trail uses the following format:

Functional location ID / Functional location ID (if there is more than one functional location) > Asset ID / Asset ID (if there is more than one asset) - Item number.

If you've selected an asset in the tree view, you can select **Active requests** or **Active work orders** to view the maintenance requests or work orders that are related to the asset. You can also select **Open > Functional location, Asset, or Asset BOM** to open the related view.

The **Asset functional locations** option that you can select in the **View** field is also available in any asset lookup where you can select an asset. The tree view is shown on an **Asset view** tab, for example, where you [create an asset](#), create a maintenance request, or create a work order.

NOTE

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Asset attribute overview

2/18/2021 • 2 minutes to read • [Edit Online](#)

This topic provides an overview of asset attributes in Asset Management. Asset attributes are properties that are related to an asset type or an asset. If you've set up [attribute types](#) and used them on assets, you can get an overview of the attribute values that are set up on the assets. This overview is shown on two pages in Asset Management: **Asset attribute overview** and **Asset attribute**.

The **Asset attribute overview** page shows a separate line for each asset. The line shows all attribute types that are related to that asset. Follow these steps to open and use the **Asset attribute overview** page.

1. Select **Asset management > Inquiries > Assets > Asset attribute overview**.
2. In the **Asset type** field, select an asset type.
3. Select **OK**. A list shows all the assets that use the selected asset type. For each asset, all related asset attribute types are shown on the same line.

The **Asset attribute** page shows a separate line for each attribute type that is used on an asset. To open this page, select **Asset management > Inquiries > Assets > Asset attribute**.

NOTE

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Maintenance requests

2/18/2021 • 2 minutes to read • [Edit Online](#)

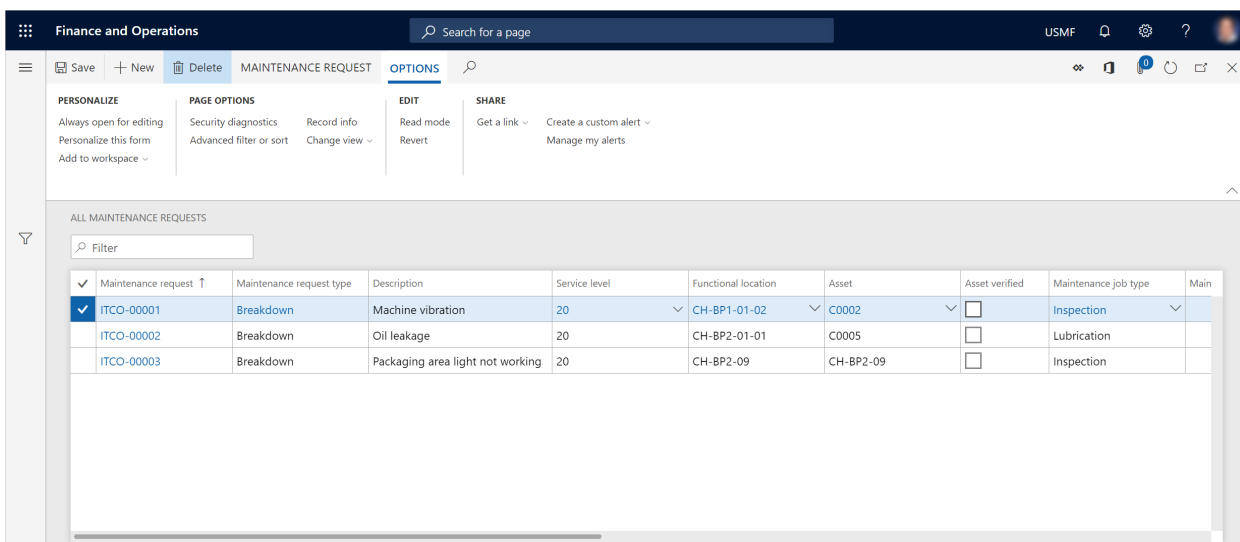
You can set up various types of requests to use in your company. Maintenance requests are one type. Maintenance requests are used to request that a work order be required for a specific job. A maintenance request can be created by any user who has access to Asset Management functionality. A planner or manager can then decide whether a maintenance request should be converted to a work order, or whether it should complete its own lifecycle.

View maintenance requests

- Select **Asset management > Common > Maintenance requests > All maintenance requests or Active maintenance requests**.

The **All maintenance requests** list page shows all maintenance requests, regardless of their lifecycle state. The **Active maintenance requests** lists page shows only maintenance requests that are in an active state.

The following illustration shows an example of the **All maintenance requests** list page.



Maintenance request	Maintenance request type	Description	Service level	Functional location	Asset	Asset verified	Maintenance job type	Main
ITCO-00001	Breakdown	Machine vibration	20	CH-BP1-01-02	C0002	<input type="checkbox"/>	Inspection	
ITCO-00002	Breakdown	Oil leakage	20	CH-BP2-01-01	C0005	<input type="checkbox"/>	Lubrication	
ITCO-00003	Breakdown	Packaging area light not working	20	CH-BP2-09	CH-BP2-09	<input type="checkbox"/>	Inspection	

NOTE

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Maintenance request lifecycle states

2/18/2021 • 3 minutes to read • [Edit Online](#)

Maintenance request lifecycle states define the stages that a request can go through. Examples include **Created**, **Active**, and **Ended**. When a maintenance request is converted to a work order, the maintenance request lifecycle state should be updated to **Ended** or **Closed** to indicate that the maintenance request is no longer active. On the **All maintenance requests** list page, you can view all maintenance requests, regardless of their lifecycle state.

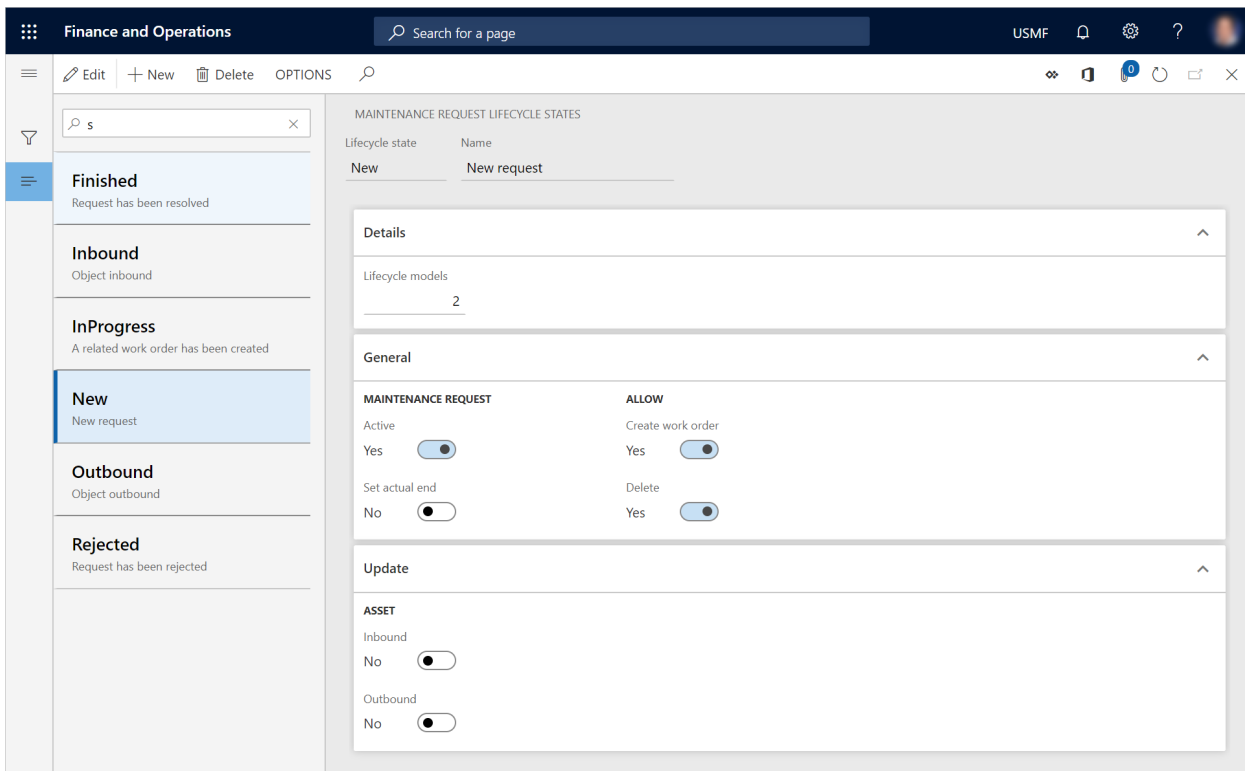
Set up maintenance request lifecycle states

1. Select **Asset management** > **Setup** > **Maintenance requests** > **Lifecycle states**.
2. Select **New** to create a maintenance request lifecycle state.
3. In the **Lifecycle state** field, enter an ID for the lifecycle state.
4. In the **Name** field, enter a name.

On the **Details** FastTab, the **Lifecycle models** field shows the number of maintenance request lifecycle models that use this lifecycle state.

5. On the **General** FastTab, set the **Active** option to **Yes** if a maintenance request should be active while it's in this lifecycle state.
6. Set the **Set actual end** option to **Yes** if an actual end date and time should automatically be entered on a maintenance request that is in this lifecycle state.
7. Set the **Create work order** option to **Yes** if a work order can be created from a maintenance request that is in this lifecycle state.
8. Set the **Delete** option to **Yes** if a maintenance request can be deleted while it's in this lifecycle state.
9. On the **Update** FastTab, the **Inbound** and **Outbound** options in the **Asset** section are relevant if you use depot repair. Set the appropriate option to **Yes** if the asset lifecycle state of assets that are selected on a maintenance request should automatically be updated to **Inbound** or **Outbound** when the maintenance request lifecycle state of that maintenance request is set to **Inbound** or **Outbound**.

The follow illustration shows an example of the **Maintenance request lifecycle states** page.



NOTE




Maintenance request lifecycle states, lifecycle state groups, and types are related to, and used in the same way as, work order lifecycle states, lifecycle state groups, and types.

Set up maintenance request lifecycle models

After you've created the lifecycle states that are required for your maintenance requests, they can be divided into lifecycle state groups, or lifecycle models. Maintenance request lifecycle models are used to create the flow that can be used for different types of maintenance requests. At a minimum, one standard maintenance request lifecycle model should be created.

1. Select **Asset management > Setup > Maintenance requests > Lifecycle models**.
2. Select **New** to create a maintenance request lifecycle model.
3. In the **Lifecycle model** field, enter an ID for the lifecycle model.
4. In the **Name** field, enter a name.

On the **Details** FastTab, the **Lifecycle states** shows the number of lifecycle states that are selected in this lifecycle model. The **Maintenance request types** field shows the number of maintenance request types that use this lifecycle model.

5. On the **Lifecycle states** FastTab, select the lifecycle states that should be included in the lifecycle model:
 - To include a lifecycle state in the lifecycle model, select it in the **Lifecycle states remaining** section, and then select the right arrow button  to move it to the **Lifecycle states selected** section.
 - To include all the available lifecycle states in the lifecycle model, select the **Select all available states** button . All lifecycle states are moved to the **Lifecycle states selected** section.
 - To remove a lifecycle state from the lifecycle model, select it in the **Lifecycle states selected** section, and then select the left arrow button  to move it to the **Lifecycle states remaining** section.
6. On the **General** FastTab, the fields in the **Updates** section are relevant if you use depot repair.

- In the **Lifecycle state for asset received** field, select the asset lifecycle state that assets that are selected on a maintenance request should automatically be updated to when they are received for depot repair.
- In the **Lifecycle state for asset delivered** field, select the lifecycle state that assets that are selected on a maintenance request should automatically be updated to when they are returned after repair.

The following illustration shows an example of the **Maintenance request lifecycle models** page.

The screenshot shows the 'MAINTENANCE REQUEST LIFECYCLE MODELS' page. The left sidebar has a 'Filter' box and two main sections: 'Depot repair' (Inbound outbound request stage group) and 'Standard' (Standard request stage group). The main content area is divided into several sections:

- Details:** Shows 'Maintenance request types' with a value of 2 and 'Lifecycle states' with a value of 4.
- Lifecycle states:** Contains two tables:

LIFECYCLE STATES REMAINING	
Inbound	Object inbound
Outbound	Object outbound

LIFECYCLE STATES SELECTED	
<input checked="" type="checkbox"/> New	New request
<input type="checkbox"/> Rejected	Request has been rejec...
<input type="checkbox"/> InProgress	A related work order h...
<input type="checkbox"/> Finished	Request has been resol...
- General:** Contains an 'UPDATES' section with two dropdown menus:
 - Lifecycle state for asset delivered
 - Lifecycle state for asset received

NOTE

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Maintenance request types

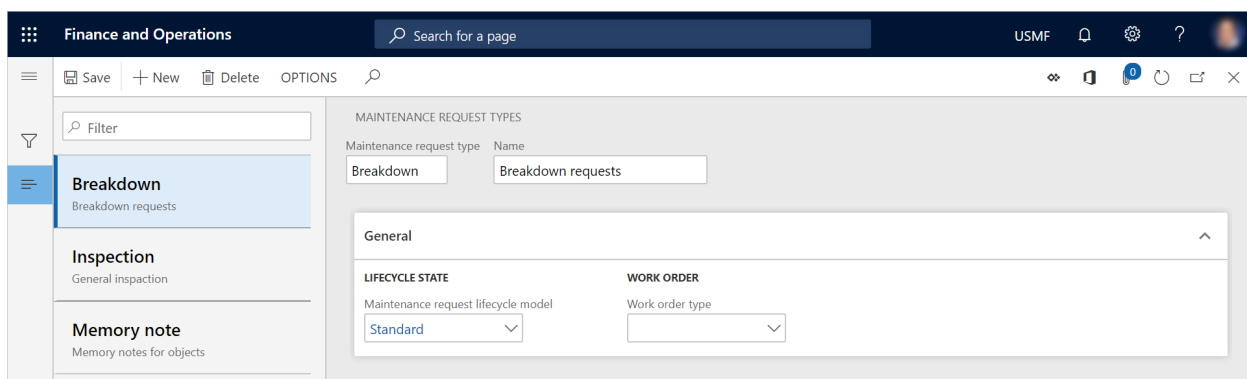
2/18/2021 • 2 minutes to read • [Edit Online](#)

Maintenance request types are used to categorize maintenance requests. For example, you might have maintenance request types that are related to preventive maintenance and corrective maintenance. Or you might have a special maintenance request type that is used to manage repair of assets (depot repair).

A maintenance request type defines the affiliation with a maintenance request lifecycle state group (maintenance lifecycle model). Maintenance request lifecycle models define the lifecycle states that can be set for a maintenance request. (Examples of maintenance request lifecycle states include **Created**, **Active**, and **Ended**.)

1. Select **Asset management > Setup > Maintenance requests > Maintenance request types**.
2. Select **New** to create a maintenance request type.
3. In the **Maintenance request type** field, enter an ID for the maintenance request type.
4. In the **Name** field, enter a name.
5. On the **General** FastTab, in the **Maintenance request lifecycle model** field, select a maintenance request lifecycle model.
6. In the **Work order type** field, select a work order type. When a maintenance request is converted to a work order, the work order automatically gets the work order type that is related to the maintenance request type.

The following illustration shows an example of the **Maintenance request types** page.



The screenshot shows the Dynamics 365 Finance and Operations interface for the 'Maintenance Request Types' page. The top navigation bar includes 'Finance and Operations', a search bar, and user information 'USMF'. The main area is divided into a left-hand navigation pane and a main content area. The left pane has a filter box and three sections: 'Breakdown' (Breakdown requests), 'Inspection' (General inspection), and 'Memory note' (Memory notes for objects). The main content area is titled 'MAINTENANCE REQUEST TYPES' and contains a table with two columns: 'Maintenance request type' and 'Name'. The first row shows 'Breakdown' and 'Breakdown requests'. Below the table is a 'General' FastTab with two sections: 'LIFECYCLE STATE' and 'WORK ORDER'. The 'LIFECYCLE STATE' section has a 'Maintenance request lifecycle model' dropdown menu set to 'Standard'. The 'WORK ORDER' section has a 'Work order type' dropdown menu.

NOTE

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Responsible maintenance workers

2/18/2021 • 2 minutes to read • [Edit Online](#)

Responsible maintenance workers can be related to asset types, assets, functional locations, maintenance job type categories, maintenance job types, maintenance job type variants, and trades. They can be used on work orders and maintenance requests to indicate a preference about the maintenance workers who should be responsible for a work order. (However, those maintenance workers aren't necessarily the same workers who are scheduled to carry out the work order.) Use of this functionality is optional. For example, it can be used to select responsible workers or worker groups for specific work types or work areas.

During a work order lifecycle or a maintenance request lifecycle, responsible maintenance workers can be changed or updated. This change or update might be related to, for example, a change in the maintenance request lifecycle state or the work order lifecycle state.

The setup on the **Responsible maintenance workers** page is *not* used during work order scheduling.

NOTE

In Asset Management, you can also set up *preferred* maintenance workers who might be allocated to work orders during work order scheduling.

Before you can set up responsible maintenance workers, you must set up the workers and maintenance worker groups that should be available for selection. For information about how to set up workers and maintenance worker groups, see [Maintenance workers and worker groups](#).

Set up responsible maintenance workers

1. Select **Asset management > Setup > Workers > Responsible maintenance workers**.
2. Select **New** to create a record.
3. First create a default responsible maintenance worker or responsible maintenance worker group setup, where you set only the **Responsible maintenance worker group** field and/or the **Responsible worker** field. Leave the remaining fields blank. This default setup will be used during work order scheduling if no other, more specific combination matches the contents of the work order.

NOTE

During creation of a maintenance request, when a responsible maintenance worker or responsible maintenance worker group is made available for selection on the **All maintenance requests** page, Asset Management goes through all responsible maintenance worker records to check for a possible match. It always checks the most specific combination first. In other words, Asset Management first checks for a match for the **Trade** field. If no match is found, it checks for a match for the **Maintenance job type variant** field. If no match is found, it checks for a match for the **Maintenance job type** field, and so on. As you can see in the layout of the page, this behavior means that, to find the most specific combination, Asset Management checks each record from right to left for a match (first **Trade**, then **Maintenance job type variant**, then **Maintenance job type**, then **Maintenance job type category**, then **Functional location**, then **Asset**, and finally **Asset type**). If no match is found, the default record that has no selections in those seven fields is used.

The following illustration shows an example of the **Responsible maintenance workers** page.

Finance and Operations

Search for a page

USMF

Save + New Delete OPTIONS

RESPONSIBLE MAINTENANCE WORKERS

Filter

Asset type ↑	Asset ↑	Functional location ↑	Maintenance job type category ↑	Maintenance job type ↑	Maintenance job type variant ↑	Trade ↑	Responsible maintenance worker group ↑	Resp
				Cal. Air			Hydraulic	
				Ad hoc			Electrical	Pila

NOTE

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Maintenance requests

2/18/2021 • 2 minutes to read • [Edit Online](#)

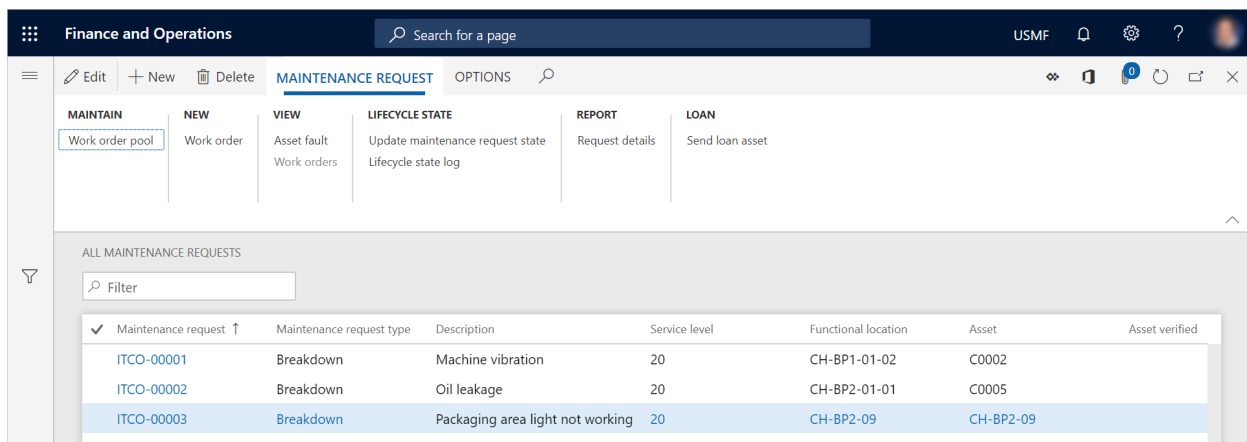
Maintenance requests are notes or declarations that are created to notify a manager or planner that an asset might require a maintenance or repair job, but without creating a work order. If the contents of a maintenance request are considered valid, a work order can then be created based on the maintenance request.

Maintenance requests can be created for any asset in Asset Management. Various types of maintenance requests can be created, depending on how your company uses maintenance requests. Here are some examples:

- Maintenance requests
- Notes
- Corrections or enhancements
- Investments
- Depot repair (This type is used when you receive assets from another location so that you can do a maintenance or repair job, and you then return the asset after the job is completed.)

View maintenance requests

To view maintenance requests, select **Asset management > Common > Maintenance requests > All maintenance requests**, **Active maintenance requests**, or **My functional location maintenance requests**. Each list page shows some of the information that is related to a maintenance request.



Maintenance request	Maintenance request type	Description	Service level	Functional location	Asset	Asset verified
ITCO-00001	Breakdown	Machine vibration	20	CH-BP1-01-02	C0002	
ITCO-00002	Breakdown	Oil leakage	20	CH-BP2-01-01	C0005	
ITCO-00003	Breakdown	Packaging area light not working	20	CH-BP2-09	CH-BP2-09	

NOTE

Use the **My functional location maintenance requests** list page to view a list of maintenance requests that contain either functional locations that you're related to as a worker or assets that are installed on functional locations that you're related to as a worker. (For information about how to set up functional locations on maintenance workers, see [Maintenance workers and worker groups](#).)

Although customer account information is available in Asset Service Management (external maintenance), it isn't available in Asset Management (internal maintenance).

To open the details view of a record, on the **All maintenance requests** list page, in the grid view, select a link in the **Maintenance request** column.

Finance and Operations Search for a page USMF

MAINTENANCE REQUEST OPTIONS

MAINTAIN NEW VIEW LIFECYCLE STATE REPORT LOAN

Work order pool Work order Asset fault Update maintenance request state Request details Send loan asset

Work orders Lifecycle state log

ALL MAINTENANCE REQUESTS

ITCO-00001: Machine vibration

General ITCO-00001

IDENTIFICATION	LOCATION	STARTED	DETAILS
Maintenance request ITCO-00001	Longitude 0.0000000000	Started by Julia Funderburk	Number of faults 1
Maintenance request type Breakdown	Latitude 0.0000000000	Actual start 7/17/2019 01:00:17 AM	Work order pools
Description Machine vibration	RESPONSIBLE Responsible group Requests	Actual end	LIFECYCLE STATE Current lifecycle state New
Service level 20	Responsible		Active Yes <input checked="" type="checkbox"/>

Notes

Asset

ASSET	ASSET	JOB	WORK ORDER
Functional location CH-BP1-01-02	Name Conveyor Belt 0002	Maintenance job type Inspection	Maintenance downtime
Asset C0002	Asset type Conveyor	Maintenance job type variant	Work order
VERIFIED Asset verified No <input type="checkbox"/>	Manufacturer	Trade	
Verified by	Model		

Inbound / outbound

The buttons on the Action Pane are organized on tabs. The following table briefly describes the buttons that are related to Asset Management.

BUTTON NAME	DESCRIPTION
Edit	Edit the selected maintenance request.
New	Create a new maintenance request.
Delete	Delete the selected maintenance request.
Work order pool	Connect the selected maintenance request to a work order pool.
Work order	Create a work order, based on the selected maintenance request.
Asset fault	Click Asset faults , where you can create a fault registration on the selected maintenance request.
Work orders	Show a list of all work orders that are connected to the selected maintenance request.

BUTTON NAME	DESCRIPTION
Update maintenance request state	Update the maintenance request state.
Lifecycle state log	View a log that shows the lifecycle states of the selected maintenance request.
Maintenance request details	Print a report that shows details of the selected maintenance request.
Send loan asset	Select a loan asset that should be a temporary replacement for the asset that is selected on the selected maintenance request.
Return loan asset	Register the loan asset as returned.

NOTE

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Create maintenance requests

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Maintenance requests can be used if maintenance workers or production workers discover that equipment requires repair, but the repair job can't be done right away.

Example: While a maintenance worker is making a repair, she discovers that another asset at the same location must be serviced. However, the maintenance worker doesn't have the time or the required spare parts to do the repair job. Therefore, she creates a maintenance request on the asset and enters a short description of the issue.

The **Active maintenance requests** section of the **Related information** pane on the right side of the **All assets** or **Active assets** page (**Asset management** > **Common** > **Assets** > **All assets** or **Active assets**) shows the active maintenance requests that are attached to the selected asset.

1. Select **Asset management** > **Common** > **Maintenance requests** > **All maintenance requests** or **Active maintenance requests**.
2. Select **New**.
3. In the **Create request** dialog box, in the **Maintenance request type** field, select the type of maintenance request. A default type is suggested.
4. In the **Description** field, enter a name or title that briefly describes the maintenance request.
5. In the **Functional location** and **Asset** fields, select a functional location or an asset, or a combination of a functional location and an asset, as you require. You can create a maintenance request without selecting an asset, and the asset can be added to the maintenance request later. If the maintenance worker who is signed in is related to a resource that is related to an asset, the **Asset** field is automatically set.

If a maintenance request is already attached to the selected asset, a message bar appears at the top of the **Create request** dialog box to notify you about the ID of the existing maintenance request. A message bar also notifies you if the asset is covered by a warranty agreement.
6. In the **Service level** field, select a service level that indicates the urgency of the request.
7. If you selected an asset in step 5, you can use the **Fault symptom**, **Fault area**, and **Fault type** fields to create a fault registration.
8. If the maintenance request has caused maintenance downtime, enter the start date and time of the downtime.

The **Started by** field is automatically set to your name.
9. The **Actual start** field is automatically set to the current date and time. However, you can change the value as you require.
10. In the **Notes** field, enter any additional notes that are required.
11. Select **OK**.

Finance and Operations Search for a page

MAINTENANCE REQUEST OPTIONS

MAINTENANCE REQUEST

Maintenance request: Pneumatic

ITCO-00004

Maintenance request type: Breakdown

Description: Visible cracks

Fault type: Unfortunate

MAINTENANCE DOWNTIME

Maintenance downtime

ASSET

Functional location: CH-BP2-09

Asset: Pi0022

Service level: 20

FAULT

Fault symptom: Air Leak

STARTED

Started by: Julia Funderburk

Actual start: 7/19/2019 08:02:51 AM

NOTES

There appears to be visible cracks on the copper pipe.

OK Cancel

Maintenance request	Maintenance request type	Description
ITCO-00001	Breakdown	Machine vibration
ITCO-00002	Breakdown	Oil leakage
ITCO-00003	Breakdown	Packaging area light not worki

Subsequent processing of maintenance requests

After a maintenance request is created, but before it's converted to a work order, various information should be updated on it. Typically, a planner or another administrative employee completes this task.

- On the **All maintenance requests** or **Active maintenance requests** page, select the request to work with, and then select **Edit**.

In the details view, you can update various information. Here are some examples:

- Select and verify the asset. If you must select a different asset later, you can set the **Asset verified** option to **No**.
- Select a responsible maintenance worker group and/or a responsible maintenance worker. For more information about the required setup, see [Responsible maintenance workers](#).
- Select a maintenance job type and, if this information is relevant, a related maintenance job variant and a job trade.
- In the **Latitude** and **Longitude** fields, enter geographic coordinates. Any coordinates that are added to a maintenance request are automatically transferred to a related work order.

Finance and Operations Search for a page USMF

Save + New Delete MAINTENANCE REQUEST OPTIONS

MAINTAIN NEW VIEW LIFECYCLE STATE REPORT LOAN
 Work order pool Work order Asset fault Update maintenance request state Request details Send loan asset
 Work orders Lifecycle state log

ALL MAINTENANCE REQUESTS
ITCO-00001: Machine vibration

General ITCO-00001

IDENTIFICATION	LOCATION	STARTED	DETAILS
Maintenance request ITCO-00001	Longitude 0.0000000000	Started by Julia Funderburk	Number of faults 1
MAINTENANCE REQUEST Maintenance request type Breakdown Description Machine vibration Service level 20	Latitude 0.0000000000 RESPONSIBLE Responsible group Requests Responsible	Actual start 7/17/2019 01:00:17 AM Actual end	Work order pools LIFECYCLE STATE Current lifecycle state New Active Yes

Notes

Asset

ASSET	ASSET	JOB	WORK ORDER
Functional location CH-BP1-01-02 Asset C0002 VERIFIED Asset verified No Verified by	Name Conveyor Belt 0002 Asset type Conveyor Manufacturer Model	Maintenance job type Inspection Maintenance job type variant 6-Month Trade Pneumatic	Maintenance downtime Work order

Inbound / outbound

NOTE

If you select an asset when you create a maintenance request, you can add one fault to the asset. After the maintenance request has been created, you can add more faults, as you require. To add faults, select **Asset fault** on the **All maintenance requests** page.

NOTE

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Create work orders from maintenance requests

2/18/2021 • 2 minutes to read • [Edit Online](#)

After you've created maintenance requests, you can easily convert them to work orders. This topic describes the quickest way to work with maintenance requests, update several maintenance requests at the same time, and then create a work order for several maintenance requests at the same time. On the **Active maintenance requests** or **My functional location maintenance requests** page, you can also work with one maintenance request at a time and convert one maintenance request to a work order.

NOTE

Every maintenance request can be related to only one work order. However, multiple maintenance requests can be included in one work order, even if the maintenance requests have different assets.

1. Select **Asset management > Common > maintenance requests > All maintenance requests**.
2. Before you can create a work order from maintenance requests, you must select, at a minimum, a maintenance job type for the maintenance requests, and also a maintenance job type variant and trade, if this information is relevant. In the grid view, you can easily update information for a maintenance request.
3. When you're ready to create a work order, select the maintenance requests to include in it.
 - If you select several maintenance requests to convert to a work order, both the **Asset** field and the **Maintenance job type** field must be set before you create the work order.
 - If you select one maintenance request to convert to a work order, only the **Asset** field must be set before you create the work order. However, when you create the work order, you can select a maintenance job type (and a related maintenance job type variant and trade, if this information is relevant) in the **Create work order** dialog box.
4. Select **Work order**.
5. In the **Create work order** dialog box, set the fields, and then select **OK**.

A message bar might notify you that a new work order has been created.

Additionally, when you create a work order that is based on a maintenance request, if the asset that is related to the maintenance request is included in a warranty agreement, a message bar notifies you about the warranty agreement.

6. Select **Asset management > Common > Work orders > All work orders**, and open the new work order.

Finance and Operations Preview USMF

Search for a page

WORK ORDER GENERAL OPTIONS

MAINTAIN: Work order pool, Adjust
 NEW: Related work order, Copy work order
 VIEW: Event history
 LINES: Notes, Tools, Checklist
 ASSET: Asset fault, Production stop, Condition assessment, Asset counters
 PROJECT: Forecast, Journals, Project transactions
 STAGE: Update work order state, Stage log
 ATTACHMENTS: Asset documents

ALL WORK ORDERS

Filter

Work order	Work order type	Description	Lines	Priority	Criticality	Start date
JPMF-00001	Corrective	Fix the ball bearing	1	20	3 Low	6/7/2018
JPMF-00003	Preventive	Motor showing wear	1	20	3 Low	6/14/2018
JPMF-00005	Corrective	Excessive vibration	1	20	3 Low	6/11/2018

Related information

NOTE

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Asset loans

2/18/2021 • 2 minutes to read • [Edit Online](#)

If your company receives assets for repair or maintenance jobs from either internal locations or customers, and if you temporarily loan assets to those locations or customers, Asset Management can track the asset loans.

Register asset loans on a maintenance request

1. Select **Asset management > Common > Maintenance requests > All maintenance requests or Active maintenance requests**.
2. Select the maintenance request to register an asset loan on, and then select **Edit**.
3. On the **Request** page, select **Send loan asset**.
4. Select the asset, and enter the expected return date.
5. Select **OK**.

NOTE

- You can send a loan asset only if an asset of the same asset type is available.
- The asset that you loan must have an asset lifecycle state that allows it to be used as a loan asset, such as **InStorage**. When the asset loan is registered, the asset lifecycle state of the asset is automatically updated to, for example, **OnLoan**.

To view a list of all the assets that you've loaned to other locations or customers, select **Asset management > Common > Asset loan > All asset loans**. If the **Ended** check box is selected for an asset, the asset has been registered as returned to your company.

Loan	Loan asset	Sent	Expected return	Returned	Asset
✓ GBSI-00001	C0008	7/19/2019 08:28:56 AM	7/26/2019 12:00:00 PM		C0007

On the **Active asset loans** page, you can view a list of all the loan assets that haven't yet been returned to your company.

Register loan assets as returned

1. Select **Asset management > Common > Asset loan > Active asset loans**.
2. Select the asset loan to register as returned, and then select **Return asset loan**.
3. In the **Returned** field, enter the date and time.
4. Select **OK**.
5. Refresh the **Active asset loans** list page, and notice that the asset loan no longer appears in the list.

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Inbound and outbound assets

2/18/2021 • 2 minutes to read • [Edit Online](#)

If your company does repair jobs or maintenance jobs on assets that are received from other locations or customers, Asset Management can track both inbound assets that are on their way to your company and outbound assets that are being returned.

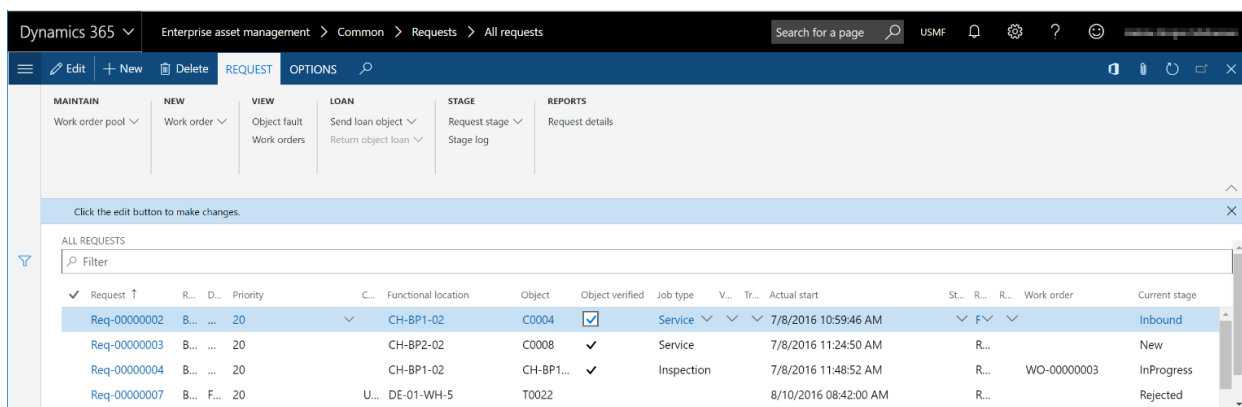
NOTE

If you want to use inbound and outbound lifecycle states to manage assets that are coming in and being returned, you must set up maintenance request lifecycle states and lifecycle models to support these actions. For more information, see [Maintenance requests](#).

The setup of Asset Management determines whether you can work with inbound and outbound assets.

Register assets as inbound

1. Select **Asset management > Common > Maintenance requests > Active maintenance requests**.
2. Select the maintenance request.
3. Select **Update maintenance request state**.
4. Select **Inbound** (or another lifecycle state that you've created for inbound assets), and then select **OK**.



The screenshot shows the Dynamics 365 interface for Enterprise asset management. The breadcrumb navigation is 'Enterprise asset management > Common > Requests > All requests'. The main area displays a table of 'ALL REQUESTS' with columns for Request ID, Priority, Functional location, Object, Object verified, Job type, Actual start, Work order, and Current stage. The first row is selected and highlighted in blue, showing 'Req-00000002' with 'Inbound' as the current stage.

Request	R...	D...	Priority	C...	Functional location	Object	Object verified	Job type	V...	Tr...	Actual start	St...	R...	R...	Work order	Current stage
Req-00000002	B...	...	20		CH-BP1-02	C0004	<input checked="" type="checkbox"/>	Service			7/8/2016 10:59:46 AM		F			Inbound
Req-00000003	B...	...	20		CH-BP2-02	C0008	<input checked="" type="checkbox"/>	Service			7/8/2016 11:24:50 AM		R...			New
Req-00000004	B...	...	20		CH-BP1-02	CH-BP1...	<input checked="" type="checkbox"/>	Inspection			7/8/2016 11:48:52 AM		R...		WO-00000003	InProgress
Req-00000007	B...	F...	20	U...	DE-01-WH-5	T0022					8/10/2016 08:42:00 AM		R...			Rejected

Register inbound assets as received

1. Select **Asset management > Common > Inbound/outbound > Inbound assets**.
2. Select the asset or maintenance request.
3. Select **Receive assets**.
4. In the **Received** field, enter the date and time. Then select **OK**. The record is removed from the **Inbound assets** list page.

Expected arrival	Request	Object	Name	Customer account	Object type	Current stage
9/22/2016 11:17:03 AM	Req-00000002	C0004	Conveyor Belt 0004		Conveyor	Inbound

Register assets as outbound

When you've completed the maintenance or repair job, you can register the asset as returned.

1. Select **Asset management > Common > Maintenance requests > Active maintenance requests**.
2. Select the maintenance request.
3. Select **Update maintenance request state**.
4. Select **Outbound** (or another lifecycle state that you've created for outbound assets), and then select **OK**.

Register outbound assets as delivered

1. Select **Asset management > Common > Inbound/outbound > Outbound assets**.
2. Select the asset or maintenance request.
3. Select **Deliver assets**.
4. In the **Delivered** field, enter the date and time. Then select **OK**. The record is removed from the **Outbound assets** list page.

NOTE

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Maintenance request reports

2/18/2021 • 2 minutes to read • [Edit Online](#)

In Asset Management, you can generate two reports that are related to maintenance requests. One report shows details, and the other report provides a list that can be used for planning and follow-up.

Create a Maintenance request details report

The **Maintenance request details** report shows various information that is related to maintenance requests.

1. Select **Asset management > Reports > Maintenance requests > Maintenance request details**.
2. On the **Records to include** FastTab, you can select specific maintenance requests to include on the report.
3. On the **Run in the background** FastTab, you can set up report generation as a batch job, as you require.
4. Select **OK** to generate the report.

The following illustration shows an example of the **Maintenance request details** report.

The screenshot shows the 'Request details ITCO-00001' report. The report title is 'Request details ITCO-00001' with the subtitle 'Contoso Entertainment System USA'. The page number is 'Page 1 of 4' and the date/time is '7/19/2019 8:44 AM'. The report is organized into several sections:

Maintenance request	Maintenance request type	Description	Priority
ITCO-00001	Breakdown	Machine vibration	20

Responsible group	Responsible	Lifecycle state
Requests		New

Started by	Actual start
Julia Funderburk	7/17/2019 1:00:17 AM

Functional location	Asset	Name
CH-BP1-01-02	C0002	Conveyor Belt 0002

Asset type	Manufacturer	Model
Conveyor		

Asset verified	Verified by
No	

Maintenance downtime	Work order

Fault symptom	Fault area	Fault type	Fault date
Excessive Noise	Mechanical	Harmful	7/16/2019

There is also a 'Note' section at the bottom of the report.

Create a Maintenance request list report

The **Maintenance request list** report shows a list of all maintenance requests of the same request type.

1. Select **Asset management > Reports > Maintenance requests > Maintenance request list**.
2. On the **Records to include** FastTab, you can make selections to define which maintenance requests are included on the report.
3. On the **Run in the background** FastTab, you can set up report generation as a batch job, as you require.
4. Select **OK** to generate the report.

The following illustration shows an example of the **Maintenance request list** report for all active maintenance requests.

Finance and Operations USMF

Search for a page

OPTIONS

Go to ◀ ▶ Find 🔍 Zoom 🔄 Export 🖨️

Maintenance requests Page 1 of 1
7/19/2019
8:45 AM

Contoso Entertainment System USA

Maintenance request	Maintenance request type	Priority	Description	Actual start	Functional location	Asset	Maintenance downtime	Maintenance worker group	Responsible	Started by	Lifecycle state
ITCO-00001	Breakdown	20	Machine vibration	7/17/2019 10:0:17 AM	CH-BP1-01-02	C0002		Requests		Julia Funderburk	New
ITCO-00002	Breakdown	20	Oil leakage	7/19/2019 6:28:26 AM	CH-BP2-01-01	C0005		Requests		Julia Funderburk	New
ITCO-00003	Breakdown	20	Packaging area light not working	7/19/2019 6:28:58 AM	CH-BP2-09	CH-BP2-09		Requests		Julia Funderburk	New
ITCO-00006	Breakdown	20	Belt slack	7/19/2019 8:27:54 AM	CH-BP2-01-03	C0007				Julia Funderburk	InProgress

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Maintenance job type categories and maintenance job types, maintenance job type variants, maintenance job trades, and maintenance checklists

2/18/2021 • 19 minutes to read • [Edit Online](#)

An asset type is attached to every asset. Asset types define the maintenance job types (and therefore, the maintenance jobs) that can be performed on assets. When you create a work order, you must select a maintenance job type. You can select only the maintenance job types that are related to the setup of the asset type that is used for the asset.

For a graphical overview of assets and maintenance job types, and their connection to work orders, see [Functional locations and assets](#).

Maintenance job type variants can be set up on a maintenance job type. Maintenance job type variants define variations of a job type, such as sizes (small, medium, or large), periods (weekly, biweekly, one month, or three months), and configurations (low standard, flexible, or high performance).

Maintenance job trades provide information about professional trades, such as mechanical, electrical, and hydraulic trades. Competency requirements can be set up on a maintenance job trade. All maintenance job trades can be used in relation to all maintenance job types. Selection of a maintenance job type variant and/or maintenance job trade on a work order is optional.

For each maintenance job type, variations of the maintenance job type setup can be created. For example, if you have a maintenance job type that is named **Service**, you can create the following variations for that maintenance job type: **Trucks 30,000 km**, **Cars 30,000 km**, and **Vans 30,000 km**.

Maintenance job type categories are used to collect a group of maintenance job types for overview purposes. Examples of maintenance job type categories might include **Calibration**, **Inspection**, **Overhaul**, and **Instrumentation**.

Maintenance checklist templates and maintenance checklist variables are used to set up maintenance checklists. Maintenance checklists are set up on maintenance job types and used on work orders.

You first set up the required maintenance job type categories, maintenance job type variants, and maintenance job trades. You then create maintenance job types. Finally, on the **Maintenance job type defaults** page, you create all the variations of maintenance job types that are required for your equipment. On that page, you can also set up forecasts, maintenance checklists, and tools for a combination of maintenance job types.

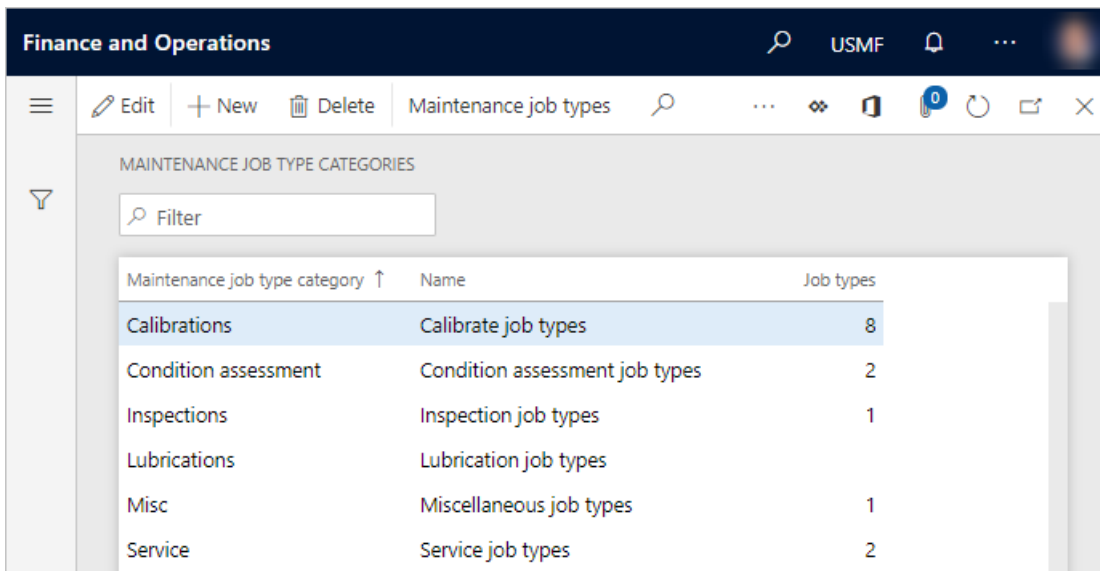
NOTE

A maintenance job type can be related to only one maintenance job type category.

Create a maintenance job type category

1. Select **Asset management > Setup > Jobs > Maintenance job type categories**.
2. Select **New**.
3. In the **Maintenance job type category** field, enter an ID for the maintenance job type category.
4. In the **Name** field, enter a name.

After you relate maintenance job type categories to maintenance job types, the **Job types** field shows the number of maintenance job types that are related to this maintenance job type category.

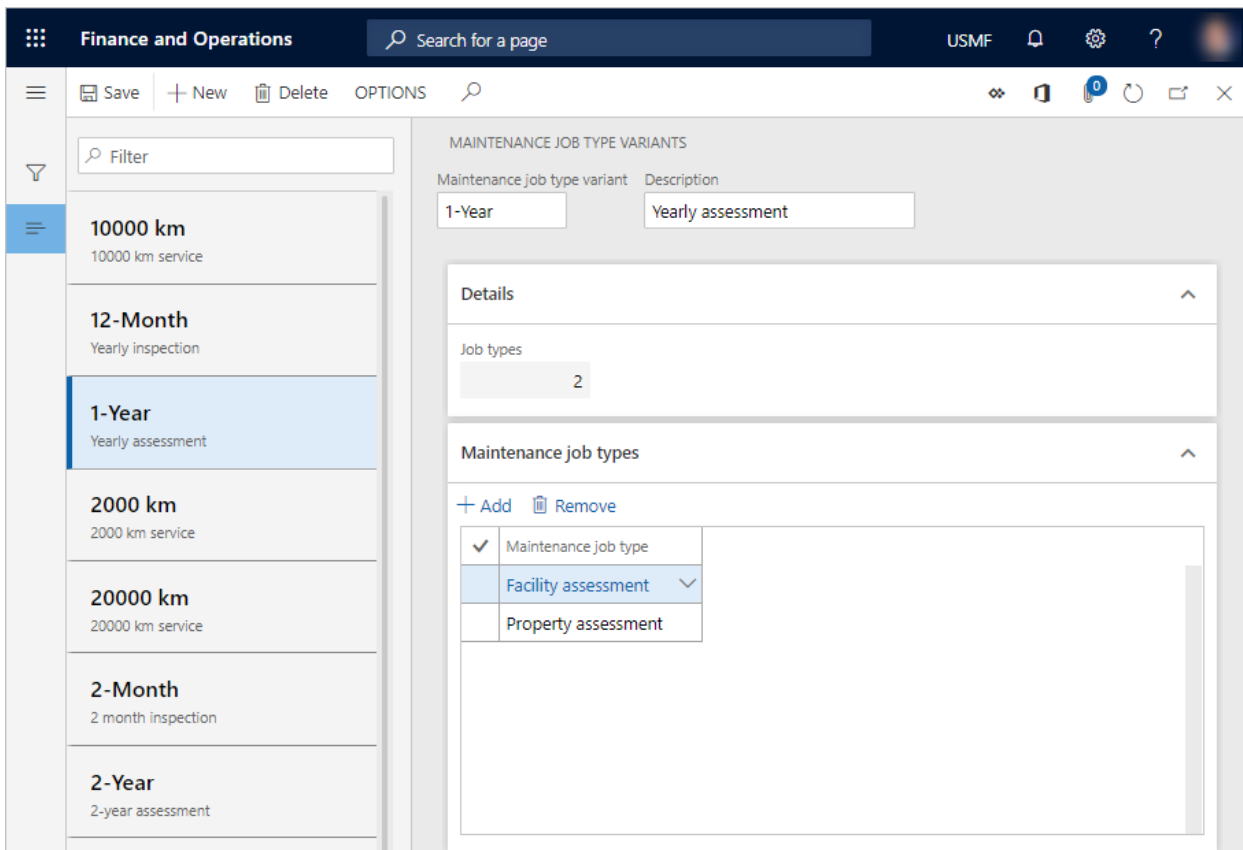


Maintenance job type category ↑	Name	Job types
Calibrations	Calibrate job types	8
Condition assessment	Condition assessment job types	2
Inspections	Inspection job types	1
Lubrications	Lubrication job types	
Misc	Miscellaneous job types	1
Service	Service job types	2

Create a maintenance job type variant

1. Select **Asset management > Setup > Jobs > Maintenance job type variants**.
2. Select **New**.
3. In the **Maintenance job type variant** field, enter an ID for the maintenance job type variant.
4. In the **Description** field, enter a description.
5. On the **Maintenance job types** FastTab, select **Add** to add a maintenance job type.
6. In the **Maintenance job type** field, select the maintenance job type.
7. Repeat steps 5 through 6 to add more maintenance job types to the maintenance job type variant.

On the **Details** FastTab, the **Job types** field shows the number of maintenance job types that have been added to this maintenance job type variant.

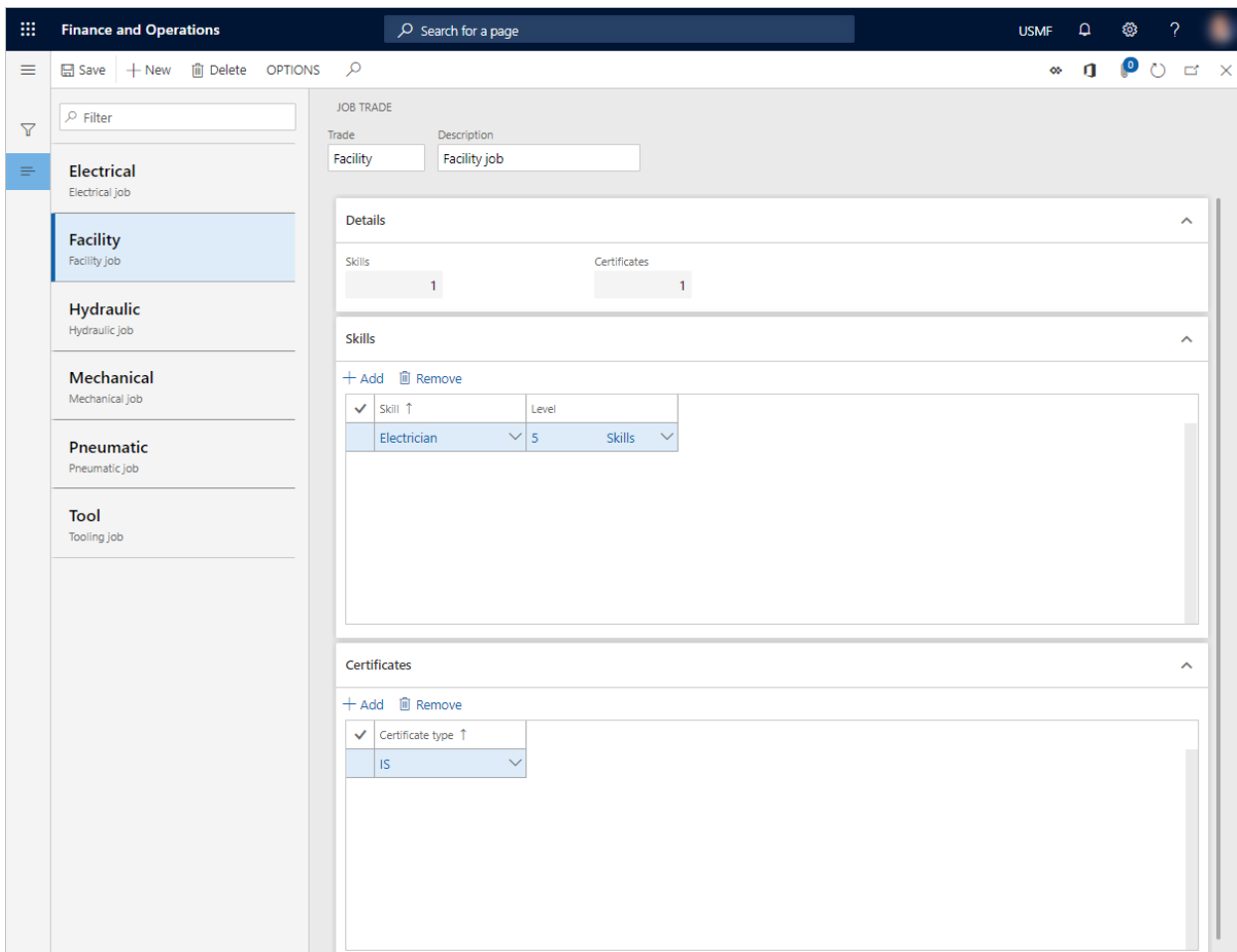


Create a maintenance job trade

1. Select **Asset management > Setup > Jobs > Maintenance job trade**.
2. Select **New**.
3. In the **Trade** field, enter an ID for the maintenance job trade.
4. In the **Description** field, enter a description.
5. On the **Skills** FastTab, select **Add** to add a new skill that should be related to the maintenance job trade.
6. In the **Skill** field, select the skill.
7. In the **Level** field, select the skill level.
8. Repeat steps 5 through 7 to add more skills to the maintenance job trade.
9. On the **Certificates** FastTab, select **Add** to add a certificate to the maintenance job trade.
10. In the **Certificate type** field, select the certificate.
11. Repeat steps 9 through 10 to add more certificates to the maintenance job trade.

On the **Details** FastTab, the **Skills** field shows the number of skills that have been added to this maintenance job trade.

On the **Details** FastTab, the **Certificates** field shows the number of certificates that have been added to this maintenance job trade.



Create a maintenance checklist variable

When you create maintenance checklist lines in the maintenance job type default, you must select a maintenance checklist type. **Variable** is one maintenance checklist type. It's used to define a possible result in a range on a maintenance checklist line that is related to a work order line. A variable lets you create a set of predefined outcomes without having to make an exact measurement.

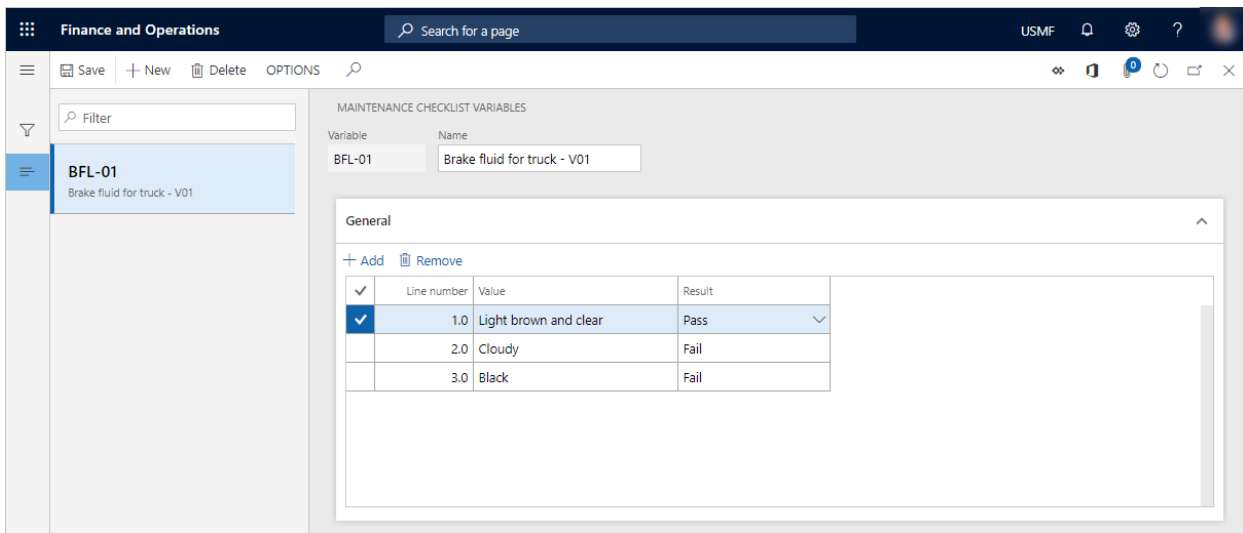
Example 1: You can measure oil level by defining three values: **Level too high**, **Level too low**, and **Level within range**. For each value, you define whether the value result is **Pass**, **Fail**, or **None**.

Example 2: You make a visual inspection of a piece of equipment to assess wear and tear.

1. Select **Asset management > Setup > Maintenance checklists > Maintenance checklist variables**.
2. Select **New**.
3. In the **Variable** field, enter an ID for the maintenance checklist variable.
4. In the **Name** field, enter a name.
5. On the **General** FastTab, select **Add** to add a line for a variable.

A sequential line number is automatically entered in the **Line number** field. After you've added all the lines, you can change the line numbers as you require. When you select line and then press the **Down arrow** key, the next number in the sequence is automatically entered on the next line.

6. In the **Value** field, enter a value description.
7. In the **Result** field, select a result for the line.



Create a maintenance checklist template

Maintenance checklist templates can be used as a common set of tasks that a worker must perform to complete a work order correctly. The templates are referenced from maintenance checklist lines on the maintenance job type default. Templates can be referenced across multiple maintenance job type default lines. Therefore, you can easily reuse a set of common maintenance checklist tasks. Examples of maintenance checklist templates include general safety instructions, and a list of items and conditions that must be checked on a specific pump or similar models of a conveyor belt.

1. Select **Asset management > Setup > Maintenance checklists > Maintenance checklist templates**.

2. Select **New**.

A template ID is automatically entered in the **Maintenance checklist template** field.

3. In the **Name** field, enter a name for the maintenance checklist template.

4. On the **Maintenance checklist lines** FastTab, select **Add** to add a template line.

A sequential line number is automatically entered in the **Line number** field. After you've added all the lines, you can change the line numbers as you require. When you select line and then press the **Down arrow** key, the next number in the sequence is automatically entered on the next line.

5. In the **Type** field, select a type for the maintenance checklist line. For each maintenance checklist type, the **Line details** FastTab shows related fields. The following values are available:

- **Text** – The line has text that describes what to do. Use this maintenance checklist type if you want a worker to check or inspect something, but you don't expect a specific (measurable) result. After you select this type, enter a name or heading in the **Name** field. In the **Instructions** field, enter a description of what must be done. If the step is mandatory for the maintenance checklist, set the **Mandatory** option to **Yes**.
- **Header** – The line is used as a heading to group the maintenance checklist lines that appear below it. This type is useful if you have several maintenance checklist lines that can be divided into specific areas. Headers provide an overview for the worker who will complete a maintenance checklist that has many maintenance checklist lines. After you select this type, enter a descriptive name in the **Name** field.
- **Template** – The line is used to make a reference to an existing template. After you select this type, enter a name for the template in the **Name** field. In the **Template** field, select the template.
- **Variable** – The line is used to define a possible result in a range. For information about how to set

up maintenance checklist variables, see the [Create a maintenance checklist variable](#) section. After you select this type, enter a descriptive name for the variable in the **Name** field. In the **Variable** field, select the variable. In the **Instructions** field, enter a description of what must be done. If the step is mandatory for the maintenance checklist, set the **Mandatory** option to **Yes**.

- **Measurement** – The line is used to record a specific measurement. You can set up the measurement that should be related to a predefined counter. After you select this type, enter a name for the template in the **Name** field. If this step is mandatory for the maintenance checklist, set the **Mandatory** option to **Yes**. If you want to use the measurement line as a counter registration, select the counter in the **Counter** field. The related **Unit** field is then automatically updated. If you've selected a counter, select the update method in the **Value** field. In the **Min. value** and **Max. value** fields, enter the allowed value range. In the **Instructions** field, enter a description of what must be done.

NOTE

Any line of the **Measurement** type that doesn't have a counter setup is treated as an independent measurement registration that there is no automatic follow-up for in Asset Management. Likewise, if the selected counter type isn't present on the asset that is related to the work order, the maintenance checklist task is treated as an independent measurement. The counter value can be changed multiple times. It isn't posted until the [work order lifecycle state](#) is changed to a state where the **Process maintenance checklist** option is set to **Yes**.

On the **Details** FastTab, the **Checks** field shows the total number of checklist lines in your template. This number includes the nested lines in any existing template that you've referenced in your template.

The screenshot shows the 'Maintenance Checklist Templates' page in Dynamics 365. The selected template is 'RUMF-00001' for 'Conveyor Belt - Model 120-122'. The 'Details' section shows 'Checks' as 2. The 'Maintenance checklist lines' table is as follows:

Line number	Type	ID	Name
1.0	Header		Inspection CB
2.0	Text		Check belt tension
3.0	Measurement	cm	Roller clearance

The 'Line details' section for the selected line shows the following configuration:

- Mandatory:** Yes (toggle)
- Unit:** cm
- Min value:** 2.00
- Max value:** 3.00
- Counter:** (dropdown)
- Update method:** Total
- Instructions:** (text area)

Create a maintenance job type

1. Select **Asset management > Setup > Jobs > Maintenance job types**.

2. Select **New**.
3. In the **Maintenance job type** field, enter an ID for the maintenance job type.
4. In the **Name** field, enter a name.

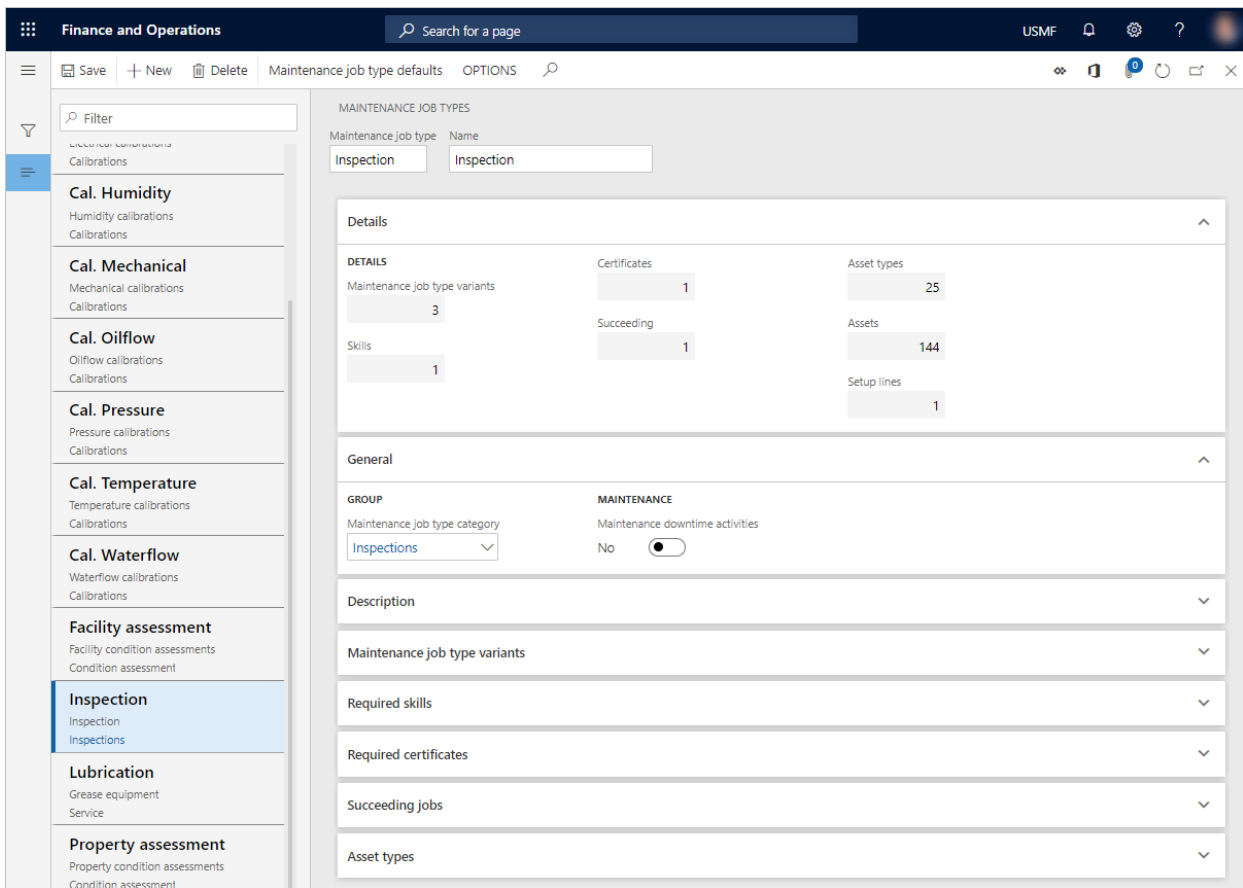
The **Details** FastTab shows an overview of the number of maintenance job type variants, skills, certificates, succeeding jobs, and asset types that have been created on this maintenance job type. The **Setup lines** field shows the number of maintenance job type default lines that have been set up on this maintenance job type. The **Assets** field shows the number of active assets that currently use this maintenance job type.

5. On the **General** FastTab, in the **Maintenance job type category** field, select a maintenance job type category.
6. Set the **Maintenance downtime activities** option to **Yes** if the maintenance job type requires a maintenance stop of the equipment before the job can be performed.
7. On the **Description** FastTab, enter a description of the maintenance job type.
8. On the **Maintenance job type variants** FastTab, you can add variants to the maintenance job type.
9. On the **Required skills** and **Required certificates** FastTabs, you can add skills and certificate requirements to the maintenance job type.
10. If a specific maintenance job type must be performed next, add it on the **Succeeding jobs** FastTab. You can also set up a maintenance job type variant and trade that are related to the maintenance job type. If the succeeding job should start a specific number of days before or after the job that uses this maintenance job type has started, enter the number of days in the **Delay by days** field. Positive numbers represent days after the start of the related job, and negative numbers represent days before the scheduled start of the related job. For example, if you enter 5, the succeeding job will start five days after the start of the job that is related to the maintenance job type. If you enter -3, the succeeding job will start three days before the scheduled start of the job that is related to the maintenance job type.

NOTE

If you add more than one maintenance job type line, the sequence of the lines indicates the order that they should be performed in. The sequence starts at the top of the list.

11. On the **Asset types** FastTab, you can add asset types to the maintenance job type.



Create maintenance job type default lines and related forecasts, maintenance checklists, tools, description, and attachments

1. Select **Asset management > Setup > Jobs > Maintenance job type defaults**.

–or–
Select **Asset management > Setup > Jobs > Maintenance job types**, select a maintenance job type, and then select **Maintenance job type defaults**.
2. Select **New**.
3. In the **Functional location**, **Asset type**, **Manufacturer**, **Model**, and **Asset** fields, select appropriate values, depending on how specific the maintenance job type default should be.
4. In the **Maintenance job type** field, select a maintenance job type if it wasn't automatically selected.
5. In the **Maintenance job type variant** and **Trade** fields, select a maintenance job type variant and a maintenance job trade as you require.
6. Select **Forecast**.
7. On the **Maintenance job type default forecast** page, you can make forecasts on hours, items, and expenses. On the relevant tabs, select **Add**, and make selections to create the required forecasts for the maintenance job type.
8. On the **Item forecast** tab, you can select inventory dimensions that should be shown on the item line. Select **Inventory > Dimensions**, select the dimensions to show, set the **Save setup** option to **Yes**, and then select **OK**.
9. On the **Item forecast** tab, select **Item where used** to see an overview of where the item on the selected line is used in Asset Management in relation to assets, maintenance job type default, spare parts, and work orders.

The **Maintenance forecast totals** FastTab shows an overview of forecast totals. This overview includes the total number of hours and forecast lines that have been created.

NOTE

To copy the forecast setup from another maintenance job type, select **Copy forecast**, and then select the maintenance job type to copy the setup from.

10. Select **Save** to save your changes.
11. Close the **Maintenance job type default forecast** page to return to the **Maintenance job type defaults** page.
12. Select **Maintenance checklist**.
13. On the **Maintenance job type defaults checklist** page, you can add maintenance checklist lines to the selected maintenance job type default. On the **Maintenance check lines** FastTab, select **New** to add a maintenance checklist line.

Line numbers are automatically entered in the **Line number** field to indicate the sequence of the maintenance checklist lines. You can edit line numbers as you require. After you've created the first maintenance checklist line, select the line, and then press the **Down arrow** key to add a line below it. Alternatively, you can select a maintenance checklist line and then select **New**. In this case, a new line is added above the selected maintenance checklist line.

14. In the **Type** field, select the line type, and then add information that is related to the maintenance checklist type. For a description of the available types and related fields, see the [Create a maintenance checklist template](#) section.

NOTE

To copy the maintenance checklist setup from another maintenance job type, select **Copy maintenance checklist**, and then select the maintenance job type to copy the setup from.

You can easily create a template from an existing maintenance checklist. You can then reuse the template across multiple maintenance checklists. The new template will be an exact copy of the active maintenance checklist. Select **Create template**, and then enter a name for the template. To replace the existing maintenance checklist with a single line that references the new template, set the **Replace** option to **Yes**. You can view the contents of the template in the **Maintenance checklist templates** details page.

15. Select **Save** to save your changes.
16. Return to the **Maintenance job type defaults** page.
17. Select **Tools**.
18. On the **Maintenance job type default tools** page, you can add the tools (resources) that should be used for the maintenance job type. Select **New**, and then select the tool in the **Resource** field.

NOTE

To copy the tool setup from another maintenance job type, select **Copy tools**, and then select the maintenance job type to copy the setup from.

19. Select **Save** to save your changes.
20. Return to the **Maintenance job type defaults** page.

21. Select **Work description**.
22. On the **Work description** page, select **Edit**, and then add a description that is related to the selected maintenance job type default, as you require.
23. Select **Save** to save the description.

If you add a work description here, it overrides any description that is set up for the maintenance job type on the **Maintenance job types** page. If you don't add a work description here, any description that is set up for the maintenance job type is used. Descriptions are automatically transferred to work orders that use the maintenance job type or maintenance job type default.

24. Return to the **Maintenance job type defaults** page.
25. To set up attachments on a selected maintenance job type default line, select **Attach documents**. Attachments that are set up on a maintenance job type default line are automatically included on work order lines that use that maintenance job type default line.
26. Select **New**, and then select a document type.
27. Upload the document or file.
28. Set the fields on the **Attachments** page. The attachment setup uses standard document setup functionality.
29. Select **Save** to save the attachment.

NOTE

Attachments on a maintenance job type default line are printed together with a work order report only if the document types of the attachments are selected on the **Document types** tab of the **Asset management parameters** page (**Asset management > Setup > Asset management parameters**). Examples of attachments include guidelines that explain how to complete a specific job or a predefined maintenance checklist (if you don't use the maintenance checklist functionality for maintenance job type default lines).

On the **Maintenance job type defaults** page, each line shows the number of forecasted hours, and also the number of lines that have been created for items, expenses, maintenance checklists, and tools. The **Assets** field shows the number of active assets that are related to the maintenance job type default line.

30. To copy a maintenance job type default to another maintenance job type default, select the maintenance job type default line to copy another setup to, select **Copy setup**, and then select the maintenance job type default to copy.
31. To view a list of the assets, maintenance plans, or maintenance rounds that currently use a maintenance job type default line, select the line, and then select **Used by**.

Maintenance job type	Maintenance job type v...	Trade	Functional location	Asset type	Manufacturer	Model	Asset	Hours	Items	Expenses	Checks	Tools	Assets	Used by
Ad hoc	Misc							1.00					144	
Cal. Air	Calibrations							1.00						
Cal. Electrical	Calibrations							1.00						
Cal. Humidity	Calibrations							1.00						
Cal. Mechanical	Calibrations							1.00						
Cal. Oilflow	Calibrations							1.00						
Cal. Pressure	Calibrations							1.00						
Cal. Temperat...	Calibrations							1.00						
Cal. Waterflow	Calibrations							1.00						
Facility assess...	Condition ass...							1.00					2	
Inspection	Inspections							1.00					144	
Lubrication	Service							1.00					36	
Property asses...	Condition ass...							1.00					14	
Service	Service							1.00					72	

When the system selects the available maintenance job type default that should be used on a work order line, the selection is based on the asset and the related asset type setup. Asset Management goes through all maintenance job type default records that are related to the maintenance job type that is related to the asset type to check for a possible match. It always checks the most specific combination first. In other words, to find the most specific combination, Asset Management first checks for a possible match for the **Trade** field. If no match is found, it checks for a match for the **Maintenance job type variant** field. If no match is found, it checks for a match for the **Maintenance job type** field, and so on (**Trade**, then **Maintenance job type variant**, then **Maintenance job type**, then **Asset**, then **Model**, then **Manufacturer**, and then **Asset type**). If no match is found, the default record where only the maintenance job type is selected is used.

A project activity ID is automatically related to each maintenance job type default line that you create. The project activity is created on the forecast project that is selected in the **Maintenance forecast project** field on the **Assets** tab of the **Asset management parameters** page. The purpose of the project activity is to manage forecasts on hours, items, and expenses in relation to work orders. Maintenance job type forecasts are automatically transferred to the work order line, and they are copied from the forecast project to the work order project that is created for the work order line. The purpose of the project activity is to manage forecasts in relation to work orders.

You can set up a batch job to update maintenance job type default references at regular intervals, or you can manually run the job. To create a batch job or run a manual update, select **Asset management > Periodic > Preventive maintenance > Update maintenance job type default references**.

Overview of maintenance job types that are related to assets

After you've created the required maintenance job type default combinations, you can use the **All assets** page to get an overview of the current maintenance job type default that is related to a specific asset. The overview shows all maintenance job type default combinations that can be used on the asset type that is selected for the asset. These combinations include combinations that have variations of maintenance job type variants and maintenance job trades.

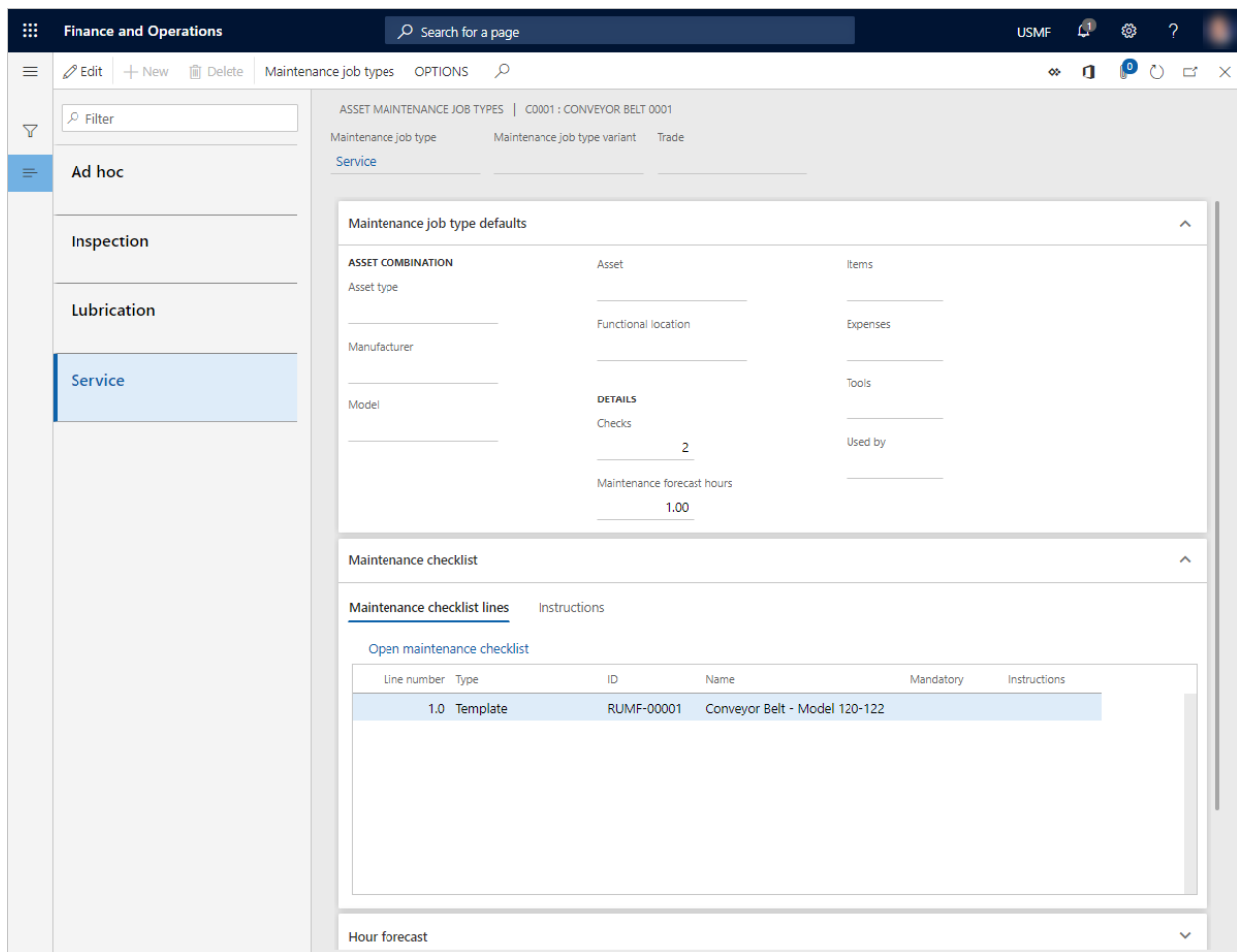
1. Select **Asset management > Common > Assets > All assets** or **Active assets**.
2. In the list, select the asset to see an overview of maintenance job type combinations for.
3. On the Action Pane, on the **General** tab, in the **Related information** group, select **Maintenance job types**.

The left pane of the **Asset maintenance job types** page shows a list of all the maintenance job type combinations that are related to the selected asset.

4. Select a maintenance job type combination to see the related setup for maintenance checklists, forecasts, and tools. The **Details** section on the **Maintenance job type defaults** FastTab shows the number of related maintenance checklists, forecasted hours, items, and so on, that are related to the selected

maintenance job type combination.

5. To view details for the selected maintenance job type, select **Maintenance job types**.



Automatic update of maintenance job type forecasts

In Asset Management, you can automatically update any changes to maintenance job type forecasts for hour costs, item costs, and expenses that have been updated in other modules. In this way, you help guarantee that your maintenance job type forecasts always use the latest cost prices.

1. Select **Asset management > Periodic > Forecast > Update maintenance job type forecast**.
2. In the **Update maintenance job type forecast** dialog box, on the **Records to include** FastTab, you can add selections for specific maintenance job types as you require. Select **Filter**, and then select **Select** to make the selections.
3. On the **Run in the background** FastTab, you can set up the automatic update as a batch job, as you require.
4. Select **OK** to start the forecast update.

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Work order lifecycle states

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Work order lifecycle states define the states that a work order can go through. Examples include **Created**, **Scheduled**, **In progress**, and **Ended**. Work order lifecycle states can be manually updated on a work order, or they can be automatically updated (for example, during work order scheduling).

The work order lifecycle states that are required for your work orders must be attached to matching project stages on the **Project management and accounting parameters** page (**Project management and accounting > Project management and accounting parameters**). You first set up project stages in Project management and accounting. You then set up work order lifecycle states and work order lifecycle models in Asset Management.

The following table describes the options in the **Work order** and **Schedule** sections on the **General** FastTab of the **Work order lifecycle state** page (**Asset management > Setup > Work orders > Lifecycle states**).

The screenshot displays the 'Work Order Lifecycle State' configuration page. On the left, a list of lifecycle states is shown, with 'New' selected. The main area is divided into sections for configuration:

- WORK ORDER**: Active (Yes), Add line (Yes), Delete (Yes), Delete line (Yes), Allow scheduling (No), Set actual start (No), Set actual end (No).
- SCHEDULE**: Ready (No), Start (No), End (No), Delete schedule lines (No).
- PROJECT**: Stage (Created), Close activities (No).
- FORECAST**: Copy hour forecast (No), Copy item forecast (No), Copy expense forecast (No).
- MAINTENANCE REQUESTS**: Lifecycle state (InProgress).
- ASSET**: Update asset BOM (No), Lifecycle state.
- WORK ORDER POOL**: Delete pool reference (No).

The **Validate** section includes:

- MAINTENANCE DOWNTIME**: No, Type (Information).
- FAULT SYMPTOM**: No, Type (Information).
- FAULT REMEDY**: No, Type (Information).
- MAINTENANCE CHECKLIST**: No.
- FAULT CAUSE**: No.
- COMMITTED COST**: No.

OPTION NAME	DESCRIPTION
Active	Set this option to Yes if the work order should be active while it's in this lifecycle state.
Add line	Set this option to Yes if work order jobs can be added to a work order that is in this lifecycle state.
Delete	Set this option to Yes if a work order can be deleted while it's in this lifecycle state.
Delete line	Set this option to Yes if work order jobs can be deleted from a work order that is in this lifecycle state.
Allow scheduling	Set this option to Yes if a work order can be scheduled while it's in this lifecycle state.
Set actual start	Set this option to Yes if the user should be prompted to select an actual start date and time for a work order when it's updated to this lifecycle state.
Set actual end	Set this option to Yes if the user should be prompted to select an actual end date and time for a work order when it's updated to this lifecycle state.
Post journals	<p>Set this option to Yes if work order journals should be automatically posted when a work order is updated to this lifecycle state. If an error occurs during journal posting, a message is shown, and the update of the work order lifecycle state is canceled. To view the journal lines for a work order, select Asset management > Common > Work orders > All work orders, Active work orders, or My active work orders, select the work order in the list, and then select Journals. This setup of automatic work order journal posting at a specific lifecycle state is the same as when you select Post journals on the Work order journals page.</p> <p>Note: If you set this option to Yes, journals are automatically posted if no approval workflow has been set up. If your company uses the journal approval setup that is configured on the Journal approval page (Project management and accounting > Setup > Journals > Journal approval), a manager or clerk must validate and post consumption registrations.</p>
Process maintenance checklist	Set this option to Yes if all attached maintenance checklists should be processed when a work order is updated to this lifecycle state. As part of this processing, any counter registrations that were made on a maintenance checklist are posted, and the result of the whole maintenance checklist is evaluated. Maintenance checklist lines that have Pass and Fail results are evaluated, and if at least one line fails, the whole maintenance checklist is marked as Failed in Asset Management.
Ready	Set this option to Yes if the work order job schedule status for all work order jobs that are created on a work order should automatically be updated to Ready when the work order is updated to this lifecycle state.

OPTION NAME	DESCRIPTION
Start	Set this option to Yes if the work order job schedule status for all work order jobs that are created on a work order should automatically be updated to Started when the work order is updated to this lifecycle state.
End	Set this option to Yes if the work order job schedule status for all work order jobs that are created on a work order should automatically be updated to Ended when the work order is updated to this lifecycle state.
Delete schedule lines	Set this option to Yes if scheduling on all work order jobs that are created on a work order that has already been scheduled should be deleted when the work order is updated to this lifecycle state. In other words, capacity reservations on the asset, the related maintenance worker, and related tools will be deleted. For example, you set this option to Yes on a work order lifecycle state that is named Estimated . Then, when a work order is rolled back to this lifecycle state because rescheduling is required, scheduling can be deleted on that work order.

Set up project stages and work order lifecycle states

1. Select **Project management and accounting > Setup > Project management and accounting parameters**.
2. On the **Project stage** tab, for each stage that you want to use, select the check box for every project type that is required for your work orders. The project types define rules about the financial tasks that are allowed. Examples of financial tasks include creating a forecast, creating estimates, and creating beginning balances.

IMPORTANT

If a project stage isn't selected for a project type, but the project stage is used for a work order lifecycle state, the work order projects won't be updated in the appropriate manner.

3. Close the **Project management and accounting parameters** page.
4. Select **Asset management > Setup > Work orders > Lifecycle states**.
5. Select **New** to create a work order lifecycle state.
6. In the **Lifecycle state** field, enter an ID for the lifecycle state.
7. In the **Name** field, enter a name.

On the **Details** FastTab, the **Lifecycle models** field shows the number of work order lifecycle models that use this lifecycle state.

8. On the **General** FastTab, in the **Work order** section, select the functions that should be available for this lifecycle state by setting the relevant options to **Yes**. For descriptions of the options, see the table earlier in this topic.
9. In the **Project** section, in the **Stage** field, select the project stage that should be related to this lifecycle state.

10. In the **Project** section, set the **Close activities** option to **Yes** if project activities that are related to each work order job should be automatically closed when the work order is in this lifecycle state.

NOTE

To find the number of the project activity that is related to a work order job, select **Asset management > Common > Work orders > All work orders, Active work orders, or My active work orders**. Open the work order, and then select the work order job. The activity number is shown in the **Activity number** field in the **Project** section on the **General** tab of the **Line details** FastTab.

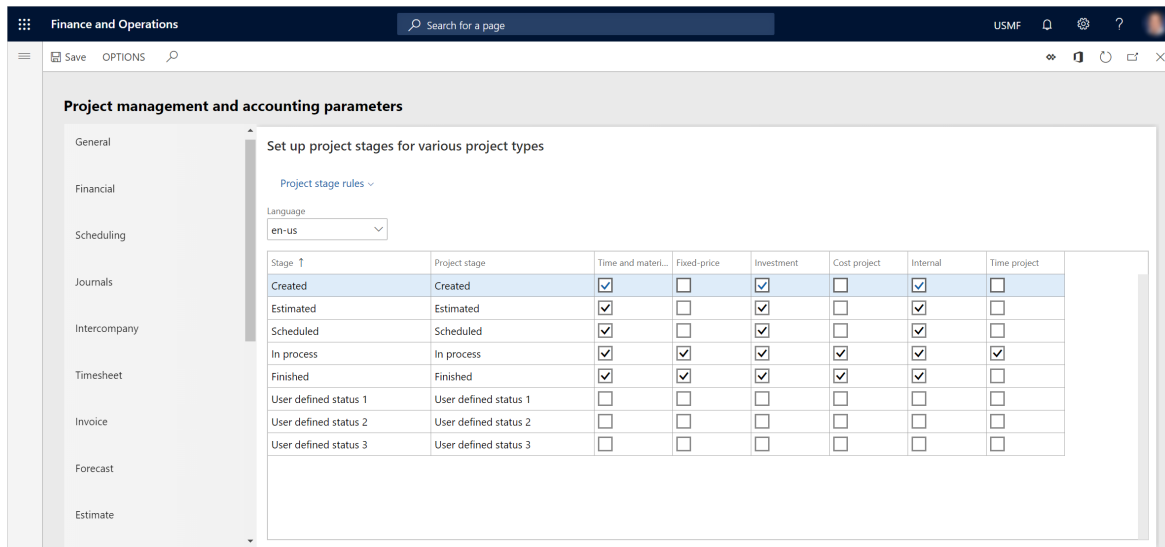
11. In the **Forecast** section, set the **Copy hour forecast, Copy item forecast, and/or Copy expense forecast** option to **Yes** if work order project forecasts should automatically be copied to work order journals when the work order is in this lifecycle state.
12. In the **Schedule** section, set one of the options to **Yes** if the schedule status for work order jobs should be updated when the work order is in this lifecycle state. For descriptions of the **Ready, Start, End, and Delete schedule lines** options, see the table earlier in this topic.

NOTE

To view schedule lines that are related to work order jobs, select **Asset management > Common > Work orders > All work orders, Active work orders, or My active work orders**. Open the work order, select the work order job on the **Work order jobs** FastTab, and view related information on the **Line details** FastTab. The **Status** field on the **Schedule** tab shows the status of the work order job. The **Status** field can be set to the following values: **Scheduled, Ready, Started, Stopped, and Ended**.

13. In the **Maintenance requests** section, in the **Lifecycle state** field, select the maintenance request lifecycle state that related maintenance requests should be updated to. This update occurs automatically. It can be done only if the maintenance request lifecycle state is selected in the maintenance request lifecycle model that is used for the maintenance request.
14. In the **Asset** section, set the **Update asset BOM** option to **Yes** if all items that are used on a work order should automatically be updated on the **Asset BOM** page when the work order is updated to this lifecycle state. This setting might be relevant if, for example, the work order lifecycle state defines the work order as completed or ended.
15. In the **Work order pool** section, set the **Delete pool reference** option to **Yes** if work orders that are in this lifecycle state should automatically be deleted from work order pools.
16. On the **Validate** FastTab, select the validation types that should be activated in this lifecycle state by setting the relevant options to **Yes**. Then, in the **Type** field for each validation type that you select, select the type of message that should be shown if mandatory fields that are related to the validation type haven't been validated. If you select **Error**, the update of the work order lifecycle state is canceled until the related mandatory fields have been updated on the work order.
 - The **Maintenance downtime, Maintenance checklist, Fault symptom, Fault cause, and Fault remedy** options are related to the options in the **Mandatory** section on the **Work order types** page (**Asset management > Setup > Work orders > Work order types**). To activate these validations, the related options must also be set to **Yes** on the work order type that is used for the work order.
 - If the **Maintenance checklist** option is set to **Yes** for the lifecycle state that a work order is updated to, validation is done to verify that maintenance checklist lines that are marked as **Mandatory** have been registered as either **Checked** or **Not applicable**. If neither of those registrations has been made on the mandatory lines, an informational, error, or warning message is shown when the work order is updated to this lifecycle state.

- If the **Committed cost** option is set to **Yes** for the lifecycle state that a work order is updated to, total amount of committed costs (that is, the total amount of expenses that the legal entity has committed to pay) are calculated for each work order job. A message is shown if the committed cost amount is more than 0 (zero). You select the types of cost commitment that are included on the **Cost commitments** FastTab on the **Cost control** tab of the **Project management and accounting parameters** page (**Project management and accounting > Setup > Project management and accounting parameters**).
- If the **Maintenance downtime** option is set to **Yes** for the lifecycle state that a work order is updated to, maintenance downtime validation is done on the asset that is related to the work order. If a maintenance downtime registration has been made, but there is no **Ended** registration, a message is shown when the work order is updated to this lifecycle state.
- If the standard project setup doesn't include all the stages that you require for your Asset Management setup, you can set up user-defined project stages on the **Project stage** tab of the **Project management and accounting parameters** page. The following illustration shows the **Project stage** tab on the **Project management and accounting parameters** page.



NOTE

If the lifecycle state that you update a work order to is inactive, journals that are related to the work order but that haven't yet been posted are automatically deleted. This behavior helps guarantee automatic cleanup of unused data. (A lifecycle state is inactive if the **Active** option for it is set to **No** on the **General** FastTab of the **Work order lifecycle state** page.)

However, if you manually set a work order so that it's inactive, journals that are related to the work order but that haven't yet been posted are **not** automatically deleted. (To manually inactivate a work order, select **Asset management > Common > Work orders > All work orders** or **Active work orders**. Open the work order, and switch to the **Header** view. On the **General** FastTab, select **Edit**, and then set the **Active** option to **No**.)

Relations among work order lifecycle models, work order types, and work order lifecycle states

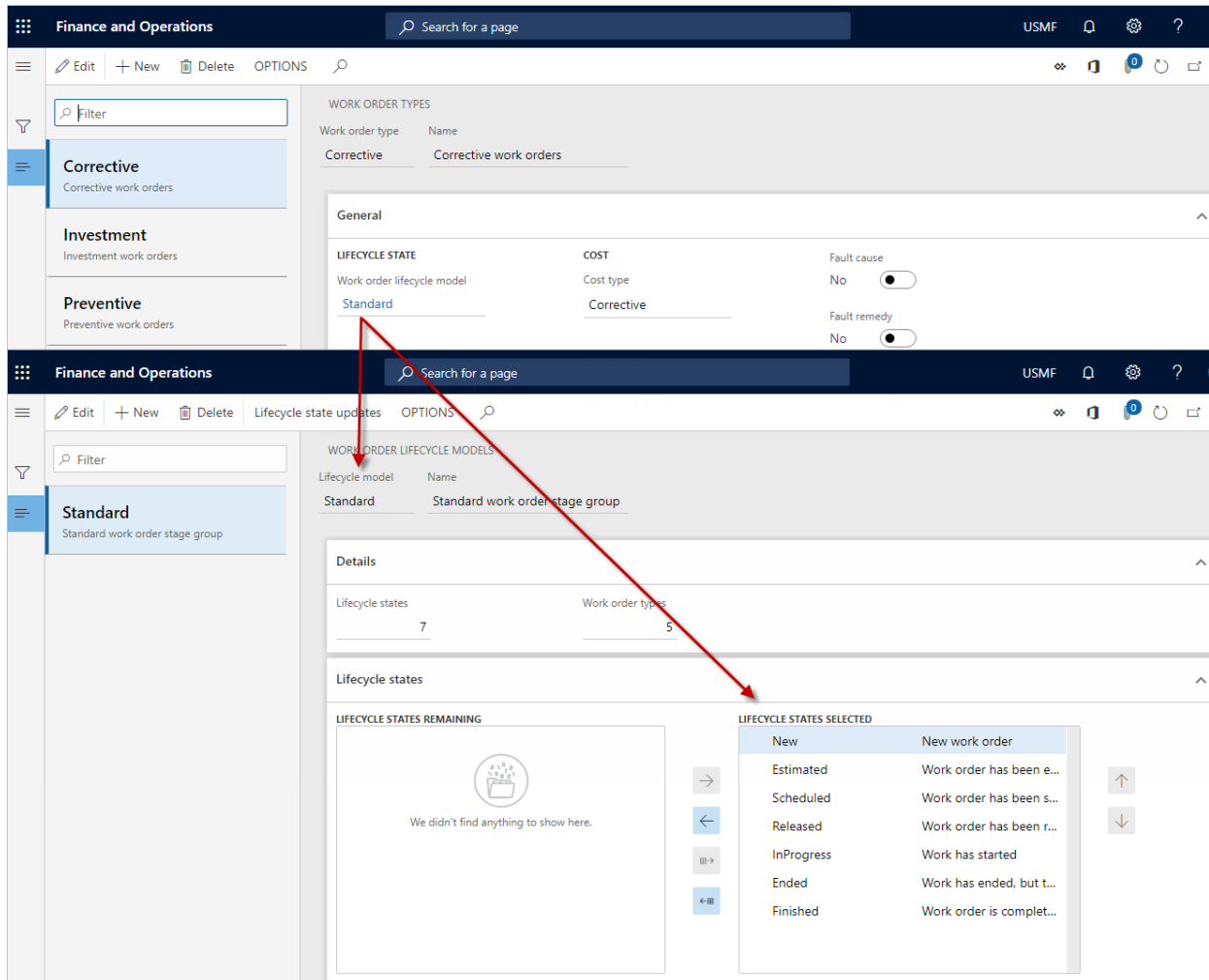
Lifecycle models refer to workflows, and lifecycle states are selected in a lifecycle model in sequential order. Lifecycle models are set up on work order types. Work order types determine the size or extent of workflows and work processes. For example, **Maintenance**, which is a standard work order type, might be related to a work order lifecycle model that has many lifecycle states. By contrast, you might have a **Corrective** work order type that is used for work orders that haven't been scheduled, or for work orders where the job is completed before the work order is made because of an urgent situation. This work order type might be related to a work order lifecycle model that has only a few lifecycle states.

The reason for using types is that when a type is defined on, for example, a work order or an asset, the related work processes (lifecycle states) are automatically defined. For more information about how to set up work order types, see [Work order types](#).

NOTE

Lifecycle states, lifecycle models, and types apply to functional locations, assets, and maintenance requests, in addition to work orders.

The following illustration shows the relation between work order types, lifecycle models, and lifecycle states.






Work order lifecycle models

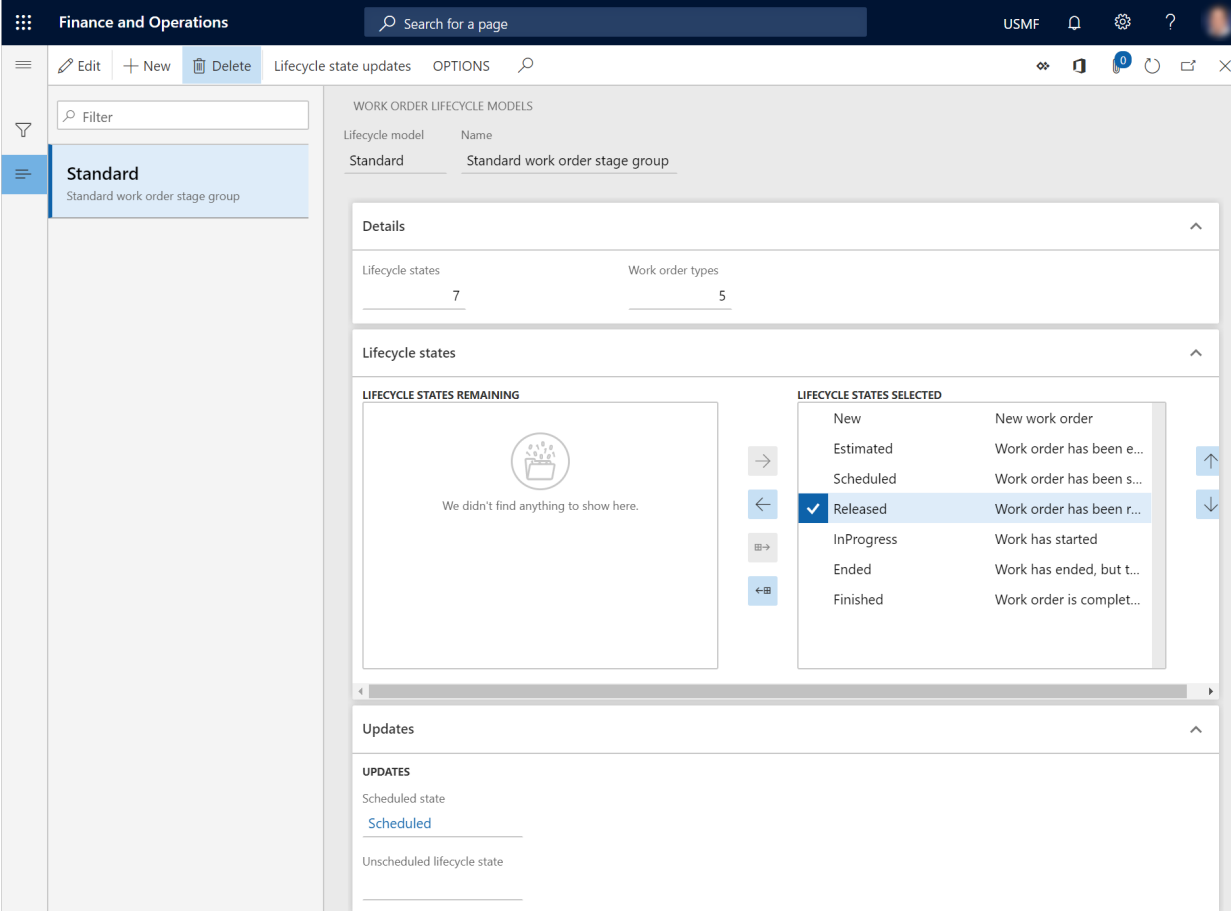
After you've created the work order lifecycle states that are required for your work orders, they can be divided into work order lifecycle models. At a minimum, you should create one standard lifecycle model.

1. Select **Asset management > Setup > Work orders > Lifecycle models**.
2. Select **New** to create a work order lifecycle model.
3. In the **Lifecycle model** field, enter an ID for the lifecycle model.
4. In the **Name** field, enter a name.

On the **Details** FastTab, the **Lifecycle states** field shows the number of lifecycle states that are selected in this lifecycle model. The **Work order types** field shows the number of work order types that use this lifecycle model.

5. On the **Lifecycle states** FastTab, select the lifecycle states that should be included in the lifecycle model:

- To include a lifecycle state in the lifecycle model, select it in the **Lifecycle states remaining** section, and then select the right arrow button  to move it to the **Lifecycle states selected** section.
 - To include all the available lifecycle states in the lifecycle model, select the **Select all available stages** button . All lifecycle states are moved to the **Lifecycle states selected** section.
 - To remove a lifecycle state from the lifecycle model, select it in the **Lifecycle states selected** section, and then select the left arrow button  to move it to the **Lifecycle states remaining** section.
6. Select **Lifecycle state updates** to define the lifecycle states that can follow a selected lifecycle state.
 7. On the **Updates** FastTab, in the **Scheduled state** field, select the lifecycle state that should always be selected for a work order that you've completed work order scheduling for, regardless of the previous lifecycle state of the work order.
 8. In the **Unscheduled lifecycle state** field, select the lifecycle state that should always be selected for a work order if work order scheduling is deleted.
 9. Save the work order lifecycle model.



The screenshot displays the 'Standard work order stage group' configuration in Dynamics 365. The interface is divided into several sections:

- Details:** Shows 7 lifecycle states and 5 work order types.
- Lifecycle states:**
 - LIFECYCLE STATES REMAINING:** Currently empty, displaying a message: "We didn't find anything to show here."
 - LIFECYCLE STATES SELECTED:** A list of lifecycle states with their descriptions:
 - New: New work order
 - Estimated: Work order has been e...
 - Scheduled: Work order has been s...
 - Released:** Work order has been r... (Selected)
 - InProgress: Work has started
 - Ended: Work has ended, but t...
 - Finished: Work order is complet...
- Updates:**
 - UPDATES:**
 - Scheduled state: Scheduled
 - Unscheduled lifecycle state: _____

NOTE

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Work order types

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Work order types are used to categorize work orders. For example, you might have work orders that are related to preventive maintenance or corrective maintenance.

A work order type defines an affiliation with a work order lifecycle model. A work order lifecycle model defines the work order lifecycle states that can be set on a work order. (Examples of work order lifecycle states include **Created**, **In Process**, and **Finished**.)

For more information about work order lifecycle states and project stages, see [Work order lifecycle states](#).

1. Select **Asset management** > **Setup** > **Work orders** > **Work order types**.
2. Select **New** to create a work order type.
3. In the **Work order type** field, enter an ID for the work order type.
4. In the **Name** field, enter a name.
5. In the **Work order lifecycle model** field, select a lifecycle model.
6. Set the **One maintenance worker** option to **Yes** if all work order jobs that are related to a work order of this type should be scheduled to the same maintenance worker.
7. In the **Cost type** field, select **Corrective**, **Preventive**, or **Investment**, as appropriate. All work order jobs on a work order must have the same cost type.
8. In the **Mandatory** section, set the relevant options to **Yes** to specify which fault-related or maintenance downtime–related information is added to a work order of this type.

NOTE

The options in the **Mandatory** section are related to the options on the **Validate** FastTab of the **Work order lifecycle states** page (**Asset management** > **Setup** > **Work orders** > **Lifecycle states**).

9. Select **Save**.

The screenshot displays the 'WORK ORDER TYPES' configuration page in Microsoft Dynamics 365 Finance and Operations. The interface includes a top navigation bar with 'Finance and Operations' and a search bar. The left sidebar shows a list of work order types: Corrective, Investment, Preventive (selected), Round, and Service. The main content area is titled 'WORK ORDER TYPES' and shows a table with columns for 'Work order type' and 'Name'. The 'Preventive' type is selected, and the 'Preventive work orders' tab is active. Below the table, the 'General' tab is expanded, showing various configuration options:

- LIFECYCLE STATE:** Work order lifecycle model is set to 'Standard'.
- COST:** Cost type is set to 'Preventive'.
- MANDATORY:** Fault symptom is set to 'No'.
- SCHEDULE:** One maintenance worker is set to 'No'.
- FAULT:** Fault cause, Fault remedy, and Maintenance downtime are all set to 'No'.

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Work order project setup

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In the **Asset management** module, a project relation is required for every work order job. The project that is associated with a work order job lets you track costs on various projects that are related to Asset Management, such as internal maintenance projects, service management projects, and investment projects.

Project setup for a work order job

When you create a work order job on a work order, the project setup in the **Project management and accounting** module and the work order project setup in the **Asset management** module determine how projects can be used for cost control on the asset that is selected on that work order job. This section describes the following parts of the project setup that is used for a work order: the parent project (project ID), project type, project activities, and financial dimensions:

- When you create a work order job on a work order, a unique project ID and a related project activity are automatically created for it. However, if several work order jobs on a work order include the same asset, the same project ID is used for them. In other words, one project ID is created for every asset on a work order.
 - The parent project (project ID) for a work order job is found in the parent project setup. (For more information about the parent project setup, see the next section.) For example, if you associate a customer or a functional location with a specific parent project, the parent project is used every time that you create work orders for that customer or that functional location. If you don't relate a specific project ID to, for example, a functional location, the next relevant parent project in the work order project setup is used.
 - A project type is required for every project ID. The project type is found in the setup of the project group setup. (For more information about the project group setup, see the next section.) If no match is found in the project group setup, the project group setup on the parent project is used.
 - The setup for requiring project activities on forecasts and journals is copied from the parent project to the work order project. If the **Hour**, **Expense**, and **Item** options are set to **Yes** for the project that is used as a parent project, a project activity is mandatory on forecasts and journals. (To access these options, select **Project management and accounting** > **Projects** > **All Projects**, and then select the project that is used as a parent project. The options are in the **Require activity on journals** section on the **Setup** FastTab.)
- Financial dimensions are copied from the asset and merged with the parent project.

The next section explains how to set up parent projects and project groups. Parent project and parent groups are used to control work orders. They are also used for reporting about work orders.

Set up work order projects

Before you start to create work orders, you must set up work order projects. The **Work order project setup** page (**Asset management** > **Setup** > **Work orders** > **Project setup**) contains two tabs: **Parent project** and **Project group**.

On the **Parent project** tab, you can set up project relations that can be used if no project is set up on the asset that is selected on the work order job. A parent project setup isn't required if your company uses asset projects. It's relevant only if you want to use work order projects instead of asset projects. In that case, you must set up at least one parent project.

On the **Project group** tab, you can set up project groups that can be associated with work order types, asset types, and assets.

Project groups can be used to create specific categories (groups) that are used for cost control. For example, by creating project groups for specific asset types or work order types, you can do detailed tracking of maintenance costs by type.

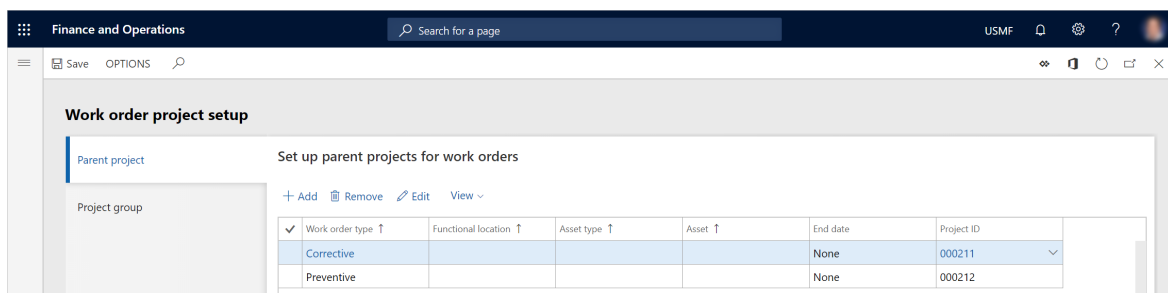
Project groups aren't mandatory. If you don't set up project groups, the parent project is used to determine the project group, and a child project is created from the parent project's project group.

The setup allows for complete integration with the **Project management and accounting** module. Therefore, you can track the costs that are related to work orders in the related projects. The following procedure describes the setup for work order projects.

1. Select **Asset management > Setup > Work orders > Project setup**.
2. On the **Parent project** tab, select **Add**.
3. In the **Work order type**, **Functional location**, **Asset type**, and **Asset** fields, select values as you require. For each line that you add, you can set just one field or multiple fields. The number of fields that you set determines the combination that is used when a project ID is selected in Asset Management.

If you select a functional location, the related child locations are automatically included. If you select an asset, you can create more work order project setup lines for the same asset, but you can select different projects for that asset.
4. In the **Project ID** field, select the project that should be related to the setup that you created in step 3.
5. If the project setup should be valid for only a limited period, select an end date in the **End date** field. Otherwise, select **None**.

By default, the start date is the date when you add the work order project to the page. It's controlled by the **Valid from** field, which is hidden by default. To show the **Valid from** field, select **View > All**. You can then use the **Valid from** field together with the **End date** field to set up a limited period of validity for the work order project.



6. On the **Project group** tab, select **Add**.
7. In the **Work order type** field, select a work order type.
8. If you want the project group association to be more specific, select an asset type in the **Asset type** field or an asset in the **Asset** field.
9. In the **Project group** field, select the project group that should be related to the work order type. For example, a work order type that is named **Preventive maintenance** might be associated with a project group that is named **Prev Maint** or **Internal**. Alternatively, an **Investment** work order type that is used for work orders that are related to investments and fixed assets might be associated with a project group that is named **Invest** or **Investment**.
10. Select **Save**.

Finance and Operations Search for a page USMF

Save OPTIONS

Work order project setup

Parent project

Project group

Set up project groups for work orders

+ Add - Remove

Work order type ↑	Asset type ↑	Asset ↑	Project group
Corrective			EAM
Preventive			EAM
Investment			Investment

NOTE

Every time that a work order line is created, Asset Management searches for a project group that should be related to the work order job project. The search is based on the setup that is described in this topic. Every project group has a related project type. Project groups that have the **Time and material** or **Fixed-price** project type are valid only for assets that are related to a customer account.

For parent projects and project groups, when the system selects the available work order project or project group, the selection is based on the records that you created by using the preceding procedure. Asset Management goes through records that are related to the work order project to check for a possible match. It always checks the most specific combination first. In other words, for the work order parent project, Asset Management first checks for a possible match for the **Asset** field. If no match is found, it checks for a match for the **Asset type** field. If no match is found, it checks for a match for the **Functional location** field, and so on. As you can see in the layout of the **Work order project setup** page, this behavior means that, to find the most specific combination, Asset Management checks each record from right to left for a match. If no match is found, the default record where only a project ID is selected is used. The process for finding the related project group is similar: Asset Management first checks for a possible match for the **Asset** field, then the **Asset type** field, and then the **Work order type** field. If no match is found, the default record where only a project group is selected is used.

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Service level and description

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When you create a work order, you might want to define the service levels for it and add a general description to it. You can create work order service levels on the **Work order service levels** page and descriptions on the **Work order description** page.

Create a service level

1. Select **Asset management > Setup > Work orders > Service level**.
2. Select **New**.
3. In the **Service level** field, enter the service level (for example, a number).
4. In the **Name** field, enter a name.

On the **Work orders** FastTab, you can define expected start and end dates and times. The fields on this FastTab define the period that work orders should be started and ended during. They are used for work orders that are manually created and work orders that are created based on maintenance requests.

5. In the **Start day** field, enter a number of days to define the period that the work order should start during. The number of days is calculated from the creation date of the work order. For example, if the work order should start when it's created, enter **0**. If the work order should start within one week after it's created, enter **7**.
6. To set a start time for the work order, in addition to a start date, set the **Set start time** option to **Yes**. Then enter the start time in the **Start time** field. If you set the option to **No**, the current time of day is used.
7. In the **End day** field, enter a number of days to define the period that the work order should end during. The number of days is calculated from the start date of the work order. For example, if the work order should end within one week of its start date, enter **7**.
8. To set an end time for the work order, in addition to an end date, set the **Set end time** option to **Yes**. Then enter the end time in the **End time** field. If you set the option to **No**, the current time of day is used.
9. Select **Save**.

The screenshot displays the Dynamics 365 interface for creating a work order service level. The top navigation bar shows 'Finance and Operations' and a search bar. The main content area is titled 'WORK ORDER SERVICE LEVELS'. It features a 'Service level' field with the value '1' and a 'Name' field with the value 'Critical'. Below this, there is a 'Work orders' section with a table of fields:

EXPECTED START		EXPECTED END	EXAMPLE
Start day	End day	Expected start	
<input type="text" value="0"/>	<input type="text" value="1"/>	7/21/2019 07:00:00 AM	
Set start time	Set end time	Expected end	
Yes <input checked="" type="checkbox"/>	Yes <input checked="" type="checkbox"/>	7/22/2019 11:00:00 PM	
Start time	End time		
<input type="text" value="12:00:00 AM"/>	<input type="text" value="04:00:00 PM"/>		

Create a description

1. Select **Asset management** > **Setup** > **Work orders** > **Descriptions**.
2. Select **New**.
3. In the **Description** field, enter the description.
4. Select **Save**.

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Scheduled execution

2/18/2021 • 2 minutes to read • [Edit Online](#)

You can use work order service levels to set up scheduled execution. (For more information about work order service levels, see [Service level and description](#).) Scheduled execution provides flexibility in work planning for maintenance workers, because you can set up more detailed or less detailed requirements for the interval that a work order should be completed during. For example, a maintenance worker who completes a job faster than expected in a production facility might be able to move on to another nearby job that was planned for the current week but not necessarily for the current day. This approach allows for optimization of worker planning and job completion.

Scheduled execution setup, which is related to work orders, can be generic or specific. You can set up generic lines that aren't limited to specific work order types, asset types, and so on. Alternatively, you can create scheduled execution lines that apply to a specific work order type, asset type, maintenance job type, and so on.

1. Select **Asset management > Setup > Work orders > Scheduled execution**.
2. Select **New** to create a scheduled execution line.
3. In the **Functional location**, **Work order type**, **Asset type**, **Manufacturer**, **Model**, **Maintenance job type category**, **Maintenance job type**, **Maintenance job type variant**, and **Trade** fields, select values as you require.
4. In the **Service level** field, select a work order service level. If you leave this field blank, you make the most generic type of scheduled execution line. For an example of a generic line, see the first record in the illustration that follows. That line enables all work orders that have no work order service level to be scheduled for a specific date and time.
5. In the **Scheduled execution** field, select the time interval.
6. Select **Save**.

Functional location ↑	Work order type ↑	Asset type ↑	Manufacturer	Model	Maintenance job type ... ↑	Maintenance job type ↑	Maintenance job type varia... ↑	Trade	Service level ↑	Scheduled execution
									5	Date and time
									10	Date
									20	Week
									30	Month

NOTE

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Fault management

2/18/2021 • 3 minutes to read • [Edit Online](#)

In Asset Management, you can use the fault designer to set up fault symptoms, fault areas, and fault types on asset types. In this way, you can manage faults that are detected on assets. Additionally, fault causes and suggestions for fixing faults can be registered on a work order.

The process for fault registration and management consists of these steps.

1. Create a list of fault symptoms, fault areas, and fault types that might occur on your asset types.
2. In the fault designer, set up symptoms, fault areas, and fault types.

Here are some examples to help you understand the difference between fault symptoms, fault areas, and fault types.

Fault symptoms:

- Unbalanced voltages
- Short circuit
- Noise
- Leak
- Vibrations

Fault areas:

- Electrical
- Mechanical
- Hydraulic
- Pneumatic

Fault types:

- Faulty main stator winding
- Faulty diode
- Dirty windings
- Defective generator
- Defective sensor

Create fault symptoms

Follow these steps to create a list of symptoms that can be used in the fault designer.

1. Select **Asset management > Setup > Fault > Fault symptoms**.
2. Select **New** to create a record.
3. In the **Fault symptom** field, enter a name for the fault symptom.
4. In the **Description** field, enter a description.
5. Select **Save**.

Create fault areas

Follow these steps to create a list of areas or locations that can be used in the fault designer.

1. Select **Asset management > Setup > Fault > Fault areas**.
2. Select **New** to create a record.
3. In the **Fault area** field, enter a name for the fault area.
4. In the **Description** field, enter a description.
5. Select **Save**.

Create fault types

Follow these steps to create a list of fault types that can be used in the fault designer.

1. Select **Asset management > Setup > Fault > Fault types**.
2. Select **New** to create a record.
3. In the **Fault type** field, enter a name for the fault type.
4. In the **Description** field, enter a description.
5. Select **Save**.

Set up the fault designer

In the fault designer, you set up fault data on asset types.

1. Select **Asset management > Setup > Fault > Fault designer**.
2. In the left pane, select the type of asset to set up a fault record for.
3. On the **Fault symptom** FastTab, select **Add line**, and then, in the **Fault symptom** field, select a fault symptom.
4. On the **Fault area** FastTab, select **Add line**, and then, in the **Fault area** field select a fault area.
5. On the **Fault type** FastTab, select **Add line**, and then, in the **Fault type** field, select a fault type.
6. To quickly create combinations of all existing fault symptoms, areas, and types for the selected asset type, select **Create fault combinations**. This function is useful if you've added many fault symptoms, areas, and types. It's easier to delete the lines for any combinations that aren't relevant to the asset type than to create new lines manually.

NOTE

To copy the setup of fault symptoms, areas, and types from one asset type to the selected asset type, select **Copy from asset type**.

7. Select **Save** to save your changes.

Finance and Operations

Search for a page

USMF

Save + New Delete Create fault combinations Copy from asset type OPTIONS

Filter

Area
Areas

Articulated Hauler
Articulated Haulers

Car
Cars

Car Engine
Car engines

Car Gear
Car gears

Conveyor
Conveyor Belts

Excavator
Excavators

Facility
Facilities

Fermentation vessel
Fermentation vessels

Filtration unit
Filtration units

Kettle
Kettles

Lauter tun
Lauter tun

Mash mixer
Mash mixers

Maturation tank
Maturation tanks

FAULT DESIGNER

Fault symptom

+ Add line Remove

✓	Fault symptom	Description
	Violent engine idle	A rough, choppy, or violent engi...
	Poor fuel economy	Poor fuel economy
	Surging engine	The engine is surging
	Misfiring engine	The engine misfires
	Fan stopped	
	Fan blades damaged	
	Fins deformed	

Fault area

+ Add line Remove

✓	Fault area	Description
	Electrical	Electrical area
	Mechanical	Mechanical area
	Hydraulic	Hydraulic area
	Pneumatic	Pneumatic area

Fault type

+ Add line Remove

✓	Fault type	Description
	Catastrophic	Catastrophic type
	Damaging	Damaging type
	Harmful	Harmful type
	Hazardous	Hazardous type
	Noxious	Noxious type
	Unfortunate	Unfortunate type

Create fault causes

Follow these steps to create a list of known fault causes that can be added to a work order or a maintenance request.

1. Select **Asset management > Setup > Fault > Fault causes**.
2. Select **New** to create a record.
3. In the **Fault cause** field, enter a name for the fault cause.
4. In the **Description** field, enter a description.
5. Select **Save**.

Create fault remedies

Follow these steps to create a list of suggestions for remedy and repair that can be added to a work order or a maintenance request.

1. Select **Asset management > Setup > Fault > Fault remedies**.
2. Select **New** to create a record.
3. In the **Fault remedy** field, enter a name for the fault remedy.
4. In the **Description** field, enter a description.
5. Select **Save**.

NOTE

You can change the names of your fault symptoms, areas, types, causes, and remedies as you require. The name changes are automatically reflected in the related fault registrations.

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Introduction to work orders

2/18/2021 • 4 minutes to read • [Edit Online](#)

Work orders are used to manage maintenance jobs, provide required information for them, and register consumption on them. Each work order can contain one or more work order jobs, and one or more assets can be connected to each work order. Each work order job defines a maintenance job that is scheduled on the asset.

Work orders can be created in the following ways:

- For calendar-based maintenance plans where the "Auto create" setting is turned on, automatically by using [Schedule maintenance plans](#).
- For maintenance rounds where the "Auto create" setting is turned on, automatically by using [Schedule maintenance rounds](#).
- For preventive maintenance jobs or maintenance requests, from [Maintenance schedule](#).
- Manually
- From the **All maintenance requests**, **Active maintenance requests**, or **My functional location maintenance requests** page.

NOTE

Work order jobs that are related to the same asset are related to the same project ID.

All work orders

Select **Asset management > Common > Work orders > All work orders** to open the **All work orders** list page. This page shows all work orders and some of the information that is related to each.

The illustration below shows an example of the **All work orders** list page.

Work order ID	Work order type	Description	LI	Service level	Criticality	Start datetime	Current lifecycle state	Active	All jobs scheduled to	Work order pools
JPMF-00002	Preventive	Oil leakage	1	20		7/24/2019 07:00:00 AM	Estimated	✓		
JPMF-00004	Corrective	Breakdown	1	20		7/28/2019 07:00:00 AM	Estimated	✓		1
JPMF-00005	Preventive	Rounds	1	20		7/28/2019 07:00:00 AM	New	✓		

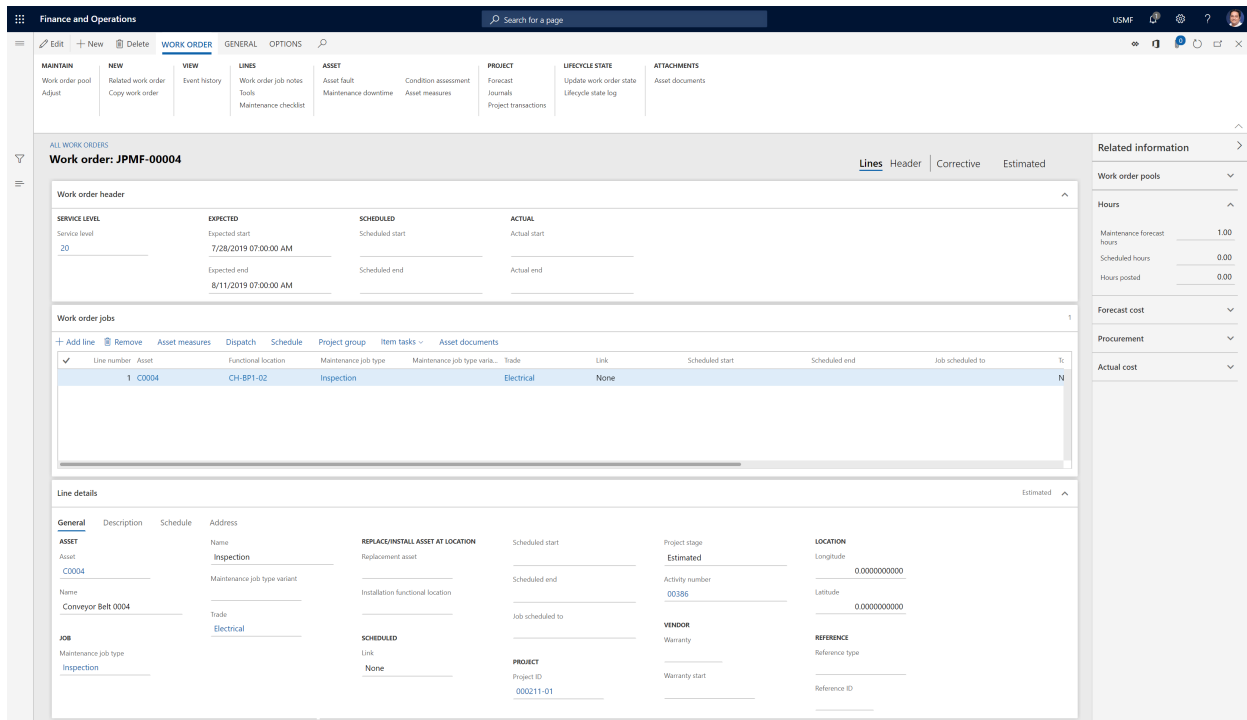
To view a list of only active work orders, select **Asset management > Common > Work orders > Active work orders**.

To view a list of work order jobs that contain assets that are installed on functional locations that you're related to as a worker, select **Asset management > Common > Work orders > My functional location work order maintenance jobs**. (The relation between workers and functional locations is set up on the **Workers** page. For more information, see [Maintenance workers and worker groups](#).)

Here are some ways that you can use the **All work orders** page:

- In the grid view, select a link in the **Work order** column to show the details view for the selected record. You can then select **Edit** to open the record for editing.
- In the details view, you view detailed information that is related to the work order.
- In the details view, select the **Lines** tab to view details of the work order job, or select the **Header** tab to view details of the work order.
- Expand the **Related information** pane on the right side of the page to view additional information that is related to the selected work order.

The illustration below shows an example of the **All work orders** details view.



The buttons on the Action Pane are organized on tabs. The following table briefly describes the buttons that are related to Asset Management:

BUTTON NAME	DESCRIPTION
Edit	Edit the selected work order.
New	Create new work order.
Delete	Delete the selected work order.
Work order pool	Add the selected work order to a work order pool, or remove it from work order pool.
Adjust	Adjust information about expected start and end, service level, responsible maintenance worker, or responsible maintenance worker group on selected work orders.
Related work order	Create a new work order related to the selected work order job. This is useful if you want to register primary and secondary work orders.

BUTTON NAME	DESCRIPTION
Copy work order	Create a new work order that is based on an existing work order.
Event history	View the registration history for the work order.
Work order maintenance job notes	Create a description on a work order, or insert notes or remarks about it. First, select Add timestamp to add your user name and a timestamp to the note. Notes are shown on the Description tab on the Line details FastTab of the Work order page.
Tools	Create a list of required tools on a work order. Tools are set up as resources in Organization administration > Resources > Resources .
Maintenance checklist	View the checklist for the asset that is connected to the work order.
Asset fault	View or register fault information on an asset. This information is used for fault management.
Maintenance downtime	Specify maintenance downtime for a work order.
Condition assessment	Register condition assessment measurements on a work order.
Asset counters	Create or view counter registrations on the asset.
Forecast	View or create forecasts on a work order.
Journals	View or create work order journals. Journal lines can be copied from forecasts.
Project transactions	View all posted transactions that are related to work orders created for the asset.
Update Work order state	Update the work order lifecycle state.
Lifecycle state log	View a log that shows the lifecycle states of the selected work order.
Asset documents	View the list of documents attached to assets that are related to a work order. These documents are set up in Asset management > Setup > Asset documents .
Schedule	Schedule the selected work orders.
Dispatch	Schedule the selected work order for one worker.
Delete schedule	Delete the scheduling for the selected work order.
Scheduled work order maintenance jobs	Open the Scheduled work order maintenance jobs list page.

BUTTON NAME	DESCRIPTION
Work order purchase requisition	Open the Work order purchase requisition list page.
Work order purchase	Open the Work order purchase list page.
Cost control	Compare budget costs and actual costs on the work order.
Hour control	Compare forecasted hours and actual hours on the work order.
Work order report	Print a work order report.
Work order consumption	Print a consumption report.

The buttons in the **Project** group on the **Work order** tab of the Action Pane are related to the functionality for forecasts, journals, and invoicing in the **Project management and accounting** module.

NOTE

To include forecasts that have been created on a work order when you run master scheduling, use the forecast model that is selected on the **Asset management parameters** page.

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Manually created work orders

2/18/2021 • 7 minutes to read • [Edit Online](#)

You can create work orders manually in two ways:

- On the **All work orders** or **Active work orders** page
- On the **All maintenance requests** or **Active maintenance requests** or **My functional location maintenance requests** page

Create work order

1. Select **Asset management** > **Common** > **Work orders** > **All work orders** or **Active work orders**.
2. Select **New**.
3. In the **Create work order** dialog, select a work order type in the **Work order type** field.
4. If required, select a **Description**.
5. In the **Asset** field, select the asset.

NOTE

When you select an asset, three tabs might be available in the **Asset** drop-down:

- **Active assets** - This tab contains a list of all assets that have an "Active" asset lifecycle state.
 - **Asset view** - This tab displays a tree view of functional locations and the assets installed on them.
 - **My assets** - This tab contains assets that are related to the functional locations that you (the worker who is signed in to the system) may be allocated to. (For information about the setup, see [Maintenance workers and worker groups](#).) If no functional locations are set up on a worker in [Maintenance workers and worker groups](#), the **My assets** tab isn't available.
6. In the **Maintenance job type** field, select a maintenance job type for the work order.
 7. If required, select **Maintenance job type variant** and **Trade**.
 8. If required, you can change the work order service level in the **Service level** field.
 9. Select **Expected start** and **Expected end** dates in the related fields.
 10. Click **OK** to create the work order.
 11. On the **All work orders** list page, you can edit the work order as you require.

Note the following points:

- In the details view on the **All work orders** list page, you can add several assets to a work order by adding lines on the **Work order maintenance jobs** FastTab. On an asset, you can select only the maintenance job types that are defined on the asset type that is selected on the asset.
- If you change an asset service level or an asset criticality after you've used the asset on a work order, the service level or criticality on the work order isn't updated accordingly. For more information about service levels and criticalities, see [Asset service levels](#) and [Asset criticality types](#).

- Criticality on a work order is recalculated every time a work order job is added to or deleted from the work order.
- In the **All work orders** details view > **Header** tab > **Schedule** FastTab, in the **Responsible group** or **Responsible** field, you can select a responsible maintenance worker group or a responsible maintenance worker. These settings can be changed while the work order is active. For example, they can be changed when the work order lifecycle state changes. The automatic selection that is made during work order creation is based on the setup on the **Responsible maintenance workers** page. If you add or remove work order jobs after you've created a work order, and if the **Responsible group** and **Responsible** fields are blank when you update the work order, Asset Management tries to find a responsible maintenance worker group or a responsible maintenance worker for a possible match on the setup page. If the **Responsible group** or **Responsible** field is already set when you update the work order, no changes are made. For more information about responsible maintenance workers and worker groups, see [Responsible maintenance workers](#).
- From the [Maintenance status](#) page, you can do a calculation to get an overview of the workload for incoming and completed work orders.
- In the details view of the **All work orders** page, on the **Line details** FastTab, you can use the **Latitude** and **Longitude** fields to add geographic coordinates for the asset that is selected on the work order job.

Create related work order

You can create a work order that is related to an existing work order. This capability is useful if, for example, you want to work with primary and secondary work orders. A new work order is based on a work order job from an existing work order.

1. Select **Asset management** > **Common** > **Work orders** > **All work orders** or **Active work orders**.
2. Select the work order to create a related work order for.
3. On the Action Pane, on the **Work order** tab, in the **New** group, select **Related work order**.
4. In the **Create related work order** dialog, in the **Work order job** field, select the work order job to create a related work order for.
5. Select a maintenance job type in the **Maintenance job type** field.
6. Select a related maintenance job type variant and trade in the **Maintenance job type variant** and **Trade** fields, as you require.
7. If this work order is the first related work order that has been created for the selected work order, follow these steps:
 - a. Select the **New work order** option.
 - b. In the **Work order type** field, select a work order type.
 - c. In the **Description**, enter a description.
 - d. In the **Service level** field, change the work order service level as you require.
 - e. In the **Expected start** and **Expected end** fields, select the expected start and end dates.
 - f. Select **OK**. The new related work order is shown on the **All work orders** list page.
8. If the work order that you're creating this related work order for already has related work orders, follow these steps to add a new work order job to an existing related work order:
 - a. Select the **Add to related work order** option.
 - b. In the **Work order** field, select the related work order to add a new work order job to.
 - c. In the **Service level** field, change the work order service level as you require.

d. In the **Expected start** and **Expected end** fields, change the expected start and end dates as you require.

e. Select **OK**. The work order job is added to the existing related work order.

The illustration below shows an example of the **Create related work order** dialog.

Work order ↑	Work order type	Description
JPMF-00002	Preventive	Oil leakage
JPMF-00004	Corrective	Breakdown
JPMF-00005	Preventive	Rounds
JPMF-00005-01	Corrective	Breakdown

NOTE

If you've set up a related work order mask in **Asset management parameters > Work orders tab > Related work order mask** field, work order IDs are created according to the mask setup. If no related work order mask is set up, the next available work order ID is used for related work orders.

Copy a work order

You can quickly create a new work order from an existing work order. This way of working with work orders differs from the creation of work orders based on [maintenance plans](#). It's useful if, for example, a work order contains many work order jobs, and the various jobs should be completed on different assets at regular intervals.

1. Select **Asset management > Common > Work orders > All work orders** or **Active work orders**.
2. Select the work order to copy content from.
3. On the Action Pane > **Work order** tab > **New** group, select **Copy work order**.
4. The work order setup from the selected work order is shown. You can edit some of the fields as you require.
5. Select **OK** to create the new work order.
6. On the **All work orders** list page, you can edit the work order as you require.

NOTE

When the new work order is created, some information is copied directly from the existing work order. Information about forecasts, tools, maintenance checklists, functional location, addresses, and scheduling isn't copied. Instead, it's initialized from the current setup in Asset Management. Therefore, if that information was changed between the time when the first work order was created and the time when you made a copy of the work order, the changes are included in the new work order. Examples include changes to forecasts and updates to maintenance checklists.

The illustration below shows an example of the **Copy work order** dialog.

The screenshot shows the 'Copy work order' dialog in the Finance and Operations system. The dialog is open over a table of work orders. The 'Copy work order' dialog has fields for 'Work order' (JPMF-00011), 'Work order type' (Preventive), 'Description' (Rounds), 'ASSET' (Service level: 20), 'Expected start' (7/28/2019 07:00:00 AM), and 'Expected end' (8/11/2019 07:00:00 AM).

Work order	Work order type	Description
JPMF-00002	Preventive	Oil leakage
JPMF-00004	Corrective	Breakdown
JPMF-00005	Preventive	Rounds
JPMF-00005-01	Corrective	Breakdown

Create a work order based on a maintenance request

1. Select **Asset management > Common > Maintenance requests > All maintenance requests** or **Active maintenance requests**.
2. Select the maintenance request to create a work order for, and click **Edit**.
3. On the Action Pane > **Maintenance request** tab > **New** group, select **Work order**.
4. In the **Work order** dialog, set the fields. If a maintenance job type has been selected in the maintenance request, you can select a different maintenance job type when you create the work order, as you require.
5. Select **OK**. A message notifies you that the work order has been created.
6. To view the work orders that are connected to a maintenance request, on the **All maintenance requests** or **Active maintenance requests** list page, select the maintenance request. Then, on the Action Pane, on the **Maintenance request** tab, in the **View** group, select **Work orders**.

The illustration below shows an example of the **Create work order** dialog.

Finance and Operations

Search for a page

Save + New Delete MAINTENANCE REQUEST OPTIONS

MAINTAIN NEW VIEW LIFECYCLE STATE REPORT

Work order pool Work order Asset fault Update maintenance request state Work orders Lifecycle state log

ALL MAINTENANCE REQUESTS

Filter

✓	Maintenance request ↑	Maintenance request type	Description
✓	ITCO-00001	Breakdown	Machine vibration
	ITCO-00002	Breakdown	Oil leakage
	ITCO-00003	Breakdown	Packaging area light not wor
	ITCO-00006	Breakdown	Belt slack

Create work order

1 maintenance requests selected

WORK ORDER

Work order

JPMF-00012

Work order type

Corrective

Description

Machine vibration

Service level

20

ASSET

Asset

C0002

Maintenance job type

Inspection

Maintenance job type variant

6-Month

Trade

Pneumatic

EXPECTED

Expected start

7/21/2019 07:17:30 AM

Expected end

NOTE

If you want work orders to be created automatically, you can schedule maintenance plan jobs, or you can set up "Auto create" [maintenance plans](#) or [maintenance rounds](#) on an asset. Work orders that are created from maintenance requests on the **All maintenance schedule** list page have the maintenance job types that are selected on the maintenance requests.

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Maintenance forecasts

2/18/2021 • 4 minutes to read • [Edit Online](#)

When you create a work order, you create work order jobs that have related assets and maintenance job types. When you select a maintenance job type that contains maintenance forecasts, the forecasts are automatically copied to the work order.

You might be able to add forecast lines to a work order or delete them from a work order. The setup of the work order lifecycle state, the related project type, and the stage rules that are related to the project type determine whether you can add or edit forecast lines. For more information about work order lifecycle states and related project stages, see [Forecasts, work orders, and projects](#).

1. Select **Asset management > Common > Work orders > All work orders** or **Active work orders**.
2. Select the work order in the list, and then, on the Action Pane > **Work order** tab > the **Project** group, select **Forecast**. The **Work order maintenance forecast** page shows forecast lines from the maintenance job type that is selected on the work order job.

Add an hours forecast to a work order

1. On the **Work order maintenance forecast** page, select the work order job to add a forecast to.
2. On the **Hours** FastTab, select **Add** to create a new line.
3. In the **Category** field, select a category.
4. In the **Hours** field, enter the number of forecasted hours.
5. In the **Line property** field, select the type of charge that should be used on the line.

Add an items forecast to a work order

There are three ways to add items to a work order maintenance forecast. You can create lines for items (spare parts) that aren't included on the spare parts list or the asset bill of materials (BOM), you can select spare parts from the approved spare parts list, or you can select items from the asset BOM.

- On the **Work order maintenance forecast** page, select the work order job to add a forecast to.
- On the **Items** FastTab, add items to the maintenance forecast by using the appropriate method.

To create a line for a spare part that isn't on the spare parts list or the asset BOM, follow these steps:

1. Select **Add**.
2. In the **Item number** field, select the item.
3. In the **Sales quantity** field, enter the quantity.
4. In the **Unit** field, select the unit of measure for the quantity.
5. In the **Cost price** and **Currency** fields, enter appropriate values.
6. In the **Line property** field, select a line property.
7. To change the list of dimensions that is shown on the item lines, select **Inventory > Display dimensions**, select the dimensions, and then set the **Save setup** option to **Yes**.

To add a spare part from an approved spare parts list, follow these steps:

1. Select **Add spare parts**.

2. Select the spare part, and edit the related information as you require.
3. Select **OK**.

To add an item from the asset BOM, follow these steps:

1. Select **Add BOM items**.
2. Select the item, and edit the related information as you require.
3. Select **OK**.

To get an overview that shows where the item on the selected line is used in relation to assets, maintenance job type defaults, spare parts, and work orders in Asset Management, select **Item where used**. For more information about this overview, see [Item where used](#).

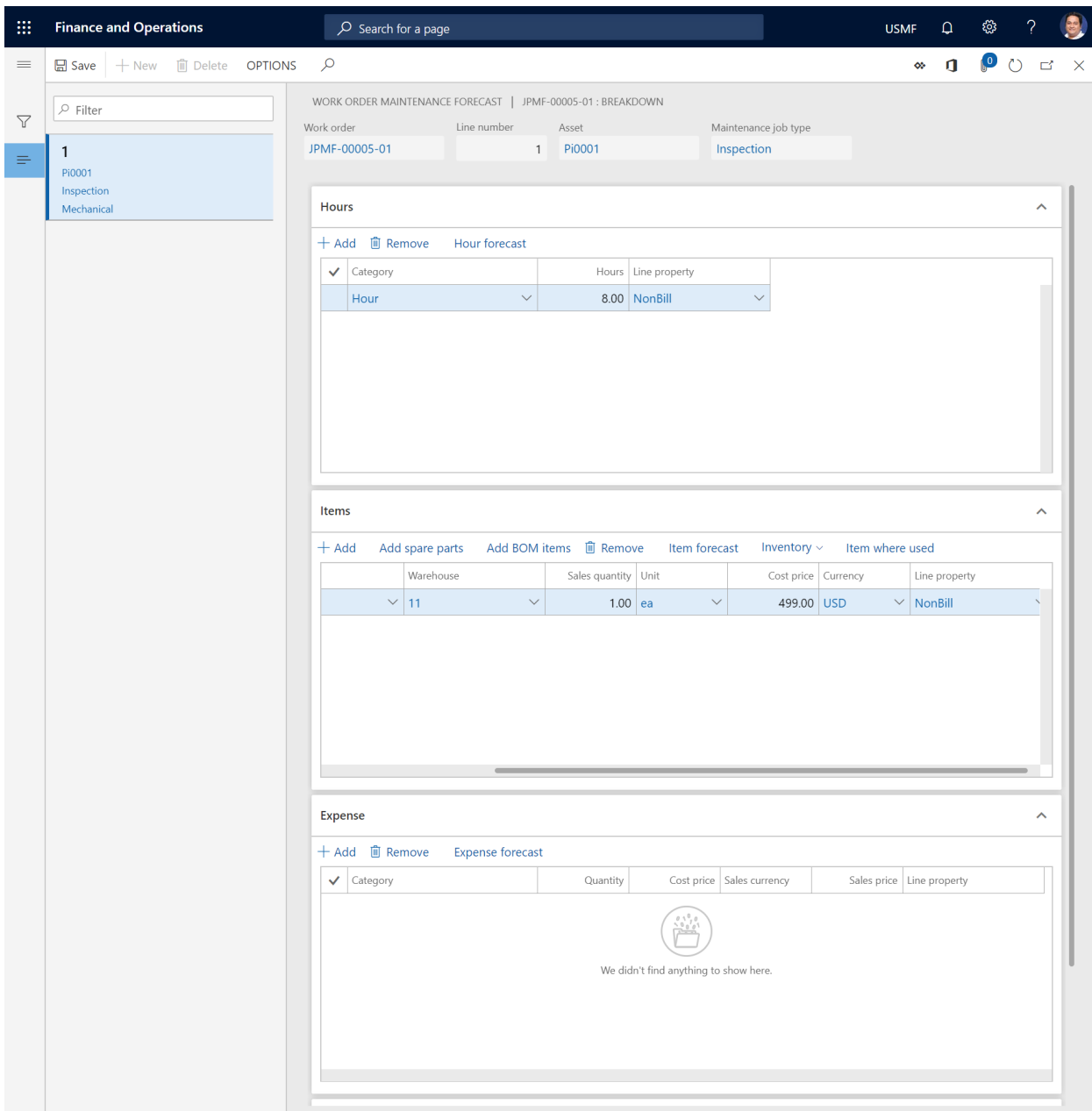
Add an expense forecast to a work order

1. On the **Work order maintenance forecast** page, select the work order job to add a forecast to.
2. On the **Expense FastTab**, select **Add** to create a line.
3. In the **Category** field, select a category.
4. In the **Quantity** field, enter the quantity.
5. In the **Cost price**, **Sales currency**, and **Sales price** fields, enter appropriate values.
6. In the **Line property** field, select the type of charge that should be used on the line.

NOTE

The **Maintenance forecast totals** FastTab shows an overview of the number of lines that have been created, for the selected work order job and for the work order, on each FastTab. It also shows the total forecasted work hours for the work order job and the work order.

The illustration below shows an example of the **Work order maintenance forecast** page.



Automatic update of work order forecasts

If hour costs, item costs, and expenses are updated in other modules in Microsoft Dynamics 365 for Finance and Operations, work order forecasts in Asset Management can automatically be updated to reflect those changes. This capability helps guarantee that the latest cost prices are always used in your work order forecasts. You can also do similar updates for [maintenance job type forecasts](#).

1. Select **Asset management > Periodic > Forecast > Update work order forecast**.
2. In the **Update work order forecast** dialog, on the **Records to include** FastTab, you can add selections regarding specific work orders or work order jobs, as you require. Click **Filter** to make the relevant selections.
3. On the **Run in the background** FastTab, you can set up the automatic update as a batch job, as you require.
4. Select **OK** to start the forecast update.

The illustration below shows an example of the **Update work order forecast** dialog.

Finance and Operations

≡

Update work order forecast ?

Records to include ^

[Filter](#)

WORK ORDERS

Work order

WORK ORDER JOBS

Line number

Active

Yes

Run in the background v

NOTE

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Procurement

2/18/2021 • 4 minutes to read • [Edit Online](#)

In Asset Management, you can get an overview of purchase requisitions and purchase orders that are related to work orders. You can also create a purchase order or a purchase requisition from a work order.

The **Work order purchase requisition** list page (**Asset management > Common > Procurement > Work order purchase requisition**) shows a list of purchase requisitions that are related to work orders. When you select a work order job on this page, you can use the buttons in the **Show** group on the **Work order purchase requisition** Action Pane tab to perform various actions:

- To open the related purchase requisition, select **Purchase requisition**.
- To open the related work order, select **Work order**.
- To get an overview that shows where the item on the selected line is used in relation to assets, maintenance job type defaults, spare parts, and work orders in Asset Management, select **Item where used**. For more information about this overview, see [Item where used](#).

The illustration below shows an example of the **Work order purchase requisition** list page.

Work order	Current lifecycle state	Line number	Maintenance job type	Functional location	Asset	Purchase requisition
JPMF-00002	Estimated	1	Inspection	CH-BP1-01-01	C0001	000031

The **Work order purchase** list page (**Asset management > Common > Procurement > Work order purchase**) shows a list of purchase orders that are related to work orders. When you select a work order job on this page, you can use the buttons in the **Show** group on the **Work order purchase** tab of the Action Pane to perform various actions:

- To open the related purchase order, select **Purchase order**.
- To open the related work order, select **Work order**.
- To get an overview that shows where the item on the selected line is used in relation to assets, maintenance job type defaults, spare parts, and work orders in Asset Management, select **Item where used**. For more information about this overview, see [Item where used](#).

The illustration below shows an example of the **Work order purchase** list page.

Work order	Current lifecycle state	Line number	Maintenance job type	Functional location	Asset	Purchase order
JPMF-00002	Estimated	1	Inspection	CH-BP1-01-01	C0001	00000100

On both the **Work order purchase** list page and the **Work order purchase requisition** list page, a symbol that is related to delivery date control appears on the right side of each line. If the symbol is an exclamation point in a red circle, delivery of the related purchase order or purchase requisition might be delayed.

For a purchase order, the date that is related to the purchase order line is used to calculate a possible delay. To view this date, on the **Purchase order** page, select the purchase order line. The date is shown in the **Confirmed delivery date** field on the **Setup** tab of the **Line details** FastTab. If the **Confirmed delivery date** field isn't set, the date in the **Delivery date** field on the **Purchase order header** FastTab is used for the calculation. One of those dates is compared to the available date on the work order or work order job, in the following order:

1. Actual start date on the work order
2. Scheduled start date on the related work order job
3. Scheduled start date on the work order
4. Expected start date on the work order

For a purchase requisition, the date in the **Requested date** field on the **Purchase requisition header** FastTab of the **Purchase requisitions** page is used to calculate a possible delay. The date in that field is compared to the available date on the work order or work order job, in the same order that is used for a purchase order.

Create a purchase order from a work order

On the **All work orders** list page, you can select a work order job, and then create a related purchase order or a related purchase requisition. In this way, you help guarantee that project relations exist between the purchase order or purchase requisition and the work order.

1. Select **Asset management > Common > Work orders > All work orders** or **Active work orders**.
2. Select the work order to create a purchase order for, and then select **Edit**.
3. On the **Work order maintenance jobs** FastTab, select the work order job to create the purchase order for.
4. Select **Item tasks > Purchase order from work order job**.
5. On the **Project purchase orders** list page, click **New**.
6. Create the purchase order.

NOTE

To create a related purchase requisition, follow the same steps. However, select **Item tasks > Purchase requisition from work order job** in step 4.

Project relation between work order and purchase order or purchase requisition

A purchase order line or purchase requisition line is related to a work order job via the work order project and the related project activity number. When you create a purchase order or purchase requisition from a work order job, the related project activity number is mandatory. If all the work order jobs in the related work order have the same maintenance job type, the project activity number is automatically entered on the purchase order or purchase requisition. If the work order jobs have different maintenance job types, you must manually enter the project activity number on the purchase order or purchase requisition.

To view or enter the activity number that is related to a purchase order line, on the **Work order purchase list** page, select the purchase order record, and then, in the **Purchase order** column, select the link for the purchase order. You can find the **Activity number** field on the **Project** tab of the **Line details** FastTab.

The illustration below shows an example of the **Purchase order** page, with focus on the **Activity number**.

The screenshot displays the Dynamics 365 Finance and Operations interface for a purchase order. The main header shows 'PURCHASE ORDER' and '0000100 : 1001 - Acme Office Supplies'. Below this, the 'Purchase order lines' table lists one line with 'Line number' 1, 'Item number' 1000, and 'Product name' Surface Pro 128 GB. The 'Line details' section is expanded to the 'Project' tab, showing fields for 'Project ID' (000212-01), 'Line property' (NonBill), 'Sales unit' (ea), 'Sales price' (0.00), 'Project category' (Projitem), 'Sales currency' (USD), and 'Sales tax' (PA). The 'Activity number' field is highlighted with a red box and contains the value '00384'. Other fields include 'Quantity' (1.00), 'Unit price' (899.00), 'Net amount' (899.00), and 'Transaction ID' (000674).

Likewise, to view or enter the activity number that is related to a work order purchase requisition line, on the **Work order purchase requisition** list page, select the purchase requisition record, and then, in the **Purchase requisition** column, select the link for the purchase requisition. You can find the **Activity number** field on the **Project** tab of the **Line details** FastTab.

NOTE

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Manual update of asset counters

2/18/2021 • 2 minutes to read • [Edit Online](#)

Counters are used to create registrations on an asset, such as registrations about the number of hours that the asset has been in operation or the quantity that has been produced.

The counter type that is selected for a counter might be set to inherit counter values. In other words, the **Inherit asset counter values** option is set to **Yes** on the **General** FastTab of the **Counters** page (**Asset management > Setup > Asset types > Counters**). In this case, when you create a new counter line of that type, every child asset that uses the same counter type is automatically updated.

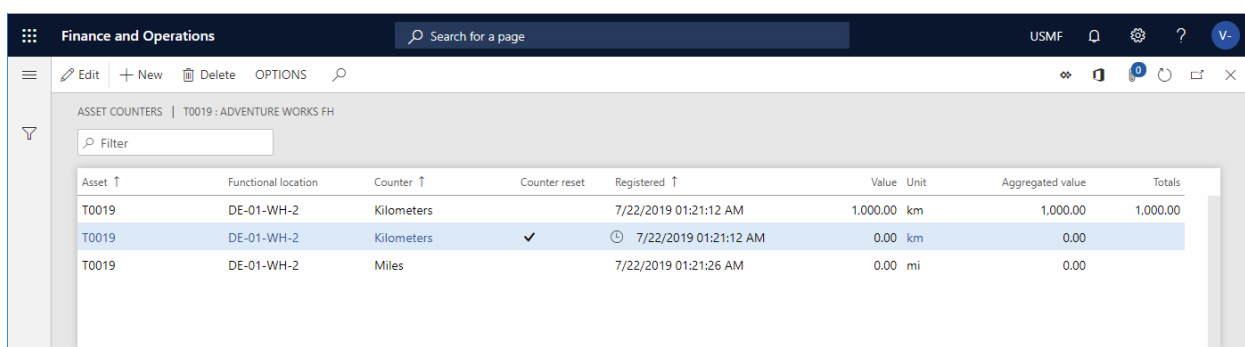
On the **All assets** page, you create hours or quantity counter registrations on an asset, based on your readings on the asset.

1. Select **Asset management > Common > Assets > All assets**.
2. Select the asset, and then, on the Action Pane, on the **Asset** tab, in the **Preventive** group, select **Counters**. The **Asset counters** page shows a list of all previous counter registrations that have been made on the selected asset.
3. Select **New** to create a registration. The asset ID is automatically entered in the **Asset** field.
4. In the **Counter** field, select the relevant counter. Only counters that are related to the asset type selected on the asset are available for selection. The related unit is automatically entered in the **Unit** field.
5. In the **Registered** field, select the date and time for the counter registration.
6. In the **Value** field, enter the number since the last counter registration. Alternatively, in the **Aggregated value** field, enter the total count number.

Note the following points:

- If you physically install a new counter on an asset, you must register the change on the asset on the **Asset counters** page. Next, you must create two registration lines that have identical timestamps. The first line must be for the counter that you're replacing. On the line that is related to the new counter, select the **Counter reset** check box. In the **Totals** field, the total count number is the sum of the counter totals of all registered values on that counter type.
- If the **Counter reset** check box is selected on an asset using a maintenance plan that has a "Once from..." or "Once reached..." interval type, the counter is still active on the new counter line, because you create a separate counter line and start over with a new counter.

The illustration below shows an example of the **Asset counters** page.



Asset ↑	Functional location	Counter ↑	Counter reset	Registered ↑	Value	Unit	Aggregated value	Totals
T0019	DE-01-WH-2	Kilometers		7/22/2019 01:21:12 AM	1,000.00	km	1,000.00	1,000.00
T0019	DE-01-WH-2	Kilometers	✓	7/22/2019 01:21:12 AM	0.00	km	0.00	
T0019	DE-01-WH-2	Miles		7/22/2019 01:21:26 AM	0.00	mi	0.00	

On the **Asset counters** page (**Asset management > Inquiries > Assets > Asset counters**), you can make

counter registrations on several assets at the same time, as you require.

NOTE

You can set up a range to define deviations in manual counter registrations. You can also specify the type of message that is shown if registrations are outside the defined range. For more information about how to set up counters, see [Counters](#).

NOTE

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Automatic update of asset counters

2/18/2021 • 2 minutes to read • [Edit Online](#)

For information about manual registration of asset counters, see [Manual update of asset counters](#). For information on how to set up asset counters, see [Counters](#).

Counter values can also be automatically updated from production registrations, based on the production hours or production quantity (that is, the quantity that is produced). This update is done on the **Update asset counters** page. You can update one or several assets by setting one parameter, **From date**. This parameter specifies the start date for production registrations (production hours or production quantities). In other words, it specifies the date that counter values should be updated from.

All assets that are related to a resource, *and* that have asset counters that are set up to be updated based on the production hours or production quantity, will be included in an automatic update. New counter values will be created.

For counters that are based on the production quantity, the count includes both the good quantity and the error quantity that are registered. If the unit that is used for production quantity registration differs from the unit that is used for the counter, the quantity is converted so that it corresponds to the counter unit.

As mentioned above, automatic counters can be updated from production registrations. Therefore, the asset for which you want to automatically update counters must be related to a resource (machine). When produced quantities or production hours have been registered on the resource, you can update the related asset counters.

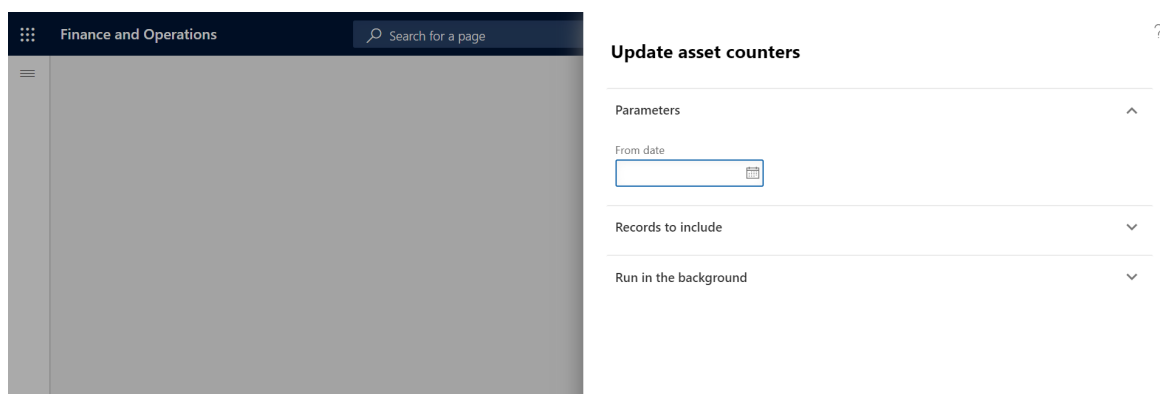
1. Select **Asset management > Periodic > Assets > Update asset counters**.
2. In the **From date** field, select the start date of the automatic update.

NOTE

The date in this field is the "work in progress" date from **Route transactions (Production control > Inquiries and reports > Production > Route transactions > Physical date field)**.

3. On the **Records to include** FastTab, you can select specific assets, asset types, or resources for the automatic update. Select **Filter**, and make the relevant selections.
4. On the **Run in the background** FastTab, you can set up the automatic update as a batch job, as you require.

The illustration below shows an example of the **Update asset counters** dialog.

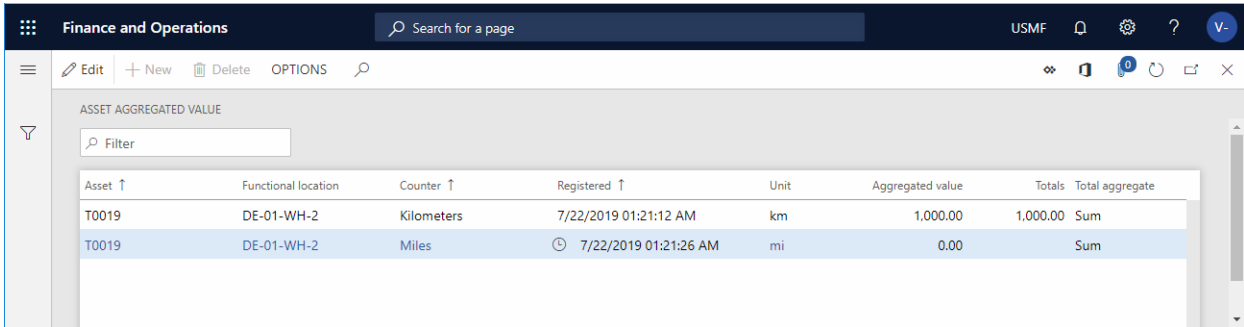


5. Select **OK**.

After the automatic asset counter update is done, you can view the counter registrations that are related to the asset on the **Asset counters** page. Select **Asset management > Common > Assets > All assets**, select the asset, and then, on the Action Pane, on the **Asset** tab, in the **Preventive** group, select **Counters**.

On the **Asset aggregated value** page, you can get an overview of the latest registration that have been made on all counter types on all assets. Select **Asset management > Inquiries > Assets > Asset aggregated value**. This page resembles the **Asset counters** page, but you can't add or edit registrations. It's for overview only.

The illustration below shows an example of the **Asset aggregated value** page.



Asset ↑	Functional location	Counter ↑	Registered ↑	Unit	Aggregated value	Totals	Total aggregate
T0019	DE-01-WH-2	Kilometers	7/22/2019 01:21:12 AM	km	1,000.00	1,000.00	Sum
T0019	DE-01-WH-2	Miles	🕒 7/22/2019 01:21:26 AM	mi	0.00		Sum

Note the following points:

- You can still create manual counter value registrations for counter types that are automatically updated. For more information, see [Manual update of asset counters](#).
- You can set up counters that are related to another counter. In this case, when a counter is updated, related counters are automatically updated at the same time. For more information about how to set up related counters, see [Counters](#).

NOTE

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Maintenance checklists

2/18/2021 • 5 minutes to read • [Edit Online](#)

Maintenance checklists are set up on maintenance job types. You fill in maintenance checklists as part of the process of completing a work order. For more information about how to set up maintenance checklists on maintenance job types on the **Maintenance job type defaults** page, see [Maintenance job type categories and maintenance job types, maintenance job type variants, maintenance job trades, and maintenance checklists](#).

When you work with maintenance checklists on a work order, you can fill in the predefined maintenance checklists that are related to maintenance job types. You can also add more maintenance checklists.

Fill in a maintenance checklist

1. Click **Asset management > Common > Work orders > All work orders** or **Active work orders**.
2. Select the work order and then, on the Action Pane, on the **Work order** tab, in the **Lines** group, select **Maintenance checklist**.
3. The **Work order maintenance job checklist** shows the checklists for all work order jobs. If the work order jobs have different maintenance job types, the maintenance checklists might differ for each work order job. Select a work order job to work with the related maintenance checklist. Details of the selected maintenance checklist line are shown on the **Line details** FastTab.
4. Complete all the maintenance checklist lines, one at a time, in the order that they appear in. You complete a maintenance checklist line by filling in the fields on the **Line details** FastTab. The information that is required to complete a line can vary, depending on the line type. For example, on a line of the **Text** type, you add a note that explains the result of your check. On a line of the **Measurement** type, you enter the counter value that you read on the equipment, and you can also add a note as you require. A maintenance checklist line of the **Header** type is used as a heading to group the maintenance checklist lines that appear below it. You don't have to fill in a header. As for all other types of maintenance checklist lines, you can add a note to a line of the **Header** type.
5. If instructions are related to a maintenance checklist line, the **Instructions** check box is selected. Read instructions for the selected maintenance checklist line in the **Instructions** field on the **Line details** FastTab.
6. When you've completed a maintenance checklist line, select the **Checked** check box on that line to mark it as completed. To discard a maintenance checklist line because it isn't relevant to the work order job, select the **N/A** check box on the line. If the **Mandatory** check box is selected on a maintenance checklist line, you must select either the **Checked** check box or the **N/A** check box.

NOTE

You can only update maintenance checklist registrations if the work order is in an [Active](#) lifecycle state.

Add a maintenance checklist line





Maintenance checklists are created from the definition on the maintenance job type default and are transferred to a work order job. As you require, you can add maintenance checklist lines to a work order job. Maintenance checklist lines that you manually add get the **Manual** reference.

1. On the **Work order maintenance job checklist** page, select the work order job to add a maintenance checklist for.
2. On the **Maintenance checklist lines** FastTab, select a maintenance checklist line. Then, to insert a new line after the selected line, press the **Down arrow** key. The next number in the sequence is automatically entered in the **Line number** field. To insert a new line before the selected line, select **Add line**.
3. On the **Name** field, enter a name for the maintenance checklist line.
4. In the **Type** field, select a type for the maintenance checklist line. The **Line details** FastTab contains related fields for each maintenance checklist type.
 - **Text** - Use this type to add a maintenance checklist line that has text that describes what must be done. For example, you can use this type if you want a worker to check or inspect something, but you aren't expecting a specific (measurable) result. After you select this type, on the **Lines details** FastTab, in the **Instructions** field, enter text that describes what must be done.
 - **Header** - A maintenance checklist line of this type is used as a heading to group the maintenance checklist lines that appear below it. This type is useful if you have several maintenance checklist lines that can be divided into specific areas. After you select this type, in the **Name** field, enter a descriptive name.
 - **Template** - This type isn't applicable when you manually add a maintenance checklist line on a work order job.
 - **Variable** - Use this type to define a possible result in a range on the maintenance checklist line. For information about how to set up maintenance checklist variables, see [Maintenance job type categories and maintenance job types, maintenance job type variants, maintenance job trades, and maintenance checklists](#). After you select this type, in the **Name** field, enter a name to describe the variable. On the **Line details** FastTab, in the **Variable** field, select the variable. In the **Instructions** field, enter text that describes what must be done.
 - **Measurement** - Use this type to record a specific measurement on the maintenance checklist line. After you select this type, in the **Name** field, enter a name for the measurement. On the **Line details** FastTab, in the **Counter** and **Unit** fields, select appropriate values. In the **Instructions** field, enter text that describes what must be done.
5. When you've finished manually adding maintenance checklist lines, fill in the lines as described in the **Fill in a maintenance checklist** section above.

NOTE

On the **Work order maintenance job checklist** page, you can't delete maintenance checklist lines that have the **Job type** reference. You can delete only maintenance checklist lines that you or other maintenance workers have manually created, and that have the **Manual** reference.

The illustration below shows an example of a maintenance checklist.

Finance and Operations USMF    

Search for a page

Save | + New | Delete | OPTIONS

Filter

JPMF-00002
1

WORK ORDER MAINTENANCE JOB CHECKLIST | JPMF-00002 : OIL LEAKAGE

Work order: JPMF-00002 | Work order job: 1

Overview

Asset: C0001 | Maintenance job type: Inspection | Result: None

Maintenance checklist lines

+ Add line | Remove | Documents

✓	Line number ↑	Name	Type	Checked	N/A	Mandatory	Inst
	1.0	Check electrical connections	Text	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	2.0	Check fluid - V01	Variable	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Line details

Instructions
Check if the electrical connections are secured.

Note from maintenance worker

Worker: Julia Funderburk

Date checked: 7/22/2019 06:13:48 AM

Checked: Yes / No

Mandatory: No / Yes

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Maintenance downtime for work orders

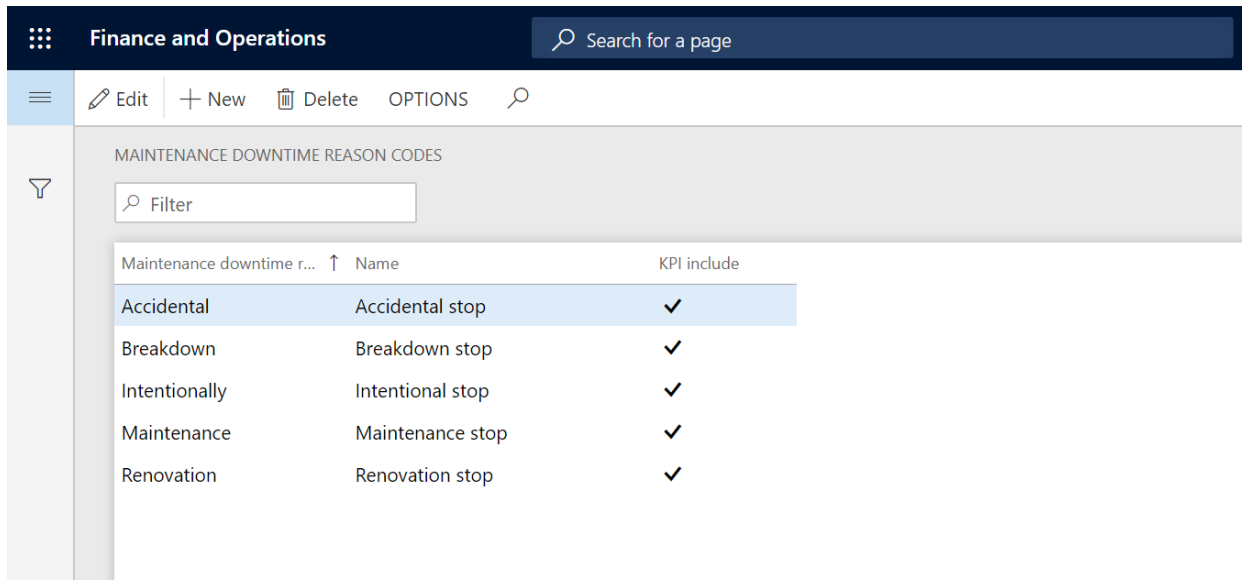
2/18/2021 • 2 minutes to read • [Edit Online](#)

You can create maintenance downtime registrations on the asset that is selected on a work order. This capability is useful if you want to register maintenance downtime on one or more machines in the production area. You first create the maintenance downtime reason codes that you want to use, such as **Breakdown** and **Planned stop**. This step is done on the **Maintenance downtime reason codes** page. You can then create maintenance downtime registrations on the **Maintenance downtime** page and add the relevant maintenance downtime reason codes.

Create maintenance downtime reason codes

1. Select **Asset management > Setup > Work orders > Maintenance downtime reason codes**.
2. Select **New**.
3. In the **Maintenance downtime reason code** field, enter an ID for the maintenance downtime reason code.
4. In the **Name** field, enter a name.
5. Select the **KPI include** check box if the reason code should be included in calculations of key performance indicators (KPIs) for the asset. In general, planned production stops should not be included in KPI calculations, because they don't affect expected performance.
6. Select **Save**.

The illustration below shows an example of the **Maintenance downtime reason codes** page.



Maintenance downtime r...	Name	KPI include
Accidental	Accidental stop	✓
Breakdown	Breakdown stop	✓
Intentionally	Intentional stop	✓
Maintenance	Maintenance stop	✓
Renovation	Renovation stop	✓

After you've created the maintenance downtime reason codes that you want to use, you can create maintenance downtime registrations for work orders and assets.

Create maintenance downtime registrations

1. Click **Asset management > Common > Work orders > All work orders** or **Active work orders**.
2. Select the work order, and then, on the **Work order** tab, in the **Asset** group, select **Maintenance**

downtime.

3. Select **New**.
4. In the **From** and **To** fields, define the date and time interval for the maintenance downtime registration.

NOTE

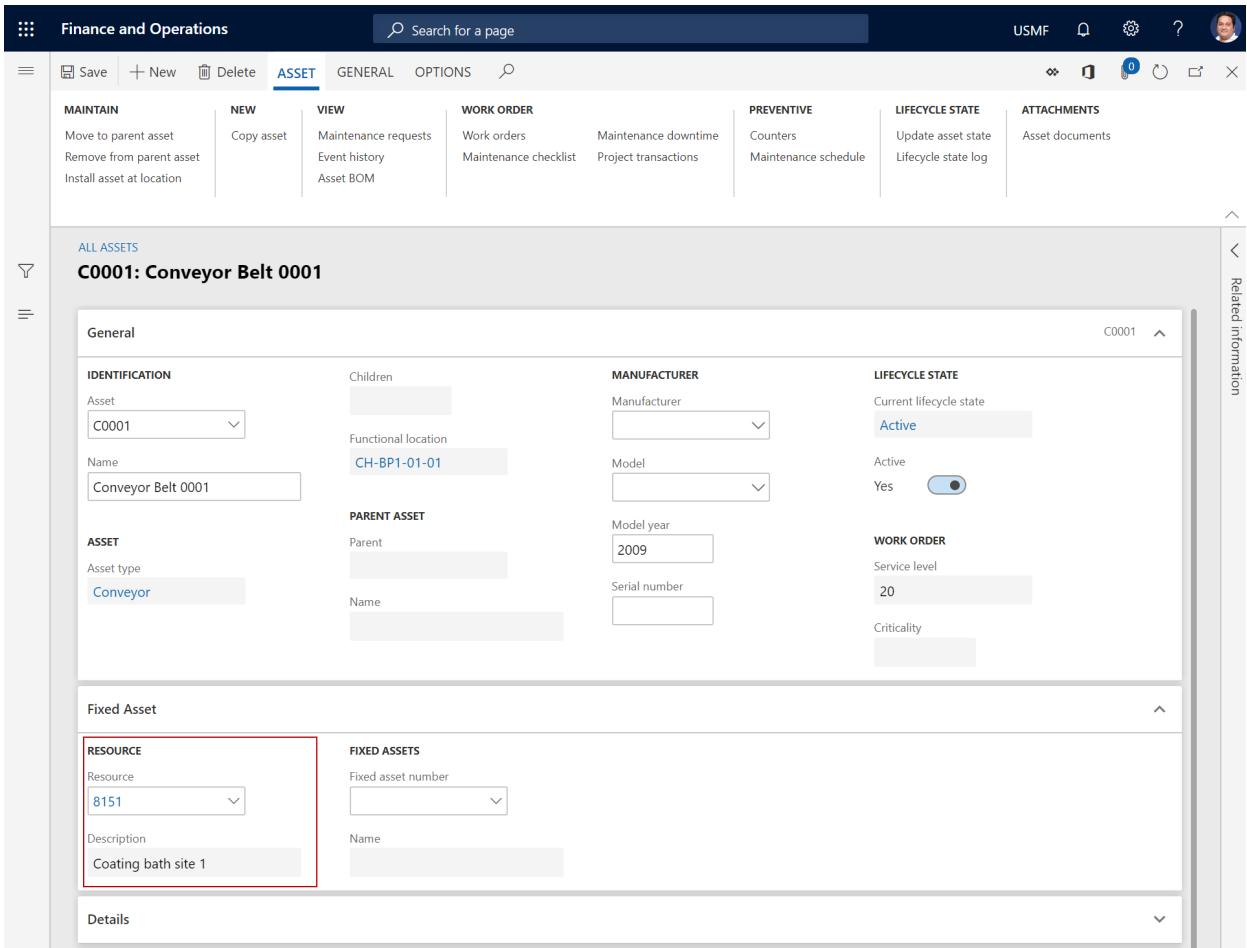
When you leave the **To** field, the duration in hours is automatically inserted in the **Duration** field.

5. In the **maintenance downtime reason code** field, select a reason code.
6. Repeat steps 3 through 5 to add more registrations.
7. Select **Save**.

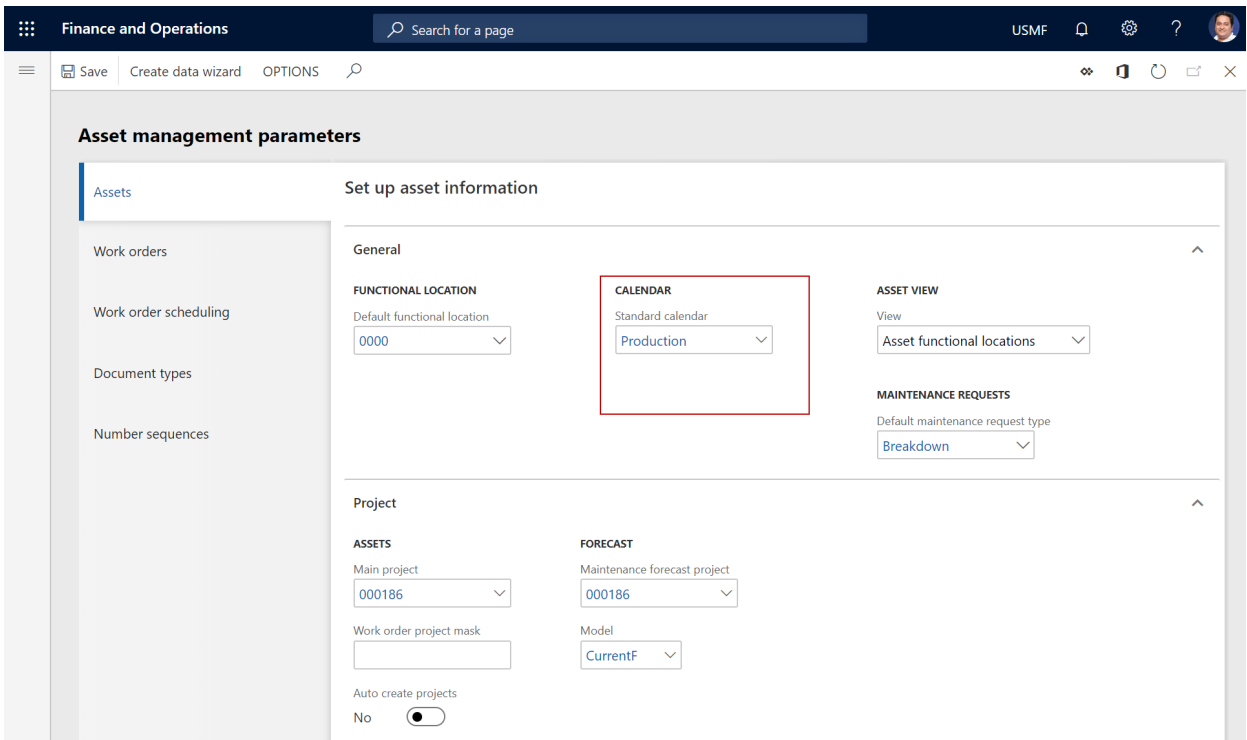
The illustration below shows an example of maintenance downtime registration.

Asset	Functional location	Work order	from ↑	to	Duration	Maintenance downtime
C0001	CH-BP1-01-01	JPMF-00002	🕒 7/23/2019 12:00:00 AM	🕒 7/24/2019 12:00:00 AM	24.00	Accidental

The calendar that is used to calculate a maintenance downtime registration depends on your selection in the setup of assets and parameters. If a resource is selected on an asset in the **Resource** field on the **Fixed asset** FastTab of the **All assets** page, the calendar that is set up for the associated resource group is used, as shown in the following illustration.



If no resource is selected on the asset, the standard calendar that is selected on the **Asset management parameters** page is used, as shown in the following illustration.



To see an overview of all maintenance downtime registrations, click **Asset management > Inquiries > Maintenance downtime**.

NOTE

All calendars that are used in the **Asset Management** module are set up in **Organization administration > Setup > Calendars > Calendars**.

NOTE

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Add fault to work order

2/18/2021 • 2 minutes to read • [Edit Online](#)

You can add faults that were set up in the fault designer to a work order. One or more fault records must be connected to the asset types that are used for the asset that is selected in the work order. For more information about the setup, see [Fault management](#).

1. Select **Asset management** > **Common** > **Work orders** > **All Work orders** or **Active work orders**.
2. Select the work order to make a fault registration on, and then, on the Action Pane, on the **Work order** tab, in the **Asset** group, select **Asset fault**.
3. On the **Symptoms** FastTab, select **Add line**. A sequential fault number is automatically entered in the **Fault** field.
4. In the **Fault symptom** field, select the relevant symptom.
5. In the **Fault area** and **Fault type** fields, select the appropriate values.
6. In the **Fault date** field, the current date is automatically inserted. You can select a different date as you require.
7. On the **Causes for selected symptom** FastTab, add a line to describe the cause of the issue.
8. On the **Remedies for selected symptom** FastTab, add a line to describe a possible solution to the issue.
9. Select **Save**.

The illustration below shows an example of a fault registration.

Finance and Operations Search for a page USMF

Save + New Delete OPTIONS

JPMF-00002 : OIL LEAKAGE

Asset faults

Symptoms

+ Add line Remove

Fault ↑	Asset	Fault date	Fault symptom	Fault area	Fault type	Causes	Remedies
MYMF-00003	C0001	7/22/2019	Air Leak	Hydraulic	Damaging	1	1

Causes for selected symptom

+ Add line Remove

Fault cause	Description	Remedies
Wear and tear	Expected wear and tear	1

Remedies for selected symptom

+ Add line Remove

Fault remedy	Description
Repaired	Object has been repaired

View asset faults

In the **Asset faults** list, you can get an overview of all faults registered on assets.

On the **Asset faults** list page, you can get an overview of all faults that have been registered on assets. To open the page, select **Asset management > Inquiries > Asset fault > Asset faults**.

Print asset fault report

From the **All assets** list page, you can print an asset fault report that shows all fault registrations and a graphical overview of fault statistics.

1. Select **Asset management > Common > Assets > All assets**.
2. Select the asset to print a fault report for.
3. On the Action Pane, on the **General** tab, in the **Reports** group, select **Asset fault**.
4. Enter a specific period, or select a fault type.
5. Select **OK** to print the report.

NOTE

To print a fault report for several assets or asset types, select **Asset management > Reports > Assets > Asset fault**.

NOTE

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Work order report

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You can generate a work order report that shows detailed information about one or more work orders that you select.

1. Select **Asset management > Reports > Work orders > Work order report**.
2. Select "Yes"/"No" on the toggle buttons as you require, to determine the details to be included in the report.
 - In the **Print settings** section, you can select whether to include attachments from the setup of the related maintenance job type.
3. On the **Records to include** FastTab, you can filter the contents of the report by **Work order**.
4. On the **Run in the background** FastTab, you can set up generation of the work order report as a batch job, as you require.
5. Select **OK** to generate the report.

The following illustration shows an example of how the report parameters can be set up.

Work order report

Parameters ^

WORK ORDER

Work order pool
Yes

ASSET

Asset image
Yes

Asset Address
No

Asset counters
No

Asset Notes
Yes

Asset attributes
Yes

WORK ORDER JOB NOTES

Notes: Description
Yes

Notes: Maintenance worker
Yes

Notes: Internal
Yes

Blank note lines

MAINTENANCE CHECKLIST

Maintenance checklist
Yes

Maintenance checklist N/A
Yes

FORECAST

Forecast
Yes

Blank maintenance forecast lines

WORK ORDER JOB

Schedule
No

Blank fault lines

Tools
Yes

Unposted Journal lines
No

Purchase
Yes

PRINT SETTINGS

Print attached documents
No

Asset attributes
No

The following illustration shows an example of a work order report that is generated based on that setup.

Go to Find Zoom Export

Work order report (Work order JPMF-00002)
 Contoso Entertainment System USA

Page 1 of 7
 7/22/2019
 6:41 AM

Work order

Work order ID	Description	Work order type	Service level	Start date and time	End date and time	Worker
JPMF-00002	Oil leakage	Preventive	20 (Medium)	7/24/2019 07:00:00 am	8/7/2019 07:00:00 am	-

Lines for JPMF-00002 - Oil leakage

Line number	Asset ID	Asset type	Location	Maintenance job type	Maintenance job type variant	Trade	Maintenance downtime activities	Scheduled start
1	C0001	Conveyor	CH-BP1-01- Steeping	Inspection		Mechanical	No	

Notes

Description	Employee	Internal
Inspect equipment		

Faults

Fault date	Fault symptom	Fault area	Fault type	Fault cause	Fault remedy
7/22/2019	Air Leak	Hydraulic	Damaging	Wear and tear	Repaired

Tools

Resource	Name	Group
8150L	Lean Coating internal	8150L

Forecast Hours

Date	Category	Worker	Hours	Line property
7/24/2019	Hour		1.00	NonBill

Items

Date	Item number	Product name	Quantity	Unit	Product dimension

Expense

Date	Category	Worker	Quantity	Unit	Product dimension

NOTE

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Work order pools

2/18/2021 • 4 minutes to read • [Edit Online](#)

You can use work order pools to group work orders that have something in common. Here are some examples of things that you can create work order pools for:

- Work crews, for example, Maintenance Crew A or Maintenance Crew B
- Professional skills, such as electricians or plumbers
- Physical locations
- Time schedules, such as weeks or other periods

As you require, you can put one work order in multiple work order pools.

Create a work order pool

On the **All work order pools** or **Active work order pools** list page, you can get an overview of your work order pools and create new pools.

1. Select **Asset management > Common > Work order pools > All work order pools** or **Active work order pools**.
2. Select **New**.
3. In the **Pool** field, enter an ID for the work order pool.
4. In the **Name** field, enter a name.
5. Set the **Active** option to **Yes** to indicate that the work order pool is active.
6. Set the **Delete work order relations** option to **Yes** if work orders should automatically be removed from the work order pool.
7. In the **Delete lifecycle state** field, select the work order lifecycle state. For example, the work order lifecycle state for completing a work order could be set to automatically delete relations to work order pools.

You can start adding work orders to your work order pool right away.

8. On the **Work orders** FastTab, select **Add line**.
9. In the **Work order** field, select a work order. The related fields are automatically updated.
10. Repeat steps 8 through 9 to add more work orders.
11. If the work orders that you added should be done in a specific order, in the **Sort order** field, you can enter the numbers **1, 2, 3**, and so on, to specify that order.
12. To view a list of all the work orders that are included in the work order pool, on the Action Pane, on the **Work order pool** tab, in the **View work order pool related** group, select **Work orders** to open the **All work orders** list page.
13. To calculate and view capacity load for the maintenance schedule, unscheduled work orders, and scheduled work orders, on the Action Pane, on the **Work order pool** tab, in the **View work order pool related** group, select **Capacity load** to open the **Calculate capacity load** dialog.

14. To calculate and view forecasts for items (spare parts and other required items) that are related to maintenance schedule, unscheduled work orders, and scheduled work orders, on the Action Pane, on the **Work order pool** tab, in the **View work order pool related** group, select **Item forecast** to open the **Calculate item forecast** dialog.
15. To view a list of purchase requisitions that are related to the work orders in the work order pool, on the Action Pane, on the **Work order pool** tab, in the **Procurement** group, select **Work order purchase requisition** to open the **Work order purchase requisition** list page.
16. To view a list of purchase orders that are related to the work orders in the work order pool, on the Action Pane, on the **Work order pool** tab, in the **Procurement** group, select **Work order purchase** to open the **Work order purchase** list page.

NOTE

When a work order pool is no longer relevant to your work planning, set the **Active** option for that pool to **No** in the list view of the **Work order pool** page.

To delete all worker order lines, set the **Delete work order relations** option to **Yes**. This option is useful if, for example, you want to create an empty pool that you can use later for other work orders. When you're ready to use the work order pool to create new work order relations later, remember to set the **Delete work order relations** option to **No**.

The illustration below shows an example of the **Work order pool** list page.

Pool	Name	Active	Delete work ord...	Work orders
Day	Day shift	✓	✓	1
Evening	Evening shift	✓	✓	
Morning	Morning shift	✓	✓	
Night	Night shift	✓	✓	
Weekend	Weekend shift	✓	✓	

Add a work order to a work order pool

As described in the previous section, you can add work orders to a work order pool when you create that pool. You can also add work orders to a work order pool on the **All work orders** or **Active work orders** list page.

1. Select the work order, and then, on the Action Pane, on the **Work order** tab, in the **Maintain** group, select **Work order pool**.
2. Select the work order in the list, and click **Work order pool**.
3. In the **Maintain work order pool** dialog, in the **Add/remove** field, select **Add**.
4. In the **Pool** field, select the work order pool.
5. Select **OK**.

6. To put the work order that you added in a specific order in the work order pool, on the **All work order pools** or **Active work order pools** list page, select the pool, and then select **Edit**. Then, on the **Work order pool** page, on the **Work orders** FastTab, use the **Sort order** field to adjust the sort order of the work orders that are included in pool.

To remove a work order from a work order pool, repeat these steps, but select **Remove** in step 3.

NOTE

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Active work order maintenance jobs overview

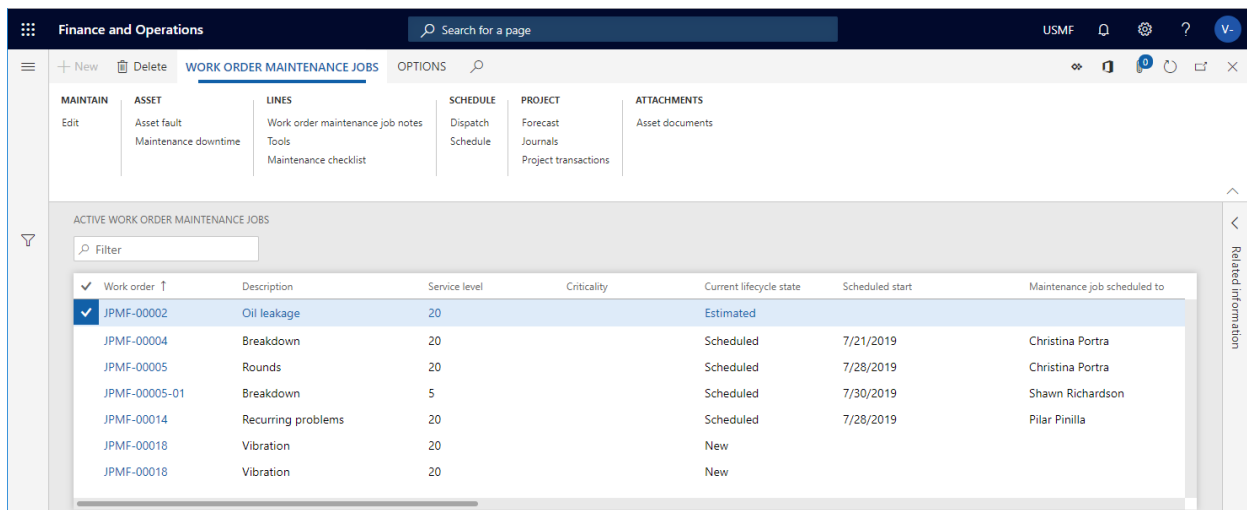
2/18/2021 • 2 minutes to read • [Edit Online](#)

On the **Active work order maintenance jobs** list page, you can get an overview of work orders, in terms of the number of work orders that have been created on specific assets, asset types, manufacturers, models, maintenance job types, and so on. By selecting a work order job and then selecting **Edit**, you can open the related work order. By selecting a work order job and then selecting one of the buttons on the **Work order maintenance jobs** tab of the Action Pane, you can view data for the work order that the work order job is related to.

To open the list page, select **Asset management > Common > Work orders > Active work order maintenance jobs**. The page lists all active work order jobs, and it also shows some of the information that is related to the work order or work order job.

In the % column, a number shows completion of the work order as a percentage. Completion is based on two calculations: posted hours compared to forecasted hours, and the number of maintenance checklists that have been completed.

The illustration below shows an example of the **Active work order maintenance jobs** list page.



Work order ↑	Description	Service level	Criticality	Current lifecycle state	Scheduled start	Maintenance job scheduled to
✓ JPMF-00002	Oil leakage	20		Estimated		
JPMF-00004	Breakdown	20		Scheduled	7/21/2019	Christina Portra
JPMF-00005	Rounds	20		Scheduled	7/28/2019	Christina Portra
JPMF-00005-01	Breakdown	5		Scheduled	7/30/2019	Shawn Richardson
JPMF-00014	Recurring problems	20		Scheduled	7/28/2019	Pilar Pinilla
JPMF-00018	Vibration	20		New		
JPMF-00018	Vibration	20		New		

For a short description of the buttons on the **Active work order maintenance jobs** list page, refer to [Introduction to work orders](#) where identical buttons are described.

NOTE

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Work orders and fixed assets

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In Asset Management, assets can be related to fixed assets, and you can create work orders for those assets. If you use this functionality, you can get a complete overview of fixed assets, related investment projects, and the costs that are registered on the investment projects in the **Project management and accounting** and **Fixed assets** modules in Microsoft Dynamics 365 for Finance and Operations.

NOTE

The **Fixed asset number** field on the work order job project is set only if **Investment** is selected as the project type on the work order job project.

The illustration below shows the relation between an investment project in the **Project management and accounting** module and a work order job project.

The screenshot displays two side-by-side views from Microsoft Dynamics 365. On the left is the 'PROJECTS' view, showing a list of projects with '000187-000041 : WO-00000060: NY-01-WH-3' selected. Below the list, the 'General' section shows 'Project ID' as '000187-000041', 'Project name' as 'WO-00000060: NY-01-WH-3', and 'Project group' as 'Investment'. The 'Project type' is set to 'Investment' and 'Project stage' is 'Created'. On the right is the 'ALL WORK ORDERS' view for 'Work order: WO-00000060'. The 'Line details' section shows 'ASSET' as 'NY-01-WH-3', 'Name' as 'New York DC Warehouse 3', and 'JOB' as 'SCHEDULED'. The 'FIXED ASSET NUMBER' is 'BUIL-000007'. A red arrow points from the 'Project ID' field in the project view to the 'Fixed asset number' field in the work order view, indicating the data flow.

The following procedure describes the relation between assets, work orders, work order job projects, and fixed assets.

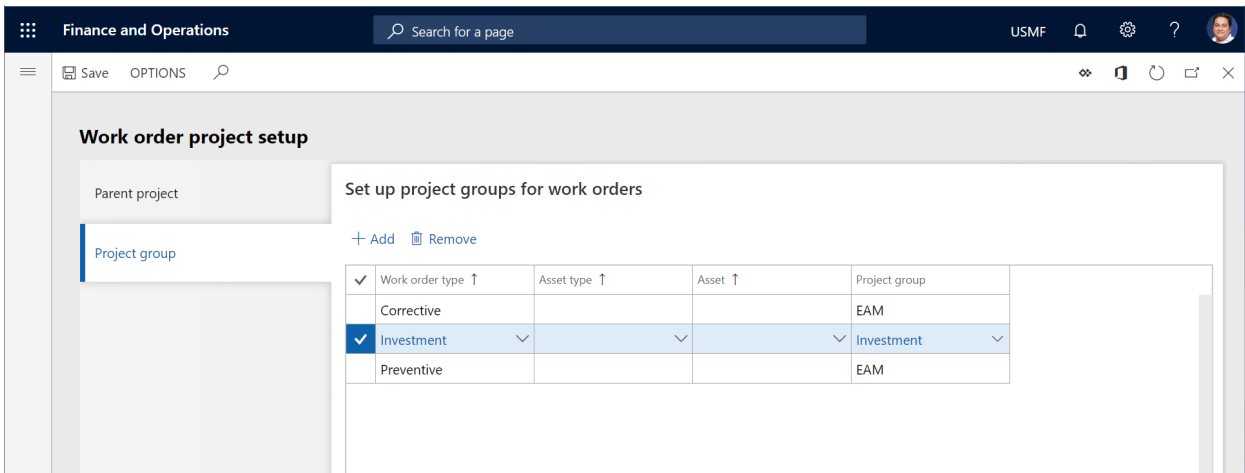
1. You create an asset that you relate to a fixed asset.

The screenshot displays the 'GENERAL' tab for asset 'DE-01: Denver Distribution Center'. The interface includes sections for 'ASSET DETAILS', 'RELATED INFORMATION', and 'REPORTS'. The main form is divided into several sections: 'IDENTIFICATION' (Asset: DE-01, Name: Denver Distribution Center), 'ASSET' (Asset type: Facility), 'CHILDREN', 'FUNCTIONAL LOCATION' (DE-01), 'PARENT ASSET', 'MANUFACTURER' (Manufacturer, Model, Model year, Serial number), 'LIFECYCLE STATE' (Current lifecycle state: Active, Active toggle: Yes), and 'WORK ORDER' (Service level: 20, Criticality). A 'Fixed Asset' section is also visible, containing 'RESOURCE' and 'FIXED ASSETS' (Fixed asset number: BUIL-000002, Name: Production Site 1). The 'FIXED ASSETS' section is highlighted with a red box.

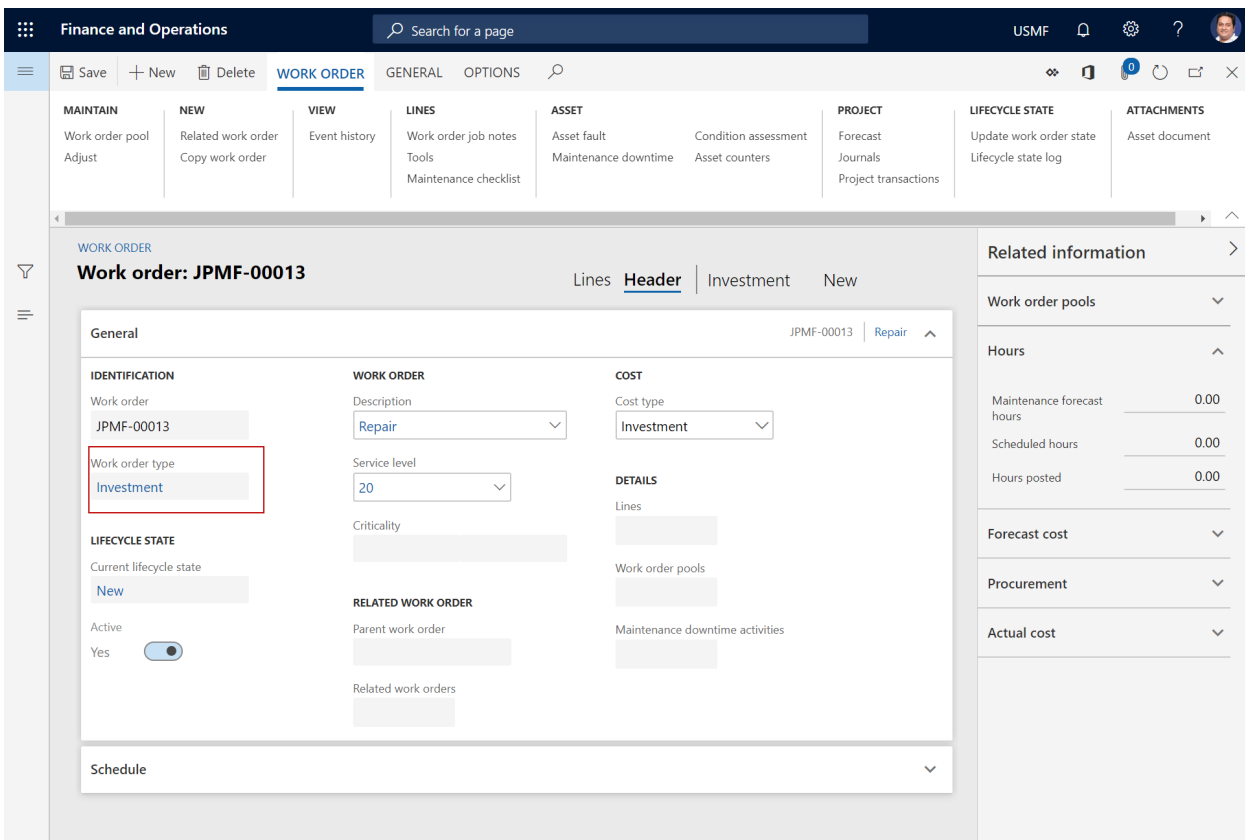
2. When you set up work order types on the **Work order types** page (Asset management > Setup > Work orders > Work order types), you create a work order type for handling investments. See also [Work order types](#).

The screenshot displays the 'WORK ORDER TYPES' page. The 'Investment' work order type is selected, and the 'General' tab is active. The form includes sections for 'LIFECYCLE STATE' (Work order lifecycle model: Standard), 'COST' (Cost type: Investment), 'SCHEDULE' (One maintenance worker: No), 'MANDATORY' (Fault symptom: No), and 'FAULT CAUSE' (Fault cause: No, Fault remedy: No, Maintenance downtime: No). The 'Investment' work order type is also visible in the left sidebar.

3. When you set up work order project groups on the **Project group** tab of the **Work order project setup** page (Asset management > Setup > Work orders > Project setup), you create a relation between the work order type that is used for investments and the project group that was created for investments on the **Project groups** page in the **Project management and accounting** module (Project management and accounting > Setup > Posting > Project groups).



- When you create a work order that is related to a fixed asset, you select the work order type that is used to handle investments, such as **Investment**.
- When the work order is created, the related work order type is shown on the **All work orders** page.



- When the work order is created, the project that is related to the work order is created on the **All projects** page in the **Project management and accounting** module (**Project management and accounting > Projects > All projects**). To view project-related information, select the link in the **Project ID** field on the **General** tab on the **Line details** FastTab in the details view of the **All work orders** page in the **Asset management** module (**Asset management > Common > Work orders > All work orders**).

Finance and Operations

Search for a page

USMF

Edit + New Delete PROJECT PLAN MANAGE CONTROL OPTIONS

NEW MAINTAIN SET UP COST PRICES SALES PRICES JOURNALS

Subproject Project stage Beginning balances Line properties Hours Hours Fees Hour Item
Copy project Project group Collaboration workspace Ledger posting Expenses Expenses Subscriptions Expense Fee

PROJECTS

000212-03 : JPMF-00013: DE-01

General Investment Investment US-023 7/29/2019 8/12/2019

PROJECT	Project stage	RESPONSIBLE	DATES	Extension date
Project ID 000212-03	Created	Sales manager	Date of creation 8/7/2019	
Project name JPMF-00013: DE-01	CUSTOMER Project contract ID	Project manager	Projected start date 7/29/2019	Actual end date
Project type Investment	Account US-023	Project controller	Actual start date	INTEGRATION Integration source
Project group Investment	Email		Projected end date 8/12/2019	

Project team and scheduling Not staffed

Setup Category PA BUIL-000002

REQUIRE ACTIVITY ON FORECAST	REQUIRE ACTIVITY ON JOURNALS	LINE PROPERTY	OTHER INFORMATION	Enable category validation
Hour No <input type="radio"/>	Hour No <input type="radio"/>	Search priority Project	Ledger posting sort priority	No <input checked="" type="radio"/>
Expense No <input type="radio"/>	Expense No <input type="radio"/>	Default	Category	Fixed asset number BUIL-000002
Item No <input type="radio"/>	Item No <input type="radio"/>	TIMESHEET Minimum time increment 0.00	Sales tax group PA	
			Sales price group	

7. To see an overview of the projects associated with a fixed asset, select **Fixed assets > Fixed assets > Fixed assets**, and then, in the **Fixed asset number** field, select the link for the fixed asset to open the details view. Expand the **Related information** pane on the right side of the page, and select the **Associated projects** FastTab.

NOTE

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Forecasts, work orders, and projects

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In Asset Management, integration with the **Project management and accounting** module helps optimize cost control, so that users can track costs on maintenance job type forecasts and work order jobs.

Tracking of maintenance job type forecasts requires two settings:

1. Select a project in **Asset management > Setup > Asset management parameters**, and then, on the **Assets** tab > on the **Project** FastTab, in the **Maintenance forecast project** field, select a project.
2. When you create a maintenance job type default line, an activity number is automatically created for the line on the **Maintenance job type defaults** page (**Asset management > Setup > Jobs > Maintenance job type defaults**).

Maintenance job type forecasts serve two purposes:

- You can track costs on maintenance job type forecasts in the **Project management and accounting** module.
- Forecasts are automatically transferred to a work order job project when you select a maintenance job type on a work order job.

To track costs on work order jobs, you must first set up work order projects. For more information, see [Work order project setup](#).

Work order job projects

When you create a work order job on a work order, the work order project is determined by the setup of the parent project for work orders on the **Work order project setup** page (**Asset management > Setup > Work orders > Project setup**).

Work order job projects are created by using a combination of the following work order information:

- The work order type selected on the work order
- The functional location related to the asset on the work order job
- The asset type that is related to the asset on the work order job
- The expected start and end times that are set on the work order

Some of this information might not be found on a work order. Therefore, the search for a work order parent project is done by using the available combination of data and selecting the project ID that corresponds to work order data.

For example, in the following illustration, because of the way that the **Truck Engine** asset type is set up, every work order job that is created with the **Truck Engine** asset type will be a sub-project of project ID 000186.

Finance and Operations

Search for a page

USMF

Save OPTIONS

Work order project setup

Parent project

Project group

Set up parent projects for work orders

+ Add Remove Edit View

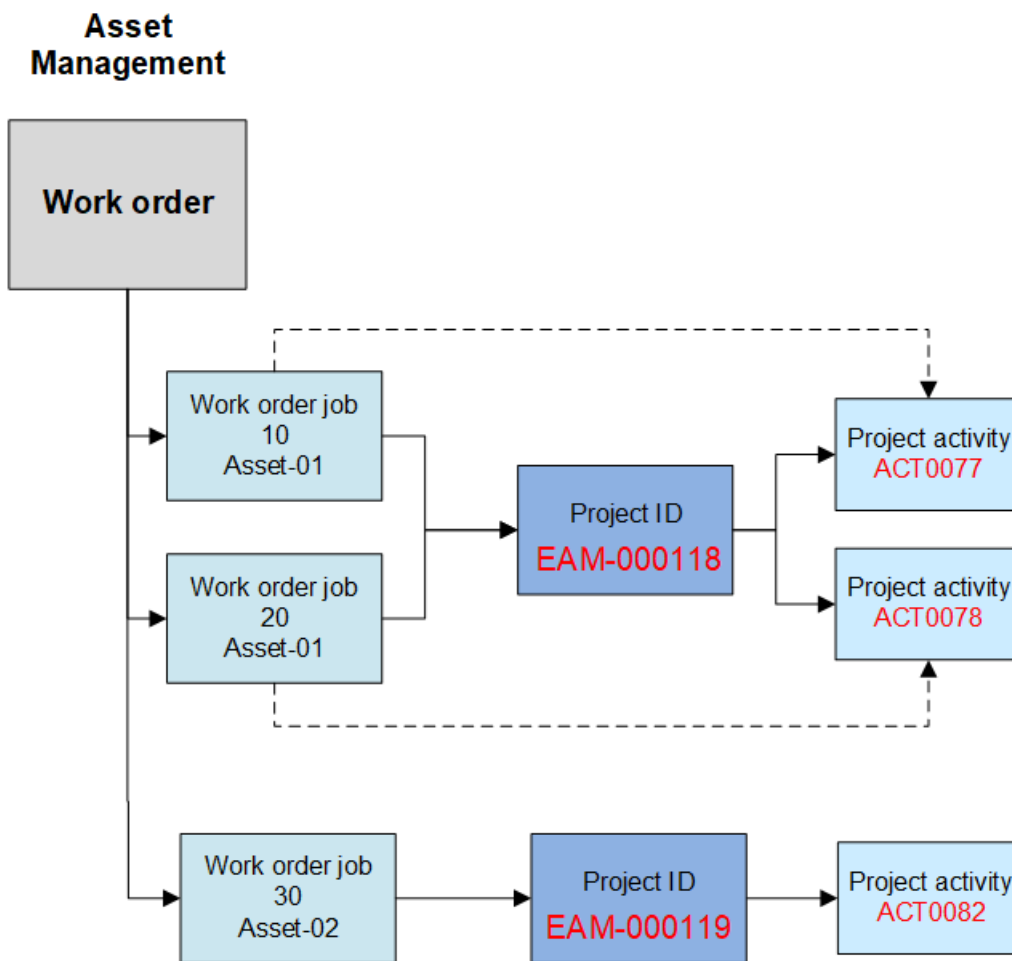
<input checked="" type="checkbox"/>	Work order type	Functional location	Asset type ↑	Asset	Valid from	End date	Project ID
	Corrective				7/21/2019	None	000211
	Preventive				7/21/2019	None	000212
<input checked="" type="checkbox"/>			Truck Engine		8/14/2019	None	000186

The purpose of the project ID on the work order job, and the related activity number, is to track costs that are related to the work order job, and the asset that is selected on it, in the **Project management and accounting** module. (To view the project ID and activity number, select **Asset management > Common > Work orders > All work orders**, and then select the work order. On the **Line details** FastTab, the **Project ID** field shows the project ID, and the **Activity number** field shows the activity number.) For more information about cost control in Asset Management, see [Cost and date control](#).

The following illustration shows a graphical overview of work order projects and related project activities.

Work order projects association

Note: Red text are examples to show dependencies.



NOTE

- A work order job in Asset Management is associated with a project activity in the Project module.
- A work order job has one maintenance job type.

When a new work order job is created on a work order, a work order project is automatically created for the job. The financial dimensions for the asset that is related to the work order job are automatically transferred to the work order project.

The project activity that is created for a work order job has related information attached to it. This information is about the maintenance job type, maintenance job type variant, and trade. It's useful if, for example, you create a purchase order from a work order (see [Procurement](#)), or if you use the **Project management and accounting** module for time registration.

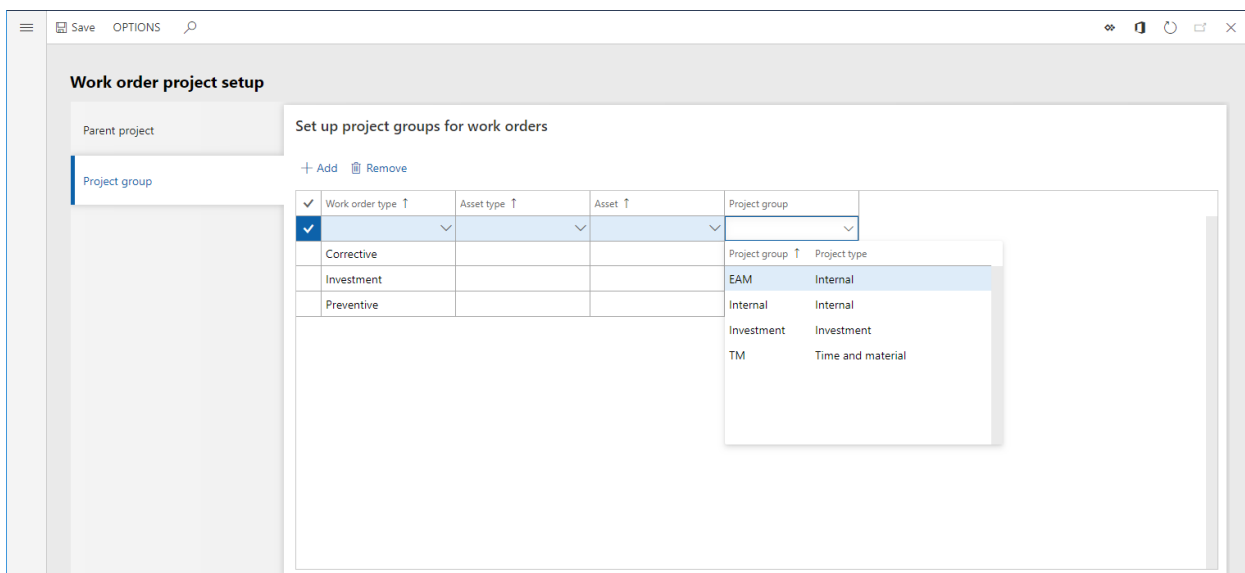
If the asset was installed on a functional location but is later installed on a different functional location, the financial dimensions that are related to the new functional location are automatically updated on the asset. Then, when you create a work order job for the asset, the work order project for the work order job automatically gets the financial dimensions that are now related to the asset. Therefore, when you use functional locations, costs can always be tracked on the functional locations that an asset was installed on at any given time. The automatic update of financial dimensions helps guarantee complete traceability of costs for project control and reporting.

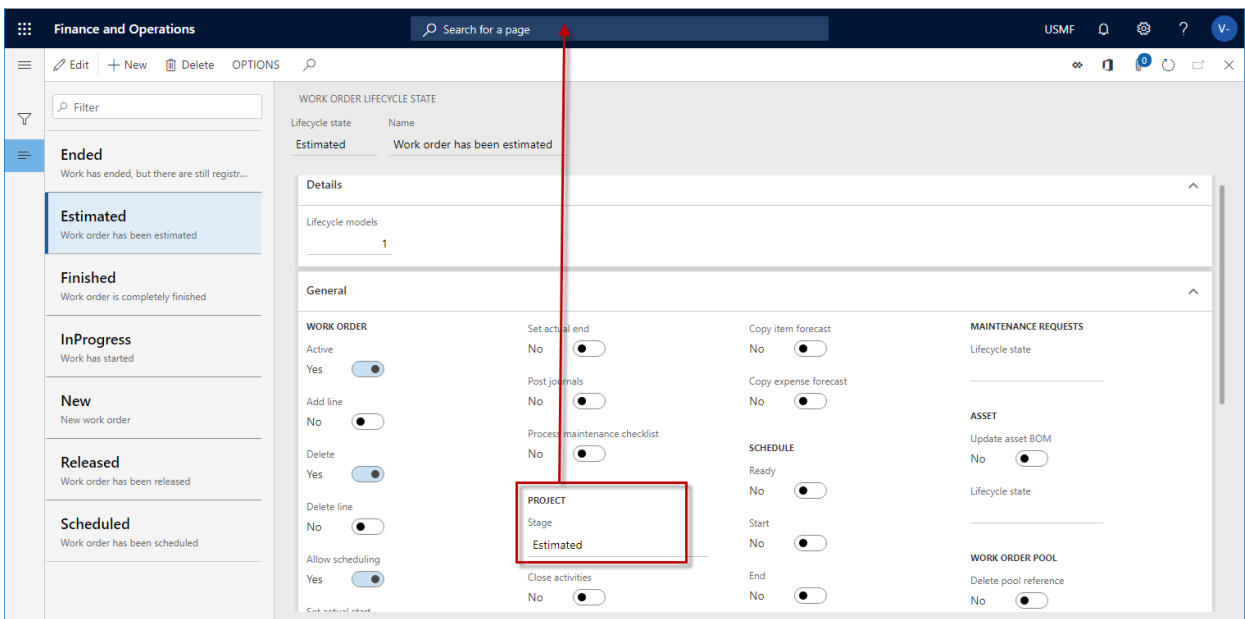
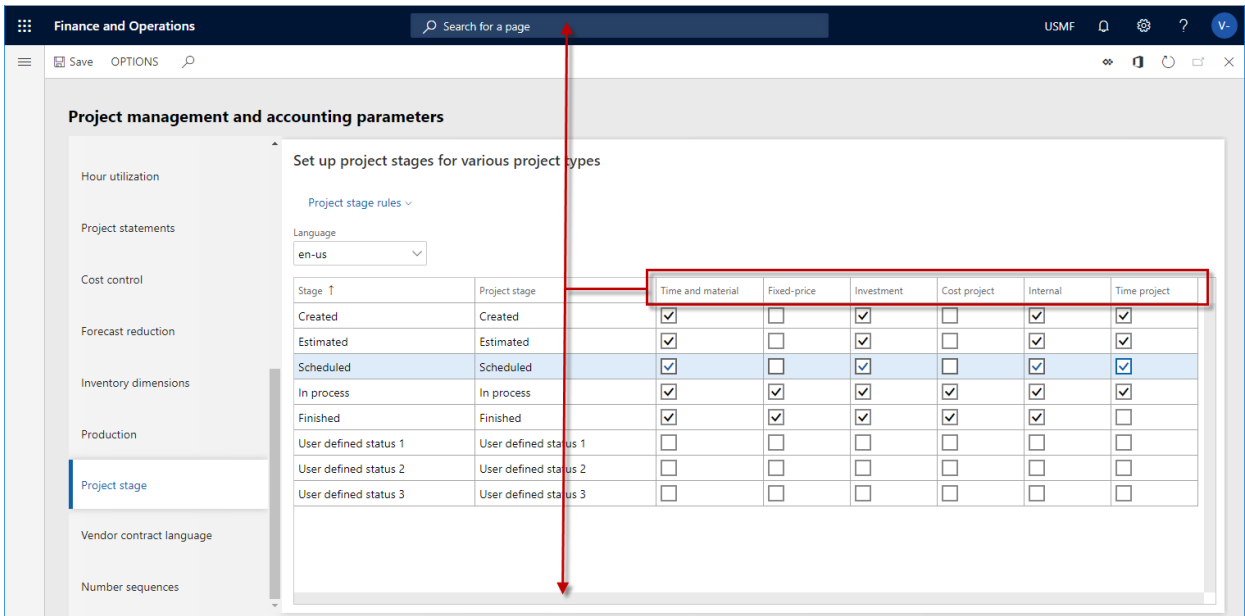
Work order projects, work order lifecycle states, project stages, and project types

To help guarantee that work order lifecycle states and related project stages on work orders are used correctly, consider the dependencies in relation to the **Project management and accounting** module:

- In the **Project management and accounting** module, project stages are set up on project types on the **Project management and accounting parameters** page.
- On the **Project management and accounting parameters** page, use the check boxes to select relevant project stages for all the project types that you will use. In the following illustrations, five stages (**Created**, **Estimated**, **Scheduled**, **In process**, and **Finished**) have been selected for the **Time and material** and **Internal** project types. Those five stages are relevant to both internal maintenance jobs and service maintenance jobs.
- In the **Asset Management** module, project types are defined by the project groups that you set up on the **Work order project setup** page > **Project group** tab (**Asset management** > **Setup** > **Work orders** > **Project setup**).
- The project groups that are set up on the **Work order project setup** page are used when you create work orders. When a work order is created, a work order project is automatically created for the work order.
- Every work order lifecycle state must have a related project stage.
- The project stage that is related to a work order lifecycle state must be defined as an active stage for the project group that is defined in the work order project. The work order project is automatically created on a work order.
- When you create a new work order, the automatic allocation of a work order project is based on the setup on the **Work order project setup** page.

The following illustrations show the associations between work order project groups, related project types, project stages, and work order lifecycle states.

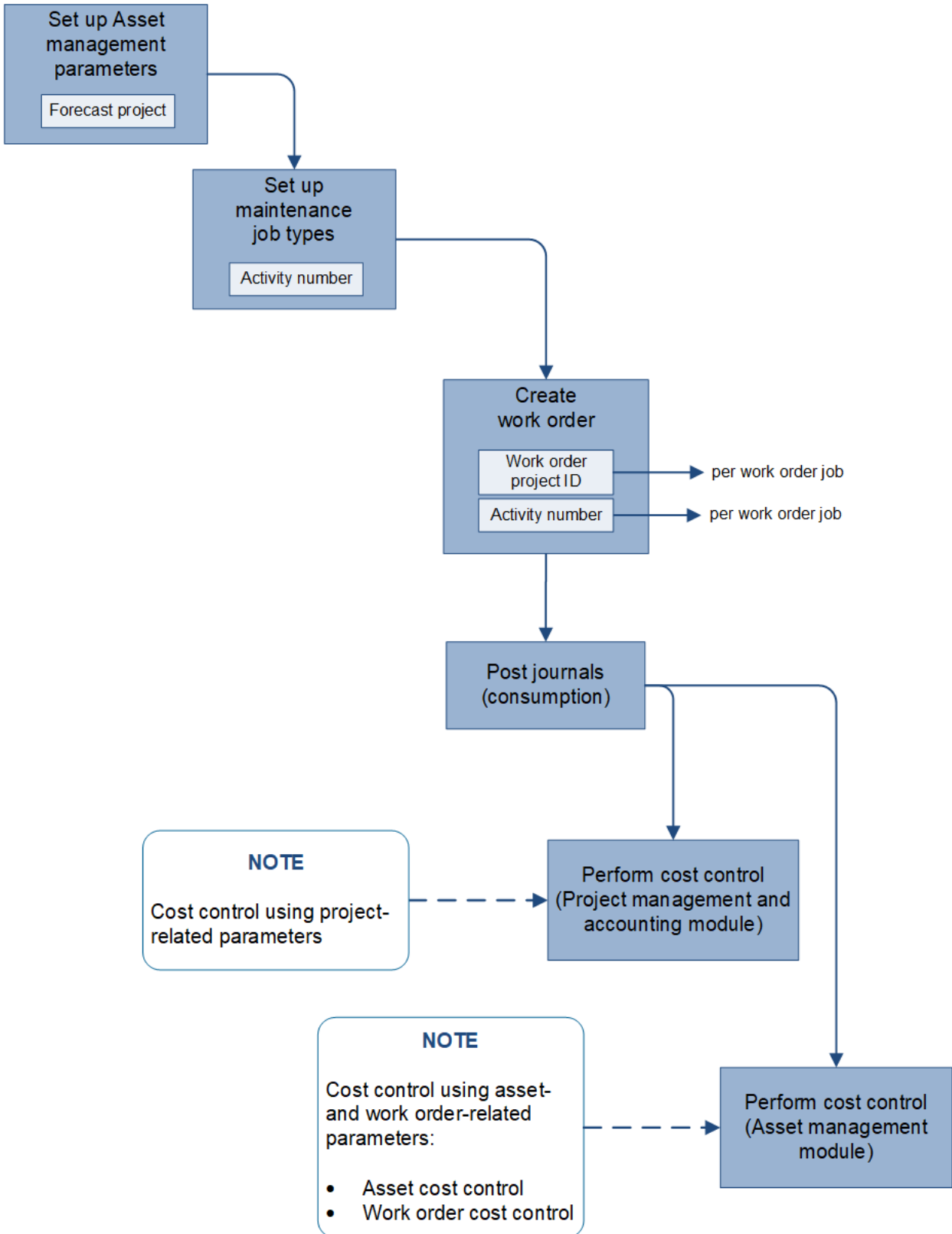




For information about how to set up work order projects, see [Work order project setup](#). For information about how to create work order lifecycle states, see [Work order lifecycle states](#).

The following illustration shows a graphical overview of the various projects that are created in the **Asset management** module to enable integration with the **Project management and accounting** module. It also shows the work processes that the projects are related to.

Project Integration - Flow Diagram



NOTE

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Bill for maintenance on customer-owned assets

2/18/2021 • 5 minutes to read • [Edit Online](#)

The *Work order billing* feature lets you create, process, and bill maintenance work that is done on assets that your customers own. This feature lets you perform the following tasks:

- Connect customers to the assets that they own.
- Select a customer and view the assets that customer owns when you create a work order.
- Set up a parent project for each customer.
- Register hours, items, expenses, and fees against the work order, and then create an invoice proposal for the customer later.

In addition, the feature provides the following functionality:

- The project contract from a customer's parent project is automatically copied to the relevant work order project.
- Asset management can now use the *fee* project transaction type on both work order forecasts and work order journals.

Turn on the customer billing feature

Before you can use this feature, it must be turned on in your system. Admins can use the [feature management](#) settings to check the status of the feature and turn it on. In the **Feature management** workspace, the feature is listed in the following way:

- **Module:** *Project management and accounting*
- **Feature name:** *Work order billing*

Example scenario

To learn how this feature works, work through the following example scenario.

To work through this scenario by using the sample records and values that are specified here, you must be on a system where the standard [demo data](#) is installed. You must select the **USMF** legal entity before you begin.

You can also use this scenario as guidance for using the feature when you work on a production system. However, in that case, you must substitute your own values, and you might be missing some types of required records that the standard demo data provides.

Step 1: Create a new project contract for the customer

1. Go to **Project management and accounting > Projects > Project contracts**.
2. On the Action Pane, select **New**.
3. In the **New project contract** dialog box, set the following values:
 - **Name:** *Pelican Wholesales*
 - **Funding type:** *Customer*
 - **Funding source:** *US-013 (Pelican Wholesales)*
4. Select **OK**.

Step 2: Create a new parent project for the customer

The parent project that you create here will be used when work orders for the customer are created.

1. Go to **Project management and accounting > Projects > All projects**.

2. On the Action Pane, select **New**.

3. In the **New project** dialog box, set the following values:

- **Project type:** *Time and material*
- **Project name:** *Pelican Wholesales work orders*
- **Project group:** *TM*
- **Project contract ID:** *Pelican Wholesales* (the contract that you created earlier)
- **Start date:** Select today's date.

4. Select **Create project**.

5. The new project is opened. Make a note of the **Project ID** value. You will have to enter it later.

Step 3: Create a new work order type in Asset management

1. Go to **Asset management > Setup > Work order > Work order types**.

2. On the Action Pane, select **New**.

3. A new record is added to the list. Set the following values for it:

- **Work order type:** *Service*
- **Name:** *Service work orders*
- **Work order lifecycle state:** *Standard*

Step 4: Link the customer account to the parent project

You must now link the customer account to the parent project in the project setup in Asset management.

1. Go to **Asset management > Setup > Work orders > Project setup**.

2. On the **Parent project** tab, select **Add** to add a line.

3. On the new line, set the following values:

- **Customer account:** *US-013 (Pelican Wholesales)*
- **Project ID:** Enter the project ID that you made a note of earlier.

Step 5: Link the project group and type to the work order project

You should still be on the **Project setup** page (**Asset management > Setup > Work orders > Project setup**).

1. On the **Project group** tab, select **Add** to add a line.

2. On the new line, set the following values:

- **Work order type:** *Service* (the work order type that you created earlier)
- **Project group:** *TM*

NOTE

The project contract on the work order project is always inherited from the parent project.

Step 6: Link an asset to the customer ID

1. Go to **Asset management > Assets > Active assets**.

2. In the **Filter** field, enter *VE-102*, and select to filter by **Asset**.
3. Select the asset to open its settings.
4. On the **Customer** FastTab, set the **Customer account** field to *US-013 (Pelican Wholesales)*.

The **Name** field is automatically updated to *Pelican Wholesales*.

Step 7: Create a new work order on the asset

1. Go to **Asset management > Work orders > Active work orders**.
2. On the Action Pane, select **New**.
3. In the **Create work order** dialog box, set the following values:

- **Work order type:** *Service*
- **Description:** *Repair Truck*
- **Customer account:** *US-013 (Pelican Wholesales)*
- **Asset:** *VE-102*

NOTE

The lookup shows only assets that are linked to the selected customer account.

- **Maintenance job type:** *Repair*
 - **Trade:** *Mechanic*
 - **Service level:** *4*
4. Select **OK**.

Step 8: Review the work order and start to work on it

In this section, you will work on the work order that you created in the previous section.

1. Follow these steps to verify that the parent project is the *Pelican wholesales Work order* project:
 - a. In the **Work order maintenance jobs** section, select a line.
 - b. On the **Line details** FastTab, inspect the **Project ID** value. It should be a hyphenated number in the form *<Parent-Project-ID>-<Project-ID>*. This value is a link.
 - c. Select the project ID link to open a page where you can view the parent project and project names.
2. On the Action Pane, on the **Work order** tab, in the **Lifecycle state** group, select **Update work order state**.
3. In the **Update work order state** dialog box, in the **Select** column, select the check box for the row where the **Lifecycle state** field is set to *In progress*.
4. Select **OK**.
5. In the **Lifecycle state: InProgress** dialog box, select **OK**.

Step 9: Post the hours that were spent on the work order and create a new invoice proposal

In this section, you will continue to work on the work order that you worked on in the previous section.

1. On the Action Pane, on the **Work order** tab, in the **Project** group, select **Journals**.

The **Work order journals** page appears. Here, you can register the time that you spent on the work

order.

2. On the **Hours** FastTab, select **Add line**.
3. On the new, line, set the **Hours** field to *4*.
4. On the Action Pane, select **Post journals**.
5. Close the **Work order journals** page to return to the work order.
6. On the Action Pane, on the **Invoicing** tab, select **New invoice proposal**.
7. In the **Create invoice proposal** dialog box, in the **Project transactions** section, select the **Select** check box for every line that you want to invoice.
8. Select **OK** to close the dialog box and view the new invoice proposal.

NOTE

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Integrate asset management with fixed assets

2/18/2021 • 4 minutes to read • [Edit Online](#)

By integrating the **Asset management** and **Fixed assets** modules, you can link fixed assets with maintenance assets. Fixed assets users can then create a maintenance asset from a new or existing fixed asset, and Asset management users can associate a maintenance asset with an existing fixed asset. This feature also makes it easy for Fixed assets users to view the costs that were posted from work orders for related maintenance assets.

NOTE

In this topic, *maintenance assets* refer to assets from the **Asset management** module, and *fixed assets* refer to assets from the **Fixed assets** module.

Set a default location for new maintenance assets that are created from fixed assets (optional)

This optional configuration lets you set a default functional location for new maintenance assets that are created from fixed assets. You typically complete this configuration just one time, if you complete it at all.

To complete the configuration, follow these steps.

1. Go to **Asset management > Setup > Asset management parameters**.
2. On the **Fixed assets** tab, in the **Functional location** field, select the default location.
3. On the Action Pane, select **Save**.

Work with integrated maintenance assets and fixed assets

This section provides a collection of procedures that show various ways that you can work with the integrated Asset management and Fixed assets features.

Associate an existing maintenance asset with a fixed asset

To associate an existing maintenance asset with a fixed asset, follow these steps.

1. Go to **Asset management > Assets > All assets (or Active assets)**.
2. Select an asset.
3. On the **Fixed asset** FastTab, in the **Fixed asset number** field, select an existing fixed asset.
4. On the Action Pane, select **Save**.

View the fixed asset that is associated with a selected maintenance asset

To view the fixed asset that is associated with a selected maintenance asset, follow these steps.

1. Go to **Asset management > Assets > All assets (or Active assets)**.
2. Select an asset.
3. On the **Fixed asset** FastTab, in the **Fixed asset number** field, select the link.

The **Fixed assets** page for the selected asset is opened. (Typically, this page is found at **Fixed assets > Fixed assets > Fixed assets**.)

View the maintenance asset that is associated with a selected fixed asset

To view the maintenance asset that is associated with a selected fixed asset, follow these steps.

1. Go to **Fixed assets > Fixed assets > Fixed assets**.
2. Select an asset.
3. On the Action Pane, on the **Asset management** tab, in the **View** group, select **Maintenance asset**.

The **Maintenance asset** page for the asset that is associated with the selected fixed asset is opened.
(Typically, this page is found at **Asset management > Assets > All assets**.)

View maintenance costs that are associated with a fixed asset

Asset management work orders can be posted for maintenance assets, and each of those work orders typically has a cost. When a fixed asset is associated with a maintenance asset, you can go directly from the fixed asset to view the related costs.

To view the maintenance costs that are associated with a fixed asset, follow these steps.

1. Go to **Fixed assets > Fixed assets > Fixed assets**.
2. Select an asset.
3. On the Action Pane, on the **Asset management** tab, in the **View** group, select **Maintenance cost**.

The **Maintenance cost** page is opened and shows the related costs.

Create a new maintenance asset for an existing fixed asset

To create a new maintenance asset for an existing fixed asset, follow these steps.

1. Go to **Fixed assets > Fixed assets > Fixed assets**.
2. Select an asset.
3. On the Action Pane, on the **Asset management** tab, in the **New** group, select **Create maintenance asset**.
(If this option is unavailable, a maintenance asset might already be associated with the selected fixed asset.)
4. Finish creating the asset as described in [Create an asset](#).

Create a new fixed asset and add a new maintenance asset for it

To create a new fixed asset and add a new maintenance asset for it, follow these steps.

1. Go to **Fixed assets > Fixed assets > Fixed assets**.
2. On the Action Pane, select **New**.
3. Finish creating the fixed asset as described in [Create a fixed asset](#).
4. On the Action Pane, on the **Asset management** tab, in the **New** group, select **Create maintenance asset**.
5. Finish creating the asset as described in [Create an asset](#).

Remove the association between two assets

In some cases, you might have to disassociate a maintenance asset from its fixed asset. For example, if you want to [create a new maintenance asset](#) from a fixed asset, you must first remove any existing association.

To remove an existing association between a maintenance asset and a fixed asset, follow these steps.

1. Go to **Asset management > Assets > All assets** (or **Active assets**).
2. Find and open the fixed asset.
3. On the **Fixed asset** FastTab, clear the value from the **Functional location** field.
4. On the Action Pane, select **Save**.

NOTE

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Preventive maintenance overview

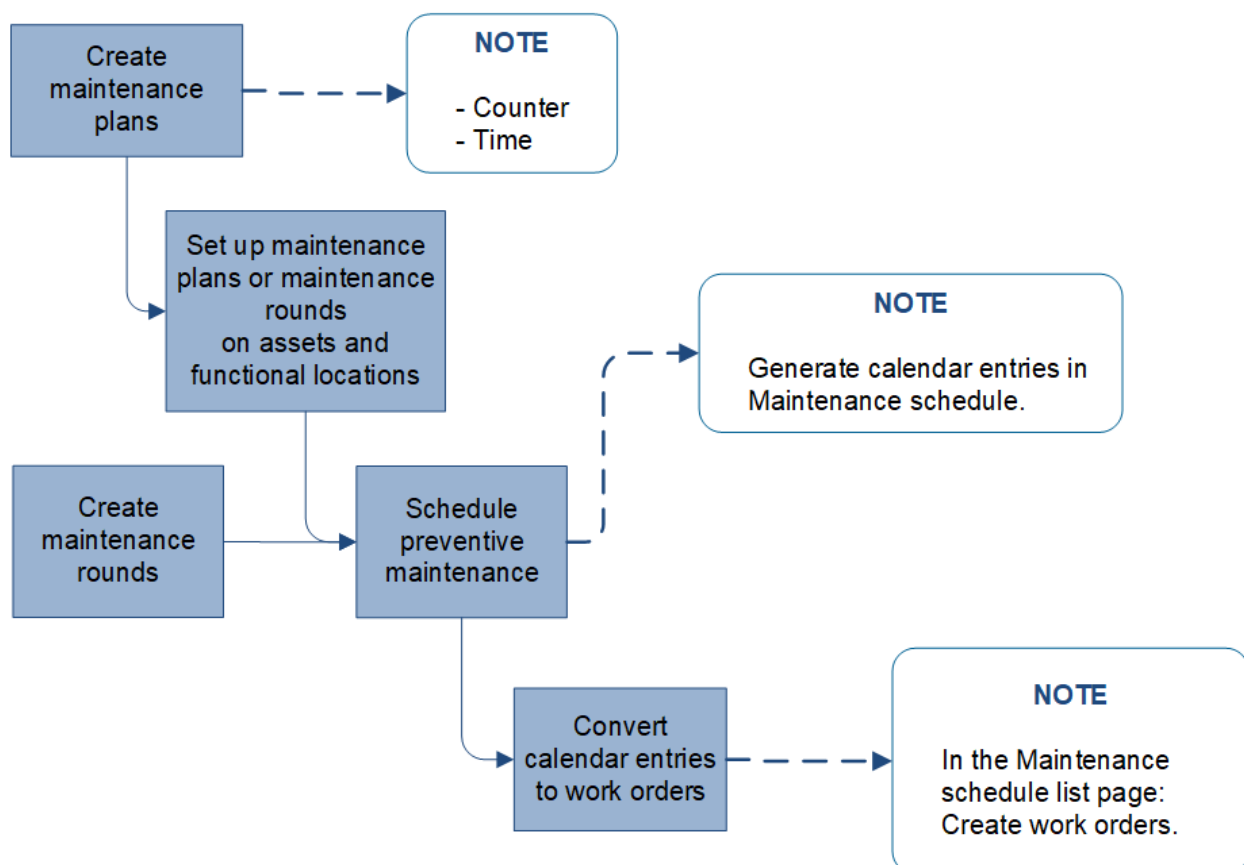
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This topic explains preventive maintenance in Asset Management. Preventive maintenance is a discipline involving planned maintenance jobs, for example, regular service, calibration, and inspections. In **Asset Management**, you can create maintenance plans and set them up on assets and functional locations. You can also set up maintenance rounds on functional locations. Maintenance plans on assets are active regardless of where the asset is installed. Maintenance plans and maintenance rounds on functional location are active for the assets currently installed at the location. Instead of setting up maintenance plans on assets, or setting up maintenance rounds on functional locations, you can create maintenance rounds that include multiple assets on which you need to perform related types of maintenance jobs in the same work routine. Maintenance rounds created from assets - instead of created on functional locations - means that you can select a number of assets for one maintenance round, which are not installed on the same functional location.

Maintenance plans are used for preventive and reactive maintenance on individual assets. Maintenance rounds are used for preventive maintenance on a group or a set of assets. Maintenance plans and maintenance rounds are used for generating work order proposals. The work order proposals are saved as maintenance schedule lines, which can be bundled and converted into work orders.

The following illustration provides an overview of the work flow from creating maintenance plans and maintenance rounds to creating work orders for assets, based on those maintenance plans and maintenance rounds.

Flow Diagram: Schedule Preventive Maintenance Work Orders



NOTE

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Maintenance plans

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A maintenance plan defines when a pre-planned preventive maintenance job is to be carried out on an asset. Maintenance plans can be related to assets, asset types, functional locations, or functional location types, but first you create the maintenance plans to be used in your company.

A maintenance plan can have multiple maintenance plan lines. Maintenance job type and interval are specified on the maintenance plan line. There are two types of maintenance plan lines:

- Time
- Counter

Maintenance plan lines of type "Time" are used for recurring planned maintenance based on a fixed time interval. Maintenance plan lines of type "Counter" are used for planned maintenance or reactive maintenance based on asset counter registrations. A maintenance plan may include several maintenance plan lines of both types.

NOTE

If no counter values have been registered for a counter type on an asset, the maintenance plan lines are omitted.

First, you create the maintenance plans you require for your preventive maintenance jobs and select the asset types, assets, functional location types, and functional locations that should be related to each maintenance plan. Afterwards, if required, you can also add maintenance plans to an asset or a functional location, which is done in **All assets** > select asset > **Asset maintenance plans** FastTab, or **All functional locations** > select functional location > **Maintenance plans** FastTab.

If you add a maintenance plan to asset types or functional location types, it means that when you create new assets or functional locations with those asset types or functional location types, the asset or functional location will automatically be added to the maintenance plan. The start date of the relation to a maintenance plan will be the current date, which may need to be adjusted.

Set up maintenance plans

This section describes how to set up maintenance plan lines and provides examples of how they can be used.

1. Go to **Asset management** > **Setup** > **Preventive maintenance** > **Maintenance plans**.
2. Select **New** to create a new sequence.
3. Insert an ID in the **Maintenance sequence** field, and a name in the **Name** field.
4. In the **Plan date** field, insert the start date from which planning can be done on the maintenance plan. Note that time-based maintenance plan lines may have other plan dates.
5. Select "Yes" in the **Active** toggle button to activate the maintenance plan.

NOTE

If you deactivate a maintenance plan, no schedule posts will be created in the maintenance schedule when you run a schedule maintenance plan job.

6. The **Tolerance days before** and **Tolerance days after** fields relate to maintenance plan lines in which the **Suppress overlapping maintenance jobs** check box is selected (refer to step 17). The "Tolerance" fields are used to extend the interval in days in which, if several maintenance plans overlap, the most comprehensive / largest job is created as a maintenance schedule line during maintenance plan scheduling, while more frequent, overlapping jobs are omitted during maintenance plan scheduling. Insert number of days in the **Tolerance days before** field, for example "2".
7. If you have inserted a value in **Tolerance days before**, also insert number of days in the **Tolerance days after** field, for example "2".

NOTE

The example described in this and the previous step means that if several maintenance plan lines overlap, and **Suppress overlapping maintenance jobs** is selected for one or more lines, the period of omitting maintenance schedule lines is extended to a total of five days (the expected start date on the maintenance schedule line *and two days before and two days after* that date).

8. The fields in the **Details** group on the **Details** FastTab show number of maintenance plan lines set up on the maintenance plan, and number of assets and functional locations related to the maintenance plan.
9. On the **Lines** FastTab, select **Add time line** or **Add asset counter line** to create a new maintenance plan line.
10. Insert a description for the line in the **Work order description** field. The description is transferred to related work orders.
11. In the **Maintenance job type** field, select the job type to which the maintenance plan line is related.
12. In the **Maintenance job type variant** and **Trade** fields, select the variant and trade related to the maintenance job type.
13. In the **Finish within days** and **Finish within hours** fields, you can insert expected end date in days or hours. The expected end date is inserted relative to the expected start date, which is calculated when maintenance schedule lines are created. For example, you can insert "7" in the **Finish within days** field to indicate that the related job should be completed within a week from the expected start date.
14. In the **Interval type** field, select the type of interval to be used on the maintenance plan line, for example, "Repeated..." or "Once...". Refer to the [Interval types overview](#) table below for a description of the relation between interval types and line types.
15. The **Period** field only relates to time-based line types. Select the period type related to the period frequency.
16. In the **Period frequency** field, insert the number of times the line should be used for planning preventive maintenance jobs. Example: If you have created a line of type "Counter", and your counter is production quantity, and you insert the number "20000" in this field, new maintenance sequence lines are created during preventive maintenance scheduling every time you are expected to produce 20,000 more items.
17. The **Suppress overlapping maintenance jobs** check box relates to time-based as well as counter-based line types. Select the check box to delete maintenance schedule entries that are created on the same date. This is relevant if, for example, you have created a 1-month inspection line, a 6-month inspection line, and a 1-year inspection line. For the 1-year inspection you only want that inspection to be done, not the other two inspections, which would also fit in the time frame. In order to set up this example correctly, you set up the 1-year inspection line as the first line, the 6-month line as the second line, and the 1-month line as the third line, and you select the **Suppress overlapping maintenance**

jobs check box for the 1-month and 6-month lines. That way you ensure that when you reach the 1-year mark, the inspections for one month and six months are omitted, and a maintenance schedule line is only created for the 1-year inspection line.

NOTE

The example described in this step shows that the most comprehensive job, which contains the largest number of tasks, and which is not done so often, should always be inserted as the first line. The more frequent jobs are then inserted as separate lines in the order of frequency, placing the most frequent job at the bottom of the list.

18. The **Counter** field only relates to counter-based line types. Select the counter type to be used on the line. If a counter type is not active on a related asset, the maintenance plan line is omitted.
19. The **Asset counter time fence in days** field only relates to counter-based line types. Insert a number that defines how many days back counter registrations are checked when maintenance plan scheduling is done. This means how far back are data (existing counter registrations) used as basis for calculating the trend that determines how many maintenance schedule lines are created.

Example: If counter registrations are expected to be made once a month, you may insert the number '365' in this field because maintenance plan scheduling will always be based on the last 12 months and therefore create maintenance schedule lines based on the trend of the past year. On the other hand, if you insert the number '10' in this field, you expect counter registrations to be made more often, for example, on a daily basis. This means that when you schedule maintenance plan, counter registrations for the last 10 days are used as the basis for the scheduling of maintenance schedule lines.

20. The **Plan date** field only relates to time-based line types. If the maintenance plan line has another planning date than the entire maintenance plan, select a date in the **Plan date** field on the line.
21. In the **Service level** field, you can select a work order service level as a further delimitation on the maintenance plan line - to be used as a service level on work orders.
22. Select the **Auto create** check box if you want a work order to be automatically created according to the selected maintenance plan line when scheduling maintenance plans.
23. If you have selected the **Auto create** check box, you can select a work order type for the auto-created work order in the **Work order type** field. If you have selected the **Auto create** check box, and you do not select a work order type in this field, the work order type selected in **Asset management > Setup > Asset management parameters > Work orders link > Preventive work order type** field is used.
24. Use the **Season from** and **Season to** fields to create a repeated time-based maintenance plan line within a 12-month period. *Example:* Equipment used for maintaining green areas requires service each spring within a predefined period. Insert the start date of the period to be repeated in the **Season from** field.
25. Insert the end date of the period to be repeated in the **Season to** field.
26. In the **Resulting period** field, the current period to be repeated is shown. When the current period has passed, and you start a new year, the period shown in this field will be updated to reflect the next period in the repeat sequence.
27. On the **Assets** FastTab, select the assets that should be related to the maintenance plan.
28. On the **Asset types** FastTab, select the asset types that should be related to the maintenance plan.

29. On the **Functional locations** FastTab, select the functional locations that should be related to the maintenance plan. If required, you can make the setup more specific by selecting a related asset type, manufacturer, and model.
30. On the **Functional location types** FastTab, select the functional location types that should be related to the maintenance plan.

NOTE

When work orders are manually created on assets that are covered by a vendor warranty, a dialog box is shown to make the user aware of the warranty. The creation of the work order can then be canceled. The check for a warranty relation is omitted for work orders that are automatically created.

Interval types overview

INTERVAL TYPE AND DESCRIPTION	LINE TYPE: TIME	LINE TYPE: COUNTER
<p>Interval type: Repeated from plan date The count starts from the plan date used. When you schedule maintenance plans, maintenance schedule lines are created when the interval is reached.</p>	<p>The Plan date on the maintenance plan line is used. If no plan date is selected on the line, the Plan date for the maintenance plan is used. Example: If the number "3" is inserted in the Period frequency field, and "Year" is selected in the Period field, a new maintenance schedule line will be created once every 3 years.</p>	<p>The Plan date for the maintenance plan is used. If the counter has been replaced, the latest replacement date is used as the plan date.</p>
<p>Interval type: Repeated from start date The count starts from the start date on the asset relation. The date is selected in the All asset details view > Asset maintenance plans FastTab > Start date field, or in the All functional locations details view > Maintenance plans FastTab > Start date field. When you schedule maintenance plans, a maintenance schedule line is created when the interval is reached.</p>	<p>The start date of the maintenance plan line on asset or functional location is used. If that field is blank, the Plan date for the maintenance plan is used.</p>	<p>The start date of the maintenance plan line on asset or functional location is used. If that field is blank, the Plan date for the maintenance plan is used.</p>
<p>Interval type: Repeated from last work order The count starts from the actual end date and time of the latest work order that was completed on the asset with that specific maintenance job type / maintenance job type variant / trade combination. That date and time is shown in the Actual end field in the All work order details view.</p>	<p>The actual end date and time of the work order completed on the asset with that specific maintenance job type / maintenance job type variant / trade combination. If no completed work order is found, one of the dates used in the "Repeated from start date" interval type described above is used instead.</p>	<p>The actual end date and time of the work order completed on the asset <i>and</i> the maintenance job type / maintenance job type variant / trade combination. is used. If the end date and time was left blank on the work order, one of the dates used in the "Repeated from start date" interval type described above is used instead.</p>

INTERVAL TYPE AND DESCRIPTION	LINE TYPE: TIME	LINE TYPE: COUNTER
<p>Interval type: Once from plan date See description for the "Repeated from plan date" interval type above. Only difference is that this interval type is to be used only once.</p>	<p>See description for "Repeated from plan date" interval type above. This interval is typically used for a one-time maintenance or service job.</p>	<p>See description for "Repeated from plan date" interval type above. This interval is typically used for a one-time maintenance or service job. Note 1: This interval type is only relevant if the counter is replaced every time you carry out a maintenance or service job. If, for some reason, a counter has been replaced before the end of the planned interval, a new time is calculated for the job from the time of the counter replacement. Note 2: If the counter is replaced when completing the maintenance or service job, this interval type functions as the "Repeated from plan date" interval type above.</p>
<p>Interval type: Once from start date See description for the "Repeated from start date" interval type above. Only difference is that this interval type is to be used only once.</p>	<p>See description for "Repeated from start date" interval type above. This interval is typically used for a one-time maintenance or service job.</p>	<p>See description for "Repeated from start date" interval type above. This interval is typically used for a one-time maintenance or service job. Note 1 above also applies to this interval type. Note 3: If the counter is replaced when completing the maintenance or service job, this interval type functions as the "Repeated from start date" interval type above.</p>
<p>Interval type: Once reached above This interval type only relates to counters and is used for indicating an upper limit set up on the maintenance plan line. Maintenance schedule entries will have the expected start date and time of the counter registration, meaning these entries will be created with an expected start date equal to or earlier than the system date.</p>	<p>Not applicable</p>	<p>The counter interval indicates an upper limit. If that limit is exceeded when you create a counter registration, a maintenance schedule line is created when you schedule preventive maintenance.</p>
<p>Interval type: Once reached below This interval type only relates to counters and is used for indicating a lower limit set up on the maintenance plan line. Maintenance schedule entries will have the expected start date and time of the counter registration, meaning these entries will be created with an expected start date equal to or earlier than the system date.</p>	<p>Not applicable</p>	<p>The counter interval indicates a lower limit. If that limit is passed when you create a counter registration, a maintenance schedule line is created when you schedule preventive maintenance.</p>

INTERVAL TYPE AND DESCRIPTION	LINE TYPE: TIME	LINE TYPE: COUNTER
<p>Interval type: Linked from start date This interval type only creates a maintenance schedule line once. A maintenance plan can contain more maintenance plan lines using this interval type, and those lines are linked. Typically, you will create a maintenance plan that contains lines of only this interval type. Maintenance schedule lines are created by identifying the maintenance plan line that has the first expected start date and time.</p>	<p>See description for "Once from start date" above. Example: You create two lines in a maintenance plan for a service job on a car: one time-based line with a 1-year period, and one counter-based line with a 25,000 km limit. A maintenance schedule line is created for the limit that is reached first. For this line type you create the line with the 1-year period.</p>	<p>See description for "Once from start date" above. Example: You create two lines in a maintenance plan for a service job on a car: one time-based line with a 1-year period, and one counter-based line with a 25,000 km limit. A maintenance schedule line is created for the limit that is reached first. For this line type you create the line with the 25,000 km limit. Example creating two counter lines: You can also set up a maintenance plan with two linked, counter-based lines in which the first line has a limit of 10,000 items quantity produced, and the second line relates to the machine or work center requiring service after running 3,000 hours.</p>
<p>Interval type: Linked from last work order This interval type creates new maintenance schedule lines after every completed work order. A maintenance plan can contain more lines using this interval type, and those lines are linked. Typically, you will create a maintenance plan that contains maintenance plan lines of only this interval type. Maintenance schedule lines are created by identifying the maintenance plan line that has the first expected start date and time.</p>	<p>This interval type basically works as "Linked from start date" described above. Only difference is the date on which the interval type is based. The date used is the actual date and time on the latest work order completed on the asset <i>and</i> the maintenance job type / maintenance job type variant / trade combination.</p>	<p>This interval type basically works as "Linked from start date" described above. Only difference is the date on which the interval type is based. The date used is the actual date and time on the latest work order completed on the asset <i>and</i> the maintenance job type / maintenance job type variant / trade combination.</p>
<p>Interval type: Repeated on aggregated value (Counter only) When the maintenance plan is run, a scheduled maintenance line will be created each time that the accumulated value for an asset counter reaches the period frequency or an even multiple of the period frequency. (The period frequency is defined on the maintenance plan line.) For more information about how to enable and use this functionality, see the Counter-based maintenance enhancements section later in this topic.</p>	<p>Not applicable</p>	<p>Example: An hour counter is set up for asset AK-101. An asset plan line is also set up for the asset. The interval type of this line is <i>Repeated on aggregated value (Counter only)</i>, and the period frequency is <i>1000</i>. When the maintenance plan is run, a scheduled maintenance line will be generated when the aggregated value for the counter exceeds 1,000 hours. Then, when the aggregated value for the counter exceeds 2,000 hours, another scheduled maintenance line will be generated, and so on for every additional 1,000 hours.</p>

INTERVAL TYPE AND DESCRIPTION	LINE TYPE: TIME	LINE TYPE: COUNTER
<p>Interval type: Once on aggregated value (Counter only) When the maintenance plan is run, a scheduled maintenance line will be created when the accumulated value for an asset counter reaches the period frequency that is defined on the maintenance plan line.</p> <p>For more information about how to enable and use this functionality, see the Counter-based maintenance enhancements section.</p>	Not applicable	<p>Example: An hour counter is set up for asset AK-101. An asset plan line is also set up for the asset. The interval type of this line is <i>Once on aggregated value (Counter only)</i>, and the period frequency is <i>1000</i>. When the maintenance plan is run, a scheduled maintenance line will be generated when the aggregated value for the counter exceeds 1,000 hours.</p>

NOTE

When maintenance schedule lines are created for time-based maintenance plan lines, expected time is always at the start of the day. For counter-based maintenance plan lines, expected time can be anytime during the day.

Below you will find examples of the setup of time-based and counter-based maintenance plan lines:

Example 1 - Time-based maintenance plan line: A lubrication job may be set up in a fixed interval, occurring once a week. For that purpose, select "Repeated from plan date" in the **Interval type** field. See an example in the following illustration.

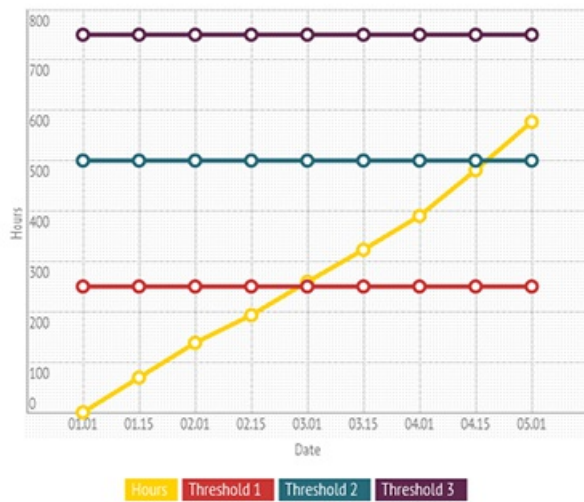
Line	Work order description	Line type	Maintenance job type	Maintenance job type	Trade	Finish within days	Finish within hours	Interval type	Period	Period frequency	Suppress over...
2.0	Weekly service	Time	Service	Service	Mechanical			Repeated from plan date	Day	7	<input type="checkbox"/>

Example 2 - Time-based maintenance plan line: An inspection job may be set up to be carried out approximately once a week. For that purpose, select "Repeated from last work order" in the **Interval type** field. See an example in the following illustration.

Line	Work order description	Line type	Maintenance job type	Maintenance job type	Trade	Finish within days	Finish within hours	Interval type	Period	Period frequency	Suppress over...
2.0	Weekly inspection	Time	Inspection	Inspections	Mechanical			Repeated from last work order	Day	7	<input type="checkbox"/>

Example 3 - Counter-based maintenance plan line: The following graphic illustration shows an hour counter for which a new maintenance schedule line is created each time 250 hours have passed. The interval type for this counter-based line is "Repeated from start date". The start date is the start date of the related assets in the **All assets** details view > **Asset maintenance plans** FastTab > **Start date** field, or in the **Functional location** details view > **Maintenance plans** FastTab > **Start date** field. This is an example of a *preventive* maintenance plan because the maintenance schedule line is automatically created each time the threshold (+ 250) is reached.

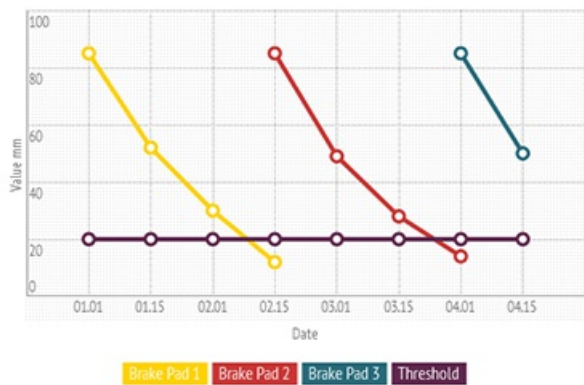
Counter Repeated



Repeated example: a hour counter with repeated thresholds at 250, 500, and 750 hours

Example 4 - Counter-based maintenance plan line: The following graphic illustration shows a decrease in counter value, measuring brake pad wear. A maintenance schedule line is created when a counter registration below 20 mm is created on the brake pad. The interval type for this counter-based line is "Once reached below" or "Once from last start date". This is an example of a *reactive* maintenance plan because the maintenance schedule line is not created until a measurement below 20 mm is registered.

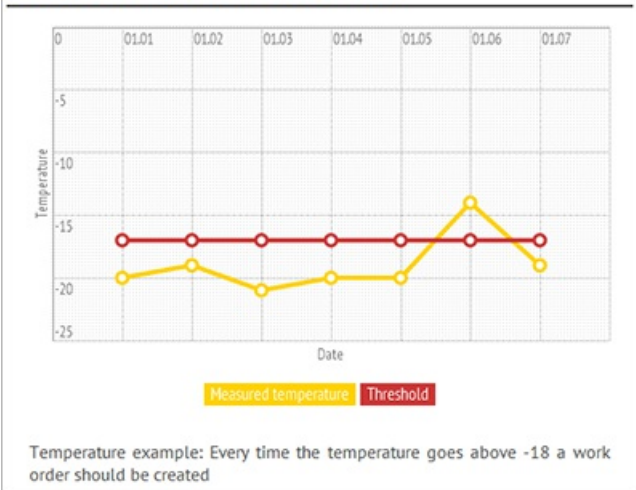
Counter Replaced



Break pad example: Pads are replaced when height is below 20 mm. New breake pads have height 85 mm.

Example 5 - Counter-based maintenance plan line: The following graphic illustration shows a counter with a threshold of -18° Celsius. A maintenance schedule line is created when a counter registration above -18° Celsius is made. The interval type for this counter-based line is "Once reached above". This is an example of a *reactive* maintenance plan because the maintenance schedule line is not created until a measurement higher than -18° Celsius is registered.

Counter Once Reached



- When you create a new asset, and that asset uses an asset type related to a maintenance plan, the maintenance plan is automatically inserted in **All objects > Asset maintenance plans** FastTab. Also, in the **Asset type defaults**, on the **Maintenance plans** FastTab, the related maintenance plans will automatically be inserted.
- If you add or remove asset types or functional location types in **Maintenance plans**, that change will only reflect on new assets created after you made the change.
- If you add or remove assets or functional locations in **Maintenance plans**, that change will automatically be updated in **All assets > Asset maintenance plans** FastTab, or in **All functional locations > Maintenance plans** FastTab.

The following illustration shows an example of a "Truck service" maintenance plan on the **Maintenance plans** page.

The screenshot shows the 'Truck service' maintenance plan configuration in Dynamics 365. The left sidebar lists various maintenance plans, with 'Truck Serv' selected. The main area displays the configuration for 'Truck service'.

MAINTENANCE PLANS
Maintenance plan Name
Truck Serv Truck service

Details

PLANNING	SKIP TOLERANCE	DETAILS
Plan date 1/1/2016	Tolerance days before 0	Lines 2
Active Yes <input checked="" type="checkbox"/>	Tolerance days after 0	Assets 22
		Functional locations

Lines

Line	Work order description	Line type	Maintenance job type	Maintenance job type variant	Trade
1.0	20000 km service	Counter	Service	Service 20000 km	Mechanical
2.0	4000 km service	Counter	Service	Service 4000 km	Mechanical

Assets

Asset	Start date
T0001	7/17/2019
T0002	7/17/2019

Add a maintenance plan to an asset

1. Go to **Asset management > Common > Assets > All assets** or **Active assets**.

2. Select the asset on which you want to set up a maintenance plan and select **Edit**.
3. On the **Asset maintenance plans** FastTab, select **Add line** to add a maintenance plan to the asset.
4. In the **Maintenance plan** field, select the relevant maintenance plan.
5. In the **Start date** field, select the date from which planning of preventive maintenance jobs can be done.
6. Select **Save**. The **Active** field is automatically updated.

The following illustration shows an example of maintenance plans set up on an asset on the **All assets** page.

The screenshot displays the 'Asset maintenance plans' section for asset 'C0003: Conveyor Belt 0003'. The table below shows the configured maintenance plans:

Maintenance plan	Active	Start date
Conveyor Insp	Yes	7/17/2019
Conveyor Lub	Yes	7/17/2019

Counter-based maintenance enhancements

IMPORTANT

The functionality that is described in this section is available as part of a preview release. The content and the functionality are subject to change. For more information about preview releases, see [One version service updates FAQ](#).

The *Counter-based maintenance enhancements* feature introduces the following functionality:

- The option to automatically insert a counter that has a value of 0 (zero) when an asset is created. This option can be useful when you use predictive maintenance that is based on counters. When the *Counter-based maintenance enhancements* feature isn't used, counters that have a value of 0 (zero) must be manually inserted.
- The ability to configure a counter so that it's automatically reset when a work order is completed. This functionality is useful when you want to schedule maintenance based on the aggregated value since the last

work order was completed.

- A new type of maintenance plan interval that is named *Repeated on aggregated value (Counter only)*. This type triggers maintenance each time that an aggregated counter reaches a multiple of a specific value. For example, maintenance can be triggered every 10,000 hours. For more information, see the [Interval types overview](#) section earlier in this topic.
- Another new type of maintenance plan interval that is named *Once on aggregated value (Counter only)*. This type triggers maintenance when an aggregated counter reaches a specific value, such as 8,000 hours. For more information, see the [Interval types overview](#) section.

Turn on the Counter-based maintenance enhancements feature

Before you can use this feature, it must be turned on in your system. Admins can use the [feature management](#) settings to check the status of the feature and turn it on. In the **Feature management** workspace, the feature is listed in the following way:

- **Module:** *Asset Management*
- **Feature name:** *(Preview) Counter-based maintenance enhancements*

Create and initialize counters when an asset is created

Each time that you create an asset, related asset counters that are initialized to a value of 0 (zero) can automatically be created, provided that you set up your system and create the asset correctly.

1. Go to **Asset management > Setup > Asset types**.
2. Make sure that you have an asset type that is applicable to your planned new asset. Create an asset type as required. Make sure that all the relevant counters are selected on the **Counters** FastTab.
3. Go to **Asset management > Setup > Asset types > Counters**.
4. For each relevant counter, make sure that the **Total aggregate** field is set to *Sum*.
5. On the **All assets** page, create the asset.
6. Set the **Asset type** field to the asset type that you identified or created in step 2.
7. Finish setting up the new asset as required.
8. Go to **Asset management > Inquiries > Assets > Counters**. You should be able to find the initialized counters that are set up for your new asset.

NOTE

When initialized asset counters are created, the assumption is that the asset had never been used before it was added to the system. When the maintenance schedule is run for the first time, the calculation uses the date and the 0 (zero) counter value as a baseline for calculating future maintenance. If the asset wasn't new when it was added to the system, you can manually adjust the counter value so that it matches the actual counter value. To adjust a counter value, open the relevant asset on the **All assets** page, and then, on the Action Pane, on the **Asset** tab, in the **Preventative** group, select **Counters**. On the **Asset counters** page for the selected asset, adjust the value in the **Value** column for the initial counter record as required.

Automatically reset a counter value

You can configure the system to automatically reset a counter each time that a relevant work order reaches a selected status value.

1. Go to **Asset management > Setup > Preventive maintenance > Maintenance plans**.
2. In the list pane, select a maintenance plan. The counter reset will apply to all assets that use this plan.
3. In the **Lines** section, find an asset counter line that you want to reset a counter for, and select the **Reset counter** check box for that line. (Asset counter lines have a value in the **Counter** column. The counter that is specified in that column is the counter that will be reset for the relevant asset.)
4. Go to **Asset management > Setup > Work orders > Lifecycle states**.

5. In the list pane, select the work order lifecycle state that the relevant counter should be reset at.
6. On the **General** FastTab, set the **Reset counter** option to *Yes*.

NOTE

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Schedule maintenance plans

2/18/2021 • 4 minutes to read • [Edit Online](#)

Preventive maintenance scheduling generates calendar entries on assets, based on the maintenance plans set up on the assets. You can schedule calendar entries based on selected maintenance plans, asset types, and assets.

1. Click **Asset management > Periodic > Preventive maintenance > Schedule maintenance plans**.
2. You can select a time interval in the **Period** and **Period frequency** fields.

NOTE

The **Period** and **Period frequency** fields indicate how far ahead in time you want maintenance schedule lines to be created, based on the maintenance plans you have created (time-based or counter-based). In the figure below, maintenance schedule lines (= work order proposals) are created from the current date and three months onwards.

3. Select "Yes" on the **Auto create if specified in the line** toggle button if work orders should automatically be created according to the maintenance plan line.

NOTE

If this toggle button is set to "Yes", *and* the **Auto create** check box is also selected on maintenance plan lines in **Maintenance plans**, work orders are created based on the maintenance plan lines, and maintenance schedule lines with status "Work order created" are also created. If only one option is selected (**Auto create if specified in the line** toggle button in this dialog or **Auto create** check box in **Maintenance plans** form), only maintenance schedule lines are created with status "Created". In that case, no work orders are created.

4. It is possible to generate calendar entries based on maintenance plans (time or counter), assets, asset types, functional locations, and functional location types. Click the **Filter** button and make your selections, if required.
 - Regarding scheduling of maintenance plans on functional locations: If you update the setup of asset types, manufacturers, and models on maintenance plans in **All functional locations > Maintenance plans** FastTab after you have scheduled maintenance plans, existing maintenance schedule entries related to that functional location are automatically deleted. In order to create new calendar entries, which correspond with the updated maintenance plan setup on the functional location, you must run a new maintenance plan schedule for that functional location. Read more about the setup of asset types, manufacturers, and models on functional locations in [Create functional locations](#).

Example: You want to create a maintenance plan for a specific functional location, meaning all assets set up on that functional location at any given time will be included when you schedule the maintenance plan. In that case, you create a maintenance plan and select the specific functional location, but you do NOT add any assets in the maintenance plan. The result is that when you schedule that maintenance plan, maintenance schedule lines will be created for all the assets related to the functional location at that time.

- If you make changes to asset types, manufacturers and models in **Asset types**, those changes only affect new assets that use the updated asset type. Read more about asset type setup in [Asset types](#).
5. Click **OK** to start the generation of maintenance schedule entries on assets. The generated entries will be shown in the **All maintenance schedule** list page. The following illustration shows an example of the

Schedule maintenance plans dialog.

Schedule maintenance plans ?

Parameters ^

Period v Period frequency

WORK ORDER

Auto create if specified in the line

No

Records to include ^

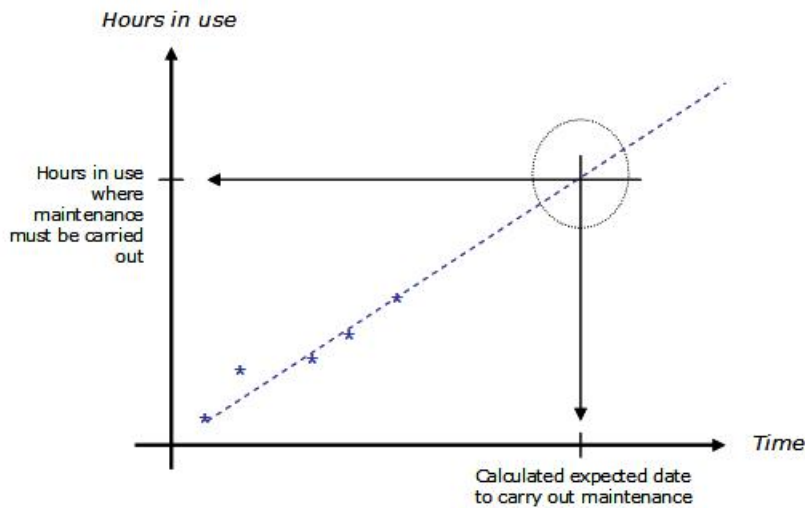
[Filter](#)

MAINTENANCE PLANS	FUNCTIONAL LOCATIONS
Maintenance plan	Functional location
<input type="text" value="Conveyor Insp"/>	<input type="text"/>
ASSETS	FUNCTIONAL LOCATION TYPES
Asset	Functional location type
<input type="text"/>	<input type="text"/>
ASSET TYPES	
Asset type	
<input type="text"/>	

Run in the background v

- In the **Schedule maintenance plans** dialog, you can set up batch jobs on the **Run in the background** FastTab to automatically generate calendar entries at regular intervals.
- When you schedule preventive maintenance, maintenance schedule lines with expected start date and time earlier than the system date and time will not be created.

The figure below provides a graphic illustration of a time-based maintenance plan calculation.



Regarding counter-based maintenance plans: In the figures below, two different counter registration cycles are shown. They are based on a maintenance plan set up for asset "V0001", expecting the asset (a car) to run approx. 2,000 km every month.

In the first example, the expected 2,000 km are not reached every month. According to the counter-based maintenance plan, the threshold is 2,000 km, meaning when you run a maintenance plan scheduling, a maintenance schedule line should be created each time the 2,000-kilometer threshold is reached. In example 1, there are 4 registration lines, but the 2,000-kilometer threshold is only reached once. This means that when you run schedule maintenance plans this asset, for example for a 3-month period, only one maintenance schedule line will be created.

In the next figure, 2,000 km or more are registered every month. Therefore, three maintenance lines would be created if you schedule maintenance plans for this asset for a 3-month period.

The examples described here show that all counter registrations made on an asset show a trend describing wear and tear on the asset. That trend is used as calculation basis at the time of maintenance plan scheduling.

Asset	Functional location	Counter	Counter reset	Registered	Value	Unit	Aggregated value	Totals
V0001	NY-01-WH-1	Kilometers	<input type="checkbox"/>	7/10/2018 02:19:55 PM	1,000.00	km	1,000.00	1,000.00
V0001	NY-01-WH-1	Kilometers	<input type="checkbox"/>	8/7/2018 02:25:00 PM	2,750.00	km	3,750.00	3,750.00
V0001	NY-01-WH-1	Kilometers	<input type="checkbox"/>	8/30/2018 10:50:57 AM	1,300.00	km	5,050.00	5,050.00
V0001	NY-01-WH-1	Kilometers	<input type="checkbox"/>	9/20/2018 11:00:00 AM	500.00	km	5,550.00	5,550.00

Asset	Functional location	Counter	Counter reset	Registered	Value	Unit	Aggregated value	Totals
V0001	NY-01-WH-1	Kilometers	<input type="checkbox"/>	7/10/2018 02:15:20 PM	2,200.00	km	2,200.00	2,200.00
V0001	NY-01-WH-1	Kilometers	<input type="checkbox"/>	8/7/2018 02:20:05 PM	6,000.00	km	8,200.00	8,200.00
V0001	NY-01-WH-1	Kilometers	<input type="checkbox"/>	8/30/2018 03:49:40 PM	3,500.00	km	11,700.00	11,700.00
V0001	NY-01-WH-1	Kilometers	<input type="checkbox"/>	9/20/2018 04:01:32 PM	5,000.00	km	16,700.00	16,700.00

NOTE

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Maintenance rounds

2/18/2021 • 5 minutes to read • [Edit Online](#)

In **Asset Management**, you can create maintenance rounds for various assets, on which you need to carry out a similar task at regular intervals. For example, lubrication jobs or safety inspection jobs that need to be carried out on a number of machines within the same intervals. First step is to create a maintenance round, including assets that require the same form of maintenance job. Next, you schedule the maintenance rounds. When you have completed the maintenance rounds schedule, you can see all the job records relating to the round in the **All maintenance schedule** and **Open maintenance schedule lines**.

NOTE

Maintenance rounds can also be set up on functional locations to be completed on the assets installed on the functional location at the time of creation of the round-based work order. Refer to [Create functional locations](#) for more information on the setup of maintenance rounds on functional locations.

Set up a maintenance round

1. Click **Asset management > Setup > Preventive maintenance > Maintenance rounds**.
2. Click **New** to create a new maintenance round.
3. Insert an ID in the **Maintenance round** field, and a name for the maintenance round in the **Name** field.
4. Select a start date for the round in the **Start date** field.
5. In the **Finish within days** and **Finish within hours** fields, you can insert expected end date in days or hours. The expected end date is calculated relative to the start date, which is calculated when maintenance schedule lines are created. For example, you can insert "7" in the **Finish within days** field to indicate that the related job should be completed within a week from the start date.
6. Select "Yes" on the **Auto create** toggle button if work orders should automatically be created from maintenance schedule lines that are created from this maintenance round.
7. In the **Work order type** field, select the work order type to be used on work orders created from this maintenance round.
8. In the **Service level** field, select the work order service level to be used on work orders created from this maintenance round.
9. On the **Asset lines** FastTab, click **Add** to add an asset to the maintenance round.
10. A line number is automatically inserted in the **Line number** field to indicate the sequence of the assets in maintenance round.
11. Select the asset in the **Asset** field.
12. Select the maintenance job type for the asset in the **Maintenance job type** field.
13. If required, select **Maintenance job type variant** and **Trade** related to the maintenance job type.
14. Select the recurrence (day, week, etc.) in the **Period type** field.

15. In the **Period frequency** field, insert the number of recurrences for the maintenance round. Example: If you have selected "Day" in the **Period type** field, and you insert the number "7" in this field, new maintenance round lines are created during preventive maintenance scheduling once a week.
16. Select a start date for the asset to be included in the maintenance round in the **Start date** field. This date may differ from the start date set on the maintenance round.
17. Repeat steps 9-16 to add more assets to the maintenance round.
18. On the **Functional location lines** FastTab, click **Add** to add a functional location to the maintenance round. Refer to the description of the related fields above. The same fields are available as for creating an asset line, but you can also select **Manufacturer** and **Model** for a functional location, if required. If you only select a functional location on a line, but make no selections in **Asset type**, **Manufacturer**, **Model**, **Maintenance job type**, **Maintenance job type variant** and **Trade**, all assets related to that functional location at the time of maintenance scheduling will be included in the maintenance round.
19. On the **Pools** FastTab, click **Add** to select a work order pool to be included in the maintenance round. Several work order pools can be connected to one maintenance round.
20. Save your setup.

NOTE

The **Assets** and **Lines** fields located in the **Details** group on the **Header** FastTab show the total number of assets and lines related to the selected maintenance round.

The illustration below shows an example of a maintenance round containing three assets.

Line number	Asset	Maintenance job type	Maintenance job type variant	Trade	Period type	Period frequency	Start date
1	CD006	Inspection	Inspections	2-Month	Month	2	8/19/2019
2	CD007	Inspection	Inspections	2-Month	Month	2	8/19/2019
3	CD008	Inspection	Inspections	2-Month	Month	2	8/19/2019

Schedule maintenance rounds

When you've set up a maintenance round, you run a schedule job to schedule all the jobs related to the maintenance round.

1. Click **Asset management > Periodic > Preventive maintenance > Schedule maintenance rounds**, or **Asset management > Common > Maintenance schedule > All maintenance schedule** or **Open maintenance schedule lines** or **Open maintenance schedule pools > select**

maintenance schedule line in the list > **Maintenance rounds** button.

2. In the **Period** field, select the period type to be used for the scheduling job.
3. In the **Period frequency** field, insert the number of periods to be included in the scheduling job. The start of the scheduling is the current date.
4. Select "Yes" on the **Auto create** toggle button if a work order should automatically be created on the basis of a maintenance round.

NOTE

If this toggle button is set to "Yes", and the **Auto create** toggle button is also set to "Yes" on the maintenance round in **Maintenance rounds** form, work orders are created based on the maintenance round lines, and maintenance schedule lines with status "Work order created" are also created. If only one of the **Auto create** toggle buttons is set to "Yes", in this drop-down or in **Maintenance rounds**, only maintenance schedule lines are created with status "Created". In that case, no work orders are created.

5. If required, you can select specific rounds or another start date for the schedule job. Click **Filter**, and add the rounds to be included.
6. Click **OK**.
7. You are now able to see the maintenance rounds jobs in **Asset management > Common > Maintenance schedule > All maintenance schedule** or **Open maintenance schedule lines**. If the scheduled rounds are connected to a work order pool, you also see maintenance schedule lines in **Open maintenance schedule pools**. Maintenance schedule lines created from a round have the reference type "Maintenance rounds".

The two illustrations below show a schedule job in the **Schedule maintenance rounds** dialog, and the maintenance schedule lines created in **All maintenance schedule** based on that schedule job.

Schedule maintenance rounds

Parameters

Period

Year

Period frequency

1

WORK ORDER

Auto create

No

Records to include

Filter

MAINTENANCE ROUNDS

Maintenance round

CB-001

Name

Start date

Run in the background

OK

Cancel

Expected start	Asset	Maintenance job type	Maintenance job type variant	Trade	Maintenance forecast hours	Functional location	Reference type	Reference ID
10/1/2019 07:00:00 AM	C0006	Inspection	6-Month	Mechanical	0.00	CH-BP2-01-02	Maintenance plans	Conveyor Insp
10/1/2019 07:00:00 AM	C0007	Inspection	6-Month	Mechanical	0.00	CH-BP2-01-03	Maintenance plans	Conveyor Insp
10/1/2019 07:00:00 AM	C0008	Inspection	6-Month	Mechanical	0.00	CH-BP2-02	Maintenance plans	Conveyor Insp
10/5/2019 07:00:00 AM	C0006	Inspection	2-Month		0.00	CH-BP2-01-02	Maintenance rounds	CB-001
10/5/2019 07:00:00 AM	C0007	Inspection	2-Month		0.00	CH-BP2-01-03	Maintenance rounds	CB-001
10/5/2019 07:00:00 AM	C0008	Inspection	2-Month		0.00	CH-BP2-02	Maintenance rounds	CB-001
12/5/2019 08:00:00 AM	C0006	Inspection	2-Month		0.00	CH-BP2-01-02	Maintenance rounds	CB-001
12/5/2019 08:00:00 AM	C0007	Inspection	2-Month		0.00	CH-BP2-01-03	Maintenance rounds	CB-001
12/5/2019 08:00:00 AM	C0008	Inspection	2-Month		0.00	CH-BP2-02	Maintenance rounds	CB-001
2/5/2020 08:00:00 AM	C0006	Inspection	2-Month		0.00	CH-BP2-01-02	Maintenance rounds	CB-001
2/5/2020 08:00:00 AM	C0007	Inspection	2-Month		0.00	CH-BP2-01-03	Maintenance rounds	CB-001
2/5/2020 08:00:00 AM	C0008	Inspection	2-Month		0.00	CH-BP2-02	Maintenance rounds	CB-001
4/5/2020 07:00:00 AM	C0006	Inspection	2-Month		0.00	CH-BP2-01-02	Maintenance rounds	CB-001
4/5/2020 07:00:00 AM	C0007	Inspection	2-Month		0.00	CH-BP2-01-03	Maintenance rounds	CB-001
4/5/2020 07:00:00 AM	C0008	Inspection	2-Month		0.00	CH-BP2-02	Maintenance rounds	CB-001
6/5/2020 07:00:00 AM	C0006	Inspection	2-Month		0.00	CH-BP2-01-02	Maintenance rounds	CB-001
6/5/2020 07:00:00 AM	C0007	Inspection	2-Month		0.00	CH-BP2-01-03	Maintenance rounds	CB-001
6/5/2020 07:00:00 AM	C0008	Inspection	2-Month		0.00	CH-BP2-02	Maintenance rounds	CB-001
8/5/2020 07:00:00 AM	C0006	Inspection	2-Month		0.00	CH-BP2-01-02	Maintenance rounds	CB-001
8/5/2020 07:00:00 AM	C0007	Inspection	2-Month		0.00	CH-BP2-01-03	Maintenance rounds	CB-001
8/5/2020 07:00:00 AM	C0008	Inspection	2-Month		0.00	CH-BP2-02	Maintenance rounds	CB-001

- When work orders are manually created on assets that are covered by a vendor warranty, a dialog box is shown to make the user aware of the warranty. The creation of the work order can then be canceled. The check for a warranty relation is omitted for work orders that are automatically created.
- You can set up a batch job on the **Run in the background** FastTab to schedule rounds at regular intervals.
- If a round is included in several work order pools (refer to [Work order pools](#)), one record is shown for each pool in **Open maintenance schedule pools**. This is done to optimize the filtering options for work order

pools.

NOTE

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Maintenance schedule

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The maintenance schedule contains a list of all the expected preventive maintenance plans, maintenance requests, and maintenance rounds to be carried out. Some schedule lines may have been converted to work orders.

The four maintenance schedule views are slightly different, depending on which maintenance schedule lines you want to see.

MENU ITEM	DESCRIPTION OF CONTENTS
All maintenance schedule	All maintenance schedule lines are shown.
My asset schedule	All maintenance schedule lines containing assets installed on functional locations to which you are related as a worker (set up in Maintenance workers and worker groups) are shown in this list.
Open maintenance schedule lines	Maintenance schedule lines with status "Created" - meaning they have not yet been converted to a work order or discarded - are shown in this list.
Open maintenance schedule pools	Maintenance schedule lines related to a work order pool are shown in this list.

NOTE

If a maintenance schedule line is included in several work order pools (refer to [Work order pools](#)), one record is shown for each pool in **Open maintenance schedule pools**. This is done to optimize filtering options on work order pools.

To open a maintenance schedule:

1. Click **Asset management > Common > Maintenance schedule > All maintenance schedule** or **Open maintenance schedule lines** or **Open maintenance schedule pools**.
2. To update the maintenance schedule, click **Maintenance plan** or **Maintenance rounds**.
3. You can edit a maintenance schedule line by selecting it and clicking **Edit**. For example, you can easily update the service level or the worker responsible for the job. You can only edit maintenance schedule lines that have not yet been connected to a work order.
4. You can delete a maintenance schedule line by selecting it in the list page and clicking **Delete**.
5. You can discard a maintenance schedule line by selecting it in the list page and clicking **Discard**. This function is useful if, for example, an asset has a 2,000 km maintenance plan and a 10,000 km maintenance plan. Then, you may want to discard the line created from the 2,000 km maintenance plan when it coincides with 10,000 km, 20,000 km, 30,000 km, and so on. If you discard a maintenance schedule line related to a maintenance plan, that line will never again appear when that maintenance plan is scheduled.
6. You can select a number of maintenance schedule lines in **All maintenance schedule** and click **Work order pool**, if you want all selected lines to be included in the same work order pool.

7. You can select a number of maintenance schedule lines in **All maintenance schedule** or **Open maintenance schedule lines** or **Open maintenance schedule pools** and click **Adjust schedule** if you want to make the same adjustments on several lines. You can change expected start and end dates, service level, and the responsible maintenance worker group or responsible maintenance worker related to the selected maintenance schedule lines.

- When a maintenance schedule line has been related to a work order, the work order ID will be displayed in the **Work order** field.
- In **All assets** details view > **Asset maintenance plans** FastTab, you can select maintenance plans for the asset. Later, if you delete a maintenance plan line related to an asset in **All assets**, you also automatically delete all maintenance schedule lines with status "Created" that have been created based on that maintenance plan. See also [Create an asset](#).

The illustration below shows the **All maintenance schedule** list page.

Expected start	Asset	Maintenance job type	Maintenance job type variant	Trade	Maintenance forecast	Functional location	Reference type	Reference ID	Description
7/18/2019 07:00:00 AM	CH-BP2-09	Inspection		Facility	0.00	CH-BP2-09	Maintenance requests	ITCO-00003	Packaging area light not working
7/18/2019 07:00:00 AM	C0005	Lubrication		Facility	0.00	CH-BP2-01-01	Maintenance requests	ITCO-00002	Oil leakage
7/26/2019 07:00:00 AM	PI0004	Inspection		Tool	0.00	CH-BP1-03-02	Maintenance requests	ITCO-00007	Inspect the pressure cylinder
10/1/2019 07:00:00 AM	C0001	Inspection	6-Month	Mechanical	0.00	CH-BP1-01-01	Maintenance plans	Conveyor Insp	6-month inspection
10/1/2019 07:00:00 AM	C0002	Inspection	6-Month	Mechanical	0.00	CH-BP1-01-02	Maintenance plans	Conveyor Insp	6-month inspection
10/1/2019 07:00:00 AM	C0003	Inspection	6-Month	Mechanical	0.00	CH-BP1-01-03	Maintenance plans	Conveyor Insp	6-month inspection
10/1/2019 07:00:00 AM	C0004	Inspection	6-Month	Mechanical	0.00	CH-BP1-02	Maintenance plans	Conveyor Insp	6-month inspection
10/1/2019 07:00:00 AM	C0005	Inspection	6-Month	Mechanical	0.00	CH-BP2-01-01	Maintenance plans	Conveyor Insp	6-month inspection
10/1/2019 07:00:00 AM	C0006	Inspection	6-Month	Mechanical	0.00	CH-BP2-01-02	Maintenance plans	Conveyor Insp	6-month inspection
10/1/2019 07:00:00 AM	C0007	Inspection	6-Month	Mechanical	0.00	CH-BP2-01-03	Maintenance plans	Conveyor Insp	6-month inspection
10/1/2019 07:00:00 AM	C0008	Inspection	6-Month	Mechanical	0.00	CH-BP2-02	Maintenance plans	Conveyor Insp	6-month inspection
10/5/2019 07:00:00 AM	C0006	Inspection	2-Month		0.00	CH-BP2-01-02	Maintenance rounds	CB-001	Conveyor Belt Inspect-001
10/5/2019 07:00:00 AM	C0007	Inspection	2-Month		0.00	CH-BP2-01-03	Maintenance rounds	CB-001	Conveyor Belt Inspect-001
10/5/2019 07:00:00 AM	C0008	Inspection	2-Month		0.00	CH-BP2-02	Maintenance rounds	CB-001	Conveyor Belt Inspect-001
12/5/2019 08:00:00 AM	C0006	Inspection	2-Month		0.00	CH-BP2-01-02	Maintenance rounds	CB-001	Conveyor Belt Inspect-001
12/5/2019 08:00:00 AM	C0007	Inspection	2-Month		0.00	CH-BP2-01-03	Maintenance rounds	CB-001	Conveyor Belt Inspect-001
12/5/2019 08:00:00 AM	C0008	Inspection	2-Month		0.00	CH-BP2-02	Maintenance rounds	CB-001	Conveyor Belt Inspect-001

NOTE

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Maintenance schedule cost

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In Asset Management, you can calculate budget costs on maintenance schedule lines. This is useful if you want to get an overview of expected costs, for example, costs relating to planned preventive maintenance jobs for the next year. The calculations are based on existing maintenance schedule lines of type "Maintenance plans" and "Maintenance rounds" and "Maintenance requests".

1. Click **Asset management > Inquiries > Assets > Maintenance schedule cost**.
2. In the **Maintenance schedule cost** dialog, you can select a **Financial dimension set** if you want to see costs grouped in financial dimensions.

NOTE

Financial dimension sets are set up in **General ledger > Chart of accounts > Dimensions > Financial dimension sets**.

3. You can use the **Level** field to indicate how detailed you want the maintenance schedule lines to be regarding functional locations. For example, if you insert the number "1" in the field, and you have a multi-level functional location structure, all maintenance schedule lines for a functional location will be shown on the top level, and therefore the hours on a line may be added up from functional locations located at a lower level. If you insert the number "0" in the **Level** field, you will see a detailed result showing all maintenance schedule lines on all the functional location levels to which they are related.
4. If you want to make a calculation for specific assets, click **Filter** on the **Records to include** FastTab, and select the relevant assets. If required, you can also specify an **Expected start** date for the cost calculation or select a different **Status** for the cost calculation
5. Click **OK** to start the cost calculation.
6. On the **Maintenance schedule cost** tab > in the **Group by...** Action Pane groups, click the relevant buttons to show the required detail level of the cost calculation. The selected Action Pane group buttons are highlighted. Click on a button to activate or deactivate it.
7. Click the **Calculate cost** button if you want to make a new cost calculation.

The illustration below shows the results of a maintenance schedule cost calculation.

Finance and Operations

Search for a page

USMF

MAINTENANCE SCHEDULE COST

MAINTENANCE SCHEDULE COST

Filter

Date	Asset	Asset type	Functional location	Reference type	Reference ID	Maintenance job type	Original budget
7/18/2019	C0005	Conveyor	CH-BP2-01-01	Maintenance requests	ITCO-00002	Lubrication	80.00
7/18/2019	CH-BP2-09	Area	CH-BP2-09	Maintenance requests	ITCO-00003	Inspection	261.00
7/26/2019	Pi0004	Pipe	CH-BP1-03-02	Maintenance requests	ITCO-00007	Inspection	261.00
10/1/2019	C0004	Conveyor	CH-BP1-02	Maintenance plans	Conveyor Insp	Inspection	261.00
10/1/2019	C0005	Conveyor	CH-BP2-01-01	Maintenance plans	Conveyor Insp	Inspection	261.00
10/1/2019	C0006	Conveyor	CH-BP2-01-02	Maintenance plans	Conveyor Insp	Inspection	261.00
10/1/2019	C0007	Conveyor	CH-BP2-01-03	Maintenance plans	Conveyor Insp	Inspection	261.00
10/1/2019	C0008	Conveyor	CH-BP2-02	Maintenance plans	Conveyor Insp	Inspection	261.00
10/5/2019	C0006	Conveyor	CH-BP2-01-02	Maintenance rounds	CB-001	Inspection	261.00
10/5/2019	C0007	Conveyor	CH-BP2-01-03	Maintenance rounds	CB-001	Inspection	261.00
10/5/2019	C0008	Conveyor	CH-BP2-02	Maintenance rounds	CB-001	Inspection	261.00

NOTE

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Creating work orders

2/18/2021 • 4 minutes to read • [Edit Online](#)

After you've scheduled preventive maintenance jobs, the next step is to create work orders for them. You can complete this step by using one of the maintenance schedules. The scheduled jobs in a maintenance schedule can have different reference types, as described in the following table.

REFERENCE TYPE	DESCRIPTION
Maintenance plans	Preventive maintenance jobs that are based on the <i>Time</i> or <i>Counter</i> maintenance plan type.
Maintenance rounds	Preventive maintenance jobs that contain several assets that require a similar type of maintenance.
Maintenance request	A manually created request for maintenance or repair of an asset. This request can be converted to a work order.

Create work orders based on your maintenance schedule

To create work orders that are based on your maintenance schedule, follow these steps.

1. Open one of the following pages, depending on how you want to select schedule items for your work orders:
 - All maintenance schedule (**Asset management > Management schedule > All maintenance schedule**)
 - Open maintenance schedule lines (**Asset management > Management schedule > Open maintenance schedule lines**)
 - Open maintenance schedule pools (**Asset management > Management schedule > Open maintenance schedule pools**)
2. In the grid, select the check box for every scheduled maintenance job that you want to create a work order for. Then, on the Action Pane, select **Work order**.

The **Create work orders** dialog box appears. The **Maintenance forecast hours** field shows the total number of forecast hours for the selected lines.

3. In the **Parameters** section, specify the number of work orders that should be created. Select one of the following options:
 - **One work order per line** – Create one work order per maintenance schedule line.
 - **One work order per** – Create work orders that are grouped according to the settings of the other options that become available when you select this option.
4. In the **Work order type** field, select the work order type to use for all the work orders that you create.
5. Select **OK** to create the work orders according to your settings.

Group work order lines that are automatically created while a maintenance plan runs

IMPORTANT

The functionality that is described in this section is available as part of a preview release. The content and the functionality are subject to change. For more information about preview releases, see [One version service updates FAQ](#).

This feature lets you define rules for grouping work order lines under a single work order when the system is set up to generate work orders automatically, based on a maintenance plan. Previously, automatically generated work orders could contain only one line. However, you can now group work orders by, for example, asset, asset type, or functional location. (Manually generated work orders could already be grouped in this way, as described in the previous section of this topic.)

Enable grouping for automatically generated work orders

Before you can use this feature, it must be turned on in your system. Admins can use the [feature management](#) settings to check the status of the feature and turn it on. In the **Feature management** workspace, the feature is listed in the following way:

- **Module:** *Asset Management*
- **Feature name:** *(Preview) Apply rules for grouping work orders while running a maintenance plan*

Set up grouping for automatically generated work orders

To set up grouping for automatically generated work orders, follow these steps.

1. Go to **Asset management > Setup > Preventative maintenance > Maintenance plans**.
2. For each plan where you want to generate grouped work orders, follow these steps:
 - a. Select the plan in the list pane.
 - b. On the **Lines** FastTab, make sure that the **Auto create** check box is selected on every line.
3. Go to **Asset management > Periodic > Preventive maintenance > Schedule maintenance plans**.
4. In the **Schedule maintenance plans** dialog box, in the **Period** section, specify the time horizon for the plan (how far to look ahead when finding scheduled maintenance jobs to generate work for).
5. Set the **Automatically create work order from schedule** option to *Yes*.
6. In the **Work order** section, select one of the following options:
 - **One work order per line** – Create one work order per maintenance schedule line. (This option provides the same functionality that is available when the *Apply rules for grouping work orders while running a maintenance plan* feature is turned off.)
 - **One work order per** – Create work orders that are grouped according to the settings of the other options that become available when you select this option.
7. If you want the options to apply when you run only some of your maintenance plans, on the **Records to include** FastTab, add filters as you require, just as you might do for other batch jobs in Microsoft Dynamics 365 Supply Chain Management.
8. On the **Run in the background** FastTab, set up batch and scheduling options as you require, just as you might do for other batch jobs in Supply Chain Management.
9. Select **OK** to run and/or schedule the selected maintenance plans.

NOTE

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Maintenance downtime activities

2/18/2021 • 6 minutes to read • [Edit Online](#)

Maintenance downtime is used to get an overview of the capacity required to carry out maintenance jobs on specific assets during a specific period. For example, you can create a maintenance downtime registration for Production line 10 in Production Hall 29-A on production site 02. The maintenance downtime registration has a start and end time indicating the period in which the assets related to the maintenance stop are not available for production.

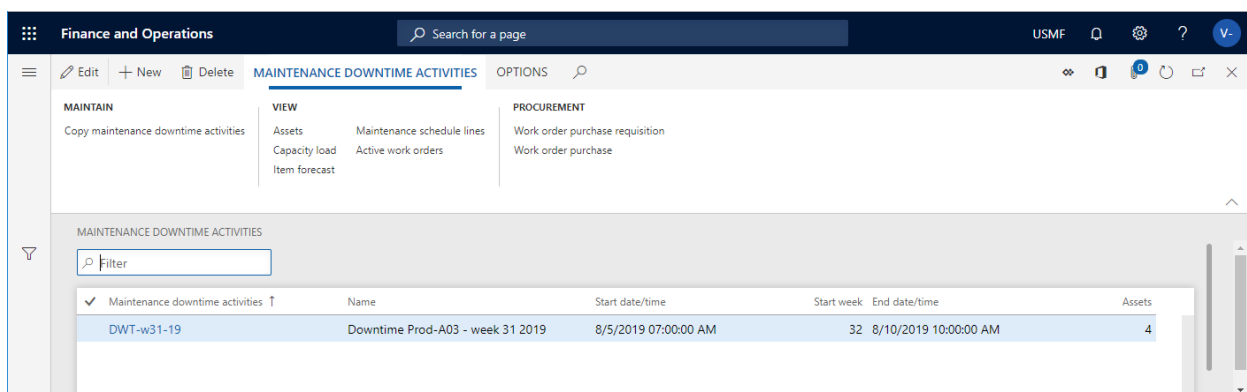
Maintenance downtime activities is an overview of maintenance schedule lines and work order maintenance jobs on related assets during a specified period. The lines related to work order maintenance jobs all have an expected start date within the maintenance stop period. You can extract useful information and make adjustments to planned maintenance jobs:

- Get an overview of required shut-down periods of production equipment (assets).
- Get an overview of planned maintenance (hours), grouped by competencies (responsible maintenance worker groups or maintenance workers), for example capacity load on electricians, smiths, or other maintenance work groups required to do the planned maintenance jobs.
- Make adjustments to maintenance schedule lines or work order maintenance jobs related to the assets, for example, change expected start and end times on a line, or select other maintenance workers to optimize the workflow for maintenance workers and maintenance worker groups.

When assets have been selected on a maintenance downtime registration, all open maintenance schedule lines and work order maintenance jobs relating to active work orders are included in the maintenance downtime registration.

Maintenance downtime activities

Click **Asset management > Common > Maintenance downtime activities > All maintenance downtime activities** to open a list of all maintenance downtime activities and see some of the information related to the activities. Click on a link in the **Maintenance downtime activities** column to open the details view. The illustration below shows an example of the **Maintenance downtime activities** list.



Maintenance downtime activities	Name	Start date/time	Start week	End date/time	Assets
✓ Maintenance downtime activities ↑					
DWT-w31-19	Downtime Prod-A03 - week 31 2019	8/5/2019 07:00:00 AM	32	8/10/2019 10:00:00 AM	4

Create a maintenance downtime activity

1. Click **Asset management > Common > Maintenance downtime activities > All maintenance downtime activities** or **Active maintenance downtime activities**.
2. Click **New**.

3. Insert an ID in the **Maintenance downtime activities** field and a name in the **Name** field.
4. Insert the period for the maintenance stop in the **Start date/time** and **End date/time** fields.
5. On the **Maintenance downtime activities assets** FastTab> click **Add line** to add assets, one at a time, to the maintenance downtime activity.
6. Click **Save** when all assets have been added. The illustration below shows an example of a maintenance downtime activity with related assets and maintenance jobs.
7. The work order maintenance jobs and open maintenance schedule lines related to the selected assets are shown on the **Resulting work order maintenance jobs** and **Maintenance schedule lines** FastTabs. On the **General** FastTab > **Work orders** group > **Maintenance forecast hours** field and **General** FastTab > **Maintenance schedule** group > **Maintenance forecast hours** field , you see the total number of hours forecasted for work order maintenance jobs and maintenance schedule lines.

The illustration below shows an example of the **Maintenance downtime activities** details view.

Maintenance Downtime Activities Details View

General

IDENTIFICATION	PERIOD	Start week	ASSETS	WORK ORDERS
Maintenance downtime activities DWT-w31-19	Start date/time 8/5/2019 07:00:00 AM	32	Assets 4	Work orders 2
Name Downtime Prod-A03 - week 31 ...	End date/time 8/10/2019 10:00:00 AM			Maintenance forecast hours 6.00
				ASSET CALENDARS Maintenance schedule lines Maintenance forecast hours 0.00

Maintenance downtime activities assets

Asset	Name	Asset type	Manufacturer	Model	Functional location
CH-BP1-01	Malting	Area			CH-BP1-01
CH-BP1-01-01	Steeping	Area			CH-BP1-01-01
C0001	Conveyor Belt 0001	Conveyor	Adatum		CH-BP1-01-01
C0004	Conveyor Belt 0004	Conveyor			CH-BP1-02

Resulting work order maintenance jobs

Expected start	Expected end	Work order	Asset	Functional location	Service level	Criticality	Maintenance job type
8/9/2019 02:00:00 PM	8/9/2019 05:00:00 PM	JPMF-00026	C0001	CH-BP1-01-01	10		Service Service
8/9/2019 02:00:00 PM	8/9/2019 05:00:00 PM	JPMF-00027	C0004	CH-BP1-02	10		Service Service

NOTE

The work order maintenance jobs and maintenance schedule lines related to the selected assets are automatically updated if new work orders or maintenance schedule lines are created after you created the maintenance downtime activity. For example, if you schedule maintenance plans or maintenance rounds on the related assets two days after the maintenance downtime activity was created, new maintenance schedule lines are automatically added to the maintenance downtime activity.

8. In **All maintenance downtime activities** > **Maintenance downtime activities** > select a maintenance downtime activity in the list and click **Capacity load** to open the **Calculate capacity load** dialog. Use this dialog to get an overview of capacity load on, for example, dates, assets, asset types, and maintenance job types. Note that the dates shown in the dialog are the start and end dates selected in

Maintenance downtime activities. This calculation includes the assets related to the maintenance downtime activity.

- In the **Calculate capacity load** dialog, edit start and end times if required, and select if you want to include work orders and maintenance schedules in the calculation. You can use the **Level** field to indicate how detailed you want the capacity load calculation to be regarding functional locations. For example, if you insert the number "1" in the field, and you have a multi-level functional location structure, all assets for a functional location, which are selected on the maintenance downtime activity, will be shown on the top level, and therefore the hours on a line may be added up from functional locations located at a lower level. If you insert the number "0" in the **Level** field, you will see a detailed result showing all capacity load lines on all the functional location levels to which they are related.
- Click **OK** to start the calculation. The total number of hours is shown in the **Capacity load** overview. On the **Capacity load** tab > the **Group by...** Action Pane groups, click the relevant buttons to get a more detailed overview of the allocation of forecasted hours. The illustration below shows the results of a **Capacity load** calculation.

The screenshot shows the SAP Capacity Load overview for maintenance downtime activity DWT-W31-19 - DOWNTIME PROD-A03 - WEEK 31 2019. The table displays the following data:

Asset	Asset type	Functional location	Functional location type	Reference type	Maintenance job type	Hours
C0001	Conveyor	CH-BP1-01-01	Area	Work orders	Ad hoc	0.00
C0001	Conveyor	CH-BP1-01-01	Area	Work orders	Service	3.00
C0004	Conveyor	CH-BP1-02	Roller mill	Work orders	Service	3.00
CH-BP1-01	Area	CH-BP1-01	Area	Work orders	Ad hoc	0.00

- After you get an overview of the capacity load, if you want to make adjustments on work order maintenance jobs or maintenance schedule lines, return to the **Maintenance downtime activities** details view and select the lines you want to adjust on the **Resulting work order maintenance jobs** and **Maintenance schedule lines** FastTabs.
- Click the **Adjust** button and update expected start/end dates, service level, or responsible maintenance workers for the selected work order maintenance jobs or maintenance schedule lines.
- Click **OK** when you have made the required adjustments.

NOTE

Work order maintenance jobs and maintenance schedule lines that are not included in the maintenance downtime period after you have made adjustments are automatically removed from **Maintenance downtime activities**.

- In **All maintenance downtime activities** > **Maintenance downtime activities** > select a maintenance downtime activity in the list and click **Item forecast** to open the **Calculate item forecast** dialog. Use this dialog to calculate forecasts for items (spare parts and other required items) and group them to get an overview, for example, by date, asset, asset type, and maintenance job type. Note that the dates shown in the dialog are the start and end dates selected in **Maintenance downtime activities**. This calculation includes spare parts and items related to the assets that are selected on the maintenance downtime activity.
- In the **Calculate item forecast** dialog, edit start and end times if required, and select if you want to include work orders and maintenance schedules in the calculation. You can use the **Level** field to indicate how detailed you want the capacity load calculation to be regarding functional locations. For example, if you insert the number "1" in the field, and you have a multi-level functional location structure, all assets

for a functional location, which are selected on the maintenance downtime activity, will be shown on the top level, and therefore the hours on a line may be added up from functional locations located at a lower level. If you insert the number "0" in the **Level** field, you will see a detailed result showing all capacity load lines on all the functional location levels to which they are related.

- Click **OK** to start the calculation. The total number of item forecasts is shown in the **Item forecast** overview. On the **Item forecast** tab > the **Group by...** Action Pane groups, click the relevant buttons to get a more detailed overview of the allocation of forecasted items. The illustration below shows the results of an **Item forecast** calculation.

Week	Asset	Asset type	Functional location	Reference type	Maintenance job type	Item number	Product name	Quantity	Unit
32	C0001	Conveyor	CH-BP1-01-01	Work orders	Service	C0002	Microsoft Arc™ Keyboard	1.00	ea
32	C0004	Conveyor	CH-BP1-02	Work orders	Service	C0002	Microsoft Arc™ Keyboard	3.00	ea

- You can copy assets from one maintenance downtime activity to another. In **All maintenance downtime activities**, select the **Copy maintenance downtime activities** button, and make your selections in the **From maintenance downtime activities** and **To maintenance downtime activities** fields, and click **OK**.
- In **All maintenance downtime activities**, click the **Maintenance schedule lines** button or the **Active work orders** button to open the related lists and view the lines related to the selected maintenance downtime activity.

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Calculate capacity load

2/18/2021 • 2 minutes to read • [Edit Online](#)

In Asset Management, you can calculate capacity load on:

- maintenance schedule lines
- work orders that have not yet been scheduled
- scheduled work orders

This is useful if you want to get an overview of expected capacity load for a specific period. Calculation of capacity load can be done on all assets or selected assets. You can also make a calculation on maintenance downtime activities or work order pools.

1. Click **Asset management > Inquiries > Capacity load**, or **Asset management > Common > Work order pools > All work order pools / Active work order pools** > select work order pool in the list > **Capacity load** button, or **Asset management > Common > Maintenance downtime activities > All maintenance downtime activities / Active maintenance downtime activities** > select maintenance activity in the list > **Capacity load** button.
2. In the **Calculate capacity load** dialog, select a period for the calculation in the **Start date/time** and **End date/time** fields.
3. Select "Yes" on the **Include maintenance schedule** toggle button if you want to include maintenance schedule lines in the calculation.
4. Select "Yes" on the **Include work order** toggle button if you want to include work order jobs in the calculation.
5. You can use the **Level** field to indicate how detailed you want the capacity load lines to be regarding functional locations.

For example, if you insert the number "1" in the field, and you have a multi-level functional location structure, all maintenance schedule lines and work orders for a functional location will be shown on the top level, and therefore the hours on a line may be added up from functional locations located at a lower level.

If you insert the number "0" in the **Level** field, you will see a detailed result showing all maintenance schedule lines and all work orders on all the functional location levels to which they are related.
6. Click **OK** to start the calculation.
7. In the **Group by...** groups, click the relevant buttons to show the required detail level of the calculation. In the screenshot below, the selected **Group by** buttons are highlighted in blue color. Click on a button to activate or deactivate it.

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CAPACITY LOAD

Calculate capacity load

GROUP BY DATE: Date, Month, **Week**, Year, Quarter

GROUP BY ASSET: **Asset type**, Model, Manufacturer, Criticality

GROUP BY FUNCTIONAL LOCATION: **Functional location**, Functional location type

GROUP BY REFERENCE: Reference type, Reference ID

GROUP BY MAINTENANCE JOB: **Maintenance job type**, Maintenance job type category, Maintenance job type variant, Trade, Criticality

GROUP BY RESPONSIBLE: Responsible group, Responsible worker

GROUP BY WORK: **Work order**, Work order type

Filter

Week	Asset	Asset type	Functional location	Maintenance job type	Work order	Work order type	Lifecycle state	Hours
32	C0001	Conveyor	CH-BP1-01-01	Service	JPMF-00026	Corrective	Scheduled	3.00
32	C0004	Conveyor	CH-BP1-02	Service	JPMF-00027	Corrective	Scheduled	3.00
33	C0001	Conveyor	CH-BP1-01-01	Ad hoc	JPMF-00018	Corrective	New	0.00
33	CH-BP1-01	Area	CH-BP1-01	Ad hoc	JPMF-00018	Corrective	New	0.00
34	C0001	Conveyor	CH-BP1-01-01	Ad hoc	JPMF-00018	Corrective	New	0.00
34	CH-BP1-01	Area	CH-BP1-01	Ad hoc	JPMF-00018	Corrective	New	0.00
34	CH-BP1-07	Filtration unit	CH-BP1-07	Ad hoc	JPMF-00028	Corrective	New	0.93
35	C0001	Conveyor	CH-BP1-01-01	Ad hoc	JPMF-00018	Corrective	New	0.00
35	CH-BP1-01	Area	CH-BP1-01	Ad hoc	JPMF-00018	Corrective	New	0.00
35	CH-BP1-07	Filtration unit	CH-BP1-07	Ad hoc	JPMF-00028	Corrective	New	1.63
36	CH-BP1-07	Filtration unit	CH-BP1-07	Ad hoc	JPMF-00028	Corrective	New	0.93

NOTE

If you want to focus only on capacity planning regarding scheduled work orders, see [Calculate capacity load on scheduled work orders](#).

NOTE

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Calculate item forecast

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Just as you can make capacity load calculations, which are described in the previous section, you can also make item forecast calculations on:

- maintenance schedule lines
- work orders that have not yet been scheduled
- scheduled work orders

This is useful if you want to get an overview of expected item consumption (spare parts as well as other items required for completing work orders) for a specific period. Calculation of item forecast can be done on all assets or selected assets. You can also make a calculation on a maintenance downtime activity (**All maintenance downtime activities** or **Active maintenance downtime activities**), or on a work order pool (**All work order pools** or **Active work order pools**).

1. Click **Asset management > Inquiries > Item forecast**, or **Asset management > Common > Work order pools > All work order pools / Active work order pools** > select work order pool in the list > **Item forecast** button, or **Asset management > Common > Maintenance downtime activities > All maintenance downtime activities / Active maintenance downtime activities** > select maintenance downtime activity in the list > **Item forecast** button.
2. In the **Calculate item forecast** dialog, select a period for the calculation in the **Start date/time** and **End date/time** fields.
3. Select "Yes" on the **Include maintenance schedule** toggle button if you want to include maintenance schedule lines in the forecast calculation.
4. Select "Yes" on the **Include work order** toggle button if you want to include work order jobs in the forecast calculation.
5. You can use the **Level** field to indicate how detailed you want the item forecast lines to be regarding functional locations.

For example, if you insert the number "1" in the field, and you have a multi-level functional location structure, all maintenance schedule lines and work orders for a functional location will be shown on the top level, and therefore the hours on a line may be added up from functional locations located at a lower level.

If you insert the number "0" in the **Level** field, you will see a detailed result showing all maintenance schedule lines and all work orders on all the functional location level to which they are related.
6. Click **OK** to start the calculation.
7. In the **Group by...** groups, click the relevant buttons to show the required detail level of the calculation. In the screenshot below, the selected **Group by** buttons are highlighted in blue color. Click on a button to activate or deactivate it.
8. Click the **Display dimensions** button if you want to see the product, storage, or tracking dimensions related to the items. Select the relevant check boxes, and click **OK**.

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ITEM FORECAST

Calculate item forecast

GROUP BY DATE: Date (selected), Month, Year, Quarter

GROUP BY ASSET: Asset (selected), Asset type, Manufacturer, Model, Criticality

GROUP BY FUNCTIONAL LOCATION: Functional location (selected), Functional location type

GROUP BY REFERENCE: Reference type (selected), Reference ID

GROUP BY MAINTENANCE JOB: Maintenance job type category (selected), Maintenance job type, Maintenance downtime activities, Maintenance job type variant, Trade, Criticality

GROUP BY RESPONSIBLE: Responsible group, Responsible worker

GROUP BY WORK: Work order, Work order type

ITEM FORECAST

Filter

Date	Asset	Asset type	Functional location	Reference type	Maintenance job type	Item number	Product name	Quantity	Unit
8/9/2019	C0001	Conveyor	CH-BP1-01-01	Work orders	Service	C0002	Microsoft Arc™ Keyboard	1.00	ea
8/9/2019	C0004	Conveyor	CH-BP1-02	Work orders	Service	C0002	Microsoft Arc™ Keyboard	3.00	ea

NOTE

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Maintenance worker calendar and scheduling

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When you schedule work orders, you create a schedule for maintenance workers, tools, and assets. In order to schedule maintenance workers, a calendar must be set up for each maintenance worker. Maintenance workers are related to a resource, and working time calendars are set up for resources. You set up the resource and calendar in **Asset management > Setup > Workers > Workers**, which is described in [Maintenance workers and worker groups](#).

The screenshot below shows an example of a maintenance worker who is related to a resource that uses the working time calendar "Production".

The screenshot displays the SAP S/4HANA 'Workers' configuration page. The left sidebar shows a list of workers, with 'Pilar Pinilla' selected. The main area shows the configuration for 'Pilar Pinilla', including a table with 'Maintenance worker groups' (5) and 'Functional locations' (1). A red box highlights the 'General' section, which shows the 'RESOURCE' (1112) and 'SCHEDULE' (Production) fields. The description for this worker is 'Polishing worker 2'.

Calendar setup for tools and assets is not needed in relation to work order scheduling. The assumption is that tools and assets are available 24 hours a day for maintenance.

NOTE

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Set up preferred maintenance workers

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During work order scheduling, you can make a preference regarding which maintenance worker or worker group is allocated to complete the work order. The use of this functionality is optional, but it can help you make a choice for the most qualified maintenance worker to complete a job, based on worker skills and competencies. Only maintenance workers that are available at scheduling time will be scheduled. If a preferred maintenance worker setup matches a work order during scheduling, but the maintenance worker is allocated to other jobs, the work order will be scheduled to another available maintenance worker.

Before you can set up preferred maintenance workers, you must first set up the maintenance workers and worker groups. For a description about how to set up maintenance workers and worker groups, see to [Maintenance workers and worker groups](#).

Set up preferred workers

A preferred maintenance worker or worker group can be related to one or more of the following:

- trade
- maintenance job type variant
- maintenance job type
- maintenance job type category
- asset
- asset type

The more selections you make for the same record, the more specific your setup will be.

1. Click **Asset management > Setup > Workers > Preferred maintenance workers**.
2. Click **New** to create a new record.
3. Start by creating a "default" maintenance worker or worker group. This means that you only make a selection in the **Preferred maintenance worker group** field or the **Preferred maintenance worker** field. In the screenshot below, you see an example in the first record in which "Requests" is selected as **Preferred maintenance worker group**.

[!NOTE] The default setup will be used during work order scheduling if no other, more specific, combination matches the contents of the work order.

4. Repeat step 2 to create a new record. Make the required selections, depending on the detail level for the preferred worker or worker group.

Example: In the screenshot below, in the sixth record, the maintenance worker Shawn Richardson is selected as preferred worker. He will automatically be selected during scheduling of a work order that includes the asset "CH-BP1-03-02 and the maintenance job type "Facility assessment", if he is available at the scheduled time.

[!NOTE] Generally, when a preferred maintenance worker is selected during work order scheduling, Asset Management goes through all **Preferred maintenance workers** records to check for a possible match, always checking the most specific combination first. If no match is found, the "default" record with a selection in either the **Preferred maintenance worker group** field or the **Preferred maintenance worker** field is used.

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Save + New Delete OPTIONS

PREFERRED MAINTENANCE WORKERS

Filter

✓	Asset type ↑	Asset ↑	Maintenance job type category ↑	Maintenance job type ↑	Maintenance job type variant ↑	Trade ↑	Preferred maintenance worker group ↑	Preferred maintenance worker
							Requests	
						Electrical	Electrical	
						Hydraulic	Hydraulic	
						Mechanical	Mechanical	
						Pneumatic	Pneumatic	
		CH-BP1-03-02		Facility assessment				Shawn Richardson
	Conveyor			Service			Electrical	

You can also set up *responsible* maintenance workers who can be selected when a maintenance request or a work order is created. You can edit the selection in **All work orders** and **All maintenance requests**, if required. For more information, see [Responsible maintenance workers](#).

During work order scheduling, different scores are calculated to determine which workers should complete the jobs related to a work order (those scores are set up in **Asset management parameters > Work order scheduling** link). If two or more preferred maintenance workers or responsible maintenance workers get the same score during work order scheduling, one worker is randomly selected. Otherwise, it is always the worker with the highest score who is allocated to complete a work order.

NOTE

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Schedule work orders

2/18/2021 • 8 minutes to read • [Edit Online](#)

This topic explains how to schedule work orders in Asset Management.

The required number of hours for a work order is defined by the sum of forecasted hours minus posted hours. If more time is required, the forecast must be adjusted accordingly. In **Asset management > Common > Work orders > All work orders** or **Active work orders**, you can view or edit forecasts on a work order by selecting the work order and clicking **Forecast** on the **Work order** tab. When work orders have been created and estimated, the next step complete the work orders is to allocate the required maintenance workers and tools.

Only work orders with a work order lifecycle state that allows scheduling can be scheduled. Allow scheduling is set up in **Asset management > Setup > Work orders > Lifecycle states > General FastTab > Allow scheduling** toggle button.

1. Click **Asset management > Common > Work orders > All work orders**.
2. Select the work orders you want to schedule in the list. For example, you can sort the list by **Current lifecycle state**.
3. On the **General** tab, click **Schedule**.
4. In the **Schedule work orders** dialog, you can add selections regarding expected start date and service level, if required. If the scheduling process should observe capacity limitations regarding resources already scheduled for other jobs, make sure that the **Asset**, **Tool**, and **Worker** toggle buttons are set to "Yes".

[!NOTE] If you set the **Asset**, **Tool**, and **Worker** toggle buttons to "No", existing reservations will be ignored. In the Infolog, a list of overlapping work order schedules will be shown, and you can click on the messages to open a work order and reschedule, if required.

5. To see detailed information about the scheduling process, select "Yes" on the **Verbose** toggle button. This means that detailed information about the calculated scores on the work orders and maintenance workers will be shown in the Infolog.
6. Click **OK** to start the scheduling process.
7. When scheduling is completed, an Infolog shows the number of work orders scheduled, and also more detailed information if the **Verbose** toggle button was set to "Yes".

NOTE

Work orders are scheduled in one cycle per work order, not per work order job. You can also open the **Schedule work orders** dialog directly in **Asset management > Periodic > Work orders > Schedule work orders**. Make your selections and click **OK** to start work order scheduling. It is possible to set up work order scheduling as a batch job in the **Schedule work orders** dialog > the **Run in the background** FastTab.

Example: In the figure below, the formula inserted in the **Expected start** field will generate work order scheduling for all work orders with expected start date a week from now and later. This formula may be useful when you run work order scheduling on an ongoing basis, but you want to make sure the work orders scheduled for the next 5-6 days are not rescheduled.

?

Schedule work orders

Parameters ^

<p>FINITE CAPACITY</p> <p>Asset</p> <p>Yes <input checked="" type="checkbox"/></p> <p>Tool</p> <p>Yes <input checked="" type="checkbox"/></p> <p>Worker</p> <p>Yes <input checked="" type="checkbox"/></p>	<p>OTHER</p> <p>Verbose</p> <p>No <input type="checkbox"/></p>
---	---

Records to include ^

Filter

<p>WORK ORDERS</p> <p>Work order</p> <p><input type="text"/></p> <p>Expected start</p> <p><input type="text" value="(greaterThanUtcDate(7))"/></p> <p>Service level</p> <p><input type="text"/></p>	<p>WORK ORDER LIFECYCLE MODEL</p> <p>Allow scheduling</p> <p><input type="text" value="Yes"/></p>
--	--

Run in the background v

The work order type related to work orders may set up scheduling for one maintenance worker (**Asset management** > **Setup** > **Work orders** > **Work order types** > **One maintenance worker** toggle button set to "Yes"). This means that if the work order type is used on a work order, the **One maintenance worker** toggle button is automatically set to "Yes" on the **All work orders** details page > **Header** view > **Schedule** FastTab. During work order scheduling, all work order jobs created on the work order will subsequently be scheduled to the same maintenance worker. If required, you can edit the selection on the **One maintenance worker** toggle button in **All work orders** to allow scheduling of several workers or one worker on the work order jobs.

The scheduling process in Asset Management includes several factors in the scheduling calculation:

- Calculating scores for both work orders and maintenance workers. Scores for work orders and maintenance workers are set up in **Asset management parameters**.
- Checking for matching competencies, meaning skills and certificates, required to perform the job. Skills and certificates are set up on maintenance workers in the **Human resources** module (**Human resources** > **Workers** > **Workers** > select worker in the list > **Worker** tab > **Competencies** section > **Skills** and **Certificates** buttons). Also, skills and certificates can be added to maintenance job types and maintenance job trades. Read more about competencies and maintenance job types in [Maintenance job type categories](#)

and maintenance job types, maintenance job type variants, maintenance job trades, and maintenance checklists.

Scores used in work order scheduling

Calculating scores for a work order job is based on expected start date and the service level of the work order.

Start date calculation: For every future date calculated from the expected start date, the start date score is subtracted and multiplied by the score, which is "10" in the examples below.

Criticality calculation: Criticality score multiplied by the criticality on the work order.

Service level calculation: Service level score divided by the service level on the work order.

In the examples below, the criticality score is "2", and the service level scores are "5" and "100".

Example 1:

WORK ORDER ID	EXPECTED START DATE	WORK ORDER CRITICALITY	WORK ORDER SERVICE LEVEL	CALCULATION	SCORE
WO-00010816	Tomorrow	2	20	$(-1 * 10) + (2 * 2) + 5 / 20$	- 5.75
WO-00010817	Two days from now	2	20	$(-2 * 10) + (2 * 2) + 5 / 20$	- 15.75
WO-00010818	Two days from now	3	5	$(-2 * 10) + (2 * 3) + 5 / 5$	- 13

The work orders will be scheduled in the following order: WO-00010816, WO-00010818, WO-00010817.

Example 2:

WORK ORDER ID	EXPECTED START DATE	WORK ORDER CRITICALITY	WORK ORDER SERVICE LEVEL	CALCULATION	SCORE
WO-00010816	Tomorrow	2	20	$(-1 * 10) + (2 * 2) + 100 / 20$	- 1
WO-00010817	Two days from now	2	20	$(-2 * 10) + (2 * 2) + 100 / 20$	- 11
WO-00010818	Two days from now	3	5	$(-2 * 10) + (2 * 3) + 100 / 5$	6

If the service level score is increased to '100' instead of '5', the scheduling order will be: WO-00010818, WO-00010816, WO-00010817.

The rating scores relating to calculating which maintenance workers should work on the work orders are all set up as numbers, which are added to each maintenance worker calculation during work order scheduling. The maintenance worker with the highest score is selected on the work order. Here is a short description of the maintenance worker scores:

MAINTENANCE WORKER SCORE	DESCRIPTION
Responsible worker	If the maintenance worker is selected as responsible worker on the work order, the score is added.

MAINTENANCE WORKER SCORE	DESCRIPTION
Responsible maintenance worker group	If the maintenance worker is part of the responsible maintenance worker group on the work order, the score is added.
Preferred maintenance worker	If the worker is selected as preferred maintenance worker on the asset, the score is added.
Preferred maintenance worker group	If the worker is part of the preferred maintenance worker group on the asset, the score is added.
Location	If your company uses functional locations, maintenance workers get full score if they are located on the functional location related to the asset. If the functional location of the asset has a parent location, maintenance workers on that functional location get 1/2 score. If that location also has a parent, maintenance workers on that location get 1/3 score. If that location also has a parent, maintenance workers on that location get 1/4 score, and so on. If you company uses asset location, which we do not recommend, location, area, and zone are used to calculate location scores. Workers get full score if they are located in the location and area and zone related to the asset. If worker location only matches location and area, the rating score for the maintenance worker is 2/3 of the full score. If maintenance worker location only matches location, the rating score for the maintenance worker is 1/3 of the full score.
Worker's start date	For every date that the scheduled start date is later than the expected start date, the score is subtracted.

NOTE

If a score is set to "0", that score is not calculated. This is useful if, for example, you do not want to include a responsible worker in your scheduling.

Competencies used in work order scheduling

Skills and certificate requirements can be set up on maintenance job types (**Asset management > Setup > Jobs > Maintenance job types**) and maintenance job trades (**Asset management > Setup > Jobs > Maintenance job trade**).

Maintenance job types and maintenance job trades are selected on work order jobs. If skills or certificates have been selected on a maintenance job type or maintenance job trade, and that maintenance job type or maintenance job trade is used on a work order job, only maintenance workers with matching skills and certificates are scheduled to work on the work order.

Work with scheduled work orders using a gantt chart

The **Scheduled work orders gantt chart** provides a graphical interface where you can view and reschedule your work orders.

To view and work with the gantt chart:

1. Go to **Asset management > Work orders > Scheduled work orders gantt chart**.

2. Use the drop-down lists and fields in the **Settings** section to set up which functional location, time span, and time scale to show in the gantt chart.
3. Select **Apply**.
 - The gantt chart updates to show the scheduled work orders that match your settings. Each work order is represented by a blue rectangle.
 - To reschedule a displayed work order, select and then drag it to the appropriate new date and time.
4. If you made any changes, select **Save** on the Action Pane to save them.

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Dispatch work order

2/18/2021 • 2 minutes to read • [Edit Online](#)

You can schedule one work order or work order jobs to one worker using the **Dispatch** functionality.

1. Click **Asset management > Common > Work orders > All Work orders** or **Active work orders**.
2. Select the work order in the list.
3. On the **General** tab, click **Dispatch**.
4. In the **Schedule work order** dialog, select the worker in the **Worker** field.
5. In the **Schedule hours** field, you can insert expected work hours in case expected work hours differ from forecast hours.
6. In the **Scheduled start** field, you can edit start date and time, if required.
7. If the scheduling process should observe capacity limitations regarding resources already scheduled on other jobs, make sure that the **Asset**, **Tool**, and **Worker** toggle buttons are set to **Yes**. If you want to see detailed information about the scheduling process, select **Yes** on the **Verbose** toggle button. This means detailed information about the calculated scores on the work order is shown in the Infolog.
8. Select **Yes** on the **Ignore schedule** toggle button to ignore closed days in the calendar (applies to asset, worker, and tools). Select **Yes** on the **Ignore scheduled execution** toggle button to ignore limitations that may have been selected on the work order regarding scheduling.

For information on the setup of scheduled execution, see the [Scheduled execution](#) section.

9. Click **OK**. The work order lifecycle state is automatically updated to the **Scheduled** lifecycle state specified **Asset management > Setup > Work orders > Lifecycle models**.

The figure below shows an example of dispatch selections in the **Schedule work order** dialog.

Schedule work order

?

1 work orders selected

WORK ORDER

Maintenance forecast hours

3.00

Hours posted

0.00

Schedule hours

4.00

Expected start

8/12/2019 07:00:00 AM

Scheduled start

8/16/2019 07:00:00 AM

Expected end

8/26/2019 07:00:00 AM

SCHEDULE

Worker

Shawn Richardson

FINITE CAPACITY

Asset

Yes



Tool

Yes



Worker

Yes



Ignore schedule

Yes



Ignore scheduled execution

No



OTHER

Verbose

Yes



OK

Cancel

[!NOTE] If you want to delete the schedule on a work order, select the work order in **All work orders**, and then click **Delete schedule** on the **General** tab. Remember to manually update the work order lifecycle state if you delete the schedule.

NOTE

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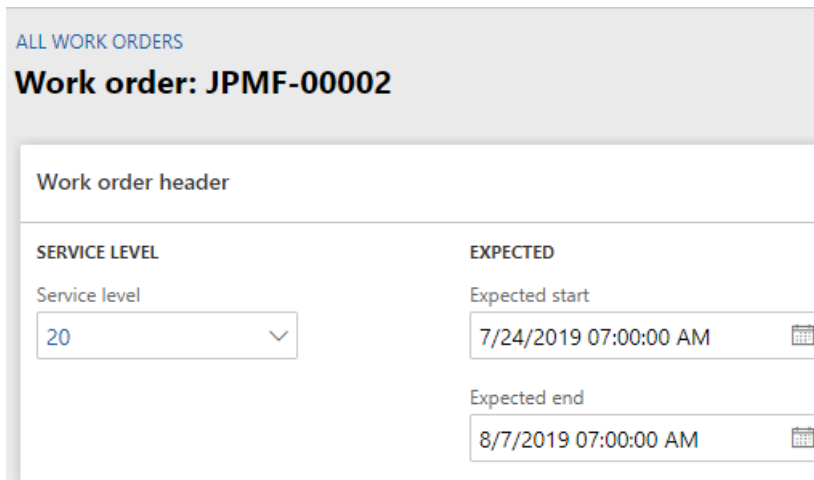
The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Schedule work order on specific date and time

2/18/2021 • 2 minutes to read • [Edit Online](#)

If a work order must be scheduled on a specific date *and* time, you can override the standard scheduling process in Asset Management and create a specific schedule for a work order.

1. Click **Asset management > Common > Work orders > All Work orders** or **Active work orders**.
2. In the work order list, click on the Work order ID in the **Work order** column.
3. Click **Edit**.
4. On the **Work order header** FastTab, insert start and end dates and times in the **Expected start** and **Expected end** fields.



The screenshot shows the 'Work order header' section of a software interface. At the top, it says 'ALL WORK ORDERS' and 'Work order: JPMF-00002'. Below this, there is a 'Work order header' section with two columns: 'SERVICE LEVEL' and 'EXPECTED'. Under 'SERVICE LEVEL', there is a 'Service level' dropdown menu with the value '20'. Under 'EXPECTED', there are two fields: 'Expected start' with the value '7/24/2019 07:00:00 AM' and a calendar icon, and 'Expected end' with the value '8/7/2019 07:00:00 AM' and a calendar icon.

5. On the **General** tab, click **Schedule** to use the standard scheduling process, or click **Dispatch** if you want to assign the work order to a specific worker.
6. In order to override any existing capacity reservations to ensure that the work order is scheduled in the expected period, make the selections as shown in the figure below in the **Schedule work order** dialog > **Finite capacity** section. This means that the scheduling process will ignore existing capacity reservations because the work order must start on the expected start time.

Schedule work order

1 work orders selected

WORK ORDER

Maintenance forecast hours

1.00

Hours posted

0.00

Schedule hours

1.00

Expected start

8/19/2019 10:00:00 AM

Scheduled start

8/19/2019 10:00:00 AM

Expected end

8/19/2019 11:00:00 AM

SCHEDULE

Worker

Shawn Richardson

FINITE CAPACITY

Asset

No

Tool

No

Worker

No

Ignore schedule

Yes

Ignore scheduled execution

Yes

OTHER

Verbose

Yes

OK

Cancel

7. Click OK to start scheduling.

8. If the scheduling process results in double bookings, you will see a message on the screen, and you can adjust the related work orders.

NOTE

In order to schedule a maintenance worker for the work order, that maintenance worker must be available at the expected start date and time. Worker availability is set up in the [worker calendar](#).

NOTE

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Scheduled work order maintenance jobs

2/18/2021 • 2 minutes to read • [Edit Online](#)

The **Scheduled work order maintenance jobs** page shows an overview of the work orders allocated to a resource. Work orders using resource types "Human resources", "Tool", and "Machine" are shown. For example, if a maintenance worker calls in sick, you can use this page to quickly find work orders allocated to the worker, and then allocate another maintenance worker to the job.

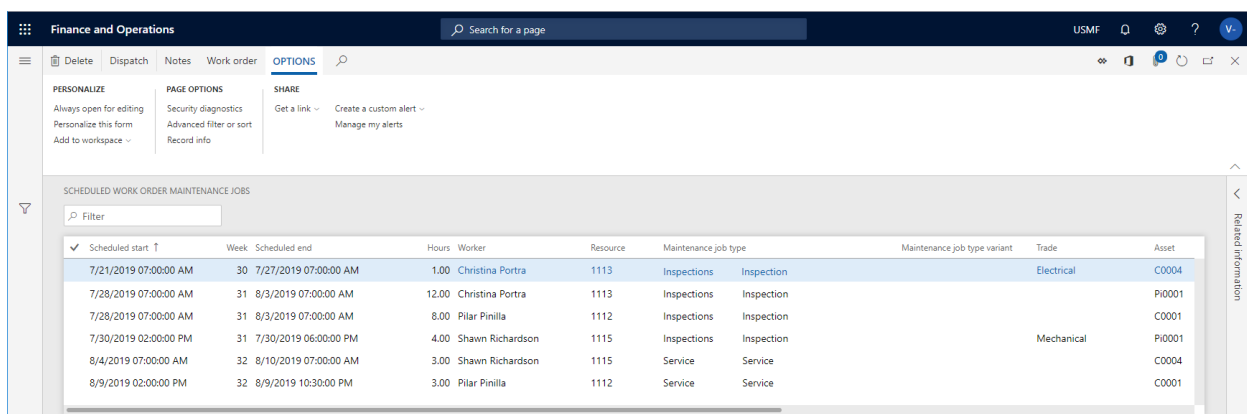
View scheduled work order maintenance jobs

1. Click **Asset management > Common > Work orders > Scheduled work order maintenance jobs**. You see a list of all work orders set to work order lifecycle state "Scheduled" or "In progress".
2. You can sort the list, for example, by maintenance worker. You can also use the filter to limit the list to display work orders allocated to a specific resource or maintenance worker.
3. You can see notes on the work order and, if required, add new notes by selecting the work order job, and then click **Notes**.
4. If you want to allocate one maintenance worker to a work order, select the work order, and then click **Work order**.
5. The **Work order** page opens. Click **Dispatch** to schedule the work order to a specific maintenance worker.

NOTE

Read more about scheduling several work orders or one work order in [Schedule work orders](#) and [Dispatch work order](#).

The following screenshot shows an example of the **Scheduled work order maintenance jobs** page.



✓ Scheduled start	Week	Scheduled end	Hours	Worker	Resource	Maintenance job type	Maintenance job type variant	Trade	Asset
7/21/2019 07:00:00 AM	30	7/27/2019 07:00:00 AM	1.00	Christina Portra	1113	Inspections	Inspection	Electrical	C0004
7/28/2019 07:00:00 AM	31	8/3/2019 07:00:00 AM	12.00	Christina Portra	1113	Inspections	Inspection		PI0001
7/28/2019 07:00:00 AM	31	8/3/2019 07:00:00 AM	8.00	Pilar Pinilla	1112	Inspections	Inspection		C0001
7/30/2019 02:00:00 PM	31	7/30/2019 06:00:00 PM	4.00	Shawn Richardson	1115	Inspections	Inspection	Mechanical	PI0001
8/4/2019 07:00:00 AM	32	8/10/2019 07:00:00 AM	3.00	Shawn Richardson	1115	Service	Service		C0004
8/9/2019 02:00:00 PM	32	8/9/2019 10:30:00 PM	3.00	Pilar Pinilla	1112	Service	Service		C0001

NOTE

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Calculate capacity load on scheduled work orders

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You can calculate capacity load on scheduled work orders to get an overview of the work load on resources for a specific period. Calculations can be made for the following resources: Maintenance workers, worker groups, tools, and assets.

1. Click **Asset management > Inquiries > Schedule > Capacity load**.
2. In the **Calculate capacity load** dialog > **Show** field, select which load type you want to calculate: **Capacity**, **Reserved**, or **Remainder**.
3. Select **Yes** on the **Skip zero** toggle button if you do not want to show results containing zero.
4. Select the resource types for which you want to calculate capacity load by selecting **Yes** on the relevant toggle buttons: **Worker**, **Maintenance worker group**, **Tool**, and **Asset**.
5. Select the start date for the calculation in the **From date** field.
6. In the **Interval type** field, select the interval for the calculation: **Day**, **Week**, **Month**, or **Quarter**.
7. In the **Period frequency** field, insert the number of intervals you want to calculate. For example, if you have selected **Day** as the interval type, and you enter the number "5" in this field, a calculation of five days from the start date will be made.
8. Click **OK** to start the calculation.

The figure below shows the result of a calculation covering three weeks for the load type **Reserved**.

Load type	Reference number	Name	8/2/2019 (31)	8/9/2019 (32)	8/16/2019 (33)
Worker	000495	Pilar Pinilla			3.00
Worker	000496	Christina Portra	6.96		
Worker	000497	Stefan Hesse			
Worker	000498	Shawn Richardson		3.00	
Worker	000499	Miles Reid			
Worker	000500	Dana Birkby			
Worker	000501	Dan Jump			
Worker	000502	Todd Rowe			
Worker	000503	Jimmy Bischoff			
Worker	000504	Lukas Keller			
Worker	000505	Chloe Brussard			
Worker	000506	Dennis Saylor			
Worker	000507	Grant Culbertson			
Worker	000508	Nate Sun			
Worker	000509	Bill Malone			
Asset	C0001	Conveyor Belt 0001		3.00	
Asset	C0002	Conveyor Belt 0002			
Asset	C0003	Conveyor Belt 0003			
Asset	C0004	Conveyor Belt 0004		3.00	
Asset	C0005	Conveyor Belt 0005			
Asset	C0006	Conveyor Belt 0006			
Asset	C0007	Conveyor Belt 0007			
Asset	C0008	Conveyor Belt 0008			
Asset	PI0001	Pipe 0001	6.96		
Asset	PI0002	Pipe 0002			

[!NOTE] If you select the load types **Capacity** or **Remainder** for your calculation, the same result will be displayed if no reservations have been made for the resources in the selected period.

For information about how to calculate capacity load on maintenance schedule lines and not scheduled work orders, refer to [Calculate capacity load](#).

NOTE

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Register consumption

2/18/2021 • 3 minutes to read • [Edit Online](#)

When a maintenance job has been completed on a work order, the next step is to make consumption registrations and post the journals. You can make registrations on the following consumption types: Hours, items, and expenses. The different consumption types are registered and posted on the **Work order journals** page. The journal setup in **Asset Management** is used for creating and posting separate journals for hours, items, and expenses in the **Project management and accounting** module.

In some cases, you may be able to add or delete forecast lines on a work order. The setup of a work order lifecycle state, the related project type, and the stage rules related to the project type determine if you are able to add or edit journal lines. Read more about work order lifecycle states and related project stages in [Forecasts, work orders, and projects](#).

NOTE

It is possible to set up automatic posting of journals on a work order lifecycle state. Refer to [Work order lifecycle states](#) for more information.

1. Click **Asset management > Common > Work orders > All Work orders** or **Active work orders**.
2. Select the work order, and click **Journals**.
3. Click **Copy from forecast** to transfer any forecast lines that may be connected to the work order. You can select which consumption types you want to transfer.
4. If necessary, you can add more consumption lines on the relevant FastTab by clicking **Add line** and filling out data on the line.
5. Click **Validate journals** to validate the journal lines before posting.
6. Click **Post journals** to post the journal lines.
7. After you've posted the consumption journals, you can update the work order lifecycle state. For example, to indicate that the work order has been completed, you can update the lifecycle state to "Ended".
 - In the **Show** field at the top of the **Work order journals** page, select which journal lines you want to see: **All**, **Not posted**, or **Posted**. Posted journals have a check mark in the **Posted** check box.
 - When item lines are created in the work order journal, product dimensions and tracking dimensions related to the item are automatically transferred to the journal line.

The screenshot below shows an example of hour and item registrations on a work order in **Work order journals**.

Finance and Operations

Search for a page

USMF

Save + New Delete Copy from forecast Validate journals Post journals Split hours OPTIONS

JPMF-00029 - PRDD-HALL25-408

Work order journals

Show

Not posted

Hours

✓	Posted	Work order job	Voucher date	Voucher	Project date	Category	Resource	Description	Hours	Line property	Amount
✓	<input type="checkbox"/>	3 C0008 Ad hoc	8/19/2019	PHJ_00000281	8/19/2019	Test	Polishing... 1115 usmf	C0008: Ad hoc	2.00	Billable	27.60
	<input type="checkbox"/>	2 C0004 Ad hoc	8/19/2019	PHJ_00000281	8/19/2019	Test	Polishing w... 1115 usmf	C0004: Ad hoc	1.50	Billable	20.70
	<input type="checkbox"/>	1 C0003 Ad hoc	8/19/2019	PHJ_00000281	8/19/2019	Maintenance hours	Polishing w... 1115 usmf	C0003: Ad hoc	3.00	Billable	0.00

Items

✓	Posted	Work order job	Date	Item number	Site	Warehouse	Location	Quantity	Line property	Cost price	Cost amount
✓	<input type="checkbox"/>	3 C0008 Ad hoc	8/19/2019	A0001	1			2.00	Billable	12.00	24.00

Split hours on work orders with several work order jobs

If a work order contains several work order jobs, you can register work hours using the **Split hours** functionality, meaning one hour registration line can be distributed evenly on each work order job.

1. Click **Asset management > Common > Work orders > All Work orders** or **Active work orders**.
2. Select the work order and click **Journals**.
3. Select the hour registration line you want to split, and click **Split hours**.
4. In the **Split hours on work order maintenance jobs** dialog, the name of the worker who is logged in is automatically shown in the **Worker** field. If required, you can select another worker.
5. Select a category for the hour registration in the **Category** field.
6. Insert number of work hours to be split in the **Hours** field.

Split hours on work order maintenance jobs

Parameters

Worker

Hours

Category

7. Click **OK**.

Example: In the screenshot below, journal lines for a work order containing three work order jobs are shown. The first line, containing three work hours, has been split, and one work hour is registered on each work order job. After the three hour registration lines have been created, you decide what to do with the original hour registration line (the first line in the example). You can keep it as is or delete it.

Finance and Operations

Search for a page

USMF

JPMF-00029 : PROD-HALL25-408

Work order journals

Show: Not posted

Hours

+ Add line Remove Financial dimensions

✓	Posted	Work order job	Voucher date	Voucher	Project date	Category	Resource	Description	Hours	Line property
1	C0003	Ad hoc	8/19/2019	PHJ_00000281	8/19/2019	Maintenance hours	Polishing w... 1115	usmf C0003: Ad hoc	3.00	Billable
1	C0003	Ad hoc	8/18/2019	PHJ_00000287	8/18/2019	Maintenance hours	Polishing w... 1115	usmf C0003: Ad hoc	1.00	Billable
2	C0004	Ad hoc	8/18/2019	PHJ_00000287	8/18/2019	Maintenance hours	Polishing w... 1115	usmf C0004: Ad hoc	1.00	Billable
3	C0008	Ad hoc	8/18/2019	PHJ_00000287	8/18/2019	Maintenance hours	Polishing w... 1115	usmf C0008: Ad hoc	1.00	Billable

Items

+ Add line Remove Inventory Financial dimensions

Financial dimensions on consumption registrations

When you make consumption registrations, financial dimensions related to the different registration types are added to the registrations in a specific sequence.

- *Hour and Expense registrations:* First, financial dimensions from the journal header are added, if any. Next, financial dimensions from the related work order project are added. Finally, financial dimensions from the resource (worker) are added.
- *Item registrations:* First, financial dimensions from the journal header are added, if any. Then, financial dimensions from the related work order project are added. Next, financial dimensions from the site are added. Finally, financial dimensions from the item are added.

NOTE

For all three registration types, the financial dimension combination is validated, and invalid combinations are blanked. This is standard setup with other Finance and Operations apps.

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Create consumption reports

2/18/2021 • 2 minutes to read • [Edit Online](#)

When you've created and posted consumption registrations on work orders in Asset Management, two reports are available to display consumption details.

Asset consumption report

When you have posted consumption on work orders, you can print an asset consumption report. The report displays hours, hour costs, item costs, and expenses posted on assets.

1. Click **Asset management > Reports > Assets > Asset consumption**.
2. In the **Asset consumption** dialog, select the parameters and detail level you want to see by selecting **Yes** on the relevant toggle buttons, and inserting a functional location level in the **Show** section.
 - You can use the **Levels** field to indicate how detailed you want the asset lines to be regarding functional locations.

For example, if you enter the number "1" in the field, and you have a multi-level functional location structure, all assets for a functional location will be shown on the top level, and therefore a line may be added up from functional locations located at a lower level.

If you enter the number "0" in the **Levels** field, you will see a detailed result showing all assets on all the functional location levels to which they are related.
 - Select **Yes** on the **Sum on all sub assets** toggle button to see sums for each sub asset in the report.
3. Select a date interval in the **Dates** section.
4. On the **Destination** FastTab, select if you want to display the report on screen, print it, or save it as a file or email.
5. If required, you can select specific assets to be displayed in the report. On the **Records to include** FastTab, click **Filter**, and add the assets you want to include in the report.
6. Click **OK** to generate the report.

Work order consumption report

When you have posted consumption on work orders, you can print a work order consumption report. The report displays hours, hour costs, item costs, and expenses posted on work orders.

1. Click **Asset management > Reports > Work orders > Work order consumption**.
2. In the **Work order consumption** dialog, select the parameters you want to include in the report by selecting **Yes** on the relevant toggle buttons in the **Show** section.
3. Select a date interval in the **Dates** section.
4. On the **Destination** FastTab, select if you want to display the report on screen, print it, or save it as a file or email.
5. If required, you can select specific work orders to be displayed in the report. On the **Records to include**

FastTab, click **Filter**, and add the work orders you want to include in the report.

6. Click **OK** to generate the report.

NOTE

You can also generate a [work order report](#), which contains more work order details.

NOTE

Can you tell us about your documentation language preferences? [Take a short survey](#).

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Warranty agreements

2/18/2021 • 2 minutes to read • [Edit Online](#)

In Asset Management, you can set up warranty terms that can be connected to an asset or an asset type. Warranty terms are created for a specific period. Warranty can be set up to provide full coverage or partial coverage, and you can set up terms that are related to hours, expenses, and items.

The first step is to create any vendor warranty agreements that you have for your equipment. You then attach warranty agreements to assets or asset types. Vendor warranty agreements are used only for informational purposes. If vendor warranty is set up on an asset, you can see the warranty coverage period on the asset.

Create a warranty agreement

A warranty agreement can include several agreement lines to cover the warranty for work hours, expenses, and items.

1. Select **Asset management** > **Setup** > **Assets** > **Warranty**.
2. Select **New** to create a product.
3. In the **Warranty** field, enter a warranty ID.
4. In the **Name** field, enter a description.

On the **Details** FastTab, the **Assets** field shows the number of active assets that use the warranty agreement.

5. On the **Warranty lines** FastTab, follow these steps to add lines that should be included in a warranty agreement:
 - a. Select **Add line** to add a new condition to the warranty. A sequential line number is automatically entered in the **Line** field.
 - b. In the **Period** field, select the type of warranty period.
 - c. In the **Interval** field, enter a number. This field defines the number of periods that the warranty should be valid for.
 - d. In the **Percent** field, enter the coverage percentage for the warranty line. The percentage indicates how much is covered by your company.

Finance and Operations Search for a page USMF

Save + New Delete Options

Filter

1 YR
1 Year Warranty

Warranty

Warranty Name
1 YR 1 Year Warranty

Details

Assets
1

Warranty lines

+ Add line Remove

Line	Period	Interval	Percent
1.0	Year	1	100.00

Example of warranty period
1/1/2020 - 1/1/2021

NOTE

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Warranties on assets and asset types

2/18/2021 • 2 minutes to read • [Edit Online](#)

This topic explains how to set up warranties on assets and asset types in Asset Management.

Set up a warranty on an asset type

1. Select **Asset management > Setup > Asset types > Asset types**.
2. In the left pane, select the asset type to attach a vendor warranty agreement to, and then select **Asset type defaults**.
3. On the **General** FastTab, in the **Vendor warranty** field, select the agreement.

Set up a warranty on an asset

1. Select **Asset management > Common > Assets > All assets**.
2. Select the asset, and then select **Edit**.
3. On the **Vendor** FastTab, in the **Vendor warranty** section, in the **Warranty** field, select the warranty agreement.
4. In the **Warranty start** and **Warranty end** fields, select the start and end dates.

IMPORTANT

If a date is selected in the **Warranty start** field on a work order, the warranty becomes valid for the work order on that date. When you create a work order, the **Warranty start** field is automatically set to the date of creation. However, you can change the date so that it corresponds to, for example, the start date of a warranty agreement.

The screenshot displays the SAP Finance and Operations interface for a Work Order (JPMF-00014). The interface is divided into several sections:

- Navigation Bar:** Includes 'Save', '+ New', 'Delete', and tabs for 'WORK ORDER', 'GENERAL', and 'OPTIONS'. A search bar is also present.
- Work Order Header:** Shows 'Work order: JPMF-00014' and 'Lines Header | Corrective | New'.
- Table:** A table with columns: Line number, Asset, Functional location, Maintenance job type, Maintenance job type varia..., and Trade. The first row shows: 1, C0001, CH-BP1-01-01, Inspection.
- Line details:** A detailed view of the work order line, including:
 - ASSET:** Asset C0001, Name Conveyor Belt 0001.
 - JOB:** Maintenance job type Inspection, Name Inspection.
 - REPLACE/INSTALL ASSET AT LOCATION:** Replacement asset and Installation functional location dropdowns.
 - SCHEDULED:** Link (None), Scheduled start, Scheduled end, Job scheduled to.
 - PROJECT:** Project ID 000211-03, Project stage Created, Activity number 00392.
 - VENDOR:** Warranty 1 YR, Warranty start 7/22/2019 (highlighted with a red box).
 - LOCATION:** Longitude 0.000000000, Latitude 0.000000000.
 - REFERENCE:** Reference type, Reference ID.
- Related information:** A sidebar on the right with expandable sections: Work order pools, Hours (Maintenance forecast hours: 0.00, Scheduled hours: 0.00, Hours posted: 0.00), Forecast cost, Procurement, and Actual cost.

NOTE

When you create a work order for an asset that is covered by a vendor warranty, if the work order has an expected start date during the warranty period, you receive a notification about the warranty agreement. You can then cancel the work order, as you require.

NOTE

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Create maintenance budgets

2/18/2021 • 2 minutes to read • [Edit Online](#)

Maintenance budgets are used to provide an overview of expected costs for preventive maintenance. Budget lines are calculated based on maintenance schedule lines that have an expected start date during the budget period.

Maintenance budgets are based on the cost types that are used in Asset Management: **Preventive**, **Corrective**, and **Investment**. Budget costs for investment maintenance are included for active assets that have a replacement date during the budget period and a related replacement value. Budget costs for corrective maintenance are included if a past corrective date is included in the budget calculation. In that case, corrective costs from an earlier period are calculated for the same future period that you calculate the maintenance budget for.

Create a maintenance budget

1. Select **Asset management > Inquiries > Maintenance budget > Budget**.
2. Select **Create budget**.
3. In the **Maintenance budget** field, enter a budget ID.
4. In the **Description** field, enter a description.
5. On the **Period** FastTab, in the **From date** and **To date** fields, enter the start and end dates of the budget period.
6. To include corrective budget costs that are calculated on the basis of actual costs from a previous period, in the **Corrective from date** field, enter the start date of the period that those costs should be included from.
7. Depending on the level of detail that is required in the budget, set the relevant options on the five **Group by** FastTabs.
8. Select **OK**.
9. Select **Budget lines** to open **Maintenance budget lines** page, where you can view all the budget lines that have been created for the period.
10. To approve the budget, select it on the **Maintenance budgets** page, and then select **Approve**. Then, in the **Approve budget** dialog box, select **OK**. Your name is entered in the **Approved by** field on the **Maintenance budgets** page.

NOTE

After you've approved a maintenance budget, you can't recalculate or adjust the related lines on the **Maintenance budget lines** page unless you first remove the approval. To remove the approval of a maintenance budget, select it on the **Maintenance budgets** page, and then select **Approve**. Then, in the **Approve budget** dialog box, select **OK**.

Finance and Operations

Search for a page

USMF

Save | + Create budget | Delete | Budget lines | Approve | Copy | OPTIONS

MAINTENANCE BUDGETS

Filter

Maintenance...	Description	From date	To date	Lines	Budget cost	Approved	Approved by
MBUD-001	Maintenance Budget	7/1/2019	12/31/2019	3	0.00	<input type="checkbox"/>	

You can also create a new maintenance budget by copying an existing budget. On the **Maintenance budgets** page, select the budget to copy, and then select **Copy**. This approach is useful if, for example, you've created a budget for one month and want to copy it to other months.

NOTE

The maintenance budget calculates only budget costs based on maintenance schedule lines. To calculate actual costs for the same period, you can do that calculation on the **Asset cost control** page.

NOTE

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Update maintenance budgets

2/18/2021 • 2 minutes to read • [Edit Online](#)

The **Maintenance budget lines** page shows all the budget lines that have been created for the budget that is selected on the **Maintenance budgets** page. (For more information, see [Create maintenance budgets](#).) You can recalculate and adjust maintenance budget lines until the maintenance budget is approved. After the budget period has passed, and costs have been posted in Asset Management, you can also update the budget lines with actual costs.

Recalculate a maintenance budget

You can recalculate a maintenance budget on the **Maintenance budget lines** page. When you recalculate a maintenance budget, the existing budget lines are deleted, and a new calculation is done.

1. On the **Maintenance budget lines** page, select **Recalculate**.
2. In the **Recalculate budget** dialog box, make the required changes for the new calculation, and then select **OK**.

New budget lines are created according to the values that you set.

Adjust budget lines

Instead of recalculating the whole maintenance budget, you can adjust selected lines that are related to budget costs.

1. On the **Maintenance budget lines** page, select the lines to update the budget cost for.
2. Select **Adjust**.
3. To add an amount to the selected lines, select the **Add cost** check box, and then enter the value in the **Add value** field.
4. To multiply the budget cost on the selected budget lines by a factor, select the **Multiply cost** check box, and enter the factor in the **Multiply value** field.

For example, if you enter 1.2 in the **Multiply value** field, you increase the budget cost on the selected lines by 20 percent. If you enter 0.7, you reduce the budget cost on the selected lines by 30 percent.

5. Select **OK**.

The selected budget lines are updated according to the values that you set in step 3 or 4.

Update actual costs

After the dates on the budget lines have passed, and actual costs have been posted in Asset Management, you can update the actual costs on the maintenance budget.

1. On the **Maintenance budget lines** page, select **Update cost**.
2. In the **Calculate actual cost** dialog box, select **OK**.

The **Actual cost** fields on the budget lines are updated if actual costs have been posted. New budget lines might be generated if new asset types have been created since you created the budget, and if those asset types have been used on assets that work orders have been created for and related costs have been posted for. New

budget lines show only actual costs, because no budget costs were calculated for them.

NOTE

To see an overview of actual costs divided into preventive, corrective, and investment costs, you can do a calculation for the same period on the **Asset cost control** page.

Manually add budget lines

On the **Maintenance budget lines** page, you can manually add a new budget line by selecting **New** and then making selections on the line. Here are some examples of situations where this approach might be useful:

- You know that refurbishment of some assets is currently in the planning phase, but related jobs haven't yet been created in Asset Management. However, you want budget costs for those jobs to be included in the maintenance budget.
- New assets or asset types have been created since you made the maintenance budget, but maintenance plans haven't yet been set up on those assets or asset types. However, you want budget costs for those asset types to be included in the maintenance budget.

NOTE

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Cost and date control

2/18/2021 • 4 minutes to read • [Edit Online](#)

In Asset Management, you can calculate costs to get an overview of actual costs compared to budget costs on assets, functional locations, and work orders. Actual costs are based on posted transactions.

You can also make a date calculation if you want to compare scheduled start and end dates to actual start and end dates on work orders.

Cost control for assets, functional locations, and work orders

The calculations made for assets, functional locations, and work orders are almost identical. The only difference is that for assets and functional locations, you can also include sub assets and sub locations in your calculation. The date is the transaction date when the registration was recorded.

1. Click **Asset management > Inquiries > Assets > Asset cost control** or **Functional location cost control**, or **Asset management > Inquiries > Work orders > Work order cost control**.
2. In the **Asset cost control / Functional location cost control / Work order cost control** dialog, select a time range to be calculated.
3. If required, select a financial dimension set to be included in the calculation.
4. Select "Yes" on the **Skip zero** toggle button if you don't want to show results with a cost of zero.
5. You can use the **Level** field to indicate how detailed you want the cost control lines to be regarding functional locations.

For example, if you insert the number "1" in the field, and you have a multi-level functional location hierarchy, all cost control lines for a functional location will be shown on the top level, and therefore the hours on a line may be added up from functional locations located at a lower level.

If you insert the number "0" in the **Level** field, you will see a detailed result showing all cost control lines on all the functional location level to which they are related.

6. Select "Yes" on the **Show open committed cost** toggle button if you want to include that column in the calculation.
7. Select "Yes" on the **Include sub assets** toggle button to show costs related to sub assets as separate lines.
8. If you want to limit the search, you can select specific assets / functional locations / work orders on the **Records to include** FastTab.
9. Click **OK** to start the calculation.

The figure below shows an example of the **Asset cost control** dialog.

Asset cost control

?

Parameters ^

PARAMETERS

From date:

To date:

Financial dimension set:

Skip zero: No

Level:

Show open committed cost: Yes

Include sub assets: Yes

Records to include v

10. On the Asset cost control page, click the Group by buttons to show the required detail level of the calculation. The selected Group by buttons are highlighted. Click on a button to activate or deactivate it.

Example

The screenshot below shows an example of calculation results in Asset cost control.

- The **Original budget** field shows budget costs from the work order forecast.
- The **Committed cost** field shows the total amount of expenses that a legal entity has committed itself to pay.
- The **Open committed cost** field shows commitments to pay for items, hours, and services you have ordered or received but not yet paid for.
- The **Actual cost** field shows related costs after all consumption registrations have been posted.

Finance and Operations USMF ?

ASSET COST CONTROL COST CONTROL OPTIONS

ASSET COST CONTROL: Calculate cost

GROUP BY DATE: Date (selected), Month, Year, Quarter

GROUP BY ASSET: Asset (selected), Asset type, Model, Manufacturer, Criticality

GROUP BY FUNCTIONAL LOCATION: Functional location (selected), Functional location type

GROUP BY WORK ORDER: Work order (selected), Work order type, Lifecycle state

GROUP BY MAINTENANCE JOB: Maintenance job type category, Maintenance job type, Maintenance job type variant, Trade, Criticality

GROUP BY PROJECT: Transaction type, Category, Dimension

ASSET COST CONTROL

Filter

Date	Asset	Asset type	Functional location	Work order	Work order type	Original budget	Actual cost	Preventive cost	Corrective cost	Investment cost	Committed cost
8/18/2019	C0008	Conveyor	CH-BP2-02	JPMF-00029	Service	18.00	0.00	0.00	0.00	0.00	0.00
8/21/2019	CH-BP1-07	Filtration unit	CH-BP1-07	JPMF-00028	Corrective	0.00	0.00	0.00	0.00	0.00	0.00
7/28/2019	PI0001	Pipe	CH-BP1-03-01	JPMF-00005	Preventive	0.00	0.00	0.00	0.00	0.00	0.00
7/30/2019	PI0001	Pipe	CH-BP1-03-01	JPMF-00005-01	Corrective	499.00	0.00	0.00	0.00	0.00	0.00
7/21/2019	C0004	Conveyor	CH-BP1-02	JPMF-00004	Corrective	0.00	0.00	0.00	0.00	0.00	0.00
8/4/2019	C0004	Conveyor	CH-BP1-02	JPMF-00027	Corrective	0.00	0.00	0.00	0.00	0.00	0.00
8/9/2019	C0004	Conveyor	CH-BP1-02	JPMF-00027	Corrective	72.00	0.00	0.00	0.00	0.00	0.00
8/18/2019	C0004	Conveyor	CH-BP1-02	JPMF-00029	Service	12.00	0.00	0.00	0.00	0.00	0.00
8/18/2019	C0003	Conveyor	CH-BP1-01-03	JPMF-00029	Service	0.00	0.00	0.00	0.00	0.00	0.00
8/9/2019	C0001	Conveyor	CH-BP1-01-01	JPMF-00026	Corrective	24.00	0.00	0.00	0.00	0.00	0.00
8/15/2019	C0001	Conveyor	CH-BP1-01-01	JPMF-00018	Corrective	0.00	0.00	0.00	0.00	0.00	0.00
8/19/2019	C0001	Conveyor	CH-BP1-01-01	JPMF-00002	Preventive	0.00	0.00	0.00	0.00	0.00	0.00
6/1/2019	C0002	Conveyor				0.00	0.00	0.00	0.00	0.00	0.00

Period 6/1/2019 - 8/21...

Another way of making a cost calculation is to multi-select assets in **All assets** or **Active assets**. Then, you click the **Cost control** button on the **General** tab. In the **Asset cost control** dialog, the selected assets are automatically inserted in the **Asset** field on the **Records to include** FastTab. Click **OK**, and a cost calculation for the selected assets is shown. The same procedure can be done for functional locations in **All functional locations** or **Active functional locations**, and for work orders in **All work orders** or **Active work orders**.

Work order date control

Use this page to get an overview of expected start and end dates compared to actual start and end dates on work orders.

1. Click **Asset management > Inquiries > Work orders > Work order date control**.
2. Click **Calculate**.
3. Select a functional location in the **Functional location** field.
4. Insert the range for which you want to make the calculation in the **From date** and **To date** fields. All work orders with expected start date within the range will be included.
5. Click **OK**.
6. Click the **Group by** buttons to show the required detail level of the calculation. The selected **Group by** buttons are highlighted. Click on a button to activate or deactivate it.

Example

The screenshot below shows an example of calculation results in **Work order date control**.

- The **Avg. start delay** field shows the difference in days between scheduled start date for a work order compared to actual start date. If, for example, the actual start date was two days before the scheduled start date, "-2" will be displayed in this field.
- The **Avg. end delay** field shows the difference in days between scheduled end date for a work order compared to actual end date. If, for example, the actual end date was three days after the scheduled end date, "3" will be displayed in this field.
- The **Occurrences** fields show the number of times deviations occur in relation to scheduled and actual start date, and scheduled and actual end date on the work order.

Work order	Lifecycle state	Asset type	Maintenance job type	Avg. start delay	Occurrences	Avg. end delay	Occurrences
JPMF-00002	Estimated	Conveyor	Inspection	0.00	0	0.00	0
JPMF-00014	Finished	Conveyor	Inspection	24.00	1	18.00	1
JPMF-00018	Estimated	Conveyor	Ad hoc	0.00	0	0.00	0
JPMF-00026	Scheduled	Conveyor	Service	0.00	0	0.00	0

NOTE

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Work hour control

2/18/2021 • 2 minutes to read • [Edit Online](#)

In Asset Management, you can calculate hours to get an overview of actual hours compared to budget hours on assets, functional locations, or work orders. Actual hours are based on posted transactions.

Work hour control for assets, functional locations, and work orders

The calculations made for assets, functional locations, and work orders are almost identical. Only difference is that for assets and functional locations, you can also include sub assets and sub locations in your calculation. The date is the transaction date when the registration was recorded.

1. Click **Asset management > Inquiries > Assets > Asset hour control** or **Functional location hour control**, or **Asset management > Inquiries > Work orders > Work order hour control**.
2. In the **Asset hour control** dialog, .
3. In the **Asset hour control / Functional location hour control / Work order hour control** dialog, select a period to be calculated in the **From date** and **To date** fields.
4. If required, select a **Financial dimension set** to be included in the calculation.
5. Select "Yes" on the **Skip zero** toggle button if you don't want to show results containing zero hours.
6. You can use the **Level** field to indicate how detailed you want the hour control lines to be regarding functional locations.

For example, if you insert the number "1" in the field, and you have a multi-level functional location hierarchy, all hour control lines for a functional location will be shown on the top level, and therefore the hours on a line may be added up from functional locations located at a lower level.

If you insert the number "0" in the **Level** field, you will see a detailed result showing all hour control lines on all the functional location levels to which they are related.

7. Select "Yes" on the **Include sub assets** toggle button to show costs related to sub assets as separate lines.
8. If you want to limit the search, you can select specific assets / functional locations / work orders on the **Records to include** FastTab.
9. Click **OK** to start the calculation.
10. On the **Asset hour control** page, click the **Group by** buttons to show the required detail level of the calculation. The selected **Group by** buttons are highlighted. Click on a button to activate or deactivate it.

Example

The screenshot below shows an example of an **Asset hour control** calculation.

- The **Original budget** field shows budget hours from the work order forecast.
- The **Actual hours** field shows posted hours on work orders.
- The **Committed hours** field shows total amount of hours that your company is committed to in relation to work orders.

Finance and Operations

Search for a page

USMF

ASSET HOUR CONTROL

GROUP BY DATE: Date, Month, Year, Quarter

GROUP BY ASSET: Asset, Asset type, Model, Manufacturer, Criticality

GROUP BY FUNCTIONAL LOCATION: Functional location, Functional location type

GROUP BY WORK ORDER: Work order, Work order type, Lifecycle state

GROUP BY MAINTENANCE JOB: Maintenance job type category, Trade, Maintenance job type, Criticality, Maintenance job type variant

GROUP BY PROJECT: Activity, Transaction type, Category, Dimension

ASSET HOUR CONTROL

Filter

Week	Asset	Asset type	Functional location	Work order	Maintenance job type	Category	Original budget	Actual hours	Preventive hours	Corrective hours	Committed hours
30	C0004	Conveyor	CH-BP1-02	JPMF-00004	Inspection	Hour	1.00	0.00	0.00	0.00	0.00
31	Pi0001	Pipe	CH-BP1-03-01	JPMF-00005	Inspection	Hour	30.00	0.00	0.00	0.00	0.00
31	Pi0001	Pipe	CH-BP1-03-01	JPMF-00005-01	Inspection	Hour	8.00	0.00	0.00	0.00	0.00
32	C0001	Conveyor	CH-BP1-01-01	JPMF-00026	Service	Maintenance hours	3.00	0.00	0.00	0.00	0.00
32	C0004	Conveyor	CH-BP1-02	JPMF-00027	Service	Maintenance hours	3.00	0.00	0.00	0.00	0.00
33	C0001	Conveyor	CH-BP1-01-01	JPMF-00018	Ad hoc	Maintenance hours	3.00	0.00	0.00	0.00	0.00
34	C0001	Conveyor	CH-BP1-01-01	JPMF-00002	Inspection	Hour	1.00	0.00	0.00	0.00	0.00
34	C0001	Conveyor	CH-BP1-01-01	JPMF-00014	Inspection	Maintenance hours	0.00	2.50	0.00	2.50	0.00
34	C0001	Conveyor	CH-BP1-01-01	JPMF-00014	Inspection	Test	0.00	0.50	0.00	0.50	0.00
34	C0003	Conveyor	CH-BP1-01-03	JPMF-00029	Ad hoc	Maintenance hours	3.00	0.00	0.00	0.00	0.00
34	C0004	Conveyor	CH-BP1-02	JPMF-00029	Ad hoc	Test	1.00	0.00	0.00	0.00	0.00
34	C0008	Conveyor	CH-BP2-02	JPMF-00029	Ad hoc	Test	1.50	0.00	0.00	0.00	0.00
34	CH-BP1-07	Filtration unit	CH-BP1-07	JPMF-00028	Ad hoc	Maintenance hours	3.50	0.00	0.00	0.00	0.00

Period 5/1/2019 - 8/21...

Another way of making an hour calculation is to multi-select assets in **All assets** or **Active assets**. Then you click the **Hour control** button on the **General FastTab**. The selected assets are automatically inserted in the **Asset** field on the **Records to include FastTab**. Click **OK** in the **Asset hour control** dialog, and the calculation for the selected assets is shown. The same procedure can be done for functional locations in **All functional locations** or **Active functional locations**, and for work orders in **All work orders** or **Active work orders**.

NOTE

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Asset fault cost control

2/18/2021 • 2 minutes to read • [Edit Online](#)

In Asset Management, you can calculate costs on asset fault registrations to get an overview of actual costs compared to budget costs. Actual costs are based on posted transactions. The date is the fault date on which the symptom was recorded.

1. Click **Asset management > Inquiries > Asset fault > Asset fault cost control**.
2. In the **Asset fault cost control** dialog, select a financial dimension set to be included in the calculation, if required.
3. Select "Yes" on the **Skip zero** toggle button if you don't want to show results with a cost of zero.
4. You can use the **Level** field to indicate how detailed you want the cost control lines to be regarding functional locations.

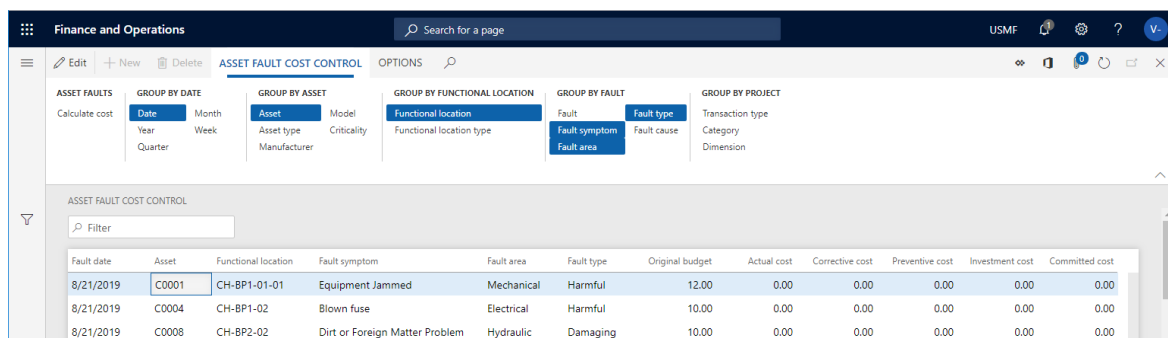
For example, if you insert the number "1" in the field, and you have a multi-level functional location structure, all asset fault cost control lines for a functional location will be shown on the top level, and therefore the hours on a line may be added up from functional locations located at a lower level.

If you insert the number "0" in the **Level** field, you will see a detailed result showing all asset fault cost control lines on all the functional location levels to which they are related.
5. If you want to limit the search, you can select specific assets, fault dates, and fault causes on the **Records to include** FastTab.
6. Click **OK** to start the calculation.
7. Click the **Group by** buttons to show the required detail level of the calculation. The selected **Group by** buttons are highlighted. Click on a button to activate or deactivate it.

Example

This example shows an asset fault cost control calculation.

- The **Original budget** field shows budget costs from the work order forecast.
- The **Actual cost** field shows posted costs on work orders.
- The **Committed cost** field shows total costs that your company is committed to in relation to work orders.



The screenshot shows the 'ASSET FAULT COST CONTROL' dialog in SAP S/4HANA. The 'GROUP BY' section is active, with 'Date', 'Asset', 'Functional location', and 'Fault' selected. The table below displays the results of the calculation.

Fault date	Asset	Functional location	Fault symptom	Fault area	Fault type	Original budget	Actual cost	Corrective cost	Preventive cost	Investment cost	Committed cost
8/21/2019	C0001	CH-BP1-01-01	Equipment Jammed	Mechanical	Harmful	12.00	0.00	0.00	0.00	0.00	0.00
8/21/2019	C0004	CH-BP1-02	Blown fuse	Electrical	Harmful	10.00	0.00	0.00	0.00	0.00	0.00
8/21/2019	C0008	CH-BP2-02	Dirt or Foreign Matter Problem	Hydraulic	Damaging	10.00	0.00	0.00	0.00	0.00	0.00

For information about how to set up faults, see the [Fault management](#) topic.

NOTE

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Asset fault analysis

2/18/2021 • 5 minutes to read • [Edit Online](#)

In Asset Management, you can analyze asset fault registrations to get an overview of the total number of faults registered during a specific period. Fault registrations can be analyzed from different perspectives, for example with focus on assets, asset types, functional locations, fault symptoms, or fault types.

1. Click **Asset management > Inquiries > Asset fault > Asset fault analysis**.
2. In the **Asset fault analysis calculation** dialog, you can use the **Level** field to indicate how detailed you want the asset fault lines to be regarding functional locations.

For example, if you insert the number "1" in the field, and you have a multi-level functional location structure, all asset fault lines for a functional location will be shown on the top level, and therefore the hours on a line may be added up from functional locations located at a lower level.

If you insert the number "0" in the **Level** field, you will see a detailed result showing all asset fault lines on all the functional location level to which they are related.

3. If you want to limit the search, you can select specific assets, fault dates, fault causes, and fault remedies on the **Records to include** FastTab.
4. Click **OK** to start the calculation.
5. On the **Asset fault analysis** tab, click one or more **Group by** buttons to display the detail level you want to see. Activated buttons are highlighted. Activate or deactivate buttons by clicking on them.
6. Click **Update calculations** to show your selections on the screen.

NOTE

Every time you activate or deactivate a **Group by** button, remember to click the **Update calculations** button. This is required because a large amount of data is processed as you are recalculating fault probability.

Examples

There are many ways to analyze fault registrations. This section has five examples of how different data selections can provide more insight and detail when analyzing asset fault registrations.

Group by symptoms

In the screenshot below, only the **Symptom** button is selected.

- Fault registrations have been made on three fault symptoms: "Air leak", "Blown fuse", and "Equipment jammed".
- In the **Probability %** column, all percentages add up to 100%. Probability is based on all **Symptom** registrations in this fault analysis.

ASSET FAULT ANALYSIS

Fault symptom	Symptoms	Symptom %	Probability %
Air Leak	4	33.33	33.33
Blown fuse	7	58.33	58.33
Equipment Jammed	1	8.33	8.33

Group by symptoms and time period

In the screenshot below, **Year** and **Month** are added to show how you can view fault registrations during a selected period.

- The fault symptoms are now shown as registrations per year/month.
- In the **Probability %** column, if you add all percentages for each month, they add up to 100%. Probability is based on the **Symptom** registrations in this fault analysis. If you have a large number of lines on an asset, but a large percentage stands out on a line, that would be an indication of a fault symptom to examine more closely to find a way to limit the number of registrations for that fault symptom.

ASSET FAULT ANALYSIS

Year	Month	Fault symptom	Symptoms	Symptom %	Probability %
2019	April	Air Leak	2	100.00	100.00
2019	May	Air Leak	1	50.00	50.00
2019	May	Blown fuse	1	50.00	50.00
2019	July	Air Leak	1	33.33	33.33
2019	July	Blown fuse	2	66.67	66.67
2019	August	Blown fuse	4	80.00	80.00
2019	August	Equipment Jammed	1	20.00	20.00

Group by multiple symptoms and assets

The combination of assets and an asset type is used as a basis for the calculations shown in the three screenshots below, which will increase in detail level.

Generally, the buttons in the **Group by date**, **Group by asset**, **Group by functional location** Action Pane groups, as well as the **Fault** button (Fault ID), contain periods or asset relations. The **Symptom**, **Area**, **Type**, **Cause**, and **Remedy** buttons are categorizations used in fault management to analyze asset fault registrations

and pinpoint problem areas.

Group by symptom, asset, and asset type

In the screenshot below, **Asset** and **Asset type** were added to provide more detail regarding fault registrations.

- The fault symptoms are now split up in **Asset / Asset type / Symptom** combinations.
- In the **Probability %** column, if you add all percentages for the combination of **Asset / Asset type / Symptom** respectively, they each add up to 100%. Probability is based on **Symptom** registrations in this fault analysis. If you have a large number of lines on an asset, but a large percentage stands out on a line, that would be an indication of a fault symptom to examine more closely to find a way to limit the number of registrations for that fault symptom.

The screenshot shows the 'ASSET FAULT ANALYSIS' interface. The top navigation bar includes 'Finance and Operations', a search bar, and user information 'USMF'. The main area has several tabs: 'ASSET FAULTS', 'GROUP BY DATE', 'GROUP BY ASSET', 'GROUP BY FUNCTIONAL LOCATION', and 'GROUP BY FAULT'. The 'GROUP BY ASSET' tab is selected, showing sub-tabs for 'Asset', 'Asset type', and 'Manufacturer'. The 'GROUP BY FAULT' tab is also selected, showing sub-tabs for 'Fault', 'Type', 'Cause', and 'Remedy'. Below the tabs is a table with the following data:

Asset ↑	Asset type	Fault symptom	Symptoms	Symptom %	Probability %
C0001	Conveyor	Air Leak	4	50.00	50.00
C0001	Conveyor	Blown fuse	3	37.50	37.50
C0001	Conveyor	Equipment Jammed	1	12.50	12.50
C0004	Conveyor	Blown fuse	4	100.00	100.00

Group by two symptoms, asset, and asset type

In the screenshot below, **Area** was added to **Symptom**, **Asset**, and **Asset type** to provide more detail regarding fault registrations.

- In the **Probability %** column, if you add all percentages for the combination of **Asset / Asset type / Symptom** on an asset, they each add up to 100%. Probability is based on the combination of **Symptom** and **Area** in this fault analysis. If you have a large number of lines on an asset, but a large percentage stands out on a line, that would be an indication of a fault area to examine more closely to find a way to limit the number of registrations for that fault area.

Finance and Operations

ASSET FAULT ANALYSIS

GROUP BY DATE: Date, Month, Year, Week, Quarter

GROUP BY ASSET: Asset, Asset type, Manufacturer

GROUP BY FUNCTIONAL LOCATION: Functional location, Functional location type

GROUP BY FAULT: Fault, Symptom, Area, Type, Cause, Remedy

ASSET FAULT ANALYSIS

Filter

Asset	Asset type	Fault symptom	Symptoms	Symptom %	Fault area	Areas	Area %	Probability %
C0001	Conveyor	Air Leak	4	50.00	Electrical	2	50.00	25.00
C0001	Conveyor	Air Leak	4	50.00	Hydraulic	2	50.00	25.00
C0001	Conveyor	Blown fuse	3	37.50	Electrical	3	100.00	37.50
C0001	Conveyor	Equipment Jammed	1	12.50	Mechanical	1	100.00	12.50
C0004	Conveyor	Blown fuse	4	100.00	Electrical	4	100.00	100.00

Group by three symptom, asset, and asset type

In the screenshot below, **Type** was added, and the most detailed calculation in this example is shown.

- In the **Probability %** column, if you add all percentages for the combination of **Asset / Asset type / Symptom** on an asset, they each add up to 100%. Probability is based on the combination of **Symptom, Area, and Type** in this fault analysis. If you have a large number of lines on an asset, but a large percentage stands out on a line, that would be an indication of a fault type to examine more closely to find a way to limit the number of registrations on that fault type.

Finance and Operations

ASSET FAULT ANALYSIS

GROUP BY DATE: Date, Month, Year, Week, Quarter

GROUP BY ASSET: Asset, Asset type, Manufacturer

GROUP BY FUNCTIONAL LOCATION: Functional location, Functional location type

GROUP BY FAULT: Fault, Symptom, Area, Type, Cause, Remedy

ASSET FAULT ANALYSIS

Filter

Asset	Asset type	Fault symptom	Symptoms	Symptom %	Fault area	Areas	Area %	Fault type	Types	Type %	Probability %
C0001	Conveyor	Air Leak	4	50.00	Electrical	2	50.00	Damaging	2	100.00	25.00
C0001	Conveyor	Air Leak	4	50.00	Hydraulic	2	50.00	Damaging	2	100.00	25.00
C0001	Conveyor	Blown fuse	3	37.50	Electrical	3	100.00	Harmful	3	100.00	37.50
C0001	Conveyor	Equipment Jammed	1	12.50	Mechanical	1	100.00	Harmful	1	100.00	12.50
C0004	Conveyor	Blown fuse	4	100.00	Electrical	4	100.00	Harmful	4	100.00	100.00

NOTE

For an overview of all fault registrations created on work orders and maintenance requests, click **Asset management > Inquiries > Asset fault > Asset faults**. On the **Asset faults** page, select an asset fault registration and expand the **Related information** pane to see information regarding the related work order or maintenance request.

NOTE

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Asset KPIs

2/18/2021 • 4 minutes to read • [Edit Online](#)

In Asset Management, you can calculate various Key Performance Indicators (KPIs) for assets and asset types. You use KPIs to get an overview of performance on assets in relation to, for example, uptime, downtime, repair time, and Mean Time Between Failure (MTBF).

1. Click **Asset management > Inquiries > Assets > Asset KPIs**.
2. In the **Calculate asset KPIs** dialog, you select the **Time scale** to be used in the calculation, and a period in the **From date** and **To date** fields.
3. On the **Records to include** FastTab, you can select specific assets and asset types to be included in the calculation, if required.
4. Click **OK** to start the calculation.
5. On the **Overview** FastTab, the results of the calculation are displayed in grid view. Each asset is displayed on a separate line.
6. On the **KPIs for selected line** FastTab, you see calculations for the asset selected on the **Overview** FastTab. The KPI values are categorized regarding **Time, Availability, Work orders, Maintenance, Faults, Maintenance downtime, and Cost**.

In the table below, you'll find a description of the fields on the **Asset KPIs** page.

FIELD	DESCRIPTION
Asset	Asset ID.
Total time	Total time set up in the calendar used in the calculation. If the asset is related to a resource, the related resource calendar is used. If the asset isn't related to a resource, the calendar selected in the Standard calendar field in Asset management parameters is used.
Uptime	Total time minus downtime.
Downtime	Maintenance downtime registrations made on the asset in the selected period.
Repair time	Total number of work hours consumed on repair work orders.
Availability %	Uptime divided by total time and multiplied by 100.
Number of faults	Number of fault causes registered on fault symptoms on the asset in the selected period.
MTBF	Mean Time Between Failure, which is total time divided by number of faults registered on the asset in the selected period. If number of faults is zero, MTBF is set to total time.

FIELD	DESCRIPTION
Fail rate	1 divided by MTBF.
MRT	Mean Repair Time, which is repair time divided by number of faults registered on the asset in the selected period. If number of faults is zero, MRT is set to repair time.
Number of stops	Number of maintenance downtime registrations created on the asset.
MTBS	Mean Time Between Stops, which is total time divided by number of maintenance downtime registrations. If number of maintenance downtime registrations is zero in the selected period, the MTBS value is set to total time.
Preventive cost	Costs posted on the asset related to cost type "Preventive" in the selected period. Cost types are set up on work order types.
Corrective cost	Costs posted on the asset related to cost type "Corrective" in the selected period. Cost types are set up on work order types.
Replacement value	Value defined on the asset as the replacement cost.
Asset type	Identification of the asset type selected on the asset.
Manufacturer	Identification of the manufacturer selected on the asset.
Model	Identification of the manufacturer model selected on the asset.
From date	Start date of the KPI calculation. If the asset was created after the start date selected for the calculation, the start date of the asset is shown in this field.
To date	End date of the KPI calculation. If the asset was registered as inactive before the end date selected for the calculation, the date from which the asset was no longer active is shown in this field.
Time scale	During calculation of the KPIs, you select a time scale to be used: Hours, Days, or Weeks.
Availability	Uptime divided by total time.
Work orders	Total number of work orders included in the KPI calculation.
Work order time	Total number of work hours consumed on the work orders.
Primary work orders	Number of primary work orders included in the KPI calculation.
Secondary work orders	Number of secondary work orders included in the KPI calculation.

FIELD	DESCRIPTION
Maintenance work orders	Number of maintenance work orders included in the KPI calculation. A maintenance work order is a work order with no related fault causes.
Maintenance time	Total number of work hours consumed on maintenance work orders.
Repair work orders	Number of repair work orders included in the KPI calculation. A repair work order is a work order with a related fault cause.
Reliability %	Calculation based on the expected exponential development in fault registrations on an asset meaning that, over time, the asset becomes less reliable due to wear and tear. The calculation of this KPI is based on MTBF and total time.
MTPS	Mean Time Production Stops, which is maintenance downtime divided by number of maintenance downtime registrations. If number of maintenance downtime registrations is zero in the selected period, the MTPS value is set to zero.
Total cost	Total costs posted on the asset in the selected period.
Investment cost	Costs posted on the asset related to cost type "Investment" in the selected period. Cost types are set up on work order types.

The figure below shows a screenshot of a KPI calculation for four assets.

The screenshot displays the SAP Asset KPIs report. The main table shows KPIs for four assets (C0001, C0002, C0003, C0004). Below the table, a detailed breakdown is provided for asset C0001, categorized into ASSET, SCALE, WORK ORDERS, FAULTS, MAINTENANCE DOWNTIME, and COST.

Asset	Total time	Uptime	Downtime	Repair time	Availability %	Number of faults	MTBF	Fail rate	MRT	Number of stops	MTBS
C0001	9.00	8.00	1.00	0.00	88.89	2	3.00	0.33	0.00	1	4.50
C0002	9.00	9.00	0.00	0.00	100.00		9.00	0.11	0.00		9.00
C0003	9.00	9.00	0.00	0.00	100.00		9.00	0.11	0.00		9.00
C0004	9.00	9.00	0.00	0.00	100.00	1	4.50	0.22	0.00		9.00

ASSET	SCALE	WORK ORDERS	FAULTS	MAINTENANCE DOWNTIME
Asset C0001	Time scale Days	Work orders 5	Number of faults 2	Number of stops 1
Asset type Conveyor	TIME Total time	Work order time 0.02	MTBF 3.00	MTBS 4.50
Manufacturer Adatum	9.00	Primary work orders 5	Repair work orders 2	MTPS 1.00
Model	Uptime 8.00	Secondary work orders	Repair time 0.00	COST Total cost 6.00
	Downtime 1.00		MRT 0.00	Corrective cost 6.00
DATES		MAINTENANCE	Fail rate 0.33	Preventive cost 0.00
From date 7/17/2019	AVAILABILITY Availability 0.89	Maintenance work orders 3	Reliability % 4.98	Investment cost 0.00
To date 8/22/2019	Availability % 88.89	Maintenance time 0.02		

- You can multi-select several assets in **All assets** and click the **Asset KPIs** button on the **General** tab. Then

click **OK** in the **Calculate asset KPIs** dialog to calculate KPIs for the selected assets.

- Results from a KPI calculation may or may not include [maintenance downtime registrations](#), depending on the setup and use of maintenance downtime reason codes.

NOTE

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Item where used

2/18/2021 • 2 minutes to read • [Edit Online](#)

You can make a calculation for a specific item to get an overview of where in Asset Management the item has been used. The results show the context in which the item has been used during its lifetime. The **Item where used** page can be opened from the main Asset Management menu, and it can also be accessed from the following pages:

- [Asset BOMs](#)
- [Spare parts on asset type defaults](#)
- [Maintenance job type categories and maintenance job types, maintenance job type variants, maintenance job trades, and maintenance checklists](#)
- [Maintenance forecast](#)
- [Procurement](#)
- [Work order purchase](#)

Make an item-where-used calculation

1. Click **Asset management > Inquiries > Item where used**, or select the **Item where used** button on one of the pages mentioned above.
2. In the **Item where used** dialog, select the item for which you want to make the calculation in the **Item number** field.
3. You can use the **Level** field to indicate how detailed you want the item lines to be regarding functional locations.

For example, if you insert the number "1" in the field, and you have a multi-level functional location structure, all item lines for a functional location will be shown on the top level. Therefore, relation/quantity on a line may be added up from functional locations located at a lower level.

If you insert the number "0" in the **Level** field, you will see a detailed result showing all item lines on all the functional location levels to which they are related.

4. In the **Include** section, select "Yes" on the toggle buttons that you want to include in the calculation.
5. Click **OK** to start the calculation.
6. On the **Item where used** tab, select the **Group by** buttons to show the required detail level of the calculation. The selected **Group by** buttons are highlighted. Click on a button to activate or deactivate it.
7. If you want to show dimensions related to the item, click **Display dimensions**, and select the dimensions to be shown.

Example

In the screenshot below, you see an example of an item-where-used calculation for item number "1000".

Finance and Operations

Search for a page

USMF

ITEM WHERE USED

Calculate where used

GROUP BY DATE: Date, Year, Month

GROUP BY REFERENCE: Reference type, Reference ID

GROUP BY ASSET: Asset, Asset type, Manufacturer, Model

GROUP BY FUNCTIONAL LOCATION: Functional location, Functional location type

GROUP BY WORK ORDER: Work order, Work order type

GROUP BY MAINTENANCE JOB: Maintenance job type category, Trade, Maintenance job type, Maintenance job type variant

DIMENSION: Display dimensions, Criticality

ITEM WHERE USED

Filter

Date ↑	Reference type	Asset	Asset type	Functional location	Work order	Maintenance job type	Trade	Quantity	Unit
7/21/2019	Work order purchase	C0001	Conveyor	CH-BP1-01-01	JPMF-00002	Inspection	Mechanical	1.00	ea
7/30/2019	Work order maintenance forecast	PI0001	Pipe	CH-BP1-03-01	JPMF-00005-01	Inspection	Mechanical	1.00	ea

1000: Surface Pro 128 ...

NOTE

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Maintenance status

2/18/2021 • 2 minutes to read • [Edit Online](#)

In Asset Management, you can make an overview calculation for a specific period for new, active, and completed maintenance requests, work orders, and maintenance downtime activities. You can also see the number of completed condition assessments for the same period. Use this calculation to get an overview of workload for incoming and completed maintenance requests and work orders.

Make a maintenance status calculation

1. Click **Asset management > Inquiries > Maintenance status**.
2. In the **Calculate status** dialog, select the time range that you want to make the calculation in the **From date** and **To date** fields.
3. You can use the **Level** field to indicate how detailed you want the maintenance lines to be regarding functional locations.

For example, if you insert the number "1" in the field, and you have a multi-level functional location structure, all maintenance lines for a functional location will be shown on the top level, and therefore the status on a line may be added up from functional locations located at a lower level.

If you insert the number "0" in the **Level** field, you see a detailed result showing all maintenance lines on all the functional location levels to which they are related.

4. Click **OK** to start the calculation.
5. Click the **Group by** buttons to show the required detail level of the calculation. The selected **Group by** buttons are highlighted. Click on a button to activate or deactivate it.
6. Remember to click the **Update** button to update the calculation each time you make changes by activating or deactivating **Group by** buttons, or by making a calculation for a new period.
7. Click **Status** if you want to create a new maintenance status calculation.

NOTE

The results shown in **Maintenance status** only include maintenance requests and work orders that have an actual start date and time. End date and time may be blank.

Example 1

In the screenshot below, the **Year** and **Month** buttons have been activated. With these **Group by** options selected, you get a general overview on a monthly basis of workload and throughput related to maintenance requests and work orders.

Year	Month	New maintenance requests	Maintenance requests	Ended maintenance requests	Started work orders	Work orders	Ended work orders	New stops	Maintenance downtime	Ended stops
2019	May	2	4							
2019	June		4							
2019	July	8	12	2				1		1
2019	August	3	13	1	2	2	1			

Example 2

In the screenshot below, information about functional locations has been added. Now it is possible to compare workload and throughput across functional locations, which may represent geographical locations, factories, or work areas.

Year	Month	Functional location	New maintenance requests	Maintenance requests	Ended maintenance requests	Started work orders	Work orders	Ended work orders	New stops
2019	May	CH-BP1-01-01	2	4					
2019	June	CH-BP1-01-01		4					
2019	July	CH-BP1-01-01		4					1
2019	July	CH-BP1-01-02	1	1					
2019	July	CH-BP1-02	2	2					
2019	July	CH-BP1-03-02	1	1					
2019	July	CH-BP1-08	1	1		1			
2019	July	CH-BP2-01-01	1	1					
2019	July	CH-BP2-01-03	1	1				1	
2019	July	CH-BP2-09	1	1					
2019	August						1	1	
2019	August	CH-BP1-01-01	2	6		1	1		1
2019	August	CH-BP1-01-02		1					
2019	August	CH-BP1-02	1	3					
2019	August	CH-BP1-03-02		1					
2019	August	CH-BP2-01-01		1					
2019	August	CH-BP2-09		1					

NOTE

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Set up the Asset management mobile workspace

2/18/2021 • 3 minutes to read • [Edit Online](#)

This topic describes how to set up Microsoft Dynamics 365 Supply Chain Management and the Finance and Operations (Dynamics 365) mobile app to run an **Asset management** mobile workspace that workers can use to perform asset management tasks.

Set up maintenance worker users in Supply Chain Management

For each user that requires access to the **Asset management** mobile workspace, follow these steps.

1. In Supply Chain Management, go to **Human resources > Workers**, and make sure that a worker record exists for the user that you want to set up. Create a new worker record as required.
2. Go to **Asset management > Setup > Workers > Workers**, and make sure that the worker record that you identified (or created) in the previous step is mapped to a maintenance worker record. Create a new maintenance worker record as required, and set the **Worker** field to the worker record from the previous step.
3. Go to **Asset management > Setup > Workers > Maintenance worker groups**, and make sure that the maintenance worker record that you identified (or created) in the previous step belongs to a maintenance worker group.
4. Go to **System administration > Users**.
5. Select the relevant user in the grid.
6. On the **User Details** FastTab, set the **Person** field to the worker account that you want to associate with the current user account. This worker account should be the worker record that you identified (or created) in step 1 and mapped to a maintenance worker record in step 2.

NOTE

User permissions and security roles apply to the features of the **Asset management** mobile workspace just as they apply to the features of the Supply Chain Management user interface. Therefore, every user that you set up to access the **Asset management** mobile workspace must have the security roles that are required to perform similar operations directly in Supply Chain Management.

Publish the Asset management mobile workspace

To make asset management features available in the Finance and Operations (Dynamics 365) mobile app, you must publish the **Asset management** mobile workspace.

1. In Supply Chain Management, select the **Settings** button (the gear symbol in upper-right corner), and then select **Mobile app** on the menu.
2. In the **Manage mobile app** dialog box, find the **Asset Management** tile. If it contains the text "In metadata - not published," the workspace hasn't yet been published. If it contains the text "In metadata - published," the workspace has already been published, and you can skip the rest of this procedure.



3. Select the **Asset Management** tile, and then select **Publish** on the toolbar. After a few seconds, you should receive a notification that states that the workspace has been successfully published. Additionally, the text on the tile should change to "In metadata - published."

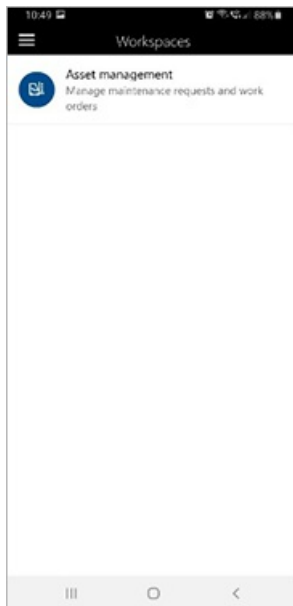
Install and set up the Finance and Operations (Dynamics 365) mobile app

1. Go to one of the following app stores to install the **Microsoft Finance and Operations (Dynamics 365)** app on your mobile device:
 - [For Google Android devices](#)
 - [For Apple iOS devices](#)
2. Open the Finance and Operations (Dynamics 365) app. The sign-in page should appear. In the **Sign in** field, enter your Supply Chain Management URL, or select a recent URL in the **Recent environments** list, and then tap **Connect**.

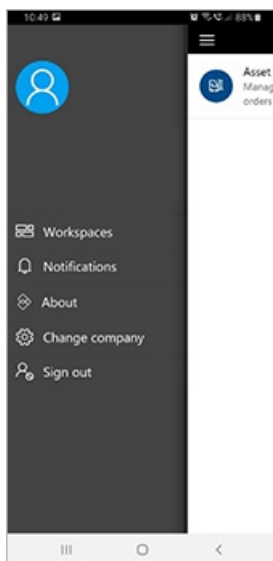


3. If you're prompted to confirm the connection, select the **I understand** check box, and then tap **Connect**.
4. On the **Pick an account** page, use your Microsoft account to sign in to the mobile application.

The **Workspaces** page appears. It lists every mobile workspace that has been published by your Supply Chain Management instance.



5. If you must change the legal entity (company), tap the Menu button (sometimes referred to as the hamburger or the hamburger button) in the upper-left corner, and then tap **Change company**.



6. On the **Workspaces** page, select the workspace that you want to work with to open it.



Work with the Asset management mobile workspace

For more information about how to work with the **Asset management** mobile workspace, see [Use the Asset management mobile workspace](#).

For more information about the Finance and Operations (Dynamics 365) mobile app, see the [Mobile app home page](#).

NOTE

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Use the Asset management mobile workspace

2/18/2021 • 6 minutes to read • [Edit Online](#)

This topic provides information about the **Asset management** mobile workspace. This workspace lets users view and create maintenance requests and work orders. Users can also view the assigned work order jobs in a calendar or list view. Assets and functional locations can also be viewed and searched for.

Overview

Asset Management is an advanced module for managing assets and work order jobs in Dynamics 365 Supply Chain Management. The **Asset management** mobile workspace lets users quickly view assigned work order jobs on the mobile device of their choice. Users can also create and manage maintenance requests, update lifecycle state, and view asset and functional location details by using their mobile device.

Specifically, the **Asset management** mobile workspace lets users perform these tasks:

- Create, view, and edit maintenance requests, take a photo or attach an existing image to the maintenance request, change the maintenance request lifecycle state.
- Create, view, and edit work orders, take a photo or attach an existing image to the work order, change the work order lifecycle state, view work order jobs.
- View assigned work order jobs in a calendar view.
- Create, view, and edit work order job, update asset counters, view maintenance checklist, view and edit work order job notes, view the tools required for the work order job.
- View or search for a specific asset or functional location.

Prerequisites

Before you can use the **Asset management** mobile workspace, your admin must set up the required user and worker accounts, and publish the workspace. For more information, see [Set up the Asset management mobile workspace](#).

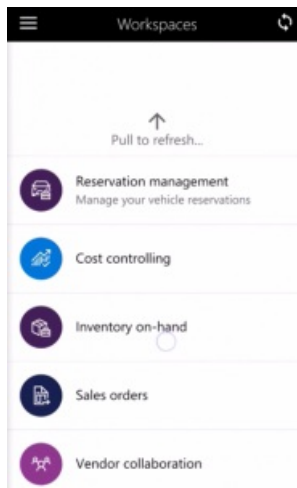
Download and install the mobile app

Download and install the Dynamics 365 for Unified Operations mobile app:

- [For Android phones](#)
- [For iPhones](#)

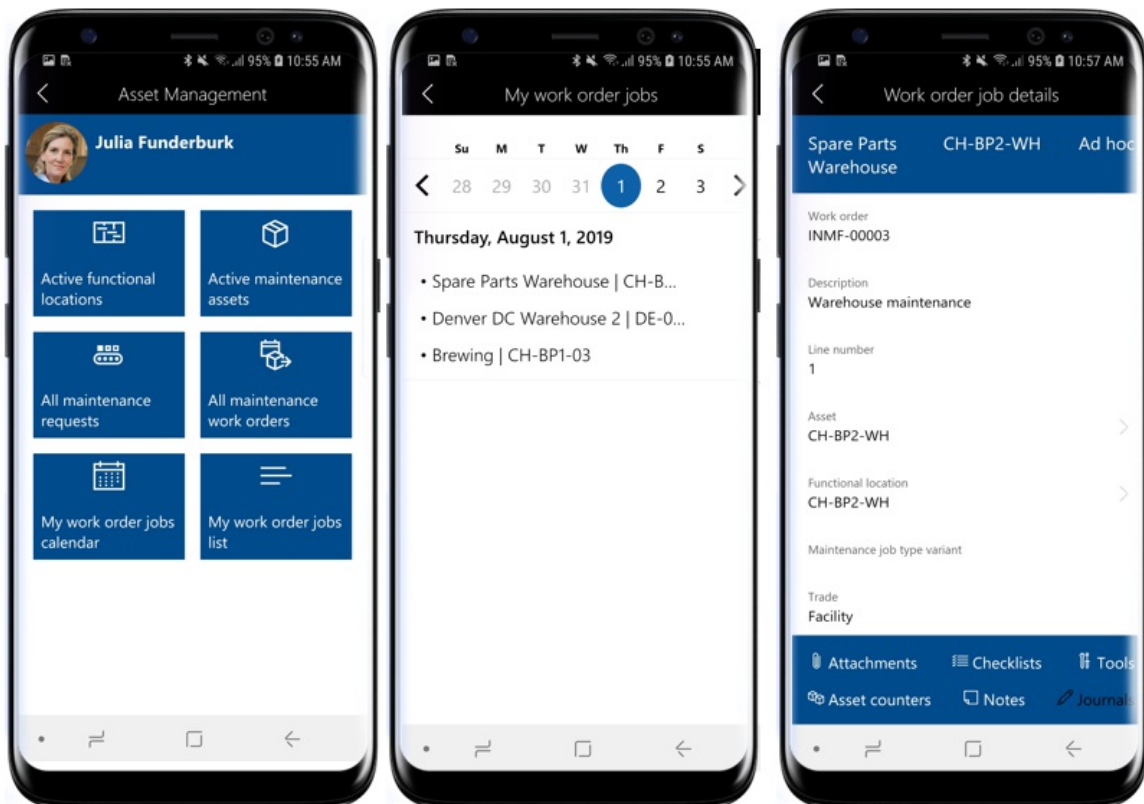
Sign in to the mobile app

1. Start the app on your mobile device.
2. Enter your Dynamics 365 URL.
3. The first time that you sign in, you're prompted for your user name and password. Enter your credentials.
4. After you sign in, the available workspaces for your company are shown. Note that if your system administrator publishes a new workspace later, you'll have to refresh the list of mobile workspaces.



View assigned work order jobs in calendar view

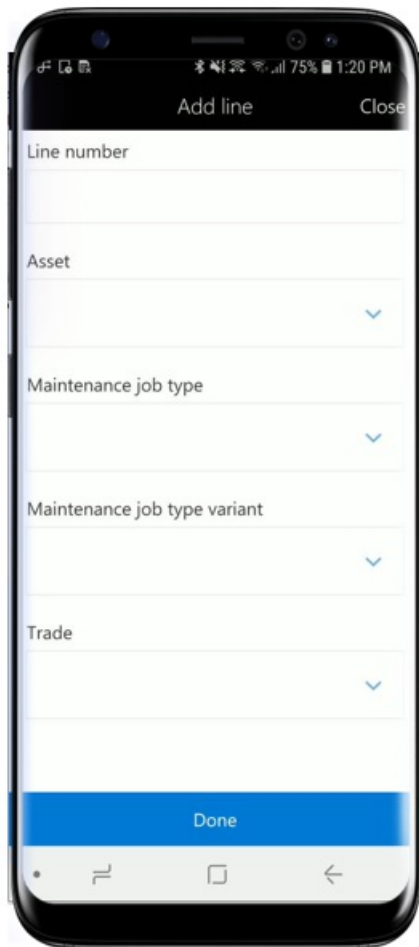
1. On your mobile device, open the **Asset management** workspace.
2. Select **My work order jobs calendar**.
3. Select the date you want to view work order jobs for. In the list, you'll see the asset ID and functional location ID for each work order job.
4. Select a work order job in the list to see job details: Asset and functional location details as well as other navigation links to view **Attachments**, **Checklists**, **Tools**, **Asset counters**, **Notes**, **Journals**.



Create a work order job

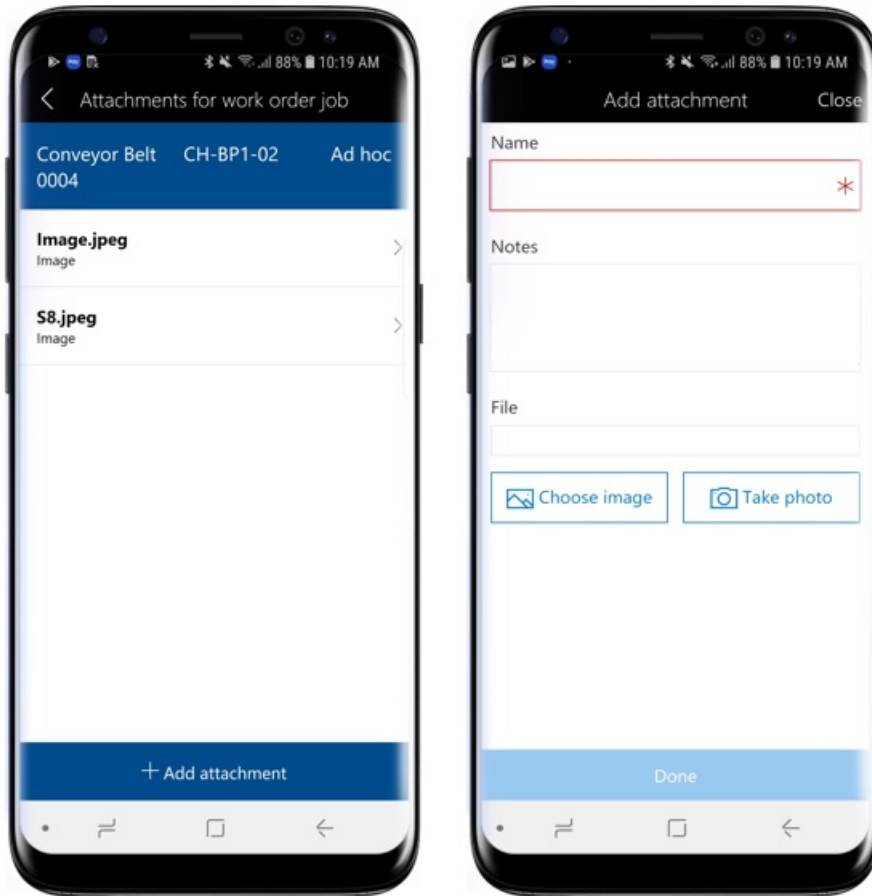
1. On your mobile device, open the **Asset management** workspace.
2. Select **All maintenance work orders**.
3. Select the work order you want to create a new work order job for.

4. Select the **Add line** button.
5. Select the **Asset** you want to create a work order job for.
6. Select **Maintenance job type**, **Maintenance job type variant** and **Trade**.
7. Select **Done**.



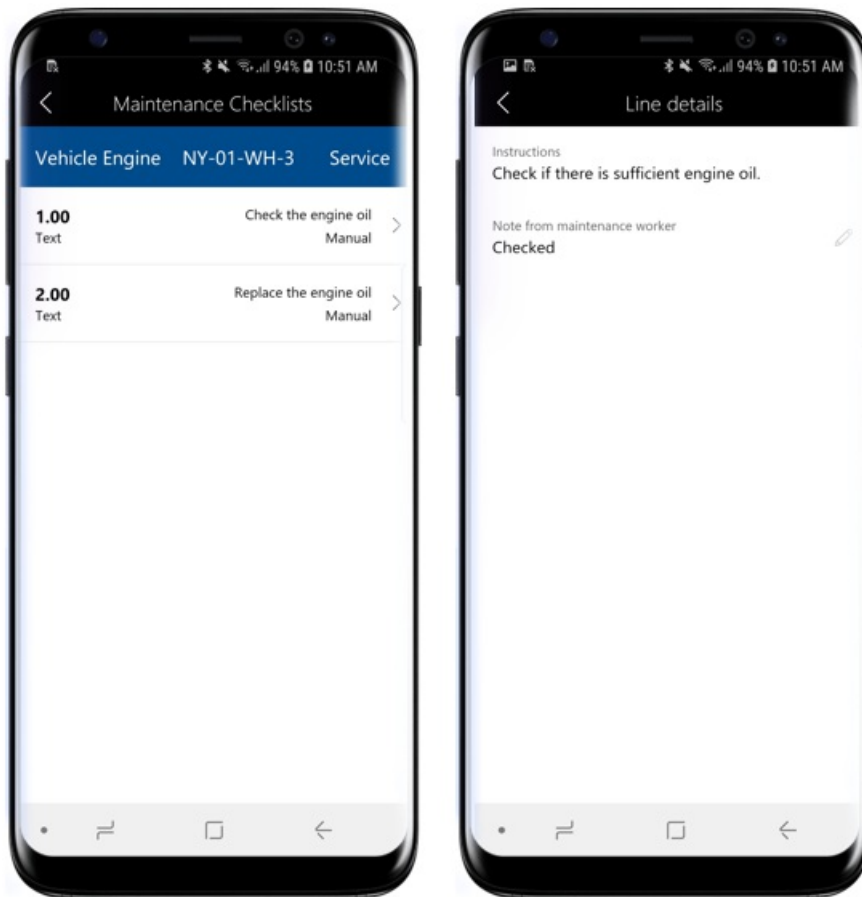
Add attachment to a work order job

1. On your mobile device, open the **Asset management** workspace.
2. Select **All maintenance work orders**.
3. Select the work order > work order job you want to add an attachment to.
 - Alternatively, you can also select **My work order jobs calendar** or **My work order jobs list** on the home page to navigate to the **Work order job details** page.
4. Select **Attachments** on the **Work order job details** page.
5. You'll see existing attachments on the work order job. Select **Add attachment**.
6. Enter **Name** and **Notes** for the attachment.
7. Select **Choose image** to select a photo from the mobile gallery, or **Take photo** to take a photo.
8. Select **Done**.



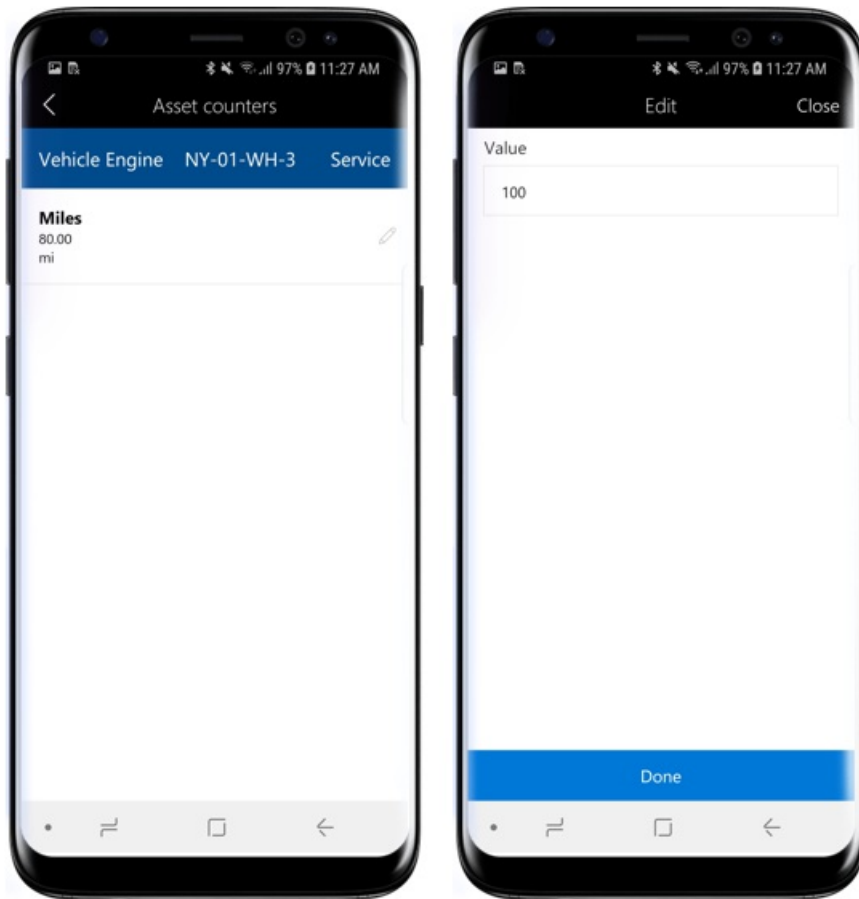
View maintenance checklist on a work order job

1. On your mobile device, open the **Asset management** workspace.
2. Select **All maintenance work orders**.
3. Select the work order > work order job you want to view checklists for.
 - Alternatively, you can also select **My work order jobs calendar** or **My work order jobs list** on the home page to navigate to the **work order job details** page.
4. Select **Checklists** on the **Work order job details** page.
5. You'll see a list of checklist lines related to the work order job. Select a checklist line to view **Instructions** and add **Notes**.
6. Select the back button (<) to return to the previous page.



View and update asset counters on a work order job

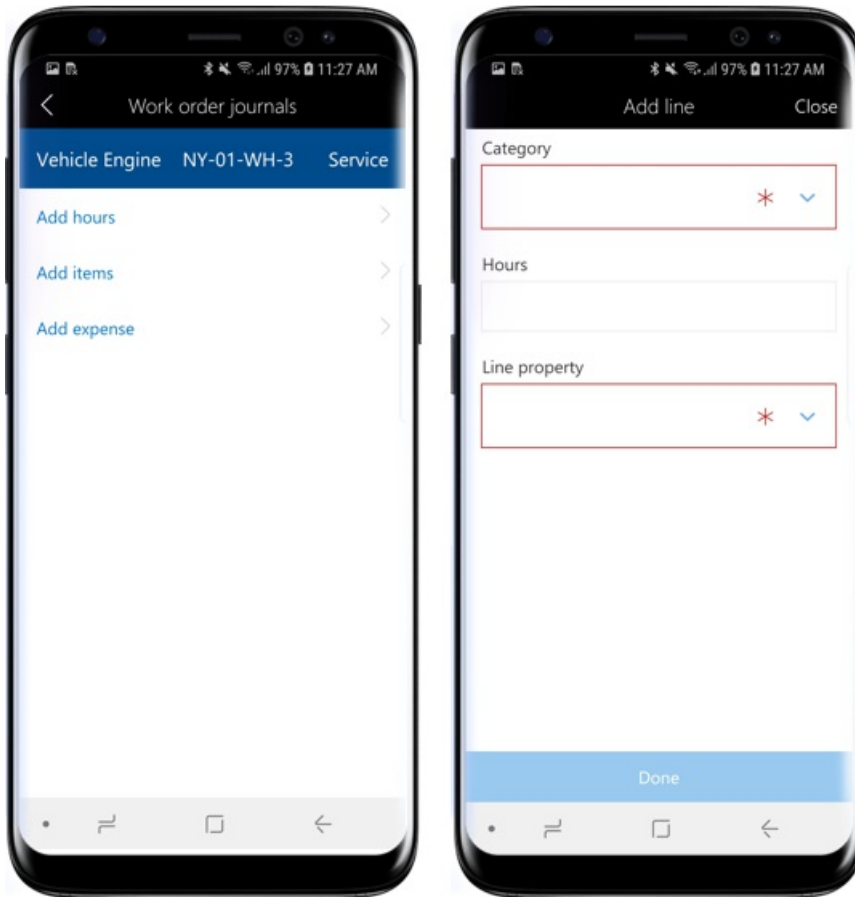
1. On your mobile device, open the **Asset management** workspace.
2. Select **All maintenance work orders**.
3. Select the work order > work order job you want to view asset counters for.
 - Alternatively, you can also select **My work order jobs calendar** or **My work order jobs list** on the home page to navigate to the **work order job details** page.
4. Select **Asset counters** on the **Work order job details** page.
5. You see a list of asset counters related to the work order job. Select the pencil icon on an asset counter line to update the counter value.
6. Enter a new counter value, and select **Done**.



Register consumption on a work order job

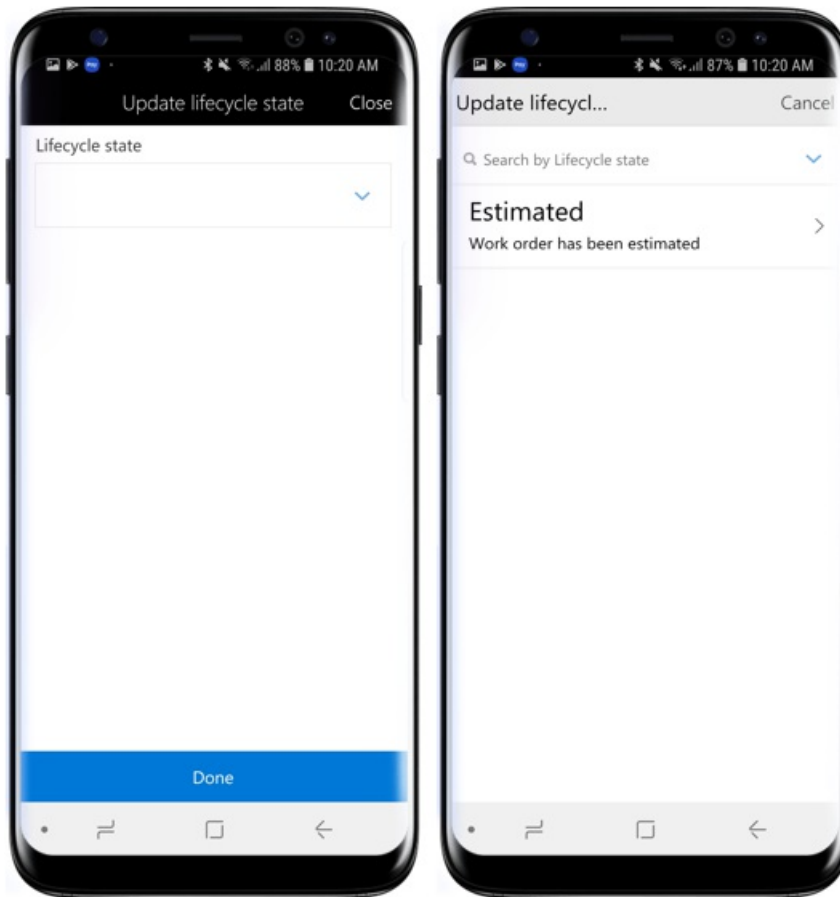
1. On your mobile device, open the **Asset management** workspace.
2. Select **All maintenance work orders**.
3. Select the work order > work order job you want to add consumption registrations for.
 - Alternatively, you can also select **My work order jobs calendar** or **My work order jobs list** on the home page to navigate to the **work order job details** page.
4. Select **Journals** on the **Work order job details** page.
5. Select **Add hours** to create work hour registrations.
 - a. Select the **Category** from the lookup.
 - b. In the **Hours** field, enter the number of work hours spent on the work order job.
 - c. Select the appropriate **Line property**.
 - d. Select **Done**.
6. Select **Add items** to create item registrations.
 - a. Select the **Item number** from the lookup.
 - b. Select the **Site** from the lookup.
 - c. Enter the **Quantity** of items consumed.
 - d. Select **Done**.
7. Select **Add expense** to create expense registrations.
 - a. Select the **Category** from the lookup.
 - b. Enter the quantity for the expense registration.
 - c. Select the **Sales currency** from the lookup.
 - d. Enter the **Cost price** for the expense registration.

e. Select Done.



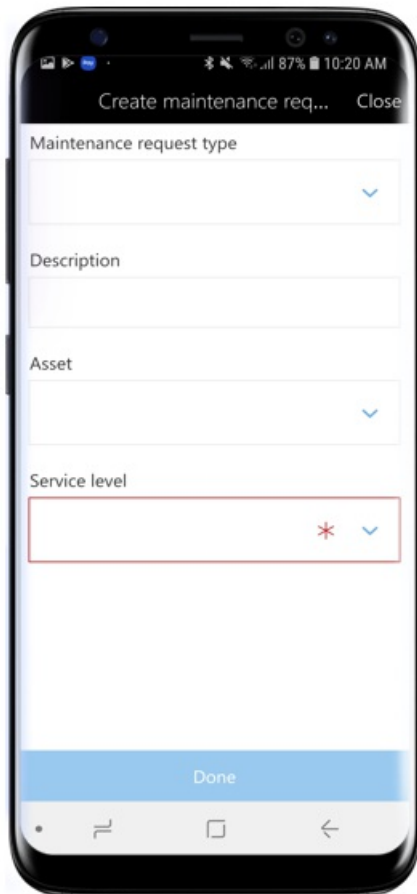
Update lifecycle state on a work order

1. On your mobile device, open the **Asset management** workspace.
2. Select **All maintenance work orders**.
3. Select the work order you want to update lifecycle state for.
4. Select the **Update state** button at the bottom of the screen.
5. Select a new lifecycle state from the list.
6. Select **Done**.



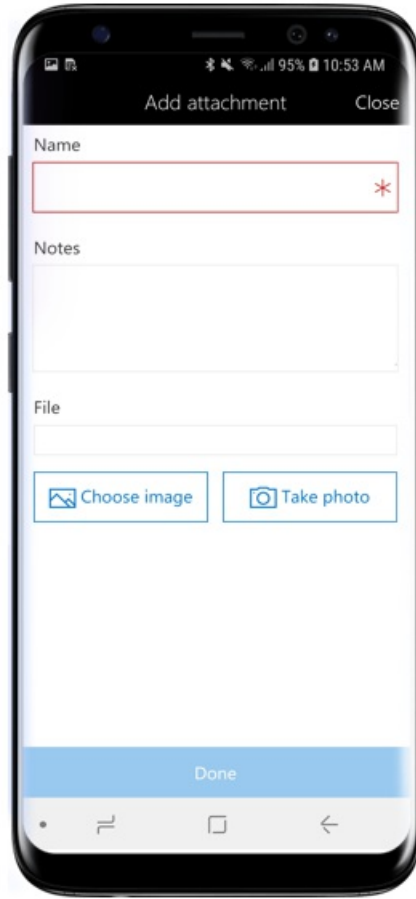
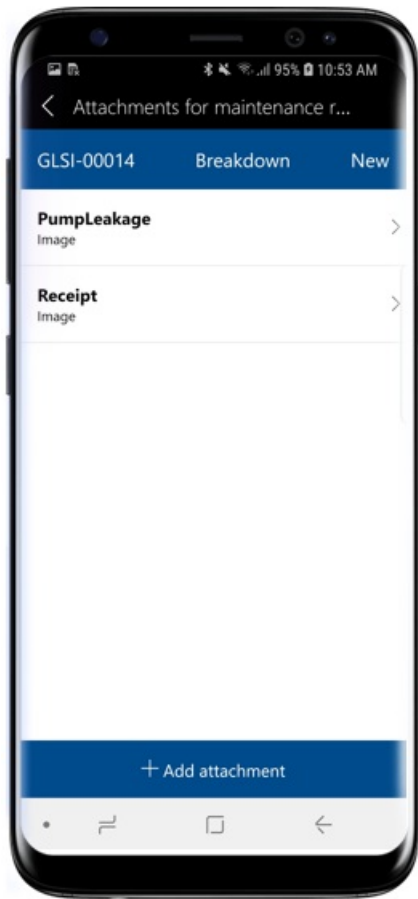
Create a maintenance request

1. On your mobile device, open the **Asset management** workspace.
2. Select **All maintenance requests**.
3. Select **Actions** at the bottom of the screen, and select **Create maintenance request**.
4. If number sequence is enabled for maintenance requests in **Asset management**, the **Maintenance request** field is hidden because it is automatically filled out. If the **Maintenance request** field is visible, enter a maintenance request ID.
5. Select a **Maintenance request type**.
6. Enter a **Description** for the maintenance request.
7. Select the **Asset** you want to create the request for.
8. Select the **Service level** for the maintenance request.
9. Select **Done**.



Add attachment to a maintenance request

1. On your mobile device, open the **Asset management** workspace.
2. Select **All maintenance requests**.
3. Select the maintenance request you want to add an attachment to.
4. Select **Attachments** at the bottom of the screen.
5. Select **Add attachments**.
6. Enter **Name** and **Notes** for the attachment.
7. Select **Choose image** to select a photo from the mobile gallery or **Take photo** to take a photo.
8. Select **Done**.



NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Integrate Dynamics 365 Supply Chain Management (Asset management) with Dynamics 365 Guides

2/18/2021 • 3 minutes to read • [Edit Online](#)

You can integrate the **Asset management** module in Microsoft Dynamics 365 Supply Chain Management with Dynamics 365 Guides to take advantage of mixed-reality guides in your day-to-day service and maintenance workflows. If a guide is associated with an Asset Management work order, a worker who opens the work order's maintenance checklist in the Supply Chain Management (Dynamics 365) mobile app sees that a guide is available. The worker can then find and open the guide in the Dynamics 365 Guides HoloLens app.

Prerequisites

Before you can attach guides to Asset management work orders, you must complete these prerequisites:

- [Set up Dynamics 365 Supply Chain Management](#) version 10.0.9 or later.
- [Turn on dual-write for Supply Chain Management apps](#).
- [Turn on flight](#) for the **MRGuidesFeature** feature. (For production environments, you must first submit a support ticket to have your tenant added to the flying group.)
- [Turn on the following configuration keys](#) on the **License configuration** page:
 - Asset management > Asset management mixed reality
 - Mixed reality > Mixed reality guide
- [Set up Dynamics 365 Guides](#) version 200.0.0.96 or later.

Use Dynamics 365 Guides with Asset management

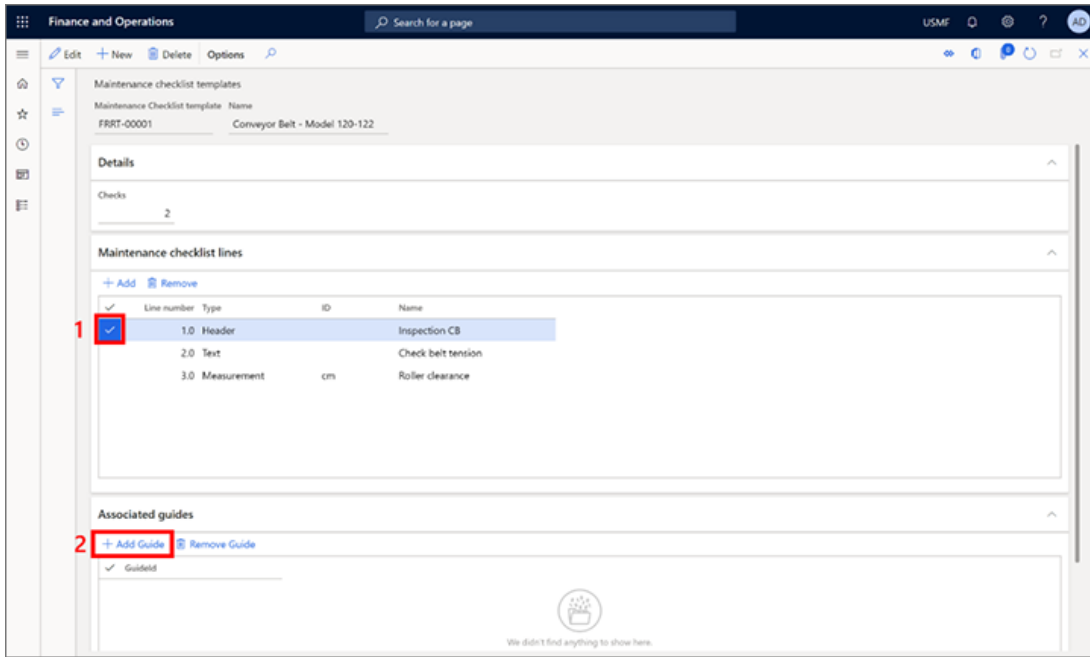
To associate a guide, you use a maintenance checklist line in Asset management. You can create the association through a maintenance checklist template, a maintenance job type, or a work order, because all three contain maintenance checklist lines. You can save time by using a template, because a template can be associated with all the maintenance job types that use it. For example, a guide that is associated with a maintenance job type is automatically associated with all work orders that specify that job type. On the other hand, a guide that is associated directly with a work order exists only for that work order.

Associate a guide with a maintenance checklist template

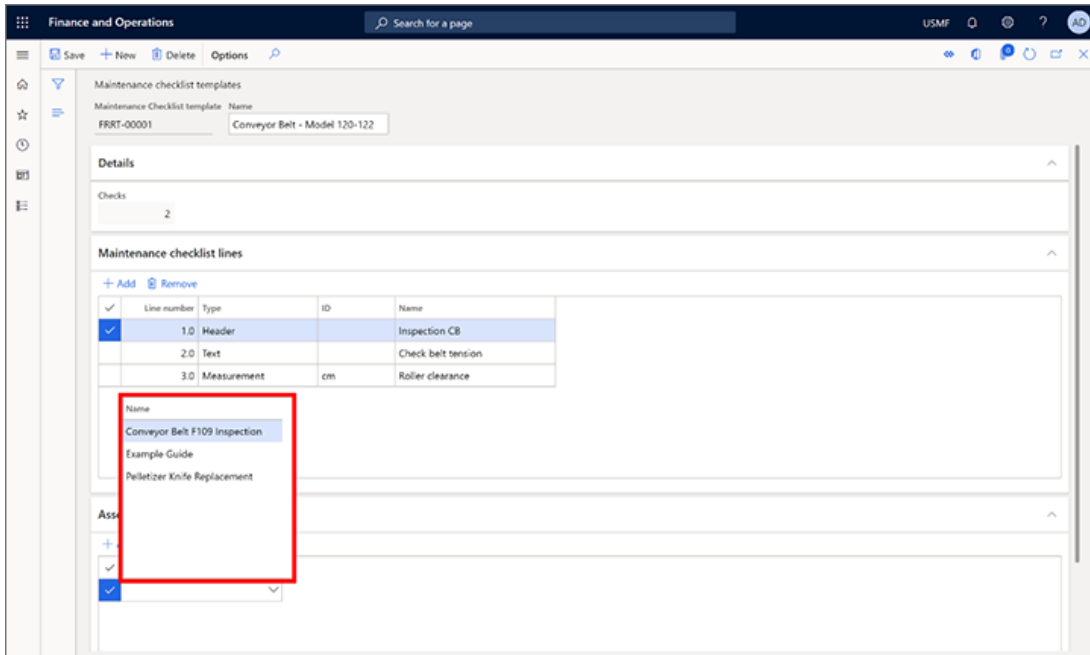
To associate a guide with a maintenance checklist template, follow these steps.

1. Create a guide by using the Dynamics 365 Guides PC and HoloLens apps. For information about how to create a guide, see the following topics:
 - [Use the PC app to create a guide](#)
 - [Use the HoloLens app to place your holograms](#)
2. In Supply Chain Management, [create a maintenance checklist template](#).
3. Associate the guide that you created with a maintenance checklist line in the new maintenance checklist template:
 - a. On the **Maintenance checklist lines** FastTab, select the line that you want to associate the guide with.

b. On the Associated guides FastTab, select Add Guide.



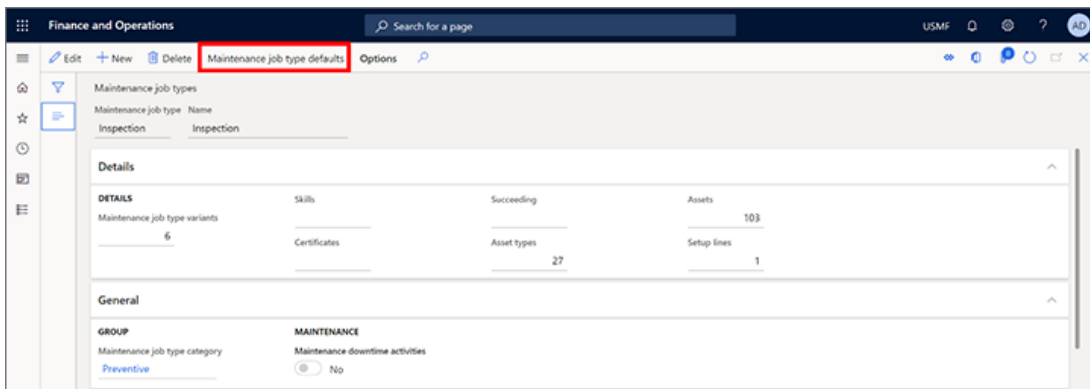
c. In the Name field, select a guide, and then select Save.



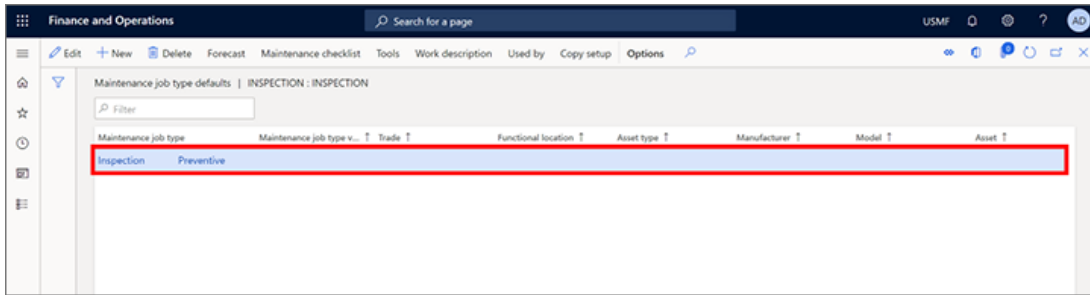
4. Associate the maintenance checklist template with a job type:

a. [Create a maintenance job type](#), or select an existing maintenance job type.

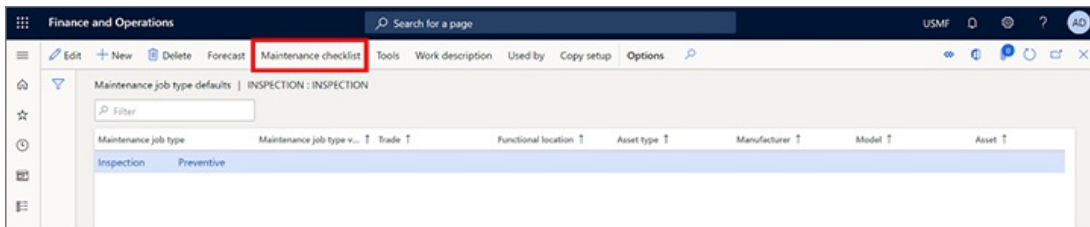
b. On the Action Pane, select Maintenance job type defaults.



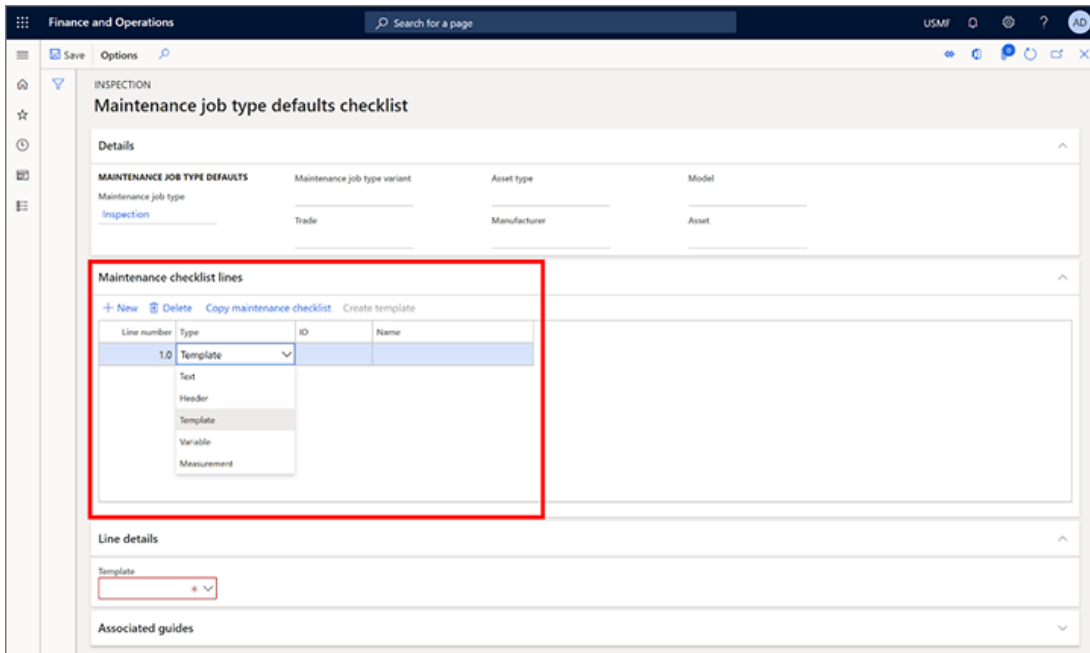
c. Create a line, and then select **Save**.



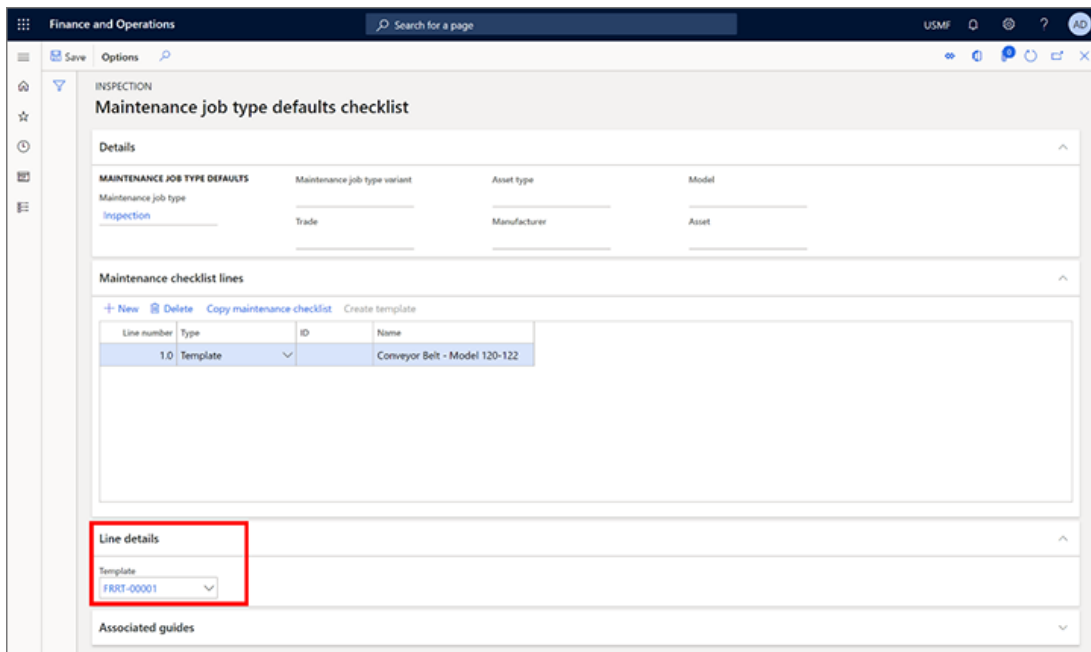
d. On the Action Pane, select **Maintenance checklist**.



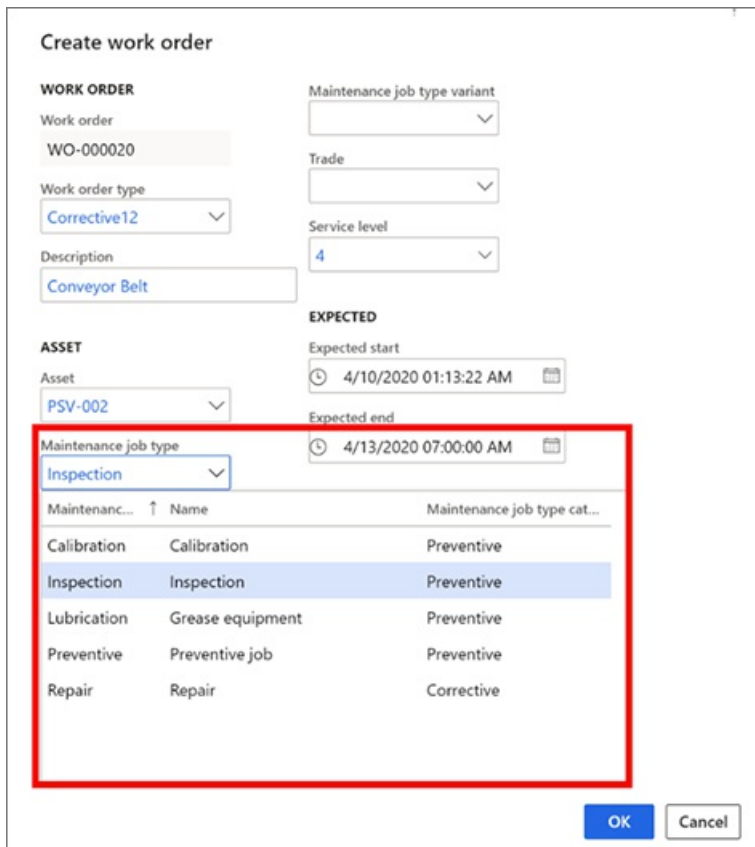
e. On the **Maintenance checklist lines** FastTab, add a line, and then change the value of the **Type** field to **Template**.



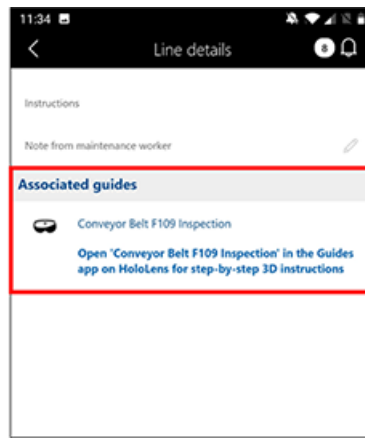
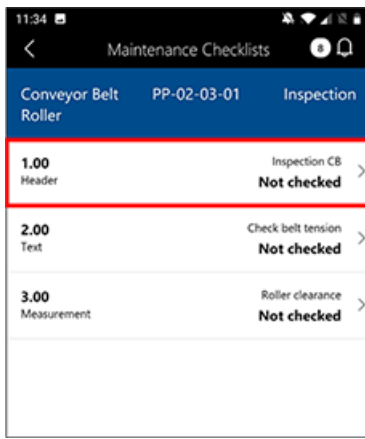
f. On the **Line details** FastTab, in the **Template** field, select the template that you associated the guide with, and then select **Save**.



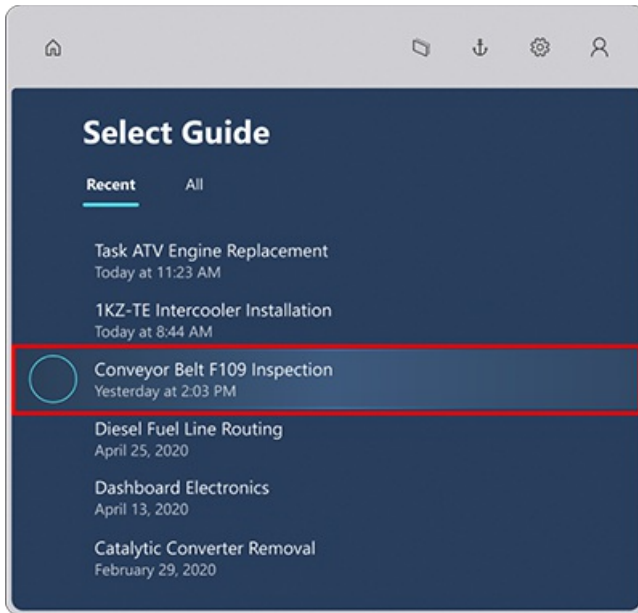
5. [Create a work order](#), and then select the maintenance job type that uses the maintenance checklist template that you associated the guide with. The guide is automatically associated with the work order.



6. View the guide that is associated with the work order and workers:
 - a. Open the [Asset management mobile workspace](#) to access the work order.
 - b. [Open the maintenance checklist](#) for the work order.
 - c. Select a checklist line to see the associated guide.



d. Open the guide on HoloLens.



NOTE

You can also associate a guide directly in the maintenance checklist of a work order or a job type.

IMPORTANT

There is a known issue where, when you associate a maintenance checklist template with a default maintenance job type, the guide that is linked to the template doesn't appear on the **Associated guides** FastTab of the **Maintenance job type defaults** page. However, the guide will appear after that job type is applied to a work order on the **Associated guides** FastTab.

See also

- [Dual-write overview](#)
- [Asset management overview](#)

NOTE

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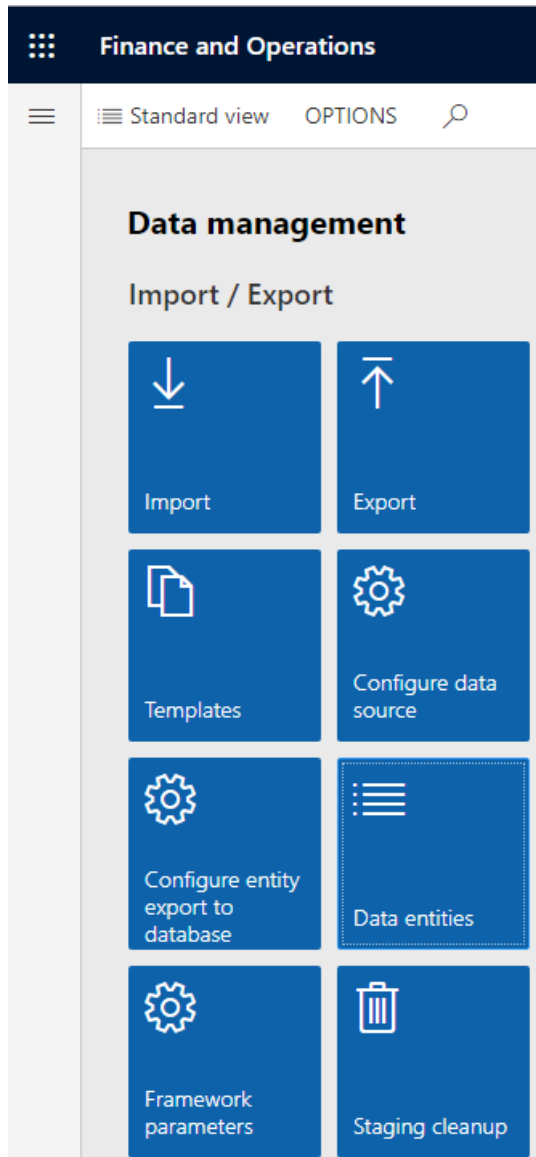
The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Target entities

2/18/2021 • 2 minutes to read • [Edit Online](#)

In the **Data management** workspace, you can get an overview of target entities, related entity types and staging tables related to the **Asset management** module.

1. Click the **Finance and Operations** button in the upper-left corner of the screen, and click **Data management**.
2. In the **Import / Export** section, click **Data entities**.



3. On the **Target entities** page, search for "asset management" in the filter, and press Enter to see a list of the entities related to Asset management.

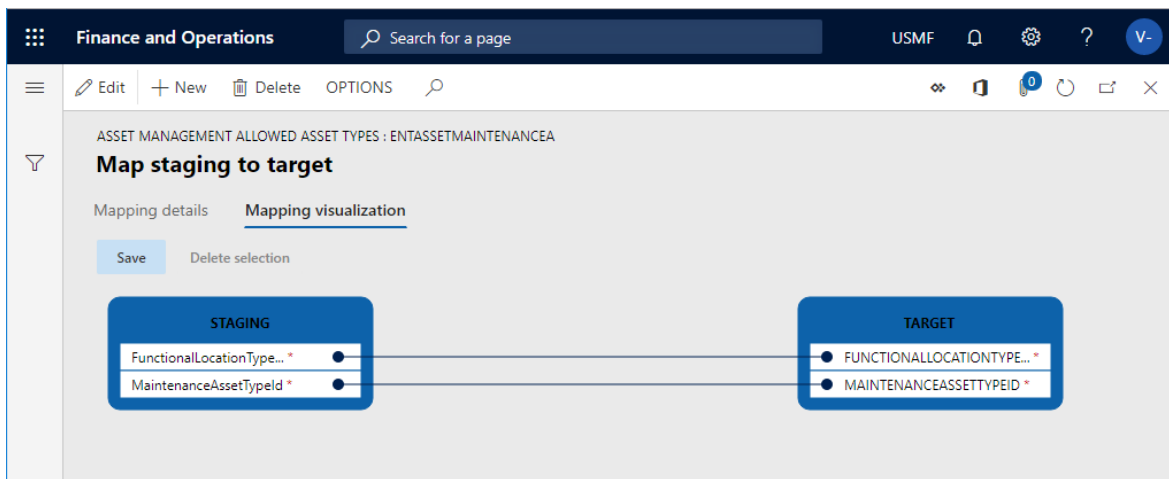
The figure below shows some of the Asset management entities.

Entity	Staging table	Target entity	Entity type	Change tracking	Type
Asset management allowed asset types	EntAssetMaintenanceAssetTypeFunctionalLocationStaging	EntAssetMaintenanceAssetTypeFunctionalLocationEntity	Entity	None	EntAssetMaintenanceAssetTypeFunctionalLoc...
Asset management asset aggregated values	EntAssetMaintenanceAssetAggregatedCounterStaging	EntAssetMaintenanceAssetAggregatedCounterEntity	Entity	None	EntAssetMaintenanceAssetAggregatedCounter...
Asset management asset attribute requirem...	EntAssetMaintenanceFunctionalLocationAttributeRequiremen...	EntAssetMaintenanceFunctionalLocationAttributeRequ...	Entity	None	EntAssetMaintenanceFunctionalLocationAttri...
Asset management asset attribute setup des...	EntAssetMaintenanceJobTypeDefaultDescriptionStaging	EntAssetMaintenanceJobTypeDefaultDescriptionEntity	Entity	None	EntAssetMaintenanceJobTypeDefaultDescri...
Asset management asset attributes	EntAssetMaintenanceAssetAttributeStaging	EntAssetMaintenanceAssetAttributeEntity	Entity	None	EntAssetMaintenanceAssetAttributeEntity
Asset management asset BOM	EntAssetMaintenanceAssetBillOfMaterialStaging	EntAssetMaintenanceAssetBillOfMaterialEntity	Entity	None	EntAssetMaintenanceAssetBillOfMaterialEntity
Asset management asset calendars	EntAssetMaintenanceAssetCalendarStaging	EntAssetMaintenanceAssetCalendarEntity	Entity	None	EntAssetMaintenanceAssetCalendarEntity
Asset management asset counter relations	EntAssetMaintenanceCounterRelationStaging	EntAssetMaintenanceCounterRelationEntity	Entity	None	EntAssetMaintenanceCounterRelationEntity
Asset management asset counter values	EntAssetMaintenanceAssetCounterRegistrationStaging	EntAssetMaintenanceAssetCounterRegistrationEntity	Entity	None	EntAssetMaintenanceAssetCounterRegistratio...
Asset management asset counters	EntAssetMaintenanceAssetCounterStaging	EntAssetMaintenanceAssetCounterEntity	Entity	None	EntAssetMaintenanceAssetCounterEntity
Asset management asset criticalities	EntAssetMaintenanceAssetCriticalityStaging	EntAssetMaintenanceAssetCriticalityEntity	Entity	None	EntAssetMaintenanceAssetCriticalityEntity
Asset management asset document attachm...	EntAssetMaintenanceAssetDocumentAttachmentStaging	EntAssetMaintenanceAssetDocumentAttachmentEntity	Entity	None	EntAssetMaintenanceAssetDocumentAttachm...
Asset management asset documents	EntAssetMaintenanceAssetDocumentStaging	EntAssetMaintenanceAssetDocumentEntity	Entity	None	EntAssetMaintenanceAssetDocumentEntity

4. Select an entity and click **Modify target mapping**.

5. On the **Map staging to target** page, you see a list of the staging fields related to the selected entity. Click **Mapping visualization** to see a graphic overview of how staging data and target data are related.

In the figure below, a visualization of the fields related to the asset types entity is shown.



NOTE

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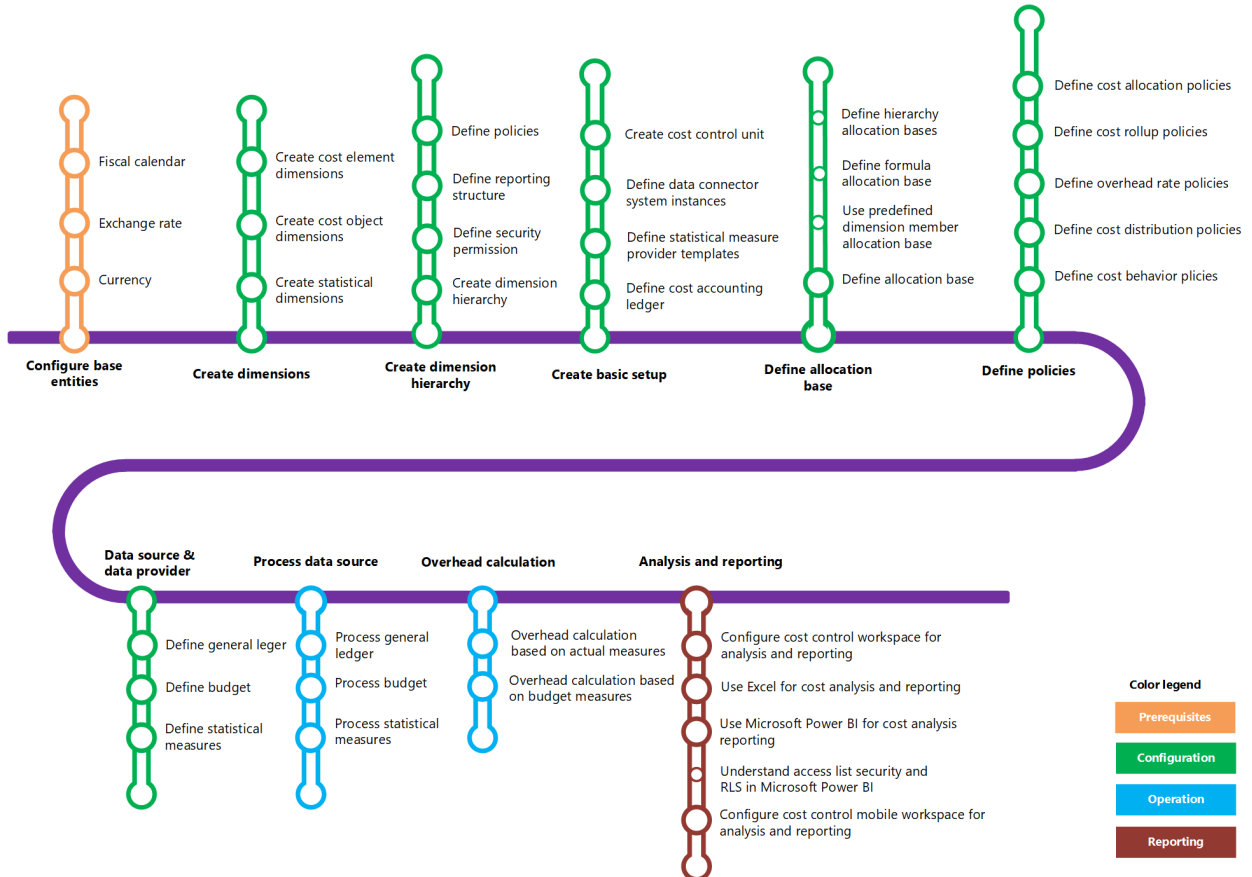
The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Cost accounting home page

2/18/2021 • 2 minutes to read • [Edit Online](#)

Learning map

The following learning map shows the major concepts and tasks that make up the framework of the Cost accounting module. Click the links in the [Quick links](#) section to learn how to use the module.



Quick links

Configure base entities (eLearning) (requires CustomerSource account)	Cost element dimensions
Dimension hierarchy	Define cost control units
Allocation bases	Create and assign a cost allocation policy to a cost control unit
Manage a data source for the cost accounting ledger	Process and trace source data
Overhead calculation	Cost control workspace

Get started videos

Get started with cost accounting	Cost accounting mobile workspace	Use Excel for cost accounting analysis
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NOTE

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Cost accounting terminology

2/18/2021 • 8 minutes to read • [Edit Online](#)

This topic defines the key terms that are used in Cost accounting.

Allocation base

The allocation base is used to measure and quantify activities, such as machine hours that are used, kilowatt hours that are consumed, or square footage that is occupied. It's used as basis for allocating costs to one or more cost objects

Cost accounting

Cost accounting lets you collect data from various sources, such as the general ledger, sub-ledgers, budgets, and statistical information. You can then analyze, summarize, and evaluate cost data, so that management can make the best possible decisions for price updates, budgets, cost control, and so on. The source data that is used for cost analysis is treated independently in Cost accounting. Therefore, updates in Cost accounting don't affect the source data. However, when you collect cost data from various sources, and especially when you import the main accounts from General ledger as cost elements, there is data redundancy, because the same data exists in both General ledger and Cost accounting. This redundancy is required, because you use financial management for external reporting and Cost accounting for internal reporting.

Cost accounting ledger

Defined by calendar, currency, and cost element dimension, it controls processes and policies for measuring costs.

Cost entry

Cost entries are the result of a transfer via data connectors from general ledger entries, cost allocations, and posted cost entries in cost journals.

Cost object

Any type of object that is selected for cost control. Costs or revenues are either directly posted on or allocated to cost objects. Some typical cost objects are:

- Products
- Projects
- Departments
- Cost centers

Management uses cost objects to quantify costs, but also to drive profitability analysis.

Cost element

Used as a function to track and categorize costs. There are two types of cost elements: primary and secondary.

Primary cost elements represent the cost flow from financial accounting to Cost accounting. The structure typically corresponds to the profit and loss account structure in the general ledger where a cost element can correspond to a main account. Not all main accounts must be represented as cost elements, depending on business requirements.

Secondary cost elements represent the internal cost flow because these costs are only used in Cost accounting. They are used in cost roll-up rules to aggregate costs into meaningful buckets used by overhead calculation.

Cost classification

Cost classification groups costs according to their shared characteristics. For example, costs can be grouped by elements, traceability, and behavior.

- **By elements** – Materials, labor, and expenses.
- **By traceability** – Direct costs and indirect costs. Direct costs are assigned directly to cost objects. Indirect costs aren't directly traceable to cost objects. Indirect costs are allocated to cost objects.
- **By behavior** – Fixed, variable, and semi-variable.

Cost behavior

Cost behavior classifies costs according to their behavior in relation to changes in key business activities. To control costs effectively, management must understand the cost behavior. There are three types of cost behavior pattern: fixed, variable, and semi-variable.

- **Fixed cost** - A fixed cost is a cost that doesn't vary in the short term, regardless of changes in activity level. For example, a fixed cost can be a basic operating expense of a business, such as rent, that won't be affected even if the activity level increases or decreases.
- **Variable cost** - A variable cost changes according to changes in activity level. For example, a specific direct materials cost is associated with each product that is sold. The more products that are sold, the more direct materials costs there are.
- **Semi-variable cost** - Semi-variable costs are partly fixed and partly variable costs. For example, an Internet access fee includes a standard monthly access fee and a broadband usage fee. The standard monthly access fee is a fixed cost, whereas the broadband usage fee is a variable cost.

Cost control unit

The cost control unit represents the cost structure. The structure determines how cost flows in a hierarchical order between cost object dimensions and their respective cost objects.

Cost distribution

Is used to distribute cost from one cost object to one or more other cost objects by applying a relevant allocation base. Cost distribution and cost allocation differ in that cost distribution always occurs at the level of the primary cost element of the original cost and no reciprocal processing.

Cost allocation

Is used to allocate the balance of a cost object to other cost objects by applying an allocation base. Finance supports the reciprocal allocation method. In the reciprocal allocation method, the mutual services that auxiliary cost objects exchange are fully recognized. The system automatically determines the order to perform the allocations in and iterate over it. The balance of a cost object is allocated by a single allocation base. Allocations across cost object dimensions and their respective members are supported. The allocation order is controlled by the cost control unit.

Cost allocation policy

A cost allocation policy defines the amounts and quantities that must be allocated. Allocation rules include allocation source rules, which determine the costs that are allocated, and allocation targets rules, which determine where the costs are allocated. For example, all costs for facility services are an allocation source that can be allocated to various departments in an organization (that is, to allocation targets).

Cost roll-up

The purpose of cost roll-up rules is to aggregate costs into meaningful buckets. The level of aggregation is user-defined and involves the assignment of a secondary cost element. If cost roll-up is not used, every element of a

cost is allocated from one cost object to another

Cost rate policy

The cost rate is used to calculate price per cost object. To understand the elements of the price, you define cost rate policies. There are two types of cost rate: historical cost rate and planned cost rate. A historical cost rate is a calculated rate that is used as a multiplier for the allocation base of a cost object. The rate is calculated based on the cost allocations in the previous period. A planned rate is a user-defined rate.

Dimension hierarchy

There are two dimension hierarchies: categorization hierarchy and classification hierarchy. The dimension categorization hierarchy type is used for reporting purposes. It supports only the cost element dimensions. The dimension classification hierarchy type is used to define policies and for reporting purposes. It supports all dimensions, such as cost objects, cost elements, and statistical dimensions.

Data connector

Cost accounting supports integration of data from source systems via a set of data connectors. The following data connectors are available:

- Imported transactions (pre-configured)
- Dynamics 365 Finance (pre-configured)
- Dynamics AX (configuration required)

Note: The data connector Imported transactions is based on data entities.

Data provider

Most source systems can provide data that matches one or more data sources in Cost accounting. To align data from the source systems with the data source in Cost accounting, a data provider needs to be configured. The following table lists the availability of data providers per data connector and data source.

DATA SOURCES	IMPORTED TRANSACTIONS DATA CONNECTOR	DYNAMICS 365 FINANCE DATA CONNECTOR	DYNAMICS AX DATA CONNECTOR
Cost element dimension members	Yes	Yes	Yes
Cost object dimension members	Yes	Yes	Yes
Statistical dimension members	Yes	No	No
General ledger	Yes	Yes	Yes
Budget entries	Yes	Yes	Yes
Statistical measures	Yes	Yes	Yes

Formula

Formula allocation bases let you define advanced formulas to achieve the correct allocation basis. You can manually create formula allocation bases. You can use the following operators to define your formula.

SYMBOLS	TEXT
()	Parentheses
<	Smaller than
>	Larger than
+	Addition
-	Subtraction
*	Multiplication

Traditional IF statements are not supported. However, you can create statements and validate whether they are true.

STATEMENT VALIDATION	RESULT
a > b	True
a > b	False

Overhead cost

Overhead costs refer to the ongoing expenses of operating a business. They are the costs that can't be linked directly to specific business activities. Here are some examples of overhead costs:

- Accounting fees
- Depreciations
- Insurance
- Interest
- Legal fees
- Taxes
- Utilities costs

Overhead rate

Rates are defined per cost object and cost element. There are two types of rates: fiscal period and user-specified. Fiscal period rates are calculated by the overhead calculation. A user-specific rate is user-defined and can be used to allocate cost between cost objects at a predetermined rate in the overhead calculation.

Published

If you set this field to Yes, a user who is assigned one of the following roles can view the report in the Cost control workspace:

- Cost accounting manager
- Cost accountant
- Cost accountant clerk
- Cost object controller

If you set this field to No, only users who are assigned one of the following roles can view the report in the Cost control workspace:

- Cost accounting manager
- Cost accountant
- Cost accountant clerk

Statistical dimension

A statistical dimension and its members are used to register and control non-monetary entries in Cost accounting. Statistical dimension members can be used for two purposes:

- As an allocation base in policies such as cost distribution or cost allocation.
- For reporting of non-monetary consumption.

A statistical dimension is the expression of a count or sum of an activity that can be used as the basis for allocations or rate calculations. It's either created manually or imported from source systems. Examples of statistical dimensions include the number of employees, the count of licensed software on each device, power consumption of each machine, or square meters for a cost center.

Statement

Statements are views for the managers who are responsible for controlling costs. Statements are defined by a cost controller, and they provide a quick overview of actual costs, budgeted costs, and deviations. A manager can drill further into details if required. To help ensure that managers view only data that they are accountable for, data that appears in the statements is subject to access rules.

Version

Versions are used to simulate, view, and compare various outcomes. By default, all actual costs are viewed in one base version that is known as *actual*. For budgets and calculations, you can work with as many versions as you require. For example, you can import budget data into an original version and then revise the budget in a revised version. For calculations, you can create multiple versions. In these various versions, you can then create calculations by using different calculation rules that will be applied for cost allocation.

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Fiscal calendars, fiscal years, and periods

2/18/2021 • 4 minutes to read • [Edit Online](#)

This article discusses fiscal calendars, fiscal years and periods and how to utilize them for legal entities, fixed assets and budgeting.

Fiscal calendars provide a framework for the financial activity of an organization. Each fiscal calendar contains one or more fiscal years, and each fiscal year contains multiple periods. Fiscal calendars can be based on a January 1 to December 31 calendar year, or on any dates that you select. For example, some organizations select a fiscal calendar that starts on July 1 of one year and ends on June 30 of the following year.

There is no limit to the number of fiscal calendars that you can create, and no limit to the number of fiscal years that can be created for a fiscal calendar. Each fiscal calendar is independent of your organization, and can be used by multiple legal entities in the organization. For example, an organization has eight departments and each department is a separate legal entity. Five of them share the same fiscal calendar and three use different fiscal calendars. You can create one fiscal calendar for the five legal entities that share the same fiscal calendar, and then create separate fiscal calendars for the other legal entities.

Create fiscal calendars, fiscal years, and periods

You can create and delete fiscal calendars, fiscal years, and periods on the Fiscal calendars page. You can also divide existing periods and create closing periods that can be used to close a fiscal year.

A closing period is used to separate general ledger transactions that are generated when a fiscal year is closed. When the closing transactions are in one fiscal period, it is easier to create financial statements that either include or exclude different types of closing entries. If a fiscal year is divided into 12 fiscal periods, the closing period is usually the 13th period. However, a closing period can be created from any period that has a status of Open.

When you create a closing period, select a period that has a status of Open and that has the dates that you want to use. The new closing period will copy the starting and ending dates from the existing period. The original period will continue to exist. For example, you select Period 12, which is the last period in the fiscal year, and that has dates of August 1 through August 31. You enter a name for the closing period, such as Close. After you create the new closing period, you now have the original period and the closing period. Both have dates that start on August 1 and end on August 31.

Select fiscal calendars for ledgers, fixed assets, and budget cycles

Fiscal calendars are used with fixed asset depreciation, financial transactions, and budget cycles. When you create a fiscal calendar, you can use it for multiple purposes. You can select a fiscal calendar for a fixed asset book to make it a fixed asset calendar. You can select a fiscal calendar for a ledger to make it a ledger calendar. And you can select a fiscal calendar for a budget cycle to make it a budget calendar. You can use the same fiscal calendar for all of these.

Select a fiscal calendar for your legal entity

Select the fiscal calendar that you want to use for the ledger for your legal entity in the Ledger form. A fiscal calendar must be selected on the Ledger page for every legal entity. After a fiscal calendar is selected, you can set up period statuses and permissions on the Ledger calendar page for any of the periods that are part of a fiscal year.

Select a fiscal calendar for fixed assets

You can select a fiscal calendar for a fixed asset book, and that fiscal calendar will be used by the fixed assets that use the selected book. You can select from any fiscal calendar that is defined on the Fiscal calendars page.

Define budget cycle time spans

Budget cycles are the length of time during which a budget is used. Budget cycles can include part of a fiscal year or multiple fiscal years, such as a biennial budget cycle of two years or a triennial budget cycle of three years. The budget cycle time span defines the number of periods that are included in the budget cycle. To specify the budget cycle time span, use the Budget cycle time spans page.

Maintain periods for your organization

You can use the Ledger calendar page to view the details of the fiscal calendar, fiscal years, and periods used by your organization. You can also change the status of the periods and select which users can post accounting transactions to periods. For example, at the start of a new period, you might want a group of users to finish posting financial transactions in the previous period, while other groups work only in the new period.

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Financial dimensions

2/18/2021 • 9 minutes to read • [Edit Online](#)

This topic explains the various types of financial dimensions and how they are set up.

Use the **Financial dimensions** page to create financial dimensions that you can use as account segments for charts of accounts. There are two types of financial dimensions: custom dimensions and entity-backed dimensions. Custom dimensions are shared across legal entities, and the values are entered and maintained by users. For entity-backed dimensions, the values are defined somewhere else in the system, such as in Customers or Stores entities. Some entity-backed dimensions are shared across legal entities, whereas other entity-backed dimensions are company-specific.

After you've created the financial dimensions, use the **Financial dimension values** page to assign additional properties to each financial dimension.

You can use financial dimensions to represent legal entities. You don't have to create the legal entities in Dynamics 365 Finance. However, financial dimensions aren't designed to address the operational or business requirements of legal entities. The interunit accounting functionality in Finance is designed to address only the accounting entries that are created by each transaction.

Before you set up financial dimensions as legal entities, evaluate your business processes in the following areas to determine whether this setup will work for your organization:

- Inventory
- Sales and purchases between financial dimensions and legal entities
- Sales tax calculation and reporting
- Operational reporting

Here are some of the limitations:

- You can use sales tax functionality only with legal entities, not with financial dimensions.
- Some reports don't include financial dimensions. Therefore, to report by financial dimension, you might have to modify the reports.

Custom dimensions

To create a user-defined financial dimension, in the **Use values from** field, select **Custom dimension**.

You can also specify an account mask to limit the amount and type of information that can be entered for dimension values. You can enter characters that remain the same for each dimension value, such as letters or a hyphen (-). You can also enter number signs (#) and ampersands (&) as placeholders for characters that will change every time that a dimension value is created. Use a number sign (#) as a placeholder for a number and an ampersand (&) as a placeholder for a letter. The field for the format mask is available only when you select **Custom dimension** in the **Use values from** field.

Example

To limit the dimension value to the letters "CC" and three numbers, enter **CC-###** as the format mask.

Entity-backed dimensions

To create an entity-backed financial dimension, in the **Use values from** field, select a system-defined entity to base the financial dimension on. Financial dimension values are then created from that entity. For example, to

create dimension values for projects, select **Projects**. A dimension value is then created for each project name. The **Financial dimension values** page shows the values for the entity. If those values are company-specific, the page also shows the company.

Activating dimensions

When you activate a financial dimension, the table is updated so that it includes the name of the financial dimension. Deleted dimensions are removed. You can enter dimension values before you activate a financial dimension. However, a financial dimension can't be consumed anywhere until it's activated. For example, you can't add a financial dimension to an account structure until the financial dimension has been activated. When you select **Activate**, all dimensions are updated and show status changes.

Translations

On the **Text translation** page, you can enter text for the selected financial dimension in various languages. On the **Main account translation** page, you can enter text for the main account in various languages.

Legal entity overrides

Not all dimensions are valid for all legal entities. Additionally, some dimensions might be relevant only for a specific period. In these cases, you can use the **Legal entity overrides** section to specify the companies that the dimension should be suspended for, the owner, and the period when the dimension is active.

Deleting financial dimensions

To help maintain referential integrity of the data, financial dimensions can rarely be deleted. If you try to delete a financial dimension, the following criteria are evaluated:

- Has the financial dimension been used on any posted or unposted transactions, or in any type of dimension value combination?
- Is the financial dimension used in any active account structure, advanced rule structure, or financial dimension set?
- Is the financial dimension part of a default financial dimension integration format?
- Has the financial dimension been set up as a default dimension?

If any of the criteria are met, you can't delete the financial dimension.

Default dimension values

You can use values from master records, such as customer and vendor, as default values in new dimensions. When the new dimensions are created, the master record ID is entered in the dimension values for those master records. For example, when you create a new customer, the customer ID is entered in the customer dimension. When you create sales orders, invoices, or other documents that require a customer ID, the existing defaulting rules are used, and the customer ID is added to the document.

This feature is controlled by a setting in the dimension. This setting is named **Copy values to this dimension on each new DimensionName created**, where **DimensionName** is the name of the dimension. By default, the feature is turned off. However, it can be turned on at any time.

If records already exist for the dimension, the master records are updated when you turn the feature on. However, existing documents and transactions aren't updated.

If you are using a template to create a master record, make sure that the template value for the master dimension is blank. For example, if you're creating customers from a template, make sure that the customer dimension in the template is blank. The customer dimension value will default from the new customer number

when you create the new customer.

Derived dimensions

You can configure a dimension so that information for other dimensions is automatically entered when you enter that dimension in a document. For example, if you enter cost center 10, a value of **20** can be automatically entered in the department dimension.

You can set up derived values on the dimensions page.

1. Select a dimension and then select **Derived dimensions**.

The **Derived dimensions** page includes a grid. The selected dimension segment is the first column in this grid.

2. Add the segments that should be derived. Each segment appears as a column.

Enter the dimension combinations that should be derived from the dimension in the first column. For example, to use the cost center as the dimension that the department and location are derived from, enter cost center 10, department 20, and location 30. Then, when you enter cost center 10 in a master record or on a transaction page, department 20 and location 30 are entered by default.

Overriding existing values with derived dimensions

By default, the derived dimension process doesn't override existing values for derived dimensions. For example, if you enter cost center 10, and no other dimension is entered, department 20 and location 30 are entered by default. However, if you change the cost center, the values that have already been established aren't changed. Therefore, you can establish default dimensions on master records, and those dimensions won't be changed by derived dimensions.

You can change the behavior of derived dimensions to override existing values by selecting the **Replace existing dimension values with derived values** check box on the **Derived dimensions** page. If this field is selected, you can enter a dimension with derived dimension values and those derived dimension values will override any values that already exist. Using the previous example, if you enter cost center 10, and no other dimension is entered, department 20 and location 30 are entered by default. However, if the values were already department 50 and location 60, the values will now be changed to department 20 and location 30.

Derived dimensions with this setting do not automatically replace the existing default dimensions values when dimension values are defaulted. Dimension values will only be overridden when you enter a new dimension value on a page and there are existing derived values for that dimension on the page.

Preventing changes with derived dimensions

When you use **Add segment** on the **Derived dimensions page** to add a segment as a derived dimension, an option is provided at the bottom of the **Add segment** page that allows you to prevent changes to that dimension when it is derived on a page. The default setting is off so it does not prevent the derived dimension values from being changed. Change the setting to **Yes** if you want prevent the dimension from being changed after it has been derived. For example, if the value for the Department dimension is derived from the value of the Cost center dimension, the Department value cannot be changed if the **Prevent changes** setting is **Yes**.

The setting does not prevent changes if the dimension value is valid but it is not listed in the derived dimensions list. For example, if Department 20 is derived from Cost center 10 and you enter Cost center 10, then you will not be able to edit Department 20. However, if you enter Cost center 20 and it is not in the list of derived dimensions for Cost center, then you can edit the Department value.

In all cases, the account value and all dimensions values will still be validated against the account structures after the derived dimensions values have been applied. If you use derived dimensions and they fail validation when used on a page, you must change the derived dimensions values on the derived dimensions page before you can use them in transactions.

When you change dimensions on the **Financials dimensions** FastTab, the dimension that is marked to prevent changes will not be editable. If you are entering an account and dimensions into the segmented entry control on a page, the dimensions are editable. However, when you move the highlight off the segmented entry control and move to another field or take an action, the account and dimensions will be validated against the derived dimensions list and the account structures to ensure that you have entered the appropriate values.

Derived dimensions and entities

You can set up the derived dimensions segments and values by using entities.

- The Derived dimensions entity sets up the driving dimensions and the segments that are used for those dimensions.
- The Derived dimensions value entity lets you import the values that should be derived for each driving dimension.

When you use an entity to import data, if that entity imports dimensions, the derived dimension rules are applied during the import unless the entity specifically overrides those dimensions.

For more information, see the following topics:

- [Define financial dimensions](#)
- [Maintain financial dimension default templates](#)

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Financial dimensions and posting

2/18/2021 • 6 minutes to read • [Edit Online](#)

When you plan and set up your chart of accounts, you must consider how the various components will work together when you post a document or journal. These components include account structures, advanced rules, and balancing and fixed dimensions. This topic explains what each component is and how the components work together.

Chart of accounts and financial dimension components

A rich, rule-based system is used to define valid combinations of main accounts and financial dimension values. This section gives a brief overview of the functionality of each component and explains where you can find the component.

Account structures

An account structure is required when you set up your ledger. You must define and activate at least one account structure, and you must assign it to the ledger. The account structure must have the main account in it. You can define the order of segments that works best for the business. After the main account is defined, the system can determine the account structure that is used. By putting the main account first or near the front of a structure, you can help limit the values and also help the system apply the last known valid value as a default value. You can have up to 10 additional financial dimensions in the account structure. The account structure defines which dimension values are valid in combination with other values. It also defines whether dimension values must be entered.

Advanced rules

Advanced rules are an optional component when you set up the chart of accounts. You can add as many advanced rules as you want to an account structure. Advanced rules are often used to handle scenarios where additional financial dimensions must be tracked when specific criteria are met. For example, if you use a Travel expense account, you might want to track additional information, such as the event that the employee is traveling for. If there are multiple advanced rules, they are applied in alphabetical order, based on the names of the rules. The segments that a rule adds can be applied only after the segments of the account structure.

Balancing dimension

You can optionally define a balancing financial dimension. On the **Ledger** page, you can define the financial dimension that should be balanced. Then, whenever transactions are posted to that financial dimension, the system automatically creates and posts entries to make the financial dimension balanced.

Default/fixed financial dimensions on the main account

Default dimensions come from various places, such as master records (for example, customer or vendor records), document headers, and the main account. This topic focuses on default dimensions on the main account by legal entity. You can define whether a main account has a **Not fixed** or **Fixed** value for each financial dimension that is used across all account structures for the ledger. If a financial dimension is **Not fixed**, it uses a default value, but that value can be overwritten. This behavior applies to all default values in the system, even default values that come from master records. If a financial dimension is set to a **Fixed** value, that value is always applied, regardless of whether it came from somewhere as a default value or the user entered it.

Order in which default dimensions are applied during posting

People often have questions about the order that the various components run in. It's very important that you understand the order that default dimensions are applied in, because this behavior affects the approach that you

take to setup.

NOTE

This information applies only to the application of default dimensions in the application. If you import data by using Microsoft Excel or the Data Management Framework, the behavior differs.

Example 1

Account structure

MAIN ACCOUNT	BUSINESS UNIT	DEPARTMENT	COST CENTER
All values are allowed.	All values are allowed.	All values are allowed.	All values are allowed.

Main account

MAIN ACCOUNT	NAME	LEGAL ENTITY	DEPARTMENT
401100	Product Sales	USMF	Fixed – 022 Sales and Marketing department

The following illustration shows the fixed default dimension that is set on main account 401100.

Default financial dimensions

Specify the default dimensions for an account. When a financial dimension is fixed, the value specified for the dimension, including a blank value, will override the values on the transaction at time of post.

BankAccount	Not fixed		No default
BusinessUnit	Not fixed		No default
CostCenter	Not fixed		No default
Department	Fixed value	022	Sales & Marketing
ItemGroup	Not fixed		No default
Project	Not fixed		No default

For this very basic example, we will enter a general journal where the Department dimension is set to use the default value 023 (Operations). We will enter and post a ledger account. The following illustration shows the default financial dimension on the general ledger header.

General journals

Show

Not posted

Show user-created only

List General Setup Blocking **Financial dimensions** History

FINANCIAL DIMENSIONS

BankAccount

BusinessUnit

CostCenter

Department Operations

ItemGroup

Project

The default dimension on the journal header will cause department 023 to be applied by default on the sales account line. The following illustration shows the general journal line, where the 023 default dimension value from the header is applied.

00634 : GENJRN

Journal voucher

Display journal lines

All

List General Invoice Payment Payment fee Fixed assets Remittance History

+ New Delete Voucher Financial dimensions Sales tax Functions Tax information

✓	Date	Voucher	Company	Account type	Account
✓	7/27/2017	GNJL000804	USMF	Ledger	401100--023--

However, when the line is posted, the fixed dimension is applied, and the line is posted to department 022. The following illustration shows the posted voucher, where the fixed dimension is applied for the sales account.

00634 : GNJL000804

Voucher transactions

Overview General

✓	Journal number	Voucher	Date ↑	Year closed	Ledger account	Account name
	020856	GNJL000804	7/27/2017		401100--022--	Product Sales
	020856	GNJL000804	7/27/2017		110110--023	Bank Account - USD

Example 2

This example uses the same setup as the first example. However, we will add a second component and use the Department dimension as a balancing dimension. In the following illustration, **Department** is set as the balancing financial dimension for the USMF ledger.

Ledger

Description: Contoso Entertainment System U | Chart of accounts: Shared | Fiscal calendar: Fiscal | Balancing financial dimension: Department

Account structures

+ Add | Remove | Configure account structures

Account structure	Name
Manufacturing B/S	Manufacturing Balance Sheet
Manufacturing P&L	Manufacturing Profit and Loss
Statistical	Statistical

When the same journal header setup is used, and the same transaction is posted, the fixed dimension is applied first. Then the balancing logic is applied to help guarantee that every department has a balanced entry. The following illustration shows voucher transactions that include the balancing entry after the fixed dimension is applied.

00635 : GNJL000805

Voucher transactions

Overview | General

Journal number	Voucher	Date ↑	Year closed	Ledger account	Account name	Currency	Amount	As
020858	GNJL000805	7/27/2017		231500--023	Interunit Payable	USD	1,000.00	
020858	GNJL000805	7/27/2017		133500--022	Interunit Receivable	USD	1,000.00	
020858	GNJL000805	7/27/2017		401100--022--	Product Sales	USD	1,000.00	
020858	GNJL000805	7/27/2017		110110--023	Bank Account - USD	USD	1,000.00	

Example 3

In this example, we will add an advanced rule. The advanced rule specifies that if sales account 401100 and department 022 (Sales and Marketing) are used, the system should track an additional segment that is named Customer.

This example is important because of the order. The account structure is determined after the main account is entered. If you refer to the account structure setup, the system can determine that the main account, business unit, department, and cost center are relevant. At this point, the advanced rule hasn't been triggered, because fixed dimensions aren't applied until default dimensions have been applied for the journal voucher during posting. In the following illustration, the Customer segment isn't present, because the criteria for the advanced rule haven't been met.

Account	Description	Debit	Credit	Offset company	Offset account type
401100--023--			15,000.00	USMF	Ledger

Value	Description
401100	Product Sales

MainAccount: 401100 Product Sales

BusinessUnit:

Department: 023 Operations


CostCenter:

The posting won't be successful, because the fixed dimension was applied at the end of the process. Dimension validation determines that the Customer segment is required if the main account is 401100 and the department is 022. Posting can't occur because of the validation error. The following illustration shows the message that


appears after dimension validation determines that Customer is a required segment.


Message details


Posting results for journal batch number 00636

 Voucher GNJL000806


 Voucher GNJL000806

 You must select a value in the Customer field in combination with the following dimensions values that are valid:


 MainAccount 401100.


 BusinessUnit <blank>.


 Department 022.

 CostCenter <blank>.

 ItemGroup <blank>.

 Dimension values were validated with this advanced rule structure: Customer

 Reported from company accounts usmf

 Posting has been canceled.

In this example, you must overwrite the default value so that the advanced rule is triggered and you can enter the Customer segment. However, this solution isn't always possible, and some users aren't even aware of the posting rules. Therefore, it's important that you understand the order that default dimensions are applied in when you set up your chart of accounts.

To achieve what you want in this example, you can change the configuration in several ways. For example, you can create a new account structure for sales accounts and include the Customer segment in the structure. You can also add more rows in an existing account structure, and specify the main account and valid department values. Then, in the additional customer structure, you might find it useful to have a separate account structure of sales accounts where the Customer segment is present.

Additional resources

Some of the following resources refer to an earlier version of our software. However, much of the information about the application of default dimensions and many of the concepts are the same in the earlier version, and the references are still valid.

[Balanced journals for interunit accounting](#)

[Plan your chart of accounts](#)

[Planning your chart of accounts in AX 2012 blog](#) – This link goes to part 1 of a seven-part series.

[Dimension defaulting in accounting distributions](#)

[Dimension defaulting in Dimensions framework](#)

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Add financial dimensions to the CFO workspace

2/18/2021 • 2 minutes to read • [Edit Online](#)

This topic explains how to add financial dimensions to the Chief Financial Officer (CFO) workspace, so that they can be used for the ledger and budget reports. The CFO workspace has an **Overview** tab and a **Financial** tab. The reports on these two tabs are backed by two measures: `LedgerActivityMeasure` and `BudgetActivityMeasure`. There is a relation between those two measures and the `DimensionCombinationEntity` entity. Therefore, you can select dimensions.

1. In Finance, on the **Entity Store** page, update the **LedgerActivityMeasure** and the **BudgetActivityMeasure** measures.
2. In Microsoft Visual Studio, open Application Explorer, and search for **LedgerCFO**.
3. Under **Resources**, open **LedgerCFOWorkspacePBIX**.
4. When the resource opens in Microsoft Power BI desktop, select **Get Data**, select **SQL Server database**, and then select **Connect**.
5. Enter the server name, and enter **AxDW** as the database. Select **DirectQuery**, and then select **OK**.
6. Search for and select **LedgerActivityMeasure_DimensionCombination**, and then select **Load**.

TIP

In the **Fields** list, rename the table **Financial dimensions**, so that it's easy to identify.

7. Select **Manage Relationships**, and then select **New**.
8. In the first field, select **General Ledger Activities**, and then select **LedgerDimension**.
9. In the second field, select **LedgerActivityMeasure_DimensionCombination** (or **Financial dimensions** if you renamed the table). Select the **DimensionCombinationRECID** header.
10. In the **Cardinality** field, select **Many to One**.
11. Change the **Cross filter direction** value to **Single**.
12. Select both **Make this relationship active** and **Assume referential integrity**, select **OK**, and then select **Close**.

Create relationship ✕

Select tables and columns that are related.

General Ledger Activities

LEDGERGREGORIANDATEID	MAINACCOUNTRECID	LEDGERRECID	LEDGERDIMENSION	Accounts payable	C

LedgerActivityMeasure_DimensionCombination

DIMENSIONCOMBINATIONRECID	DISPLAYVALUE	MAINACCOUNT	ACCOUNTVALUE	PARTITION

Cardinality: Many to one (*:1)

Cross filter direction: Single

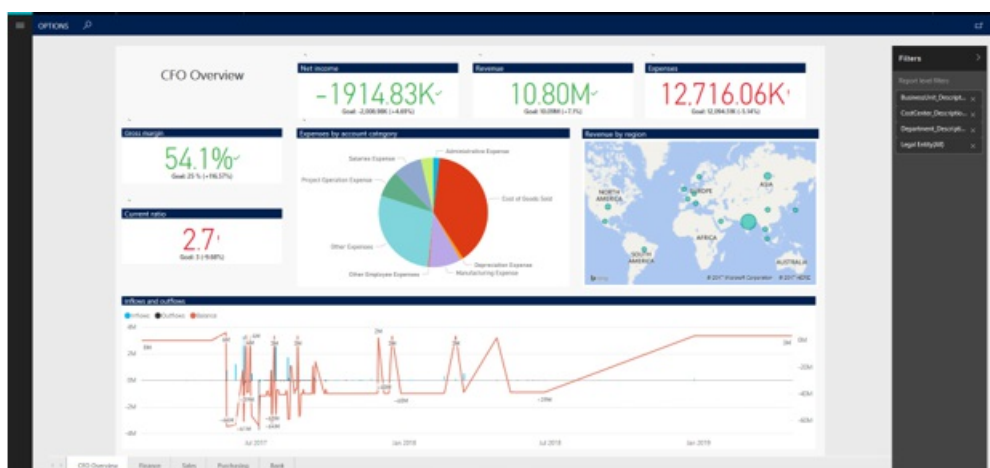
Make this relationship active

Assume referential integrity [Learn more](#)

Apply security filter in both directions

OK
Cancel

13. In the **Fields** list, you should see the table and the available financial dimensions. Drag the financial dimensions that you want to the report-level filters.
14. Save your changes.
15. In the Application Object Tree (AOT), right-click your project, and then select **Synchronize**.
16. Build your project, and then open the application to view the results.



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Create account structures

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This task guide steps through creating an account structure. The steps use demo data company USMF.

1. Go to **Navigation pane > Modules > General ledger > Chart of accounts > Structures > Configure account structures**.
2. On the **Action pane**, click **New** to open the drop dialog.
3. In the **Account structure** field, type a name to describe the purpose of the account structure.
4. In the **Description** field, type a description to specify the purpose of the account structure.
5. Click **Create**.
6. In the **Segments and allowed values**, click **Add segment**.
7. In the dimensions list, select the dimension to add to the account structure.
8. At the end of the list, click **Add segment**.
9. Repeat step 6 to 9 as needed.
10. In the **Allowed value details** section, select the segment to edit the allowed values. For example, click the **Main Account** field.
11. In the **Operator** field, select an option, such as is between and includes.
12. In the **Value** field, type a value. For example, 600000.
13. In the **through** field, type a value. For example, 699999.
14. In the **Allowed value details** section, click **Apply**.
15. Repeat step 10 to 15 as needed.
16. In the **Allowed value details** section, click **Add new criteria**.
17. In the **Operator** field, select an option, such as is between and includes.
18. In the **Value** field, type a value. For example, 033.
19. In the **through** field, type a value. For example, 034.
20. Click **Apply**.
21. In the grid, select the segment to edit the allowed values. For example, Cost Center.
22. In the **CostCenter** field, type a value. For example, 007..021.
23. In the **Segments and allowed values**, click **Add**.
24. In the **MainAccount** field, type a value. For example, 600000..699999
25. In the grid, select the segment to edit the allowed values. For example, Department.
26. In the **Department** field, type a value. For example, 032.
27. In the **CostCenter** field, type a value. For example, 086.
28. On the **Action pane**, click **Validate**.
29. On the **Action pane**, click **Activate**.
30. Click **Activate**.

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Budgeting overview

2/18/2021 • 6 minutes to read • [Edit Online](#)

Almost every company that uses Financials functionality in Microsoft Dynamics 365 Finance will have to be able to create reports of budget vs. actuals. This article explains the minimum configuration that is required in order to create budgets in Finance and Operations or load them from a third-party program.

Overview

The approved budget for a legal entity is maintained in a document that is known as a *budget register entry*. The lines in a budget register entry document are known as *budget account* entries, and contain financial dimension information, dates, and the amounts of the approved budget. The budget register entry document is integrated with basic financial reports and inquiry pages where ledger actual amounts are compared to budget amounts.

There are multiple methods for creating budget register entries:

- Manually enter the document information on the **Budget register entries** page.
- Use the Microsoft Excel template that you can open by clicking the **Open in Excel** button on the **Budget register entries** page.
- Use the **Budget Account Entries** data entity in Data management to import budget register entries. You should consider using this method and turning on the **Set based **processing ****parameter when you must import many budget account entries into the system.
- If the company uses Budget planning functionality to prepare budget data, you can use the **Generate budget register entry** periodic process.

The budget register entry is considered completed when the budget balances have been updated. On the **Budget register entries** page, click **Update budget balances** for a selected budget register entry or multiple entries. After you update the budget balances, the status of the budget register entry changes to **Completed**. Completed budget register entry can't be re-opened for edits. Therefore, if the budget data must be adjusted, you must create a new budget register entry instead of correcting data in the completed budget register entry.

Configuration

When you configure budgeting, start on the **Budgeting parameters** page. On this page, you must define the budget journal, the number sequence for budget register entries, and the default behavior in the workspaces.

Next, if there are policies that govern the approval of budget register entries, based on budget type (for example, transfers or revisions), you must create budget register entry workflows on the **Budgeting workflows** page. If there are scenarios where transfers might be allowed without workflow approval, you can define budget transfer rules to support those scenarios.

On the **Budgeting dimensions** page, you must select the financial dimensions that are used for budgeting, based on the dimensions that are used in the chart of accounts. You can select all financial dimensions or a subset of them for budgeting.

Define a **budget model* that corresponds to all or some of the budgets. You can use a single budget model for all budget register entries. Alternatively, you can create separate models that are based on the budget type, the geographical location, or some other way that a budget can be classified.

NOTE

If budget control is used, you can associate only one budget model with a specific budget cycle time span.

Create *budget codes* that identify the type of budget transactions to record and any related workflow. Budget codes can support the following budget types:

- Original budget
- Transfer
- Revision
- Encumbrance
- Pre-encumbrance
- Carry-forward budget

Budget codes let you have an audit trail of approved budget modifications throughout the course of the budget cycle. If a workflow is associated with a budget code, the workflow will be enabled for all budget register entries that use that budget code, and workflow steps must be completed before the budget register entry can reach the **Completed** stage.

You can also optionally set up *budget transfer rules*. To use budget transfer rules, select **Use rules for budget transfers** on the **Budget parameters** page. When budget transfer rules are used, if a user creates a document by using a budget code of the **Transfer** type, budget balances won't be updated if the budget transfer rules are violated. For example, you can allow budget transfer documents where the expense budget is transferred between the main accounts for the Sales and Marketing department, but can prohibit budget from being transferred from or to that department unless workflow approval has been granted for that type of budget account entry.

Functionality that was introduced in Microsoft Dynamics 365 Finance version 10.0.7 (January 2020) added capability and flexibility for budget register entries. To enable these enhancements, go to the **Feature management** workspace and select **Budget register entries for quantity only** and/or **Budget register entries defaulting of amount type**.

The **Budget register entries for quantity only** feature lets you post a budget register entry with quantity-only amounts. For example, you could post a budget entry with a quantity of 32 and a price of zero, which results in an amount of zero. You can then use this quantity within the context of a financial report to determine a price per quantity. Note that no inquiries or reports were updated as part of this feature; the feature just enables you to post an amount of zero.

The **Budget register entries defaulting of amount type** feature allows the default amount type within a budget register entry to be an amount type other than expense. The budget register entry line now will default to expense when the main account type is expense; will default to revenue when the main account type is revenue; and will default to expense for all other account types.

Using workspaces and inquiry pages to track budget vs. actuals

The budget manager can review the current state of a budget in the **Ledger budgets and forecasts** workspace. The **Expense over budget** and **Revenue under budget** tabs provide a quick view of the financial dimension combinations where budget targets aren't being met or are approaching the threshold. You can personalize the budget threshold percentage and financial dimension sets that are used on those tabs by clicking **Configure my workspace**. You can click **Unit managers** to see the workers who are responsible for specific financial dimension combinations that are selected on those tabs. For example, if you see that the expense budget of the Operations department is going over the budget threshold, you can easily find and contact the Operations department manager to discuss the issue.

NOTE

The **Department manager** field on the **Organization Units** page determines which managers support specific financial dimension combinations. Click **See more** at the bottom of the tab to open the **Budget vs actuals** inquiry page for more details about budget amounts versus actual amounts.

The **Actual vs budget** inquiry page lets you drill into the details of the budget versus actual amounts. Select a line on the inquiry page, and then click **Period balances** to see budget and actual amounts spread across fiscal periods. The **Budget account entries** page provides drill-through to the details of the budget amount in budget register entries. The **General journal entries** page opens the ledger transactions that are included in the calculated **Actuals** amount.

A company that is using Budget planning functionality can create and use *budget forecasts* in the **Ledger budgets and forecasts** workspace.

NOTE

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Create dimensions and import dimension members

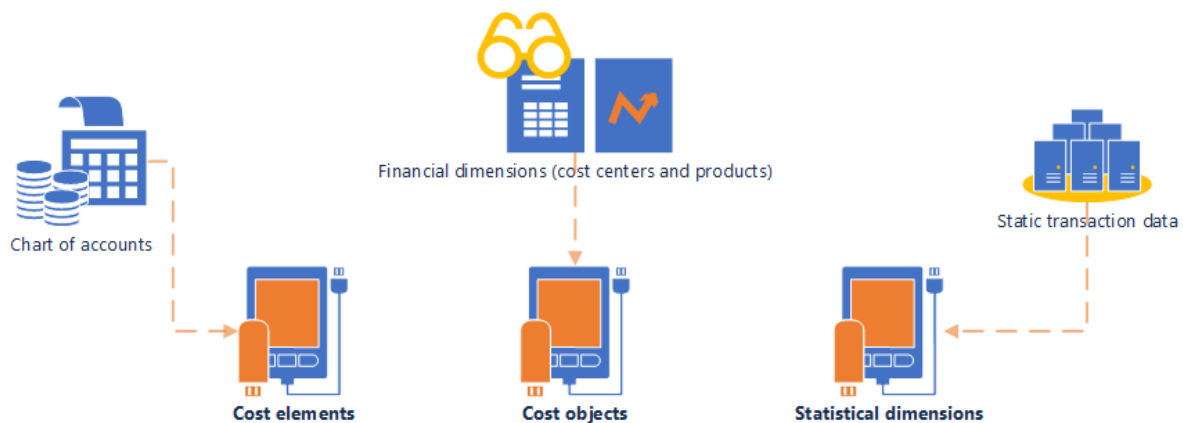
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Cost accounting is an independent module that requires data from other modules. This data is categorized into the following:

- Cost elements
- Cost objects
- Statistical dimensions

A **Cost element** corresponds to a cost-relevant item in the chart of accounts. A **Cost object** corresponds to any type of financial dimension, such as products, cost centers, and projects that you want to estimate, allocate costs to, or measure directly. A **Statistical dimension** and its members are used to register non-monetary entries. Statistical dimension members can be used as an allocation base in cost distribution and allocation

The following diagram illustrates the dimensions that are used in Cost accounting.



After the data is imported into Cost accounting, you can use it to build various perspectives that provide insights to managers at all levels of the organization. The following topics provide information about creating dimensions and importing dimension members.

- [Cost element dimensions](#)
- [Create cost elements](#)
- [Cost object dimensions](#)
- [Map cost element dimension members to a common set of dimension members](#)
- [Map a cost element dimension](#)
- [Statistical dimension members and statistical measure provider templates](#)

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Cost element dimensions

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As one of the core pillars in Cost accounting, cost element dimensions are used to categorize and track where costs flow to.

A cost element corresponds to a cost-relevant item in the chart of accounts. Basically, it can be any type of element at the lowest level in a business where costs can flow to. Cost elements as a concept range from ledger accounts to all cost-relevant resources. Currently, Cost accounting supports ledger accounts.

Two types of cost elements

There are two types of cost elements: primary cost elements and secondary cost elements. The following table describes the difference between the two types.

Primary cost elements	Secondary cost elements
<p>The primary cost elements represent the flow of costs from financial accounting to cost accounting. The cost element structure corresponds to the profit and loss account structure in the general ledger, where a cost element can correspond to a main account. Not all main accounts may necessarily be represented as cost elements depending on the business needs. Examples of primary cost elements include:</p> <ul style="list-style-type: none">• Costs of goods sold (COGs)• Indirect material costs• Personnel costs• Energy costs	<p>The secondary cost elements represent the flow of costs internally because these costs are created and used only in Cost accounting. They are used to secure that the source of costs can be traced. These cost elements are used in cost allocations and overhead calculations. Examples of secondary cost elements include:</p> <ul style="list-style-type: none">• Production costs• Production, material, and marketing overheads

Cost element dimensions and cost element dimension members

Cost elements are referred to as *cost element dimensions*. The individual dimension values are called *cost element dimension members*. For example, you have a US chart of accounts structure (COA) that is the base for your statutory reporting. This COA is used as the cost element dimension. The accounts, which are primary cost elements, are represented as the cost element dimension members in Cost accounting. The following screenshot shows an example of Main Accounts as the cost element dimension with its actual main accounts as the cost element dimension members.

Cost element dimension members

✓ Cost elements	Description	Type
401100	Product Sales	Primary
401200	Service Revenues	Primary
401300	Other Revenues	Primary
401400	Accrued Sales (Shipped Not Inv...	Primary
402100	Sales Adjustment Internal	Primary
402200	Intercompany Accrued Sales (Pa...	Primary
402300	Intercompany Sales - USMF/DE...	Primary
402400	Intercompany Sales - USSI/GBSI	Primary

Import cost element dimension members through data connectors

To ease the setup of cost element dimension members in Cost accounting, you can use data connectors that are either pre-built or your custom build to retrieve the primary cost elements from one or more source systems.

Implementation considerations

As cost elements represent the lowest level of cost details, you should make sure that all the cost elements required to make the managerial reporting are included when you implement the cost elements structure. It can be a challenge to find an appropriate number of cost elements for cost control. Having thousands of cost elements can make it difficult to control each cost element. As an alternative, you can group cost elements and manage cost control at an aggregated level.

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Create cost elements

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There are several ways to create cost elements in Cost accounting. This procedure shows how to create cost elements by importing main accounts via a data connector. The USMF demo company was used to create this procedure. This procedure is for a Cost accounting feature that was added in Dynamics 365 for Operations, version 1611.

Create new cost elements

1. Go to Cost accounting > Dimensions > Cost element dimensions.
2. Click New.
3. In the Name field, type a value.
4. In the Data connector for dimension members field, enter or select a value.
5. In the Description field, type a value.
6. Click Save.

Configure the data connector

1. Click Configure dimension member provider.
2. In the Chart of accounts field, enter or select a value.
 - Select Shared to use the shared chart of accounts.
3. Click New.
4. In the list, mark the selected row.
 - You can apply filters to accounts to meet your criteria.
5. In the From main account field, enter or select a value.
6. In the To main account field, enter or select a value.
7. Click OK.

Import main accounts

1. Click Import dimension members.
 - Main accounts will be imported into Cost accounting and used as cost elements.
2. Click OK.

View the imported accounts as cost elements

1. Click View dimension members.
 - View the imported ledger accounts as cost elements in your business that costs can flow to.

NOTE

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Cost object dimensions

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When you analyze costs, you use cost element dimensions to determine where costs flow to. You use cost object dimensions to determine where you should assign costs. This topic provides information about cost object dimensions.

A cost object can be any type of object that you want to estimate, allocate costs to, or measure directly. Typical cost objects include products, projects, resources, departments, cost centers, and geographical regions. Management uses cost objects to quantify costs and also to drive profitability analysis.

Cost object dimensions and cost object dimension members

Cost objects are known as *cost object dimensions*. After you've decided which entity the cost object dimension should refer to, you must specify the individual dimension values or import them into Cost accounting from other source systems. These individual dimension values are known as *cost object dimension members*. For example, you want to use the financial dimension that is named Cost center as the cost object dimension. To see how costs flow to the individual cost centers, you must import the cost object dimension members. In this case, the cost object dimension members are the actual cost centers, such as Sales, Production, Administration, and Geographic locations. The following screenshot shows an example of Cost Centers as the cost object dimension with its actual cost centers as cost object dimension members.

COST CENTERS

Cost object dimension members

✓ Cost centers	Description
007	Trade Shows
008	Marketing Campaign
009	Service Operations
010	Production
011	Quality Control
012	Logistics
013	Procurement
014	Administration

Import cost object dimension members through data connectors

To make the import of cost object dimension members easier, you use data connectors to retrieve the values from the entities that you want to use as cost object dimensions. You can use either the pre-built data connectors or custom data connectors that you build.

NOTE

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Create cost objects

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This procedure shows how to create cost objects by importing the cost center financial dimension into Cost accounting via a data connector. The USMF demo company was used to create this procedure.

Create new cost objects

1. Go to Cost accounting > Dimensions > Cost object dimensions.
2. Click New.
3. In the Name field, type a value.
4. In the Data connector for dimension members field, enter or select a value.
5. In the Description field, type a value.
6. Click Save.

Configure the data connector

1. Click Configure dimension member provider.
 - Select CostCenter to import the CostCenter dimension into Cost accounting.
2. In the Dimension name field, select Cost center.
3. Click OK.

Import cost centers

1. Click Import dimension members.
2. Click OK.

View the imported cost centers

1. Click View dimension members.

NOTE

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Map cost element dimension members to a common set of dimension members

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By mapping different cost element dimension members to a common set of cost element dimension members, you merge data into a common format for analysis purposes.

If you're a global company and comply with statutory accounting requirements, you might use multiple charts of accounts. When you import cost element dimension members from different charts of accounts, you can end up with a mix of accounts. However, these accounts might actually have the same nature, and you might want to analyze and allocate costs for them by using a common format.

Map cost element dimension members to a common format

The following example shows how you, as a cost controller, can create a new cost element dimension in Cost accounting that maps cost element dimension members from the US chart of accounts structure and the French chart of accounts structure to a common set of cost element dimension members. You can then use the common set of cost element dimension members to analyze cost data from the two legal entities in a cost accounting ledger.

SOURCE: US CHART OF ACCOUNTS	SOURCE: FRENCH CHART OF ACCOUNTS	NEW COMMON SET OF COST ELEMENT DIMENSION MEMBERS
Imported cost element dimension members from the US chart of accounts	Imported cost element dimension members from the French chart of accounts	Mapping of US and French cost element dimension members to a common set
5001: Sales	5001: Sales and advertising	5000: Sales and advertising
5030: Advertising	6390: Stock purchase*	7000: Cleaning expenses
7001: Cleaning expenses	7001: Travel expense	7001: Travel expenses

*The Stock purchase French cost element dimension member isn't mapped.

Currency conversion

The various charts of accounts that you use might be set up to use different currencies. In this case, be sure to specify a currency conversion, so that cost data is processed by using the correct currency, as defined in the cost accounting ledger where the cost element dimension members are used. In the preceding example, if US dollars (USD) are used in the cost accounting ledger, you must create a currency conversion from USD to euros (EUR) to process transactions for the mapped cost element dimension members.

Update mappings at any time

You can update the mapping definitions for a cost element dimension at any time. Because mappings aren't date-effective, changes are applied the next time that you process cost transactions or run cost calculations.

NOTE

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Map a cost element dimension

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A cost controller can use this procedure to map a cost element dimension to a cost element dimension in the MXMF legal entity. This recording uses the USP2 demo data company.

1. Go to Cost accounting > Dimensions > Cost element dimensions.
2. In the list, find and select the desired record.
 - For this example, select Cost elements.
3. Click Dimension mappings.
4. Click Configure mappings from this dimension.
5. Click New.
6. In the To dimension field, enter or select a value.
 - For this example, select MXMF Cost elements.
7. Click New.
8. In the list, mark the selected row.
9. In the From dimension member field, enter or select a value.
 - For this example, select dimension member 606400 Telephone & Fax Expense.
10. In the To dimension member field, enter or select a value.
 - For this example, select dimension member 6001004 Telefono.
11. Click Save.

NOTE

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Dimension hierarchy

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This topic provides information about dimension hierarchies. You use a dimension hierarchy to define the reporting structure, cost policies, and security setup in Cost accounting.

Overview

Dimension hierarchies are used in various places in Cost accounting. A dimension hierarchy lets you define the following information:

- The reporting structure that fits into the organization's requirements
- Cost policies
- The security setup

Here is an example of a dimension hierarchy.

The screenshot displays the SAP S/4HANA Cost Accounting interface. On the left is a navigation tree under 'CDS P/L' with 'Business travel' selected. The main area shows the 'Dimension hierarchy' configuration for 'Business travel'. The 'Node name' is 'Business travel'. Under 'Dimension member ranges', there is a table with one entry:

From dimension member	To dimension member
601500	601509

A dimension hierarchy can be created for the following types of dimensions:

- Cost element dimensions
- Cost object dimensions
- Statistical dimensions

NOTE

- You can create multiple dimension hierarchies for the same dimension if different perspectives are required.
- A dimension hierarchy can be associated with only one dimension.
- A dimension hierarchy can have unlimited levels in its structure. All the levels will be available in the **Cost control** workspace. When you use Microsoft Excel or Microsoft Power BI for reporting purposes, only the first 15 levels of the dimension hierarchy are exported. This limitation exists because both Excel and Power BI require a fixed schema.
- A dimension hierarchy isn't date-effective. Therefore, any change to a dimension hierarchy is immediately saved to the record, and you can't compare the before date and after date.

Dimension hierarchy type

When you create a new dimension hierarchy, you must select a hierarchy type. Go to **Cost accounting > Dimensions > Dimension hierarchies**. Click **New**, and select a dimension hierarchy type. You can select either **Dimension categorization hierarchy** or **Dimension classification hierarchy**.

Dimension categorization hierarchy

The **Dimension categorization hierarchy** type is used for reporting purposes. It supports only the cost element dimensions. When you select this type, the following rules apply:

- A dimension member can be associated more than one time in the hierarchy structure.
- You can put a cost element dimension member in different nodes by assigning a cost behavior to the leaf node.

Dimension classification hierarchy

The **Dimension classification hierarchy** type is used to define rules and for reporting purposes. It supports all dimensions, such as cost objects, cost elements, and statistical dimensions. When you select this type, a dimension member can be associated only one time in the hierarchy structure.

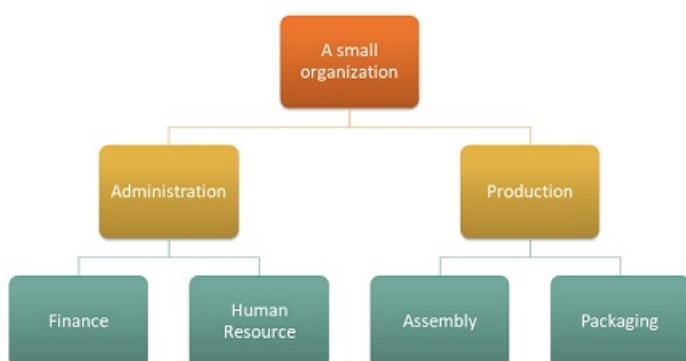
Create and maintain a dimension hierarchy

A dimension hierarchy is created as a tree structure that has node and leaf node relationships.

- A node can have 1:n subnodes.
- A node can't have both subnodes and leaf nodes assigned to it.
- A leaf node can be assigned only at the lowest level in the hierarchy.

Example

A small company has the following organization structure, where Finance and Human resources are departments under Admin, and Assembly and Packaging are departments under Production.



A cost object dimension represents all the cost centers in the organization.

- Cost object dimension
 - Cost centers

The cost object dimension that represents all the cost centers can be set up as shown here.

COST CENTERS	DESCRIPTION
CC001	HR
CC002	Finance
CC003	Tax
CC007	AR/AP
CC005	Assembly
CC006	Packaging

A cost element dimension represents all the cost elements in the organization.

- Cost element dimension
 - Cost elements

The cost element dimension that represents all the cost elements can be set up as shown here.

COST ELEMENTS	DESCRIPTION
10001	Electricity
10010	Cleaning
10011	Heating
40001	COGS

A dimension hierarchy that meets the organizational reporting requirements can be set up as shown here.

Dimension hierarchy details

DIMENSION HIERARCHY NAME	DIMENSION	DIMENSION HIERARCHY TYPE NAME	ACCESS LIST HIERARCHY
Organization	Cost centers	Dimension classification hierarchy	No

The dimension hierarchy for reporting can be set up as shown here.

	DIMENSION MEMBER RANGES	
Nodes	From dimension member	To dimension member
Organization		
Admin		

	DIMENSION MEMBER RANGES	
Finance	CC002	CC003
	CC007	CC007
HR	CC001	CC001
Production		
Packaging	CC005	CC005
Assembly	CC006	CC006

A dimension hierarchy that meets the policy requirement can be set up as shown here.

Dimension hierarchy details

DIMENSION HIERARCHY NAME	DIMENSION	DIMENSION HIERARCHY TYPE NAME
Cost behavior	Cost elements	Dimension classification hierarchy

The dimension hierarchy for the policy can be set up as shown here.

	DIMENSION MEMBER RANGES	
Nodes	From dimension member	To dimension member
Cost behavior		
Fixed cost	10001	10011
Variable cost	40001	40010

NOTE

Under **Dimension member ranges**, a node can contain 1:n dimension member ranges. You can insert dimension member IDs that don't yet exist as dimension members. This approach makes the hierarchy resilient for the future.

Copy a hierarchy

You can copy a current dimension hierarchy as the starting point for a new dimension hierarchy. This approach can be useful if you want to compare the previous dimension hierarchy to the new dimension hierarchy.

Rearrange nodes in a hierarchy

You can move a node up and down within its current level in the structure. In this way, you can rearrange the order of nodes for reporting in the **Cost control** workspace.

You move a node to a new location in the hierarchy by selecting the target node. There are two ways to move a node:

- **Move below** – Move the selected node from its current position in the hierarchy, and insert it **under** the selected target node.
- **Move after** – Move the selected node from its current position in the hierarchy, and insert it **after** the

selected target node at its level of the hierarchy.

NOTE

The order of the nodes isn't maintained when you export data to Excel or Power BI, because those tools use an alphanumeric sort order by default. You should manually rearrange the order.

Define dimension hierarchies for reporting

Dimension hierarchies are important for reporting. They let you define the specific structure that fits into the individual organization. The aggregations that are done at the node level of the dimension hierarchy let stakeholders at any level of the organization see data at any level.

Dimension hierarchies are available in the following reporting tools. This approach helps guarantee consistency in the reporting structure.

- **Cost control** workspace (Client):
 - Controlled by configuration.
- **Cost control** workspace (Mobile application):
 - Controlled by configuration.
- Excel
 - Provides the option to select specific dimension hierarchies per export definition:
 - One cost element dimension hierarchy (mandatory)
 - One cost object dimension hierarchy (optional)
 - One statistical dimension hierarchy (optional)
- Power BI:
 - All dimension hierarchies are available.

If you create reports by using Excel or Power BI, only the first 15 levels of the dimension hierarchies are exported. This limitation exists because a fixed schema is required in Excel and Power BI. If a hierarchy has more than 15 levels, the additional levels won't be exported. The normalized table contains a record for each dimension member in the hierarchy. Therefore, automated aggregation occurs. This behavior helps guarantee that the balances at any of the 15 available levels in the hierarchy are still correct.

The following example shows what a dimension hierarchy might look like in the reporting structure.

COST OBJECT DIMENSION HIERARCHY – LEVEL 1	COST OBJECT DIMENSION HIERARCHY – LEVEL 2	COST OBJECT DIMENSION HIERARCHY – LEVEL 3	COST OBJECT DIMENSION HIERARCHY – LEVEL 4	COST OBJECT DIMENSION HIERARCHY – LEVEL 15
Organization	Admin	Finance	CC002	
Organization	Admin	Finance	CC003	
Organization	Admin	Finance	CC007	
Organization	Admin	HR	CC001	
Organization	Production	Packaging	CC005	

COST OBJECT DIMENSION HIERARCHY – LEVEL 1	COST OBJECT DIMENSION HIERARCHY – LEVEL 2	COST OBJECT DIMENSION HIERARCHY – LEVEL 3	COST OBJECT DIMENSION HIERARCHY – LEVEL 4	COST OBJECT DIMENSION HIERARCHY – LEVEL 15
Organization	Production	Assembly	CC006	

Update the dimension hierarchies that are used for reporting

Over time, the dimension hierarchies that are used in the previously mentioned reporting tools will have to be updated. You can update dimension hierarchies by refreshing the client.

- **Cost control** workspace (Client)
- **Cost control** workspace (Mobile application)

Updates to dimension hierarchies are picked up every 24 hours by a pre-cached job. After the exported data is updated, the updated dimension hierarchies are available in the following tools:

- Excel
- Power BI

NOTE

To manually trigger an update of the dimension hierarchy cache, you can create a new export to Excel for the dimension hierarchy or hierarchies that must be updated.

Define dimension hierarchies for cost policies

Cost accounting consists of multiple policies where detailed rules are defined. You must define one or more dimension hierarchies for the following policies:

- Cost behavior
- Cost distribution
- Cost allocation
- Cost rollup

Dimension hierarchies make it easy to create rules. To avoid having to create rules for every dimension member, you can take advantage of the aggregations of dimension members that are provided by dimension hierarchy levels. If you have overlapping rules, you must define specific rules that the system will consider when it does the overhead calculation.

Example: Define a cost behavior policy

A new cost behavior policy is created, and appropriate dimension hierarchies are assigned to the policy, as shown here.

Cost behavior policy

POLICY NAME	COST ELEMENT DIMENSION HIERARCHY	COST OBJECT DIMENSION HIERARCHY	ACCOUNTING CURRENCY
Cost behavior	Cost behavior	Organization	USD

Rules

COST ELEMENT DIMENSION HIERARCHY NODE	COST OBJECT DIMENSION HIERARCHY NODE	FIXED PERCENTAGE	FIXED AMOUNT	VALID FROM	VALID TO
Fixed cost	Organization	100.00	0.00	1/1/2017	Never
10001	Organization	0.00	150.00	1/1/2017	Never
10001 (*)	Finance		50.00	1/1/2017	Never
Cost behavior or Variable cost (**)	Organization	0.00	0.00	1/1/2017	Never

* The variable cost node isn't required. If a cost isn't classified as a fixed cost, it must be a variable cost.

** A detailed rule is created for the combination of cost element member 10001 and all cost object members that are aggregated under the Finance hierarchy level (CC002, CC003, CC007).

The preceding rules show the flexibility that dimension hierarchies provide. By defining high-level rules, you can help minimize maintenance. You can then define detailed rules to fit into a specific business objective.

If the dimension hierarchies that are used in rules are updated, the system automatically brings the updates forward.

If a level of granularity in the rules is no longer required, the rule can be expired.

For example, a specific cost behavior rule for the Finance cost object dimension hierarchy node is no longer required. In this case, click **Expire rule** to expire the rule.

COST ELEMENT DIMENSION HIERARCHY NODE	COST OBJECT DIMENSION HIERARCHY NODE	FIXED PERCENTAGE	FIXED AMOUNT	VALID FROM	VALID TO
Fixed cost	Organization	100,00	0,00	1/1/2017	Never
10001	Organization	0,00	150,00	1/1/2017	Never
10001	Finance		50,00	1/1/2017	20/1/2017
Cost behavior or Variable cost	Organization	0,00	0,00	1/1/2017	Never

Any overhead calculation that is run after January 20, 2017, no longer considers this rule.

NOTE

The **Valid from** and **Valid to** fields are date-effective and time-effective. You can expire the rule and run a new overhead calculation on the same day.

Define dimension hierarchies for security setup

Cost accounting data should be made available to all managers who are responsible for a reporting unit. In Cost accounting terminology, a reporting unit is represented as a cost object or a set of cost objects.

Potentially, all managers will be able to access highly sensitive business data, such as revenues and margins.

Therefore, it's important that you set up security, so that managers see only the data that is relevant to them. To help control data security, you define dimension hierarchies.

- The use of dimension hierarchies applies only when the dimension value that is selected in the dimension hierarchy reference is a cost object dimension.
- Only one dimension hierarchy can be enabled per cost object dimension in the access list hierarchy.

Dimension hierarchy details

DIMENSION HIERARCHY NAME	DIMENSION	DIMENSION HIERARCHY TYPE NAME	ACCESS LIST HIERARCHY
Organization	Cost centers	Dimension classification hierarchy	Yes

A new **Users** FastTab is available in the hierarchy designer. Here, you can insert one or more user IDs at each node in the hierarchy.

	USERS	DIMENSION MEMBER RANGES	
Nodes	User ID	From dimension member	To dimension member
Organization	Benjamin, Claire		
Admin	April		
Finance	Alicia	CC002	CC003
		CC007	CC007
HR	Arnie	CC001	CC001
Production	David		
Packaging	Ellen	CC005	CC005
Assembly	Chris	CC006	CC006

NOTE

Cost accountants should be assigned to the top level of the hierarchy, so that they can see all entries in Cost accounting.

To enable the access list hierarchy and its security settings, go to **Cost accounting > Setup > Parameters > General**. Select the **Enable view access for cost object dimension members** parameter.

The settings for the access list hierarchy are used to control the data that is shown in the following areas:

- **Cost control** workspace (Client):
 - Data in forms that are used to drill through scenarios
- **Cost control** workspace (Mobile application):
 - Balances in cards

- Power BI:
 - Data that is shown in Power BI visualizations
 - Data Power BI visualizations that are embedded in the Dynamics 365 Finance client

NOTE

- Before the access list hierarchy can affect data in Power BI, access list hierarchy and row-level security in Power BI must be paired. For more information, see [Set up security for Cost accounting content pack](#).
- The access list hierarchy doesn't help secure the export of data to Excel. Therefore, that reporting tool should be used only by cost accountants and managers who must have full access to view the data.

NOTE

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Create an organization report hierarchy

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Use this procedure to create a report hierarchy for organization reporting. The purpose of this recording is to guide you through the dimension hierarchy so that you can continue until the whole organization reporting structure is created. This recording uses the USP2 demo data company.

1. Go to Cost accounting > Dimensions > Dimension hierarchies.
2. Click New.
3. In the HierarchyTypeComboBox field, select 'Dimension classification hierarchy'.
 - Select Dimension classification hierarchy. The Dimension classification hierarchy type is used to define rules and for reporting purposes. It supports all dimensions, such as cost objects, cost elements, and statistical dimensions.
4. Click Create.
5. In the Dimension hierarchy name field, type 'Organization USP2'.
6. In the Dimension field, enter or select a value.
 - Select Cost centers.
7. Click Save.
8. Click View hierarchy.
9. Click New.
10. In the Node name field, type 'CEO'.
11. Click Save.
12. Click New.
13. In the Node name field, type 'CEO cost centers'.
14. Click Save.
15. Click New.
16. In the Node name field, type 'Region East'.
17. Click Save.
18. Click New.
19. In the list, mark the selected row.
20. In the From dimension member field, enter or select a value.
 - Select the dimension member that corresponds to the node.
21. Click Save.
22. In the tree, select 'Organization USP2\CEO\CEO cost centers'.
23. Click New.
24. In the Node name field, type 'Region West'.
25. Click Save.
26. Click New.
27. In the list, mark the selected row.
28. In the From dimension member field, enter or select a value.
 - Select the dimension member that corresponds to the node.
29. Click Save.
30. In the tree, select 'Organization USP2\CEO'.
31. Click New.
32. In the Node name field, type 'CFO cost centers'.

33. Click Save.
34. Click New.
35. In the Node name field, type 'Marketing campa'.
36. In the Node name field, type 'Marketing campaign'.
37. Click Save.
38. Click New.
39. In the list, mark the selected row.
40. In the From dimension member field, enter or select a value.
 - Select the dimension member that corresponds to the node.
41. Click Save.
42. In the tree, select 'Organization USP2\CEO\CFO cost centers'.
43. Click New.
44. In the Node name field, type 'Trade shows'.
45. Click Save.
46. Click New.
47. In the list, mark the selected row.
48. In the From dimension member field, enter or select a value.
 - Select the dimension member that corresponds to the node.
49. Click Save.
50. In the tree, select 'Organization USP2\CEO'.
51. In the Node name field, type 'CIO cost centers'.
52. Click Save.
53. Click New.
54. In the Node name field, type 'Call centers'.
55. Click Save.
56. Click New.
57. In the list, mark the selected row.
58. In the From dimension member field, enter or select a value.
 - Select the dimension member that corresponds to the node.
59. Click Save.

NOTE

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Access rights for cost object controllers

2/18/2021 • 2 minutes to read • [Edit Online](#)

The **Cost control** workspace is a central point where managers can view the performance of their cost objects. This workspace lets managers consume Cost accounting data even though they aren't cost accountants. For security reasons, managers should be allowed to see only the Cost accounting data that is related to the specific cost objects that they are responsible for.

There are four unique roles in Cost accounting.

ROLE NAME	LICENSE
Cost accounting manager	Activity
Cost accountant	Operations
Cost accountant clerk	Operations
Cost object controller	Team members

This topic explains how to assign the **Cost object controller** role to a manager.

When the **Cost object controller** role is assigned to a manager, the manager can perform the following tasks:

- Access the **Cost control** workspace (in the client).
 - Drill through and have view access to the pages that support the drill-through experience.
- Access the **Cost control** workspace (in the mobile application).

NOTE

The **Cost object controller** role doesn't control which cost objects the user can access and view data for. Row-level security is provided via dimension hierarchies and the Access list hierarchy.

Grant access rights

The following example shows what a dimension hierarchy can look like.

Dimension hierarchy details

DIMENSION HIERARCHY NAME	DIMENSION	DIMENSION HIERARCHY TYPE NAME	ACCESS LIST HIERARCHY
Organization	Cost centers	Dimension classification hierarchy	Yes

You can use the **Users** FastTab in the hierarchy designer to insert one or more user IDs on each node.

	USERS	DIMENSION MEMBER RANGES	
Nodes	User ID	From dimension member	To dimension member
Organization	Benjamin, Claire		
Admin	April		
Finance	Alicia	CC002	CC003
		CC007	CC007
HR	Arnie	CC001	CC001
Production	David		
Packaging	Ellen	CC005	CC005
Assembly	Chris	CC006	CC006

NOTE

Cost accountants should be assigned to the top level of the hierarchy, so that they can see all entries in Cost accounting.

Before the Access list hierarchy and its security settings can be applied, the **Enable view access for cost object dimension members** option must be set to **Yes** on the **General** tab of the **Cost accounting parameters** page (**Cost accounting > Setup > Parameters**).

The settings for the Access list hierarchy are used to control the data that is shown in following areas:

- **Cost control** workspace (in the client):
 - Data on the pages that are used for drill-through
- **Cost control** workspace (in the mobile application):
 - Balances in cards
- Microsoft Power BI:
 - Data that is shown in Power BI visualizations
 - Data Power BI visualizations that are embedded in the Dynamics 365 Finance client

IMPORTANT

- Before the Access list hierarchy can affect data in Power BI, the Access list hierarchy and row-level security in Power BI must be paired. For more information, see [Set up security for Cost accounting content pack](#).
- This topic shows the prerequisites that must be in place before you can use the **Cost control** workspace.

Additional resources

- [Cost control workspace](#)
- [Dimension hierarchy](#)
- [Set up security for Cost accounting content pack](#)

NOTE

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Configure access rights for a cost object controller

2/18/2021 • 2 minutes to read • [Edit Online](#)

Use this procedure to configure access rights for a cost object controller. This recording uses the USP2 demo data company.

Assign the cost object controller role

1. Go to System administration > Users > Users.
2. Use the Quick Filter to find records. For example, filter on the User name field with a value of 'alicia'.
3. In the list, click the link in the selected row.
4. Click Assign roles.
5. In the list, find and select the desired record.
6. Click OK.

Enable access list security

1. Go to Cost accounting > Dimensions > Dimension hierarchies.
2. In the list, find and select the desired record.
 - Select Organization.
3. Click Edit.
4. Select Yes in the Access list hierarchy field.
5. Click View hierarchy.

Assign access rights to user

1. Click New.
2. In the list, mark the selected row.
3. In the User ID field, enter or select a value.
 - Select Admin.
4. In the tree, select 'Organization\CEO\CFO\FIM'.
5. Click New.
6. In the list, mark the selected row.
7. In the User ID field, enter or select a value.
 - Select Alicia.
8. Click Save.

Enable access rights in Cost accounting

1. Go to Cost accounting > Setup > Parameters.
2. Click the General tab.
3. Select Yes in the Enable view access for cost object dimension members field.
4. Click Save.
5. Close the page.
6. Go to Cost accounting > Setup > Cost control workspace configuration.
7. Click Edit.

8. Select Yes in the Published field.

- If you select Yes, a user who is assigned one of the following four roles can see the reports in the Cost control workspace: cost accounting manager, cost accountant, cost accountant clerk, and cost object controller. If you select No, only a user who is assigned one of the following roles can see the reports: cost accounting manager, cost accountant, and cost accountant clerk.

9. Click Save.

NOTE

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Define cost control units

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This procedure shows how to define cost control units in the cost accounting ledger. You select the cost object dimension for which you want to control costs in the ledger. The cost object dimension members are transformed into cost objects of the cost control units. The demo data company used to create this procedure is USP2.

1. Go to Cost accounting > Ledger setup > Cost accounting ledgers.
2. In the list, find and select the desired record.
3. Click Control units.
4. Click New.
5. In the Name field, type a value.
6. In the Dimension field, enter or select a value.
7. Click Save.
8. Click New.
9. In the Name field, type a value.
10. In the Dimension field, enter or select a value.
11. Click Save.

NOTE

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Create a cost accounting ledger

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A cost accounting ledger represents the overall reporting unit. It is defined by a cost element dimension, statistical dimension, fiscal calendar, and currency. It is agnostic to the concept of legal entities. A legal entity and its data can be associated with many cost accounting ledgers. This recording uses the USP2 demo data company.

1. Go to Cost accounting > Ledger setup > Cost accounting ledgers.
2. Click New.
3. In the Name field, type a value.
4. In the Cost element dimension field, enter or select a value.
5. In the Fiscal calendar field, enter or select a value.
6. In the Accounting currency field, enter or select a value.
7. In the Exchange rate type field, enter or select a value.
8. In the Statistical dimension field, enter or select a value.
9. Click Save.

NOTE

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Provider templates for statistical dimension members and measure providers

2/18/2021 • 10 minutes to read • [Edit Online](#)

A statistical dimension and its members are used to register and control non-monetary entries in Cost accounting. Statistical dimension members can be used for two purposes:

- As an allocation base in policies such as cost distribution or cost allocation
- For reporting of non-monetary consumption

Statistical dimension

A statistical dimension has a unique name and a set of unique dimension members. The statistical dimension is assigned to a Cost accounting ledger ID. This relationship ties all corresponding statistical dimension members to the Cost accounting ledger. Therefore, all statistical entries will be created in the context of the Cost accounting ledger.

NOTE

A statistical dimension can be assigned to more than one Cost accounting ledger.

Here is an example of a statistical dimension.

NAME	DATA CONNECTOR FOR DIMENSION MEMBERS
Shared Statistical elements	Imported dimension members

Here is an example of a statistical dimension that has been assigned to a Cost accounting ledger.

NAME	ACCOUNTING CURRENCY	EXCHANGE RATE TYPE	FISCAL CALENDAR	COST ELEMENT DIMENSION	STATISTICAL DIMENSION
Managerial accounting	USD	Constant currency	Fiscal period	Shared Cost elements	Shared Statistical elements

Statistical dimension members

A statistical dimension member represents an entity that you want to register non-monetary measures for. These measures can be used either as an allocation base or just to report non-monetary values.

Statistical dimension members can be created manually. Alternatively, they can be imported from a file by using the Data management import/export tool.

A statistical dimension member automatically becomes a predefined allocation base. It can be used as an allocation base in policies or as input in other types of allocation bases.

Here are some examples of typical statistical dimension members.

STATISTICAL DIMENSION NAME	STATISTICAL ELEMENTS	DESCRIPTION	UNIT
Shared Statistical elements	FTE	Full time employees	Ea.
Shared Statistical elements	Electricity	Electricity consumption	kWh
Shared Statistical elements	Pack CC	Packaging Cost center	Hrs.

Statistical measure provider template

Statistical measures can originate from many kinds of sources. Dynamics 365 Finance is a great source to extract statistical measures from. You can use a statistical measure provider template to easily configure the statistical measures that you want to extract.

The definition of a statistical measure provider template is generic and can be reused in multiple statistical dimension members.

NOTE

All tables that contain financial dimensions can be used as sources for statistical measures.

Example: Count of employees per cost center

The count of employees per cost center is a statistical measure that can be used for various purposes that provide managerial insight:

- A statistical reporting measure by cost center
- An allocation base for various types of expenses
- Internal cost rates by cost center:
 - Cost by employee
 - Revenue by employee

The HcmEmployment table holds a list of all employees in the instance. This table is a global table. Therefore, the records aren't related to a specific data area ID.

Here is an example of employees in the HcmEmployment table.

NAME	COST CENTER	DESCRIPTION	WORKER TYPE
Employee 1	CC001	HR	Employee
Employee 2	CC002	FI	Employee
Employee 3	CC002	FI	Employee
Employee 4	CC003	IT	Employee
Employee 5	CC003	IT	Employee
Employee 6	CC002	FI	Contractor

When you create a **Statistical measure provider template** record, you must decide which function to use:

- **Count** – A count of records per cost object is transferred.
- **Sum** – A sum for records per cost object is transferred. (The **Sum** field and **Date** field are required.)

Using the Count function

For example, a statistical measure provider template can be set up as follows.

NAME	FUNCTION	SOURCE TABLE	SUM FIELD	DATE FIELD
FTEs	Count	HcmEmployment	Not applicable	Not applicable

You can also add one or more ranges to narrow the measures from the source table.

In this example, if you just want a count of all full-time employees (FTEs), you can add a range in the **Worker type** field. In the **Criteria** field, select **Employee** to limit the output range as follows.

Ranges

SOURCE TABLE	FIELD	CRITERIA
HcmEmployment	Worker type	Employee

Before you can get statistical measures into Cost accounting, you must establish the relation between the statistical measure provider template and the statistical dimension member. This relation is created per Cost accounting ledger and version. The relation consists of a data connector and a data provider. You can have several data connectors and data providers per statistical dimension member.

NOTE

In this example, we will create a relation only for the **Actual** version.

Go to **Cost accounting ledger > Actual version > Manage > Statistical measures** to establish the relation. For this scenario, select the **Dynamics 365 Finance – Statistical measures** data connector, because we want to extract data from Finance.

Data source

NAME	DATA CONNECTOR	STATISTICAL DIMENSION MEMBER
FTEs D365FO	Dynamics 365 Finance – Statistical measures	FTEs

Data provider configuration

STATISTICAL TEMPLATE NAME
FTEs

After the source data for the statistical measure is processed, the following statistical entries are created in Cost accounting.

Journal

JOURNAL	JOURNAL TYPE	FISCAL CALENDAR PERIOD	YEAR	PERIOD	VERSION	DATA CONNECTOR SOURCE ENTRIES
00001	Statistical entry transfer journal	Fiscal	2017	Period 1	CA ledger USMF	FTEs

Statistical entry transfer journal entries

ACCOUNTING DATE	MAGNITUDE	STATISTICAL ELEMENT	DESCRIPTION	COST CENTER
31-01-2017	1.00	FTEs	Full time employees	CC001
31-01-2017	2.00	FTEs	Full time employees	CC002
31-01-2017	2.00	FTEs	Full time employees	CC003

Statistical entries

COST OBJECT		ACCOUNTING DATE	STATISTICAL DIMENSION MEMBER	DESCRIPTION	MAGNITUDE
CC001	HR	31-01-2017	FTEs	Full time employees	1.00
CC002	FI	31-01-2017	FTEs	Full time employees	2.00
CC003	IT	31-01-2017	FTEs	Full time employees	2.00

If the FTEs predefined dimension member allocation basis is assigned as an allocation base in a cost distribution rule, the cost will be distributed by using the following allocation factor.

COST OBJECT	DESCRIPTION	MAGNITUDE	ALLOCATION FACTOR
CC001	HR	1.00	$(1/5) \times \text{Amount}$
CC002	FI	2.00	$(2/5) \times \text{Amount}$
CC003	IT	2.00	$(2/5) \times \text{Amount}$

Using the Sum function

A production cost center, CC010 (Packaging), is responsible for packaging the products before they are shipped to customers. The direct labor cost is added to the products via the bill of materials (BOM) and route. The indirect cost of running the cost center must also be allocated to the produced products. Often, the best statistical measure for such an allocation is the number of registered production hours per product within the given period.

The ProdRouteTrans table holds all production labor transactions per legal entity DataAreadID.

Here is an example of the ProdRouteTrans table.

REFERENCE	NUMBER	OPERATION	TYPE	TIME	PHYSICAL DATE	PRODUCT GROUP (FINANCIAL DIMENSION)	LEGAL ENTITY
Production order	P0001	Packaging	Time	8.00	01-01-2017	Orange juice B2B	USMF
Production order	P0001	Packaging	Time	8.00	02-01-2017	Orange juice B2B	USMF
Production order	P0002	Packaging	Time	4.00	03-01-2017	Orange juice Consumer	USMF
Production order	P0003	Packaging	Time	4.00	03-01-2017	Orange juice Consumer	USMF
Production order	P0004	Reconst.	Time	10.00	03-01-2017	Orange juice Consumer	USMF

When you create a **Statistical measure provider template** record, you must decide which function to use:

- **Count** – A count of records per cost object is transferred.
- **Sum** – A sum for records per cost object is transferred. (The **Sum** field and **Date** field are required.)

The statistical measure provider template can be set up as follows.

NAME	FUNCTION	SOURCE TABLE	SUM FIELD	DATE FIELD
Pack CC	Sum	ProdRouteTrans	Hours	Physical date

You can also add ranges to narrow the measures from the source table.

In this example, if you just want the sum of hours that are related to the CC010 Packaging cost center, you can add a range in the **Operation** field. In the **Criteria** field, select **Packaging** to limit the output range.

Ranges

SOURCE TABLE	FIELD	CRITERIA
ProdRouteTrans	Operation	Packaging

Before you can get statistical measures into Cost accounting, you must establish the relation between the statistical measure provider template and the statistical dimension member. This relation is created per Cost accounting ledger and version. The relation consists of a data connector and a data provider. You can have several data connectors and data providers per statistical dimension member.

NOTE

In this example, we will create a relation only for the **Actual** version.

Go to **Cost accounting ledger > Actual version > Manage > Statistical measures** to establish the relation. For this scenario, select the **Dynamics 365 Finance – Statistical measures** data connector, because we want to extract data from Finance.

Data source

NAME	DATA CONNECTOR	STATISTICAL DIMENSION MEMBER
Pack CC D365FO	Dynamics 365 Finance – Statistical measures	Pack CC

The system recognizes that ProdRouteTrans is a table where each record belongs to a separate legal entity. Therefore, you will be asked to select the legal entity that transactions should be imported from.

Data provider configuration

STATISTICAL TEMPLATE NAME	LEGAL ENTITY
Pack CC	USMF

After the source data for the statistical measure processed, the following statistical entries are created in Cost accounting.

Journal

JOURNAL	JOURNAL TYPE	FISCAL CALENDAR PERIOD	YEAR	PERIOD	VERSION	DATA CONNECTOR SOURCE ENTRIES
00002	Statistical entry transfer journal	Fiscal	2017	Period 1	CA ledger USMF	Pack CC

Statistical entry transfer journal entries

ACCOUNTING DATE	MAGNITUDE	STATISTICAL ELEMENT	DESCRIPTION	PRODUCT GROUP
31-01-2017	16.00	Pack CC	Packaging Cost center	Orange juice B2B
31-01-2017	8.00	Pack CC	Packaging Cost center	Orange juice Consumer

Statistical entries

COST OBJECT	ACCOUNTING DATE	STATISTICAL DIMENSION MEMBER	DESCRIPTION	MAGNITUDE
Orange juice B2B	31-01-2017	Pack CC	Packaging Cost center	16.00
Orange juice Consumer	31-01-2017	Pack CC	Packaging Cost center	8.00

If the Pack CC predefined dimension member allocation basis is assigned as an allocation base in a cost distribution rule, the cost will be distributed by using the following allocation factor.

COST OBJECT	MAGNITUDE	ALLOCATION FACTOR
Orange juice B2B	16.00	$(16 \div 24) \times \text{Amount}$
Orange juice Consumer	8.00	$(8 \div 24) \times \text{Amount}$

Imported statistical measures

You can import statistical measures into Cost accounting by using the Data management import/export tool.

The data entity that is used for the import is named Imported statistical measures.

NOTE

This data entity is designed to allow a maximum of five unique dimension values per entry.

The consumption of electricity is recorded in Microsoft Excel by using the predefined format of the data entity. Here is an example.

ACCOUNTING DATE	DIMENSION MEMBER NAME1	DIMENSION MEMBER NAME2	DIMENSION MEMBER NAME5	MAGNITUDE	SOURCE IDENTIFIER
31-01-2017	CC001			2,450.00	Electricity
31-01-2017	CC002			4,100.00	Electricity
31-01-2017	CC003			15,000.00	Electricity

When you've imported your data via Data management, the data will be stored in a Cost accounting staging table. Therefore, the imported data can be used in multiple Cost accounting ledgers. A reload of data isn't required.

To import the data, go to **Imported data > Data entity > Imported statistical measures**.

SOURCE IDENTIFIER	ACCOUNTING DATE	MAGNITUDE	DIMENSION MEMBER NAME1	DIMENSION MEMBER NAME2	DIMENSION MEMBER NAME5
Electricity	31-01-2017	2,450.00	CC001		
Electricity	31-01-2017	4,100.00	CC002		
Electricity	31-01-2017	15,000.00	CC003		

Before you can get statistical measures into Cost accounting, you must establish the relation between the source identifier and the statistical dimension member. This relation is created per Cost accounting ledger and version. The relation consists of a data connector and a data provider. You can have several data connectors and data providers per statistical dimension member.

NOTE

In this example, we will create a relation only for the **Actual version**.

Go to **Cost accounting ledger > Actual version > Manage > Statistical measures** to establish the

relation. For this scenario, select the **Imported statistical measures** data connector, because data has been imported from a third-party system into Cost accounting via Excel.

Data source

NAME	DATA CONNECTOR	STATISTICAL DIMENSION MEMBER
Electricity	Imported statistical measures	Electricity

Data provider configuration

IMPORT SOURCE IDENTIFIER	FUNCTION	DIMENSION1	DIMENSION2	DIMENSION5
Electricity	Sum	Cost centers		

NOTE

When you define the data provider configuration, you must specify which cost object dimensions to match against the imported transactions. After the source data for the statistical measure is processed, the following statistical entries are created in Cost accounting.

Journal

JOURNAL	JOURNAL TYPE	FISCAL CALENDAR PERIOD	YEAR	PERID	VERSION	DATA CONNECTOR SOURCE ENTRIES
00002	Statistical entry transfer journal	Fiscal	2017	Period 1	CA ledger USMF	Electricity

Statistical entry transfer journal entries

ACCOUNTING DATE	MAGNITUDE	COST ELEMENT	DESCRIPTION	COST CENTER
31-01-2017	2,450.00	Electricity	Electricity consumption	CC001
31-01-2017	4,100.00	Electricity	Electricity consumption	CC002
31-01-2017	15,000.00	Electricity	Electricity consumption	CC003

Statistical entries

COST OBJECT		ACCOUNTING DATE	STATISTICAL DIMENSION MEMBER	DESCRIPTION	MAGNITUDE
CC001	HR	31-01-2017	Electricity	Electricity consumption	2,450.00

COST OBJECT		ACCOUNTING DATE	STATISTICAL DIMENSION MEMBER	DESCRIPTION	MAGNITUDE
CC002	FI	31-01-2017	Electricity	Electricity consumption	4,100.00
CC003	IT	31-01-2017	Electricity	Electricity consumption	15,000.00

If the Electricity predefined dimension member allocation basis is assigned as an allocation base in a cost distribution rule, the cost will be distributed by using the following allocation factor.

COST OBJECT		MAGNITUDE	ALLOCATION FACTOR
CC001	HR	2,450.00	$(2,450 \div 21,550) \times \text{Amount}$
CC002	FI	4,100.00	$(4,100 \div 21,550) \times \text{Amount}$
CC003	IT	15,000.00	$(15,000 \div 21,550) \times \text{Amount}$

Additional resources

Allocation bases

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Allocation bases

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An allocation base is the basis on which Cost accounting allocates overhead costs. An allocation base can be a quantity, such as machine hours that are used, kilowatt hours (kWh) that are consumed, or square footage that is occupied. Allocation bases are mostly used to assign overhead costs to inventory that is produced. For example, an IT department allocates its expenses according to the number of computers that each department uses.

There are three types of allocation bases in Cost accounting:

- Predefined dimension member allocation bases
- Hierarchy allocation bases
- Formula allocation bases

Predefined dimension member allocation bases

The predefined dimension member allocation bases are created automatically when a dimension member of one the following types is created:

- Statistical dimension members
- Cost element dimension members

NOTE

The predefined dimension member allocation bases that are based on a cost element dimension member consider the values only from the data source provider, such as the general ledger or budget.

Example 1: Use a cost element dimension member as the allocation base

This example shows how to create a cost allocation rule to allocate cost element 10002 (Employee insurance) to the balance that is recorded on cost element 10001 (Salaries). The allocation rule is defined based on the ratio of each department's salaries to total salaries. (Review needed!)

In the general ledger, the chart of account is defined as follows.

CHART OF ACCOUNT	MAIN ACCOUNT	DESCRIPTION	MAIN ACCOUNT TYPE
Shared	10001	Salaries	Expense
Shared	10002	Employee insurance	Expense

Define a cost element dimension, and configure the data connector. After the data is imported, the following entries are created in Cost accounting.

Cost element dimension members

COST ELEMENT DIMENSION NAME	COST ELEMENT	DESCRIPTION	TYPE
Cost elements	10001	Salaries	Primary

COST ELEMENT DIMENSION NAME	COST ELEMENT	DESCRIPTION	TYPE
Cost elements	10002	Employee insurance	Primary

Predefined dimension member allocation bases

NAME	DESCRIPTION	COST ELEMENT DIMENSION
10001	Salaries	Cost elements
10002	Employee insurance	Cost elements

In the general ledger, the following entries have been posted:

- The entries that show the Salaries main account come from the Payroll system and are posted to cost centers.
- The expense for employee insurance is manually posted to a default cost center.

ACCOUNTING DATE	COST CENTER	DESCRIPTION	MAIN ACCOUNT	DESCRIPTION	AMOUNT IN ACCOUNTING CURRENCY
03-01-2017	CC001	HR	10001	Salaries	2,000.00
03-01-2017	CC002	FI	10001	Salaries	5,000.00
03-01-2017	CC003	IT	10001	Salaries	3,000.00
03-01-2017	CC099	Default cost center	10002	Employee insurance	1,000.00

After the general ledger source data is processed, the following entries are created in Cost accounting.

Cost entries

COST OBJECT	DESCRIPTION	COST ELEMENT	DESCRIPTION	COST BEHAVIOR	AMOUNT	ACCOUNTING DATE
CC001	HR	10001	Salaries	Unclassified	2,000.00	03-01-2017
CC002	FI	10001	Salaries	Unclassified	5,000.00	03-01-2017
CC003	IT	10001	Salaries	Unclassified	3,000.00	03-01-2017
CC099	Default cost center	10002	Employee insurance	Unclassified	1,000.00	03-01-2017

In this simplified example, a cost allocation rule is created to allocate cost element 10002 (Employee insurance) relative to the balance that is recorded on cost element 10001 (Salaries).

Cost distribution rule

COST OBJECT DIMENSION HIERARCHY NODE	COST ELEMENT DIMENSION HIERARCHY NODE	COST BEHAVIOR	ALLOCATION BASE
CC099	10002	Unclassified	10001

Perform overhead calculation

After cost element 10001 (Salaries) is applied as the allocation base, the result of the overhead calculation is as follows.

COST OBJECT	DESCRIPTION	MAGNITUDE	ALLOCATION FACTOR	AMOUNT
CC001	HR	2,000	$(2,000 \div 10,000) \times 1,000.00$	200.00
CC002	FI	5,000	$(5,000 \div 10,000) \times 1,000.00$	500.00
CC003	IT	3,000	$(3,000 \div 10,000) \times 1,000.00$	300.00

Journal

JOURNAL	JOURNAL TYPE	FISCAL CALENDAR PERIOD	YEAR	PERIOD	VERSION
00001	Cost distribution calculation journal	Fiscal	2017	Period 1	Overhead calculation / 01-02-2017 11:51:00 PM / Ledger /2017 / Period 1

Cost object balance journal entries

ACCOUNTING DATE	COST OBJECT	DESCRIPTION	COST ELEMENT	DESCRIPTION	COST BEHAVIOR	AMOUNT
31-01-2017	CC099	Default cost center	10002	Employee insurance	Unclassified	1,000.00

Cost entries

COST OBJECT	DESCRIPTION	COST ELEMENT	DESCRIPTION	COST BEHAVIOR	AMOUNT	ACCOUNTING DATE
CC099	Default cost center	10002	Employee insurance	Unclassified	-1,000.00	31-01-2017
CC001	HR	10002	Employee insurance	Unclassified	200.00	31-01-2017
CC002	FI	10002	Employee insurance	Unclassified	500.00	31-01-2017

COST OBJECT	DESCRIPTION	COST ELEMENT	DESCRIPTION	COST BEHAVIOR	AMOUNT	ACCOUNTING DATE
CC099	IT	10002	Employee insurance	Unclassified	300.00	31-01-2017

Example 2: Use a statistical dimension member as the allocation base

Statistical dimension members can be used as allocation bases to define policies or report non-monetary consumption by cost objects. You can manually create statistical dimension members or import them from a file by using the Data management import/export tool.

Statistical dimension members

STATISTICAL DIMENSION NAME	STATISTICAL ELEMENT	DESCRIPTION	UNIT
Statistical elements	FTE	Full time employees	Ea
Statistical elements	Electricity	Electricity consumption	kWh

When a statistical dimension member is saved, a corresponding record is created in the predefined dimension member allocation bases.

Predefined dimension member allocation bases

NAME	DESCRIPTION	STATISTICAL ELEMENT DIMENSION
FTE	Full time employees	Statistical elements
Electricity	Electricity consumption	Statistical elements

Statistical measures can come from various sources:

- Electricity consumption can be measured by meters that are installed in different areas of the company.
- Tables hold statistical measures. For example, the HcmEmployment table holds a list of all employees and the cost centers that they work for.

NAME	COST CENTER	DESCRIPTION	WORKER TYPE
Employee A	CC001	HR	Employee
Employee B	CC002	FI	Employee
Employee C	CC002	FI	Employee
Employee D	CC003	IT	Employee
Employee F	CC003	IT	Employee

NOTE

All the tables that contain financial dimensions can be used as sources for statistical measures.

Cost accounting supports a collection of statistical measures by using the following data connections:

- Data management import/export tool
- Statistical measures

To pull statistical measures from the system, a statistical measure provider template is required. For more information, see Statistical measure provider template. (Will add a link once this topic is written.)

Statistical measure provider templates

NAME	FUNCTION	SOURCE TABLE	SUM FIELD	DATE FIELD
FTE's	Count	HcmEmployment	Not applicable	Not applicable

After the statistical measure source data is processed, the following entries will be created in Cost accounting.

Statistical entries

COST OBJECT	DESCRIPTION	ACCOUNTING DATE	STATISTICAL DIMENSION MEMBER	DESCRIPTION	MAGNITUDE
CC001	HR	31-01-2017	FTE's	Full time employees	1.00
CC002	FI	31-01-2017	FTE's	Full time employees	2.00
CC003	IT	31-01-2017	FTE's	Full time employees	2.00

Here is an example of a cost distribution rule if the FTE's predefined dimension member allocation basis is assigned as the allocation base in it.

COST OBJECT	DESCRIPTION	MAGNITUDE	ALLOCATION FACTOR
CC001	HR	1.00	$(1/5) \times \text{Amount}$
CC002	FI	2.00	$(2/5) \times \text{Amount}$
CC003	IT	2.00	$(2/5) \times \text{Amount}$

You can use the Imported statistical measures data entity to import statistical measures into Cost accounting. You can also use the Data management import/export tool. In Excel, the consumption of electricity is recorded as follows.

ACCOUNTING DATE	DIMENSION MEMBER	MAGNITUDE	SOURCE IDENTIFIER
31-01-2017	CC001	2,450.00	Electricity
31-01-2017	CC002	4,100.00	Electricity
31-01-2017	CC003	15,000.00	Electricity

After the statistical measure source data is processed, the following entries will be created in Cost accounting.

Statistical entries

COST OBJECT		ACCOUNTING DATE	STATISTICAL DIMENSION MEMBER	DESCRIPTION	MAGNITUDE
CC001	HR	31-01-2017	Electricity	Electricity consumption	2,450.00
CC002	FI	31-01-2017	Electricity	Electricity consumption	4,100.00
CC003	IT	31-01-2017	Electricity	Electricity consumption	15,000.00

Here is an example of a cost distribution rule if the Electricity predefined dimension member allocation basis is assigned as the allocation base in it.

COST OBJECT	DESCRIPTION	MAGNITUDE	ALLOCATION FACTOR
CC001	HR	2,450.00	$(2,450 \div 21,550) \times \text{Amount}$
CC002	FI	4,100.00	$(4,100 \div 21,550) \times \text{Amount}$
CC003	IT	15,000.00	$(15,000 \div 21,550) \times \text{Amount}$

Hierarchy allocation bases

Cost accountants can manually create the hierarchy allocation bases by applying a cost object dimension hierarchy node to an existing allocation base. In this way, you can limit the range of the original predefined dimension member allocation basis. One predefined dimension member allocation basis can be used to create several hierarchy allocation bases. Ranges can be maintained in the cost object dimension hierarchy that is associated with the hierarchy allocation bases.

Example: Hierarchy allocation bases that are based on full-time employees in the organization

Here is an example of a cost object dimension hierarchy that can be created to describe a simplified organization.

HIERARCHY NAME	NODE LEVEL 0	NODE LEVEL 1	NODE LEVEL 2	DIMENSION MEMBERS
Organization	CEO	CFO	FICO	CC001
Organization	CEO	CFO	HR	CC002
Organization	CEO	CIO	IT	CC003

The FTE's predefined dimension member allocation basis that was created in the previous section holds the following entries.

Statistical entries

COST OBJECT	DESCRIPTION	ACCOUNTING DATE	STATISTICAL DIMENSION MEMBER	DESCRIPTION	MAGNITUDE
CC001	HR	31-01-2017	FTE's	Full time employees	1.00
CC002	FI	31-01-2017	FTE's	Full time employees	2.00
CC003	IT	31-01-2017	FTE's	Full time employees	2.00

A cost must be distributed between cost centers that report to the organization's chief financial officer (CFO). It's acknowledged that the correct allocation ratio is the number of full-time employees (FTEs) by cost center.

Hierarchy allocation bases

NAME	ALLOCATION BASE	COST OBJECT DIMENSION HIERARCHY	COST OBJECT DIMENSION HIERARCHY NODE
Number of FTEs in CFO	FTE's	Organization	CFO

A Preview function lets you validate the hierarchy allocation basis that is created, based on statistical entries in the system.

Allocation base details

COST OBJECT	DESCRIPTION	MAGNITUDE
CC001	HR	1.00
CC002	FI	2.00

Here is an example of a cost distribution rule if the Number of FTEs in CFO hierarchy allocation basis is assigned as the allocation base in it.

COST OBJECT	DESCRIPTION	MAGNITUDE	ALLOCATION FACTOR
CC001	HR	1.00	$(1/3) \times \text{Amount}$
CC002	FI	2.00	$(2/3) \times \text{Amount}$

Formula allocation bases

Formula allocation bases let you define advanced formulas to achieve the correct allocation basis. You can manually create formula allocation bases.

When you create a formula allocation base, you select which statistical dimension and cost element dimension should be the basis for the formula. All allocation bases that come from the previously selected dimensions can be used in a formula allocation base.

NOTE

Previously defined formula allocation bases can be used to define a new formula allocation base.

In formula allocation base factors, you create an alias, and associate it with either an allocation base or a constant. The aliases are then used to define the formula.

You can use the following operators to define your formula.

SYMBOLS	TEXT
()	Parentheses
<	Smaller than
>	Larger than
+	Addition
-	Subtraction
*	Multiplication

Traditional IF statements aren't supported. However, you can create statements and validate whether they are true.

STATEMENT	VALIDATION	RESULT
a > b	True	1
a > b	False	0

Example 1: A simple formula

Electricity bills often consist of two parts:

- A fixed fee for being connected to grid
- A cost that is associated with consumption per kWh

The Electricity predefined dimension member allocation basis has already been defined and holds these values.

Statistical entries

COST OBJECT	NAME	ACCOUNTING DATE	STATISTICAL DIMENSION MEMBER	DESCRIPTION	MAGNITUDE
CC001	HR	31-01-2017	Electricity	Electricity consumption	2,450.00
CC002	FI	31-01-2017	Electricity	Electricity consumption	4,100.00
CC003	IT	31-01-2017	Electricity	Electricity consumption	15,000.00

If the fixed fee must now be evenly spread over cost objects that consume electricity, you have two options for allocating the costs:

- Create a new predefined allocation base, Electricity fixed, and then apply a statistical measure of 1.00 for each cost object that consumed electricity.

- Create a formula allocation base, Electricity fixed, that takes advantage of the Electricity predefined allocation base that is already defined in the system. The benefit of this option is that data must be loaded into Cost accounting for only one Electricity statistical dimension member.

Formula allocation base

NAME	COST ELEMENT DIMENSION	STATISTICAL DIMENSION	FORMULA
Electricity fixed		Statistical elements	

Before the **Formula** field can be filled, you must specify the alias that should be used in the formula.

Formula allocation base factors

ALIAS	CONSTANT	ALLOCATION BASE
a		Electricity
b	0.01	

Note that 0 (zero) isn't supported as a constant.

Formula allocation base

NAME	COST ELEMENT DIMENSION	STATISTICAL DIMENSION	FORMULA
Electricity fixed		Statistical elements	a > b

A Preview function lets you validate the formula allocation base that is created, based on statistical entries in the system.

Allocation base details

COST OBJECT	DESCRIPTION	FORMULA	MAGNITUDE
CC001	HR	2,450.00 > 0.01	1.00
CC002	FI	4,100.00 > 0.01	1.00
CC003	IT	15,000.00 > 0.01	1.00

Here is an example of a cost distribution rule if the Electricity formula allocation base is assigned as the allocation base in it.

Cost object magnitude allocation factor

COST OBJECT	NAME	MAGNITUDE	ALLOCATION FACTOR
CC001	HR	1.00	(1/3) × Amount
CC002	FI	1.00	(1/3) × Amount
CC003	IT	1.00	(1/3) × Amount

Example 2: An advanced formula

For this example, the cost of electricity should not just follow the actual electricity that is consumed in kWh. Management wants to incorporate incentive for lowering electricity usage.

RULE	RATE
$a \leq 10000,00 \text{ kWh}$	0.75
$a > 10000,00 \text{ kWh}$	1.15

A new formula allocation base, Electricity usage, is created.

Formula allocation base

NAME	COST ELEMENT DIMENSION	STATISTICAL DIMENSION	FORMULA
Electricity usage		Statistical elements	

Before the **Formula** field can be filled, you must specify the alias that should be used in the formula.

Formula allocation base factors

ALIAS	CONSTANT	ALLOCATION BASE
a		Electricity
b	10,000.00	
c	0.75	
d	1.15	

Formula allocation base

NAME	COST ELEMENT DIMENSION	STATISTICAL DIMENSION	FORMULA
Electricity fixed		Statistical elements	$((a > b) \times ((b \times c) + (a - b) \times d)) + ((a \leq b) \times a \times c)$

A Preview function lets you validate the formula allocation base that is created, based on statistical entries in the system.

Allocation base details

COST OBJECT		FORMULA	MAGNITUDE
CC001	HR	$((2,450.00 > 10,000.00) \times ((10,000.00 \times 0.75) + (2,450.00 - 10,000.00) \times 1.15)) + ((2,450.00 \leq 10,000.00) \times 2,450.00 \times 0.75)$	1,837.50

COST OBJECT		FORMULA	MAGNITUDE
CC002	FI	$((4,100.00 > 10,000.00) \times ((10,000.00 \times 0.75) + (4,100.00 - 10,000.00) \times 1.15)) + ((4,100.00 \leq 10,000.00) \times 4,100.00 \times 0.75)$	3,075.00
CC003	IT	$((15,000.00 > 10,000.00) \times ((10,000.00 \times 0.75) + (15,000.00 - 10,000.00) \times 1.15)) + ((15,000.00 \leq 10,000.00) \times 15,000.00 \times 0.75)$	1,3250.00

Here is a closer look at the formula for CC003 (IT):

$$((15,000.00 > 10,000.00) \times ((10,000.00 \times 0.75) + (15,000.00 - 10,000.00) \times 1.15)) + ((15,000.00 \leq 10,000.00) \times 15,000.00 \times 0.75) = 13,250.00$$

$$(1 \times (7,500.00 + 5,000.00 \times 1.15)) + (0 \times 15,000.00 \times 0.75)$$

$$1 \times 7,500.00 + 5,750.00 + 0$$

Here is an example of a cost distribution rule if the Electricity fixed formula allocation base is assigned as the allocation base in it.

COST OBJECT	DESCRIPTION	MAGNITUDE	ALLOCATION FACTOR
CC001	HR	1,837.50	$(1,837.50 \div 18,162.50) \times \text{Amount}$
CC002	FI	3,075.00	$(3,075.00 \div 18,162.50) \times \text{Amount}$
CC003	IT	13,250.00	$(13,250.00 \div 18,162.50) \times \text{Amount}$

NOTE

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Create and assign a cost allocation policy to a cost control unit

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Use this procedure to create and assign a cost allocation policy and the corresponding rules to a cost control unit. This recording uses the USP2 demo data company.

Create a policy

1. Go to Cost accounting > Policies > Cost allocation policies.
2. Click New.
3. In the Policy name field, type a value.
4. In the Cost object dimension hierarchy field, enter or select a value.
 - Select Organization.
5. In the Statistical dimension field, enter or select a value.
6. Click Save.

Create allocation rules

1. Click New.
2. In the list, mark the selected row.
3. In the Cost object dimension hierarchy node field, enter or select a value.
4. In the Cost behavior field, select 'Total'.
5. In the Allocation base field, enter or select a value.
6. Click New.
7. In the list, mark the selected row.
8. In the Cost object dimension hierarchy node field, enter or select a value.
9. In the Cost behavior field, select 'Total'.
10. In the Allocation base field, enter or select a value.
11. Click New.
12. In the list, mark the selected row.
13. In the Cost object dimension hierarchy node field, enter or select a value.
14. In the Cost behavior field, select 'Total'.
15. In the Allocation base field, enter or select a value.
 - Continue until you've created all the rules.
16. Click Save.

Assign the policy to a cost control unit

1. Click Policy assignments for cost control unit.
2. Click New.
3. In the list, mark the selected row.
4. In the Valid from accounting date field, enter a date.
 - The rules are date-effective. A user or the system can expire the rules if a newer version is created.
5. In the Cost control unit field, enter or select a value.

6. Click Save.

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Create and assign a cost behavior policy to a cost control unit

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Cost behavior is the classification of costs as either fixed or variable. A policy and the corresponding rules have to be assigned to a cost control unit for the policy to become effective. Use this procedure to create a policy and then assign the policy to a cost control unit.

Create a cost behavior hierarchy

1. Go to Cost accounting > Dimensions > Dimension hierarchies.
2. Click New.
3. Click Create.
4. In the Dimension hierarchy name field, type 'Cost behavior hierarchy'.
5. In the Dimension field, enter or select a value.
 - Select Cost elements.
6. Click Save.
7. Click View hierarchy.
8. Click New.
9. In the Node name field, type a value.
 - Enter Fixed cost.
10. In the tree, select 'Cost behavior hierarchy'.
11. Click New.
12. In the Node name field, type a value.
 - Enter Variable cost.
13. Click Save.
14. In the tree, select 'Cost behavior hierarchy\Fixed cost'.
15. Click New.
16. In the list, mark the selected row.
17. In the From dimension member field, enter or select a value.
 - The range of dimension members can contain gaps, but the members cannot overlap.
18. In the To dimension member field, enter or select a value.
 - The range of dimension members can contain gaps, but the members cannot overlap.
19. In the tree, select 'Cost behavior hierarchy\Variable cost'.
20. Click New.
21. In the list, mark the selected row.
22. In the From dimension member field, enter or select a value.
 - The range of dimension members can contain gaps, but the members cannot overlap.
23. In the To dimension member field, enter or select a value.
 - The range of dimension members can contain gaps, but the members cannot overlap.
24. Click Save.

Create the policy and rules

1. Go to Cost accounting > Policies > Cost behavior policies.
2. Click New.
3. In the Policy name field, type a value.
4. In the Cost element dimension hierarchy field, enter or select a value.
 - Select the policy hierarchy that you just created.
5. In the Cost object dimension hierarchy field, enter or select a value.
 - Select Organization.
6. Click Save.
7. Click New.
8. In the list, mark the selected row.
9. In the Cost element dimension hierarchy node field, enter or select a value.
 - Expand the hierarchy to select Variable cost.
10. In the Cost object dimension hierarchy node field, enter or select a value.
 - By default, the variable percentage is 100 percent.
11. Click Policy assignments for cost control unit.
12. Click New.
13. In the list, mark the selected row.
14. In the Valid from accounting date field, enter a date.
 - The rules are date-effective, and a user or the system can expire a rule if a newer version is created.
15. In the Cost control unit field, enter or select a value.
16. Click Save.

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Create and assign a cost distribution policy to a cost control unit

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Cost distribution rules are used to distribute costs that have been financially counted on a collective cost center. The cost accountant makes sure that the cost is distributed to the cost centers, based on the selected allocation base. A policy and the corresponding rules are assigned to a cost control unit. This task guide uses an example to show how to create a cost distribution policy and the corresponding rules.

Create a policy

1. Go to Cost accounting > Policies > Cost distribution policies.
2. Click New.
3. In the Policy name field, type a value.
4. In the Description field, type a value.
5. In the Cost object dimension hierarchy field, enter or select a value.
 - Select Organization.
6. In the Cost element dimension hierarchy field, enter or select a value.
 - Select CDS P/L.
7. In the Statistical dimension field, enter or select a value.
 - Select Statistical elements.
8. Click Save.

Create rules for the policy

1. Click New.
2. In the list, mark the selected row.
3. In the Cost object dimension hierarchy node field, enter or select a value.
 - Expand the hierarchy to select 094.
4. In the Cost element dimension hierarchy node field, enter or select a value.
 - Select Other operating expenses and then select 605110 Cleaning.
5. In the Cost behavior field, select an option.
 - Select Fixed cost.
6. In the Allocation base field, enter or select a value.
7. Click New.
8. In the list, mark the selected row.
9. In the Cost object dimension hierarchy node field, enter or select a value.
 - Expand the hierarchy to select 094.
10. In the Cost element dimension hierarchy node field, enter or select a value.
 - Select Other operating expenses and then select 605150 Rent.
11. In the Cost behavior field, select an option.
 - Select Fixed cost.
12. In the Allocation base field, enter or select a value.
13. Click Save.

Assign rules to a cost control unit

1. Click Policy assignments for cost control unit.
2. Click New.
3. In the list, mark the selected row.
4. In the Valid from accounting date field, enter a date.
 - Select September 1 in the valid fiscal year.
5. In the Cost control unit field, enter or select a value.
6. Click Save.

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Create a cost rollup policy

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This procedure shows how to create a cost rollup policy and create rules for the policy. The demo data used to create this procedure is USP2.

Create a policy

1. Go to Cost accounting > Policies > Cost rollup policies.
2. Click New.
3. In the Policy name field, type a value.
4. In the Description field, type a value.
5. In the Cost object dimension hierarchy field, enter or select a value.
 - Select Cost rollup CC.
6. In the Cost element dimension hierarchy field, enter or select a value.
 - Select Cost rollup CC.
7. Click Save.

Create rules for the cost rollup policy

1. Click New.
2. In the list, mark the selected row.
3. In the Cost object dimension hierarchy node field, enter or select a value.
 - Select 007.
4. In the Cost element dimension hierarchy node field, enter or select a value.
 - Select Cost rollup CE.
5. In the Secondary cost element field, enter or select a value.
 - For this example, map the secondary cost element CC-007 to the cost center.
6. Click New.
7. In the list, mark the selected row.
8. In the Cost object dimension hierarchy node field, enter or select a value.
 - Select 008.
9. In the Cost element dimension hierarchy node field, enter or select a value.
 - Select Cost rollup CE.
10. In the Secondary cost element field, enter or select a value.
 - For this example, map the secondary cost element CC-008 to the cost center.
11. Click New.
12. In the list, mark the selected row.
13. In the Cost object dimension hierarchy node field, enter or select a value.
 - Select 009.
14. In the Cost element dimension hierarchy node field, enter or select a value.
 - Select Cost rollup CE.
15. In the Secondary cost element field, enter or select a value.
 - For this example, map the secondary cost element CC-009 to the cost center.
 - Continue until all cost centers are mapped to their corresponding secondary cost elements.

16. Click Save.

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Manage a data source for the cost accounting ledger

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Use this procedure to manage the general ledger data source for a cost accounting ledger. Before you complete this task, make sure that you play the "Create a cost accounting ledger" and "Define cost control units" task guides. This recording uses the USP2 demo data company.

1. Go to Cost accounting > Ledger setup > Cost accounting ledgers.
2. In the list, find and select the desired record.
3. Click Actual versions.
4. On the Action Pane, click Manage.
5. Click General ledger.
6. Click New.
7. In the Name field, type a value.
8. In the Data provider field, enter or select a value.
 - For this example, select Dynamics 365 Finance - General ledger entries.
9. In the Cost element dimension field, enter or select a value.
 - For this example, select Cost elements.
10. Click Save.
11. Click Configure data provider.
12. In the Legal entity field, enter or select a value.
 - For this example, select USP2.
13. Click New.
14. In the Posting layer field, select Current.
15. Click OK.

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Process and trace source data

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All data processing is run by jobs. For each job and data provider, a journal is created to document that the process has been run, and that the entries were processed in the current job. Use this procedure to set up a data source and then trace the origin of a specific cost entry. This recording uses the USP2 demo data company USP2. Before you complete this task, make sure that you play the following task guides: "Create a cost accounting ledger," "Define cost control units," and "Manage data source for the cost accounting ledger."

1. Go to Cost accounting > Ledger setup > Cost accounting ledgers.
2. In the list, find and select the desired record.
 - Select the cost accounting ledger that you created earlier.
3. Click Actual versions.
4. On the Action Pane, click Source data processing.
5. Click General ledger entry transfer journals.
6. In the list, find and select the desired record.
7. Click Journal entries.
8. In the list, mark the selected row.
9. Click Cost entries.
10. Click Source entry.
11. On the Action Pane, click Source data processing.
12. Click General ledger.
13. In the Fiscal calendar period field, enter or select a value.
 - For this example, select Fiscal 2017 Period 9.
14. Click OK.

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Overhead calculation

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This topic describes the typical processes for calculating and allocating overhead costs.

Term definition

Overhead costs are the costs that are incurred in order to run a business, but that can't be directly attributed to any specific business activity, product, or service. Overhead costs provide critical support for the generation of profit-making activities. Here are some examples of overhead costs:

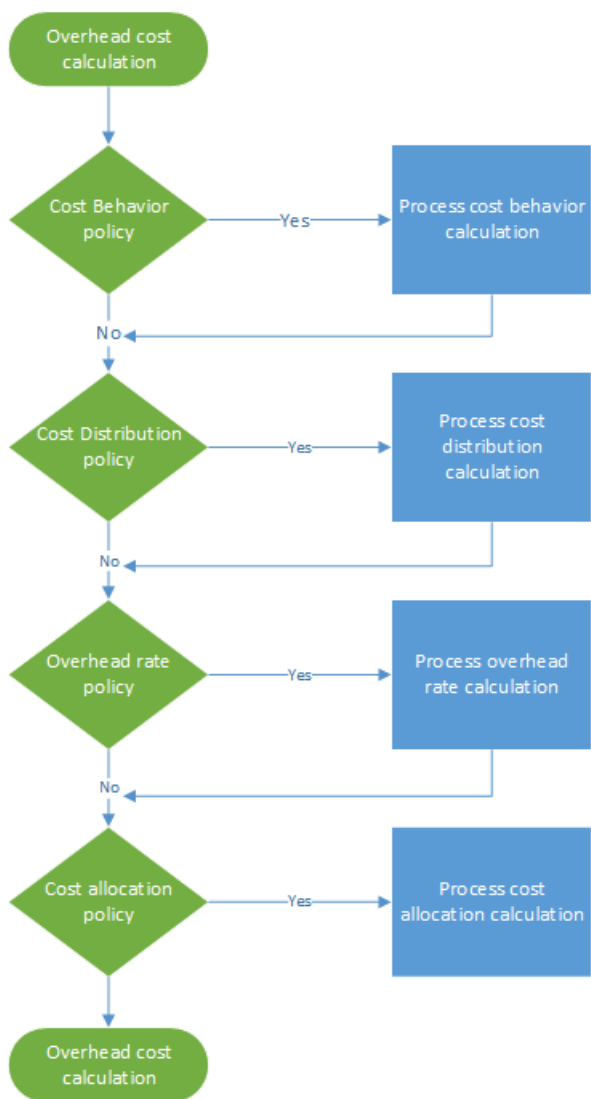
- Rent
- Electricity
- Administrative salaries

Overhead calculation overview

Overhead calculation runs the cost accounting policies in the correct order. You can run overhead calculation multiple times for the same fiscal period if cost accounting policies have been changed or specific errors have been detected. Each run of the overhead calculation is stored and receives a unique version ID that lets you compare the calculations in various versions. The cost entries that the overhead calculation generates receive an accounting date. This accounting date matches the end date of the fiscal period that is used in the calculation. The unique version ID consists of the following elements:

- Version type
- Date and time
- Cost accounting ledger
- Fiscal year
- Fiscal period

Overhead calculation is run independently of the version. Therefore, you can calculate the Budget version before the Actual version. Overhead calculation consists of four steps, as shown in the following illustration. In each step, a journal header is created that has journal entries. This journal header keeps the input data for each calculation step. Policies and rules are applied to each journal line, and cost entries are generated as output. Therefore, you always have full traceability.



Calculate and allocate the Electricity overhead cost

In Financial accounting, some costs, such as electricity, are registered as a lump sum. Therefore, detailed managerial insight isn't provided for Cost accounting. In Cost accounting, to provide correct managerial insight across all organizational units and levels, costs must flow through the organizational units. This flow must be based on either an accurate record of the consumption or a fair assessment. In the general ledger, an electricity cost can be posted as shown in the following table.

ACCOUNTING DATE	COST CENTER		MAIN ACCOUNT		AMOUNT IN THE ACCOUNTING CURRENCY
January 3, 2017	CC099	Default cost center	10001	Electricity	10,000.00

Step 1: Process the cost behavior calculation

By default, when cost entries are imported from the source data, they receive the **Unclassified** cost behavior classification in Cost accounting. By applying cost behavior policy rules, you can reclassify cost entries as either **Fixed cost** or **Variable cost**.

Define the cost behavior rule

In some cases, part of the cost is a fixed fee, and the remaining cost is based on consumption. Electricity bills often match this definition. After you pay a specific fixed fee, you pay for consumption per kilowatt hour (Kwh). For example, if the fixed cost fee is 1,000.00, here is how the cost behavior rule is defined:

- Fixed amount 1,000.00
 - $0 \leq 1,000.00 = \text{Fixed}$
 - $1000,01 < N = \text{Variable}$

Journal

JOURNAL	JOURNAL TYPE	FISCAL CALENDAR PERIOD			VERSION
00001	Cost behavior calculation journal	Fiscal	2017	Period 1	Overhead calculation / 01-02-2017 11:51:00 PM / Ledger /2017 / Period 1

Journal entries (Cost object balance journal entries)

ACCOUNTING DATE	COST OBJECT		COST ELEMENT		COST BEHAVIOR	AMOUNT
January 3, 2017	CC099	Default cost center	10001	Electricity	Unclassified	10,000.00

Cost entries

COST OBJECT		COST ELEMENT		COST BEHAVIOR	AMOUNT	ACCOUNTING DATE
CC099	Default cost center	10001	Electricity	Unclassified	10,000.00	January 3, 2017
CC099	Default cost center	10001	Electricity	Unclassified	-10,000.00	January 31, 2017
CC099	Default cost center	10001	Electricity	Fixed cost	1,000.00	January 31, 2017
CC099	Default cost center	10001	Electricity	Variable cost	9,000.00	January 31, 2017

For more information, see [Create and assign a cost behavior policy to a cost control unit](#).

Step 2: Process the cost distribution calculation

Cost distribution is used to redistribute cost from one cost object to one or more other cost objects by applying a relevant allocation base. Cost distribution and cost allocation differ in that cost distribution always occurs at the level of the primary cost element of the original cost.

Define the cost distribution rule

In Financial accounting, electricity costs are often registered as a lump sum. In Cost accounting, this approach isn't detailed enough. The variable cost should be distributed to the individual cost objects on a fair basis. The most logical allocation basis is the consumption of electricity (Kwh). A statistical dimension member that is named Electricity is created, and electricity consumption is recorded. By default, all statistical dimension members become available as allocation bases.

COST OBJECT		KWH
CC001	HR	1,000

COST OBJECT		KWH
CC002	Finance	6,000
CC003	Assembly	0

The following table shows the result when electricity consumption is applied as an allocation base for variable costs.

COST OBJECT		MAGNITUDE	ALLOCATION FACTOR	AMOUNT
CC001	HR	1,000	$(1,000 \div 7,000) \times 9,000.00$	1,285.71
CC002	Finance	6,000	$(6,000 \div 7,000) \times 9,000.00$	7,714.29
CC003	Assembly	0	$(0 \div 7,000) \times 9,000.00$	0.00

The fixed cost should be distributed evenly to the individual cost objects that have consumed electricity. You can achieve this result by using the Electricity statistical dimension member in a formula allocation base: (Electricity > 0.00) The following table shows the result when electricity consumption is applied as an allocation base for variable costs.

COST OBJECT		FORMULA	MAGNITUDE	ALLOCATION FACTOR	AMOUNT
CC001	HR	$(1,000 > 0.00)$	1	$(1 \div 2) \times 1,000.00$	500.00
CC002	Finance	$(6,000 > 0.00)$	1	$(1 \div 2) \times 1,000.00$	500.00
CC003	Assembly	$(0 > 0.00)$	0	$(0 \div 2) \times 1,000.00$	0.00

Journal

JOURNAL	JOURNAL TYPE	FISCAL CALENDAR PERIOD			VERSION
00002	Cost distribution calculation journal	Fiscal	2017	Period 1	Overhead calculation / 01-02-2017 11:51:00 PM / Ledger /2017 / Period 1

Journal entries (Cost object balance journal entries)

ACCOUNTING DATE	COST OBJECT		COST ELEMENT		COST BEHAVIOR	AMOUNT
January 31, 2017	CC099	Default cost center	10001	Electricity	Fixed cost	1,000.00

ACCOUNTING DATE	COST OBJECT		COST ELEMENT		COST BEHAVIOR	AMOUNT
January 31, 2017	CC099	Default cost center	10001	Electricity	Variable cost	9,000.00

Cost entries

COST OBJECT		COST ELEMENT		COST BEHAVIOR	AMOUNT	ACCOUNTING DATE
CC099	Default cost center	10001	Electricity	Fixed cost	-1,000.00	January 31, 2017
CC001	HR	10001	Electricity	Fixed cost	500.00	January 31, 2017
CC002	Finance	10001	Electricity	Fixed cost	500.00	January 31, 2017
CC099	Default cost center	10001	Electricity	Variable cost	-9,000.00	January 31, 2017
CC001	HR	10001	Electricity	Variable cost	1,285.71	January 31, 2017
CC002	Finance	10001	Electricity	Variable cost	7,714.29	January 31, 2017

For more information, see [Create and assign a cost distribution policy to a cost control unit](#).

Step 3: Process the overhead rate calculation

The overhead rate is used to charge one or more specific cost objects. The charge is based on a predetermined cost rate and the magnitude from the assigned allocation base.

Define the overhead rate

Cost object CC001 HR contributes to a set of internal projects. A statistical dimension member that is named HR projects is created to measure the consumed magnitude.

COST OBJECT		HOURS	
Proj 1	Project 1	3	
Proj 2	Project 2	1	

A predetermined cost rate for the cost projects contribution has been defined.

COST OBJECT		COST ELEMENT	COST BEHAVIOR	UNITS	RATE
CC001	HR	10001	Variable cost	1	10

The following table shows the result when the HR projects are applied as an allocation base.

COST OBJECT		MAGNITUDE	COST ELEMENT	ALLOCATION FACTOR	AMOUNT
Proj 1	Project 1	3	10001	$(3 \div 1) \times 10.00$	30.00
Proj 2	Project 2	1	10001	$(1 \div 1) \times 10.00$	10.00

Journal

JOURNAL	JOURNAL TYPE	FISCAL CALENDAR PERIOD			VERSION
00003	Overhead rate calculation journal	Fiscal	2017	Period 1	Overhead calculation / 01-02-2017 11:51:00 PM / Ledger /2017 / Period 1

Journal entries (Journal entries for overhead rate calculation)

ACCOUNTING DATE	COST OBJECT		MAGNITUDE
January 31, 2017	Proj 1	Internal Proj 1	3.00
January 31, 2017	Proj 2	Internal Proj 2	1.00

Cost entries

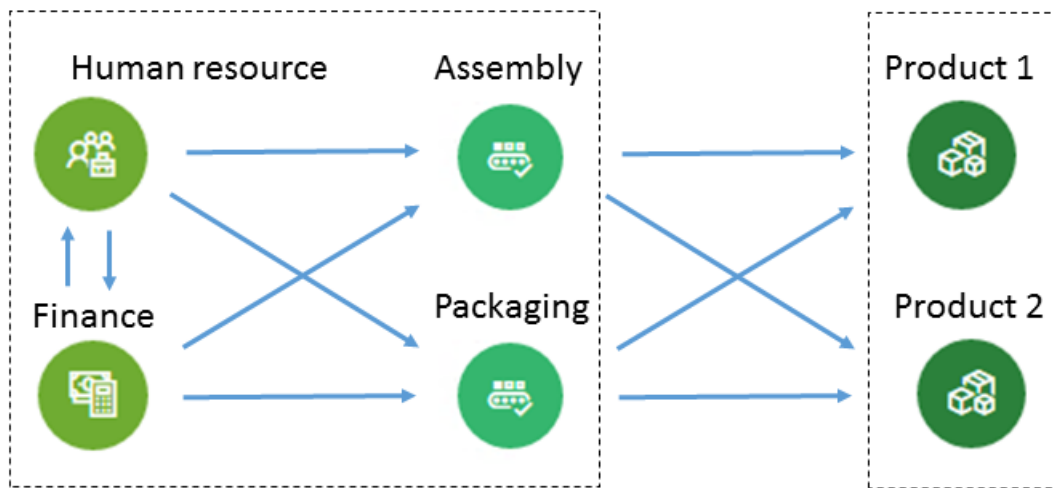
COST OBJECT		COST ELEMENT		COST BEHAVIOR	AMOUNT	ACCOUNTING DATE
CC0001	HR	10001	Electricity	Variable cost	-30.00	January 31, 2017
Proj 1	Internal Proj 1	10001	Electricity	Variable cost	30.00	January 31, 2017
CC001	HR	10001	Electricity	Variable cost	-10.00	January 31, 2017
Proj 2	Internal Proj 2	10001	Electricity	Variable cost	10.00	January 31, 2017

For more information, see [Perform overhead calculation](#).

Step 4: Process the cost allocation calculation

Allocation is used to allocate the balance of a cost object to other cost objects by applying an allocation base. Finance supports the reciprocal allocation method. In the reciprocal allocation method, the mutual services that auxiliary cost objects exchange are fully recognized. The system automatically determines the correct order to perform the allocations in. The balance of a cost object is allocated by a single allocation base. Allocations across cost objects dimensions and their respective members are supported. The allocation order is controlled by the cost control unit.

Cost object: Cost center



Define the cost allocation

Here is a simple example that explains how you can trace the flow of cost. Cost object CC001 HR contributes to several cost objects. A statistical dimension member that is named HR services is created to measure the consumed magnitude.

COST OBJECT		HR SERVICES
CC002	Finance	35
CC003	Assembly	55
CC004	Packaging	10

Cost object CC002 Finance contributes to several cost objects. A statistical dimension member that is named Finance services is created to measure the consumed magnitude.

COST OBJECT		FINANCE SERVICES
CC003	Assembly	65
CC004	Packaging	35

Cost object CC003 Assembly contributes to several cost objects. A statistical dimension member that is named Assembly services is created to measure the consumed magnitude.

COST OBJECT		ASSEMBLY SERVICES (HOURS)
Prod 1	Product 1	60
Prod 2	Product 2	20

Cost object CC004 Packaging contributes to several cost objects. A statistical dimension member that is named Packaging services is created to measure the consumed magnitude.

COST OBJECT		PACKAGING SERVICES (HOURS)
Prod 1	Product 1	80

COST OBJECT		PACKAGING SERVICES (HOURS)
Prod 2	Product 2	15

NOTE

Statistical measures such as the production hours that a product consumes can be derived from source data. For more information, see [Statistical measure provider template](#). The following table shows the result when the HR services are applied as an allocation base for total cost (fixed cost and variable cost).

COST OBJECT		MAGNITUDE	ALLOCATION FACTOR	AMOUNT	COST BEHAVIOR
CC002	Finance	35	$(35 \div 100) \times 500.00$	175.00	Fixed cost
CC003	Assembly	55	$(55 \div 100) \times 500.00$	275.00	Fixed cost
CC004	Packaging	10	$(10 \div 100) \times 500.00$	50.00	Fixed cost
CC002	Finance	35	$(35 \div 100) \times 1,245.71$	436.00	Variable cost
CC003	Assembly	55	$(55 \div 100) \times 1,245.71$	685.14	Variable cost
CC004	Packaging	10	$(10 \div 100) \times 1,245.71$	124.57	Variable cost

The following table shows the result when the Finance services are applied as an allocation base for total cost (fixed cost and variable cost).

COST OBJECT		MAGNITUDE	ALLOCATION FACTOR	AMOUNT	COST BEHAVIOR
CC003	Assembly	65	$(65 \div 100) \times (500.00 + 175.00)$	438.75	Fixed cost
CC004	Packaging	35	$(35 \div 100) \times (500.00 + 175.00)$	236.25	Fixed cost
CC003	Assembly	65	$(65 \div 100) \times (7,714.29 + 436.00)$	5,297.69	Variable cost
CC004	Packaging	35	$(35 \div 100) \times (7,714.29 + 436.00)$	2,852.60	Variable cost

The following table shows the result when the Assembly services are applied as an allocation base for total cost (fixed cost and variable cost).

COST OBJECT		MAGNITUDE	ALLOCATION FACTOR	AMOUNT	COST BEHAVIOR
Prod 1	Product 1	60	$(60 \div 80) \times (275.00 + 438.75)$	535.31	Fixed cost
Prod 2	Product 2	20	$(20 \div 80) \times (275.00 + 438.75)$	178.44	Fixed cost
Prod 1	Product 1	60	$(60 \div 80) \times (5,297.69 + 685.14)$	4,487.12	Variable cost
Prod 2	Product 2	20	$(20 \div 80) \times (5,297.69 + 685.14)$	1,495.71	Variable cost

The following table shows the result when the Packaging services are applied as an allocation base for total cost (fixed cost and variable cost).

COST OBJECT		MAGNITUDE	ALLOCATION FACTOR	AMOUNT	COST BEHAVIOR
Prod 1	Product 1	80	$(80 \div 95) \times (50.00 + 236.25)$	241.05	Fixed cost
Prod 2	Product 2	15	$(15 \div 95) \times (50.00 + 236.25)$	45.20	Fixed cost
Prod 1	Product 1	80	$(80 \div 95) \times (2,852.60 + 124.57)$	2,507.09	Variable cost
Prod 2	Product 2	15	$(15 \div 95) \times (2,852.60 + 124.57)$	470.08	Variable cost

Journal entries (cost object balance journal entries)

JOURNAL	JOURNAL TYPE	FISCAL CALENDAR PERIOD		VERSION
00004	Cost allocation journal	Fiscal	2017	Period 1 Overhead calculation / 01-02-2017 11:51:00 PM / Ledger /2017 / Period 1

Journal lines

ACCOUNTING DATE	COST OBJECT		COST ELEMENT		COST BEHAVIOR	AMOUNT
January 31, 2017	CC001	HR	10001	Electricity	Fixed cost	500.00

ACCOUNTING DATE	COST OBJECT		COST ELEMENT		COST BEHAVIOR	AMOUNT
January 31, 2017	CC001	HR	10001	Electricity	Variable cost	1,245.71
January 31, 2017	CC002	Finance	10001	Electricity	Fixed cost	675.00
January 31, 2017	CC002	Finance	10001	Electricity	Variable cost	8,150.29
January 31, 2017	CC003	Assembly	10001	Electricity	Fixed cost	713.75
January 31, 2017	CC003	Assembly	10001	Electricity	Variable cost	5,982.83
January 31, 2017	CC003	Packaging	10001	Electricity	Fixed cost	286.25
January 31, 2017	CC003	Packaging	10001	Electricity	Variable cost	2,977.17
January 31, 2017	Prod 1	Product 1	10001	Electricity	Fixed cost	776.36
January 31, 2017	Prod 1	Product 1	10001	Electricity	Variable cost	6,994.21
January 31, 2017	Prod 2	Product 1	10001	Electricity	Fixed cost	223.64
January 31, 2017	Prod 2	Product 1	10001	Electricity	Variable cost	1,965.79

Cost entries

COST OBJECT		COST ELEMENT		COST BEHAVIOR	AMOUNT	ACCOUNTING DATE
CC001	HR	10001	Electricity	Fixed cost	-500.00	January 31, 2017
CC002	Finance	10001	Electricity	Fixed cost	175.00	January 31, 2017
CC003	Assembly	10001	Electricity	Fixed cost	275.00	January 31, 2017
CC004	Packaging	10001	Electricity	Fixed cost	50,00	January 31, 2017
CC001	HR	10001	Electricity	Variable cost	-1,245.71	January 31, 2017

COST OBJECT		COST ELEMENT		COST BEHAVIOR	AMOUNT	ACCOUNTING DATE
CC002	Finance	10001	Electricity	Variable cost	436.00	January 31, 2017
CC003	Assembly	10001	Electricity	Variable cost	685.14	January 31, 2017
CC004	Packaging	10001	Electricity	Variable cost	124.57	January 31, 2017
CC002	Finance	10001	Electricity	Fixed cost	-675.00	January 31, 2017
CC003	Assembly	10001	Electricity	Fixed cost	438.75	January 31, 2017
CC004	Packaging	10001	Electricity	Fixed cost	236.25	January 31, 2017
CC002	Finance	10001	Electricity	Variable cost	-8,150.29	January 31, 2017
CC003	Assembly	10001	Electricity	Variable cost	5,297.69	January 31, 2017
CC004	Packaging	10001	Electricity	Variable cost	2,852.60	January 31, 2017
CC003	Assembly	10001	Electricity	Fixed cost	-713.75	January 31, 2017
Prod 1	Product 1	10001	Electricity	Fixed cost	535.31	January 31, 2017
Prod 2	Product 2	10001	Electricity	Fixed cost	178.44	January 31, 2017
CC003	Assembly	10001	Electricity	Variable cost	-5,982.83	January 31, 2017
Prod 1	Product 1	10001	Electricity	Variable cost	4,487.12	January 31, 2017
Prod 2	Product 2	10001	Electricity	Variable cost	1,495.71	January 31, 2017
CC003	Assembly	10001	Electricity	Fixed cost	-286.25	January 31, 2017
Prod 1	Product 1	10001	Electricity	Fixed cost	241.05	January 31, 2017
Prod 2	Product 2	10001	Electricity	Fixed cost	45.20	January 31, 2017

COST OBJECT		COST ELEMENT		COST BEHAVIOR	AMOUNT	ACCOUNTING DATE
CC003	Assembly	10001	Electricity	Variable cost	-2,977.17	January 31, 2017
Prod 1	Product 1	10001	Electricity	Variable cost	2,507.09	January 31, 2017
Prod 2	Product 2	10001	Electricity	Variable cost	470.08	January 31, 2017

Conclusion

In Financial accounting, a cost of 10,000.00 for Electricity is posted to a dummy cost center ID. Therefore, cost accountants will know that this cost must be allocated. In Cost accounting, the costs flow across organizational units and levels, based on the policies and rules that are applied. Each cost has been associated with an allocation base that provides the best assessment for the allocation of costs.

COST ELEMENT	COST OBJECT									TOTAL
	CC099	CC001	CC002	CC003	CC004	PROJ1	PROJ2	PROD1	PROD2	
10001 Electricity	0.00	0.00	0.00	0.00		30.00	10.00	7,770.57	2,189.43	10,000.00
Unclassified	0.00									
Fixed cost	0.00	0.00	0.00	0.00	0.00			776.36	223.64	1,000.00
Variable cost	0.00	0.00	0.00	0.00	0.00	30.00	10.00	6,994.21	1,965.79	9,000.00

NOTE

This topic shows how a primary cost element, 10001 Electricity, flows through the cost objects. Therefore, this overhead cost is allocated to the lowest level in the organization. In other words, the cost objects at the lowest level bear the cost. If you require a visual flow of the cost between the cost objects, you can use the cost roll-up policy rules to visualize the flow of the cost. For more information, see [Cost rollup policy and overhead calculation](#).

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Cost rollup policy and overhead calculation

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Cost accounting lets you gain insight into how the cost flow relates to the products and services that are delivered within an organization. To see the cost transparency, it's crucial to achieve cost allocation between cost objects based on an appropriate allocation basis. By default, the cost allocation is achieved for the primary cost element, which is desired in some situations, but it has a few implications that should be considered.

- Auxiliary cost objects will end with a zero balance for the primary cost element after overhead calculation.
- The volume of cost entries generated by overhead calculation can be very high.
- It is not possible to track the cost flow between cost objects.

To avoid these implications, Cost accounting lets you configure cost allocation to fit into your organization managerial reporting requirements. This topic discusses how you can determine the correct level of secondary cost elements and create cost rollup rules that fit into organization reporting and cost traceability.

NOTE

You can change configurations if reporting requirements change.

Example of cost rollup policy setup

Imagine that an organization has the following structure with 4 cost centers.



Cost object dimension

COST CENTERS	DESCRIPTION
CC001	HR
CC002	Finance
CC003	Assembly
CC004	Packaging

Cost element dimension

COST ELEMENTS	DESCRIPTION	TYPE
1001	Electricity	Primary
1002	Salaries	Primary
1003	Advertising	Primary

A dimension hierarchy that fulfills the organizational reporting requirements can be set up as follows.

Dimension hierarchy details

DIMENSION HIERARCHY NAME	DIMENSION	DIMENSION HIERARCHY TYPE NAME	ACCESS LIST HIERARCHY
Organization	Cost centers	Dimension classification hierarchy	No

Dimension hierarchy

	DIMENSION MEMBER RANGES	
Nodes	From dimension member	To dimension member
Organization		
Admin		
Finance	CC001	CC001
HR	CC002	CC002
Production		
Packaging	CC003	CC003
Assembly	CC004	CC004

A dimension hierarchy that fulfills the policy requirement can be set up as follows.

Dimension hierarchy details

DIMENSION HIERARCHY NAME	DIMENSION	DIMENSION HIERARCHY TYPE NAME
Profit & Loss statement	Cost elements	Dimension classification hierarchy

Dimension hierarchy

	DIMENSION MEMBER RANGES	
Nodes	From dimension member	To dimension member
Profit & Loss statement		

	DIMENSION MEMBER RANGES	
Primary cost	10001	10003

After the general ledger entries are processed, the cost entry balance by cost object looks like this.

	COST OBJECT				TOTAL
Cost element	CC001	CC002	CC003	CC004	
1001 Electricity	100,00	200,00	6.000,00	2.000,00	8.300,00
1002 Salaries	10.000,00	10.000,00	8.000,00	6.500,00	34.500,00
1003 Advertising	0,00	4.000,00	0,00	0,00	4.000,00
	10.100,00	14.200,00	14.000,00	8.500,00	46.800,00

Statistical dimension

STATISTICAL ELEMENTS	DESCRIPTION
SE-1	HR services
SE-2	Finance services

Cost object CC001 HR is contributing HR services to several cost objects.

HR services are consumed by the following distribution of magnitude.

COST OBJECT	DESCRIPTION	HR SERVICES
CC002	Finance	35
CC003	Assembly	55
CC004	Packaging	10

Cost object CC002 Finance is contributing to several cost objects.

Finance services are consumed by the following distribution of magnitude.

COST OBJECT	DESCRIPTION	FINANCE SERVICES
CC003	Assembly	65
CC004	Packaging	35

Cost allocation polices can be set up as follows.

POLICY NAME	DESCRIPTION	COST OBJECT DIMENSION HIERARCHY	STATISTICAL DIMENSION	COST ELEMENT DIMENSION
2017	Cost allocation	Organization	Statistical elements	Cost elements

Cost allocation rules can be set up as follows.

COST OBJECT DIMENSION HIERARCHY NODE	COST BEHAVIOR	ALLOCATION BASE
CC001	Total	HR services
CC002	Total	Financial services

How cost flows between cost centers

If you want to learn how cost flows between the cost centers in the organization, you can create cost elements of the type **Secondary** for each cost center. These cost elements will then be used to transfer balances between the cost centers during the overhead calculation.

Cost element dimension members can be set up as follows.

COST ELEMENTS	TYPE	
1001	Electricity	Primary
1002	Salaries	Primary
1003	Advertising	Primary
SC-CC001	HR	Secondary
SC-CC002	Finance	Secondary
SC-CC003	Assembly	Secondary
SC-CC004	Packaging	Secondary

The dimension hierarchy **Profit & Loss statement** needs to be updated with the new dimension members so that the dimension hierarchy contains the correct data that can be used for defining reporting and policies.

Dimension hierarchy details

DIMENSION HIERARCHY NAME	DIMENSION	DIMENSION HIERARCHY TYPE NAME
Profit & Loss statement	Cost elements	Dimension classification hierarchy

Dimension hierarchy

	DIMENSION MEMBER RANGES	
Nodes	From dimension member	To dimension member

	DIMENSION MEMBER RANGES	
Profit & Loss statement		
Primary cost	10001	10003
Secondary cost	SC-CC001	SC-CC004

Create a **Cost rollup policy** where each cost center is mapped to a corresponding cost element of the type **Secondary**.

Cost rollup polices

POLICY NAME	DESCRIPTION	COST OBJECT DIMENSION HIERARCHY	COST ELEMENT DIMENSION HIERARCHY
2017	Cost flow	Organization	Profit & Loss statement

Cost rollup rules

COST OBJECT DIMENSION HIERARCHY NODE	COST ELEMENT DIMENSION HIERARCHY NODE	SECONDARY COST ELEMENT
CC001	Profit & Loss statement	SC-CC001
CC002	Profit & Loss statement	SC-CC002
CC003	Profit & Loss statement	SC-CC003
CC004	Profit & Loss statement	SC-CC004

Perform overhead calculation

Journal

JOURNAL	JOURNAL TYPE	FISCAL CALENDAR PERIOD	YEAR	PERIOD	VERSION
00002	Cost allocation journal	Fiscal	2017	Period 1	Overhead calculation / 01-02-2017 11:51:00 PM / Ledger /2017 / Period 1

The system will now apply the **Cost rollup policy** when it creates the **Cost object balance journal entries**.

Cost object balance journal entries

ACCOUNTING DATE	COST OBJECT	DESCRIPTION	COST ELEMENT	DESCRIPTION	AMOUNT
31-01-2017	CC001	HR	SC-CC001	HR	10.100,00
31-01-2017	CC002	Finance	SC-CC002	Finance	17.735,00

ACCOUNTING DATE	COST OBJECT	DESCRIPTION	COST ELEMENT	DESCRIPTION	AMOUNT
31-01-2017	CC003	Assembly	SC-CC003	Assembly	31.082,75
31-01-2017	CC004	Packaging	SC-CC004	Packaging	15.717,25

NOTE

The journal entries are created based on the rules in the **Cost rollup policy** if a policy exists. The balance displayed is the balance of the overhead calculation.

The **Cost object cost balance journal entry details** page that is accessed from the journal entries displays how the balance is obtained.

Example: The journal entry for Cost object CC002 Finance

Cost object cost balance journal entry details

COST ELEMENT DIMENSION MEMBER	DESCRIPTION	AMOUNT
1001	Electricity	200,00
1002	Salaries	10.000,00
1003	Advertising	4.000,00
SC-CC001	HR	3.535,00

Cost entries generated by the Overhead calculation

COST OBJECT	DESCRIPTION	COST ELEMENT	DESCRIPTION	AMOUNT	ACCOUNTING DATE
CC001	HR	SC-CC001	HR	-10.100,00	31-01-2017
CC002	Finance	SC-CC001	HR	3.535,00	31-01-2017
CC003	Assembly	SC-CC001	HR	5.555,00	31-01-2017
CC004	Packaging	SC-CC001	HR	1.010,00	31-01-2017
CC002	Finance	SC-CC002	Finance	-17.735,00	31-01-2017
CC003	Assembly	SC-CC002	Finance	11.527,75	31-01-2017
CC004	Packaging	SC-CC002	Finance	6.207,25	31-01-2017

After the **Overhead calculation** is completed, you can report the results using tools such as Microsoft SharePoint Workspace, Excel, or Power BI.

View reporting in Excel

The dimension hierarchies allow you to view data at different aggregation levels.

Here is an example of a Power Pivot reporting in Excel.

PROFIT & LOSS STATEMENT	COST OBJECT				TOTAL
	CC001	CC002	CC003	CC004	
Primary cost	10.100,00	14.200,00	14.000,00	8.500,00	46.800,00
1001	100,00	200,00	6.000,00	2.000,00	8.300,00
1002	10.000,00	10.000,00	8.000,00	6.500,00	34.500,00
1003	0,00	4.000,00	0,00	0,00	4.000,00
Secondary cost	-10.100,00	-14.200,00	17.082,75	7.217,25	0,00
SC-CC001	-10.100,00	3.535,00	5.555,00	1.010,00	0,00
SC-CC002	0,00	-17.735,00	11.527,75	6.207,25	0,00
SC-CC003	0,00	0,00	0,00	0,00	0,00
SC-CC004	0,00	0,00	0,00	0,00	0,00
Total	0,00	0,00	31.082,75	15.717,25	46.800,00

Using **Cost rollup policy** and **Cost elements of the type secondary** allows you to leave the primary cost per cost object for internal reporting as the primary cost that remains after **Overhead calculation**.

If the same example had been performed without creating the **Cost rollup policy**, the reporting result would be as shown below. The cost flows correctly but the traceability and insight into how cost flows between the cost centers are lost.

PROFIT & LOSS STATEMENT	COST OBJECT				TOTAL
	CC001	CC002	CC003	CC004	
Primary cost	0,00	0,00	31.082,75	15.717,25	46.800,00
1001	0,00	0,00	6.207,75	2.092,25	8.300,00
1002	0,00	0,00	22.275,00	12.225,00	34.500,00
1003	0,00	0,00	2600,00	1.400,00	4.000,00
Secondary cost	0,00	0,00	0,00	0,00	0,00
SC-CC001	0,00	0,00	0,00	0,00	0,00
SC-CC002	0,00	0,00	0,00	0,00	0,00

PROFIT & LOSS STATEMENT	COST OBJECT				TOTAL
SC-CC003	0,00	0,00	0,00	0,00	0,00
SC-CC004	0,00	0,00	0,00	0,00	0,00
Total	0,00	0,00	31.082,75	15.717,25	46.800,00

Depending on the reporting and traceability requirements in your organization, you can determine the correct level of secondary cost elements and create cost rollup rules that fit your needs.

The clear separation between **Cost allocation** and **Cost rollup policies** provides the flexibility to make continuous updates without affecting each other.

Additional resources

- [Cost object dimensions](#)
- [Cost element dimensions](#)
- [Dimension hierarchy](#)
- [Overhead calculation](#)

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Cost control workspace

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The **Cost control** workspace is a central point where managers who are responsible for controlling a cost object or a set of cost objects within a dimension or across dimensions (for example, cost centers and product groups) can access reports. The reports in the workspace are fully managed by cost accountants, so that the layout and data that are used for reporting can be consistent across the whole organization.

Cost control workspace configuration

Cost accountants can define as many report configurations as they require for the desired data composition or layout. A report configuration consists of six sections, each of which contributes to either the selection of the targeted data composition or the layout.

To configure a cost control workspace, click **Cost accounting > Setup > Cost control workspace configuration**.

General

On the **General** FastTab, you can create a unique report layout. The name of the report will be a unique identifier that users will be able to recognize in the **Cost control** workspace. You can also specify whether the report should be shared or kept internal for cost accountants.

FIELD	DESCRIPTION
Name	Enter a unique name for the layout.
Description	Enter a detailed description.
Published	<p>If you set this field to Yes, a user who is assigned one of the following roles can see the report in the Cost control workspace:</p> <ul style="list-style-type: none">• Cost accounting manager• Cost accountant• Cost accountant clerk• Cost object controller <p>If you set this field to No, only users who are assigned one of the following roles can see the report in the Cost control workspace:</p> <ul style="list-style-type: none">• Cost accounting manager• Cost accountant• Cost accountant clerk

Data filtering

On the **Data filtering** FastTab, you define the data foundation for the report. Users of this report will see values on the report after source data has been processed.

FIELD	DESCRIPTION
Cost accounting ledger	The Cost accounting ledger that the report is based on. The value is derived from the Cost control unit field.

FIELD	DESCRIPTION
Cost control unit	The value that you select determines the cost accounting ledger and cost objects that this report will be based on.
Statistical dimension hierarchy, Cost element dimension hierarchy	<p>A Cost control workspace configuration record can report either non-monetary or monetary values, but not in the same layout. Select a value in the Cost element dimension hierarchy field to report monetary values. Select a value in the Statistical dimension hierarchy field to report non-monetary values. The dimension hierarchy record that you select determines the structure of the reporting and aggregation levels.</p> <div style="border: 1px solid gray; padding: 5px; margin-top: 10px;"> <p>[!NOTE] To view non-monetary and monetary values side by side, you can export data to Microsoft Excel for the Microsoft Power BI content pack.</p> </div>
Cost object dimension hierarchy	Select the dimension hierarchy of the cost object dimension that suits the purpose of the reporting that you're defining.
Budget original version	Select the budget version ID that acts as the original budget in the context of this report.
Budget revised version	Select the budget version ID that acts as the revised budget in the context of this report.

Assign calculation records

The overhead calculation performs several calculation steps on the source data, such as cost behavior classification, cost distribution, and cost allocation. Multiple overhead calculations can be done for the same fiscal period, in case missing source data is discovered or rules must be updated. Each overhead calculation is saved with a unique ID. The cost accountant can select a specific overhead calculation ID. Users of the report, such as managers, will see the results of the overhead calculation in the **Cost control** workspace.

FIELD	DESCRIPTION
Fiscal calendar period	<p>Select the fiscal calendar period to assign an overhead calculation ID to.</p> <div style="border: 1px solid gray; padding: 5px; margin-top: 10px;"> <p>[!NOTE] The fiscal periods that are listed in the field come from the fiscal calendar that is associated with the cost accounting ledger.</p> </div>
Actual version	Select the appropriate overhead calculation ID.
Budget version	Select the appropriate overhead calculation ID.
Revised budget version	Select the appropriate overhead calculation ID.

Fiscal periods per column

On the **Fiscal periods per column** FastTab, the cost accountant decides which fiscal period should be shown in the report layout.

The values in the selected columns will be multiplied by the selected values on the **Fiscal periods per column** FastTab.

FIELD	DESCRIPTION
Current period	<p>The balance of the current fiscal period is shown.</p> <div style="border: 1px solid gray; padding: 5px;"> <p>[!NOTE] By default, the current period is determined by the session date. In the Cost control workspace, a specific fiscal period can be selected. The selected value then represents the current period.</p> </div>
Previous period	<p>The balance of the previous fiscal period is shown. The following formula is used: Current fiscal period – 1</p> <div style="border: 1px solid gray; padding: 5px;"> <p>[!NOTE] By default, the previous period is derived from the session date. In the Cost control workspace, a specific fiscal period can be selected as the current period. Previous period will then be recalculated accordingly.</p> </div>
Year to date	<p>The for the year to date is shown. The following formula is used: YearToDate (Current fiscal period)</p> <div style="border: 1px solid gray; padding: 5px;"> <p>[!NOTE] By default, the current period is determined by the session date. In the Cost control workspace, a specific fiscal period can be selected. The selected value then represents the current period, and the Year to date value will be updated accordingly.</p> </div>

FIELD	DESCRIPTION
Year to date average	<p>The average for the year to date is shown. The following formula is used: $(\text{YearToDate} [\text{Current fiscal period}]) \div (\text{Count} [\text{Current fiscal period}])$</p> <p>Example</p> <ul style="list-style-type: none"> • Statistical dimension member: Full time employees • Current date: 3-21-2017 • Period: Fiscal period 1, Fiscal period 2, Fiscal period 3 • Magnitude: 10, 10, 12 <p>In this case, Year to date average = $(10 + 10 + 12) \div 3 = 10.67$</p> <p>The Year to date average value can be calculated for cost element dimension members and statistical dimension members.</p> <div style="border: 1px solid gray; padding: 5px; margin-top: 10px;"> <p>[!NOTE] By default, the current period is determined by the session date. In the Cost control workspace, a specific fiscal period can be selected. The selected value then represents the current period, and the Year to date and Year to date average values will be updated accordingly.</p> </div>

Columns to display for costs

On the **Columns to display for costs** FastTab, the cost accountant decides which columns the report layout should contain. There are three categories: Fixed cost, Variable cost, and Unclassified cost.

FIELD	DESCRIPTION
Fixed cost	<p>This column type shows the fixed cost, based on the selected overhead calculation ID.</p> <div style="border: 1px solid gray; padding: 5px; margin-top: 10px;"> <p>[!NOTE] This column type will show a balance only when an overhead calculation ID is selected for the fiscal period.</p> </div>
Variable cost	<p>This column type shows the variable cost, based on the selected overhead calculation ID.</p> <div style="border: 1px solid gray; padding: 5px; margin-top: 10px;"> <p>[!NOTE] This column type will show a balance only when an overhead calculation ID is selected for the fiscal period.</p> </div>
Fixed + variable cost	<p>This column type shows the fixed cost and variable cost, based on the selected overhead calculation ID.</p> <div style="border: 1px solid gray; padding: 5px; margin-top: 10px;"> <p>[!NOTE] This column type will show a balance only when an overhead calculation ID is selected for the fiscal period.</p> </div>

FIELD	DESCRIPTION
Total cost	<p>This column type shows the total cost (unclassified cost, fixed cost, and variable cost).</p> <div style="border: 1px solid #ccc; padding: 5px; margin-top: 10px;"> <p>[!NOTE] The column type will show the balance at all times.</p> </div>
Unclassified cost	<p>This column type shows the unclassified cost.</p> <div style="border: 1px solid #ccc; padding: 5px; margin-top: 10px;"> <p>[!NOTE] This column can be used to validate whether all costs have been correctly classified by the overhead calculation, or whether the cost behavior rules must be adjusted.</p> </div>

Columns to display for budgeted costs

On the **Columns to display for budgeted costs** FastTab, the cost accountant decides which columns should be shown for the selected budget versions. Individual selections can be made for the original and revised budget.

NOTE

Because the following fields behave in the same manner for original budget and revised budget, they will be explained only one time.

FIELD	DESCRIPTION
Budget	<p>Budget balances will be shown per the selected columns.</p> <div style="border: 1px solid #ccc; padding: 5px; margin-top: 10px;"> <p>[!NOTE] The balances will be based on the budget versions that are selected on the Data filtering FastTab.</p> </div>
Budget variance	<p>Calculate and show the difference between budget and actual. The following formula is used: Budget balance – Actual balance</p>
Budget variance in %	<p>Calculate and show the difference in percentage between budget and actual. The following formula is used: (Budget balance – Actual balance) ÷ Budget balance</p>
Variance period threshold	<p>Set a threshold for the variance in monetary amount for the current period. If the threshold is exceeded, the line will be highlighted in red in the Cost control workspace.</p> <div style="border: 1px solid #ccc; padding: 5px; margin-top: 10px;"> <p>[!NOTE] This field applies only to the cost elements that represent expenditures.</p> </div>

FIELD	DESCRIPTION
Variance year threshold	Set a threshold for the variance in monetary amount for the year. If the threshold is exceeded, the line will be highlighted in red in the Cost control workspace.
Variance threshold %	Set a threshold for the variance in percentage. If the threshold is exceeded, the line will be highlighted in red in the Cost control workspace.

[!NOTE]
The same percentage threshold applies to the current period and year.

Cost control workspace

The **Cost control** workspace is designed as a web report. Therefore, all managers who are responsible for a cost object can be granted access as described in [Define access rights for cost object controllers](#).

The list of reports that are available for users, such as managers, is controlled by the setting of the **Published** option on the **Cost control workspace configurations** page.

Node name	Current period (total)	Current period (total - budget)	Current period (budget variance)	% Current period (budget variance)	Year to date (total)	Year to date (total - budget)	Year to date (budget variance)	% Year to date (budget variance)
CDS P/L	0.00	0.00	0.00	0.00	0.02	0.02	0.00	0.00
Total Cost	0.00	0.00	0.00	0.00	0.02	0.02	0.00	0.00
Personnel costs	9,912.24	9,900.00	-12.24	-0.13	48,592.66	48,592.59	-190.16	-0.39
Direct personnel	9,000.00	9,000.00	0.00	0.00	45,000.00	45,000.00	0.00	0.00
Indirect personnel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Person & Benefits	912.24	900.00	-12.24	-1.47	3,692.66	3,502.50	-190.16	-5.43
Expenses	33,213.40	28,265.22	-4,948.18	-17.51	134,371.42	110,078.04	-24,293.38	-22.07
Business travel	32,187.35	27,300.00	-4,887.35	-17.90	130,148.85	106,242.50	-23,906.35	-22.50
Consumables	494.23	459.38	-34.85	-7.59	2,072.17	1,866.95	-205.22	-10.99
Fee & Services	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Office expenses	235.23	196.36	-38.87	-19.80	951.14	764.17	-186.97	-24.47
Operating taxes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other operating expenses	296.59	309.48	12.89	4.17	1,199.26	1,204.42	5.16	0.43
Other personnel expenses	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other expenses	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Secondary cost allocations	-41,126.64	-38,165.22	4,961.42	-13.00	-183,064.06	-158,580.52	24,483.54	-15.44
Cost center allocation	55,608.40	60,042.13	4,433.73	7.38	268,967.31	284,782.25	15,814.94	5.55
Product group allocation	-98,735.04	-98,207.35	527.69	-0.54	-452,031.37	-443,362.77	8,668.60	-1.96

A manager can select the fiscal calendar period to view. The session date is used to determine the default current period.

The values in the fiscal calendar period are determined by the report name and the fiscal calendar that is selected for the cost accounting ledger that is associated with the report name on the **Cost control workspace configurations** page.

In the cost object dimension hierarchy, users can select the aggregation level at which balances should be shown. By enabling access-level security, you control the permissions, so that users can select only the hierarchy levels that they have been granted access to. Therefore, they can see only the aggregated balances that they have been granted access to.

Add or remove columns

Users can customize the columns on a report to fit their requirements.

View details

Users can drill into the details behind the balances that are shown in the workspace. If users select a cost element dimension hierarchy node, and then click **View details**, the **Cost element details** dialog box shows detailed information for the node.

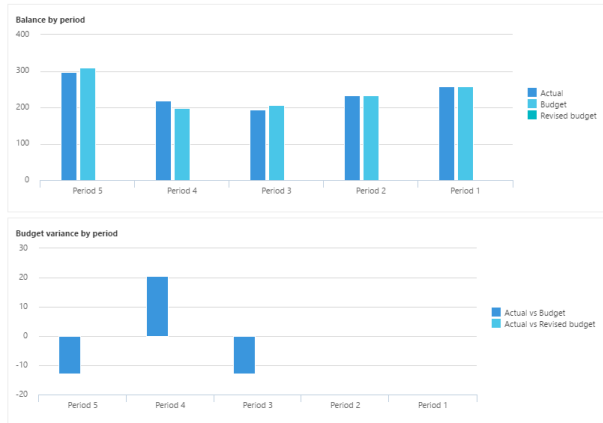
A grid shows each cost element that is associated with the cost element dimension hierarchy node, and its

values. The columns that appear in the grid match the workspace settings.

Two charts show a summary of actual versus budget and budget variance by period.

Cost element details for Other operating expenses

Cost entries			Current period Total	Current period Total - Budget	Current period Budget variance	Current period Budget variance %	Year to date Total	Year to date Total - Budget	Year to date Budget variance	Year to date Budget variance %
✓ Dimension member			21.46	22.39	0.93	4.15	86.77	87.14	0.37	0.42
Cost elements	605110	Cleaning Expense	21.46	22.39	0.93	4.15	86.77	87.14	0.37	0.42
✓ Cost elements	605150	Rent Expense	275.13	287.09	11.96	4.17	1,112.49	1,117.28	4.79	0.43



Users can click **Cost entries** to drill down into the entry details as required.

Cost entries											
Filter	Fiscal calendar period	Period start	End date	Version							
Cost object	Accounting date 'Y'	Debit	Credit	Amount	Cost element dimension member	Cost behavior	Version				
USP2	Cost center co... Cost centers 010	Production	5/31/2017	275.13	275.13	Cost elements 605150	Rent Expense	Fixed cost	Overhead calculation / 5/10/2017 07:3044 pm / USP2 / 2017 / Period 5		
USP2	Cost center co... Cost centers 010	Production	5/31/2017	287.09	287.09	Cost elements 605150	Rent Expense	Fixed cost	Overhead calculation / 5/10/2017 08:0111 pm / USP2 / Original budget / 2017 / Period 5		

For example, rent is an expenditure that is distributed to cost centers. A user who wants to understand the rent cost that their cost center must carry can drill down to see how rent has been calculated.

If users click **Allocation base** on the **Cost entries** page, a dialog box appears. Users can then assign the allocation base to the rule and view the corresponding statistical measures that are registered for the period.

In the following example, the allocation base is of the **Formula allocation base** type, and the formula is shown. The factors that define the formula are listed. Additionally, a grid shows the calculation that is done per cost object.

Allocation base

Allocation base: Rent
Formula: (d'b) = (a*c)

Formula allocation base factors

Formula allocation base factor	Office area
c	Office area
d	Production area
a	0.75
b	0.25

Allocation base details

Cost object	Formula	Magnitude
USP2 Cost cent... Cost cent... 017 Mall	(875.00 * 0.25) + (0.75 * 125.00)	312.50
USP2 Cost cent... Cost cent... 016 Super	(470.00 * 0.25) + (0.75 * 30.00)	140.00
USP2 Cost cent... Cost cent... 015 Outlet	(90.00 * 0.25) + (0.75 * 19.00)	36.75
✓ USP2 Cost cent... Cost cent... 010 Production	(0.00 * 0.25) + (0.75 * 25.00)	18.75
USP2 Cost cent... Cost cent... 011 Quality C...	(0.00 * 0.25) + (0.75 * 25.00)	18.75
USP2 Cost cent... Cost cent... 008 Marketin...	(0.00 * 0.25) + (0.75 * 200.00)	150.00
USP2 Cost cent... Cost cent... 012 Logistics	(0.00 * 0.25) + (0.75 * 12.00)	9.00

Additional resources

[Define access rights for cost object controllers](#)

NOTE

Can you tell us about your documentation language preferences? [Take a short survey.](#)

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Configure cost control workspace parameters

2/18/2021 • 2 minutes to read • [Edit Online](#)

Use this procedure to configure the Cost control workspace so that managers at various levels in an organization can gain insight into their cost objects, such as cost centers and product groups. The USP2 demo company was used to create this recording.

1. Go to Cost accounting > Setup > Cost control workspace configuration.
2. Click New.
3. In the Name field, type a value.
4. In the Description field, type a value.
5. Select Yes in the Published field.
 - If you set this option to Yes, users who are assigned one of these roles can see the report in the Cost control workspace: cost accounting manager, cost accountant, cost accountant clerk, or cost object controller. If you set this option to No, only users who are assigned one of these roles can see the report in the Cost control workspace: cost accounting manager, cost accountant, or cost accountant clerk.
6. Expand the Data filtering section.
7. In the Cost control unit field, enter or select a value.
8. In the Budget original version field, enter or select a value.
9. In the Cost element dimension hierarchy field, enter or select a value.
10. In the Cost object dimension hierarchy field, enter or select a value.
11. Expand the Assign calculation records section.
12. Click New.
13. In the list, mark the selected row.
14. In the Fiscal calendar period field, enter or select a value.
15. In the Actual version field, enter or select a value.
16. Expand the Fiscal periods per column section.
17. Select Yes in the Current period field.
18. Expand the Columns to display for costs section.
19. Select Yes in the Fixed cost field.
20. Select Yes in the Variable cost field.
21. Select Yes in the Total cost field.
22. Click Save.
23. Close the page.
24. Go to Cost accounting > Workspaces > Cost control.
25. Select a statement to see fixed, variable, total, and unclassified costs for the selected fiscal periods.
26. In the Fiscal calendar period field, enter or select a value.
27. In the Cost object dimension hierarchy node field, enter or select a value.
 - After you've selected a Cost object dimension hierarchy, expand the Cost element dimension hierarchy to see the desired cost values. For example, you can expand the hierarchy to Manufacturing overhead to see the value.

NOTE

Can you tell us about your documentation language preferences? [Take a short survey](#).

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Set up security for the Cost accounting analysis Power BI content

2/18/2021 • 2 minutes to read • [Edit Online](#)

This topic explains how you can propagate the access-level security in Cost accounting to row-level security in Microsoft Power BI. This functionality helps guarantee that users see only Power BI data that they are granted access to.

Overview

The **Cost accounting analysis** Microsoft Power BI content uses Power BI row-level security to limit a user's access. Security is based on the access-level organizational hierarchy that is set up in the Cost accounting parameters. For more information about the **Cost accounting analysis** Power BI content, see [Cost accounting analysis Power BI content](#).

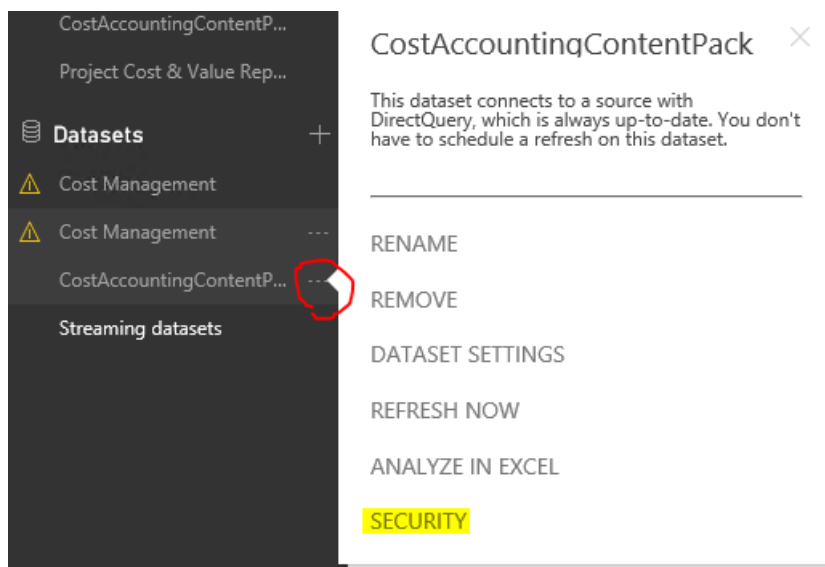
Setup

To propagate access-level security to Power BI, the owner of the Power BI content must follow these steps.

NOTE

The user who publishes the **Cost accounting analysis** Power BI content automatically becomes the owner. Only an owner can set up security in Power BI. Additionally, until an owner adds other users on PowerBI.com, no one except the owner can see any data in the **Cost accounting analysis** Power BI content.

1. Publish the definition file to Power BI.
2. Sign in to PowerBI.com.
3. Find the dataset for the **Cost accounting analysis** Power BI content.
4. Open the security page.



5. The **Cost object controller** role is already created. Add other members who are part of the Cost accounting access-level organizational hierarchy.

Row-Level Security

Cost accountant (1)

Cost object controller (1)

Members (1)

People or groups who belong to this role

Enter email addresses

Add

AX Administrator User ×

Users who are added to the **Cost object controller** role will see only the data that they are allowed to see, according to the definition in the Cost accounting access-level organizational hierarchy.

NOTE

Row-level security applies to tiles and reports that are embedded from Power BI.

Updating security

If updates are made to access-level security in Cost accounting, and you want Power BI to reflect those updates, you must update the entity store for the **Cost accounting analysis** Power BI content. After you complete the entity store update you must update the artifacts on PowerBI.com. For more information about how to do an entity store update, see [Power BI integration with Entity store](#). The owner of the **Cost accounting analysis** Power BI content must also do an entity store update if new users are granted access to the organizational hierarchy. Additionally, the owner must add the new users to the **Cost object controller** role on PowerBI.com, so that row-level security is applied for them.

Disabling security

We assume that your organization wants to restrict data access. If, for some reason, the security parameters are disabled when you run Cost accounting, the owner must add users to the **Cost accountant** role in Power BI instead. If you change security from an enabled state to a disabled state, it's a good idea to remove users from the **Cost object controller** role. And vice versa if you re-enable security. Users can belong to both roles. Joint access is the union of both roles. In the case of the **Cost accounting analysis** Power BI content, users who have joint access have unrestricted data access. If your goal is to apply restricted access, users must be assigned only to the **Cost object controller** role. These row-level security updates take effect immediately. Affected users should refresh their browsers.

Additional resources

To learn more about Power BI row-level security, see [Manage security on your model in Power BI](#).

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Cost accounting analysis Power BI content

2/18/2021 • 6 minutes to read • [Edit Online](#)

This topic describes what is included in the **Cost accounting analysis** Microsoft Power BI content. It explains how to access the Power BI reports, and provides information about the data model and entities that were used to build the content.

Overview

The **Cost accounting analysis** Power BI content is intended for cost controllers or anyone who is responsible for performing cost control of an organization. It includes the key metrics, such as cost, magnitude, and cost rate by actual cost, budget cost, and flexible budget cost. It uses transaction data from the **Cost accounting** module and provides an aggregate view of costs for the whole organization in one reporting currency. Managers can filter the data by cost objects to perform cost control of their organizational units, even if the organization can have several legal entities.

Because the **Cost accounting analysis** content highlights variances between the actual costs and budgeted costs, managers can be notified about positive and negative trends for their operational units. Managers can drill down to the cost element hierarchies or individual cost elements. In this way, managers can gain detailed insight into how cost variances have occurred, and then take effective action.

The **Cost accounting analysis** content lets cost accountants analyze how cost flows through the cost objects of the whole organization.

To learn more about Cost accounting, see [Cost accounting home page](#).

By defining access-level security in Cost accounting and combining it with row-level security in Power BI, you can grant all cost object owners access to the **Cost accounting analysis** Power BI content. All data in the visualizations will then be filtered based on the access level that is controlled in Cost accounting. To learn more about access-level security and row-level security, see [Set up security for the Cost accounting analysis Power BI content](#).

Accessing the Power BI content

You can find the **Cost accounting analysis** Power BI content in the Shared assets library in Microsoft Dynamics Lifecycle Services (LCS). For more information about how to download the content and implement it in your organization, see [Power BI content in LCS from Microsoft and your partners](#).

Be sure to download the **Cost accounting analysis** content that applies to the version of Microsoft Dynamics 365 that you're using.

NOTE

KB 4011327 is a prerequisite for this Power BI content. After you sign in to LCS, you can access the KB here at <https://fix.lcs.dynamics.com/issue/results/?q=kb4011327>.

Metrics that are included in the Power BI content

The content includes a set of report pages. Each page consists of a set of metrics that are visualized as charts, tiles, and tables. The following table provides an overview of the visualizations in the **Cost accounting analysis** Power BI content.

REPORT PAGE	CHART	TITLE
Cost control by fiscal period	Actual cost and Budget cost by Cost element hierarchy level	Actual cost vs Budget cost
	Budget variance by Cost element hierarchy level	Actual cost rate vs Budget cost rate
	Top 10 Budget variance in percentage by Cost element	Actual magnitude vs Budget magnitude
Cost control by Year to date	Actual cost and Budget cost by Calendar Year Period	Actual cost vs Budget cost
	Budget variance by Calendar Year Period	Actual cost rate vs Budget cost rate
	Top 10 Budget variance in percentage by Cost element	Actual magnitude vs Budget magnitude
Cost rate by fiscal year	Actual cost rate by Cost behavior	Actual cost rate vs Budget cost rate
	Actual cost rate, Budget cost rate variance, Budget cost rate percentage and Budget cost rate by Cost element hierarchy level	Actual magnitude vs Budget magnitude
	Budget variance by Cost element hierarchy level	
	Top 10 Budget variance in percentage by Cost element	
Flexible budget by fiscal period	Actual cost, Budget cost and Flexible budget cost by Cost element hierarchy level	Actual magnitude vs Budget magnitude
	Budget variance and Flexible budget variance by Cost element hierarchy level	Actual cost vs Flexible budget cost
	Actual cost, Budget cost and Flexible cost by Cost behavior and Cost element hierarchy level	Actual cost rate vs Flexible budget cost rate
Cost statement by fiscal period	Actual cost by Cost element hierarchy level and Cost object dimension member name	
	Actual cost by Cost object dimension member name and Cost element dimension member name	

Understanding the data model and entities

The following data is used to fill the report pages in the **Cost accounting analysis** Power BI content. This data

is represented as aggregate measurements that are staged in the Entity store. The Entity store is a Microsoft SQL Server database that is optimized for analytics. For more information, see [Power BI integration with Entity store](#).

The following key aggregate measurements are used as the basis of the content.

ENTITY	KEY AGGREGATE MEASUREMENT	DATA SOURCE FOR DYNAMICS 365	FIELD	DESCRIPTION
Cost accounting entries	SUM(Amount)	CAMDATAAggregate dCostEntry	Amount	The amount in the Cost accounting ledger currency.
Statistical entries	SUM(Magnitude)	CAMDATAAggregate dStatisticalEntry	Magnitude	

The following table shows how the key aggregate measurements are used to create several calculated measures in the content's dataset.

MEASURE	HOW THE MEASURE IS CALCULATED
Actual cost	CALCULATE('Cost accounting entries'[Measure], 'Transaction versions'[ISSOURCEVERSIONBUDGET_VALUE] = 0)
Budget cost	CALCULATE('Cost accounting entries'[Measure], 'Transaction versions'[ISSOURCEVERSIONBUDGET_VALUE] = 1)
Budget cost variance	[Budget cost] - [Actual cost]
Budget variance percentage	IF([Budget cost] = 0, blank(), [Budget variance] / [Budget cost])
Actual magnitude	CALCULATE('Statistical entries'[FullMagnitude], 'Transaction versions'[ISSOURCEVERSIONBUDGET_VALUE] = 0)
Budget magnitude	CALCULATE([FullMagnitude], 'Transaction versions'[ISSOURCEVERSIONBUDGET_VALUE] = 1)
Statistical budget variance	[Budget magnitude] - [Actual magnitude]
Statistical budget variance percentage	IF([Budget magnitude] = 0, blank(), [Statistical budget variance] / [Budget magnitude])
Actual cost rate	IF([Actual magnitude] = 0, BLANK(), [Actual cost] / [Actual magnitude])
Budget cost rate	IF([Budget magnitude] = 0, BLANK(), [Budget cost] / [Budget magnitude])
Budget cost rate variance	[Budget cost rate] - [Actual cost rate]
Budget cost rate variance percentage	IF([Budget cost rate] = 0, blank(), [Budget cost rate variance] / [Budget cost rate])
Fixed budget cost	CALCULATE([Budget cost], 'Cost accounting entries'[COSTBEHAVIOR] = 1)

MEASURE	HOW THE MEASURE IS CALCULATED
Variable budget cost	CALCULATE([Budget cost], 'Cost accounting entries'[COSTBEHAVIOR] = 2)
Fixed flexible budget cost	[Fixed budget cost]
Variable flexible budget cost	IF([Budget magnitude] = 0, BLANK(), ([Variable budget cost] / [Budget magnitude]) * [Actual magnitude])
Flexible budget cost	[Fixed flexible budget cost] + [Variable flexible budget cost]
Flexible budget variance	[Flexible budget cost] - [Actual cost]
Flexible budget variance percentage	IF([Flexible budget cost] = 0, BLANK(), [Flexible budget variance] / [Flexible budget cost])
Flexible budget cost rate	IF([Actual magnitude] = 0, BLANK(), [Flexible budget cost] / [Actual magnitude])
Flexible budget cost rate variance	[Flexible budget cost rate] - [Actual cost rate]
Flexible budget cost rate variance percentage	IF([Flexible budget cost rate] = 0, BLANK(), [Flexible budget cost rate variance] / [Flexible budget cost rate])

The following key dimensions are used as filters to slice the aggregate measurements to achieve greater granularity and provide deeper analytical insights.

ENTITY	EXAMPLES OF ATTRIBUTES
Cost accounting ledgers	Cost accounting ledger
Cost control units	Cost control unit name
Cost element dimensions	Cost elements dimension name, Cost element dimension member name, Cost element dimension member description
Cost object dimensions	Cost object dimension name, Cost object dimension member name, Cost object dimension member description
Statistical dimensions	Statistical dimension name, Statistical dimension member name, Statistical dimension member description
Cost object dimension hierarchies	Cost object dimension hierarchy name, Cost object dimension hierarchy level, Cost object dimension hierarchy tree
Cost element dimension hierarchies	Cost element dimension hierarchy name, Cost element dimension hierarchy level, Cost element dimension hierarchy tree
Statistical dimension hierarchies	Statistical dimension hierarchy name, Statistical dimension hierarchy level, Statistical dimension hierarchy tree
Transaction versions	Version name

ENTITY	EXAMPLES OF ATTRIBUTES
Fiscal calendars	Calendar, Calendar description
Fiscal years	Calendar year
Fiscal periods	Calendar year period

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Cost controlling mobile workspace

2/18/2021 • 3 minutes to read • [Edit Online](#)

This topic provides information about the **Cost controlling** mobile workspace. This workspace lets cost center managers view information about cost center performance anytime and anywhere.

This mobile workspace is intended to be used with the Finance and Operations mobile app.

Overview

The **Cost controlling** mobile workspace provides an instant view of the current performance of cost centers by comparing actual costs against the budgeted costs. You can drill down to the status of individual cost elements.

For example, an employee receives an invitation to an international conference, but the organization must cover all the travel expenses. The employee asks their manager whether they can attend the conference. The manager opens the **Cost controlling** mobile workspace on their mobile device to see whether there is budget for the employee to attend the conference.

Data security

The data in the **Cost controlling** mobile workspace is secured through user credentials. Cost center managers are allowed to see data only for their own cost center. The access-level security is managed in the **Cost accounting** module.

Cost accountants define the configuration of the **Cost controlling** mobile workspace in the **Cost accounting** module. After the workspace is published to the mobile app, it's available in the app. Therefore, all cost center managers in the organization can view data in the same format.

Actions, views, and links

The **Cost controlling** mobile workspace provides the following actions, views, and links:

- **Actions:**

- Use **Select configuration** to select a layout.
- Use **Select cost object** to select the cost centers to filter data on.

NOTE

The cost centers that appear in the list depend on the access that is granted in the **Cost accounting** module.

- **Views:** Based on the actions that are selected and the configuration in the **Cost accounting** module, you can view the following information on the cards:

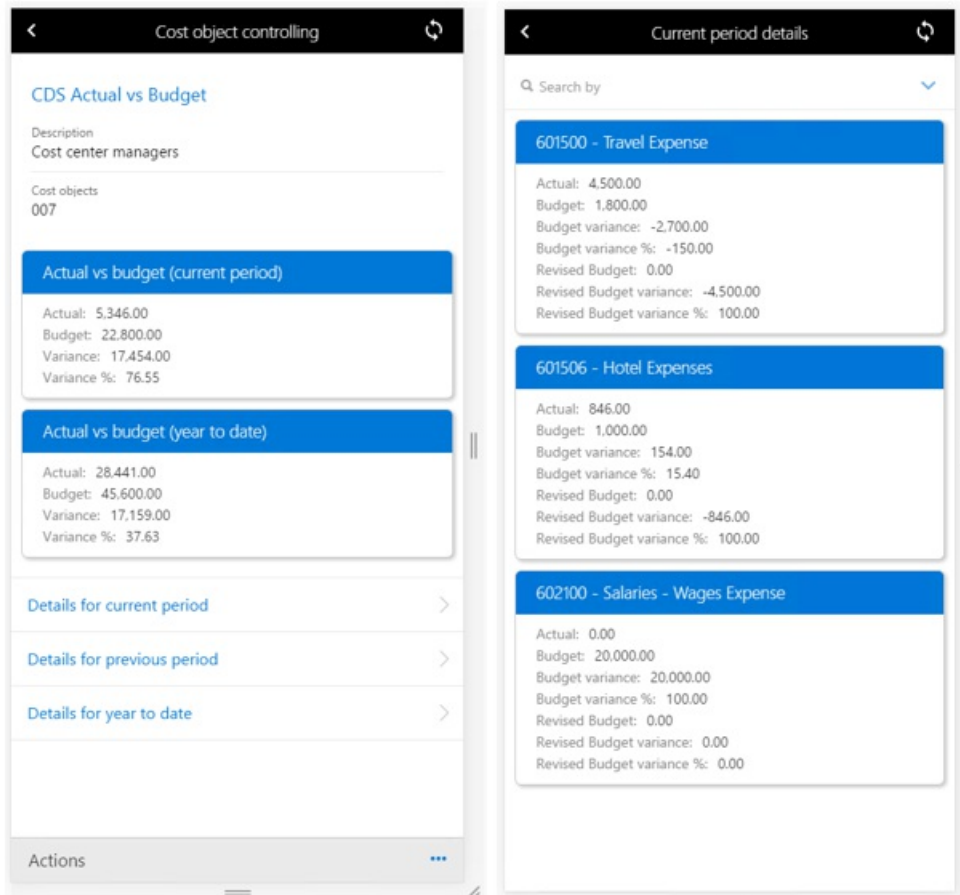
- Actual vs budget (current period)
- Actual vs revised budget (current period)
- Actual vs budget (previous period)
- Actual vs revised budget (previous period)
- Actual vs budget (year to date)
- Actual vs revised budget (year to date)

The following amounts are shown on every card: Actual, Budget, Variance, and Variance %.

- **Links:**

- Details for current period
- Details for previous period
- Details for year to date

When you select a link, a card is shown for each cost element. The following amounts are shown on every card: Actual, Budget, Budget variance, Budget variance %, Revised budget, Revised budget variance, and Revised budget variance %.



Prerequisites

The prerequisites differ, based on the version of Microsoft Dynamics 365 that has been deployed for your organization.

Prerequisites if you use Microsoft Dynamics 365 Finance

If Finance has been deployed for your organization, the system administrator must publish the Cost controlling mobile workspace. For instructions, see [Publish a mobile workspace](#).

Prerequisites if you use version 1611 with Platform update 3 or later

If version 1611 with Platform update 3 or later has been deployed for your organization, the system administrator must complete the following prerequisites.

PREREQUISITE	ROLE	DESCRIPTION
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PREREQUISITE	ROLE	DESCRIPTION
Implement KB 4013633.	System administrator	KB 4013633 is an X++ update or metadata hotfix that contains the Cost controlling mobile workspace. To implement KB 4013633, your system administrator must follow these steps. <ol style="list-style-type: none"> 1. Download the metadata hotfix from Microsoft Dynamics Lifecycle Services (LCS). 2. Install the metadata hotfix. 3. Create a deployable package that contains the SCMMobile model, and then upload the deployable package to LCS. 4. Apply the deployable package.
Publish the Cost controlling mobile workspace.	System administrator	See Publish a mobile workspace .

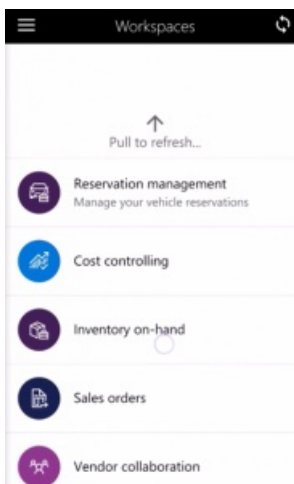
Download and install the mobile app

Download and install the Finance and Operations mobile app:

- [For Android phones](#)
- [For iPhones](#)

Sign in to the mobile app

1. Start the app on your mobile device.
2. Enter your Dynamics 365 URL.
3. The first time that you sign in, you're prompted for your user name and password. Enter your credentials.
4. After you sign in, the available workspaces for your company are shown. Note that if your system administrator publishes a new workspace later, you will have to refresh the list of mobile workspaces.



View the performance of your cost center by using the Cost controlling mobile workspace

1. On your mobile device, select the **Cost controlling** workspace.

2. Select **Cost object controlling**.
3. Select **Actions**.
4. Select **Select configuration** to select a cost controlling layout.
5. Select **Done**.
6. Select **Actions**.
7. Select **Select cost object** to select the cost centers that you've been granted access to.
8. Select **Done**.
9. View the overall performance of your cost center.
10. Select the **Details for current period** link.
11. View the performance of individual cost elements.
12. You can also search for specific cost elements.

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Cost management home page

2/18/2021 • 2 minutes to read • [Edit Online](#)

[Cost management \(video\)](#) lets you work with the valuation and accounting of raw materials, semi-finished goods, finished goods, and work-in-progress assets. It is the process of defining, managing, and reporting [Inventory accounting](#) and [Manufacturing accounting](#).

You can define cost policies in the following areas:

- [Predetermined cost](#)
- [Inventory accounting](#)
- [Manufacturing accounting](#)
- [Indirect cost accounting](#)
- [Ledger integration](#)

For example, you can define which inventory valuation methods, such as [FIFO](#), [Weighted average](#), [Standard cost](#), or [Moving average](#) that you want to apply to products in the [Item model group](#) in Inventory accounting.

You can access Inventory accounting and Manufacturing accounting from the **Cost administration** and **Cost analysis** workspaces. These workspaces provide a comprehensive overview of the current status, key performance indicators (KPIs), and detection of deviation.

Manufacturing accounting lets you handle [Job order costing](#) in production orders and batch orders, as well as [Backflush costing](#) in lean manufacturing.

The [Cost management Power BI content](#) provides managerial insight into inventory and work-in-progress (WIP) inventory, and how cost flows through them by category over time. The information can also be used as a detailed supplement to the financial statement.

Additional resources

What's new and in development

Go to the [Microsoft Dynamics 365 Roadmap](#) to see what new features have been released and what new features are in development.

White paper

[BOM calculation by using a costing sheet](#) describes how to set up a costing sheet that includes material and manufacturing, and how the setup affects the BOM calculation results. To better explain the topics, it provides concrete scenarios and data that demonstrates the effect of the various settings and configurations.

Blogs

You can find opinions, news, and other information about Cost management on the [Dynamics AX Manufacturing R&D Team blog](#) and [Supply Chain Management in Dynamics AX R&D Team blog](#). Although some of these posts were written for the previous version of Cost management, the same concepts still apply, and the procedures are also similar in the current version.

Task guides

Additional help is available as task guides. To access task guides, click the Help button on any page.

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Prerequisites for standard costs overview

2/18/2021 • 3 minutes to read • [Edit Online](#)

This topic describes the basic steps for using standard costs. Subsequent steps depend on the company's operations. For example, the steps differ for a nonmanufacturing environment, a manufacturing environment that doesn't use routings, and a manufacturing environment that uses routings.

To set up standard costs, follow these steps.

1. Create an item model group for standard costs.

Use the **Item model groups** page to create a new group for standard costs, and assign an inventory model of **Standard cost**. The identifier for the item model group should be meaningful, such as **Std Cost**. Select the check boxes to indicate that the group should allow financial negative inventory, and that it should post physical inventory and financial inventory. This standard cost group will be assigned to items.

2. Define ledger accounts that are related to standard cost variances.

Use the **Chart of accounts** page to define ledger accounts that are related to standard cost variances. These ledger accounts must be defined before they can be assigned on the **Posting** page. The ledger accounts can reflect item groups and cost groups.

3. Assign ledger accounts to item postings that are related to standard cost variances.

Use the **Posting** page to assign the ledger accounts that are related to standard cost variances. You can specify a variance's ledger account by item (or item group) and by cost group (or cost group type), or you can specify that the ledger account applies to all items and all cost groups. These options correspond to cost relations for tables, groups, and all.

Before you define the item posting rules, use the **Transaction combinations** page to enable cost relations (for tables, groups, and all).

4. Define inventory parameters that are related to standard costs.

- Use the **Inventory accounting** tab on the **Inventory accounting policies setup > Parameters** page to define two cost control parameters that are related to standard costs.
 - In the **Cost breakdown** field, select **None** or **Sub ledger**. If you select **Sub ledger**, the cost breakdown is an *active* cost breakdown. An active cost breakdown is critical for calculating, retaining, and viewing cost group segmentation across a multilevel product structure for standard cost items. When the cost breakdown is active, you can report and analyze inventory, work in process (WIP), and cost of goods sold (COGS) per cost group in a single-level, multilevel, or total format. When the cost breakdown is active, if you activate a manufactured item's cost, the cost group segmentation will be stored in the item's cost record.
 - If you select **None**, cost group segmentation won't be maintained for standard cost items. In other words, a manufactured item's standard cost will be calculated and maintained as a single amount, without cost group segmentation. The cost contributions of manufactured components will be aggregated into the single amount.
- In the **Variances to standard** field, select **Summarized** or **Per cost group**. If you select **Per cost group**, you can identify purchase price variances and production variances by cost group. You can also identify the four types of production variances: the lot size, quantity, price, and substitution variances. If you select **Summarized**, you can't identify variances by cost group, and you can't identify the four types

of production variances. You can just view a summarized production variance.

- The policy about variance to standard works independently of the cost breakdown policy. In other words, you can select a cost breakdown policy of **None** and select variances per cost group, so that production variances by cost group will still be captured.

5. Create costing versions for standard costs.

Use the **Costing version setup** page to create one or more costing versions for standard costs. Each costing version must be designated by a costing type of **Standard cost** and must allow content to include cost data.

6. Prepare an existing customer to use standard costs.

Customers who want to change their existing items to a standard cost inventory model must use the **Standard cost conversions** page.

Related topics

[Standard cost conversion overview](#)

Blogs

Community blogs

- [How to set up standard costs for direct materials in Dynamics 365 for Finance and Operations](#)
- [Standard direct labor costs in Dynamics 365 for Finance and Operations](#)

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Standard cost conversion overview

2/18/2021 • 10 minutes to read • [Edit Online](#)

This article provides a process overview to help you set up and run a standard cost conversion. The steps listed are intended to be completed after you've completed the prerequisites for a standard cost conversion.

Use the **Standard cost conversions** page to convert the inventory model for a batch of selected items from an actual costing approach to a standard costing approach. The conversion process involves a prerequisite inventory close, several steps during a transition period, which is defined by a transition start date and a planned conversion date, and then the conversion and an associated inventory close.

- Inventory close before the transition period – An inventory close represents a prerequisite step because it settles an item's open transactions using the old valuation method. During the transition period, you can enter and post backdated transactions, such as invoices, so that you can close the previous period. The inventory close date must be one day before the transition start date to ensure a clean break from the old valuation method.
- Conversion steps during the transition period – Use the **Standard cost conversions** page to create a conversion record that also contains the user-defined identifier for a new costing version. You identify the items that require conversion, and then enter the items' pending standard costs in the new costing version. You perform a check of the selected items to identify issues that might prevent conversion, resolve the issues, and then perform another check. After the items have successfully passed the checks, you change the status of the conversion record to **Ready**. On the planned conversion date, you perform the conversion and optionally include an inventory close. An item's inventory movements during the transition period are posted and valued according to the old inventory model. Then, after the conversion is successfully completed, the inventory movements are revalued to standard cost.
- Inventory close before the conversion – The inventory close can be included as part of the conversion on the planned conversion date, or it can be performed as a separate step before the conversion.

After the conversion process is successfully completed, the inventory model for each item is based on standard cost, and the item's standard cost is enabled. Subsequent inventory transactions will be valued at the item's standard cost. In addition, the system converts the item's physical inventory transactions for receipts and issues to standard cost based on the conversion date. The system also converts the item's financial on-hand inventory to standard cost, and posts the difference in value as an inventory revaluation. Any transactions that occur after the conversion are valued at the item's standard cost. You cannot enter backdated transactions before the conversion date, because an inventory close must be performed one day before the conversion date. A conversion can only be performed if an inventory close was performed one day earlier. This inventory close cannot be canceled.

1. Define a standard cost conversion record and the associated costing version

Use the **Standard cost conversions** page to create a conversion record. You can create a new conversion record only when existing conversion records have been completed. The duration of the planned transition period is defined by the transition start date and the planned conversion date. A planned transition period can be as short as one day. A planned transition period helps to ensure that the conversion process has enough time to complete all its steps. An inventory close must be performed on a date that is one day before the transition start date, to help ensure that settlements are completed before you start the conversion process. To make sure that the transition start date and inventory close date are correctly aligned, you can either change the transition start date to one day after an existing inventory close or perform an inventory close. When you enter a

conversion record, you also enter a user-defined identifier for a new costing version that will contain the standard costs for converted items. The costing version is generated automatically when you save the conversion record.

2. Review and change the new costing version for the conversion record

The new costing version is dedicated to the conversion record, as the **Conversion** costing type indicates. The dedicated costing version is similar to a costing version for standard costs and contains the item cost records for items that are associated with the conversion record. The dedicated costing version for a conversion record has the following settings, which you should review and modify on the various tabs as required:

- **Costing type:** This field should be set to **Standard cost**.
- **Version:** The identifier reflects the information that is entered on the conversion record for the costing version ID.
- **Name:** By default, the name is blank. You can optionally enter a name.
- **Block:** This field should be set to **No**. You can enter cost records into the costing version until you change the status of the conversion record to **Ready**. A status of **Ready** indicates that the selected items have been checked, and that changes to cost records should not be permitted.
- **Block activation:** This field should be set to **Yes**. You can't manually activate a pending cost record in the dedicated costing version. Activation occurs when you perform the conversion.
- **From date:** The from date reflects the planned conversion date that is entered on the conversion record.
- **Site:** Leave this field blank, so that cost records can be entered for any site.
- **Allow price type field group:** Set this field to **Yes**, so that only cost price records can be entered.
- **Fallback principle:** This field is set to **None**. Change the fallback principle to **Active** if you require cost information that has been activated in other costing versions. For example, cost information about components, cost categories, and indirect costs might be required in order to calculate the costs of manufactured items.
- **Fallback costing version:** Leave this field blank.

Item cost information in the dedicated costing version can be maintained only from the **Standard cost conversions** page. You can't use the **Costing version setup** page or the **Costing version maintenance** page to calculate costs for the costing version during conversion. However, you can use these pages to maintain the dedicated costing version after you've completed the conversion process.

3. Identify the items to convert to standard cost

Use the **Standard cost conversions** page to identify the individual items that should be converted to standard cost. You can add multiple items by using the **Add items to standard cost conversion** page. In general, you should include all manufactured items in a single conversion record to help ensure that costs are calculated correctly.

4. Enter or calculate the pending standard cost for each item that is being converted

Use the **Item price** page to enter pending standard costs in the dedicated costing version for purchased items and transfer items. Cost records are site-specific, and an item's pending costs must be entered for every site. Use the **Item price** page to calculate pending standard costs for manufactured items. A manufactured item's pending costs should be calculated for every manufacturing site, unless the site represents a transfer site. In this case, the pending costs should be entered manually. Some items might have color, size, or configuration product dimensions. On the **Standard cost conversions** page, the **Use cost price by variant** check box shows the standard cost for every combination of product dimensions. When this check box is cleared, you must enter only

a pending cost for the item.

5. Check and resolve any issues for the items that are being converted

Use the **Standard cost conversion checks** report to identify issues for the items that are being converted. If an item doesn't have any issues, its status in the conversion record is changed to **Checked**. If an item has issues, you must resolve the issues and then run the report again until the item's status is changed to **Checked**. If you can't resolve an item's issues in a timely manner, you can optionally delete the item from the conversion record and then convert the item later.

6. Change the status of the conversion record to Ready

When the status of the conversion record is changed to **Ready**, the system performs a final check before it runs a standard cost conversion. The status is changed to **Ready** only if the following conditions have been met:

- Every item in the conversion record has a status of **Checked**.
- An inventory close was performed on a date that is one day before the transition start date. To make sure that the transition start date and inventory close date are correctly aligned, you can either change the transition start date to one day after an existing inventory close or perform an inventory close.

7. Back up the database before conversion

The backup lets you restore the database if errors are encountered during the conversion.

8. Perform the conversion when the conversion record has a Ready status

The conversion process requires that an inventory close be performed on a date that is one day before the planned conversion date. This requirement helps ensure that back-dated transactions can't be entered during the transition period. If an inventory close hasn't yet been performed, you will be asked if you want to perform it as part of the conversion process. The conversion process handles one item at a time. It starts with the lowest items in a product structure, based on the item's low-level code. When an item has been successfully converted, its status in the conversion record is changed to **Converted**. If the conversion process is interrupted, any items that haven't been successfully converted will still have a status of **Checked**. Successful completion of the conversion process has the following effects:

- The status of the conversion record is changed from **Ready** to **Completed**, and the status of each selected item is changed from **Checked** to **Converted**.
- The item model group for converted items is changed so that it reflects a new group that has a standard cost inventory model.
- The standard costs for the converted items have been enabled in the dedicated costing version.
- The costing type of the costing version is changed from **Conversion** to **Standard cost**, and the costing version is now like other costing versions for standard costs.

9. Validate and reconcile the inventory values for the converted items

The **Variance analysis statement** report lets you analyze revaluation variance and the **Inventory value** report lets you view inventory value on a specific date.

- Analyze revaluation variances. Use the **Variance analysis statement** report to view inventory revaluation variances for the converted items. You can also use the **Standard cost transactions** page to view the inventory revaluation transactions for the converted items that have inventory.

- Analyze the inventory value before the transition start date. Use the **Inventory value** report to view inventory values for the converted items. For the To date for the report, use a date that is one day before the transition start date.
- Analyze the inventory value before the conversion date. Use the **Inventory value** report to view inventory values for the converted items. As the To date for the report, use a date that reflects one day before the conversion date.
- Analyze the inventory value on the conversion date. Use the **Inventory value** report to view inventory values as of the conversion date. Both the From date and the To date for the report should match the conversion date. The report selection criteria should reflect the converted items.
- Analyze back-dated inventory movements. Use the **Inventory value** report to view back-dated inventory movements that were entered after the conversion. The From date and the To date for the report should correspond to the transition start date and the conversion date, minus one day. The report selection criteria should reflect the converted items. The report shows inventory movements that were made at standard cost during the transition period.

Additional resources

[Prerequisites for a standard cost conversion](#)

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Prerequisites for a standard cost conversion

2/18/2021 • 3 minutes to read • [Edit Online](#)

This topic discusses tasks to perform before you run a standard cost conversion.

Before you run a standard cost conversion, follow these steps:

1. Define an **item model group** for standard costs. Use the Item model groups page to create an item model group that uses a standard cost inventory model. When setting up a standard cost conversion, you assign this item model group to the items that are being converted.
2. Assign a **cost group** to each item.
 - The cost group that is assigned to a purchased item can act as the basis for assigning ledger accounts that are related to standard costs. This can include assigning ledger accounts for purchase price variances. In a manufacturing environment, the cost group that is assigned to purchased components also provides cost segmentation in the calculated costs of a manufactured item.
 - The cost group that is assigned to a manufactured item can act as the basis for assigning ledger accounts that are related to standard costs, such as assigning ledger accounts for production variances.
3. Assign a **standard order quantity** to a manufactured item when it has constant costs. The standard order quantity for a manufactured item acts as an accounting lot size for amortizing, or prorating, constant costs. These can include setup times in routing operations or a constant component quantity in a bill of material (BOM).
4. Assign **general ledger accounts** that are related to standard costs, especially the revaluation variance. Use the **Posting** page (**Inventory management > Setup**) to assign general ledger accounts that are related to standard costs. As a minimum for the standard cost conversion process, you must assign the account for the revaluation variance for all items and all cost groups. Use the **Chart of accounts** page to define the general ledger accounts that will be needed for standard costs. Use the **Transaction combinations** page to enable cost relations (for tables, groups, and all) before you define the item posting rules.
5. Define the inventory parameters that are related to standard costs. Use the **Number sequences** tab on the **Inventory and warehouse management parameters** page to assign a number sequence to revaluation vouchers. A revaluation voucher is generated when the standard cost conversion creates a change of an item's inventory value. Use the **Inventory and warehouse management parameters** page to define Cost Control parameters (on the **Inventory accounting** tab) to define two parameters that are related to standard costs.
 - Use the **Cost breakdown** field to select No or Sub ledger. The selection of Sub ledger is termed an active cost breakdown. An active cost breakdown is very important for calculating, retaining, and viewing cost group segmentation across a multilevel product structure for standard cost items. When the cost breakdown is active, you can report and analyze the following in a single level, multi-level, or total format:
 - a. Inventory
 - b. Work in process (WIP)
 - c. Cost of goods sold (COGS) per cost group

An active cost breakdown means that if you enable a manufactured item's cost, the result will be stored in the cost group segmentation in the item's cost record. If you put no value in the **Cost**

breakdown field, the cost group segmentation will not be maintained for standard cost items. That is, a manufactured item's standard cost will be calculated and maintained as a single amount without cost group segmentation, and the cost contributions of manufactured components will be aggregated into the single amount.

- Use the **Variances to standard** field to select summarized or per cost group. The selection of per cost group enables you to identify purchase price variances and production variances by cost group. This also enables you to identify the four types of production variances (the lot size, quantity, price, and substitution variances). If you select summarized, you cannot identify variances by cost group, and you cannot identify the four types of production variances. You can only view a summarized production variance. The policy about variance to standard is independent of the cost breakdown policy. That is, you can select a cost breakdown policy of none, and select variances per cost group, so that production variances by cost group will still be captured.

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Manage standard cost updates

2/18/2021 • 4 minutes to read • [Edit Online](#)

Updates to standard cost data can be managed by using two different approaches - the one-version approach or the two-version approach.

The one-version approach uses a single costing version that contains all cost records. These records include the original costs and all cost updates.

The two-version approach uses one version that contains records of the original costs and a second version that contains records of all cost updates. A primary advantage of the two-version approach is the clear delineation and tracking of cost updates in a separate costing version, without affecting the original costing version. The two-version approach can be used to identify multiple incremental updates, where each incremental update has a separate costing version that contains the incremental cost records.

Example

The following example illustrates how the one-version and two-version approaches can be used for updating standard costs in a manufacturing environment. For example, updates that reflect new items or error corrections. Assume that a single costing version represents the standard costs for the current year. The identifier for this version is 2020-STD. Version 2020-STD contains the current active costs for all items. Additionally, it contains all routing-related cost categories and overhead calculation formulas that were known at the start of the year 2020. 2020-STD is the original costing version.

- **One-version approach to cost data updates** – In the one-version approach, the original costing version 2020-STD contains all cost records. Cost updates are recorded in 2020-STD and set to a status of Pending. The pending costs can be manually entered for new purchased items, or they can be calculated for a manufactured item to reflect corrections. When the one-version approach is used, the BOM calculations do not require a fallback data source because all active costs are contained in the costing version. After the pending costs become active, the original costing version 2020-STD will again contain all the current active costs.
- **Two-version approach to cost data updates** – The two-version approach requires an additional costing version that contains only the cost updates. The identifier for this version is 2020-STD-CHANGES. Cost updates are recorded in 2020-STD-CHANGES and are set to a status of Pending. With the two-version approach, the BOM calculations of pending costs for manufactured items require a fallback data source. This is because the additional costing version 2020-STD-CHANGES contains only a subset of cost data. The fallback can be expressed as the active costs or as the costing version 2020-STD, because both identify the source of cost data when it is not included in 2020-STD-CHANGES. After the pending costs become active, the costing version 2020-STD-CHANGES will contain the current active costs that reflect the updates, whereas the original costing version 2020-STD will not be affected. When the two-version approach is used, blocking policies for the original costing version should be set up to prevent updates. Identical blocking policies should be set up for the additional costing version, except for the specified from-date and the selective use of blocking policies to allow for updates. The specified from-date should be updated with each batch of changes to reflect the scheduled activation date.

This example used one additional costing version for managing updates throughout the year 2020. More than one additional costing version can be used, such as a separate version for each batch of updates. When more than one additional costing is used, the fallback must be expressed as the active costs, because the active costs are spread over multiple costing versions.

Financial dimensions for the standard cost revaluation

Activating a new standard price will typically revalue the on-hand inventory value by standard cost revaluation transactions. Usually, the financial dimensions of the item are then posted on the transactions. However, if you would like to control whether and how the financial dimensions are posted, use [feature management](#) to turn on the feature named *Options of defaulting financial dimensions for inventory standard cost revaluation*. After enabling this feature, go to **Cost management > Inventory accounting policies setup > Parameters** and set the new **Origin of financial dimension** drop-down list to one of the following values:

- **None** – No financial dimensions are posted on the revaluation transactions. If your account structure includes a required financial dimension, the revaluation process will still run, but it will create accounting entries that have no financial dimensions. In this case, users will receive a warning message first, so they can cancel the revaluation if necessary.
- **Table** – The financial dimensions of the item are posted on the revaluation transactions. This is the default setting and is consistent with the original system behavior without turning on the feature *Options of defaulting financial dimensions for inventory standard cost revaluation*.
- **Posting** – The financial dimensions of the transaction that is being revalued are posted on the revaluation transactions. By default, the financial dimensions from the original transaction's inventory account will be used for both the inventory account and the revaluation account.

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Restrictions on costing versions for standard costs

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This topic describes the restrictions that apply to a costing version for standard costs.

The following restrictions help guarantee adherence to standard costing principles:

- Charges must be included in an item's cost. The charges for a manufactured item represent the amortized constant costs in the bill of materials (BOM) and route information. Therefore, the charges must be included in the unit cost. The charges for a purchased item are also included in the item's unit cost.
- Calculation of standard costs for manufactured items must be based on the cost records in a costing version for standard costs. Alternative sources of cost data can be used only with a costing version for planned costs, such as purchase price trade agreements for purchased items. Alternative sources of cost data are defined by the BOM calculation group.
- BOM calculations must be performed in a single-level explosion mode.

The item cost data for standard costs can be copied to another costing version that contains standard costs or planned costs. However, the item cost data for planned costs can't be copied to a cost version that contains standard costs, because the restrictions that are listed earlier in this topic don't apply to planned costs.

Related topics

[Costing versions overview](#)

[Update standard costs in a non-manufacturing environment](#)

[Prepare to maintain standard costs for manufactured items](#)

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Information used in BOM calculations with standard costs

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Bills of material (BOM) calculations use data from several sources to calculate the standard costs of a manufactured item. The sources include information about items, bills routings, indirect cost calculation formulas, and the costing version.

The purchased item information that is used in a standard cost BOM calculation includes the following:

- Cost – A purchased item's costs are maintained as site-specific cost records in a costing version for standard costs. Each cost record has an effective date, and the BOM calculation date determines which cost record will be used. For example, a BOM calculation with a future calculation date might use a cost record with a pending status and a future effective date.
- Cost group – The cost group that is assigned to a purchased item provides the basis for cost segmentation in the calculated costs of a manufactured item.
- Warning conditions that are embedded in the item's BOM calculation group enable the BOM calculation to identify potential problems. This can be when the purchased item has a zero cost, a zero quantity in a BOM, or an out-of-date cost record. The applicable warning conditions can be overridden when initiating a BOM calculation.

The manufactured item information that is used in a standard cost BOM calculation includes the following:

- Standard order quantity for inventory – The item's standard order quantity for inventory, acts as the default accounting lot size for amortizing constant costs in a BOM calculation. The accounting lot size will also reflect the order quantity multiple if it is specified.
- Warning conditions that are embedded in the item's BOM calculation group enable the BOM calculation to identify potential problems. One example could be that the manufactured item does not have a BOM or route. The applicable warning conditions can be overridden when initiating a BOM calculation.

The bill of material information that is used in a standard cost BOM calculation includes the following:

- BOM version – The BOM version that is assigned to the manufactured item has effective from and to dates, and a status for approved and active. The bill version can be company-wide or site-specific, and it can optionally reflect quantity breakpoints.
- BOM line item quantity – A component typically has a variable quantity required, but it can be a constant. The component quantity is typically expressed for producing one parent item, but it may be expressed per 100 or per 1000 to handle decimal precision issues. The component quantity can also be calculated based on measurements.
- BOM line item scrap – A component can have a variable or constant quantity for planned scrap.
- BOM line item valid dates – A component can have valid from and to dates.
- BOM line item type of production – The costing lot size for amortizing constant costs will reflect the BOM calculation quantity and a make-to-order explosion mode, because the BOM calculation assumes that the manufactured component will be produced to the exact quantity instead of its standard order quantity.
- Sub-BOM for a manufactured component – A manufactured component can optionally have a specified BOM version, which would be used instead of the item's current active BOM version in a BOM calculation.
- Sub-route for a manufactured component – A manufactured component can optionally have a specified route version, which would be used instead of the item's current active route version in a BOM calculation.
- Operation number and the impact of operation scrap percentages – The operation number links a

component to a specific operation, and operations can have a scrap percentage. The linkage enables BOM calculations to account for scrap percentages and cumulative scrap percentages across multiple operations on the component's required quantity.

- Ignore BOM line item in cost calculations – A component can be ignored for BOM calculation purposes.

The operations resource information that is used in a standard cost BOM calculation includes:

- Hourly costs – The hourly costs that are associated with an operations resource are expressed as cost categories that are assigned to set up time and run time. These cost categories should be identified for resource groups and operations resources. The hourly costs that are associated with a cost category can be site-specific or company-wide.
- Per unit costs – Some manufacturing environments assign operations resource costs per unit of output, which would be expressed as a different cost category for quantity. For example, the quantity-related costs can reflect piece rates for labor, or a paint manufacturer may assign operations resource costs per gallon of output.
- Overriding operations resource information on routing operations – The resource information about cost categories will be inherited by operations, where it can be overridden. BOM calculations will use the cost category information that is specified on the routing operations.
- Cost group for a cost category – The cost group that is assigned to a cost category provides cost segmentation in the calculated costs of a manufactured item. For example, different cost groups might be used to segment the calculated costs that are associated with machines and labor or with setup and run time.

The route information that is used in a standard cost BOM calculation includes:

- Route version – The route version that is assigned to the manufactured item has effective from and to dates, and a status for approved and active. The route version must be site-specific, and it can optionally reflect quantity breakpoints.
- Routing operation time – The time can be specified for runtime and setup time. The hourly time is typically expressed for producing one parent item, but it may be expressed per 100 or per 1000 to handle decimal precision issues.
- Routing operation time for secondary resources – A secondary resource has the same operation number as the primary resource, and the same routing operation time. For example, an operation might require a machine as the primary resource and labor and tools as secondary resources.
- Routing operation scrap percentage – BOM calculations will account for scrap percentages and cumulative scrap percentages across multiple operations. This applies to the required time for routing operations and the required quantity for components that are linked to operation numbers.
- Cost categories for a routing operation – Operations resource information about cost categories will be inherited by operations, where it can be overridden. BOM calculations will use the cost category information that is specified on the routing operations.

The manufacturing overhead information that is used in a standard cost BOM calculation includes:

- Surcharge – A surcharge calculation formula reflects a percentage of value, such as 100 percent, that is tied to a specific cost group, such as labor.
- Rate – A rate calculation formula reflects an amount per unit, such as USD 10.00 per hour, that is tied to a specific cost group, such as labor.
- Time-based versus material-based overhead – The manufacturing overhead can be tied to routing operations or material components.

The costing version information that is used in a standard cost BOM calculation includes:

- Costing type – The costing version must contain standard costs. Several restrictions apply to BOM calculations that use standard costs. For example, these restrictions specify that miscellaneous charges must be included in unit costs and that the BOM calculation explosion mode must be single level.

- Mandated fallback principle – The costing version can mandate the use of a fallback principle, such as using a specified costing version or the active cost records. The mandated fallback principle typically applies to a costing version that represents the incremental updates in a two-version approach for cost updates.
- Blocking flag for pending costs – A blocking flag can prevent BOM calculations of the pending cost for manufactured items.
- Specified from-date – The specified from-date will act as the default calculation date for all BOM calculations that involve the costing version.
- Specified site – A specified site will limit BOM calculations to the single site.
- Content of the costing version must include costs – The content must include costs. It can optionally include sales prices in order to calculate suggested sales prices for manufactured items.

Several sources of information can be specified when initiating a BOM calculation. This includes the site, the calculation date, and the costing version.

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Update standard costs in a manufacturing environment

2/18/2021 • 2 minutes to read • [Edit Online](#)

This article provides guidance about how to update standard costs in a manufacturing environment.

Updates can reflect new items, cost categories, or indirect cost calculation formulas. They can also reflect corrections and cost changes. The type of update affects the steps that you must complete to update standard costs, as illustrated in the following cases:

- Enter expected standard cost changes for purchased items, and then change the status of the item cost records to **Active** on the appropriate date. However, don't recalculate the costs of manufactured items that use the purchased items.
- Enter standard costs for a new purchased item, but don't recalculate the costs of manufactured items that have a bill of materials (BOM) version that contains the new purchased item as a component.
- Correct or change the cost of a purchased item, or change the cost group that is assigned to a purchased item, and calculate the cost for all manufactured items that have a BOM version that contains the purchased item as a component.
- Change the cost for a cost category, and calculate the cost for all manufactured items that have a route version that contains routing operations that use the cost category.
- Change the cost categories that are assigned to routing operations or the cost group that is assigned to cost categories. Then calculate the cost for all manufactured items that have a route version that contains routing operations that use the cost category.
- Change an indirect cost calculation formula, and calculate the cost for all manufactured items that are affected by the change.
- Change or add a manufacturing site for a manufactured item, and calculate the item's manufactured cost for the site.
- Calculate, or recalculate, the cost for a manufactured item, and recalculate the cost for all manufactured items that have a BOM version that contains the manufactured item as a component.
- Calculate costs for a new manufactured item, based on its defined, approved, and active BOM and route information.

Each case requires careful consideration about how to update standard costs.

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Update standard costs for a new manufactured item

2/18/2021 • 3 minutes to read • [Edit Online](#)

This article provides guidance for updating standard costs for a new manufactured item.

The following guidelines assume that you use a two-version approach to update standard costs. In this approach, one costing version contains the standard costs that were originally defined for the frozen period, and the second costing version contains the incremental updates that pertain to the new manufactured items. The incremental updates are entered as cost records in the second costing version, and eventually they are enabled. The two-version approach requires that you define a second costing version. Here are the guidelines for defining this costing version:

- Assign a costing type of **Standard cost**.
- Assign a significant identifier that indicates the contents of the costing version, such as **2016-UPDATES**.
- In the **Allow price types** field group, make sure that **Cost price** is set to **Yes**.
- Allow cost records to be entered for all sites (that is, leave the **Site** field blank). If you enter a site, cost records can be entered only for that site.
- Use a fallback principle of **Active**.

To add new manufacturing items throughout the frozen period, follow these steps.

1. Use the **Costing version setup** page to enable cost records to be entered into the second costing version that contains the incremental updates. Prevent the activation of pending costs, where activation is allowed after pending costs have been completely and accurately defined. Indicate a blank from-date as a policy in the costing version, and then enter the from-date when you enter each cost record. The from-date should represent a date before the new items are purchased or manufactured.
2. Use the **Item price** page to enter cost records for new purchased items. For each cost record, enter the costing version that contains incremental updates, and use a from-date that comes before the expected manufacturing date for new manufactured items.
3. Calculate the cost of new manufactured items by using the **Calculation** page. Open the **Calculation** page from the **Costing version maintenance** page, and then select the costing version that contains the incremental updates. Use the selection criteria to specify the new manufactured item and any one of its manufactured components. In a multilevel product structure, you might also have to specify any parent item that contains the new manufactured items as a component. Enter a from-date for the bill of materials (BOM) calculation that corresponds to the start of manufacturing for the new manufactured items. The from-date should be in the effective dates for the item's BOM version and route version. **Note:** A missing cost record can indicate a new manufactured item. BOM calculations can be limited to items that have missing costs.
4. Verify the completeness and accuracy of the calculated costs for new manufactured items. Use the **Complete** page to review the calculated costs for each item cost record, and also review any Infolog warning messages. Alternatively, use the **Calculation** page to review the calculated costs.
5. Use the **Costing version setup** page to change the blocking flag to allow activation of the pending cost records in the second costing version.
6. Use the **Activate prices** page (which you open from the **Costing version maintenance** page) to enable all pending cost records in the second costing version. You can also enable the pending cost records for individual items by clicking the **Activate** button on the **Item price** page.
7. Use the **Costing version setup** page to change the blocking flags in the second costing version to prevent additional data maintenance. The blocking policies prevent the entry of new pending costs and the activation of pending costs.

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Update standard costs in a non-manufacturing environment

2/18/2021 • 2 minutes to read • [Edit Online](#)

This article provides guidance for updating standard costs in a non-manufacturing environment.

The following guidelines assume that you use a two-version approach to update standard cost. In this approach, one costing version contains the standard costs that were originally defined for the frozen period, and the second costing version contains the incremental updates. Each update is entered as a cost record that is enclosed in the second costing version, and eventually it's enabled. An alternative, one-version approach uses the set of standard costs that was originally defined. The two-version approach requires that you define a second costing version. Here are the guidelines for defining this costing version:

- Assign a costing type of **Standard costs**.
- Assign a meaningful identifier that indicates the contents of the costing version, such as **2016-UPDATES**.
- Make sure that the content includes cost records.
- Allow cost records to be entered for all sites. If you specify a site, cost records can be entered only for that site.
- Indicate a fallback principle of **None**. The fallback principle applies only to cost calculations for manufactured items.

To correct, adjust, or update standard costs for new items, follow these steps.

1. Use the **Costing version setup** page to enable cost data to be entered into the second costing version. Optionally, prevent the activation of pending costs, so that activation will be allowed after pending costs have been completely and accurately defined. You can also optionally enter a date in the **From date** field. As a general guideline, use the date when you intend to enable the incremental updates. Alternatively, leave the **From date** field blank for the costing version, and then enter a date in the **From date** field for each cost record.
2. Use the **Item price** page to enter updates as item cost records that are enclosed in the second costing version.
3. Use the **Item prices** report to verify the completeness and accuracy of the item cost records that are enclosed in the second costing version.
4. Use the **Costing version maintenance** page to change the blocking flag to allow activation of the pending cost records that are enclosed in the second costing version.
5. Use the **Activate prices** page (which you open from the **Costing version maintenance** page) to activate all pending item cost records that are enclosed in the second costing version. You can also activate the pending cost records for individual items by clicking the **Activate pending price** button on the **Item price** page.
6. To prevent additional data maintenance, use the **Costing version setup** page to change the blocking flags that are enclosed in the second costing version. The blocking policies will prevent the entry of new pending costs and the activation of pending costs.

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Prepare to maintain standard costs for manufactured items

2/18/2021 • 2 minutes to read • [Edit Online](#)

This topic describes the steps for preparing to maintain costs for manufactured items. The steps for manufactured items differ slightly from the steps for purchased items.

Policies that are assigned to manufactured items can affect the cost calculations for the parent manufactured items. To prepare to maintain costs for manufactured items, follow these steps.

1. Assign an item model group to the manufactured item.

The item model group identifies that standard costs will be used.

2. Assign an item group to the manufactured item.

The item group contains ledger accounts that apply to the manufactured item. The ledger accounts for a manufactured item that has a standard cost inventory model include several production variances, the cost change variance, and the inventory cost revaluation.

3. Assign the inventory unit of measure to the item.

The item's costs are always expressed in the item's inventory unit of measure.

4. Don't assign a cost group to the manufactured item unless the item will be treated as a purchased item.

5. Assign a bill of materials (BOM) calculation group to the manufactured item.

The item's BOM calculation group defines warning conditions that apply. In that way, when a BOM calculation is done, warning messages can be generated about possible sources of calculation errors. For example, a warning message can identify when an active BOM or route doesn't exist. The BOM calculation group contains a stop explosion policy that indicates when a manufactured item should be treated as a purchased item.

6. If the manufactured item has constant costs, assign a standard order quantity to it.

The standard order quantity is an accounting lot size for amortizing constant costs. Examples of constant costs include setup times in routing operations and a constant component quantity in the BOM.

7. Define the BOM for the manufactured item.

One or more BOM versions can be defined for the manufactured item. Verify that the versions that you want have been marked as approved and active, and that they have the effective dates that you want. The BOM version can be company-wide or site-specific.

8. Define the routing for the manufactured item.

One or more route versions can be defined for the manufactured item. Verify that the versions that you want have been marked as approved and active, and that they have the effective dates that you want. The route version must be site-specific.

If you want to use routing information for costing purposes, additional preparation steps are required. For example, the cost categories that are assigned to routing operations must be correct and completed.

Related topics

Amortize constant costs for a manufactured item

Set up products that can be produced or procured

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Costing versions overview

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This article provides information about costing versions, how to maintain them, and the types of data that you can include in them. The primary purpose of a costing version is to contain cost records about items, cost categories, and calculation formulas for indirect costs.

A costing version can serve one or more purposes, depending on the data that the costing version contains. The primary purpose of a costing version is to contain cost records about items, cost categories, and calculation formulas for indirect costs. A costing version can contain a set of standard cost records or a set of planned cost records that are based on the costing type that is assigned to the costing version.

Costing versions for standard or planned costs

Standard costs

A costing version can support a standard cost inventory model for items, where the costing version contains a set of standard cost records about items and manufacturing processes. Cost data about manufacturing processes is expressed in terms of the cost categories for routing operations and the calculation formulas for manufacturing overheads.

Planned costs

A costing version can contain a set of planned cost records about items and manufacturing processes. A costing version that contains planned costs is often used to support cost calculation simulations, such as simulations of the effect that cost changes to purchased materials or manufacturing processes has on the calculated costs of manufactured items. The item cost records for planned costs can also be used to support an actual cost inventory model by providing the initial values for item costs. These values include the calculation of planned costs for manufactured items.

Entering costs

Data maintenance for cost records in a costing version involves entering costs for purchased items and for items that are transferred between sites. Additional data maintenance for manufacturers involves entering costs for cost categories that are associated with routing operations, entering calculation formulas for the indirect costs that reflect manufacturing overhead, and calculating costs for manufactured items.

The item cost data in a costing version consists of one or more cost records for each item. When an item cost record is first entered, it has **Pending** status and an intended effective date. When you activate the item cost record, the status is updated to **Active**, and the effective date is updated to the activation date. Different item cost records can reflect different sites, effective dates, or statuses. When you calculate costs for manufactured items for a future date, the bill of materials (BOM) calculation uses cost records that have the relevant effective date, regardless of whether the status is **Pending** or **Active**. An item's current active cost record is used to estimate production order costs and to value inventory transactions under a standard costing inventory model. The maintenance of cost records for cost categories and indirect cost calculation formulas resembles the maintenance of item cost records.

Two blocking policies for a costing version determine whether pending costs can be maintained and whether the pending cost can be activated. Use the blocking policies to permit data maintenance, and then use them to prevent data maintenance for cost records in a costing version.

A costing version can also contain data about item sales prices or purchase prices for BOM calculation purposes.

Item sales prices for BOM calculations

The main reason for including data about sales prices is to retain a manufactured item's calculated sales price. The calculated sales price can then be analyzed to determine how components, routing operations, and overhead contribute to the cost and sales price.

A secondary reason for including data about sales prices is to define the sales price records for component items. These records can then be used to calculate the sales price of manufactured items. You first define the sales price model that is embedded in a BOM calculation group, and assign the BOM calculation group to purchased items. Then, when you perform BOM calculations that use planned costs, you select the cost price model of the BOM calculation group.

Otherwise, the sales price records for items are used only as reference information, regardless of whether the records are manually entered or calculated. By activating an item's sales price record, you can update the item's base sales price. However, the base sales price isn't site-specific and can be manually overridden. The item's base sales price is used as a default sales price on sales orders and sales quotations.

Item purchase prices for BOM calculations

The main reason for enabling purchase price data is to define purchase price records for component items, so that these records can be used to calculate the costs of manufactured items. The item purchase price records must be manually entered.

To enable purchase price content, you first define a BOM calculation group that contains a cost price model for the item's purchase price, and assign the BOM calculation group to purchased items. You then use a cost price model for the BOM calculation group when you perform BOM calculations that use planned costs to calculate the sales price of manufactured items.

The purchase price records for items are also used as reference information. By changing the status of an item's purchase price record from **Pending** to **Active**, you can update the item's base purchase price. However, the base purchase price isn't site-specific and can be manually overridden. The item's base purchase price is used as a default purchase price on purchase orders.

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Costing sheets

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Setting up the costing sheet involves two objectives. As the first objective, you define the format for displaying cost of goods sold information about a manufactured item or production order. The formatted display is termed a costing sheet. As the second objective, you define the basis for calculating indirect costs. The costing sheet setup builds on the cost group feature for displaying information and for the indirect cost calculation formulas. The two objectives of costing sheet setup are described in this article.

A costing sheet is the formatted display of information about the cost of goods that are sold for a manufactured item or a production order. When you set up a costing sheet, you define the format for the information and also define the basis for calculating indirect costs. The costing sheet setup builds on the cost group features for displaying information and for the formulas that are used to calculate indirect cost. Here is more information about the two objectives of costing sheet setup:

- **Define the format for the costing sheet.** The user-defined format for a costing sheet identifies the segmentation of costs that contain a manufactured item's cost of goods sold. For example, the information about an item's cost of goods sold can be segmented into material, labor, and overhead, based on cost groups. These cost groups are assigned to items, cost categories for routing operations, and indirect cost calculation formulas. The format for the costing sheet typically requires intermediate totals when multiple cost groups have been defined. For example, multiple cost groups that are related to material can be aggregated. The definition of a costing sheet format is optional, but a costing sheet format must be defined if indirect costs will be calculated.
- **Define the basis for calculating indirect costs.** Indirect costs reflect manufacturing overhead that is associated with the production of a manufactured item. An indirect cost calculation formula can be expressed as either a surcharge or a rate. A surcharge represents a percentage of value, whereas a rate represents an amount per hour for a routing operation. A cost group defines the basis for the calculation formula, such as a 100-percent surcharge for a labor cost group or a USD 50.00 hourly rate for a machine cost group. If you want to define a calculation formula and its cost group basis, the costing sheet setup requires that you identify the cost group that represents the overhead, and select whether a surcharge or rate approach is used.

Each calculation formula must be entered as a cost record. The cost record consists of a specified costing version, a surcharge percentage or a rate amount, the cost group basis, a status, and an effective date. When a cost record is first entered, it has **Pending** status and an effective date. When you activate the cost record, the status is updated to so that the record is the current active record, and the effective date is updated to the activation date. The cost record can also specify a site for a site-specific calculation formula. Alternatively, you can leave the **Site** field blank to indicate that the calculation formula is a company-wide formula. The cost record can optionally consist of a specified item or item group when the calculation formula has been marked as a per-item formula.

The current active cost records for indirect cost calculation formulas are used to estimate production order costs. They are also used to calculate actual costs that are related to actual consumption of time and material. Pending cost records are used in bill of materials (BOM) calculations for a future date.

Two blocking policies for a costing version determine whether pending costs can be maintained, and whether the pending cost can be started. Use the blocking policies to permit data maintenance, and then to prevent data maintenance for the cost data in a costing version.

After you define the costing sheet format and calculations for indirect costs, you must perform a separate step to validate and save the information. The costing sheet represents a company-wide format for consistently

displaying information about the costs of goods sold.

The costing sheet is displayed as part of the **Calculate item cost** page. The costing sheet can be displayed for a manufactured item's calculated cost record on the **Item price** page or for an order-specific calculation record on the **BOM calculation results** page. It can also be displayed as part of the **Price calculation** page for a production order.

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Simulate cost changes by using a costing version for planned costs

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This article explains how you can simulate the effects of cost changes on a manufactured item's calculated costs by using a separate costing version for planned costs.

You can simulate the effects of cost changes on the calculated costs of a manufactured item by using a separate costing version for planned costs. Use this separate costing version to enter pending cost records that reflect incremental cost changes, and to calculate the cost impact on manufactured items. Because the Active costs fallback principle will be used in the bill of materials (BOM) calculations, only the incremental cost changes must be entered.

Guidelines for defining the simulation costing version

Use the following guidelines when you define the costing version for simulations:

- Assign a costing type of **Planned costs**.
- Assign a meaningful identifier for the costing version, such as **Simulation**.
- Make sure that the content includes cost records.
- Allow the entry of cost records. Don't block the entry of pending costs.
- Allow the entry of cost records for all sites. If you specify a site, you will limit the entry of cost records to that site.
- Prevent the activation of pending costs. Only pending costs must be entered for cost records in the simulation costing version.
- Don't enter a "from" date. A calculation date will be entered for each BOM calculation that uses the simulation costing version.
- Specify a fallback principle of **Current active**. The fallback principle enables incremental cost changes to be entered for simulation purposes but uses the current active costs as the source for all other cost records. We assume that all current active costs exist for all other cost records.
- Specify a cost price model of **Version cost price**, but don't restrict calculations. For example, the simulations can also use the **BOM calculation group** cost price model to indicate the source of cost contribution data for purchased items.
- Specify an explosion mode of **Multilevel**, but don't restrict calculations. The simulations can use other explosion modes.

Costing versions

The following scenarios illustrate how the simulation costing version is used to simulate the impact of cost changes. Before you enter a simulated cost change, delete the pending cost records in the simulation costing version, so that you have a clean starting point. Use the **Item price** page to view and delete the pending cost records that are related to item prices and cost category prices.

- Simulate the cost change for a purchased item. For example, the cost change might reflect an expected increase or decrease in the cost of critical purchased materials. To define the different cost for a purchased item, use the **Item price** page to enter a pending cost record in the simulation costing version.
- Simulate the cost change for a cost category. For example, the cost change might reflect an expected increase or decrease in labor rates, or in the hourly rates for operations resources. To define the different cost for a

cost category, use the **Cost category price** page to enter a pending cost record in the simulation costing version.

- Simulate the cost change in an indirect cost calculation formula. For example, the cost change might reflect an expected increase or decrease in manufacturing overhead. To define the change in an indirect cost calculation formula, use the **Costing sheet setup** page to enter a pending cost record in the simulation of costing version, and to validate and save the change.

After you enter the simulated cost changes, calculate the costs for manufactured items that are affected by the cost changes. Use the **Calculation** page for the simulation costing version, and identify the selected manufactured items that will be affected by the cost changes. The BOM calculations apply to all manufactured items unless you select specific items. Alternatively, you can use the BOM calculation option for where-used updates. View the item cost records in the simulation costing version to analyze how the simulated cost changes affected the costs of the selected manufactured items. Use the **Item price** page and the **Calculate item cost** page to view and analyze the costs.

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Compare item prices storage report

2/18/2021 • 5 minutes to read • [Edit Online](#)

This topic explains how to run a **Compare item prices storage** report and make the output available digitally, either as an interactive page in Dynamics 365 Supply Chain Management, or as an exported document in any of several formats.

When you view the report in your browser, columns and aggregate balances are dynamically adjusted, depending on your configured layout. You can sort the results, filter them, drill down into the data, and more.

Report results are stored in the **Compare item prices** data entity, which lets you filter and export the results to a format such as CSV or Microsoft Excel.

The **Compare item prices storage** report is helpful in cases where the output contains many lines. For example, the output will contain many lines if you have more than 40,000 items holding a pending item price in the costing version.

Enable compare item prices storage

Before you can use this feature, you must enable it on your system. Administrators can use the [feature management](#) settings to check the feature status and enable it if needed. Here, the feature is listed as:

- **Module** - Cost management
- **Feature name** - Compare item price storage

Generate a Compare item prices storage report

Follow these steps to generate and store a **Compare item prices storage** report:

1. Go to **Cost management > Inquiries and reports > Predetermined cost reports > Compare item prices storage**.
2. Select **New** to open the **Compare item prices** pane. Set the following options to define which prices to compare in your report:
 - On the **Parameters** FastTab, give the report a unique **Name** and use the fields in the **Pending prices to compare** and **Prices used for comparison** sections to define which prices and dates to compare.
 - On the **Records to include** FastTab, set up filters and constraints to define which data to include in the report.
 - On the **Run in the background** FastTab, set up how, when, and the frequency at which you want to generate the report.

NOTE

This report is always executed as part of a batch job.

3. Select **OK** to apply your settings and close the pane.
4. After the batch job is completed, it will be listed on the **Compare item prices storage** page. You may need to refresh the page to see the report.

Explore the Compare item prices storage report

After you've generated a report, you can view and explore it at any time as follows:

1. Go to **Cost management > Inquiries and reports > Predetermined cost reports > Compare item prices storage**.
2. Select a report from the list.
3. Do one of the following:
 - Select **Overview** to get an overview of your report results.
 - Select **View details** to get a more detailed view of your report
4. After the selected view opens, you can do the following:
 - Select almost any column heading to sort or filter the table by values in that column, just as with most standard forms in Supply Chain Management. Note, you can't sort or filter the **Net change price %** column because it's a calculated field.
 - Select **Dimension display** to open a pane where you can choose which dimension column to include on the form. Set **Save setup** to **Yes** if you'd like to save these settings so they will be preserved the next time you open the report. Select **OK** to apply your settings and close.
 - Select any row in the form and then select **View details** to see more information about the selected item. You'll be able to drill down into the data from here.
 - Select any row in the form and then select **View comparison chart** to see an interactive graphical representation of your results as they relate to your selected item. You can explore these results by selecting various graphical elements in the chart and chart legend.
 - Select any row in the form and then select **View calculation details** to see more information about calculations related to the selected item. You'll be able to drill down into the data from here.

Export the Compare item prices storage report

Each report that you generate is stored in the **Compare item prices** data entity. You can use the standard data management features of Supply Chain Management to export data from this entity to any supported data format, including CSV or Microsoft Excel.

The following is an example of how to export a **Compare item prices storage** report:

1. Go to **System administration > Workspaces > Data management**.
2. Select the **Export** button in the **Data management** section.
3. The **Export** page opens, which you'll use to set up your export job. Start by giving your job a **Group name**.
4. In the **Selected entities** section, select **Add entity** to open a dialog box where you can set the following options:
 - **Entity name** - Select **Compare item prices**.
 - **Target data format** - Choose the format that you want to export to.
5. Select **Add** to add the new row and then select **Close** to close the dialog box.
6. Usually you'll export one report at a time. To do this, set up a **Filter** for the row you just added to the **Inquiry** pane. This will let you define which reports from the **Compare item prices** entity that you want to include in your export. Set the following filter options to export a single report:
 - On the **Range** tab, select **Add** to add a new row.
 - Set **Table** to **Compare item prices**.

- Set **Derived table** to **Compare item prices**.
 - Set **Field** to the field that you want to filter by. Usually you'll use **Execution name** or **Execution time**.
 - Set **Criteria** to the value from your selected field that you want to look for (either the name of the report or the time the report was generated).
 - If necessary, add more rows to the **Range** table until you have uniquely identified the report that you're looking for.
7. Select **OK** to save your settings and close.
 8. Select **Save** to save your export setup.
 9. Open the **Export options** tab and select **Export now** to generate the export file.
 10. The **Execution summary** page opens, where you can see the status of your export job and a list of entities that were exported. Select the **Compare item prices** entity listed in the **Entity processing status** area and then select **Download file** to download the data exported from that entity.

For more information about how to use data management to export data, see [Data import and export jobs overview](#).

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Cost objects

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This article provides information about costs objects, and explains how costs and quantities are accumulated. A cost object is an entity that costs and quantities are accumulated for. A cost object entity can be either a product or product variants, such as variants for style and color.

Cost objects

The **Cost objects** page lists all cost objects that are registered on a product. The cost objects are defined by data from the following sources:

- Product
- Product dimension group
- Storage dimension group
- Tracking dimension group

Note: A cost object represents a cost element of the **Direct material** type only. A cost object and an inventory object differ in the way that a cost object is defined by the inventory dimensions that are selected for financial inventory. For example, an item has the following configuration:

- **Site:** Physical inventory = Yes, Financial inventory = Yes
- **Warehouse:** Physical inventory = Yes, Financial inventory = No
- **Batch No.:** Physical inventory = Yes, Financial inventory = No

The following table shows what is a cost object and what is an inventory object.

OBJECT TYPE	ITEM NUMBER	SITE	WAREHOUSE	BATCH NO.
Cost object	x	x		
Inventory object	x	x	x	x

Accumulation of costs and quantities

- The value in the **Value** field is a sum of the following values:
 - Physical cost amount
 - Financial cost amount
 - Adjustments
- The value in the **Quantity** field is a sum of the following values:
 - Received
 - Deducted
 - Posted quantity
- The **Average unit cost** field is a calculated field. The value is calculated by dividing the **Value** value by the **Quantity** value.

Note: The ****Include physical value**** parameter has no effect on the preceding calculations.

Additional resources

[Product dimension group](#)

[Storage dimension group](#)

[Tracking dimension group](#)

[What's new or changed](#)

[Cost entries](#)

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View cost object balance

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The demo data company used to create this procedure is USMF. This procedure is intended for the cost controller.

1. Click Cost administration.
2. Click Released products.
3. Use the Quick Filter to filter on the Item number field with a value of 'm0004'.
4. On the Action Pane, click Manage costs.
5. Click Cost objects.
6. Click Physical quantity.
7. Click Dimensions display.
8. Clear the Location check box.
9. Click OK.

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View inventory statement and KPI by cost object

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The demo data company used to create this procedure is USMF. This procedure is intended for the cost controller.

1. Click Cost administration.
2. Click Released products.
3. Use the Quick Filter to find records. For example, filter on the Item number field with a value of 'd0005'.
4. On the Action Pane, click Manage costs.
5. Click Cost objects.
6. Click Inventory statement and KPIs.
7. In the From date field, enter a date.
8. In the To date field, enter a date.

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Cost entries

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This article provides information about cost entries and when they are created. A cost entry is a record that registers the quantity and cost of a given event.

Cost entries are aggregations of inventory transactions that are recorded on active financial inventory dimensions.

Examples

Example 1: No cost entries are created

A transfer journal event is registered. The event transfers one piece of item A from location A to location B. The Location inventory dimension isn't considered part of the cost object. Therefore, the event creates two inventory transactions and no cost entries.

Example 2: Cost entries are created

A transfer journal event is registered. The event transfers one piece of item A from site 1 to site 2. The Site inventory dimension is considered part of the cost object. Therefore, the event creates two inventory transactions and two cost entries.

Example 3: One cost entry is created

A product receipt event is registered for a purchase order. The event registers 100 pieces of item A at a unit cost of 10.00 U.S. dollars (USD). Because item A uses a serial number to track the purpose of inventory management, a unique serial number is created for each item that is received. Therefore, the event creates 100 inventory transactions and one cost entry.

Cost entries page

The new **Cost entries** page lets you view and control registrations of quantities and costs. This page complements the **Inventory transaction** and **Inventory settlement** pages. Records are registered in chronological order for an event. Therefore, you can quickly find and control the accumulated costs of a specific event or all events that are related to a document. Here is an example:

- A product receipt event is registered for item A. One hundred pieces are received at a unit cost of 10.00 USD.
- A few days after the invoice event is registered, the cost increases to 11.00 USD. Therefore, the total amount is 1,100 USD. A second voucher is created to account for the difference of 100 USD.
- A few days later, a miscellaneous charge of 15.00 USD to cover the transportation cost is registered on the purchase order.

VOUCHER	DATE	REFERENCE	NUMBER	LOT ID	QUANTITY	AMOUNT
00001	01-01-2015	Purchase order	100001	0000101	100.00	1000.00
00002	20-01-2015	Purchase order	100001	0000101		100.00
00003	31-01-2015	Adjustment	100001	0000101		15.00

The **Cost entries** page enables filtering by document ID and document date.

NOTE

Cost entries are available only for [cost objects](#) or released products.

Additional resources

[Cost objects](#)

NOTE

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View cost entries for a cost object

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This procedure shows how to view cost entries for a cost object. The demo data company used to create this procedure is USMF. This procedure is intended for the cost controller.

1. Click Cost administration.
2. Click Released products.
3. Use the Quick Filter to find records. For example, filter on the Item number field with a value of 'm0004'.
4. On the Action Pane, click Manage costs.
5. Click Cost objects.
6. Click Cost entries.
7. Use the Quick Filter to filter on the Number field with a value of 'p000031'.
 - If cost entries are blank, set From date to January 31, 2012 and To date to December 31, 2012.

NOTE

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Cost groups

2/18/2021 • 3 minutes to read • [Edit Online](#)

Cost groups provide the basis for segmenting and analyzing cost contributions in a manufactured item's calculated cost, such as the cost contributions for material, labor, and overhead. Cost group segmentation has several synonyms within manufacturing environments, such as cost breakdown, cost decomposition, or cost classification.

Cost group segmentation has several synonyms within manufacturing environments, such as cost breakdown, cost decomposition, or cost classification. Cost group segmentation can serve several purposes. Here are some examples:

- It can segment costs for different types of material, such as ingredients and packaging material for a canned goods product, based on the cost groups that are assigned to items.
- It can segment costs for different types of operations resources, such as different types of labor or machines, based on the cost groups that are assigned to cost categories that are related to operations resources and routing operations.
- It can segment costs for setup time and run time in routing operations, based on the cost groups that are assigned to cost categories that are related to the routing operations.
- It can segment costs for different types of overhead, such as labor-related and machine-related overhead, based on cost groups that are assigned to indirect costs in the costing sheet setup.
- It can act as the basis for calculating various types of manufacturing overhead in the costing sheet setup. This overhead can include different types of overhead that are related to routing information about operations resources, or information about setup time and run time. Manufacturing overhead can also be related to cost contributions of component material, reflecting a lean manufacturing philosophy that eliminates the need for routing information.

Cost group segmentation applies to a manufactured item's calculated cost, regardless of whether that cost was based on standard costs or planned costs. The **Summary** page displays this segmentation by cost group, by level, or by both cost group and level.

The ability to retain cost group segmentation across multiple levels in a product structure is known as *splitting*. Splitting applies only to manufactured items that use a standard cost inventory model. If splitting isn't used, the cost of a manufactured component is treated as a material cost contribution. The inventory parameter for cost breakdown by subledger indicates that cost group segmentation will be retained across multiple levels in standard cost calculations. By contrast, if a policy has no levels, cost group segmentation applies only to a single-level calculation. For example, the **Cost rollup by cost group** page displays the cost group segmentation across multiple levels for standard cost items.

Cost group segmentation can also apply to variances for a standard cost item. A second inventory parameter defines whether variances are identified by cost group or just summarized.

A cost group can be assigned a cost group type and a behavior for supplemental segmentation purposes.

- **Cost group type** – Each cost group must be assigned a cost group type to indicate that the cost group applies to direct material, direct manufacturing, or direct outsourcing, or to designate it as indirect or undefined. A cost group that is designated as direct material can be assigned to items. A direct manufacturing cost group can be assigned to cost categories. A direct outsourcing cost group can be assigned to a product type of service, so that you can classify costs that are associated with the service purchase to subcontracting activities. An indirect cost group can be assigned to indirect costs for surcharges or rates. A cost group that is designated as undefined can be assigned to items, cost categories, or indirect

costs. The assignment of a cost group type serves several purposes. First, it constrains the ability to assign a cost group and to view a list of applicable cost groups. Second, it provides supplemental segmentation for reporting purposes. Third, it can be used to assign ledger accounts for variances.

- **Behavior** – Each cost group can optionally be assigned a behavior to indicate that the cost group applies to fixed costs or variable costs. A cost group that has a null value for behavior is treated as a variable cost. The assignment of a behavior serves only a reporting purpose. For example, costs can be displayed with segmentation of fixed and variable costs on the costing sheet and on the **Cost rollup by cost group** page. If you assign a profit setting percentage to each cost group, the bill of materials (BOM) calculation provides a suggested sales price, based on a cost-plus-markup approach.

NOTE

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FIFO with physical value and marking

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First in, First out (FIFO) is an inventory model in which the first acquired receipts are issued first. Financially updated issues from inventory are settled against the first financially updated receipts into inventory, based on the financial date of the inventory transaction.

When you use FIFO, you don't have to use the FIFO rule. Instead, you can mark inventory transactions so that a specific item receipt is settled against a specific issue. We recommend a periodic inventory closing when you use the FIFO inventory model. The following examples show the effect of using FIFO in three configurations:

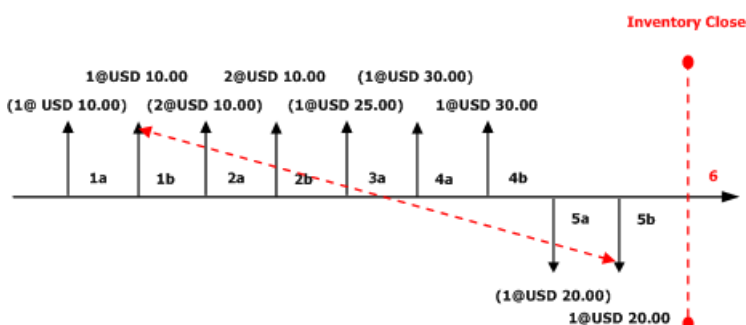
- FIFO without the **Include physical value** option
- FIFO with the **Include physical value** option
- FIFO with marking

FIFO without the Include physical value option

In this example, the item model group isn't marked to include physical value. The illustration that follows shows these transactions:

- 1a. Inventory physical receipt for a quantity of 1 at a cost of USD 10.00 each.
- 1b. Inventory financial receipt for a quantity of 1 at a cost of USD 10.00 each.
- 2a. Inventory physical receipt for a quantity of 2 at a cost of USD 10.00 each.
- 2b. Inventory financial receipt for a quantity of 2 at a cost of USD 10.00 each.
- 3a. Inventory physical receipt for a quantity of 1 at a cost of USD 25.00 each.
- 4a. Inventory physical receipt for a quantity of 1 at a cost of USD 30.00 each.
- 4b. Inventory financial receipt for a quantity of 1 at a cost of USD 30.00 each.
- 5a. Inventory physical issue for a quantity of 1 at a cost price of USD 20.00 each (running average of financially updated transactions).
- 5b. Inventory financial issue for a quantity of 1 at a cost price of USD 15.00 each (running average of financially updated transactions).
- 6. Inventory close is performed. Based on the FIFO method, the first financially updated issue will be settled against the first financially updated receipt. An adjustment of USD -5.00 will be made on the issue transaction.

The new running average cost price reflects the average of the financially updated transactions. The following illustrations shows the effects of the FIFO inventory model on this series of transactions when the **Include physical value** option isn't used.



Key to the diagram

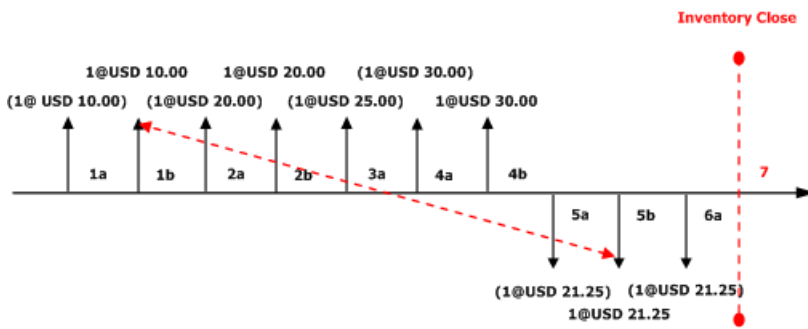
- Inventory transactions are represented by vertical arrows.
- Receipts into inventory are represented by vertical arrows above the timeline.
- Issues out of inventory are represented by vertical arrows below the timeline.
- Above (or below) each vertical arrow, the value of the inventory transaction is specified in the format Quantity@Unitprice.
- An inventory transaction value that is enclosed in parentheses indicates that the inventory transaction is physically posted into inventory.
- An inventory transaction value that isn't enclosed in parentheses indicates that the inventory transaction is financially posted into inventory.
- Each new receipt or issue transaction is designated by a new label.
- Each vertical arrow is labeled with a sequential identifier, such as *1a*. The identifiers indicate the order of inventory transaction postings in the timeline.
- Inventory closings are represented by a red vertical dashed line and the label *Inventory Close*.
- Settlements that are performed by inventory close are represented by red diagonal dashed arrows that go from a receipt to an issue.

FIFO with the Include physical value option

If the **Include physical value** check box is selected for an item on the **Item model group** page, the system uses both physical and financial receipt transactions to calculate the running average cost price. Where applicable, the system also makes adjustments to the physically updated issue transaction. When the **Include physical value** check box is cleared, inventory close with the FIFO inventory model makes settlements only to transactions that are financially updated. The illustration that follows shows these transactions:

- 1a. Inventory physical receipt for a quantity of 1 at a cost of USD 10.00 each.
- 1b. Inventory financial receipt for a quantity of 1 at a cost of USD 10.00 each.
- 2a. Inventory physical receipt for a quantity of 1 at a cost of USD 20.00 each.
- 2b. Inventory financial receipt for a quantity of 1 at a cost of USD 20.00 each.
- 3a. Inventory physical receipt for a quantity of 1 at a cost of USD 25.00 each.
- 4a. Inventory physical receipt for a quantity of 1 at a cost of USD 30.00 each.
- 4b. Inventory financial receipt for a quantity of 1 at a cost of USD 30.00 each.
- 5a. Inventory physical issue for a quantity of 1 at a cost price of USD 21.25 each (running average of financial and physical updated transactions).
- 5b. Inventory financial issue for a quantity of 1 at a cost price of USD 21.25 each (running average of financial and physical updated transactions).
- 6a. Inventory physical issue for a quantity of 1 at a cost price of USD 21.25 each.
- 7. Inventory close is performed. Based on the FIFO method, the first financial issue transaction will be adjusted or settled against the first updated receipt, either financial or physical.

Transaction 5b will be settled against receipt transaction 1b. There will be an adjustment of USD –11.25 to this issue transaction. The new running average cost price reflects the average of the financially and physically updated transactions, USD 27.50. The following illustration shows the effects of the FIFO inventory model on this series of transactions when the **Include physical value** option is used.



Key to the diagram

- Inventory transactions are represented by vertical arrows.
- Receipts into inventory are represented by vertical arrows above the timeline.
- Issues out of inventory are represented by vertical arrows below the timeline.
- Above (or below) each vertical arrow, the value of the inventory transaction is specified in the format Quantity@Unitprice.
- An inventory transaction value that is enclosed in parentheses indicates that the inventory transaction is physically posted into inventory.
- An inventory transaction value that isn't enclosed in parentheses indicates that the inventory transaction is financially posted into inventory.
- Each new receipt or issue transaction is designated by a new label.
- Each vertical arrow is labeled with a sequential identifier, such as *1a*. The identifiers indicate the order of inventory transaction postings in the timeline.
- Inventory closings are represented by a red vertical dashed line and the label *Inventory Close*.
- Settlements that are performed by inventory close are represented by red diagonal dashed arrows that go from a receipt to an issue.

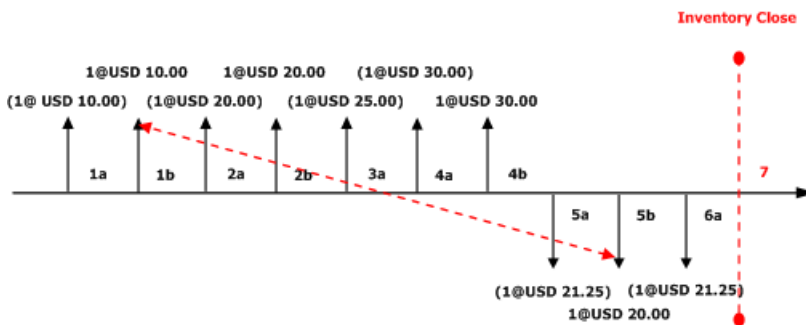
FIFO with marking

Marking is a process that lets you link, or mark, an issue transaction to a receipt transaction. Marking can occur either before or after a transaction is posted. You can use marking when you want to be sure of the exact cost of inventory when the transaction is posted or the inventory close is performed. For example, the Customer Service department accepted a rush order from an important customer. Because this order is a rush order, you must pay more for this item in order to fulfill your customer's request. You must make sure that the cost of this inventory item is reflected in the margin, or cost of goods sold (COGS), for this sales order invoice. When the purchase order is posted, the inventory is received at a cost of USD 120.00. If this sales order document is marked to the purchase order before the packing slip or invoice is posted, the COGS will be USD 120.00, not the current running average cost for the item. If the sales order packing slip or invoice is posted before the marking occurs, the COGS will be posted at the running average cost price. Before inventory close is performed, these two transactions can still be marked to each other. When a receipt transaction matches an issue transaction, the valuation method that is defined in the item model group is disregarded, and the system settles these transactions to each other. You can mark an issue transaction to a receipt before the transaction is posted. You can do this from a sales order line on the **Sales order details** page. You can view the open receipt transactions on the **Marking** page. You can also mark an issue transaction to a receipt after the transaction is posted. You can match or mark an issue transaction for an open receipt transaction for an inventoried item from a posted inventory adjustment journal. The illustration that follows shows these transactions:

- 1a. Inventory physical receipt for a quantity of 1 at a cost of USD 10.00 each.
- 1b. Inventory financial receipt for a quantity of 1 at a cost of USD 10.00 each.
- 2a. Inventory physical receipt for a quantity of 1 at a cost of USD 20.00 each.
- 2b. Inventory financial receipt for a quantity of 1 at a cost of USD 20.00 each.
- 3a. Inventory physical receipt for a quantity of 1 at a cost of USD 25.00 each.

- 4a. Inventory physical receipt for a quantity of 1 at a cost of USD 30.00 each.
- 4b. Inventory financial receipt for a quantity of 1 at a cost of USD 30.00 each.
- 5a. Inventory physical issue for a quantity of 1 at a cost price of USD 21.25 each (running average of financial and physical updated transactions).
- 5b. Inventory financial issue for a quantity of 1 is marked to inventory receipt 2b before the transaction is posted. This transaction is posted at a cost price of USD 20.00 each.
- 6a. Inventory physical issue for a quantity of 1 at a cost price of USD 21.25 each.
- 7. Inventory close is performed. Because the financially updated FIFO transaction is marked to an existing receipt, these transactions are settled against each other, and no adjustment is made.

The new running average cost price reflects the average of the financially and physically updated transactions, USD 27.50. The following illustration shows the effects of the FIFO inventory model on this series of transactions when marking between issues and receipts is used.



Key to the diagram

- Inventory transactions are represented by vertical arrows.
- Receipts into inventory are represented by vertical arrows above the timeline.
- Issues out of inventory are represented by vertical arrows below the timeline.
- Above (or below) each vertical arrow, the value of the inventory transaction is specified in the format Quantity@Unitprice.
- An inventory transaction value that is enclosed in parentheses indicates that the inventory transaction is physically posted into inventory.
- An inventory transaction value that isn't enclosed in parentheses indicates that the inventory transaction is financially posted into inventory.
- Each new receipt or issue transaction is designated by a new label.
- Each vertical arrow is labeled with a sequential identifier, such as 1a. The identifiers indicate the order of inventory transaction postings in the timeline.
- Inventory closings are represented by a red vertical dashed line and the label *Inventory Close*.
- Settlements that are performed by inventory close are represented by red diagonal dashed arrows that go from a receipt to an issue.

NOTE

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Include physical value

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You use the Include physical value check box on the Inventory model FastTab of the Item model groups page to specify whether physically updated transactions are considered when the running average cost price is calculated for an item.

The **Include physical value** check box has the following values.

VALUE	RESULT
Selected	Both physically updated transactions and financially updated transactions are used to calculate the running average cost price.
Cleared	Only financially updated transactions are used to calculate the running average cost price.

The check box has slightly different effects, depending on the inventory model that you use.

- If you select the **Include physical value** check box when you use the FIFO (First in, first out), LIFO (Last in, first out), or LIFO date inventory model, inventory close also makes adjustments to physically updated transactions.
- If you don't select the **Include physical value** check box when you use these inventory models, inventory close makes settlements only to financially updated transactions.
- When you use the weighted average or weighted average date inventory model, inventory close settles only financially updated transactions, regardless of whether you select the **Include physical value** check box.

Example 1 You've selected the **Include physical value** check box and receive the following purchase orders:

- A purchase order for a quantity of 2 and a cost price of USD 10.00 that has been packing slip–updated.
- A purchase order for a quantity of 3 and a cost price of USD 12.00 that has been invoice–updated.

In this case, the running average cost price will be $USD\ 11.20 = (2 \times 10 + 3 \times 12) / (2 + 3)$, because both physically updated transactions and financially updated transactions are used to calculate the cost price.

Example 2 You haven't selected the **Include physical value** check box, and the cost price on the item setup is USD 10.00.

- You receive a purchase order for a quantity of 20 and a cost price of USD 12.00 that has been packing slip–updated.

When a sales order is posted, the posted cost amount is USD 10.00, because the running average cost price won't include physically posted transactions.

NOTE

For comparison, if you select the **Include physical value** check box for this item, when a sales order is posted, the posted cost amount will be USD 12.00.

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Inventory object values

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This article provides information about how the values of an inventory object are calculated.

A new functionality that is named **physical quantity** lets you see the values of a specific inventory object.

A cost object represents the entity level where inventory accounting is performed. For more information about cost objects, see [Cost objects](#).

To see the values of a specific inventory object, click **Physical quantity** on the **Cost object** page. Here is how the value of an inventory object is calculated:

Inventory object.Value = Cost object.Average unit cost × Inventory object.Quantity

The following example shows how the values of an inventory object and a cost object are calculated. Two product receipt events are registered on item A:

- Product receipt 1: Quantity = 100 pcs., Amount = \$1,000.00, Site = 1, Warehouse = 11, Batch No. = B1
- Product receipt 2: Quantity = 50 pcs., Amount = \$800.00, Site = 1, Warehouse = 11, Batch No. = B2

The following table shows the calculation result for a cost object. You can view the result on the **Cost object** page.

OBJECT TYPE	ITEM NUMBER	SITE	QUANTITY	INVENTORY UNIT	VALUE	AVERAGE UNIT COST
Cost object	A	1	150	Pcs.	\$1800.00	\$12.00

The following table shows the calculation result for an inventory object. You can view the result by clicking **Physical quantity** on the **Cost object** page.

OBJECT TYPE	ITEM NUMBER	SITE	WAREHO USE	BATCH NO.	QUANTIT Y	INVENTO RY UNIT	VALUE	AVERAGE UNIT COST
Inventory object	A	1	11	B1	100	Pcs.	\$1200.00	\$12.00
Inventory object	A	1	11	B2	50	Pcs.	\$600.00	\$12.00

Additional resources

[Cost objects](#)

[Cost entries](#)

[What's new and changed](#)

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LIFO Date with physical value and marking

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Last in, First out Date (LIFO Date) is an inventory model based on the LIFO principle. Issues from inventory are settled against the last receipts into inventory based on the date of the inventory transaction. By using LIFO Date, if there is no receipt before the issue, the issue is settled against any receipts that occur after the date of the issue. Several issues on the same date may be settled in the order of last issue, last receipt.

When you use the Last in, First out Date (LIFO Date) inventory model, if there is no receipt before the issue, the issue is settled against any receipts that occur after the date of the issue. Several issues on the same date can be settled in the order of last issue, last receipt. When you use LIFO Date, you don't have to use the LIFO Date rule. Instead, you can mark inventory transactions so that a specific item receipt is settled against a specific issue.

We recommend a periodic inventory closing when you use the LIFO Date inventory model.

The following examples show the effect of using LIFO Date in three configurations:

- LIFO Date without the **Include physical value** option
- LIFO Date with the **Include physical value** option
- LIFO Date with marking

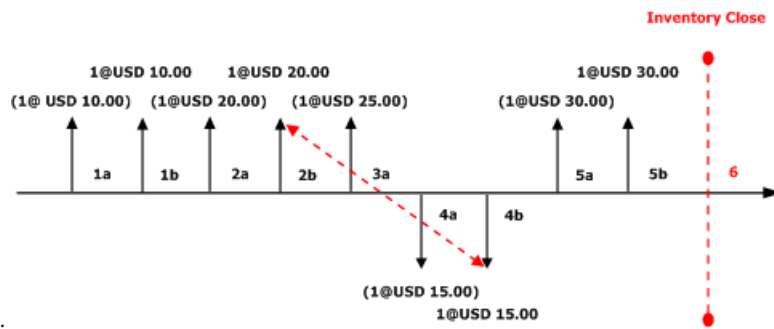
LIFO Date without the Include physical value option

In this example, the item model group isn't marked to include physical value. The illustration that follows shows these transactions:

- 1a. Inventory physical receipt for a quantity of 1 at a cost of USD 10.00 each.
- 1b. Inventory financial receipt for a quantity of 1 at a cost of USD 10.00 each.
- 2a. Inventory physical receipt for a quantity of 1 at a cost of USD 20.00 each.
- 2b. Inventory financial receipt for a quantity of 1 at a cost of USD 20.00 each.
- 3a. Inventory physical receipt for a quantity of 1 at a cost of USD 25.00 each.
- 4a. Inventory physical issue for a quantity of 1 at a cost price of USD 15.00 (running average of financially updated transactions).
- 4b. Inventory financial issue for a quantity of 1 at a cost price of USD 15.00 (running average of financially updated transactions).
- 5a. Inventory physical receipt for a quantity of 1 at a cost of USD 30.00 each.
- 5b. Inventory financial receipt for a quantity of 1 at a cost of USD 30.00 each.
- 6. Inventory close is performed. Based on the LIFO Date method, the last financially updated issue will be settled against the last financially updated receipt by date. An adjustment of USD 5.00 will be made on the issue transaction. These transactions will be settled against each other.

The new running average cost price reflects the average of the financially updated transactions at USD 15.00.

The following illustration shows the effects of the LIFO Date inventory model when the **Include physical value**



option isn't used.

Key to the diagram

- Inventory transactions are represented by vertical arrows.
- Receipts into inventory are represented by vertical arrows above the timeline.
- Issues out of inventory are represented by vertical arrows below the timeline.
- Above (or below) each vertical arrow, the value of the inventory transaction is specified in the format Quantity@Unitprice.
- An inventory transaction value that is enclosed in parentheses indicates that the inventory transaction is physically posted into inventory.
- An inventory transaction value that isn't enclosed in parentheses indicates that the inventory transaction is financially posted into inventory.
- Each new receipt or issue transaction is designated by a new label.
- Each vertical arrow is labeled with a sequential identifier, such as *1a*. The identifiers indicate the order of inventory transaction postings in the timeline.
- Inventory closings are represented by a red vertical dashed line and the label *Inventory Close*.
- Settlements that are performed by inventory close are represented by red diagonal dashed arrows that go from a receipt to an issue.

LIFO Date with the Include physical value option

You can select the **Include physical value** check box for an item on the **Item model groups** page. In this case, the system uses both physical and financial receipt transactions to calculate the running average cost price. Where applicable, the system also makes adjustments to the physically updated issue transaction. When the **Include physical value** check box is cleared, inventory close that uses the LIFO Date inventory model makes settlements only to transactions that are financially updated.

In this example, the item model group is marked to include physical value.

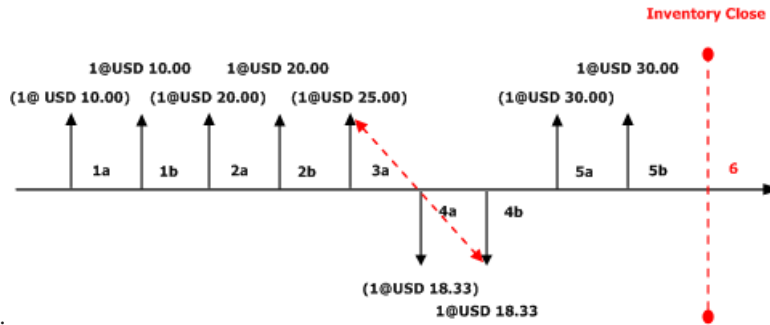
The illustration that follows shows these transactions:

- 1a. Inventory physical receipt for a quantity of 1 at a cost of USD 10.00 each.
- 1b. Inventory financial receipt for a quantity of 1 at a cost of USD 10.00 each.
- 2a. Inventory physical receipt for a quantity of 1 at a cost of USD 20.00 each.
- 2b. Inventory financial receipt for a quantity of 1 at a cost of USD 20.00 each.
- 3a. Inventory physical receipt for a quantity of 1 at a cost of USD 25.00 each.
- 4a. Inventory physical issue for a quantity of 1 at a cost price of USD 18.33 each (running average of financially updated transactions).
- 4b. Inventory financial issue for a quantity of 1 at a cost price USD 18.33 each (running average of financially updated transactions).
- 5a. Inventory physical receipt for a quantity of 1 at a cost of USD 30.00 each.
- 5b. Inventory financial receipt for a quantity of 1 at a cost of USD 30.00 each.
- 6. Inventory close is performed. Based on the LIFO Date method, the last updated issue will be adjusted or settled against the last updated receipt by date. These transactions will not be settled by each other,

because the financial receipt transaction is adjusted to a physical update transaction. Instead, only an adjustment of USD 6.67 will be made on the issue transaction.

The new running average cost price reflects the average of the financially updated transactions at USD 20.00.

The following illustration shows the effects of the LIFO inventory model when the **Include physical value**



option is used.

Key to the diagram

- Inventory transactions are represented by vertical arrows.
- Receipts into inventory are represented by vertical arrows above the timeline.
- Issues out of inventory are represented by vertical arrows below the timeline.
- Above (or below) each vertical arrow, the value of the inventory transaction is specified in the format Quantity@Unitprice.
- An inventory transaction value that is enclosed in parentheses indicates that the inventory transaction is physically posted into inventory.
- An inventory transaction value that isn't enclosed in parentheses indicates that the inventory transaction is financially posted into inventory.
- Each new receipt or issue transaction is designated by a new label.
- Each vertical arrow is labeled with a sequential identifier, such as *1a*. The identifiers indicate the order of inventory transaction postings in the timeline.
- Inventory closings are represented by a red vertical dashed line and the label *Inventory Close*.
- Settlements that are performed by inventory close are represented by red diagonal dashed arrows that go from a receipt to an issue.

LIFO Date with marking

Marking is a process that lets you link, or mark, an issue transaction to a receipt transaction. Marking can occur either before or after a transaction is posted. You can use marking when you want to be sure of the exact cost of inventory when the transaction is posted or the inventory close is performed.

For example, the Customer Service department accepted a rush order from an important customer. Because this order is a rush order, you will have to pay more for this item in order to fulfill your customer's request. You must make sure that the cost of this inventory item is reflected in the margin, or cost of goods sold (COGS), for this sales order invoice.

When the purchase order is posted, the inventory is received at a cost of USD 120.00. If this sales order document is marked to the purchase order before the packing slip or invoice is posted, the COGS will be USD 120.00, not the current running average cost for the item. If the sales order packing slip or invoice is posted before the marking occurs, the COGS will be posted at the running average cost price.

Before inventory close is performed, these two transactions can still be marked to each other.

For example, a receipt transaction is marked for an issue transaction. In this case, the valuation method that is defined in the item's item model group is disregarded, and the system settles these transactions against each other.

You can mark an issue transaction to a receipt before the transaction is posted. You can do this from a sales order line on the **Sales order details** page. You can view the open receipt transactions on the **Marking** page.

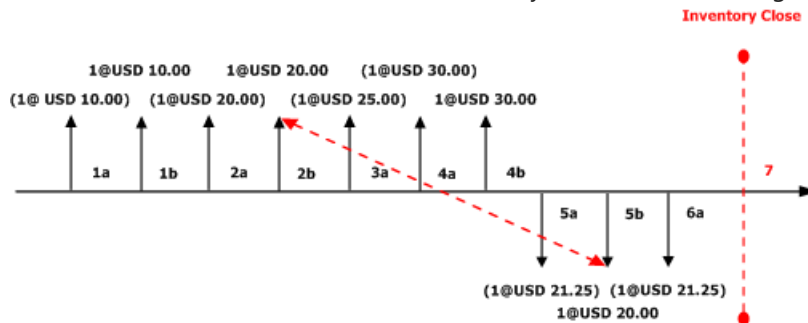
You can also mark an issue transaction to a receipt after the transaction is posted. You can match or mark an issue transaction for an open receipt transaction for an inventoried item from a posted inventory adjustment journal.

The illustration that follows shows these transactions:

- 1a. Inventory physical receipt for a quantity of 1 at a cost of USD 10.00 each.
- 1b. Inventory financial receipt for a quantity of 1 at a cost of USD 10.00 each.
- 2a. Inventory physical receipt for a quantity of 1 at a cost of USD 20.00 each.
- 2b. Inventory financial receipt for a quantity of 1 at a cost of USD 20.00 each.
- 3a. Inventory physical receipt for a quantity of 1 at a cost of USD 25.00 each.
- 4a. Inventory physical receipt for a quantity of 1 at a cost of USD 30.00 each.
- 4b. Inventory financial receipt for a quantity of 1 at a cost of USD 30.00 each.
- 5a. Inventory physical issue for a quantity of 1 at a cost price of USD 21.25 each (running average of financial and physical updated transactions).
- 5b. Inventory financial issue for a quantity of 1 is marked to inventory receipt 2b before the transaction is posted. This transaction is posted with a cost price of USD 20.00 each.
- 6a. Inventory physical issue for a quantity of 1 at a cost price of USD 21.25 each.
- 7. Inventory close is performed. Because the financially updated First in, First out (FIFO) transaction is marked to an existing receipt, these transactions are settled to each other, and no adjustment is made.

The new running average cost price reflects the average of the financially and physically updated transactions at USD 27.50.

The following illustration shows the effects of the LIFO inventory model when marking between issues and



receipts is used.

Key to the diagram

- Inventory transactions are represented by vertical arrows.
- Receipts into inventory are represented by vertical arrows above the timeline.
- Issues out of inventory are represented by vertical arrows below the timeline.
- Above (or below) each vertical arrow, the value of the inventory transaction is specified in the format Quantity@Unitprice.
- An inventory transaction value that is enclosed in parentheses indicates that the inventory transaction is physically posted into inventory.
- An inventory transaction value that isn't enclosed in parentheses indicates that the inventory transaction is financially posted into inventory.
- Each new receipt or issue transaction is designated by a new label.
- Each vertical arrow is labeled with a sequential identifier, such as 1a. The identifiers indicate the order of inventory transaction postings in the timeline.
- Inventory closings are represented by a red vertical dashed line and the label *Inventory Close*.

- Settlements that are performed by inventory close are represented by red diagonal dashed arrows that go from a receipt to an issue.

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LIFO with physical value and marking

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Last in, First out (LIFO) is an inventory model in which the last (newest) receipts are issued first. Issues from inventory are settled against the last receipts into inventory based on the date of the inventory transaction.

In the Last in, First out (LIFO) inventory model, the last (newest) receipts are issued first. Issues from inventory are settled against the last receipts into inventory, based on the date of the inventory transaction. When you use LIFO, you don't have to use the LIFO rule. Instead you can mark inventory transactions so that a specific item issue is settled against a specific receipt. We recommend a periodic inventory closing when you use the LIFO inventory model.

The following examples show the effect of using LIFO in three configurations:

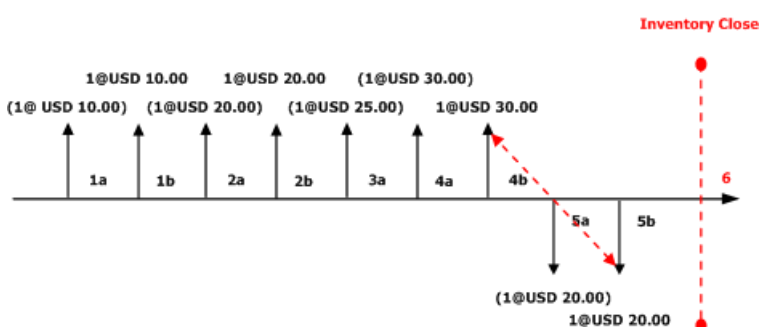
- LIFO without the **Include physical value** option
- LIFO with the **Include physical value** option
- LIFO with marking

LIFO without the Include physical value option

In this example, the item model group isn't marked to include physical value. The illustration that follows shows these transactions:

- 1a. Inventory physical receipt for a quantity of 1 at a cost of USD 10.00 each.
- 1b. Inventory financial receipt for a quantity of 1 at a cost of USD 10.00 each.
- 2a. Inventory physical receipt for a quantity of 1 at a cost of USD 20.00 each.
- 2b. Inventory financial receipt for a quantity of 1 at a cost of USD 20.00 each.
- 3a. Inventory physical receipt for a quantity of 1 at a cost of USD 25.00 each.
- 4a. Inventory physical receipt for a quantity of 1 at a cost of USD 30.00 each.
- 4b. Inventory financial receipt for a quantity of 1 at a cost of USD 30.00 each.
- 5a. Inventory physical issue for a quantity of 1 at a cost price of USD 20.00 each (running average of financially updated transactions).
- 5b. Inventory financial issue for a quantity of 1 at a cost price of USD 20.00 each (running average of financially updated transactions).
- 6. Inventory close is performed. Based on the LIFO method, the last financially updated issue will be settled against the last financially updated receipt. An adjustment of USD 10.00 will be made on the issue transaction.

The new running average cost price reflects the average of the financially updated transactions, USD 15.00. The following illustration shows the effects of the LIFO inventory model on this series of transactions when the **Include physical value** option isn't used.



Key to the diagram

- Inventory transactions are represented by vertical arrows.
- Receipts into inventory are represented by vertical arrows above the timeline.
- Issues out of inventory are represented by vertical arrows below the timeline.
- Above (or below) each vertical arrow, the value of the inventory transaction is specified in the format Quantity@Unit price.
- An inventory transaction value that is enclosed in parentheses indicates that the inventory transaction is physically posted into inventory.
- An inventory transaction value that isn't enclosed in parentheses indicates that the inventory transaction is financially posted into inventory.
- Each new receipt or issue transaction is designated by a new label.
- Each vertical arrow is labeled with a sequential identifier, such as *1a*. The identifiers indicate the order of inventory transaction postings in the timeline.
- Inventory closings are represented by a red vertical dashed line and the label *Inventory Close*.
- Settlements that are performed by inventory close are represented by red diagonal dashed arrows that go from a receipt to an issue.

LIFO with the Include physical value option

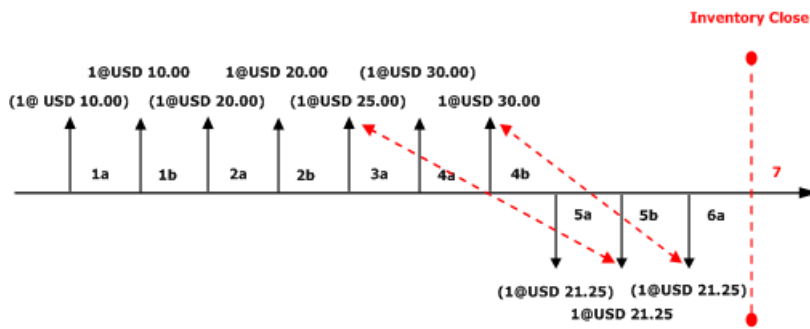
If the **Include physical value** check box is selected for an item on the **Item model groups** page, the system uses both physical and financial receipt transactions to calculate the running average cost price. Where applicable, the system also makes adjustments to the physically updated issue transaction. When the **Include physical value** check box is cleared, inventory close with the LIFO inventory model makes settlements only to transactions that are financially updated.

The illustration that follows shows these transactions:

- 1a. Inventory physical receipt for a quantity of 1 at a cost of USD 10.00 each.
- 1b. Inventory financial receipt for a quantity of 1 at a cost of USD 10.00 each.
- 2a. Inventory physical receipt for a quantity of 1 at a cost of USD 20.00 each.
- 2b. Inventory financial receipt for a quantity of 1 at a cost of USD 20.00 each.
- 3a. Inventory physical receipt for a quantity of 1 at a cost of USD 25.00 each.
- 4a. Inventory physical receipt for a quantity of 1 at a cost of USD 30.00 each.
- 4b. Inventory financial receipt for a quantity of 1 at a cost of USD 30.00 each.
- 5a. Inventory physical issue for a quantity of 1 at a cost price of USD 21.25 each (running average of financial and physical updated transactions).
- 5b. Inventory financial issue for a quantity of 1 at a cost price of USD 21.25 each (running average of financial and physical updated transactions).
- 6a. Inventory physical issue for a quantity of 1 at a cost price of USD 21.25 each.
- 7. Inventory close is performed. Based on the LIFO method, the last issue transaction will be adjusted or settled against the last updated receipt.

Transaction 6a will be adjusted to receipt transaction 4b. The system won't settle these transactions, because the receipt is updated physically but not financially. Instead, only an adjustment of USD 8.75 will be posted to the physical issue transaction. Transaction 5b will be adjusted to physical receipt transaction 3a. The system won't settle these transactions, because they aren't both financially updated. Instead, only an adjustment of USD -3.75 will be made to this issue transaction. The new running average cost price reflects the average of the financially and physically updated transactions, USD 20.00.

The following illustration shows the effects of the LIFO inventory model on this series of transactions when the **Include physical value** option is used.



Key to the diagram

- Inventory transactions are represented by vertical arrows.
- Receipts into inventory are represented by vertical arrows above the timeline.
- Issues out of inventory are represented by vertical arrows below the timeline.
- Above (or below) each vertical arrow, the value of the inventory transaction is specified in the format Quantity@Unit price.
- An inventory transaction value that is enclosed in parentheses indicates that the inventory transaction is physically posted into inventory.
- An inventory transaction value that isn't enclosed in parentheses indicates that the inventory transaction is financially posted into inventory.
- Each new receipt or issue transaction is designated by a new label.
- Each vertical arrow is labeled with a sequential identifier, such as *1a*. The identifiers indicate the order of inventory transaction postings in the timeline.
- Inventory closings are represented by a red vertical dashed line and the label *Inventory Close*.
- Settlements that are performed by inventory close are represented by red diagonal dashed arrows that go from a receipt to an issue.

LIFO with marking

Marking is process that lets you link, or mark, an issue transaction to a receipt transaction. Marking can occur either before or after a transaction is posted. You can use marking when you want to be sure of the exact cost of inventory when the transaction is posted or the inventory close is performed. For example, the Customer Service department accepted a rush order from an important customer. Because this order is a rush order, you must pay more for this item in order to fulfill your customer's request.

You must make sure that the cost of this inventory item is reflected in the margin, or cost of goods sold (COGS), for this sales order invoice. When the purchase order is posted, the inventory is received at a cost of USD 120.00. If this sales order document is marked to the purchase order before the packing slip or invoice is posted, the COGS will be USD 120.00, not the current running average cost for the item. If the sales order packing slip or invoice is posted before the marking occurs, the COGS will be posted at the running average cost price.

Before inventory close is performed, these two transactions can still be marked to each other.

You can mark an issue transaction to a receipt before the transaction is posted. You can do this from a sales order line on the **Sales order details** page. You can view the open receipt transactions on the **Marking** page.

You can also mark an issue transaction to a receipt after the transaction is posted. You can match or mark an issue transaction for an open receipt transaction for an inventoried item from a posted inventory adjustment journal.

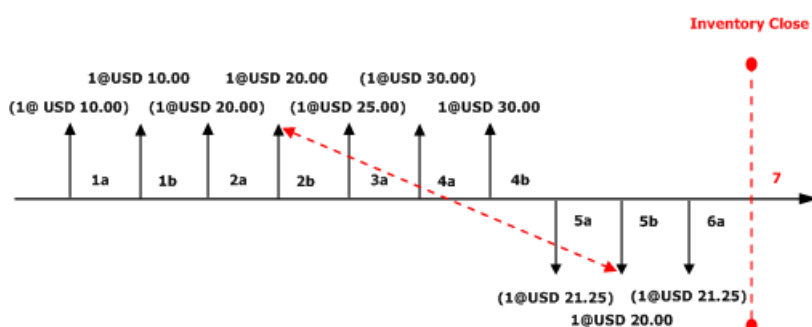
The illustration that follows shows these transactions:

- 1a. Inventory physical receipt for a quantity of 1 at a cost of USD 10.00 each.
- 1b. Inventory financial receipt for a quantity of 1 at a cost of USD 10.00 each.

- 2a. Inventory physical receipt for a quantity of 1 at a cost of USD 20.00 each.
- 2b. Inventory financial receipt for a quantity of 1 at a cost of USD 20.00 each.
- 3a. Inventory physical receipt for a quantity of 1 at a cost of USD 25.00 each.
- 4a. Inventory physical receipt for a quantity of 1 at a cost of USD 30.00 each.
- 4b. Inventory financial receipt for a quantity of 1 at a cost of USD 30.00 each.
- 5a. Inventory physical issue for a quantity of 1 at a cost price of USD 21.25 each (running average of financial and physical updated transactions).
- 5b. Inventory financial issue for a quantity of 1 is marked to inventory receipt 2b before the transaction is posted. This transaction is posted with a cost price of USD 20.00 each.
- 6a. Inventory physical issue for a quantity of 1 at a cost price of USD 21.25 each.
- 7. Inventory close is performed. Because the financially updated FIFO transaction is marked to an existing receipt, these transactions are settled against each other, and no adjustment is made.

The new running average cost price reflects the average of the financially and physically updated transactions, USD 27.50.

The following illustration shows the effects of the LIFO inventory model on this series of transactions when marking between issues and receipts is used.



Key to diagram

- Inventory transactions are represented by vertical arrows.
- Receipts into inventory are represented by vertical arrows above the timeline.
- Issues out of inventory are represented by vertical arrows below the timeline.
- Above (or below) each vertical arrow, the value of the inventory transaction is specified in the format Quantity@Unit price.
- An inventory transaction value that is enclosed in parentheses indicates that the inventory transaction is physically posted into inventory.
- An inventory transaction value that isn't enclosed in parentheses indicates that the inventory transaction is financially posted into inventory.
- Each new receipt or issue transaction is designated by a new label.
- Each vertical arrow is labeled with a sequential identifier, such as *1a*. The identifiers indicate the order of inventory transaction postings in the timeline.
- Inventory closings are represented by a red vertical dashed line and the label *Inventory Close*.
- Settlements that are performed by inventory close are represented by red diagonal dashed arrows that go from a receipt to an issue.

NOTE

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Moving average

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Moving average is a perpetual costing method based on the average principle, where the costs on inventory issues do not change when the purchase cost does. The difference is capitalized and is based on a proportional calculation. The amount that remains is expensed.

When you use moving average, inventory settlements and inventory marking are not supported. Inventory close does not affect products that have moving average as the inventory model group, and it does not generate any settlements between the transactions.

The following are prerequisites when you use moving average cost as a costing method.

1. On the **Item model groups** page, set up an item model group that has **Moving average** selected in the **Inventory model** field.

NOTE

By default, when **Moving average** is selected, the **Post physical inventory** and **Post financial inventory** fields are also selected.

2. On the **Posting** page, assign accounts to the **Price difference for moving average**. You use the **Price difference for moving average** account when cost has to be proportionally expensed. This occurs in following two scenarios:
 - There is a difference in cost between a purchase receipt and the purchase invoice because there is a difference between the original inventory quantity and the current on-hand quantity.
 - The transactions bring the inventory from negative to zero, and there is a difference between the transaction cost and the current moving average cost.
3. On the **Posting** page, assign accounts to the **Cost revaluation for moving average** accounts on the **Inventory** tab. You use the **Cost revaluation for moving average** account when you want to adjust the moving average cost for a product to a new unit price.
4. On the **Released products** page, assign the moving average item model group to the product.

NOTE

The inventory close process only closes the accounting period. It does not affect products that have moving average assigned to them as an item model group.

Convert to the moving average costing method

Products can be converted to use the moving average inventory valuation method. This type of conversion is usually done at the end of the year, after the last month of the current year is closed. It is done by using the product's current costing model. You can change your inventory costing method from a costing method that is based on average cost or standard cost to a method that is based on moving average.

If you are changing your costing method from a standard costing method to a moving average method, you have to complete the following tasks:

1. Make adjustments to get inventory quantities and values down to 0 (zero).

2. After the inventory value and quantity are 0 (zero), change the item model group to moving average.
3. Make adjustments to get the quantity and value back into inventory.

You cannot change your inventory costing method from a moving average method to a First in, First out (FIFO) method, a Last in, First out (LIFO) method, or a weighted average method.

NOTE

Converting from standard cost to moving weighted average is a manual process.

The following examples illustrate the effect of using the moving average costing method. There are four configurations:

- Purchase order and proportionally expensed cost difference
- Moving average product and inventory adjustment
- Moving average with production
- Moving average with a backdated transaction

Purchase order and proportionally expensed cost difference

With moving average, the product's cost is determined by the purchase receipt. When the purchase invoice is posted, if there is a difference in cost between the purchase receipt and the purchase invoice, the difference is proportionally adjusted to the current products in stock, and any remaining amount is expensed.

In this example, a purchase order is created and received at one cost, and the purchase invoice is posted with a different cost.

1. Create a purchase order for a quantity of 2 and a unit price of 10.00.
2. Create a purchase receipt of the product.
3. Create a sales order for a quantity of 1 and a unit price of 10.00.
4. Create a purchase invoice for a quantity of 2 and a unit price of 12.00.

The difference in unit price, 2.00, is posted to the Price difference for moving average account when the purchase invoice is posted. The reason is that two products were purchased for a cost of 20.00. One of the products was sold for a unit price of 10.00. The purchase invoice was posted at a unit price of 12.00 with a quantity of 2. The unit price of the product cannot be posted at 14.00.

Moving average product and inventory adjustment

If you need to adjust the moving average cost of a product, inventory adjustments are allowed as of today's date. You cannot backdate an inventory adjustment to correct the moving average cost of a product. You cannot have the cost flow through subsequent transactions.

In this example, the moving average cost is adjusted for a product.

1. Select the product that you want to adjust the moving average cost for.

NOTE

The **Revaluation for moving average** page examines the inventory available for a product. The product selected has a posted quantity of 1, a posted a value of 12.00, a posted unit cost of 12.00, and a unit cost of 12.00.

1. Update the **Unit cost** field to 16.00. The system calculates the remaining fields.
2. The adjustment is posted.

NOTE

You can only adjust the moving average cost as of today's date.

On the **Settlements for voucher** page, you can see an adjustment of 4.00 posted to the Cost revaluation for moving average account.

Moving average with production

Moving average supports produced items. If you plan to use moving average in a production environment, select **Use estimated cost price** on the **Production control parameters** page. This means that the cost price that is calculated during estimation is used instead of the actual BOM calculation cost price.

Moving average with a backdated transaction

Backdated transactions are assigned the current moving average cost, and the product's physical quantity is updated, but the product's moving average cost is not affected. In this moving average example, a backdated transaction for a moving average product is posted.

1. Create an inventory adjustment for the moving average product for a quantity of 1 and a cost of 20.00.
2. The inventory transaction history for the product would resemble the following:
 - An inventory transaction of 1, a cost of 16.00, a posting date of January 15, and a transaction date of January 15.
 - An inventory adjustment of 1, a cost of 20.00, a posting date of January 1, and a transaction date of January 15.
3. Post the adjustment.

On the **Inventory transactions** page, you can see that 4.00 is expensed as the current moving average for the product is 16.00. You can post in the past, but the difference in cost is expensed, so the moving average cost is not affected.

Negative inventory balances

Transactions are handled differently depending on whether the new on-hand quantity after the transaction is negative, zero, or positive.

New balance is negative or zero

If the new on-hand quantity is negative or zero, the transaction is costed at the current average costs. If there is a difference between the purchase price and the current average costs, it's posted to **Price difference for moving average**.

New balance is positive

If the new on-hand quantity is positive after the transaction, the transaction is split into two parts and costed differently, as summarized in the following table.

PART	DESCRIPTION
Quantity from negative to zero	Inventory uses the current moving average cost of the item rather than the transaction cost for that portion of the receipt quantity that increases the on-hand balance from negative to zero. The difference between the transaction cost and the current moving average cost is posted to Price difference for moving average .

PART	DESCRIPTION
Quantity from zero to positive	Inventory uses the transaction cost for that portion of the receipt quantity that increases the on-hand balance from zero to positive.

Inventory value report

In this moving average example, the inventory value report is printed to support the current moving average calculation for a product. The Inventory value report can print the transactions in chronological order, together with the cost to support the moving average cost calculation of a product. The report displays the moving average cost for the product. In the **Inventory value reports** dialog box, a date interval allows you to select the **Transaction time** or the **Posting date** to sort the report by. The **Posting date** option is how the report is traditionally printed. The **Transaction time** option is the actual date that the transaction is reported and the moving average cost for the product is updated. You can print the Inventory value report by using the **Transaction time sorting** option if you want to see the moving average cost calculation over time. The following table displays the transactions for the product that the report is printed for when the **Transaction time sorting** option is used.

TRANSACTION TIME	DATE	TRANSACTION TYPE	QUANTITY	AMOUNT	AVERAGE UNIT COST
	October 1	Beginning balance	0	0.00	0.00
October 8	September 28	Backdated receipt	1	16.00	16.00
October 3	October 3	Purchase receipt	2	20.00	12.00
October 5	October 5	Sales order	-1	-10.00	13.00
October 7	October 7	Purchase invoice		2.00	14.00
October 8	October 8	Moving average revaluation		4.00	16.00
	October 31	Total	2	32.00	16.00

NOTE

You cannot reconcile the general ledger with inventory by using the **Transaction time sorting** option. The report must be printed by using the **Posting date** option.

NOTE

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Moving average fallback cost sequence

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One way that you can calculate the cost of your inventory is by using a *moving average*. Up to three cost values can be associated with each inventory item:

- **Last issue** – The last issue cost that was assigned before inventory went negative
- **Active cost** – The latest cost that was activated in a costing version
- **Item price** – The cost that is specified for the released product

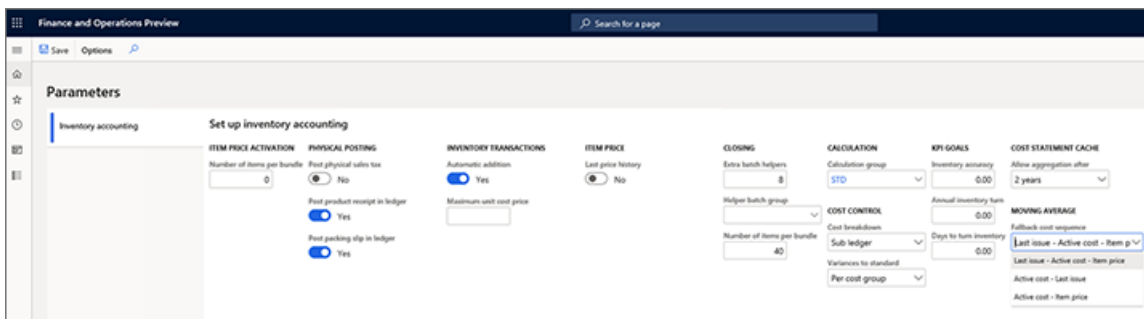
To determine which of these cost values should be used in moving average calculations, the system uses a *fallback cost sequence* to establish the order of preference for the values. If the preferred cost value isn't available, the system uses the next-preferred value, and so on.

In previous versions of Microsoft Dynamics 365 Supply Chain Management, the system used a fixed fallback cost sequence (*Last issue – Active cost – Item price*). In version 10.0.11, this sequence is still the default sequence. However, you can also turn on a feature that lets you select among three available fallback cost sequences. This feature can be especially useful for organizations that regularly use negative inventory values.

To make the selector for the fallback cost sequence available, you (or an admin) must use [Feature management](#) to turn on the feature that is named *Moving average fallback cost sequence*.

To select the fallback cost sequence for moving average calculations, follow these steps.

1. Open the **Parameters** page.
2. On the **Inventory accounting** tab, in the **Moving average** section, set the **Fallback cost sequence** field to one of the following values:
 - **Last issue – Active cost – Item price** – This sequence is the default sequence. It's the same sequence that is used if the *Moving average fallback cost sequence* feature isn't turned on.
 - **Active cost – Last issue**
 - **Active cost – Item price** – Organizations might experience performance issues if they use business processes where inventory regularly goes negative and, at the same time, the transaction volume is high. This setting can help mitigate those performance issues.



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Physical and financial updates

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This topic provides an overview of which types of transactions increase or decrease inventory quantities.

Inventory transactions can be physically updated and financially updated in Dynamics 365 Supply Chain Management. Some types of physical and financial transactions increase inventory quantities, whereas others decrease the quantity.

Physical increases

When a physical transaction is posted, the status of the transaction record is **Received**. The following transactions are considered physical increases:

- Purchase order receipt
- Sales order packing slip return
- Reporting a production order as finished
- By-product on a production order picking list

Financial increases

When a financial receipt transaction is posted, the status of the transaction record that increases the quantity is **Purchased**. The following transactions are considered financial increases:

- Vendor invoice
- Sales order invoice for a return
- Production order costing
- Positive quantity inventory journals, such as movement, profit and loss, counting, bill of materials, and transfer

Transactions that increase quantity

Transactions that increase quantity are posted at the running average cost price. The calculated running average cost price is based on the cost of each of these transactions for each inventory dimension that is being tracked financially. For information about running average cost prices, see [Running average cost price](#).

Transactions that decrease quantity

The calculated running average cost price is used when a transaction that decreases quantity is posted, regardless of the inventory model that is associated with that inventory. The transaction that decreases quantity must not have been marked to another transaction before it was posted. If the physical on-hand inventory becomes negative, the inventory cost that is defined for the item on the **Item** page is used.

NOTE

If multisite functionality is enabled, this cost will instead be the inventory cost that is defined for a site on the **Default order settings** page.

Physical issues vs. financial issues

When a physical issue transaction is posted, the status of the transaction record is **Deducted**. The following transactions are considered physical issues:

- Production order picking list journal
- Sales order packing slip
- Purchase order packing slip return

When a financial transaction is posted, the status of the transaction record is **Sold**. The following transactions are considered financial issues:

- Ending a production order
- Sales order invoice
- Vendor invoice return
- Negative quantity inventory journals, such as movement, profit and loss, counting, bill of materials, and transfer

Transactions that decrease quantity are posted at the running average cost price. Therefore, the inventory close procedure is required in order to settle issue transactions to receipt transactions, based on the inventory model that is assigned to each item.

NOTE

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Running average cost price

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The inventory close process settles issue transactions to receipt transactions, based on the inventory valuation method that is selected in the item's item model group. However, before inventory close is run, the system calculates a running average cost price that is typically used when issue transactions are posted.

The system estimates this running average cost price for an item by using the following formula:

Estimated price = (Physical amount + Financial amount) ÷ (Physical quantity + Financial quantity)

Using the running average cost price

The following table shows when the system posts inventory transactions by using the running average cost price, and when it uses the cost price that is defined on the item master record instead.

CONDITION	THE SYSTEM USES THE ESTIMATED RUNNING AVERAGE COST PRICE	THE SYSTEM USES THE COST PRICE THAT IS DEFINED ON THE ITEM MASTER
Both the numerator* and denominator** are positive.	Yes	No
The numerator*, denominator**, or both are negative.	No	Yes
The denominator** is 0 (zero).	No	Yes

* Numerator = (Physical amount + Financial amount) ** Denominator = (Physical quantity + Financial quantity)

Note: If the **Include physical value** option isn't selected for an item, the system uses 0 (zero) for both the physical amount and the physical quantity. For information about this option, see [Include physical value](#).

Avoiding pricing amplification

On rare occasions, the system prices several issues before it has enough receipts to base the price on. This scenario can cause estimates of the running average cost price to be overly inflated. However, there are steps that you can take to avoid pricing amplification, or to reduce its impact when it does occur. **Scenario** The following transactions occur for an item that you've selected the **Include physical value** option for:

1. You financially receive a quantity of 100 at USD 100.00.
2. You financially issue a quantity of 200.
3. You physically receive a quantity of 101 at USD 202.00.

When you examine the estimated running average cost price for the item, you expect a cost price of USD 1.51. Instead, you find an estimated running average of USD 102.00, which is based on the following formula:
Estimated price = $[202 + (-100)] \div [101 + (-100)] = 102 \div 1 = 102$ This pricing amplification occurs because, when 200 items are issued financially in step 2, the system must price 100 of the items before it has any corresponding receipts. This situation causes negative inventory. The system then estimates a unit price of USD 1.00, as we might expect. However, when the corresponding 100 receipts arrive, they are at a unit price of USD 2.00 each.

Note: Although the issues create negative inventory, inventory is positive when the issue price is calculated.

Therefore, the running average cost price is used instead of the price on the item master. At this point, the system has an inventory value offset of USD 100.00. Although that offset was built up over 100 pieces, where there was a unit offset of USD 1.00 each, we now have only one piece in inventory. Therefore, the offset of USD 100.00 is allocated to this one piece. The result is the overly inflated estimated cost price.

Note: For comparison, notice that if steps 2 and 3 are reversed in the scenario, 200 items will be issued at a unit price of USD 1.51, and one piece will remain at a unit price of USD 1.51. Because this pricing amplification scenario can occur when negative inventory is involved, it's difficult to avoid in the following cases:

- You must estimate issue prices on the on-hand value and quantity.
- You must adjust the on-hand value and quantity on issues and receipts.
- Your business model allows you to send out, or price, more pieces than you have.
- You must accept any receipt value and quantity that are submitted to you.

However, if your business model allows for the following practices, they can help you avoid the negative quantities that make the pricing amplification scenario possible:

- If you select the **Include physical value** option for an item, clear the **Physical negative inventory** check box on the **Item model groups** page.
- If you do *not* select the **Include physical value** option for an item, clear the **Financial negative inventory** option on the **Item model groups** page.

Additionally, consider that the maximum offset in your physical inventory value is limited by the number of physical transactions, and the difference between physical and financial prices. Provided that all physical transactions are eventually updated financially, the physical value can't rise to extreme levels. Finally, note that the amplification effect decreases significantly when the accumulated offset is spread out over several on-hand pieces instead of just one.

NOTE

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Track running average cost per inventory dimension

2/18/2021 • 2 minutes to read • [Edit Online](#)

An inventory dimension group is attached to every inventory item. Therefore, the running average cost price of an item is calculated based on the selected inventory dimensions that are being tracked financially.

There are three types of inventory dimensions: product, storage, and tracking. Product dimensions include configuration, size, and color. Product dimensions are always tracked financially. Storage and tracking dimensions include site, warehouse, location, inventory status, license plate, batch number, and serial number. You can decide which storage and tracking dimensions are tracked financially.

Example 1

If the storage dimension group that is attached to the item is financially tracked by warehouse, the running average cost price is calculated per warehouse. The following purchase orders have been invoiced:

- A purchase order for a quantity of 2 at a cost price of USD 10.00 has been invoiced for warehouse GW.
- A purchase order for a quantity of 3 at a cost price of USD 12.00 has been invoiced for warehouse GW.
- A purchase order for a quantity of 5 at a cost price of USD 15.00 has been invoiced for warehouse MW.

The running average cost price for warehouse GW is USD 11.20, and the running average cost price for warehouse MW is USD 15.00. A sales order invoice is posted for warehouse GW. The value of the inventory and the cost of goods sold (before inventory close is run and without marking) is USD 11.20. Another sales order is posted for warehouse MW. The value of the inventory and the cost of goods sold (before inventory close is run and without marking) is USD 15.00.

Example 2 If the storage dimension group that is attached to the item is financially tracked by warehouse, and the tracking dimension group is financially tracked by batch number, the running average cost price is calculated for each batch.

Note: We recommend that you always view the cost price for all financial dimensions that are being tracked. The following purchase orders have been invoiced:

- A purchase order for a quantity of 2 at a cost price of USD 10.00 has been invoiced for warehouse GW and batch AAA.
- A purchase order for a quantity of 3 at a cost price of USD 12.00 has been invoiced for warehouse GW and batch AAA.
- A purchase order for a quantity of 2 at a cost price of USD 15.00 has been invoiced for warehouse GW and batch BBB.

The running average cost price for warehouse GW and batch AAA is USD 11.20, and the running average cost price for warehouse GW and batch BBB is USD 15.00.

NOTE

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Weighted average date

2/18/2021 • 13 minutes to read • [Edit Online](#)

Weighted average date is an inventory model that is based on the weighted average principle. For the weighted average principle, issues from inventory are valued at the average value of the items that are received into inventory for each day in the inventory closing period.

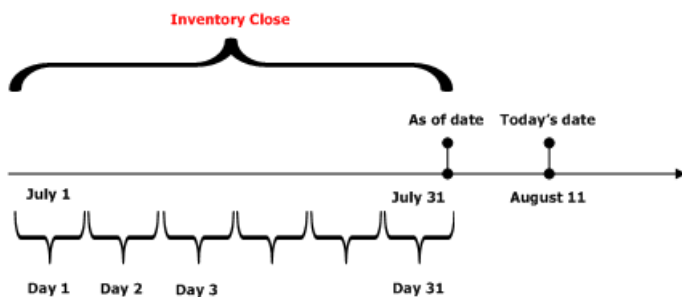
When you run an inventory closing by using weighted average date, all daily receipts are settled against a virtual issue. This virtual issue holds the total received quantity and value for that day. The virtual issue has a corresponding virtual receipt that the issues will be settled against. Therefore, all issues receive the same average cost. The virtual issue and virtual receipt can be considered a virtual transfer that is known as the *weighted average inventory closing transfer*.

If only one receipt has occurred on or before the date, you don't have to value the average. Because all issues are settled from that receipt, the virtual transfer won't be created. Likewise, if only issues occur on the date, there are no receipts to value the average from, and the virtual transfer won't be created. When you use weighted average date, you can mark inventory transactions so that a specific item receipt is settled against a specific issue. In this case, you don't use the weighted average date rule. We recommend a monthly inventory closing when you use the weighted average date inventory model.

The following formula is used to calculate the weighted average date costing method:

$$\text{Weighted average} = \frac{[Q1 \times P1] + [Q2 \times P2] + [Qn \times Pn]}{Q1 + Q2 + Qn}$$

During inventory close, the calculation is performed every day through the closing period, as shown in the following illustration.



Inventory transactions that leave the inventory, such as sales orders, inventory journals, and production orders, occur at an estimated cost price on the date of posting. This estimated cost price is also referred to as the running average cost price. On the date of inventory close, the system analyzes the inventory transactions for previous periods, previous days, and the current day. This analysis is used to determine which of the following closing principles should be used:

- Direct settlement
- Summarized settlement

Settlements are inventory close postings that adjust the issues to the correct weighted average as of the closing date.

Note: For more information about settlements, see the article about inventory close. The following examples illustrate the effect of using weighted average with five configurations:

- Weighted average date direct settlement when the **Include physical value** option isn't used
- Weighted average date summarized settlement when the **Include physical value** option isn't used

- Weighted average date direct settlement when the **Include physical value** option is used
- Weighted average date summarized settlement when the **Include physical value** option is used
- Weighted average date when marking is used

Weighted average date direct settlement when the Include physical value option isn't used

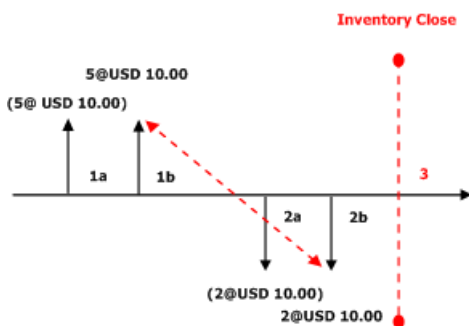
The current version uses the same direct settlement principle that was used for weighted average in earlier versions. The system settles directly between receipts and issues. The system uses this direct settlement principle in specific situations:

- One receipt and one or several issues have been posted in the period.
- Only issues have been posted in the period, and the inventory contains on-hand items from a previous closing.

In the following scenario, a financially updated receipt and issue have been posted. During inventory close, the system settles the receipt directly against the issue, and no adjustment to the cost price is required on issue.

The following illustration shows these transactions:

- 1a. Inventory physical receipt is updated for a quantity of 5 at a cost of USD 10.00 each.
- 1b. Inventory financial receipt is updated for a quantity of 5 at a cost of USD 10.00 each.
- 2a. Inventory physical issue is updated for a quantity of 2 at a cost of USD 10.00 each.
- 2b. Inventory financial issue is updated for a quantity of 2 at a cost of USD 10.00 each.
- 3. Inventory close is performed by using the direct settlement method to settle the inventory financial receipt to the inventory financial issue.



Key to the illustration:

- Inventory transactions are represented by vertical arrows.
- Receipts into inventory are represented by vertical arrows above the timeline.
- Issues out of inventory are represented by vertical arrows below the timeline.
- Above or below each vertical arrow, the value of the inventory transaction is specified in the form *Quantity@Unit price*.
- If an inventory transaction value is enclosed in parentheses, the inventory transaction is physically posted into inventory.
- If an inventory transaction value isn't enclosed in parentheses, the inventory transaction is financially posted into inventory.
- Each new receipt or issue transaction is designated by a new label.
- Each vertical arrow is labeled with a sequential identifier, such as *1a*. The identifiers indicate the sequence of inventory transaction postings in the timeline.
- Inventory closings are represented by a red vertical dashed line and the label *Inventory Close*.
- Settlements that are performed by inventory close are represented by dashed red arrows that go diagonally from a receipt to an issue.

Weighted average date summarized settlement when the Include physical value option isn't used

Weighted average is based on the principle that all receipts in a closing period are summarized into a new inventory transfer transaction. This transaction is known as *weighted average inventory closing*. All the receipts for the day are settled against the issue of the newly created inventory transfer transaction. All issues for the day are settled against the receipt of the new inventory transfer transaction. If the on-hand inventory is positive after the inventory close, the on-hand inventory and the value of the inventory are summarized on the new inventory transfer transaction receipt. If the on-hand inventory is negative after the inventory close, the on-hand inventory and the value of the inventory are the sum of individual issues that haven't been fully settled.

In the following scenario, several financially updated receipts and issues have been posted during the period. During inventory close, the system evaluates every day to determine how each day should be treated by closing.

The following illustration shows these transactions:

Day 1:

- 1a. Inventory physical receipt is updated for a quantity of 3 at USD 15.00 each.
- 1b. Inventory financial receipt is updated for a quantity of 3 at USD 15.00 each.
- 2a. Inventory physical issue for a quantity of 1 at a running average cost of USD 15.00.
- 2b. Inventory financial issue for a quantity of 1 at a running average cost of USD 15.00.

The system will use the direct settlement approach for day 1.

Day 2:

- 3a. Inventory physical issue for a quantity of 1 at a running average cost of USD 15.00
- 3b. Inventory financial issue for a quantity of 1 at a running average cost of USD 15.00

The system will use the direct settlement approach for day 2.

Day 3:

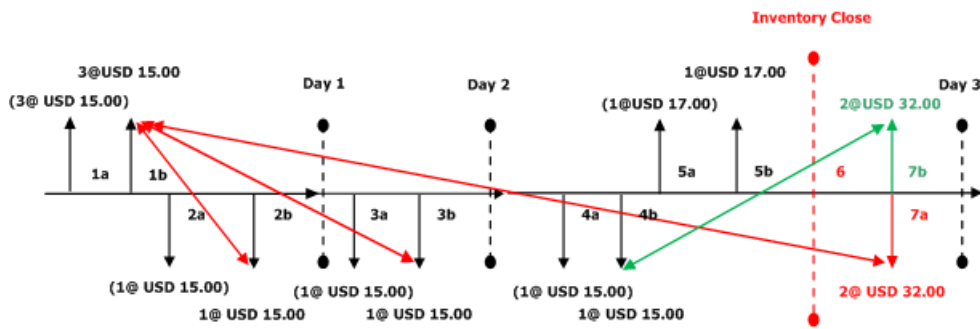
- 4a. Inventory physical issue for a quantity of 1 at a running average cost of USD 15.00
- 4b. Inventory financial issue for a quantity of 1 at a running average cost of USD 15.00
- 5a. Inventory physical receipt for a quantity of 1 at USD 17.00 each
- 5b. Inventory financial receipt for a quantity of 1 at USD 17.00 each

Inventory close is performed. The direct settlement must be used, because there are multiple receipts that cross multiple days.

- 7a. A weighted average inventory close transaction financial issue is created at for a quantity of 2 at USD 32.00 to summarize the settlements of all inventory financial receipts to date that haven't been closed.
- 7b. A weighted average inventory close transaction financial receipt is created as the offset to 7a.

The system generates and posts the summarized inventory transfer transaction. Additionally, the system settles all the receipts for the day and on-hand inventory for previous days against the summarized inventory transfer issue transaction. All the issues for the day are settled against the summarized inventory transfer receipt transaction. The weighted average cost price is calculated as USD 16.00. The issue will have an adjustment of USD 1.00 to adjust it to the weighted average cost. The new running average cost price is USD 16.00.

The following illustration shows this series of transactions, and the effects of using the weighted average inventory model and the summarized settlement principle, but without using the **Include physical value** option.



Key to the illustration

- Inventory transactions are represented by vertical arrows.
- Receipts into inventory are represented by vertical arrows above the timeline.
- Issues out of inventory are represented by vertical arrows below the timeline.
- Above or below each vertical arrow, the value of the inventory transaction is specified in the form *Quantity@Unit price*.
- If an inventory transaction value is enclosed in parentheses, the inventory transaction is physically posted into inventory.
- If an inventory transaction value isn't enclosed in parentheses, the inventory transaction is financially posted into inventory.
- Each new receipt or issue transaction is designated by a new label.
- Each vertical arrow is labeled with a sequential identifier, such as *1a*. The identifiers indicate the sequence of inventory transaction postings in the timeline.
- Inventory closings are represented by a red vertical dashed line and the label *Inventory Close*.
- Settlements that are performed by inventory close are represented by dashed red arrows that go diagonally from a receipt to an issue.
- Solid red diagonal arrows show the receipt transactions being settled to the issue transaction that is created by the system.
- The solid green diagonal arrow represents the offsetting system-generated receipt transaction that the originally posted issue transaction is settled to.

Weighted average date direct settlement when the Include physical value option is used

The current version uses the same direct settlement principle for weighted average date that is used in earlier versions. The system settles directly between receipts and issues. The system uses this direct settlement principle in specific situations:

- One receipt and one or several issues have been posted in the period.
- Only issues have been posted in the period, and the inventory contains on-hand inventory from a previous closing.

If you select the **Include physical value** check box for an item on the **Item model group** page, the system uses physically updated receipts when it calculates the estimated cost price, or running average. Issues are posted based on this estimated cost price during the period. During the inventory close, only financially updated receipts will be considered in the weighted average calculation.

Weighted average date summarized settlement when the Include physical value option is used

If you select the **Include physical value** check box for an item on the **Item model group** page, the system uses physically updated receipts when it calculates the estimated cost price, or running average. Issues are

posted based on this estimated cost price during the period. During the inventory close, only financially updated receipts will be considered in the weighted average calculation. Weighted average settlement is based on the principle that receipts in a closing period are summarized into a new inventory transfer transaction that is known as *weighted average inventory closing*. All the receipts for the day are settled against the issue of the newly created inventory transfer transaction. All issues for the day are settled against the receipt of the new inventory transfer transaction. If the on-hand inventory is positive after the inventory close, that on-hand inventory and the value of the inventory are summarized on the new inventory transfer transaction (receipt). If the on-hand inventory is negative after the inventory close, the on-hand inventory and the value of the inventory are the sum of individual issues that haven't been fully settled.

Weighted average date when marking is used

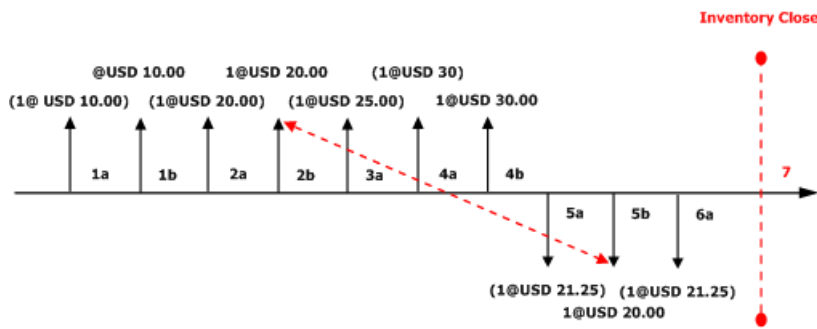
Marking is a process that lets you link an issue transaction to a receipt transaction. Marking can occur either before or after a transaction is posted. You can use marking when you want to be sure of the exact cost of the inventory when the transaction is posted or when the inventory close is performed.

For example, your Customer Service department accepted a rush order from an important customer. Because this is a rush order, you will have to pay more for this item to meet your customer's request. You must make certain that the cost of this inventory item is reflected in the margin, or cost of goods sold (COGS), for this sales order invoice. When the purchase order is posted, the inventory is received at a cost of USD 120.00. The sales order document is marked to the purchase order before the packing slip or invoice is posted. The COGS will then be USD 120.00 instead of the current running average cost for the item. If the sales order packing slip or invoice is posted before the marking occurs, the COGS will be posted at the running average cost price. Before inventory close is performed, these two transactions can still be marked to each other. When a receipt transaction is marked to an issue transaction, the valuation method that is defined in the item's item model group will be disregarded. Instead, the system settles these transactions to each other.

You can mark an issue transaction to a receipt before the transaction is posted. You can do this from a sales order line on the **Sales order details** page. You can view the open receipt transactions on the **Marking** page. You can mark an issue transaction to a receipt after the transaction is posted. You can match or mark an issue transaction for an open receipt transaction for an inventoried item from a posted inventory adjustment journal. The following illustration shows these transactions:

- 1a. Inventory physical receipt for a quantity of 1 at a cost price of USD 10.00 each.
- 1b. Inventory financial receipt for a quantity of 1 at a cost price of USD 10.00 each.
- 2a. Inventory physical receipt for a quantity of 1 at a cost price of USD 20.00 each.
- 2b. Inventory financial receipt for a quantity of 1 at a cost price of USD 20.00 each.
- 3a. Inventory physical receipt for a quantity of 1 at a cost price of USD 25.00 each.
- 4a. Inventory physical receipt for a quantity of 1 at a cost price of USD 30.00 each.
- 4b. Inventory financial receipt for a quantity of 1 at a cost price of USD 30.00 each.
- 5a. Inventory physical issue for a quantity of 1 at a cost price of USD 21.25 (running average of financial and physical updated transactions).
- 5b. Inventory financial issue for a quantity of 1 is marked to the inventory receipt 2b before the transaction is posted. This transaction is posted at a cost price of USD 20.00.
- 6a. Inventory physical issue for a quantity of 1 at a cost price of USD 21.25.
- 7. Inventory close is performed. Because the financially updated transaction is marked to an existing receipt, these transactions are settled to each other, and no adjustment is made.

The new running average cost price reflects the average of the financially and physically updated transactions at USD 27.50. The following illustration shows this series of transactions, and the effects of using the weighted average date inventory model and marking.



Key to the illustration:

- Inventory transactions are represented by vertical arrows.
- Receipts into inventory are represented by vertical arrows above the timeline.
- Issues out of inventory are represented by vertical arrows below the timeline.
- Above or below each vertical arrow, the value of the inventory transaction is specified in the form *Quantity@Unit price*.
- If an inventory transaction value is enclosed in parentheses, the inventory transaction is physically posted into inventory.
- If an inventory transaction value isn't enclosed in parentheses, the inventory transaction is financially posted into inventory.
- Each new receipt or issue transaction is designated by a new label.
- Each vertical arrow is labeled with a sequential identifier, such as *1a*. The identifiers indicate the sequence of inventory transaction postings in the timeline.
- Inventory closings are represented by a red vertical dashed line and the label *Inventory Close*.
- Settlements that are performed by inventory close are represented by dashed red arrows that go diagonally from a receipt to an issue.

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Weighted average with physical value and marking

2/18/2021 • 16 minutes to read • [Edit Online](#)

Weighted average is an inventory model based on the weighted average principle, where issues from inventory are valued at the average value of the items that are received into inventory during the inventory closing period, plus any on-hand inventory from the previous period.

When you run an inventory closing, all receipts are settled against a virtual issue, which holds the total received quantity and value. This virtual issue has a corresponding virtual receipt from which the issues are settled. In this manner, all issues get the same average cost. The virtual issue and receipt can be seen as a virtual transfer, which is named the weighted average inventory closing transfer.

If there is only one receipt, all issues can be settled from it and the virtual transfer will not be created.

When using weighted average, you can mark inventory transactions so that a specific item receipt is settled against a specific issue, instead of using the weighted average rule.

We recommend a monthly inventory closing when you use the weighted average inventory model.

The weighted average inventory costing method is calculated by the following formula:

- $\text{Weighted average} = (Q1 * P1 + Q2 * P2 + Qn * Pn) / (Q1 + Q2 + Qn)$

Inventory transactions leaving the inventory issues. This includes sales orders, inventory journals, and production orders, occur at an estimated cost price on the posting date. This estimated cost price is also referred to as running average. At the time of inventory close, the system will analyze the inventory transactions for previous and current periods and determine which of the following closing principles should be used.

- Direct settlement
- Summarized settlement

Settlements are inventory close postings that adjust the issues to the correct weighted average as of the closing date. The following examples illustrate the effect of using weighted average with five different configurations:

- Weighted average direct settlement without the Include physical value option
- Weighted average summarized settlement without the Include physical value option
- Weighted average direct settlement with the Include physical value option
- Weighted average summarized settlement with the Include physical value option
- Weighted average with marking

Weighted average direct settlement without Include physical value

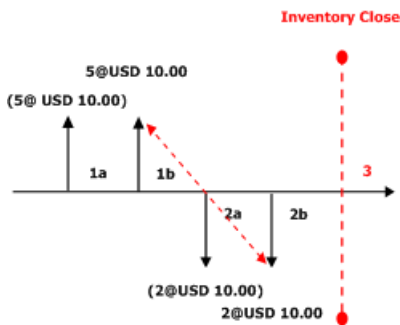
The direct settlement principle is the same used for weighted average in earlier versions. The system will settle directly between receipts and issues. The system uses this direct settlement principle in certain specific situations:

- One receipt and one or several issues has been posted in the period
- Only issues have been posted in the period and the inventory contains on-hand items from a previous closing

In the scenario in the following sections, a financially updated receipt and issue have been posted. During inventory close, the system will settle the receipt directly against the issue, and no adjustment to the cost price is needed on issue. The following transactions are illustrated in the graphic.

- 1a. Inventory physical receipt updated for a quantity of 5 at USD 10.00 each
- 1b. Inventory financial receipt updated for a quantity of 5 at USD 10.00 each
- 2a. Inventory physical issue updated for a quantity of 2 at USD 10.00 each
- 2b. Inventory financial issue updated for a quantity of 2 at USD 10.00 each
- 3. Inventory close is performed using the direct settlement method to settle the inventory financial receipt to the inventory financial issue.

The following diagram illustrates this series of transactions with the effects of choosing the Weighted average inventory model and the direct settlement principle without the Include physical value option.



Key to diagram

- Inventory transactions are represented by vertical arrows.
- Receipts into inventory are represented by vertical arrows above the timeline.
- Issues out of inventory are represented by vertical arrows below the timeline.
- Above (or below) each vertical arrow, the value of the inventory transaction is specified in the format Quantity@Unitprice.
- An inventory transaction value enclosed in brackets indicates that the inventory transaction is physically posted into inventory.
- An inventory transaction value without brackets indicates that the inventory transaction is financially posted into inventory.
- Each new receipt or issue transaction is designated with a new label.
- Each vertical arrow is labeled with a sequential identifier, such as *1a*. The identifiers indicate the sequence of inventory transaction postings in the timeline.
- Inventory closings are represented by a red vertical dashed line and the label Inventory Close.
- Settlements that are performed by inventory close are represented by dotted red arrows going diagonally from a receipt to an issue.

Weighted average summarized settlement without the Include physical value option

Weighted average uses the settlement principle that all receipts within in a closing period are summarized into a transaction called Weighted average inventory closing. All the receipts for the period will be settled against the issue of the newly created inventory transfer transaction. All issues for the period will be settled against the receipt of the new inventory transfer transaction. If the on-hand inventory is positive after the inventory close, that on-hand inventory and value of the inventory are summarized on the new inventory transfer transaction (receipt). If the inventory on-hand is negative after the inventory close, the on-hand inventory and value of the inventory is the sum of individual issues that have not been fully settled. In the scenario below, several financially updated receipts and one issue have been posted.

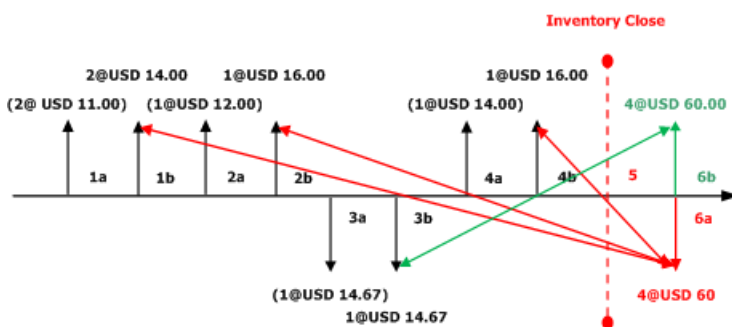
During inventory close, the system will generate and post the summarized inventory transfer transaction and settle the receipts for the period against the summarized inventory transfer issue transaction. All the issues posted for the period will be settled against the summarized inventory transfer receipt transaction. The

weighted average is calculated to be USD 15.00. The issue was originally posted with an estimated cost price of USD 14.67. Therefore, an adjustment of negative USD 0.33 will be created and posted on the issue. As of the inventory closing date, the on-hand inventory is 3 pieces with a value of USD 45.00.

The following transactions are illustrated in the graphic below:

- 1a. Inventory physical receipt updated for a quantity of 2 at a cost of USD 11.00 each.
- 1b. Inventory financial receipt updated for a quantity of 2 at a cost of USD 14.00 each.
- 2a. Inventory physical receipt updated for a quantity of 1 at a cost of USD 12.00 each.
- 2b. Inventory financial receipt updated for a quantity of 1 at a cost of USD 16.00 each.
- 3a. Inventory physical issue updated for a quantity of 1 at a cost of USD 14.67 each (running average).
- 3b. Inventory financial issue updated for a quantity of 1 at a cost of USD 14.67 each (running average).
- 4a. Inventory physical receipt updated for a quantity of 1 at a cost of USD 14.00 each.
- 4b. Inventory financial receipt updated for a quantity of 1 at a cost of USD 16.00 each.
- 5. Inventory close is performed.
- 6a. "Weighted average inventory close transaction" financial issue is created to sum the settlements of all the inventory financial receipts.
- 6b. "Weighted average inventory close transaction" financial receipt is created as the offset to 5a.

The following diagram illustrates this series of transactions with the effects of choosing the Weighted average inventory model and the summarized settlement principle without the Include physical value option.



Key to diagram

- Inventory transactions are represented by vertical arrows.
- Receipts into inventory are represented by vertical arrows above the timeline.
- Issues out of inventory are represented by vertical arrows below the timeline.
- Above (or below) each vertical arrow, the value of the inventory transaction is specified in the format Quantity@Unitprice.
- An inventory transaction value enclosed in brackets indicates that the inventory transaction is physically posted into inventory.
- An inventory transaction value without brackets indicates that the inventory transaction is financially posted into inventory.
- Each new receipt or issue transaction is designated with a new label.
- Each vertical arrow is labeled with a sequential identifier, such as 1a. The identifiers indicate the sequence of inventory transaction postings in the timeline.
- Inventory closings are represented by a red vertical dashed line and the label Inventory Close.
- Settlements that are performed by inventory close are represented by dotted red arrows going diagonally from a receipt to an issue.
- Red arrows illustrate the receipt transactions being settled to the issue transaction created by the system.
- The green arrow represents the offsetting system-generated receipt transaction to which the originally posted issue transaction is settled

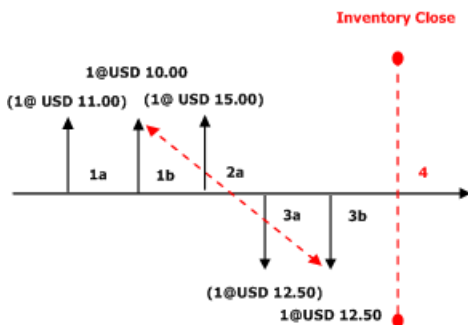
Weighted average direct settlement with the Include physical value option

The parameter Include physical value works differently with the weighted average inventory model than in earlier versions of the product. Select the Include physical value box for an item in the Item model group form. Then the system will use physically updated receipts when calculating the estimated cost price, or running average. Issues will be posted based on this estimated cost price during the period. During the inventory close, financially updated receipts only will be considered in the weighted average calculation. We recommend a monthly inventory close when you use the weighted average inventory model. In this weighted average direct settlement example, the item model group is marked to include physical value.

The following transactions are illustrated in the graphic below:

- 1a. Inventory physical receipt updated for a quantity of 1 at a cost of USD 11.00 each.
- 1b. Inventory financial receipt updated for a quantity of 1 at a cost of USD 10.00 each.
- 2a. Inventory physical receipt updated for a quantity of 1 at a cost of USD 15.00 each.
- 3a. Inventory physical issue updated for a quantity of 1 at a cost of USD 12.50 each (running average cost, since the physical receipt value is taken into consideration).
- 3b. Inventory financial issue updated for a quantity of 1 at a cost of USD 12.50 each (running average cost, since the physical receipt value is taken into consideration).
- 4. Inventory close is performed. During inventory close, the system will disregard all inventory transactions that have been only physically updated. Instead, the direct settlement principle will be used because only one financial receipt exists. An adjustment of USD 2.50 will be posted to the inventory transaction that has been financially issued as of the inventory closing date. After inventory close, the on hand inventory will be a quantity of 1 with a running average cost price of USD 15.00.

The following diagram illustrates this series of transactions with the effects of choosing the Weighted average inventory model and the direct settlement principle with the Include physical value option.



Key to diagram

- Inventory transactions are represented by vertical arrows.
- Receipts into inventory are represented by vertical arrows above the timeline.
- Issues out of inventory are represented by vertical arrows below the timeline.
- Above (or below) each vertical arrow, the value of the inventory transaction is specified in the format Quantity@Unitprice.
- An inventory transaction value enclosed in brackets indicates that the inventory transaction is physically posted into inventory.
- An inventory transaction value without brackets indicates that the inventory transaction is financially posted into inventory.
- Each new receipt or issue transaction is designated with a new label.
- Each vertical arrow is labeled with a sequential identifier, such as 1a. The identifiers indicate the sequence of inventory transaction postings in the timeline.
- Inventory closings are represented by a red vertical dashed line and the label Inventory Close.

- Settlements that are performed by inventory close are represented by dotted red arrows going diagonally from a receipt to an issue.

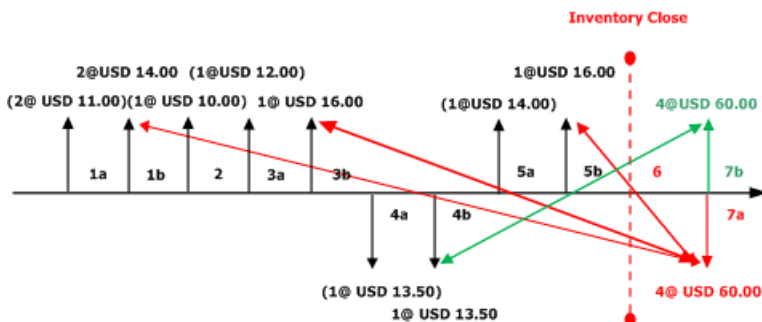
Weighted average summarized settlement with the Include physical value option

The Include physical value parameter works differently with weighted average than in earlier versions. Select the Include physical value box for an item in the Item model group page. Then the system will use physically updated receipts in the calculation of estimated cost price, or running average. Issues will be posted based on this estimated cost price during the period. During the inventory close financially updated receipts only will be considered in the weighted average calculation. We recommend a monthly inventory close when you use the weighted average inventory model. In this weighted average summarized settlement example, the inventory model is marked to include physical value.

The following transactions are illustrated in the graphic below:

- 1a. Inventory physical receipt updated for a quantity of 2 at a cost of USD 11.00 each.
- 1b. Inventory financial receipt updated for a quantity of 2 at a cost of USD 14.00 each.
- 2. Inventory physical receipt updated for a quantity of 1 at a cost of USD 10.00 each.
- 3a. Inventory physical receipt updated for a quantity of 1 at a cost of USD 12.00 each.
- 3b. Inventory financial receipt updated for a quantity of 1 at a cost of USD 16.00 each.
- 4a. Inventory physical issue updated for a quantity of 1 at a cost of USD 13.50 each (running average cost, since the physical receipt value is taken into consideration).
- 4b. Inventory financial issue updated for a quantity of 1 at a cost of USD 13.50 each (running average cost, since the physical receipt value is taken into consideration).
- 5a. Inventory physical receipt updated for a quantity of 1 at a cost of USD 14.00 each.
- 5b. Inventory financial receipt updated for a quantity of 1 at a cost of USD 16.00 each.
- 6. Inventory close is performed. During inventory close, the system will disregard all inventory transactions that are updated only physically. The summarized settlement principle will be used because only one financial receipt exists. An adjustment of USD 1.50 will be posted to the inventory transaction that has been financially issued as of the inventory closing date. After inventory close, the on-hand inventory will be a quantity of 3 with a running average cost price of USD 15.00.
- 7a. "Weighted average inventory close transaction" financial issue is created to sum the settlements of all the inventory financial receipts.
- 7b. "Weighted average inventory close transaction" financial receipt is created as the offset to 5a.

The following diagram illustrates this series of transactions with the effects of choosing the weighted average inventory model and the summarized settlement principle without the Include physical value option.



Key to diagram

- Inventory transactions are represented by vertical arrows.
- Receipts into inventory are represented by vertical arrows above the timeline.

- Issues out of inventory are represented by vertical arrows below the timeline.
- Above (or below) each vertical arrow, the value of the inventory transaction is specified in the format Quantity@Unitprice.
- An inventory transaction value enclosed in brackets indicates that the inventory transaction is physically posted into inventory.
- An inventory transaction value without brackets indicates that the inventory transaction is financially posted into inventory.
- Each new receipt or issue transaction is designated with a new label.
- Each vertical arrow is labeled with a sequential identifier, such as 1a. The identifiers indicate the sequence of inventory transaction postings in the timeline.
- Inventory closings are represented by a red vertical dashed line and the label Inventory Close.
- Settlements that are performed by inventory close are represented by dotted red arrows going diagonally from a receipt to an issue.
- Red arrows illustrate the receipt transactions being settled to the issue transaction created by the system.
- The green arrow represents the offsetting system-generated receipt transaction to which the originally posted issue transaction is settled

Weighted average with marking

Marking is a process that lets you link, or mark, an issue transaction to a receipt transaction. Marking can occur either before or after a transaction is posted. You can use marking when you want to make sure of the exact cost of the inventory when the transaction is posted or when the inventory close is performed.

For example, your Customer Service department accepted a rush order from an important customer. Because this is a rush order, you will have to pay more for this item to service your customer's request. You must be certain the cost of this inventory item is reflected in the margin, or cost of goods sold (COGS), for this sales order invoice.

When the purchase order is posted, the inventory is received at a cost of USD 120.00. For example, this sales order document is marked to the purchase order before the packing slip or invoice is posted. Then COGS will be USD 120.00 instead of the current running average cost for the item. If the sales order packing slip or invoice is posted before the marking occurs, the COGS will be posted at the running average cost price.

Before inventory close is performed, these two transactions can still be marked to each other.

A receipt transaction is marked to an issue transaction. Then, the valuation method selected for the item's item model group will be disregarded and the system will settle these transactions to each other.

You can mark an issue transaction to a receipt before the transaction is posted. You can do this from a sales order line in the Sales order details page. The open receipt transactions are viewed in the Marking page.

You can mark an issue transaction to a receipt after the transaction has been posted. You can match or mark an issue transaction for an open receipt transaction for an inventoried item from a posted inventory adjustment journal.

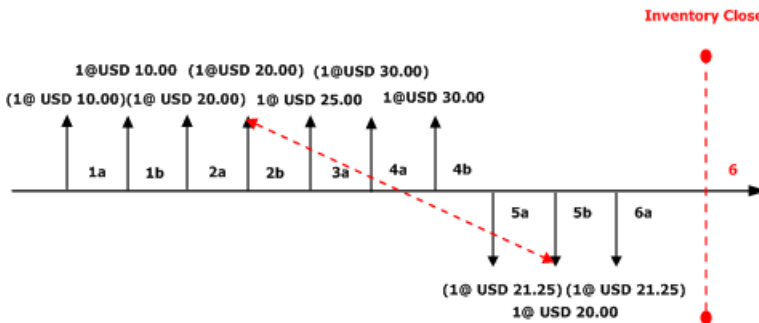
The following transactions are illustrated in the graphic below:

- 1a. Inventory physical receipt for a quantity of 1 at a cost of USD 10.00 each.
- 1b. Inventory financial receipt for a quantity of 1 at a cost of USD 10.00 each.
- 2a. Inventory physical receipt for a quantity of 1 at a cost of USD 20.00 each.
- 2b. Inventory financial receipt for a quantity of 1 at a cost of USD 20.00 each.
- 3a. Inventory physical receipt for a quantity of 1 at a cost of USD 25.00 each.
- 4a. Inventory physical receipt for a quantity of 1 at a cost of USD 30.00 each.
- 4b. Inventory financial receipt for a quantity of 1 at a cost of USD 30.00 each.

- 5a. Inventory physical issue for a quantity of 1 at a cost price USD 21.25 (running average of financial and physical updated transactions).
- 5b. Inventory financial issue for a quantity of 1 is marked to the inventory receipt 2b before the transaction is posted. This transaction is posted with a cost price of USD 20.00.
- 6a. Inventory physical issue for a quantity of 1 at a cost price of USD 21.25 each.
- 7 Inventory close is performed. Since the financially updated transaction is marked to an existing receipt these transactions are settled to each other and no adjustment is made.

The new running average cost price reflects the average of the financially and physically updated transactions at USD 27.50.

The following diagram illustrates this series of transactions with the effects of choosing the Weighted average inventory model with marking.



Key to diagram

- Inventory transactions are represented by vertical arrows.
- Receipts into inventory are represented by vertical arrows above the timeline.
- Issues out of inventory are represented by vertical arrows below the timeline.
- Above (or below) each vertical arrow, the value of the inventory transaction is specified in the format Quantity@"Unitprice".
- An inventory transaction value enclosed in brackets indicates that the inventory transaction is physically posted into inventory.
- An inventory transaction value without brackets indicates that the inventory transaction is financially posted into inventory.
- Each new receipt or issue transaction is designated with a new label.
- Each vertical arrow is labeled with a sequential identifier, such as 1a. The identifiers indicate the sequence of inventory transaction postings in the timeline.
- Inventory closings are represented by a red vertical dashed line and the label Inventory Close.
- Settlements that are performed by inventory close are represented by dotted red arrows going diagonally from a receipt to an issue.

NOTE

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Inventory close

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As part of the process to settle issue transactions with receipt transactions, you can also choose to have the general ledger updated to reflect the adjustments that have been made.

The inventory close process settles issue transactions to receipt transactions, based on the inventory valuation method that is selected in the item's item model group. As part of the settlement process, you can specify that the general ledger should be updated, so that it reflects the adjustments that have been made. However, until inventory close or recalculation has been run, issue transactions are posted at the calculated running average cost price.

After inventory close, you can no longer post in periods that are before the inventory closing date that you set, unless you reverse a completed inventory close process. For example, if inventory close is run for the period that ends on January 31, you can't post transactions that have a date that is earlier than January 31.

Items in inventory are assigned to one of two inventory types: item or service. Inventory close performs the same functions for both types. However, for service items, inventory close still settles issues to receipts.

How often the inventory close process is run varies by company. However, transaction volume should help determine how often you decide to run inventory close. In general, most companies run inventory close as part of their month-end close and reconciliation procedures.

Inventory recalculation and the general ledger

If adjustments to inventory and the general ledger are required during a month or other inventory period, you can run inventory recalculation instead of inventory close. Inventory recalculation makes adjustments but doesn't make settlements to inventory transactions.

During inventory recalculation, on-hand inventory is adjusted, inventory transactions are adjusted, and inventory recalculations and inventory closes are run. These tasks affect any ledger account that is linked to the original inventory transaction.

Example

When you create a purchase order from a sales order, the general ledger accounts that are used for the original sales order are updated. Even if the ledger accounts for the item group that is assigned to the item were changed after the sales order was posted, and an inventory recalculation created an adjustment amount, the adjustment amount is posted to the original ledger accounts. The adjusted amount isn't posted to the new ledger accounts that are assigned to the item.

After the update is completed, you can review the ledger voucher that is posted because of one of these tasks.

1. On the **Closing and adjustment** page, on the **Overview** tab, select the update to review.
2. Click **Details**, and then select **Voucher**.

Effects of the inventory close process on the general ledger

Several of the tasks that you can perform on the **Closing and adjustment** page cause an update to general ledger. For example, the general ledger is updated when you make inventory on-hand adjustments, make inventory transaction adjustments, run inventory recalculation, and run inventory close.

The ledger accounts that are updated because of these tasks are linked to the original inventory transaction. For

example, if a sales order is settled to a purchase order, the general ledger accounts that were used for the original sales order are adjusted. This behavior occurs even if the ledger accounts for the item group that is assigned to the item have changed since the sales order was posted. After inventory close creates a settlement amount, the settlement amount is still posted to the original ledger accounts, not to the new ledger accounts that are assigned to the item. The general ledger might also be updated if you reverse an inventory close.

NOTE

- Inventory close is a required step in the month-end closing procedure for all inventory models except moving average. You will be warned if you try to close a financial period without first performing the inventory close as of the period end date.
- Before you run the closing procedure, you can view a list of items that can't be settled during the update.
- We recommend that you run inventory close during off-peak hours, to distribute computing resources more evenly.

The inventory close log

After the inventory close process has been completed, a message in the message center might inform you that a unit cost price might be incorrect because a transaction could not be fully settled.

Before this message is shown, the system reports the item number and the affected transaction. The message informs you that the cost amount that is used for this transaction wasn't updated because of the inventory close. This message appears when a transaction of the issue type can't be settled.

During the inventory close process, the system checks each financial dimension to see whether there are more issues than receipts up to the specified closing date. This type of imbalance can occur when an inventory transaction from a purchase order isn't fully posted financially, either because the vendor invoice hasn't been received, or because bill of materials (BOM) components that are included in a production on a higher level aren't financially posted. (The sub-production isn't cost-calculated.) In this case, the subsequent close won't adjust all issues to the correct cost price, because not enough receipt information is available.

For each run of the closing procedure, the system indicates whether a log that contains the warnings is stored and can be viewed.

If you receive many warnings in the message, we recommend that you perform the following actions:

- Update receipts financially.
- Advance the closing date.
- Reevaluate the business procedures.

In some circumstances, you might not be able to do anything about the warnings. For example, if marking is used, and the marked purchase order has a financial date that is after the closing date, the closing date can't be changed.

Reversing a completed inventory close

Occasionally, you might have to reverse a completed inventory close to return settlements to the state that they had before adjustments were made. When you reverse a completed inventory close, inventory is reopened to enable posting in the period that the inventory close covers. Related changes might also be made in the general ledger. After you've finished making adjustments, you can run inventory close again for the period that you're working with.

NOTE

Only the last inventory period that was closed can be reopened. To reverse an earlier inventory close, you must reverse each subsequent inventory close one at a time, starting with the most recent close.

NOTE

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Adjust on-hand inventory cost values

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Use the Adjustment of on-hand inventory page to adjust the cost value of the on-hand inventory quantities after an inventory close process is run.

You can use the **Adjustment of on-hand inventory** page to adjust the cost value of on-hand inventory quantities after an inventory close process is run. **Note:** To open the **Adjustment of on-hand inventory** page, on the **Closing and adjustment** page, select the record of a completed inventory close process, and then click **Adjustment > On-hand**. **Example:** You have the following transactions in February:

- February 1: An inventory financial receipt for a quantity of 2 at a cost of USD 10.00
- February 5: An inventory financial receipt for a quantity of 1 at a cost of USD 13.00
- February 19: An inventory financial issue for a quantity of 1 at a running average cost of USD 11.00

This item was set up with the first in, first out (FIFO) inventory model, and inventory close was performed as of February 28. The financial issue transaction of USD 11.00 will be settled against the financial receipt that is dated February 1, and an adjustment of USD 1.00 will be made. The following inventory receipts will then contain open inventory quantities:

- February 1: A quantity of 1 at a cost of USD 10.00
- February 5: A quantity of 1 at a cost of USD 13.00

To set the cost of these two items to USD 15.00, use the on-hand adjustment option to adjust the open on-hand quantities as of the last inventory close period. **Note:** The posting date of the on-hand adjustment transaction will be the date of the last inventory close. This date can't be modified.

NOTE

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Inventory value storage report

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This topic explains how to run an **Inventory value storage** report and make the output available digitally, either as an interactive page in Microsoft Dynamics 365 Supply Chain Management or as an exported document in any of several formats.

When you view the report in your browser, columns and aggregate balances are dynamically adjusted, depending on the layout that you've configured. You can sort the results, filter them, drill down into the data, and more.

Report results are stored in the **Inventory value** data entity. Therefore, you can filter and export the results to a format such as comma-separated values (CSV) or Microsoft Excel format.

The **Inventory value storage** report is helpful when the output contains many lines. For example, you have 50,000 items, and 300 stores have been created as warehouses. In this case, if you request inventory ending balances by item, site, and warehouse, the output will contain many lines.

NOTE

The report won't include subtotals that are defined in the report layout. It also won't include general ledger balances, even when they are defined in the report layout. Reconciliation to the general ledger must be done by using trial balances.

Turn on the Inventory value storage feature

Before you can generate an **Inventory value storage** report, you must turn on the feature in your system. Administrators can use the [feature management](#) settings to check the status of the feature and turn it on if it's required. In the **Feature management** workspace, the feature is listed in the following way:

- **Module** – Cost management
- **Feature name** – Inventory value storage

Generate an Inventory value storage report

Follow these steps to generate and store an **Inventory value storage** report.

1. Go to **Cost management > Inquiries and reports > Inventory value report storage**.
2. Select **New**.
3. In the **Inventory value** dialog box that appears, set the following values to define which records are included in your report:
 - On the **Parameters** FastTab, enter a unique name for the report, and use the fields in the **Date interval** section to define which records are included in the report. To define the date interval, you can either select a preset range (relative to the report generation date) in the **Date interval code** field, or select specific dates in the **From date** and **To date** fields.
 - On the **Records to include** FastTab, set up filters and constraints to define which data is included in the report.
 - On the **Run in the background** FastTab, specify how, when, and how often the report is generated.

NOTE

This report is always run as part of a batch job.

4. Select **OK** to apply your settings and close the dialog box.

After the batch job is completed, the report will be listed on the **Inventory value report storage** page. You might have to refresh the page to see the report.

Explore an Inventory value storage report

After you've generated a report, you can view and explore it at any time by following these steps.

1. Go to **Cost management > Inquiries and reports > Inventory value report storage**.
2. Select a report in the list.
3. Select **View details** to show the report content.
4. Explore the report by following any of these steps:
 - As for most standard pages in Supply Chain Management, you can select almost any column heading to sort or filter the grid by the values in that column.
 - Use the **Filter** field to filter the report by any value in any of several available columns.
 - Use the view menu (above the **Filter** field) to save and load your favorite combinations of sort and filter options.

Export an Inventory value storage report

Every report that you generate is stored in the **Inventory value** data entity. You can use the standard data management features of Supply Chain Management to export data from this entity to any supported data format, such as CSV or Excel format.

The following example shows how to export an **Inventory value report** report.

1. Go to **System administration > Workspaces > Data management**.
2. In the **Import / Export** section, select the **Export** tile.
3. On the **Export** page that appears, you will set up the export job. First enter a group name for the job.
4. In the **Selected entities** section, select **Add entity**.
5. In the dialog box that appears, set the following fields:
 - **Entity name** – Select **Inventory value**.
 - **Target data format** – Select the format to export data to.
6. Select **Add** to add the new row, and then select **Close** to close the dialog box.
7. Usually, you will export one report at a time. To export a single report, set up a filter for the row that you just added to the **Inquiry** dialog box. In this way, you can define which report from the **Inventory value** entity is included in your export. Follow these steps to set the following filter options to export a single report:
 - a. On the **Range** tab, select **Add** to add a row.
 - b. Set the **Table** field to **Inventory value**.
 - c. Set the **Derived table** field to **Inventory value**.

- d. Set the **Field** field to the field that you want to filter by. Usually, you will use the **Execution name** field and/or the **Execution time** field.
 - e. Set the **Criteria** field to the value that you want to look for in the selected field. (If you selected the **Execution name** field in the previous step, this value will be the name of the report. If you selected the **Execution time** field, it will be the time when the report was generated.)
 - f. Add more rows to the **Range** tab as you require, until you've uniquely identified the report that you're looking for.
8. Select **OK** to save your settings and close the dialog box.
 9. Select **Save** to save your export setup.
 10. On the **Export options** tab, select **Export now** to generate the export file.
 11. On the **Execution summary** page that appears, you can view the status of your export job and a list of the entities that were exported. In the **Entity processing status** section, select the **Inventory value** entity in the list, and then select **Download file** to download the data that was exported from that entity.

For more information about how to use data management to export data, see [Data import and export jobs overview](#).

NOTE

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Inventory aging report storage

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In Microsoft Dynamics 365 Supply Chain Management, you can run an **Inventory aging report storage** report and make the output available as a form and a chart. In the form, columns and aggregate balances are dynamically adjusted, depending on the layout that is configured. The chart provides a visual overview that supports filtering and lets you drill down into details. Additionally, a data entity that is named **Inventory aging report** lets you export the results of an **Inventory aging report storage** report run to a format such as a Microsoft Excel file or a PDF file.

This method of running an **Inventory aging report storage** report is helpful in cases where the output contains many lines. For example, the output will contain many lines if you have 50,000 items and 300 stores that are created as warehouses, and you request inventory aging by item, site, and warehouse.

Enable the Inventory value storage report feature

Before you can use this feature, you must enable it on your system. Administrators can use the [feature management](#) settings to check the feature status and enable it if needed. Here, the feature is listed as:

- **Module** - Cost management
- **Feature name** - Inventory aging report storage

Run an Inventory aging report storage

1. Go to **Cost management > Inquiries and reports > Inventory aging report storage**.
2. Select **New**.
3. In the **Process Identifier – Name** field, enter a unique name for the report.
4. Select the **Identification – ID** report, and filter it as you require.

Report execution is always done in a batch job.

5. After the batch job is completed, the output is shown on the **Inventory aging report storage** page.
6. To view the output as a form that has a traditional grid layout, select **View details**. To view the output as an aggregated chart, select **View chart**.

NOTE

The form won't include subtotals that are defined in the report layout.

The **Inventory aging report** data entity lets you export the output of an **Inventory aging report storage** report by applying a filter for the **Process Identifier – Name** field to any format that Data management supports.

NOTE

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Inventory aging report examples and logic

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This topic presents some examples that show how to interpret the results of an **Inventory aging** report. This report categorizes on-hand quantity and inventory values for a selected item or item group into several period buckets. This topic also shows the internal logic of the report.

The examples in this topic show results that are presented on a standard **Inventory aging** report. However, in general, we recommend that you use the [Inventory aging report storage](#) version of this report, especially when you have many items and warehouses that must be processed. Inventory aging report storage saves each report that you generate, shows the results as an interactive page and a chart, and lets you export any saved report.

Sample data that is used in these examples

The examples in this topic are based on the sample inventory transaction data that is described in this section.

Storage dimension setup

The example system contains the following setup of storage dimensions.

NAME	ACTIVE	PHYSICAL INVENTORY	FINANCIAL INVENTORY
Site	Yes	Yes	Yes
Warehouse	Yes	Yes	No

Inventory model

For the example system, the inventory model for the released products is *FIFO*, and the **Cost price** setting for the inventory model is *Include physical value*.

Inventory transactions

The example system contains the following inventory transactions for a released product that has the item number *1000*.

REFERENCE	SITE	WAREHOUSE	RECEIPT	ISSUE	PHYSICAL DATE	FINANCIAL DATE	QUANTITY	COST AMOUNT	PHYSICAL COST AMOUNT
Purchase order	1	11	Purchased		March 15	March 15	10	1,000	1,000
Purchase order	2	21	Purchased		March 15	March 15	10	2,000	2,000
Purchase order	1	11	Received		April 15		5		375
Transfer order	1	11		Sold	May 2	May 2	-5	-458.33	-458.33

REFERENCE	SITE	WAREHOUSE	RECEIPT	ISSUE	PHYSICAL DATE	FINANCIAL DATE	QUANTITY	COST AMOUNT	PHYSICAL COST AMOUNT
Transfer order	1	12	Purchased		May 2	May 2	5	458.33	458.33
Sales order	1	12		Sold	May 3	May 3	-1	-91.67	-91.67

How quantities and amounts in each period bucket are calculated

By using the sample data that is described in the previous sections, you can run an **Inventory aging** report that has the following settings:

- **As of date:** *May 9, 2020*
- **Site:** *View*
- **Warehouse:** *No*
- **Item number:** *Total*
- **Aging period:** Set this field to generate monthly buckets.

In this case, the content of the report that is generated will resemble the following example.

ITEM NUMBER	SITE	ON-HAND QUANTITY	ON-HAND VALUE	INVENTORY VALUE QUANTITY	INVENTORY VALUE	AVERAGE UNIT COST	5/8/2020 - 5/1/2020		4/30/2020 - 4/1/2020		3/31/2020 - 3/1/2020	
							P1:QUANTITY	P1:AMOUNT	P2:QUANTITY	P2:AMOUNT	P3:QUANTITY	P3:AMOUNT
1000	1	14	1,283.33	14	1,283.33	91.67			5.00	458.33	9.00	825.00
1000	2	10	2,000.00	10	2,000.00	200.00					10.00	2,000.00
1000 Total		24.00	3,283.33						5.00	458.33	19	2,825.00

Note the following details in this example report:

- The **Inventory value quantity**, **Inventory value**, and **Average unit cost** values that are shown on the report are values for the financial inventory dimension (**Site**, in this case).

For example, for site 1, the report shows the following information:

- The **Inventory value quantity** value is *14* (= 10 + 5 – 5 + 5 – 1).
 - The **Inventory value** value is *1,283.33* (= 1,000 + 375 – 458.33 + 458.33 – 91.67).
 - The **Average unit cost** value is *91.67*.
 - The **On-hand value** value and the **Amount** value in each period bucket are calculated by using the **Average unit cost** value.
- The report determines the on-hand quantity for each period bucket by summarizing the total received

inventory quantity for each period bucket. It then applies the first in, first out (FIFO) principle to deduct the total issued quantity, regardless of the inventory model that the items use.

If you run the same report again, but this time you set both the **Site** and **Warehouse** fields to *View*, the new report will resemble the following example.

ITEM NUMBER	SITE	WAREHOUSE	ON-HAND QUANTITY	ON-HAND VALUE	INVENTORY VALUE QUANTITY	INVENTORY VALUE	AVERAGE UNIT COST	5/8/2020 - 5/1/2020		4/30/2020 - 4/1/2020		3/31/2020 - 3/1/2020	
								P1:QUANTITY	P1:AMOUNT	P2:QUANTITY	P2:AMOUNT	P3:QUANTITY	P3:AMOUNT
1000	1	11	10	916.67	14	1,283.33	91.67			5.00	458.33	5.00	458.33
1000	1	12	4	366.67	14	1,283.33	91.67	4.00	366.67				
1000	2		10	2,000.00	10	2,000.00	200.00					10.00	2,000.00
1000 Totals			24.00	3,283.33				4.00	366.67	5.00	458.33	15	2,458.33

This time, site 1 is split into two rows, one for warehouse 11 and one for warehouse 12. However, the **Inventory value quantity**, **Inventory value**, and **Average unit cost** values are the same, because **Warehouse** isn't a financial inventory dimension.

Additionally, notice that the quantity distribution of site 1 is different. In the first report that you ran, the system ignored the transfer order that occurred in the same site and deducted the quantity of the sales invoice from the 3/31/2020 - 3/1/2020 period bucket in site 1. However, in the new report, the system deducts the quantity of the sales invoice from the 5/8/2020 - 5/1/2020 period bucket in warehouse 12.

Effects of inventory closing

If you run the inventory closing for May and then run the previous report again, but you set the **As of date** field to *May 31, 2020*, you will notice the following results:

- The **Inventory value** and **Average unit cost** values are updated.
- The **On-hand value** value and all the **Amount** values in every period bucket are updated accordingly.

The new report will resemble the following example.

ITEM NUMBER	SITE	WAREHOUSE	ON-HAND QUANTITY	ON-HAND VALUE	INVENTORY VALUE QUANTITY	INVENTORY VALUE	AVERAGE UNIT COST	5/31/2020 - 5/1/2020		4/30/2020 - 4/1/2020		3/31/2020 - 3/1/2020	
								P1:QUANTITY	P1:AMOUNT	P2:QUANTITY	P2:AMOUNT	P3:QUANTITY	P3:AMOUNT
1000 Totals			24.00	3,275.00				4.00	364.29	5.00	455.36	15	2,455.36

ITEM NUMBER	SITE	WAREHOUSE	ON-HAND QUANTITY	ON-HAND VALUE	INVENTORY VALUE	INVENTORY VALUE	AVERAGE UNIT COST	5/31/2020 - 5/1/2020		4/30/2020 - 4/1/2020		3/31/2020 - 3/1/2020	
								P1:QUANTITY	P1:AMOUNT	P2:QUANTITY	P2:AMOUNT	P3:QUANTITY	P3:AMOUNT
1000	1	11	10	910.70	14	1,275.00	91.07	0.00		5.00	455.36	5.00	455.36
1000	1	12	4	364.29	14	1,275.00	91.07	4.00	364.29				
1000	2		00	2.00	10	2,000.00	200.00					10.00	2.00
1000			24.00	3275.00				4.00	364.29	5.00	455.36	15.00	1,500.00
Totals				00									36

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BOM calculations

2/18/2021 • 9 minutes to read • [Edit Online](#)

The cost roll-up and sales price calculations are known as bill of materials (BOM) calculations, and you initiate them from the **Calculations** page. This topic provides information about BOM calculations.

The cost roll-up and sales price calculations are known as bill of materials (BOM) calculations, and you initiate them from the **Calculations** page. You use the **Calculations** page to perform the following tasks:

- Calculate the cost of a manufactured item, and generate an associated item cost record within a costing version.
- Calculate the sales price of a manufactured item, and generate an associated item sales price record within a costing version.

The way that you use the **Calculations** page varies slightly, depending on how you initiate the BOM calculations. The way that you use the **Calculations** page also depends on whether the BOM calculations involve a costing version for standard costs or planned costs, and on several policies that are defined in the costing version that is used in the BOM calculations. **Note:** A variation of the **Calculations** page is used in the context of a sales order, sales quotation, or service order line item. These calculations are known as order-specific BOM calculations. An order-specific BOM calculation doesn't generate an item cost record within a costing version. Instead, it generates a calculation record that appears on the **BOM calculation details** page. The calculation record includes a calculated cost and a calculated sales price. The **Calculations** page can be opened for a single manufactured item or for a costing version:

- To calculate costs for a single manufactured item, you initiate BOM calculations from the **Item price** page. The **Calculations** page inherits the item identifier. The costing version, BOM version, route version, calculation quantity, calculation date, and site must be specified.
 - By default, the BOM version and route version are set to the active versions for the item, site, date, and calculation quantity. However, you can override the default values with approved versions.
 - By default, the calculation quantity is set to the item's standard order quantity. However, you can override the default value.
 - The calculation date or site can be mandated by the costing version, or user-specified values can be set when the date or site isn't mandated in the costing version. A future calculation date determines how pending cost records are used. BOM calculations use a pending cost record that has the nearest from-date that is on or before the calculation date.
- To calculate costs for all manufactured items or selected items, or to update items on a where-used basis, you initiate BOM calculations from the **Costing version setup** page or the **Costing version maintenance** page. The **Calculations** page inherits the costing version.
 - For the calculations, it's assumed that the active BOM version and route version are used for a manufactured item (and for the related site, date, and quantity), unless a manufactured component has a specified sub-BOM or subroute.
 - For the calculations, it's assumed that the standard order quantity is used for manufactured items. The standard order quantity provides the basis for calculating component quantities, determining the relevant BOM versions and route versions (when you use quantity-sensitive BOMs and routes), and amortizing constant costs. However, when a manufactured component has a BOM line type of **Production** or **Vendor**, or when you use a make-to-order explosion mode for the BOM calculations, this assumption doesn't apply, because quantities reflect the specified calculation quantity.
 - The calculation date or site can be mandated by the costing version, or user-specified values can be set when the date or site isn't mandated in the costing version.

Other variations in BOM calculations reflect the costing type and restrictions of the costing version:

- BOM calculations that use standard costs must be restricted by costing version policies, because the restrictions help guarantee that standard costing principles are used. Standard costing principles require the enforcement of restrictions about the use of standard costs for purchased items, a single-level explosion mode, and the inclusion of miscellaneous charges in unit costs.
- BOM calculations that use planned costs don't have to follow standard costing principles. These BOM calculations can use different explosion modes, alternative sources of cost data for purchased items, and optional enforcement of restrictions within the costing version.

BOM calculations that use standard costs

Policies within the costing version (for standard costs) can mandate enforcement of five BOM calculation policies. The **Recording restriction** option in the costing version mandates one of these policies, where miscellaneous charges must be included in the unit price. Miscellaneous charges for purchased items can be entered manually, whereas miscellaneous charges for manufactured items reflect the calculated amortization of constant costs. The **Calculation restriction** option in the costing version mandates the other four BOM calculation policies:

- The source of cost contributions for purchased items must be based on standard costs. In other words, BOM calculations must use the item cost records within the specified costing version, or within the fallback that contains standard costs.
- To help guarantee accurate and consistent calculation of standard costs, the explosion mode must be single-level.
- To help guarantee consistent results when the sales price of the items is calculated, the profit setting must be mandated. The profit setting can be used, and the item sales price records can be generated, only if the costing version allows for content of sales prices.
- The fallback principle must be mandated, and can be set to **None**, **Active** (for active cost records), or **Costing version** (for a specified costing version).

BOM calculations that use planned costs

Policies within the costing version (for planned costs) can optionally mandate enforcement of five BOM calculation policies. Alternatively, the policies can just provide default values. The **Recording restriction** option in the costing version determines whether the BOM calculation policy about miscellaneous charges will be mandated or act as a default value. Miscellaneous charges can optionally be included in the unit price. The **Calculation restriction** option in the costing version determines whether the other four BOM calculation policies will be mandated or act as default values:

- The source of cost contributions for a purchased item can be the item cost records within a costing version. Alternatively, the source can be defined by the BOM calculation group that is assigned to the item. For example, the BOM calculation group can define purchase price trade agreements as the source of cost contribution data.
- The explosion mode can be single-level, multilevel, or make-to-order, or it can be based on the BOM line item. The explosion mode for the BOM line type replicates the cost calculation logic for production order estimates.
- The profit setting can be mandated, or it can be a default value. The profit setting can be used, and the item sales price records can be generated, only if the costing version allows for content of sales prices.
- The fallback principle can be mandated, or it can be a default value. The fallback principle can be set to **None**, **Active** (for active cost records), or **Costing version** (for a specified costing version).

BOM calculations generate warning messages and other types of messages. Several BOM calculation policies determine the types of messages. The warning conditions are defined in the BOM calculation group that is assigned to items. However, you can override these warning conditions when you initiate a BOM calculation. When the fallback principle is used, it's often helpful if the fallback is shown as an information message. When

you're trying to update calculated costs for items that have missing cost records, it's also helpful if the information message identifies items that weren't updated.

BOM calculations that use the fallback principle

The following situations illustrate two uses of the fallback principle:

- **Two-version approach to standard cost updates** - A costing version can contain the incremental changes to standard costs, such as pending cost records that represent new items or cost changes. In this situation, the fallback principle can identify the use of the active standard costs that are contained in other costing versions.
- **Simulation of the effect of cost changes by using planned costs** - A costing version for planned costs can contain incremental changes for simulation purposes. This costing version will include pending cost records that represent the simulated cost changes to items, cost categories, and calculation formulas for indirect cost. In this situation, the fallback principle can identify the use of the active standard costs that are contained in other costing versions.

BOM calculation of a suggested sales price

When you use a cost-plus-markup approach, the calculated sales price for an item reflects the set of profit-setting percentages that is specified for the BOM calculation, and the costs that are associated with the item's component items, routing operations, and applicable manufacturing overheads. The markup reflects profit-setting percentages that are assigned to cost groups, and the cost groups that are assigned to items, cost categories for routing operations, and the indirect cost calculation formulas for manufacturing overheads. The sets of profit-setting percentages are labeled **Standard**, **Profit 1**, **Profit 2**, and **Profit 3**. Within the Profit 1 set, for example, a profit-setting percentage of 50 percent can be defined for a cost group that is assigned to purchased material, and a profit-setting percentage of 80 percent can be defined for a cost group that is assigned to cost categories for routing operations. The context of the BOM calculation determines how the results of a calculated sales price are handled:

- **BOM calculation for an item and specified costing version** - The BOM calculation generates a pending sales price record within the costing version. This sales price record provides the starting point for viewing the calculation details (for example, on the **Calculate item cost** page). The sales price record acts mainly as reference information and isn't used as the basis for a sales price on sales orders.
- **Order-specific BOM calculation** - A variation of the **BOM calculation** page is used in the context of a sales order, sales quotation, or service order line item. An order-specific BOM calculation doesn't generate a record in the within a costing version. Instead, it generates a calculation record that appears on the **BOM calculation results** page. This calculation record provides the starting point for viewing the calculation details (for example, on the **Calculate item cost** page). Information about a selected calculation record can be transferred to the originating line item. For example, the calculated sales price can be transferred to a sales order line item.

Order-specific BOM calculations

An order-specific BOM calculation represents a variation of a BOM calculation for a manufactured item. The order-specific BOM calculation is performed in the context of a sales order, sales quotation, or service order line item. An order-specific BOM calculation generates a calculation record that appears on the **BOM calculation results** page. The calculation record includes a calculated weight, a calculated cost that is based on active cost records, and a calculated sales price. The calculation record that each order-specific BOM calculation for an item generates on the **BOM calculation results** page is uniquely identified by a calculation number. The results of a calculation record can be optionally transferred to the originating line item. An order-specific BOM calculation differs from a BOM calculation for a manufactured item in two ways:

- An order-specific BOM calculation doesn't generate an item cost record within a costing version. Therefore,

the BOM calculation policies aren't applied when an item cost record is created, or when a cost record is overwritten.

- An order-specific BOM calculation always uses the active cost records for components, cost categories, and indirect cost calculation formulas.

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BOM calculations groups

2/18/2021 • 8 minutes to read • [Edit Online](#)

This article provides information about calculation groups for bills of materials (BOMs) and how to set them up. To run a BOM calculation, you must either set up calculation groups and assign them to individual items, or set a default calculation group. The calculation settings from the calculation group are then used as default values on the BOM calculation page at the time of BOM calculation.

A default calculation group is required on the **Inventory and warehouse management parameters** page, or a product-specific calculation group is required on the **Released product details** page. The system first looks for the calculation group setup on the **Released product details** page. If it doesn't find a calculation group there, it looks on the **Inventory and warehouse management parameters** page. If the system can't find a calculation group, the user receives an error message during calculation. A calculation group contains policies for the cost price model, the sales price model, and the warnings checklist. The calculation settings from the calculation group are used as default values on the **BOM calculation** page at the time of BOM calculation.

Purposes of BOM calculation groups

You assign a BOM calculation group to items for several reasons:

- By setting the **Cost price model** field, you indicate the source of a purchased component's cost contribution data during the calculation of the planned cost of a manufactured item. Some manufacturers calculate planned costs by using the purchase price trade agreements for purchased components or another basis, such as the purchase price records in a costing version.
- By setting the **Sales price model** field, you indicate how the item's data is used to calculate a suggested sales price. You can specify either the item sales price or the cost group. Some manufacturers want to calculate a suggested sales price for manufactured items. The calculated sales price can reflect a rolled-price approach that is based on the component's sales price record. Alternatively, the calculated sales price can reflect a cost-plus-markup approach that is based on the component's cost and applicable profit percentage, which is associated with the item's cost group.
- By using the **Stop explosion** field, you indicate that a manufactured item should be treated as a purchased item for cost roll-up purposes during BOM calculation. Typical scenarios include a purchased item that is occasionally manufactured or a manufactured item that is now being purchased. The item is first designated as a manufactured item to define BOM and route information, and to support production orders for the item. However, the **Stop explosion** flag prevents cost calculations from using the item's BOM and route. Instead, the BOM calculation uses the item's specified costs.

Calculation groups

You define calculation groups under **Predetermined cost policies setup** in Cost management. Calculation groups that are assigned to items let you specify how the cost or sales price of components, as outlined by the calculation group, is sourced for the calculation. On the **Calculation groups** page, you can define a cost price model, an alternative cost price model, a sales price model, and warnings.

Cost price model

There are four options for the **Cost price model** field:

- **Item cost price** – The cost price from the **Released product** table is used, or the combination of item dimensions is used as the cost price.
- **Item purchase price** – The purchase price from the **Cost price** field on the **Purchase** tab of the **Released**

product list page is used.

- **Trade agreements** – You can configure trade agreements for specific combinations of items and vendors, or for specific sites. Then, when you select the **Trade agreements** option here, the trade agreement that you created for the purchase price together with the item and site will be used.
- **Inventory price** – The current inventory value for the item is used to calculate the unit cost in the BOM calculation. A unit cost price is calculated only if the posted quantity and the physical quantity are more than 0 (zero).

Alternative cost price

The **Alternate cost price** field has the same options as the **Cost price model** field. However, this field is used only when a price can't be found in the primary cost price model.

Sales price model

There are two options for the calculation of the **Sales prices** field:

- **Cost group** – When this option is selected, the sales price is calculated based on the cost price and the profit setting percentage from the cost group.
- **Item sales price** – When this option is selected, the sales price on the **Sell** FastTab from the Released product table is used.

Stop explosion

The **Stop explosion** check box is used to indicate when a manufactured item should be treated as a purchase item. Typically, you will leave the **Stop explosion** check box cleared. By selecting this check box, you indicate that a manufactured item must be treated as a purchase component instead of a manufactured component for the purpose of BOM calculation. Depending on the site, the item's cost can still be calculated by using BOM calculations. Explosion of planned purchase orders and production orders is stopped at the BOM whose components are associated with the calculation group that the **Stop explosion** check box is selected for. Master scheduling generates the planned orders on the BOM itself, not on the items that are included in the BOM. Basically, by selecting this check box, you specify that a cost won't be added into the BOM calculation for items that have this calculation group.

Warnings

On the **Warnings** FastTab, you select the options for any warning messages that users should receive when they do BOM calculations.

For example, if you select the **No BOM** check box, the user receives a warning if no active BOM version is found for one of the components or the parent item that the BOM calculation is run for. If you select the **No route** check box, the user receives a warning if no active route version is found. If you're using resources on your routes and operations, you can instruct the system to check for those resources. Then, if a resource isn't found on every line in the active route, the user receives a warning.

You can also verify and check for consumption. Consumption is the quantity in a particular route. Typically, it represents the amount of time that is required in order to perform a specific operation for a production process. You can check whether an item has no cost price. If there is no active cost price for an item, no cost is added into the BOM calculation.

You can also check and verify the age of the cost price. For example, enter **60** to indicate that the unit cost price must be reevaluated after 60 days. If this limit is reached, the system generates a warning. For example, a cost price was entered for an item in January of this year. If it's now August, which is more than 60 days after the cost price was entered, the user receives a warning when the BOM calculation is run. You can enter in a percentage in the **Minimum contribution margin** field. This value indicates the point at which the minimum contribution margin isn't being met. If the contribution margin for a particular component isn't met, the user receives a warning. Therefore, this field helps guarantee that you don't undercut the costs and the additional carrying costs that might be required for your items.

Default setup in Inventory and warehouse management parameters

Because calculation groups are required in order to run calculations, you must set up a default calculation group in the Inventory management parameters. This setup enables companies to have a standard cost group and profit setting for all items. Then, if a particular item has special calculation requirements, the user can assign a different calculation group to that item. Typically, you can set calculation groups on BOM component items instead of BOM items. However, when warning messages are shown, calculation groups can be applied. A calculation group that is assigned to items overrides the default value that is set up in the Inventory management parameters.

You can set up the default parameter at **Cost management > Inventory accounting policies setup > Parameters > Inventory accounting > Calculation group**. By setting up a default configuration group, you can also configure the warning conditions that prompt users during the BOM calculation process, if the selected components might cause calculation errors.

View warning messages on the Complete page

A BOM calculation generates warning messages. You can view the warnings about a selected item. For example, in Sales and marketing, create a new sales order for item D0001. Then, on the sales order line, on the **Update line** menu, click **Calculate Based on BOM/Formula** to view the calculation details and warnings. You can also view BOM calculation results on the **Complete** page. For the warning messages, only two warning conditions apply to manufactured items, whereas four warning conditions apply to any item:

- Identify when a manufactured item doesn't have an active BOM.
- Identify when a manufactured item doesn't have an active route.
- Identify when the item on a BOM line has a quantity of 0 (zero).
- Identify when the item on a BOM line has a cost of 0 (zero), or when it doesn't have a cost record.
- Identify when the item on a BOM line has an out-of-date cost. The warning reflects a comparison of the calculation date to the specified days for a maximum age of cost.
- Identify when the item on a BOM line has a profitability percentage that is less than you want.

You can define multiple BOM calculation groups, depending on your requirements for variations in warning messages. For example, one BOM calculation group that has warning conditions about an active BOM, a component quantity of 0 (zero), and component cost of 0 (zero) might be enough. When you start a BOM calculation, you can override the warning conditions that are associated with the BOM calculation group. You can also add or remove warning conditions. For example, if the current situation doesn't involve routing data, you can remove the warning condition about an active route. **Note:** Time and attendance includes a **Calculation groups** page, but that page has no relationship to BOM calculation groups. In Time and attendance, workers can be assigned to calculation groups that reflect the grouping of workers who are associated with the same supervisor or manager. Calculation of worker registrations can be done either automatically or manually by a supervisor or manager.

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Cost calculation level

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The bill of materials (BOM) level that is named **Cost calculation level** excludes production orders and batch orders from its calculations. The system uses this level when it runs cost calculations in costing versions. In processes such as recalculation and inventory close, the system uses the **Costing level** BOM level instead.

The following simple scenario shows the differences between the **Cost calculation level** BOM level and the **Costing level** BOM level.

You have three products: A, B, and C. Product C is the component of product B, and product B is the component of product A.

- **Costing level** assigns the following BOM levels:
 - **Product A:** 0
 - **Product B:** 1
 - **Product C:** 2
- **Cost calculation level** assigns the following BOM levels:
 - **Product A:** 0
 - **Product B:** 1
 - **Product C:** 2

A production order for product C is then created, and product A is added to the production order BOM. After the order is estimated, BOM levels are updated in the following way:

- **Costing level** assigns the following BOM levels:
 - **Product B:** 1
 - **Product C:** 2
 - **Product A:** 3
- **Cost calculation level** assigns the following BOM levels:
 - **Product A:** 0
 - **Product B:** 1
 - **Product C:** 2

This behavior ensures that changes to production order BOMs don't affect subsequent cost calculations.

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Backflush costing

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This topic introduces the concept of backflush costing that is used for Lean manufacturing.

Costing for Lean manufacturing enables the production flow to use the cost accumulation method that is known as backflush costing. In the backflush costing method, the direct materials that are consumed are accumulated in the production flow's work in progress (WIP) cost account. The standard cost inventory model group is used. The products that are received from the production flow are deducted from WIP at their standard cost. The main difference between backflush costing and standard cost is that, for backflush costing, variances aren't calculated per kanban or finished product. Instead, variances are calculated per production flow over a period. This method introduces a truly lean concept for reporting material consumption. Dedicated picked quantities of material aren't reported to a kanban or production order. Instead, full batches or handling units are staged to the production flow. After the batches or handling units are registered as empty, they are declared consumed. Advanced consumption might be used, depending on the [configuration of the production flow](#). Before advanced consumption can be used, organizations must allow themselves to make material vanish in the WIP of the production flow. The periodic backflush costing determines the effective value of WIP to the end of the period. This determination is based on the kanban handling units and the kanban job status. Deviations between the effective values and the actual WIP values per cost group and item are accounted and shown as variances.

Configuring backflush costing

To enable costing, you must complete the following setup:

- **Set up WIP accounts for the production group and production flow.** The WIP accounts for the production flow are specified in the production group. The backflush costing production flow calculates variances as the difference in the WIP value before and after backflush costing is run for each production flow. Therefore, we recommend that you create a WIP account for every production flow.
- **Assign a cost category to the resource group.** You must assign a cost category to the run-time category of the work cell. To determine variances by activity, you should create a cost category for every work cell. The cost categories for setup and quantity aren't considered in costing for lean manufacturing. The WIP accounts per resource group are ignored in backflush costing. For subcontracted activities, no cost category is required. The cost group that is assigned to the active service is used instead.
- **Assign cost groups.** To enable segmentation of the cost contribution in a production flow, you must assign cost groups by cost group type:
 - **Direct material cost group** - Direct material requires a cost group that identifies the material category for costing. This cost group enables an aggregated view of cost, WIP, and variances by direct material.
 - **Direct manufacturing cost group** - The direct manufacturing cost group captures the direct cost contribution of operational resources to the production flow. This cost group enables an aggregated view of cost, WIP, and variances by direct manufacturing cost.
 - **Indirect cost group** - The indirect cost group is required in order to calculate the indirect cost contribution to the production flow. This cost group enables an aggregated view of cost, WIP, and variances by indirect cost.
 - **Direct outsourcing cost group** - The cost group for the services enables an aggregated view of assigned cost and WIP, and determines the cost variances of the subcontracted services.
 - **Cost group for a finished product** - Finished products require a cost group that identifies the product category for costing. This cost group enables an aggregated view of cost, WIP, and variances by product category. The standard cost for products is calculated by using the cost calculation that is

based on the bill of materials (BOM), and either the production flow and kanban rules or the route.

Costing sheet

The costing sheet models the cost structure for the company and is built by the cost groups to classify the cost. The costing sheet has various forms. It shows cost information according to the structure that is designed in it. In the costing sheet, you also define the formula that is used to calculate the indirect cost. The calculation formula can be based on quantities, weight, volume, or value.

- **Define a costing version.** In the costing version, the company defines how the cost should be maintained. A costing version can contain a set of standard cost records or a set of planned cost records, depending on the costing type that is assigned to the costing version. The costing version that is used for costing for Lean manufacturing must be based on standard cost.
- **Assign an inventory model group for released products.** All products that are related to the production flow must be assigned to an inventory model group that uses the **Standard cost** inventory model group. Standard cost is maintained per site and activation date. For product masters, the inventory model group can be selected if the cost is maintained per variant or product master.
- **By definition, subcontracted services are non-inventoried services.** Subcontracted activities have no inventory model group. To cost a subcontracted activity correctly, you must make sure that the service activity belongs to an inventory model group where the inventory policy is set to **Stocked product = False**.

For output products, cost calculation that is based on the production flow requires that a standard cost be maintained for the services that are related to subcontracted activities. The cost group that is assigned to the services is used to determine the cost variances of the subcontracted activity.

Cost calculation for Lean manufacturing

For products that are supplied out of a production flow, the BOM calculation must be based on either a route version or a production flow. The BOM calculation calculates the cost of a product and the related breakdown to the resources and material that are required in order to build the product. The deduction from the WIP account for the production flow is done by using the breakdown of a product by item and cost group.

Calculation that is based on the production flow

Lean manufacturing for Dynamics 365 Supply Chain Management is independent of routes. The cost calculation for products that are supplied from a production flow can be based on the production flow itself. Before the calculation can be done, a kanban rule must be created that supplies the product out of the production flow. If a product can be supplied from multiple production flows at the same site on the calculation date, you can select the production flow for the BOM calculation. On the **Default production flow** page, you can configure a default production flow for each item. If multiple kanban rules exist for the same product in the same production flow that is active on the calculation date, the calculation selects the first kanban rule that is active for the calculation.

Calculation that is based on the route

Calculation that is based on a route is as valid as calculation that is based on a production flow. However, calculation that is based on a route doesn't use the costing for Lean manufacturing functionality. The route should use resource requirements for resource groups. To avoid systematic variances, it should also use the same work cells, or at least the same cost categories. Again, you should avoid cost categories for setup and quantity. They don't help calculate the cost in a more granular breakdown than Lean manufacturing cost backflushing. To determine which option (production flow or route) you should use to calculate the cost, consider the results of the cost breakdown. The version that comes closer to reality and produces fewer variances overall is the better option. In a Lean manufacturing environment where a product is supplied by a single production flow and a single kanban rule, the calculation that is based on the production flow is probably more accurate. For a product that can be supplied by Lean manufacturing and production orders on the same site, or that can have multiple production flows or multiple kanban rules in the same flow, a calculation might be

more accurate if it's based on a route version that is built specifically for the cost calculation, not for the production. The production flow calculation must be used to calculate products that involve subcontracting. The cost models for subcontracting via production orders and subcontracting in Lean manufacturing are using two different approaches. Lean manufacturing introduces a new cost group type, **Direct outsourcing**, to calculate subcontracted services.

Material consumption

When material is consumed from inventory to WIP, the cost of material is added to WIP at its actual standard cost for a cost group. This operation occurs under the following conditions:

- Kanban issues are posted for kanban picking lines that update inventory.
- Transfer jobs are completed that update inventory on pick but not receipt (Transfer of material from inventory to WIP).

Receiving products from the production flow

Products are received from the production flow under the following conditions:

- Process jobs are completed that have **Update inventory on receipt** set to **Yes**.
- Transfer jobs are completed that update inventory on receipt, but that have **Update inventory on pick** set to **No** (Transfer from WIP to inventory). This option lets you receive any products out of a production flow independently of the BOM and route configuration. The process just follows the physical flows. This option is especially suitable for receiving by-products, co-products, or scrap out of a production flow, and for correcting the cost balance of the production flow WIP accordingly.

Products that are received from the production flow are deducted from WIP.

Products in WIP

The WIP model of Lean manufacturing lets you use the kanban handling unit status to manage the material, semi-finished products, and finished products that are part of WIP.

- **Assigned** - The kanban can have consumed material that is accounted in WIP.
- **Received** - If the kanban refers to a last activity where **Update inventory on receipt** is set to **No**, it represents a full handling unit of a product or a semi-finished product that isn't registered to inventory.

Note that material in WIP isn't visible in inventory on-hand overviews. However, it's visible in the kanban quantity overviews.

Consuming products in WIP

Products in WIP are consumed when the corresponding kanban handling units are emptied. A kanban empty signal doesn't produce an active costing transaction but will take effect when the next backflush costing is run. Emptied kanban handling units are no longer accounted as on-hand and therefore calculated as consumed within the period.

Automatic empty registration

Scheduled or event kanbans can be set to automatic empty registration in the kanban rule:

- **When handling units are received** - By default, for scheduled kanbans, the material is declared as consumed when the last job of the kanban is completed. For fixed quantity kanbans, this option is recommended only for single-bin kanbans, because it returns the card to the source of demand whenever a kanban is received at the final destination.
- **When source requirement is registered** - This option is available only for event kanbans and is the

default option for them. In connection to WIP, this option is useful for keeping WIP clean, because kanbans for components in WIP are automatically emptied, and therefore consumed from WIP, when the parent kanban is prepared.

In conclusion, kanban handling units can be assigned (= in process), received (=full), or emptied. There is no partial emptying. Therefore, to enable accurate registration of consumption, it's important that you limit the product quantities of a kanban so that they are less than the consumption per period. Products that are moved to the shop floor in big batches that cover days or weeks of demand should not be consumed to WIP. Instead, these products should be kept in inventory.

Backflush costing

You should run backflush costing to periodically value the WIP and produce an end-of-period status that calculates the variances of material, labor, and indirect costs. The calculated variances are posted to the variance accounts. In the backflush costing process, all production flows of the legal entity are used in the same batch run. When backflush costing is run in a batch, the processing might be multi-threaded by production flow. The backflush period is defined by an end date. You can't post new transactions to a date when a backflush costing calculation has been run. You should never run backflush costing for the current date before the day is actually over. Backflush costing performs the following steps.

1. Determine the unused quantities in the production flow as of the period's end date. After the backflush costing is run, you can view the unused quantities on the date of the costing run in the **Unused quantities** dialog box.
2. Calculate the production flow's net realized usage over the period.
3. Clear the WIP from the realized resource consumption and products.
4. Calculate production variances to standard cost for the period. **For consumed components for the period:**
 - Financially update the net realized quantities of material that the production flow consumed over the period. The system processes in first in, first out (FIFO) order on the individual inventory transactions as to financially update the physically updated transactions for the production flow, until the net realized quantities for the period are reached.
 - Transactions are financially split to map the exact consumed quantities.
 - Unused quantities in the production flow WIP remain in physically updated status.

For production completed quantities of the period:

- Financially update the inventory transactions for the completed quantities for the period.

For the conversion cost:

- The applied conversion cost transactions (route transactions) that were recorded for the period are financially updated.
 - All direct manufacturing cost is financially updated. All kanban process jobs that are completed during the period are accumulated.
 - All indirect cost calculated for the consumed material within the period is calculated and deducted from WIP. The remaining indirect cost is posted as a variance.
5. Calculate the production variances to standard cost. The variance is calculated per cost group.

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Common sources of production variances

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This article explains various typical sources of each type of production variance.

Here are some typical sources of a **lot size** variance:

- The good quantity for a production order differs from the calculation quantity that is used in the standard cost calculation. The quantity provides the basis for amortizing constant costs.
- The value of constant costs on the production order differs from the constant costs that are used in the standard cost calculation. The constant costs on the production order can differ for several reasons. For example, the constant costs might reflect the following factors:
 - Manual changes to the production bill of materials (BOM) or route
 - The selection of a different BOM version or route version when you create the production order
 - Planned engineering changes to the BOM version or route version that is assigned to the item

Here are some typical sources of a **production price** variance:

- The cost category (and cost category price) for the reported consumption of a routing operation differs from the cost category that is used in standard cost calculation.
- The active cost for the cost category price differs from the cost category price that is used in standard cost calculation.

Here are some typical sources of a **production quantity** variance:

- You over-issue or under-issue a material component.
- You over-report or under-report the time for a routing operation.
- You over-receive or under-receive the good quantity of the parent item, relative to the order quantity. However, you issue components and report operations completely, based on the order quantity for the production order.

Here are some typical sources of a **production substitution** variance:

- You issue a material component that isn't on the production BOM.
- You manually add a component to the production BOM and report that component as consumed.
- You report an item as consumed but don't manually add it to the production BOM.
- You manually add an operation to the production route and report that operation as consumed.
- When you create the production order, you select a BOM version that differs from the BOM version that is used in the standard cost calculation.
- When you create the production order, you select a route version that differs from the route version that is used in the standard cost calculation.

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Cost categories used in production routing

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This article provides information about cost categories that apply to manufacturing environments that use routing.

Cost categories apply to manufacturing environments that use routing. They are assigned to operations resources and routing operations to define hourly costs and to segment cost contributions in a manufactured item's calculated costs. The cost groups that are assigned to cost categories classify manufacturing cost contributions, based on the operation resources and the type of activity, such as setup time and run time. The specificity of cost group assignments enables manufacturing overhead to be calculated based on routing information.

Note: In manufacturing environments, cost categories are known by several other names, such as labor rate codes or machine rate codes.

Each cost category has associated cost records and an assigned cost group. Different cost categories are required for different production purposes.

- Assign different hourly costs, depending on the operations resource. For example, the costs can differ for various types of labor skills, machines, or manufacturing cells.
- Assign different hourly costs for the setup time or run time that is associated with a routing operation.
- Assign operations resource costs based on the output quantity instead of hourly costs, such as the piece rates for paying labor.
- Provide cost group segmentation of cost contributions to a manufactured item's calculated cost. For example, you can segment of labor and machine costs.
- Provide the cost group basis for overhead calculation formulas, such as formulas for labor-related and machine-related overhead, or overhead that is related to setup and run time.

A cost category can be assigned to the setup time, the process time, and the quantity for a routing operation. When, for example, costs or cost group segmentation differs between the setup time and the process time, different cost categories should be defined and assigned to the setup time and the process time. The selective use of cost categories for setup time, process time, and quantity is determined by the route group that is assigned to an operation. The assignment of cost categories to time and quantity can be mandated by company-wide policies that are defined on the **Production control parameters** page.

Each cost category has associated costs that are based on the definition of cost records in a costing version. Use the **Cost category price** page to define the cost records for a specified costing version and site. When the cost record for a cost category is first entered, it has a status of **Pending** and an intended effective date. When you activate the cost record, the status is updated to **Current active**, and the effective date is updated to the activation date. Different cost records might reflect different sites, effective dates, or statuses. Bills of materials (BOM) calculations for a future or historical date use cost records that have the relevant effective date. The current active cost record will be used to estimate production order costs and to value reported time against a production order.

The cost record for a cost category can be site-specific or company-wide. To make a cost record site-specific, assign a site to it. Otherwise, a blank value indicates that the cost record applies to all sites in the company. Because costs can differ between sites, for example, the cost records must be defined as site-specific.

A routing operation generally inherits the cost categories that are assigned to the operations resource or master operation. When a production order is created, the routing operations in the production route reflect the

selected route version. You can override the cost categories that are assigned to the operations in the production route.

Some types of production work can apply to project time estimates and reporting. In this case, a cost category is required for production and project purposes. You must define additional project-related information when a cost category is flagged for use in projects.

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Cost categories used in Production control and Project management accounting

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Some types of production work can apply to project time estimates and reporting. This article provides information about the cost categories that you must define for these types of production work for production and project purposes.

Some types of production work can apply to project time estimates and reporting. In this case, a cost category is required for production and project purposes. When a cost category is used in production and projects, additional project-related information must be defined. For example, the hourly costs that are associated with projects can differ from the hourly costs that are associated with production. You can use the **Cost categories** page to define a cost category that is used in Production control and Project management accounting.

Note: Cost accounting has a **Project categories** page, but this page has no relationship to the functionality that is described in this topic. When you use a cost category in projects, the **Cost categories** page has additional tabs that show additional project-related information. This information includes the category group, a line property, and ledger accounts that are assigned to the cost category.

- The cost category must be assigned to a category group that supports a transaction type of **Hours**.
- The line property indicates default information about how reported time can be charged to a project.
- Typically, the ledger accounts that are related to costs and sales are defined for the category group that is assigned to the cost category. However, specific accounts can be defined for an individual cost category.

Additional buttons on the **Cost categories** page let you access project-related information about a selected cost category. For example, you can view project-related transactions, define employees or projects, define hourly costs and sales prices, and view reports.

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Display charges for a manufactured item

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The constant costs of a manufactured item reflect the operation setup times and the components that have a constant quantity or a constant scrap amount.

The calculated amount of an item's charges can be displayed with the item's unit costs. However, the charges are sometimes displayed as separate fields, and they are not included in the item's unit costs. When the charges appear as separate fields, one field displays the total amount of charges, and another field displays the costing lot size that is used to amortize the amount. The Item price page, for example, displays the charges as two separate fields. However, the Complete page displays the item's total cost per unit, and the amortized costs are included in the unit costs.

The charges for a manufactured item are always included in the item's unit cost for standard cost purposes. They can optionally be included for planned cost purposes. A policy in the costing version enforces the inclusion of charges in the cost of a manufactured item. When you activate an item's cost record, you update the charges for the item's base cost information, which is displayed in the Item price page. The charges are displayed as two separate fields, and they are not included in the item's unit cost. Each activation updates the item's base cost information, even if the activation reflects different sites. Therefore, you should view the base cost information as reference information.

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Production order cost analysis

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This article provides information about the cost analysis that you can do for completed and current production orders. You can analyze the estimated costs and actual costs by using the Price calculation page or the Cost estimates and costings report. You can view information about the estimated and actual costs (and quantity) for each component item, the routing operation, and the indirect cost.

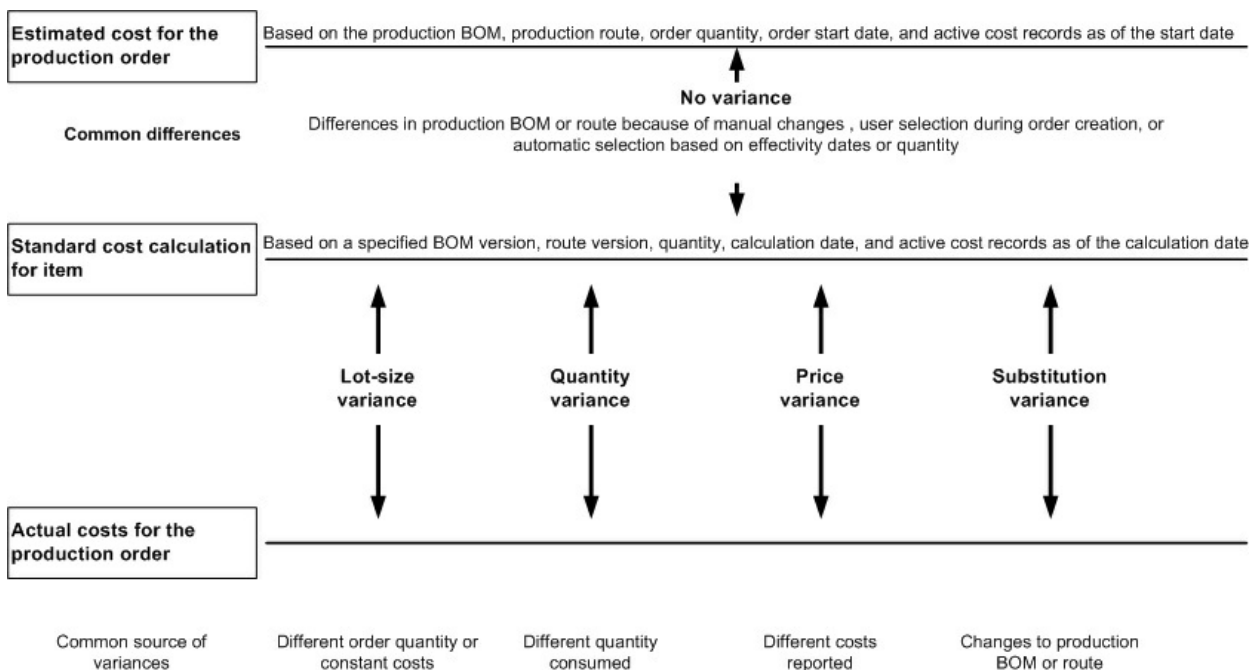
The actual costs for a production order are based on the reported consumption of material and routing operations. You can access detailed transactions about the reported consumption of material, routing operations, and indirect costs for a production order on the **Production posting** page.

Variance analysis for a completed production order

The variances reflect a comparison of the reported production activities and the calculation of standard costs for the production item. The variances don't reflect a comparison to the production order's estimated costs. The production activities that are reported include the consumption of material and routing operations, together with the associated indirect costs, and the quantity that is reported as finished. The following four types of variance are calculated:

- Lot size variance
- Production quantity variance
- Production price variance
- Production substitution variance

The following diagram shows the four variances that account for the difference between a production order's actual costs and the calculated costs within the item's cost record when the production order is ended.



You can analyze the production variances by using the **Variance** page or the **Production variance** report. Use the display options to view detailed variances by item and operations resource, or by cost group. The policy for cost breakdown in the inventory parameters determines whether the variances are tracked by cost group. You can also use the **single**, **multi**, and **total** display options to view summarized variances. The information about detailed variances can help you understand the source of each variance. To predict variances before you end a

production order, analyze the detailed information that is provided on the **Cost estimates and costings** report.

Cost analysis for current production orders

Separate reports provide information about each type of transaction. Use these reports to analyze costs for reported production activities. Information is displayed only for current production orders that have a status of **Started** or **Reported as finished**.

- **Materials in process** – This report lists the picking list transactions that are reported against the current production orders as of a specified transaction date. The report indicates the quantity of a component that was issued and the cost amount for each transaction. Use the selection criteria for a single component item. For example, you can print information about the component's issued quantity against applicable production orders. The issued quantity isn't updated by the quantities that are reported as finished for the parent item. Therefore, the actual quantity of raw materials in process might be overstated.
- **Work in process** – This report lists route transactions (or job transactions) that are reported against the current production orders as of a specified transaction date. The report indicates the hours, amount, and quantity (both good quantity and error quantity) that are reported for each transaction. It also includes information such as the operation number, operation ID, and operations resource. Additionally, this report shows the total time and amount for all transactions against the production order, and the quantity that is reported as finished.
- **Indirect costs in process** – This report lists the indirect costs that have been incurred against production orders. This data is based on reported consumption of routing operations and components as of a specified transaction date. The report indicates the type of indirect cost (surcharge or rate), the costing sheet code for the indirect cost, and the cost amount for each transaction. This report doesn't provide information about the route card or pick list transaction that generated the indirect cost.
- **In process production costing** – This report lists the combined consumption of material, routing operations, and indirect cost against the production orders as of a specified transaction date.
- **Finished items in process** – This report lists current production orders and the report-as-finished transactions as of a specified transaction date.

Additional resources

[Common sources of production variances](#)

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Production order cost estimation

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This article provides information about production cost estimation. Production cost estimation provides the projected material and capacity consumption costs of producing an item in the planned production order quantity.

After you create a production order, you must estimate production costs. The purpose is to estimate item and route consumption for the production process, because these estimates are used as the basis for subsequent scheduling and production processes.

Production cost estimation

Estimates of production costs are based on the following information:

- The quantity on the production order
- The components on the production bills of materials (BOMs)
- The routing operations in the production route
- The indirect costs that apply to the components and operations
- The active cost data as of the calculation date

If there is a phantom line item on the production BOMs, the calculations reflect the phantom's components and route operations. You can use the estimation task to recalculate estimated costs so that they reflect updated information. For example, the updated information might be changes to the quantity on the production order, the components on the production BOMs, the routing operations in the production route, the indirect costs that apply to these components and operations, or the active cost data as of the recalculation date. The calculations of estimated cost also suggest a sales price for the production item, based on a cost-plus-markup approach. The calculations of estimated cost can optionally apply to reference orders that reflect other production orders that are linked to the production order.

View the estimated costs

After you run estimation, you can view the results on the **Price calculation** page. The estimation calculates the following values:

- **Production cost** – The production cost is the top line of the estimate. It shows the complete cost of running the production order and the total sales price for the production. It's the sum of all the cost lines on the estimate.
- **Route or resource costs** – Route or resource costs are the costs for the production operations. They include the cost of elements such as setup time, run time, and overhead.
- **Material costs** – Material costs are the costs and prices of the BOM components that are required in order to produce the item. These costs have previously been established and entered into the system.

Other uses of cost estimation

A cost estimate also provides the following information:

- Meaningful price quotations
- Estimates of the profitability of the order
- Estimates of raw material usage

- Comparisons of cost information from previous productions
- Budget and forecasting information
- Estimates of the production size that is required in order to maintain a particular cost

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View current WIP status on a production order

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This procedure shows how to view WIP statement on a production order. The demo data company used to create this procedure is USMF. This procedure is intended for the cost controller.

1. Click Cost administration.
2. Click Production orders.
3. Use the Quick Filter to filter on the Production field with a value of 'p000153'.
4. On the Action Pane, click Manage costs.
5. Click Production WIP statement.
6. In the From date field, set the date to '2012-12-01'.
7. In the To date field, set the date to '2012-12-31'.

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Compare active, estimated, and realized costs on a production order

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This procedure shows how to view reasons for high production variance for a production order. The demo data company used to create this procedure is USMF. This procedure is intended for the cost controller.

1. Click Cost administration.
2. In the Date field, enter or select a value.
 - This procedure uses the fiscal year 2012. You can set From date to January 1, 2012 and To date to December 31, 2012.
3. Click the High production variances tab.
4. Click to follow the link in the Production field.
 - Click P000116 to follow the link in the Production field.
5. On the Action Pane, click Manage costs.
6. Click View cost comparison.
7. Click Close.

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Production posting

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This article provides information about different types of postings in the production process.

Production posting activities follow production processes that are described in the sections below.

Material consumption

Materials are registered as consumed during production when the production picking list journal is posted. This process generates issue transactions that deduct the on-hand inventory. In the production parameters, you can specify whether the value of raw materials that are in progress (work in process [WIP]) should be posted in the ledger. The value of raw materials that are in progress (WIP) is then posted to a dedicated Picking list account and a dedicated Picking list offset account.

Time consumption

The time that workers spend on production jobs is recorded in the Route card journal or the Job card journal. When these journals are posted, ledger posting to a dedicated account for resources that are in progress (WIP) is processed. This posting represents the value of the time that is spent on the production order. After the production order is registered as ended, the WIP accounts are settled.

Reporting finished goods and error quantities

When a production order is reported as finished, the quantity of the finished goods that have been completed is updated in Inventory management through the Report as finished journal. If you're using WIP accounting, which can be set up in the production parameters, a ledger journal is made to reduce the WIP accounts and increase the inventory of the finished goods. The journal uses the standard cost that is defined for the product.

Ending the production order

Before a production order is ended, actual costs are calculated for the quantity that was produced. All estimated costs of material, labor, and overhead are reversed and replaced with actual costs. The overall cost of the finished item is debited from the inventory Receipt account and credited to the inventory Issues account. If you select the **End job** check box when you run the cost calculation, the status of the production order is changed to **Ended**. This status prevents any additional costs from being unintentionally posted to a completed production order. You can specify that the value of error quantities that are reported during reporting as finished should be allocated to the good quantities that are reported as finished. Alternatively, you can specify that the value of error quantities should be posted to a dedicated scrap account.

Controlling the level of ledger posting

In the **Production control parameters**, you can use the **Ledger posting** field to set the level of ledger posting for production processes. The following values are available:

- **Item and resource** – Use the ledger accounts that are set up on the item groups for raw materials and finished goods. WIP for time consumption is taken from resource or resource group from the route operations.
- **Item and category** – Use the ledger accounts that are set up on the item groups for raw materials and finished goods. WIP for time consumption is taken from the cost categories that are associated with the route

operations.

- **Production groups** – Use the ledger accounts that are set up on the production groups for both material and time consumption. The production groups are associated with the released products and copied to the production orders when those orders are created. The posting on the production orders will then follow the production groups that are associated with the production order.

Note: If the standard method for calculating the cost of the finished item was used, the final transactions reflect this fact. If actual costs and the costs that are calculated by using the standard method differ, the difference is posted to the account that shows profit or loss.

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Set up products that can be produced or procured

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Products can be sourced in various ways - they can be produced (manufactured) or procured (purchased). This article describes some typical points to consider when you configure products to support multi-sourcing.

Multi-sourcing is typically used for a purchased item that is occasionally manufactured, or when an item that was primarily a manufactured item is changed so that it's now primarily a purchased item. The item is first designated as a manufactured item, so that bill of materials (BOM) and route information can be defined, and to support production orders for the item. The production type should be set to **BOM** (or, for process manufacturing, **Formula** or **Co-Product**).

When you use standard cost, the item cost record can be calculated for the manufactured item. However, the item cost record might not match the standard cost that you want for purchasing purposes. In this case, the standard cost must be manually entered and activated for the item cost record. For the cost calculation, consider using a special BOM and route that represent the supply mix of the product over the course of a fiscal period, to minimize the variances over time. Additionally, a manufactured item at one site can be transferred to another site. Therefore, the item's cost must be manually entered and activated for the site that the item is transferred to. When you use the manufactured item as a component in higher-level products, the component's costs should be treated as a purchased item. This guideline applies, regardless of whether the component's costs were calculated or manually entered. In other words, a BOM calculation should treat the item's costs as a purchased component instead of using the item's BOM and route information to calculate costs.

To prevent the calculation from occurring, select the **Stop explosion** flag that is embedded in the BOM calculation group that is assigned to the item. To prevent master scheduling calculations from exploding requirements through the item, set the explosion fence to 0 (zero) days in item coverage or in the coverage group. The master scheduling calculation will then treat the item as a purchased item and won't perform more calculations for the item's BOM and route information.

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Total cost allocation method

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Total cost allocation (TCA) is a method of calculating the cost between the main formula item for a batch order and the co-products that are defined for the formula. This method is dynamic. It calculates the cost as a weighted average between the quantities that are reported as finished for the formula item and the co-products. When TCA is used, you don't have to review cost allocations for every batch order. If TCA isn't used, the formula calculation uses existing functionality.

Using TCA for coproducts

Here are some of the guidelines for using TCA for co-products:

- If you set the **Total Cost Allocation** slider to **Yes** for a formula version, co-products must have a cost price that is more than 0 (zero). The value can be retrieved from the active cost version for the same site, or for the first site for a formula that isn't site-specific. This condition is validated when the formula is approved.
 - You don't need to manually enter cost allocation percentages for co-products. Instead, the system automatically creates the cost allocation percentage as the average of active cost prices of co-products.
 - You don't need to enter standard cost for non-standard cost items that are co-products. There are two types of costing versions in the system: standard cost and planned cost
 - If an item isn't valued by the standard cost valuation method, we recommend you use an active cost price in the planned cost version. This price is used for cost estimation, for example, BOM calculation, production cost estimation, and fallback price in the inventory valuation process.
- If you set the **Total Cost Allocation** slider to **Yes** for the formula version and the following conditions are true, the method of cost allocation is **TCA**, and the percentage of cost allocation is unchanged:
 - You added co-products.
 - You used a different method of cost allocation for the co-products.
- If you set the **Total Cost Allocation** slider to **No** for the formula version and the following conditions are true, the method of cost allocation is changed to **Manual**, and the percentage of cost allocation is unchanged:
 - You added co-products.
 - The percentage of cost allocation is more than 0 (zero).
- Before you can successfully perform a formula calculation, you must estimate the percentages of cost allocation. You can complete this step either manually or by using the **Estimate cost** option on the **Co-products** page. **Note:** The **Estimate cost** option is available only when the **Total Cost Allocation** slider is set to **Yes** for the formula version. You can view the expected allocation if the batch order quantities that are reported as finished match quantities that appear on the formula.
- When a batch order is created manually or a planned batch order is firmed, the value of the **Total Cost Allocation** slider for the formula version is copied to the batch order. However, you can change this setting on the batch order. If the **Total Cost Allocation** slider is set to **No** for the formula version and then changed to **Yes** for the batch order, the method of cost allocation for each line that was set to **Manual** is changed to **TCA**. A cost allocation of **None** is unchanged. If the **Total Cost Allocation** slider is set to **Yes** for the formula version and then changed to **No** for the batch order, the method of cost allocation for each co-product of the **Production** type is changed to **Manual**. Any estimated percentage

of cost allocation is unchanged.

- The **Co-product cost allocation** page shows the calculated cost allocation percentage. You can open this page from the **Batch order** page. This information is useful when the products and quantities that are reported differ from the scheduled or started quantities on the batch order. When the cost is complete, these new percentage allocations from TCA are shown on the **Co-product cost allocation** page.

Calculating the burden for byproducts

The **By-product cost allocation** field on the **Co-products** page is an enumerator field that is used only for by-products. For co-products, the value of this field is always **None**. For by-product lines, this field determines how the cost amount for the by-product line is added to the total cost of the production. The following options are available:

- **None** — No amount is added to the total cost of the production for this by-product line.
- **Percent** — The cost amount is calculated as a percentage of the total cost of raw materials that are consumed in the production. The percentage that is used for the calculation is entered in the field.
- **Per series** — The cost amount is calculated as an amount per standard batch size of the production order. This amount is independent of the reported quantity in the production. The amount that is used for the calculation is entered in the field.
- **Per quantity** — The cost amount is calculated as an amount per reported quantity of the formula item in the production. The amount that is used for the calculation is entered in the field.

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Amortize constant costs for a manufactured item

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A manufactured item's constant costs reflect the operation setup times and the components that have a constant quantity or a constant scrap amount.

The concept of a costing lot size is used to amortize these constant costs in the calculated cost of a manufactured item. This concept has several synonyms, one of which is accounting lot size. The concept of amortizing constant costs also has several synonyms, one of which is proportional constant costs.

The quantity of a costing lot size for a manufactured item is used in a bill of material (BOM) calculation. The quantity depends on how you initiate and perform the BOM calculation, as illustrated by the following:

- Default calculation quantity in an item's BOM calculation – The item's standard order quantity for inventory acts as the costing lot size, but the default value might be a greater quantity to reflect the item's order quantity multiple. The item's standard order quantity and multiple can be defined within its default order settings or site-specific order settings.
- Specified calculation quantity in an item's BOM calculation – The specified calculation quantity acts as the costing lot size for the item. The calculation quantity initially uses the item's standard order quantity, but the default value can be manually overridden. The specified calculation quantity represents the costing lot size for the specified item, and for manufactured components that have a BOM line type of production. This is because it is assumed that the component will be produced to the exact quantity. The costing lot size for other manufactured components that have a BOM line type of item will reflect their standard order quantity.
- Specified make-to-order calculation quantity in an item's BOM calculation – The specified calculation quantity acts as the costing lot size for the item and its manufactured components when BOM calculations use a make-to-order explosion mode. It is assumed that the manufactured components will be produced to the exact quantity, just like a manufactured component that has a BOM line type of production.
- Specified calculation quantity in an order-specific BOM calculation – An order-specific BOM calculation can be performed for a line item on a sales order, sales quotation, or service order. The specified calculation quantity uses the quantity on the originating line item, but the default quantity can be overridden. You can select whether the order-specific BOM calculation uses a make-to-order or multilevel explosion mode.

The calculated amount of a manufactured item's amortized constant costs is termed charges.

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Cost management Power BI content

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Overview

The **Cost management** Microsoft Power BI content is intended for inventory accountants or individuals in the organization who are responsible for or interested in the status of inventory or work in progress (WIP), or who are responsible for or interested in analyzing standard cost variances.

NOTE

The **Cost management** Power BI content described in this this topic applies to Dynamics 365 Finance and Operations 8.0.

The **Cost management** Power BI content pack, available on the AppSource site, has been deprecated. For more information about that deprecation, see [Removed or deprecated features for Finance and Operations](#).

This Power BI content provides a categorized format that helps you monitor the performance of inventories and visualize how cost flows through them. You can gain managerial insights such as the turnover ratio, number of days that inventory is on hand, accuracy, and "ABC classification" at your preferred aggregated level (company, item, item group, or site). The information that is made available can also be used as a detailed supplement to the financial statement.

The Power BI content is built on the **CostObjectStatementCacheMonthly** aggregated measurement, which has the **CostObjectStatementCache** table as its primary data source. This table is managed by the Data set cache framework. By default, the table is updated every 24 hours, but you can change the update frequency or enable manual updates in the configuration of the data set cache. Manual updates can be run in either the **Cost administration** workspace or the **Cost analysis** workspace.

After every update of the **CostObjectStatementCache** table, the **CostObjectStatementCacheMonthly** aggregated measurement must updated before data in the Power BI visualizations is updated.

Accessing the Power BI content

The **Cost management** Power BI content is shown in the **Cost administration** and **Cost analysis** workspaces.

The **Cost administration** workspace contains the following tabs:

- **Overview** – This tab shows application data.
- **Inventory accounting status** – This tab shows Power BI content.
- **Manufacturing accounting status** – This tab shows Power BI content.

The **Cost analysis** workspace contains the following tabs:

- **Overview** – This tab shows application data.
- **Inventory accounting analysis** – This tab shows Power BI content.
- **Manufacturing accounting analysis** – This tab shows Power BI content.
- **Std. cost variance analysis** – This tab shows Power BI content.

Report pages that are included in the Power BI content

The **Cost management** Power BI content includes a set of report pages that consist of a set of metrics. These metrics are visualized as charts, tiles, and tables.

The following tables provide an overview of the visualizations in the **Cost management** Power BI content.

Inventory accounting status

REPORT PAGE	VISUALIZATION
Inventory overview	Beginning balance
	Net change
	Net change %
	Ending balance
	Inventory accuracy
	Inventory turnover ratio
	Days inventory on-hand
	Active product in period
	Active cost objects in period
	Balance by item group
Inventory overview by site and item group	Balance by site
	Statement by category
	Net change by quarter
	Inventory accuracy by site
	Inventory turnover ratio by site
	Inventory ending balance by site
	Inventory accuracy by item group
	Inventory turnover ratio by item group
	Inventory ending balance by site and item group
	Inventory statement
Inventory statement by site	Inventory statement by site
	Inventory statement
Inventory statement by product hierarchy	Inventory statement by site

REPORT PAGE	VISUALIZATION
-------------	---------------

Manufacturing accounting status

REPORT PAGE	VISUALIZATION
WIP overview YTD	Beginning balance
	Net change
	Net change %
	Ending balance
	WIP turnover ratio
	Days WIP on-hand
	Active cost object in period
	Net change by resource group
	Balance by site
	Statement by category
	Net change by quarter
WIP statement	Beginning balance
	Ending balance
	WIP statement by category
WIP statement by site	Beginning balance
	Ending balance
	WIP statement by category and site
WIP statement by hierarchy	Beginning balance
	Ending balance
	WIP statement by category hierarchy

Inventory accounting analysis

REPORT PAGE	VISUALIZATION
Inventory details	Top 10 resources by ending balance

REPORT PAGE	VISUALIZATION
	Top 10 resources by net change increase
	Top 10 resources by net change decrease
	Top 10 resources by inventory turnover ratio
	Resources by low inventory turnover ratio and ending balance above threshold
	Top 10 resources by low accuracy
ABC classification	Inventory ending balance
	Consumed material
	Sold (COGS)
Inventory trends	Inventory ending balance
	Inventory net change
	Inventory turnover ratio
	Inventory accuracy

Manufacturing accounting analysis

REPORT PAGE	VISUALIZATION
WIP trends	WIP ending balance
	WIP net change
	WIP turnover ratio

Std. cost variance analysis

REPORT PAGE	VISUALIZATION
Purchase price variance (Std. cost) YTD	Procured balance
	Purchase price variance
	Purchase price variance ratio
	Variance by item group
	Variance by site
	Purchase price by quarter

REPORT PAGE	VISUALIZATION
	Purchase price by quarter and Item group
	Top 10 resources by unfavorable purchase price ratio
	Top 10 resources by favorable purchase price ratio
Production variance (Std. cost) YTD	Manufactured cost
	Production variance
	Production variance ratio
	Variance by item group
	Variance by site
	Production variance by quarter
	Production variance by quarter and variance type
	Top 10 resources by unfavorable production variance
	Top 10 resources by favorable production variance

Understanding the data model and entities

Data from the application is used to fill the report pages in the **Cost management** Power BI content. This data is represented as aggregate measurements that are staged in the entity store, which is a Microsoft SQL Server database that is optimized for analytics. For more information, see [Power BI integration with Entity store](#).

The key aggregate measurements of the following objects are used as the basis of the Power BI content.

OBJECT	KEY AGGREGATE MEASUREMENTS	DATA SOURCE FOR FINANCE AND OPERATIONS	FIELD
CostObjectStatementCache Monthly	Amount	CostObjectStatementCache	Amount
CostObjectStatementCache Monthly	Quantity	CostObjectStatementCache	Qty
CostInventoryAccountingKPIGoal	AnnualInventoryTurn	CostInventoryAccountingKPIGoal	AnnualInventoryTurn
CostInventoryAccountingKPIGoal	InventoryAccuracy	CostInventoryAccountingKPIGoal	InventoryAccuracy

The following table shows the key calculated measurements in the Power BI content.

MEASURE	CALCULATION
Beginning balance	Beginning balance = [Ending balance]-[Net change]
Beginning balance qty.	Beginning balance qty. = [Ending balance qty.]-[Net change qty.]
Ending balance	Ending balance = (CALCULATE(SUM([Amount]), FILTER(ALL(FiscalCalendar) ,FiscalCalendar[MONTHSTARTDATE] <= MAX(FiscalCalendar[MONTHSTARTDATE])))
Ending balance qty.	Ending balance qty. = CALCULATE(SUM([QTY]), FILTER(ALL(FiscalCalendar),FiscalCalendar[MONTHSTARTDATE] <= MAX(FiscalCalendar[MONTHSTARTDATE])))
Net change	Net change = SUM([AMOUNT])
Net change qty.	Net change qty. = SUM([QTY])
Inventory turnover ratio by amount	Inventory turnover ratio by amount = if(OR([Inventory average balance] <= 0, [Inventory sold or consumed issues] >= 0), 0, ABS([Inventory sold or consumed issues])/[Inventory average balance])
Inventory average balance	Inventory average balance = (([Ending balance] + [Beginning balance]) / 2)
Days inventory on-hand	Days inventory onhand = 365 / CostObjectStatementEntries[Inventory turnover ratio by amount]
Inventory accuracy	Inventory accuracy by amount = IF([Ending balance] <= 0, IF(OR([Inventory counted amount] <> 0, [Ending balance] < 0), 0, 1), MAX(0, ([Ending balance] - ABS([Inventory counted amount]))/[Ending balance]))

The following key dimensions are used as filters to slice the aggregate measurements, so that you can achieve greater granularity and gain deeper analytical insights.

ENTITY	EXAMPLES OF ATTRIBUTES
Products	Product number, Product name, Unit, Item groups
Category hierarchies (Assigned to role Cost management)	Category hierarchy, Category level
Legal entities	Legal entity names
Fiscal calendars	Fiscal calendar, Year, Quarter, Period, Month
Site	ID, Name, Address, State, Country

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Troubleshoot cost management

2/18/2021 • 5 minutes to read • [Edit Online](#)

This topic describes how to fix issues that you might encounter while working with cost management.

Functional gaps between the inventory value/aging reports and their storage versions

The [Inventory aging report storage](#) and [Inventory value storage report](#) features enable Supply Chain Management to display large volumes of inventory transactions. In each case, the report results are saved for browsing and exporting, unlike with the non-storage versions of these reports. However, some functionality that exists in the non-storage versions of these reports doesn't exist in the storage versions. The following subsections summarize the differences and provide workarounds.

Storage reports don't include subtotals, even if they are enabled in the report layout

Subtotals can cause issues when the result is exported, especially if users change the record sequence.

To check the subtotals, you can export the result into Microsoft Excel. Alternatively, if you want to check subtotals within Supply Chain Management, use [Feature management](#) to enable the *New grid control* and *(Preview) Grouping in grids* features, which provide a much more flexible way to see the subtotal for any group by column. For more information, see [Grid capabilities](#).

Inventory value storage report doesn't support ledger account information

You can run the trial balance to get the inventory accounts balance and compare that to the **Inventory value storage** report.

Warnings or errors are shown when changing a ledger period status without closing inventory

Microsoft introduced the following validations to prevent issues caused by an incorrect period-end process around costing. If you encounter any of the following error messages, refer to [KB 4561987](#) for more information about how to resolve these issues.

- You are about to execute a Recalculation with a date %1 (10-02-2019). The last registered Recalculation was executed in a previous period with a date %2 (20-01-2019). No execution of an inventory close with a date %3 (31-01-2019) matching period end has been registered. Please remember to execute an inventory close as of %3 (31-01-2019) matching the period end. The valuation of inventories, cost of goods sold, and variances may not be correct in subledger or general ledger until this has been executed.
- You are about to change the status of ledger period %1 to %2. No execution of inventory close with a date %3 matching period end has been registered. Please execute an inventory close as of %3 matching the period end before changing the status. The valuation of inventories, cost of goods sold, and variances may not be correct in subledger or general ledger until this has been executed. Reported from legal entity %4. For now, it is informational, but you will be required to perform such action in future.
- The Account structure %1 has been changed. One or more main accounts %2 no longer exist. These Main accounts are required by the %3 with a date %4. Please add these Main accounts to the Account structure %1 before you can resume the %3 job. For now, it is informational, but you will be required to perform such action in future.
- You are about to execute an inventory close with a date %1 (31-01-2019). No execution of backflush

costing calculation with a date %2 (31-01-2019) matching period end has been registered. Please remember to execute a backflush costing calculation with a date of %3 (31-01-2019) matching period end. The valuation of inventories, cost of goods sold, and variances may not be correct in subledger or general ledger until this has been executed.

- You are about to execute a backflush costing calculation with a date %1 (28-02-2019). The last registered backflush costing calculation was executed in a previous period with a date %2 (31-01-2019). No execution of an inventory close with a date %3 (31-01-2019) matching a period end has been registered. Please remember to execute an inventory close as of %3 (31-01-2019) matching a period end. The valuation of inventories, cost of goods sold and variances may not be correct in subledger or general ledger until the inventory close has been executed.

Inventory aging report discrepancies

The **Inventory aging report** shows different values when viewed at different storage dimensions (such as site or warehouse). For more information about the reporting logic, see [Inventory aging report examples and logic](#).

An update conflict occurs when the inventory valuation method is either Standard cost or Moving average

When you post documents such as inventory journals, purchase order invoices, or sales order invoices in parallel for scalability and performance, you might receive an error message about an update conflict, and some of the documents might not be posted. This issue can occur when the inventory valuation method is either *Standard cost* or *Moving average*. Both these methods are perpetual costing methods. In other words, the final cost is determined at the time of posting.

If you're using the *Moving average* method, the error message resembles this example:

```
Inventory value xx.xx is not expected after the proportional expense calculation
```

If you're using the *Standard cost* method, the error message resembles this example:

```
The standard cost does not match with the financial inventory value after the update. Value = xx.xx, Qty = yy.yy, Standard cost = zz.zz
```

Until Microsoft releases a solution to fix the issue, consider using the following workarounds to help avoid or reduce these errors:

- Repost the failed documents.
- Create documents that have fewer lines.
- Avoid decimal values in the standard cost. Try to define the standard cost so that the **Price quantity** field is set to *1*. If you must specify a **Price quantity** value that is more than *1*, try to minimize the number of decimal places in the unit standard cost. (Ideally, there should be fewer than two decimal places.) For example, avoid defining standard cost settings such as **Price** = *10* and **Price quantity** = *3*, because they will produce a unit standard cost of 3.333333 (where the decimal value repeats).
- In a majority of documents, avoid having multiple lines that hold the same combination of product and financial inventory dimensions.
- Reduce the degree of parallelization. (In this case, your system might become faster, because fewer update conflicts and retries occur.)

NOTE

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Reporting and analytics with Power BI home page

2/18/2021 • 2 minutes to read • [Edit Online](#)

This topic points you to resources that you can use to learn more about the business intelligence (BI) and reporting tools that are available.

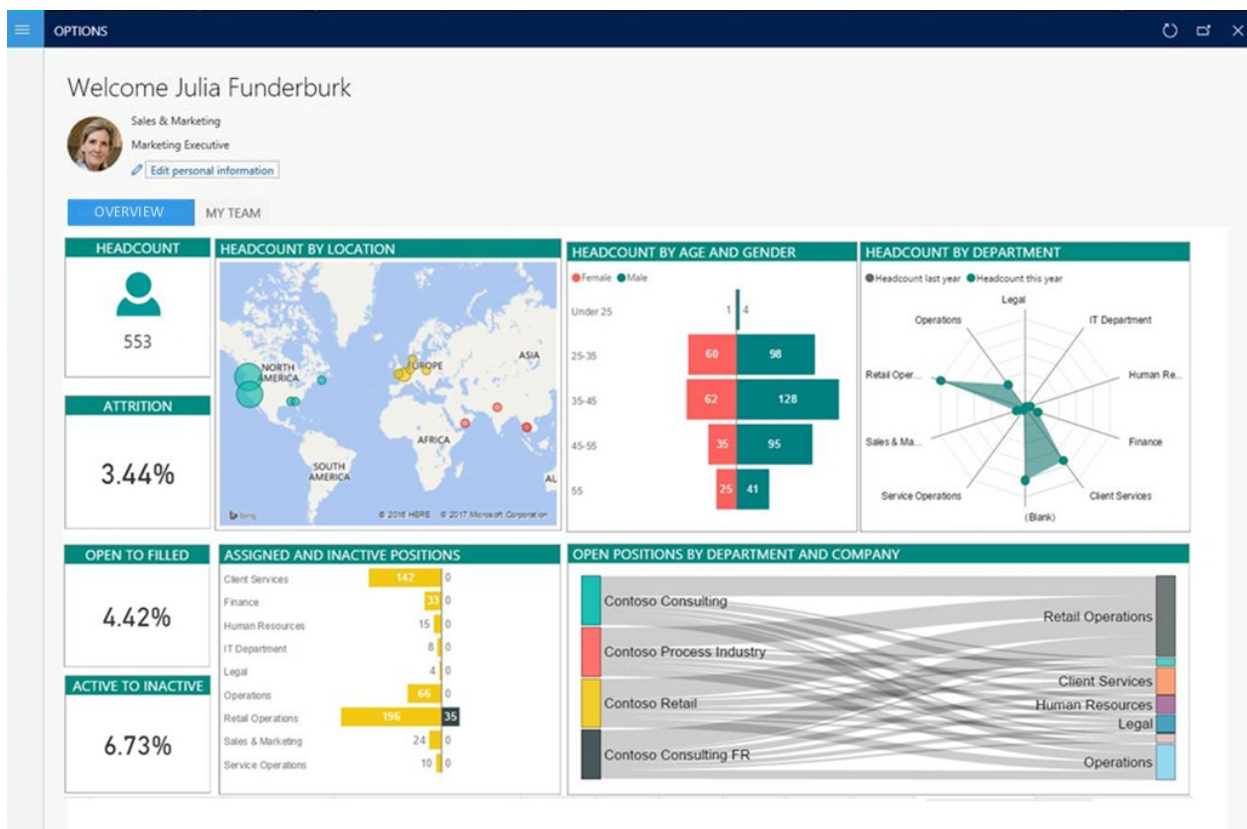
Get started

- [Information access and reporting](#)
- [Tech Talk: Reporting options](#) (video)
- [Finance and Operations: Power BI Analytics & Reporting Services blog](#) (blog)

Analytical workspaces

Workspaces can use rich infographics and visuals that are supported by Microsoft Power BI. These infographics and visuals include many controls that are provided by third parties. Therefore, workspaces can provide a highly visual, interactive experience for users.

Users can interact with data by clicking or touching visuals on the page. They can see cause and effect, and do simple what-if operations without leaving the workspace. Thanks to stunning, interactive visuals, your users will have fun exploring data and discovering hidden trends.



To learn more, see the following topics:

- [Embedded Power BI in workspaces](#)
- [Power BI Embedded integration](#)
- [Add analytics to workspaces by using Power BI Embedded](#)
- [Help secure analytical workspaces and reports by using Power BI Embedded](#)

- [Power BI content home page](#)

Business documents and printing

Reporting solutions are often used to capture and communicate the details of business transactions. Therefore, a reporting solution must be able to produce physical manifestations of business data by using existing devices, such as network printers. Examples of business documents include sales invoices, customer statements, and checks.

The image shows a configuration window for a 'Customer account statement' on the left, which is linked by a blue arrow to a sample 'Microsoft' sales invoice on the right. The configuration window includes sections for 'Parameters', 'Criteria', 'Maturity Distribution', and 'Destination'. The sales invoice displays the Microsoft logo, address, invoice number (CIV-000576), date (30 November 2012), and total amount (\$315,479.00). It features a table of items with columns for Item, Description, Quantity, Sales Price, Discount, and Amount. The invoice also includes a 'METHODS OF PAYMENT' section and 'OTHER INFORMATION'.

User parameters

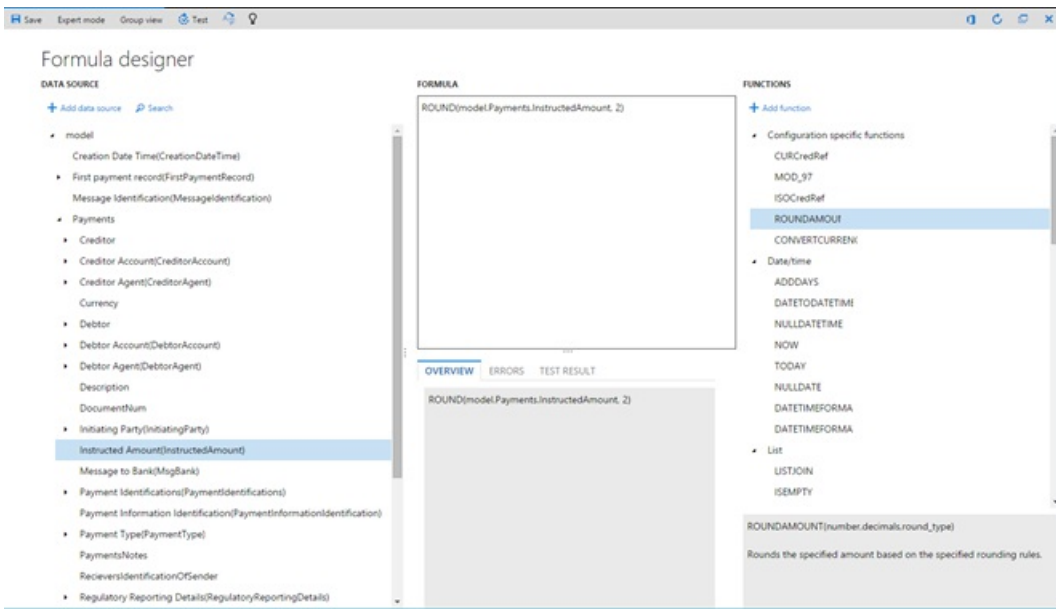
Paginated document

To learn more, see the following topics:

- [Document Reporting Services](#)
- [Document printing overview](#)
- [Install the Document Routing Agent to enable network printing](#)

Electronic reporting

Electronic reporting (ER) is the tool that you use to configure electronic document formats that comply with the legal requirements of various countries or regions. The applications of electronic reporting include financial auditing, tax reporting, and electronic invoicing.

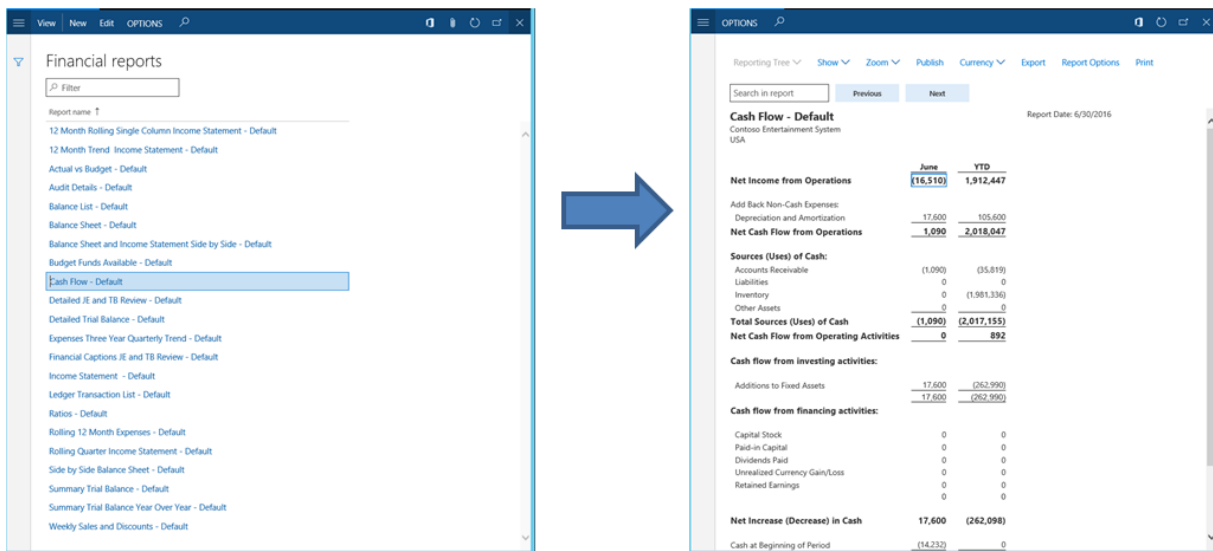


To learn more, see the following topics:

- [Electronic reporting \(ER\) overview](#)
- [MManage the Electronic reporting \(ER\) configuration lifecycle](#)
- [Create Electronic reporting \(ER\) configurations](#)

Financial reporting

Standard financial reports are provided that use the default main account categories. You can use the report designer to create or modify traditional financial statements, such as income statements and balance sheets. You can then share the results with other members of your organization. Examples of financial reporting include balance sheets, cash flow, and summary trial balance year over year.



Standard templates (GL > Inquiries > Financial reports)

Interactive financial reports

To learn more, see the following topics:

- [Financial reporting](#)
- [Generate financial reports](#)
- [Financial report components](#)

Technical reference reports

The following reports provide reference information about the objects:

- [Find information about standard data entities](#)
- [License codes and configuration keys report](#)
- [SQL Server Reporting Services \(SSRS\) reports that are available](#)
- [Workflow types report](#)

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Information access and reporting

2/18/2021 • 11 minutes to read • [Edit Online](#)

This topic explains the various reporting options available as part of the platform.

Why information access is important

Information access is an essential part of an ERP solution and represents a significant portion of the user engagement with the system. Consider the numerous methods of capturing information related to daily activities and the level of investments required to manage the data. Employees depend on logical interpretations of massive amounts of data to stay on top of their daily tasks. Out of the box the platform provides a collection of reporting solutions to address the various information access needs of an ERP solution. In an increasingly competitive environment, mergers and acquisitions seem to occur as often as the change in seasons. More than ever before, businesses today are finding ways to expand their global reach to attract more customers. To be successful, they must adapt legacy solutions used to communicate with customers and prepare for the enforcement of regional regulatory requirements associated with new markets. Beyond the primitive functions provided by Microsoft Azure – compute, networking, storage, and authentication – the platform provides tools to manage resources for organizations that span in size from small businesses to global enterprise conglomerates. These tools are designed with flexibility in mind, to accommodate a dynamic world of business.

What is a "report" in the application?

A *report* can be defined simply as a structured presentation of data. Under ideal circumstances, reports materialize data in such a way that it allows the user to make informed decisions. The application supports a broad spectrum of information access scenarios: cross company all-up financial reporting; analytical dashboards and tiles; electronically transferable funds; customer sales invoices; checks and tax documents; and many more. Examples of integrated report scenarios that involve the consumption of business data include:

- **Native controls** including list pages, grid controls, and chart visualizations.
- **Dashboards and workspaces** containing predefined and personalized views.
- **Financial reporting** providing all-up views across legal entities.
- **Structured documents** distributed internally to employees or externally to customers and vendors.

Although each of these scenarios at its core involves the presentation of structured business data, the process of accessing these reports and how the results are subsequently consumed varies greatly. Flexibility in the user tooling is essential for scenarios that involve data exploration. By contrast, layout precision is required for compliance with most regulatory documents. Given the diversity of information access scenarios it's understandable that not all reports are created equal. This topic is intended to help familiarize you with the various reporting options available as part of the platform.

Common myths of reporting

To become a proficient *report maker*, it's often useful to let go of past inhibitions. The following section seeks to rebuke three common myths about reporting.

- **Myth #1: Operational reports require "real-time" data** To the contrary, there are relatively few reporting scenarios that require *real-time* results. And, in the grand scheme of things, taking a critical stance on a request for *real-time* views is recommended given the high development costs and potential heavy burden these solutions may incur on production environments.
- **Myth #2: The best tool is the one the developer is most comfortable using** Consider a customer

request for a report that allows them to monitor company's assets. In the past, a developer would build a static report displaying a list of inventory items with complex calculations relying entirely on the user to provide filters to sufficiently reduce the result set. This solution may function perfectly in developer environments with a reduced data set. However, this approach is prone to unnecessarily consume significant amounts of compute resources when utilized in production.

- **Myth #3: Developers are good at creating visually compelling designs** In reality, developers are the often the worst offenders when it comes to producing elegant design layouts that will appeal to the customer's aesthetic preferences. When it comes to analytical reports you're better off empowering users to both explore the data directly and share personalized views.

Understanding report requirements

The best reporting solutions are designed with the expertise, daily functions, and information access needs of the target user in mind. The platform offers several tools designed to meet the functional requirements which are common across various reporting experiences. Without question, selecting the right tool that most effectively addresses the *need* requires a clear understanding of the customer experience. You can drastically increase your chances of delivering a complete and robust solution that fully satisfies customer requirements by simply asking the right questions. Here are some leading questions to ask when evaluating customer requirements for reporting solutions:

- **Get to know the user**
 - What is the proficiency of the target persona? Are they familiar with analytical tools like Microsoft Excel?
 - Does the user require a guided parameter experience to refine the dataset?
 - How frequently will the report be accessed?
- **Familiarize yourself with the data**
 - Are they looking for transactional, analytical, and/or predictive information?
 - Does the shape of the data change and if so, how often?
 - Will the report include data from external sources?
- **Determine how the results will be used**
 - Are you going to explore the data to gain insights?
 - How will the results be shared with others?
 - Is there a fixed document structure for the target output?

It's understandable that customers *want* a solution that aligns with the existing processes they are comfortable using. However, there's a lot you can learn through these leading questions used to discover what the customer actually *needs* to be successful in their task. Delight your customers by providing them with solutions that empower them to be more productive.

Reporting experiences

Information access scenarios supported in applications can be broken down into five distinct reporting experiences. Specialized tools are provided to meet the complex and diverse reporting needs of various functions throughout the organization.

- **Operational views** – Designed to address the specific needs of a given business persona.
- **Business documents** – Static documents used to capture and exchange processed business data.
- **Analytical tools and visualizations** – Personalized presentations of logical calculations that allow the user to explore their data.
- **Electronic reporting** – Tool used to configure formats for electronic documents.

- **Financial reporting** – Designed to provide in-depth accounting management tools based on standard views of financial activities across legal entities.

Scorecard

The following table can be used as a guide when choosing the right tool for the reporting solution.

MAKER	OPERATIONAL VIEWS	BUSINESS DOCUMENTS	ANALYTICAL TOOLS & VISUALIZATIONS	ELECTRONIC REPORTING	FINANCIAL REPORTING
Persona	Developer	Developer	Power user	Power user	Power user
Authoring tool	Visual Studio	Visual Studio	PowerBI.com PowerBI app	Excel	Management Reporter Designer
Time to market	Weeks	Weeks	Hours	Hours	Hours
Data sources	Entity DB OLTP	OLTP	Entity DB Azure Catalog	OLTP	OLTP
Effort	Days	Days	Minutes	Hours	Hours
VIEWER	OPERATIONAL VIEWS	BUSINESS DOCUMENTS	ANALYTICAL TOOLS & VISUALIZATIONS	ELECTRONIC REPORTING	FINANCIAL REPORTING
Target	Organization	Back Office	Power user	Power user	Finance officers
Data accuracy	Near real-time	Real-time	Near real-time	Real-time	Cached views
Personalization	Medium-Modeled	None	High - Free form designer	Low - Expressions	Medium - Modeled
Sharing	None	PDF export O365 export Email	Dashboards Reports Tiles	Excel export	Excel export
Printing	Screen captures	Local printer Network devices	Screen captures	Excel	Local printer
Automation	Auto-refresh	Batch integration	Scheduled refresh	Batch jobs	None
Scenarios	Monitoring	Transactions	Exploratory	Transactions	Accounting

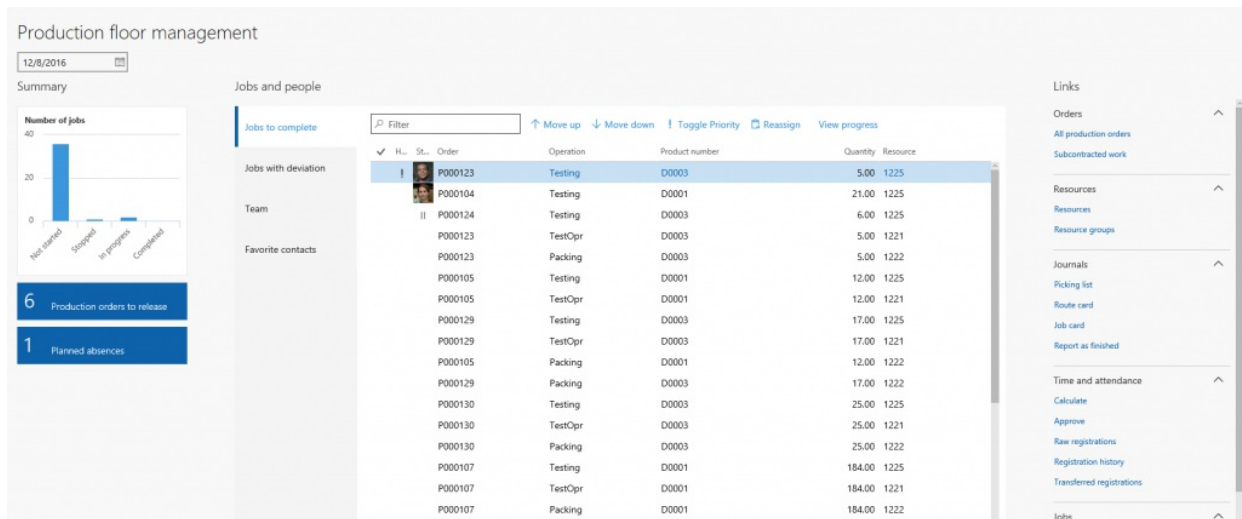
NOTE

"Near real-time" denotes processed data that is slightly slower than real-time.

Operational views

Operational views represent an essential part of the average employee's daily life. As important as a brush is to a painter, operational views are used to empower people to be productive. These views contain logical presentations of data to help the user discover patterns, highlight anomalies, and act on the most important

tasks. Targeted experiences are used to satisfy the unique information access requirements for a given persona. These views provide actionable controls that help to maximize efficiency for common user actions. Learn more about constructing custom operational workspaces in [Build operational workspaces](#). Example applications of operational views include controller operations, production floor management, and customer collections monitoring.



What are the characteristics and capabilities?

- A fully-integrated experience with responsive visualizations fully-aware of user context and selections.
- Views can be personalized to a large extent, to meet the unique desires of the user that are prone to change.
- Actionable controls allow the user to efficiently transact and monitor activities.
- Combination of analytical data to help answer general questions and transactional views to access record details.

What distinguishes "operational views" from other types of visualizations?

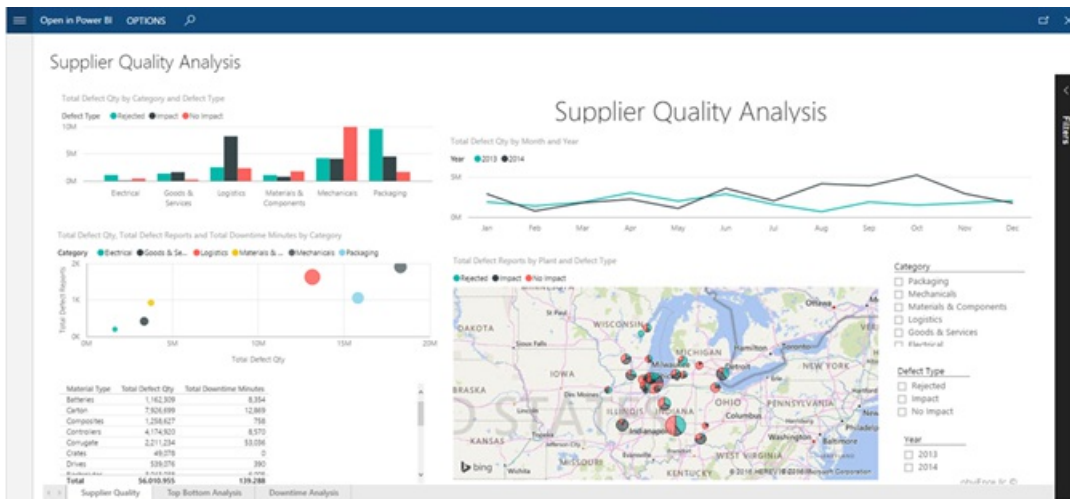
- General purpose tools designed to be utilized at all levels of the organization.
- Pre-defined views are provided based on common information access requirements associated with a specific role within the organization.
- Highly responsive to user interactions and changes made to the transactional database.

What's important to consider when selecting this tool for the job?

- The platform allows users to embed Power BI tiles and links to reports directly in workspaces.
- Users can introduce personalized workspaces to create their own custom operational views.
- Form data sources now support aggregate queries for analytical views using native controls.

Analytical tools and visualizations

Embedded visuals based on analytical data allow users to navigate between aggregate views down to the transactional details that affect them. Power BI service integration delivers world-class analytical tools with built-in support for accessing data. These tools empower "citizen developers" to author the reports they need and share the reports with others within the organization. Use the Power BI content packs available in Lifecycle Services to get started. Learn more about Power BI integration in [Features and services available through Power BI integration](#). Example applications of analytical tools and visualizations include customer sales per quarter, total revenue by region, and inventory turn-over.



What are the characteristics and capabilities?

- Near real-time results that provide macro level insights based on micro level activities.
- Common applications include charts, KPIs, and more complex visuals.
- Offer a deep exploratory experience with interactive controls that provide drill-thru navigations.

What distinguishes "analytical tools and visualizations" from other types of reports?

- Highly graphical in nature, these presentations are used to find the hidden meaning behind the data.
- Free form web designer that supports rich visualizations with built-in user interactions.
- Utilized by power users to explore data and gain insight through analysis.
- Personal in nature by allowing the user to choose which information to include.
- Built-in sharing capabilities and user controlled access management.

What's important to consider when selecting this tool for the job?

- Developers are responsible for publishing data entities that can be consumed by Power BI.
- Power users can produce mash-up views based on application data combined with external data sources.
- Visuals are highly-responsive to user interactions and provide near real-time results when using Direct Query access to the data source.

Business documents

These reporting solutions are often used to capture and communicate the details of business transactions. As such, this requires a reporting solution capable of producing physical manifestations of business data using existing devices like network printers. Learn more about the enhancements to the Document reporting service in [Document Reporting Services](#). Example applications of business documents include sales invoice, customer statements, and checks.

Customer account statement

Parameters

Use print management destination
No

Show credit limit
No

CRITERIA

From date

To date

Show due until

Only open
No

Include reversed
No

Associated payment attachment on acc...
None

Go with sum
No

Balance other than zero
No

Show payment schedule
No

Destination

MATURITY DISTRIBUTION

Show maturity distribution
No

AGING PERIOD DEFINITIONS

Aging period definition

Print period description
No

MANUAL SETUP OF MATURITY DISTRIBUTION

Internal

Day/Mth

Day

Printing direction
Forward

Change

OK Cancel



Microsoft
123 Second Street
Ballwin City, MO 63005
USA
Telephone 0123456789
www.microsoft.com

Invoice CIV-000576
30 November 2012
Payment terms Net 45 days
Payment due 14 January 2013
\$315,479.00

Our Wholesaler
123 Violet Road
Phoenix AZ 85003
USA

ITEM	DESCRIPTION	QUANTITY	SALES PRICE	DISCOUNT	AMOUNT
00001	Mid Range Speaker	14 Each	400.00	0.00	5,700.00
00001	Mid Range Speaker 2	25 Each	500.00	0.00	12,500.00
00001	Acoustic Foam panel	117 Each	37.00	0.00	4,329.00
00003	Standard Speaker	23 Each	220.00	0.00	5,060.00
10001	Speaker cable 10	65 Each	500.00	0.00	32,500.00
00004	High End Speaker	12 Each	2,000.00	0.00	24,000.00
10004	Television M120 37" Silver	53 Each	350.00	0.00	18,550.00
10002	Projector Television	23 Each	3,750.00	0.00	86,250.00
10005	Television HDTV X590 52" White	33 Each	2,890.00	0.00	95,370.00
10002	Surround Sound Receiver	56 Each	450.00	0.00	25,200.00
SALES SUBTOTAL AMOUNT					315,479.00
SALES TAX					0.00
USD TOTAL					\$315,479.00

This text is from the Sales Invoice form notes

METHODS OF PAYMENT

Electronic payment Check

Payment reference US-009 Make check payable to Microsoft

Subtotal White reference US-009 on reverse of check

Account No. 34567

OTHER INFORMATION

Tax registration number 1234567890

Our reference Karl Nyström

Page 1 of 1

User parameters

Paginated document

What are the characteristics and capabilities?

- Paginated documents that are ultimately destined to be printed on paper or distributed via email.
- Heavily dependent on parameters to filter and produce the desired result set.
- Business documents capture a snap-shot of customer and vendor activity that can be archived for future reference.
- The complex solutions are developed in Visual Studio and deployed as part of the application.

What distinguishes "business documents" from other types of visualizations?

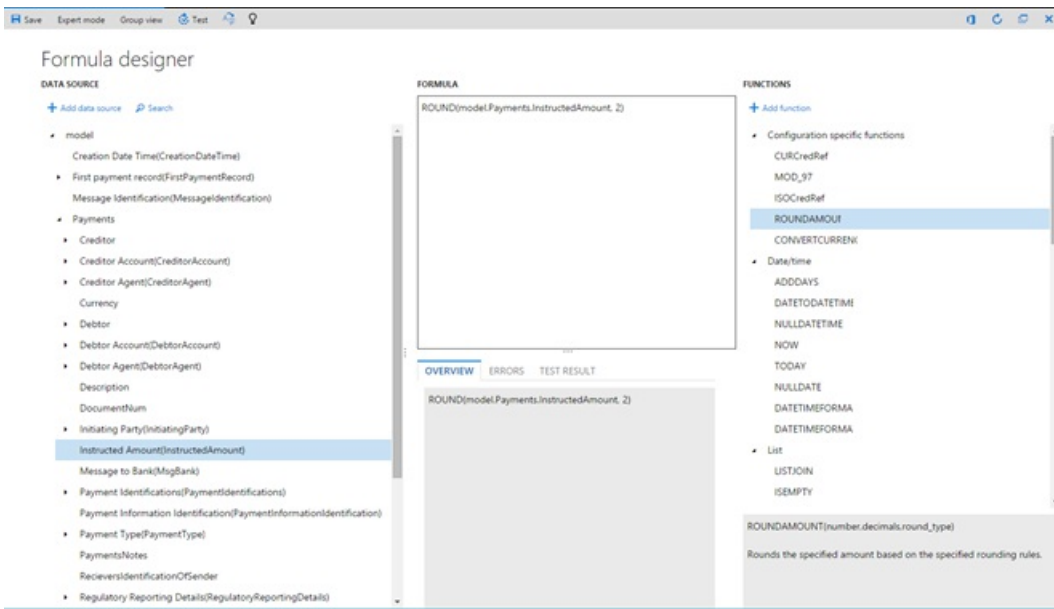
- Asynchronous data access and rendering solution designed to handle relatively large data sets.
- Dedicated reporting services offer distributed resource utilization.
- Ideal solution for automated processes that involve bulk generation of business documents.
- Includes built-in support for document archive and data extraction via file export to PDF in addition to Word, Excel, and CSV.

What's important to consider when selecting this tool for the job?

- Application suite reports are intended to be used as a starting point for custom solutions.
- Solutions are heavily dependent on metadata changes and do not offer personalization.
- Modifications to out-of-box solutions must be managed as a metadata change.

Electronic reporting

Electronic reporting (ER) is the tool to use to configure electronic document formats in accordance with the legal requirements of various countries/regions. For more information about the Electronic reporting tool, see [Electronic reporting \(ER\) overview](#). Example applications of electronic reporting include financial auditing, tax reporting, and electronic invoicing.



What are the characteristics and capabilities?

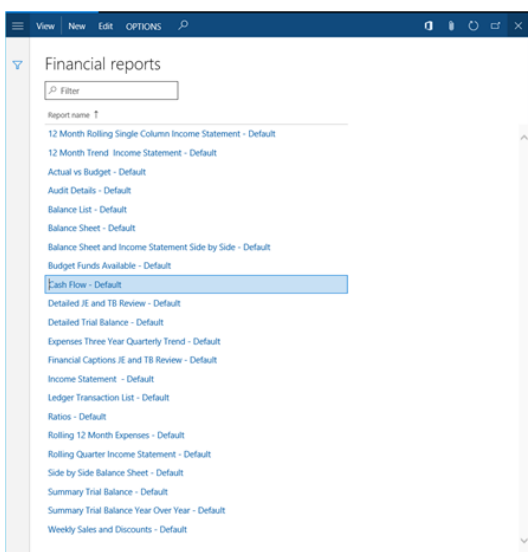
- Perfect tool for producing TEXT, XML, and OPENXML worksheet formats.
- Tooling is designed for business users familiar with Excel-based formulas.
- Highly adaptable to adhere to changes in regulatory requirements.
- Component versioning is available to manage draft definitions.

What distinguishes "electronic reports" from other types of visualizations?

- Designed for electronic submission to banks, governments, and other external entities.
- Use formulas to define data transformations into groups containing summary data and logical calculations.

Financial reporting

Standard financial reports are provided using the default main account categories. Use the report designer to create or modify traditional financial statements, such as Income statement and Balance sheet and share the results with other members of your organization. For detailed information about the Financial reporting tooling, see [General ledger and Financial reporting overview](#). Example applications of financial reporting include balance sheets, cash flow, and summary trial balance year over year.



	June	YTD
Net Income from Operations	16,510	1,912,447
Add Back Non-Cash Expenses:		
Depreciation and Amortization	17,600	105,600
Net Cash Flow from Operations	1,090	2,018,047
Sources (Uses) of Cash:		
Accounts Receivable	(1,090)	(35,819)
Liabilities	0	0
Inventory	0	(1,981,336)
Other Assets	0	0
Total Sources (Uses) of Cash	(1,090)	(2,017,155)
Net Cash Flow from Operating Activities	0	892
Cash flow from investing activities:		
Additions to Fixed Assets	17,600	(262,990)
	17,600	(262,990)
Cash flow from financing activities:		
Capital Stock	0	0
Paid-in Capital	0	0
Dividends Paid	0	0
Unrealized Currency Gain/Loss	0	0
Retained Earnings	0	0
Net Increase (Decrease) in Cash	17,600	(262,098)
Cash at Beginning of Period	(14,232)	0

Standard templates (GL > Inquiries > Financial reports)

Interactive financial reports

What are the characteristics and capabilities?

- Built-in flexible financial reporting solution designed to handle complex organizational structures.
- Fully-integrated with General ledger.
- Create custom financial reports using the default solutions as a starting point.
- Interactive reports with drill-down capabilities to navigate down to transaction details.

What distinguishes "financial reports" from other types of visualizations?

- User controls are tailored for the specialized needs of financial reporting.
- Create roll-up reports containing data across companies or business units.
- Utilizes a financial data mart for optimized performance.

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Features available through the Power BI integration

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Microsoft Power BI is a suite of business analytics tools that let you analyze data and share insights. By using Power BI tools, you can explore data and quickly create rich reports and dashboards. You and your colleagues can then use the reports interactively on many devices. The application uses Power BI for data exploration.

Data exploration through Power BI

There are various types of reporting.

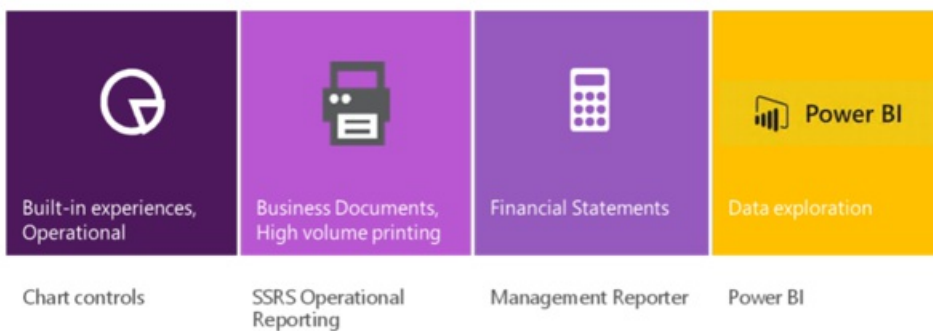


Chart controls are used to build embedded experiences that require visuals.

Microsoft SQL Server Reporting Services (SSRS) is an engine that is designed for pixel-perfect, formatted reports that often require printing. We use SSRS for document-style reports, such as invoices and purchase orders. Our investments in SSRS integration focus on document generation and printing scenarios.

For all non-document reports or reports that don't have to be printed, we want to embrace Power BI.

In the past, we have used the terms *self-service reports* and *ad-hoc reports* to refer to Power BI. We will now use the term *data exploration*. This change in terminology reflects a subtle shift in paradigms. Self-service reports were reports that the users themselves created. (Alternatively, a power user created the reports and shared them with other people. These people then continued to adjust the reports according to their requirements.) Often, users had to change the shape of a chart, add a new column, change the grouping, or just create a new view of data. Although we might think of the results as reports, users are just trying to understand the data by exploring it, pivoting it around columns, and changing the shape of charts. Technologies of the past didn't let users interactively explore large volumes of data. Therefore, users had to create "reports," or many views of the same data.

In Power BI, thanks to the in-memory database technologies in Microsoft SQL Server, a report is a just the starting point for interactive data exploration. Charts in a Power BI report invite users to click them, visuals change shape interactively, and data can easily be filtered. Users can easily adjust existing reports and create their own views of the data. The reports can be shared, and teams can collaborate over data.

Therefore, although you might use the term *report* to refer to Power BI artifacts, you should think about the larger scenario that is involved. Your users are exploring data! Power BI is the tool of choice when you must address data exploration and visualization requirements.

For a detailed discussion of reporting concepts, see [Information access and reporting](#).

Ready-made Power BI content

You can use ready-made Power BI reports right away. Two types of Power BI content are available:

- Power BI content that is available in Microsoft Dynamics Lifecycle Service (LCS)
- Power BI content packs that are distributed in the PowerBI.com marketplace

Depending on your version, you can use one of both types of content.

Power BI content that is available in LCS

LCS is a service that can manage your environments. LCS is operated by Microsoft. Power BI reports are developed by using Entity store and are then distributed in LCS as implementation assets. In LCS, you will find not only content that is developed by Microsoft, but also content that is developed by independent software vendors (ISVs) and partners.

We will continue to release Power BI content that is based on Entity store. For information, see the [Roadmap](#).

Power BI content packs that are distributed in the PowerBI.com marketplace

There are several Power BI content packs in the PowerBI.com marketplace. Although these content packs will continue to be supported until further notice, our future investments in content packs will be based on Entity store, and content will be released via LCS.

For more information about the content, see [Power BI content](#).

Extending, creating, and distributing Power BI reports

You should use the ready-made Power BI content as a first step. You can modify ready-made reports or extend them by using capabilities that are built into PowerBI.com. In addition to modifying ready-made reports, you can extend them using Power BI authoring tools such as Power BI desktop. You can also create new reports. You can use several approaches to create new Power BI reports.

Creating high-volume, near-real-time "operational Power BI reports" by using Entity store

Entity store is an operational data store that is built specifically for Power BI integration. To create high-volume, near-real-time Power BI reports that use Entity store, a business analyst or a developer can use Power BI desktop, which is the authoring tool for Power BI reports. Like other artifacts that developers create, these reports must be distributed to your users via LCS.

Reports that are created by using Entity store take advantage of DirectQuery technology. This technology enables reports to be created over large volumes of data. Reports that are created by using DirectQuery technology don't cache data in the PowerBI.com service. Instead, data is always stored in application.

For an overview of Power BI integration with Entity store, see [Power BI integration with Entity store](#).

If you're upgrading from Microsoft Dynamics AX 2012, you can upgrade cubes to aggregate measurements that use Entity store. You can then create Power BI reports by using Entity store. For more information, see [Migrate upgraded AX 2012 R3 sales cubes to the entity store](#).

Creating Power BI reports by using Excel

In addition to using the Power BI desktop authoring tool, you can use "Power tools" that are incorporated into Excel to create visualizations. Your organization might have many users who already use Excel every day. For a quick "one-off" report, Excel might be the best option for these users.

There are several scenarios where you can use Excel:

- Export data from a page in Dynamics 365 into Excel. You can then use the Power View add-in that is built into Excel to visualize the data. The Excel workbook can be used as a stand-alone visualization. In addition, you can import the report into the PowerBI.com service.
- Use the Power Query extension in Excel to combine the data in another worksheet (or data that is imported from OData endpoints) with external data. You can visualize the resulting data by using Power View.

- Use the PowerPivot extension in Excel to ingest a larger amount of data into Excel.

Consider using Export to Excel functionality for ad-hoc "one-off" reports. If the reports will be shared with a group of users, you should consider using Entity store to create them.

Sharing and using reports in PowerBI.com

PowerBI.com is a service that is offered by Microsoft. It lets you create dashboards and reports, and also enables collaboration with a group of users. Regardless of how you create your reports, you can share reports with users by uploading them into the PowerBI.com service. (This process is also known as *publishing*.)

After your reports are uploaded, your users can view, adjust, and explore them either on the web (when they are connected to the Internet at home or in the office) or by using apps on a device.

For more information about Power BI concepts, see the [Power BI documentation](#).

Pinning Power BI content to the client

PowerBI.com can be used on its own as a reporting and dashboard solution for your organization or business unit. However, users can also pin tiles and reports from their own PowerBI.com accounts to workspaces. Power BI content in Dynamics 365 provides contextual insights that are related to business operations.

You can pin two types of objects from PowerBI.com: tiles in PowerBI.com dashboards, and reports.

Before you can pin Power BI content, you must configure Power BI in your Dynamics 365 environment.

One-time configuration of PowerBI.com integration

Before you can pin tiles or reports, an administrator must configure integration with PowerBI.com in your environment. This configuration must be done only one time per environment. For instructions, see [Configure Power BI integration for workspaces](#).

Pinning PowerBI.com tiles

Power BI tiles that are pinned to the Dynamics 365 client provide insightful visuals at a glance. They also let users open PowerBI.com for interactive analysis. For more information, see [Configure Power BI integration for workspaces](#).

Pinning PowerBI.com reports to workspaces

As a power user, a business analyst, or a developer, you can use Power BI desktop to create reports that use Entity store. Not only are these reports rich and interactive, but your users can make changes without having to rely on another person.

Although the reports in PowerBI.com are powerful and interactive on their own, they can also be pinned into workspaces. Your users can pin reports to workspaces themselves. For more information about how to pin reports to workspaces, see [Pin Power BI reports to workspaces](#).

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Pin Power BI content

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Microsoft Dynamics 365 Finance uses Power BI for data exploration. This topic explains how you can pin full-page Power BI reports to workspaces to give your users an interactive data exploration experience.

This topic assumes that you're familiar with the feature that lets you pin Microsoft Power BI tiles to a workspace. For more information, see [Features and services available through Power BI integration](#). If you're a developer who is creating a workspace, to let users pin Power BI tiles to the workspace, embed the Power BI tile control.

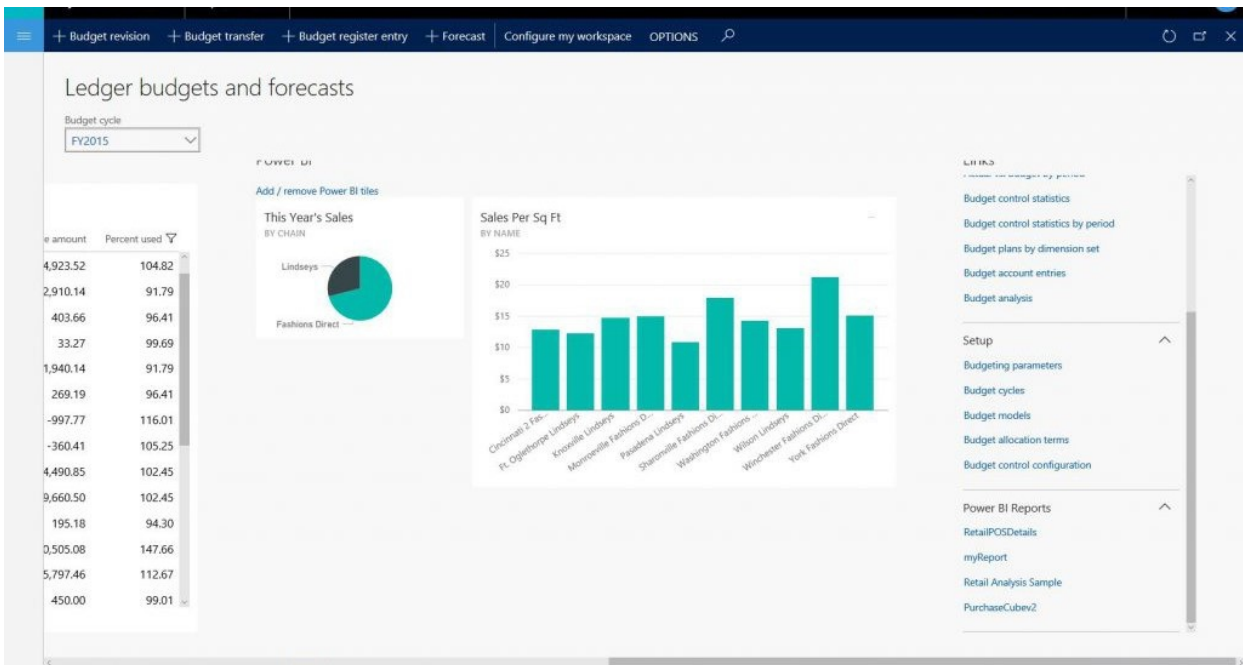
Pin Power BI reports to workspaces

Microsoft Dynamics AX platform update 1 (May 2016) introduced the capability to pin Power BI reports to workspaces. Power BI reports can be added to any workspace that contains a **Links** section. In other words, the reports can be added to most of the out-of-box workspaces that are included in the product. To enable Power BI reports and tiles, you must configure Power BI to work with the application. This one-time operation must be completed by an administrator of the environment. For instructions, see [Configure Power BI integration for workspaces](#). After you've configured Power BI to work with the application, open the **Ledger budgets and forecasts** workspace in the client. In the workspace, click the **Options** tab. Notice that this tab contains buttons to open the (Power BI) tile catalog and the (Power BI) report catalog. Click **Open report catalog**. A dialog box that contains a list of reports appears. The list of reports comes from the reports that you have in your Power BI account. If you open PowerBI.com in a browser, you will see that the same list of reports is used across your Power BI dashboards. Select some reports, as shown in the following illustration, and then click **OK** to continue.

The screenshot shows the 'Ledger budgets and forecasts' workspace in Dynamics 365 Finance. The 'Options' tab is active, and the 'Open report catalog' dialog box is open. The dialog box displays a list of reports with checkboxes for selection. The following table represents the data shown in the 'Open report catalog' dialog box:

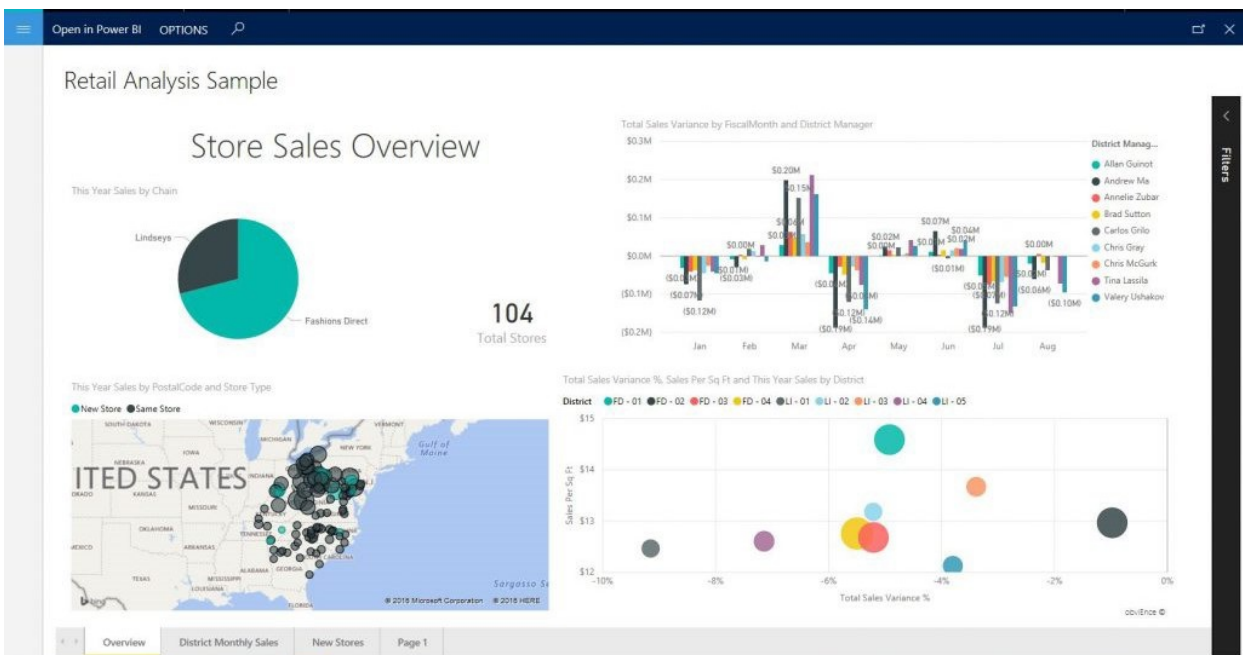
Report Name	Selected
Supplier Quality Analysis	<input type="checkbox"/>
Financial Performance Data Mo...	<input type="checkbox"/>
Retail Analysis Sample	<input checked="" type="checkbox"/>
myReport	<input checked="" type="checkbox"/>
RetailPOSDetails	<input checked="" type="checkbox"/>
RetailPOSDetails	<input type="checkbox"/>
CustomerReport	<input type="checkbox"/>
Retail Sales by Item	<input type="checkbox"/>
SalesInvoices-Import	<input type="checkbox"/>
Cost Management	<input type="checkbox"/>
Retail Channel Performance	<input type="checkbox"/>
VendorInvoices_PurchaseCubev...	<input type="checkbox"/>
Practice Manager BI Report - R1...	<input type="checkbox"/>
myLedgerReport	<input type="checkbox"/>
PurchaseCubev2	<input checked="" type="checkbox"/>
Workforce	<input type="checkbox"/>

Next, scroll to the bottom of the **Links** section in the workspace. Notice that a new section for Power BI reports has been added to your links.

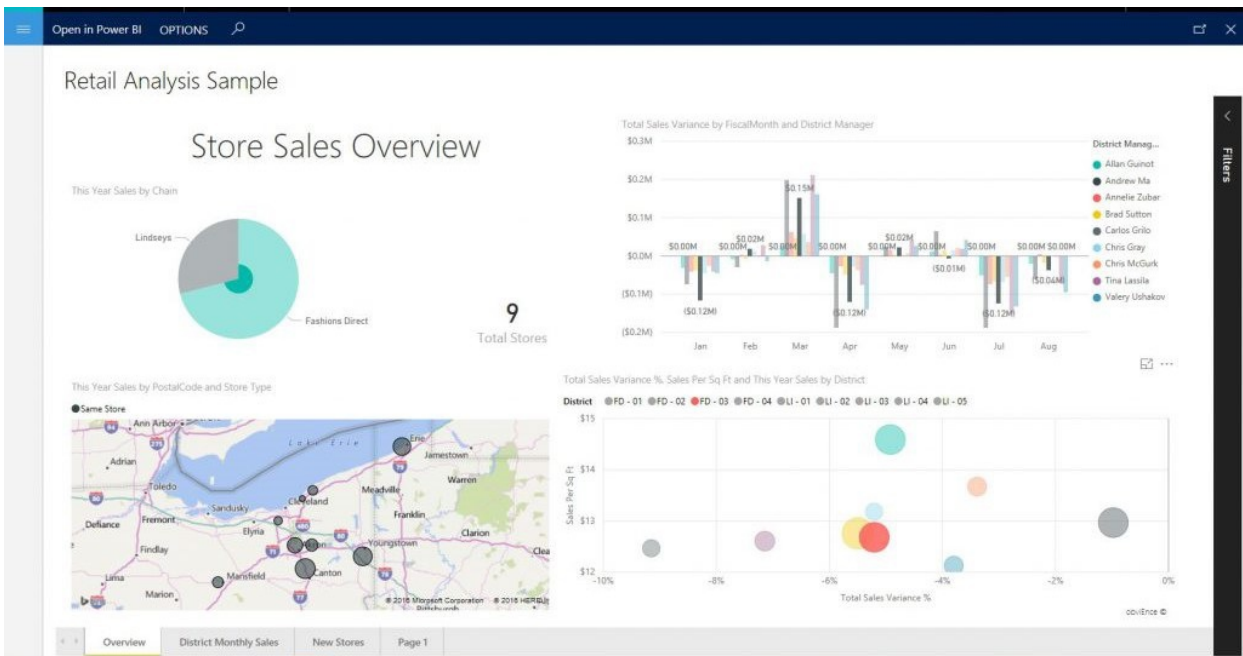


Full-page Power BI reports in the client

You can open and run Power BI reports in the client. The functionality resembles the functionality for running Microsoft SQL Server Reporting Services (SSRS) reports. To run a Power BI report, in the **Links** section, click the link for one of the Power BI reports. For this example, click the **Retail Analysis Sample** link. The Power BI report is opened in the client in a full-page view, as shown in the following illustration. This report is interactive. As you click regions of the report, the remaining visuals react to your selection.



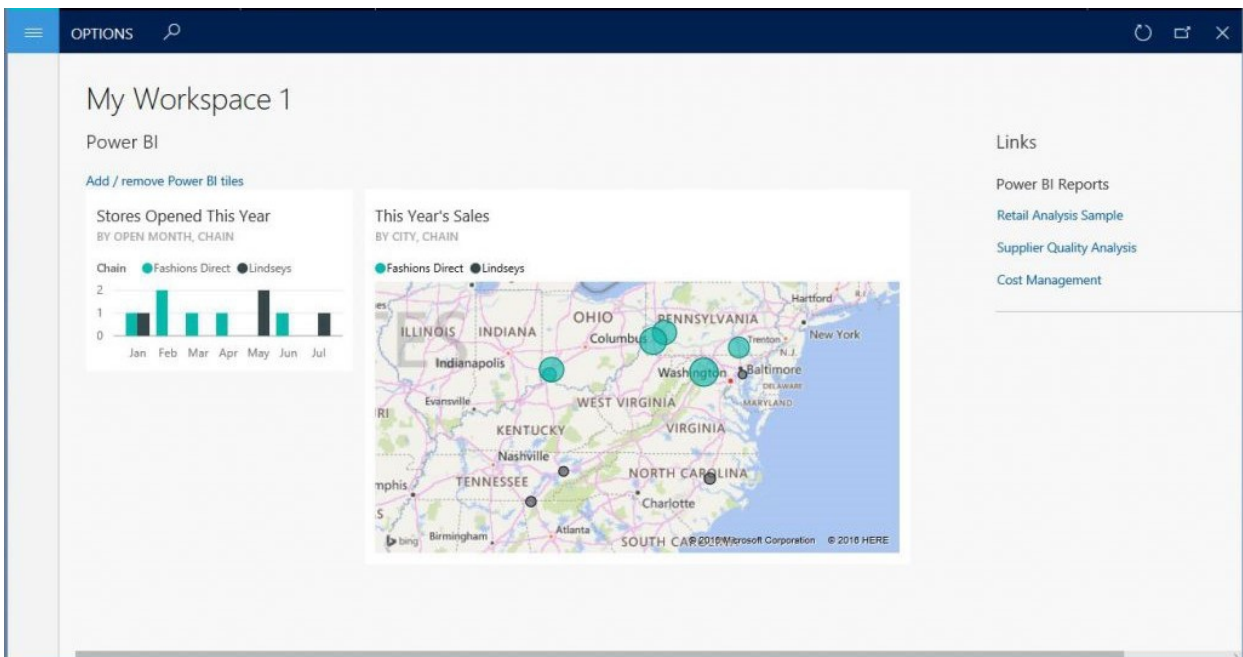
You can filter the data on the report by using the filter pane. The following illustration shows the report after filters have been applied.



You can also open this report on PowerBI.com and make changes. You can then save the modified report as another copy that has a different name, and even pin the new report to the workspace.

Power BI in user-created workspaces

So far, we have described how to add Power BI tiles and reports to "developer-created" workspaces. Developer-created workspaces are workspaces that are created by Microsoft (that is, they are built into the product), by your independent software vendor (ISV) or partner, or by in-house developers. However, in Microsoft Dynamics AX platform update 1 (May 2016), users can create new workspaces by using the personalization capabilities of the client. To create a new workspace, on the home page (or the dashboard), right-click the tile for a workspace, and then click **Add a workspace**. A new workspace is created. New workspaces are named **My Workspace 1**, **My Workspace 2**, and so on. You can change the name later. Click the workspace that you just created. You can now add Power BI tiles and reports by using the same options that we discussed earlier. The following illustration shows an example.



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Select analytical workspaces from Power BI

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Analytical workspaces

The analytical workspaces that are bundled with the application suite offer users relevant insights into their business data. However, in some cases, it might make sense to replace standard reports with custom reports that are designed specifically for the users in your organization.

The world-class tooling that PowerBI.com provides lets you produce analytical reports that contain mashup views that use data from external sources. In Platform update 26 for Finance and Operations, power users can replace the standard embedded reports with those that are hosted on PowerBI.com.

IMPORTANT

The functionality that this topic describes isn't a personalization. The customization of analytical workspaces applies to all users in the active legal entity.

Motivations for embedding PowerBI.com reports

Although standard reports deliver insights that are tailored for a given business persona, an organization might prefer a custom report in some cases. The application lets power users promote custom reports that are hosted on PowerBI.com and shared with members of the organization.

Here are some of the top motivations for selecting reports that are hosted on PowerBI.com:

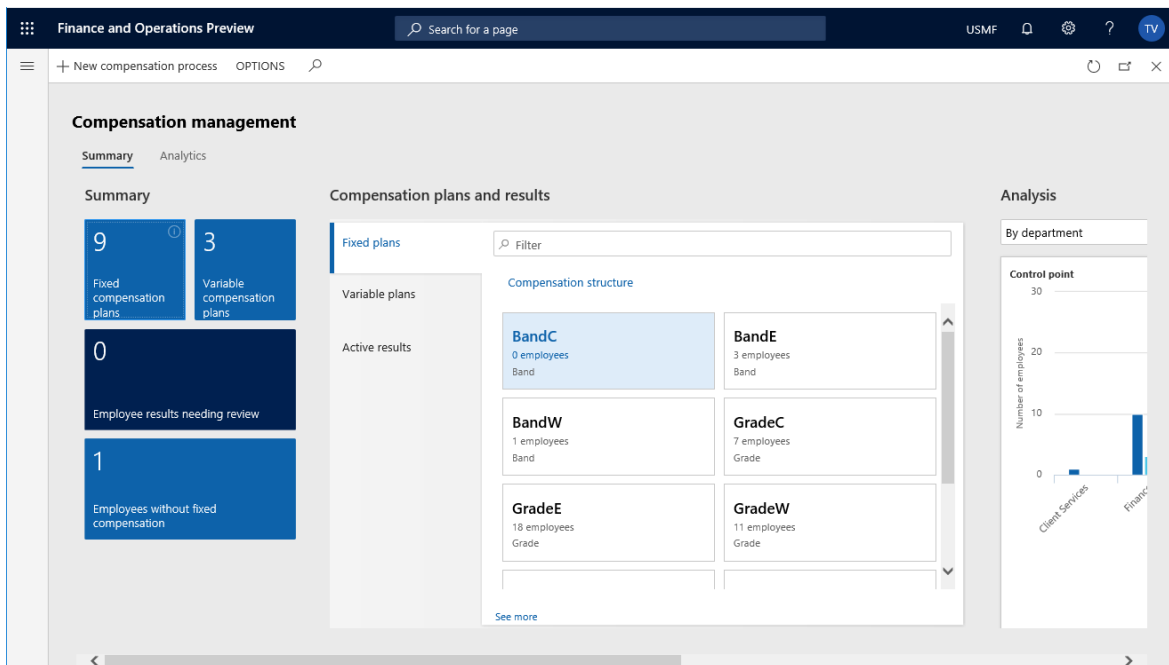
- PowerBI.com reports support data mashups that use external data sources and can be accessed outside the application.
- The reports are appropriate for demonstrating custom solutions that are hosted on PowerBI.com and embedded in the application in one-box deployments.
- Organizations that have Microsoft Power BI Premium services want to augment the standard reports.

Embed a PowerBI.com report in an analytical workspace

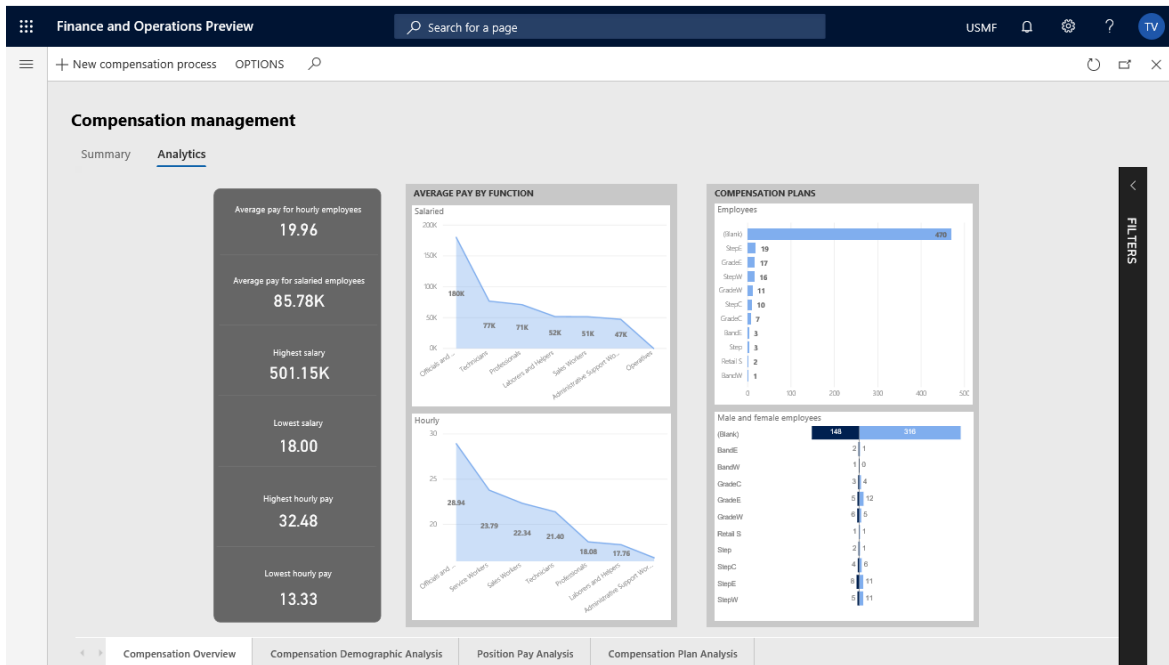
The [How to embed PowerBI.com reports](#) video (shown above) is included in the [Finance and Operations playlist](#) available on YouTube.

To replace the standard reports, you must be a member of the System Report Editors security group. Members of this security group can access the options in application workspaces that let them customize the standard reports. This example shows how to replace the standard analytical report with a customized report that is hosted on PowerBI.com.

1. Sign in and open the application report that you want to customize. In this example, you will replace the standard analytical report that is embedded in the **Compensation management** workspace.



2. Select the **Analytics** tab to access the workspace's embedded analytical report.

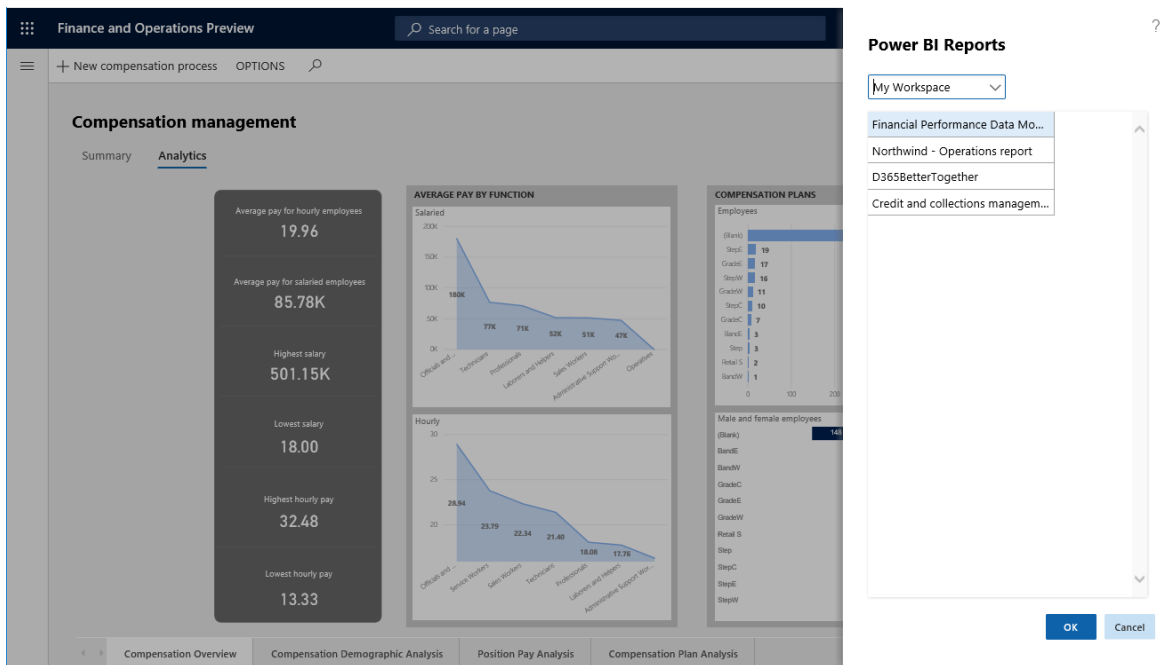


By default, you will see the standard analytical workspace solution that is included with your application. The reports in this solution are automatically deployed and configured for your environment during the provisioning process.

NOTE

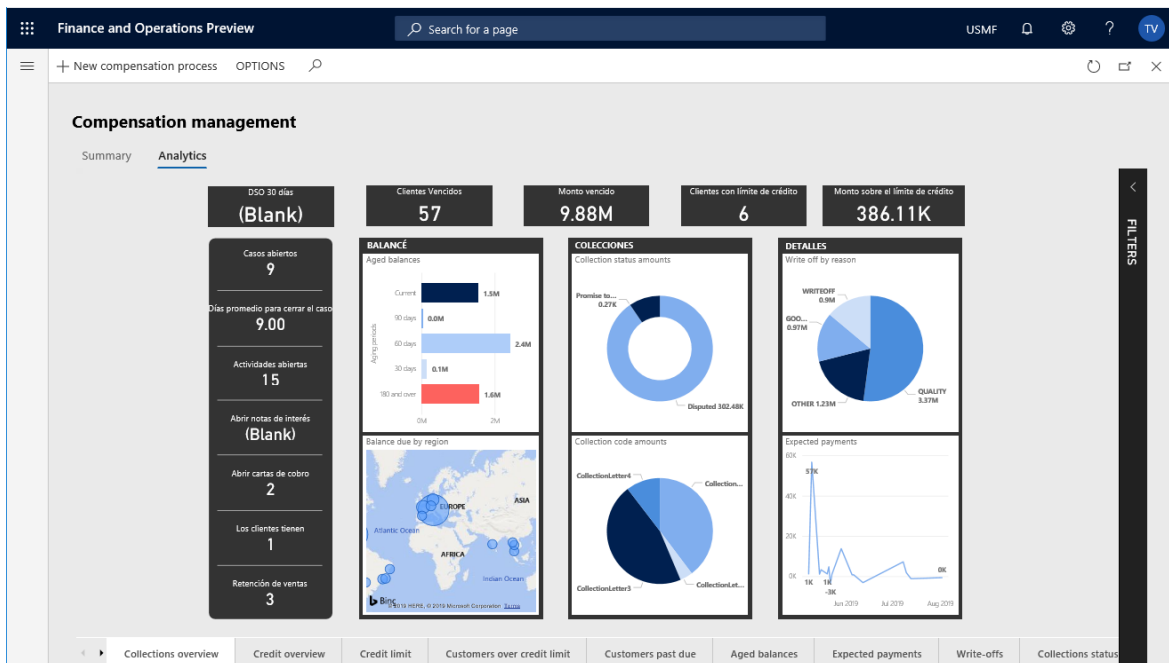
The analytical workspaces require a hosted Power BI service that is available only for dedicated environments. For more information, see the blog post, [Accessing Analytical Workspaces and Reports on 1-Box Environments](#).

3. On the Action Pane, on the **Options** tab, in the **Power BI** group, select **Select Analytics** to open the **Power BI Reports** dialog box.



This dialog box lets you select among the reports that have been shared on the PowerBI.com service. The reports are organized by workspace.

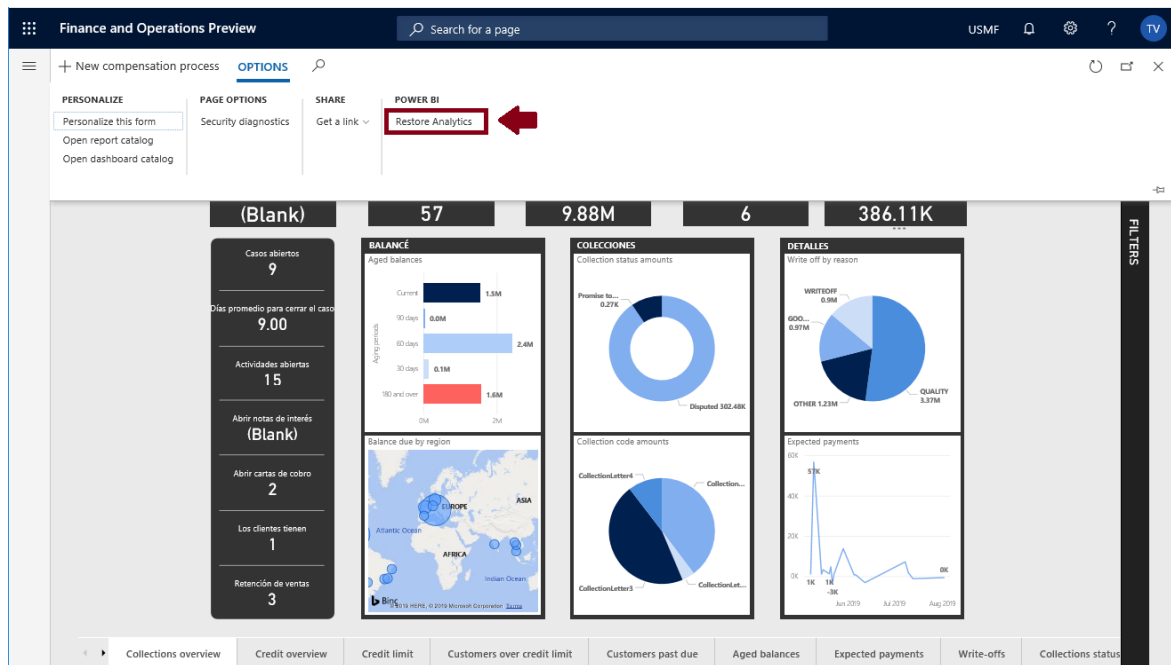
4. In the drop-down list, select the workspace that contains the report.
5. Select the report to embed in the application workspace, and then select **OK**.
6. To view the updates to the workspace, you must reload the page. Either move away from the workspace and then return, or refresh your browser.
7. In the **Compensation management** workspace, select the **Analytics** tab to access the PowerBI.com report that is now embedded in the analytical workspace.



Revert to the standard solution

After a PowerBI.com report has been embedded in an application workspace, updates to the report are reflected immediately for users. However, to replace the report with another PowerBI.com solution, a power user must first revert to the standard application solution. Follow these steps to revert to the standard application solution.

1. On the Action Pane, on the **Options** tab, in the **Power BI** group, select **Restore Analytics**.



2. To view the updates to the workspace, you must reload the page. Either move away from the workspace and then return, or refresh your browser.
3. In the **Compensation management** workspace, select the **Analytics** tab to access the standard solution that is now embedded in the analytical workspace.

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Power BI content home page

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The following PowerBI.com solutions are available for application environments.

PowerBI.com solutions available from Lifecycle Services (LCS)

The following PowerBI.com solutions are available in the Shared assets library of LCS. Refer to the version information in the Shared assets library to download the correct version for your environment.

NOTE

Most of the PowerBI.com solutions in the following list have been embedded in analytical workspaces in recent versions. Using analytical workspaces eliminates the need to download these solutions from the Shared assets library in LCS. The topics in this list indicate where these PowerBI.com solutions have been embedded where applicable.

- [Actual vs budget](#)
- [Cash overview](#)
- [Compensation and benefits](#)
- [Cost accounting analysis](#)
- [Credit and collections management](#)
- [Employee competencies and development](#)
- [Financial performance](#)
- [Fixed asset management](#)
- [Organizational training](#)
- [Practice manager](#)
- [Production performance](#)
- [Purchase spend analysis](#)
- [Recruiting](#)
- [Sales and profitability performance](#)
- [Vendor payments](#)
- [Warehouse performance](#)
- [Workforce metrics](#)

PowerBI.com solutions available from AppSource

The following PowerBI.com solutions are available from [Microsoft AppSource](#).

NOTE

These solutions have been deprecated as documented in [Power BI content packs available on AppSource](#).

- [Cost management](#)
- [Financial performance](#)
- [Retail channel performance](#)

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Cost management Power BI content

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Overview

The **Cost management** Microsoft Power BI content is intended for inventory accountants or individuals in the organization who are responsible for or interested in the status of inventory or work in progress (WIP), or who are responsible for or interested in analyzing standard cost variances.

NOTE

The **Cost management** Power BI content described in this topic applies to Dynamics 365 Finance and Operations 8.0.

The **Cost management** Power BI content pack, available on the AppSource site, has been deprecated. For more information about that deprecation, see [Removed or deprecated features for Finance and Operations](#).

This Power BI content provides a categorized format that helps you monitor the performance of inventories and visualize how cost flows through them. You can gain managerial insights such as the turnover ratio, number of days that inventory is on hand, accuracy, and "ABC classification" at your preferred aggregated level (company, item, item group, or site). The information that is made available can also be used as a detailed supplement to the financial statement.

The Power BI content is built on the **CostObjectStatementCacheMonthly** aggregated measurement, which has the **CostObjectStatementCache** table as its primary data source. This table is managed by the Data set cache framework. By default, the table is updated every 24 hours, but you can change the update frequency or enable manual updates in the configuration of the data set cache. Manual updates can be run in either the **Cost administration** workspace or the **Cost analysis** workspace.

After every update of the **CostObjectStatementCache** table, the **CostObjectStatementCacheMonthly** aggregated measurement must be updated before data in the Power BI visualizations is updated.

Accessing the Power BI content

The **Cost management** Power BI content is shown in the **Cost administration** and **Cost analysis** workspaces.

The **Cost administration** workspace contains the following tabs:

- **Overview** – This tab shows application data.
- **Inventory accounting status** – This tab shows Power BI content.
- **Manufacturing accounting status** – This tab shows Power BI content.

The **Cost analysis** workspace contains the following tabs:

- **Overview** – This tab shows application data.
- **Inventory accounting analysis** – This tab shows Power BI content.
- **Manufacturing accounting analysis** – This tab shows Power BI content.
- **Std. cost variance analysis** – This tab shows Power BI content.

Report pages that are included in the Power BI content

The **Cost management** Power BI content includes a set of report pages that consist of a set of metrics. These metrics are visualized as charts, tiles, and tables.

The following tables provide an overview of the visualizations in the **Cost management** Power BI content.

Inventory accounting status

REPORT PAGE	VISUALIZATION
Inventory overview	Beginning balance
	Net change
	Net change %
	Ending balance
	Inventory accuracy
	Inventory turnover ratio
	Days inventory on-hand
	Active product in period
	Active cost objects in period
	Balance by item group
	Balance by site
	Statement by category
	Net change by quarter
Inventory overview by site and item group	Inventory accuracy by site
	Inventory turnover ratio by site
	Inventory ending balance by site
	Inventory accuracy by item group
	Inventory turnover ratio by item group
Inventory overview by site and item group	Inventory ending balance by site and item group
Inventory statement	Inventory statement
Inventory statement by site	Inventory statement by site
Inventory statement by product hierarchy	Inventory statement
Inventory statement by product hierarchy	Inventory statement by site

REPORT PAGE	VISUALIZATION
-------------	---------------

Manufacturing accounting status

REPORT PAGE	VISUALIZATION
WIP overview YTD	Beginning balance
	Net change
	Net change %
	Ending balance
	WIP turnover ratio
	Days WIP on-hand
	Active cost object in period
	Net change by resource group
	Balance by site
	Statement by category
	Net change by quarter
WIP statement	Beginning balance
	Ending balance
	WIP statement by category
WIP statement by site	Beginning balance
	Ending balance
	WIP statement by category and site
WIP statement by hierarchy	Beginning balance
	Ending balance
	WIP statement by category hierarchy

Inventory accounting analysis

REPORT PAGE	VISUALIZATION
Inventory details	Top 10 resources by ending balance

REPORT PAGE	VISUALIZATION
	Top 10 resources by net change increase
	Top 10 resources by net change decrease
	Top 10 resources by inventory turnover ratio
	Resources by low inventory turnover ratio and ending balance above threshold
	Top 10 resources by low accuracy
ABC classification	Inventory ending balance
	Consumed material
	Sold (COGS)
Inventory trends	Inventory ending balance
	Inventory net change
	Inventory turnover ratio
	Inventory accuracy

Manufacturing accounting analysis

REPORT PAGE	VISUALIZATION
WIP trends	WIP ending balance
	WIP net change
	WIP turnover ratio

Std. cost variance analysis

REPORT PAGE	VISUALIZATION
Purchase price variance (Std. cost) YTD	Procured balance
	Purchase price variance
	Purchase price variance ratio
	Variance by item group
	Variance by site
	Purchase price by quarter

REPORT PAGE	VISUALIZATION
	Purchase price by quarter and Item group
	Top 10 resources by unfavorable purchase price ratio
	Top 10 resources by favorable purchase price ratio
Production variance (Std. cost) YTD	Manufactured cost
	Production variance
	Production variance ratio
	Variance by item group
	Variance by site
	Production variance by quarter
	Production variance by quarter and variance type
	Top 10 resources by unfavorable production variance
	Top 10 resources by favorable production variance

Understanding the data model and entities

Data from the application is used to fill the report pages in the **Cost management** Power BI content. This data is represented as aggregate measurements that are staged in the entity store, which is a Microsoft SQL Server database that is optimized for analytics. For more information, see [Power BI integration with Entity store](#).

The key aggregate measurements of the following objects are used as the basis of the Power BI content.

OBJECT	KEY AGGREGATE MEASUREMENTS	DATA SOURCE FOR FINANCE AND OPERATIONS	FIELD
CostObjectStatementCache Monthly	Amount	CostObjectStatementCache	Amount
CostObjectStatementCache Monthly	Quantity	CostObjectStatementCache	Qty
CostInventoryAccountingKPIGoal	AnnualInventoryTurn	CostInventoryAccountingKPIGoal	AnnualInventoryTurn
CostInventoryAccountingKPIGoal	InventoryAccuracy	CostInventoryAccountingKPIGoal	InventoryAccuracy

The following table shows the key calculated measurements in the Power BI content.

MEASURE	CALCULATION
Beginning balance	Beginning balance = [Ending balance]-[Net change]
Beginning balance qty.	Beginning balance qty. = [Ending balance qty.]-[Net change qty.]
Ending balance	Ending balance = (CALCULATE(SUM([Amount]), FILTER(ALL(FiscalCalendar) ,FiscalCalendar[MONTHSTARTDATE] <= MAX(FiscalCalendar[MONTHSTARTDATE]))))
Ending balance qty.	Ending balance qty. = CALCULATE(SUM([QTY]), FILTER(ALL(FiscalCalendar),FiscalCalendar[MONTHSTARTDATE] <= MAX(FiscalCalendar[MONTHSTARTDATE]))))
Net change	Net change = SUM([AMOUNT])
Net change qty.	Net change qty. = SUM([QTY])
Inventory turnover ratio by amount	Inventory turnover ratio by amount = if(OR([Inventory average balance] <= 0, [Inventory sold or consumed issues] >= 0), 0, ABS([Inventory sold or consumed issues])/[Inventory average balance])
Inventory average balance	Inventory average balance = (([Ending balance] + [Beginning balance]) / 2)
Days inventory on-hand	Days inventory onhand = 365 / CostObjectStatementEntries[Inventory turnover ratio by amount]
Inventory accuracy	Inventory accuracy by amount = IF([Ending balance] <= 0, IF(OR([Inventory counted amount] <> 0, [Ending balance] < 0), 0, 1), MAX(0, ([Ending balance] - ABS([Inventory counted amount]))/[Ending balance]))

The following key dimensions are used as filters to slice the aggregate measurements, so that you can achieve greater granularity and gain deeper analytical insights.

ENTITY	EXAMPLES OF ATTRIBUTES
Products	Product number, Product name, Unit, Item groups
Category hierarchies (Assigned to role Cost management)	Category hierarchy, Category level
Legal entities	Legal entity names
Fiscal calendars	Fiscal calendar, Year, Quarter, Period, Month
Site	ID, Name, Address, State, Country

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Learning Power BI content

2/18/2021 • 2 minutes to read • [Edit Online](#)

This topic describes the **Learning** Microsoft Power BI content.

Reports that are included in the Power BI content

The reports that are included in the **Learning** Power BI content have both charts and tables that contain additional information. The following table describes the reports.

REPORT	CONTENTS
Learning Overview	Summary of other reports
Course Analysis	Registration by location, attendee by status, courses by type per company, and course attendance by job
Registration Analysis	Registration list
Course Types	Course types by skill
Instructor Analysis	Ratio of courses to instructors, number of instructors, courses by instructor, courses per instructor, and course agenda by instructor
Courses Offered	List of courses
Courses Design	Course agenda

You can filter the charts and tiles on these reports, and pin the charts and tiles to the dashboard. For more information about how to filter and pin in Power BI, see [Create and Configure A Dashboard](#).

Understanding the data model and entities

The following data is used to fill the reports in the **Learning** Power BI content. This table shows the entities that the content was based on.

ENTITY	CONTENTS	RELATIONSHIPS WITH OTHER ENTITIES
Calendar Offset	Calendar offsets to slice reports	Course Agenda, Course Attendees
Company	Companies to filter reports by	Course Agenda, Course Attendees
Course	Course, description, instructor name, location, room, and status	Course Agenda, Course Attendees, Course Skill
Course Agenda	Agenda, course, and start and end times	Company, Calendar Offset, Date, Course

ENTITY	CONTENTS	RELATIONSHIPS WITH OTHER ENTITIES
Course Attendees	Name, status, job, and registration date	Company, Calendar Offset, Date, Course, Demographics, Employment, Course, Employee Name, Employee Title, Job, Position
Course Skill	Skill, skill type, and level	Course
Date	Days, weeks, months, and years	Course Agenda, Course Attendees
Demographics	Date of birth, gender, ethnic origin, and marital status	Course Agenda, Course Attendees
Employment	Start date, end date, and transition date	Course Agenda, Course Attendees
Job	Function, type, and title	Course Agenda, Course Attendees
Position	Position, title, and full-time equivalent (FTE)	Course Agenda, Course Attendees
Employee Name	First name, last name, and full name	Course Attendees
Employee Title	Title and seniority date	Course Attendees

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Organizational training Power BI content

2/18/2021 • 2 minutes to read • [Edit Online](#)

This topic describes the Finance and Operations - Organizational training Power BI content.

Reports that are included in the content pack

After you've connected the content pack to your data, the reports show your organization's data. If you've never used Microsoft Power BI before, you can learn more about it on the [Guided Learning page for Power BI](#). The reports that are included in the content pack have both charts and tables that contain additional information. The following table describes the reports.

REPORT	CONTENTS
Course Analysis	Registration by location, course attendees by status, and registration list
Course Types	Course types by skill

You can filter the charts and tiles on these reports, and pin the charts and tiles to the dashboard. For more information about how to filter and pin in Power BI, see [Create and Configure A Dashboard](#).

Understanding the data model and entities

Application data is used to populate the reports in the Organizational training content pack. The following table shows the entities that the content pack was based on.

ENTITY	CONTENTS	RELATIONSHIPS WITH OTHER ENTITIES
Training_CalendarOffset	Calendar offsets to slice reports	Training_CourseAgenda, Training_CourseAttendees
Training_Company	Companies to filter reports by	Training_CourseAgenda, Training_CourseAttendees
Training_Course	Course, description, instructor name, location, room, and status	Training_CourseAgenda, Training_CourseAttendees, Training_CourseSkill
Training_CourseAgenda	Agenda, course, and start and end times	Training_Company, Training_CalendarOffset, Training_Date, Training_Course
Training_CourseAttendees	Name, status, job, and registration date	Training_Company, Training_CalendarOffset, Training_Date, Training_Demographics, Training_Employment, Training_Course, Training_WorkerName, Training_WorkerTitle, Training_Job, Training_Position

ENTITY	CONTENTS	RELATIONSHIPS WITH OTHER ENTITIES
Training_CourseSkill	Skill, skill type, and level	Training_Course
Training_Date	Days, weeks, months, and years	Training_CourseAgenda, Training_CourseAttendees
Training_Demographics	Date of birth, gender, ethnic origin, and marital status	Training_CourseAgenda, Training_CourseAttendees
Training_Employment	Start date, end date, and transition date	Training_CourseAgenda, Training_CourseAttendees
Training_Job	Function, type, and title	Training_CourseAgenda, Training_CourseAttendees
Training_Position	Position, title, and full-time equivalent (FTE)	Training_CourseAgenda, Training_CourseAttendees
Training_WorkerName	First name, last name, and full name	Training_CourseAttendees
Training_WorkerTitle	Title and seniority date	Training_CourseAttendees

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Production performance Power BI content

2/18/2021 • 6 minutes to read • [Edit Online](#)

This topic describes what is included in the **Production performance** Microsoft Power BI content. It explains how to access the Power BI reports, and provides information about the data model and entities that were used to build the content.

Overview

The **Production performance** Power BI content is for production managers or individuals in the organization who are responsible for production control.

The reports that are included let you use Power BI to monitor the performance of manufacturing operations with regard to timely execution, quality, and cost. The reports use transactional data from production orders and batch orders, and provide both an aggregate view of company-wide production metrics and a breakdown of metrics by product and resource.

The Power BI content highlights the organization's ability to complete production on time and in full. Future performance is projected based on the production plans. Comprehensive reports provide detailed insights into product defects that are caused by production, and also the defect rates for resources and operations.

This Power BI content also lets you analyze production variances. Production variances are calculated as the difference between estimated cost and realized cost. Production variances are calculated when production orders or batch orders reach **Ended** status.

The **Production performance** Power BI content includes data that originates from production orders and batch orders. The reports don't include data that is related to kanban productions.

Accessing the Power BI content

The **Production performance** Power BI content is shown on the **Production performance** page (**Production control > Inquiries and reports > Production performance analysis > Production performance**).

Metrics that are included in the Power BI content

The **Production performance** Power BI content includes a set of report pages. Each page consists of a set of metrics that are visualized as charts, tiles, and tables.

The following table provides an overview of the visualizations that are included.

REPORT PAGE	CHARTS	TILES
Production performance	<ul style="list-style-type: none">• Number of production by date• Number of productions by product and item group• Number of planned productions by date• Bottom 10 products by on-time & in-full	<ul style="list-style-type: none">• Total orders• On-time & in full %• Incomplete %• Early %• Late %

REPORT PAGE	CHARTS	TILES
Defects by product	<ul style="list-style-type: none"> Defective rate (ppm) by date Defective rate (ppm) by product and item group Quantity produced by date Top 10 products by effective rate 	<ul style="list-style-type: none"> Defective rate (ppm) Defective quantity Total quantity
Defects trend by product	Defect rate (ppm) by quantity produced	Defect rate (ppm)
Defects by resource	<ul style="list-style-type: none"> Defect rate (ppm) by date Defect rate (ppm) by resource and Site Defect rate (ppm) by operation Top 10 resources by defect rate 	Defective quantity
Defects trend by resource	Defect rate (ppm) by quantity processed	
Production variances for job order costing	<ul style="list-style-type: none"> Production variance by date and cost group type Production variance by site and cost group type Top 10 products with unfavorable production variance Top 10 unfavorable production variance by resource 	<ul style="list-style-type: none"> Realized cost Production variance Production variance %

Understanding the data model and entities

The following data is used for the report pages in the **Production performance** Power BI content. This data is represented as aggregate measurements that are staged in the Entity store. The Entity store is a Microsoft SQL Server database that is optimized for analytics. To learn more about the entity store, see [Power BI integration with Entity store](#).

The following table shows the key aggregate measurements that are used as the basis of the Power BI content.

ENTITY	KEY AGGREGATE MEASUREMENTS	DATA SOURCE FOR FINANCE AND OPERATIONS APPS	FIELD
CostCalculation	CostAmount	ProdCalcTransExpanded	CostAmount
CostCalculation	CostMarkup	ProdCalcTransExpanded	CostMarkup
CostCalculation	ActualCostAmount	ProdCalcTransExpanded	RealCostAmount
CostCalculation	RealCostAdjustment	ProdCalcTransExpanded	RealCostAdjustment
RouteTransactions	ErrorQuantity	ProdRouteTransExpanded	QtyError

ENTITY	KEY AGGREGATE MEASUREMENTS	DATA SOURCE FOR FINANCE AND OPERATIONS APPS	FIELD
RouteTransactions	GoodQuantity	ProdRouteTransExpanded	QtyGood
ProductionOrder	DaysDelayed	ProdTableExpanded	DaysDelayed
ProductionOrder	LeadTime	ProdTableExpanded	LeadTime
ProductionOrder	PlannedLeadTime	ProdTableExpanded	PlannedLeadTime
ProductionOrder	ProductionOrderCount	ProdTableExpanded	
CoproductCostCalculation	CoproductCostAmount	PmfCoByProdCalcTransExpanded	CostAmount
CoproductCostCalculation	CoproductCostMarkup	PmfCoByProdCalcTransExpanded	CostMarkup
CoproductCostCalculation	CoproductRealCostAdjustment	PmfCoByProdCalcTransExpanded	RealCostAdjustment
CoproductCostCalculation	CoproductActualCostAmount	PmfCoByProdCalcTransExpanded	RealCostAmount

The following table shows how the key aggregate measurements are used to create several calculated measures in the content's dataset.

MEASURE	HOW THE MEASURE IS CALCULATED
Production variance, %	$\text{SUM}(\text{'Production variance' [Production variance]}) / \text{SUM}(\text{'Production variance' [Estimated cost]})$
All planned orders	$\text{COUNTROWS}(\text{'Planned production order'})$
Early	$\text{COUNTROWS}(\text{FILTER}(\text{'Planned production order'}, \text{'Planned production order' [Scheduled end date]} < \text{'Planned production order' [Requirement date]}))$
Late	$\text{COUNTROWS}(\text{FILTER}(\text{'Planned production order'}, \text{'Planned production order' [Scheduled end date]} > \text{'Planned production order' [Requirement date]}))$
On-time	$\text{COUNTROWS}(\text{FILTER}(\text{'Planned production order'}, \text{'Planned production order' [Scheduled end date]} = \text{'Planned production order' [Requirement date]}))$
On-time %	$\text{IF} (\text{'Planned production order' [On-time]} < > 0, \text{'Planned production order' [On-time]}, \text{IF} (\text{'Planned production order' [All planned orders]} < > 0, 0, \text{BLANK}())) / \text{'Planned production order' [All planned orders]}$
Completed	$\text{COUNTROWS}(\text{FILTER}(\text{'Production order'}, \text{'Production order' [Is RAF'ed]} = \text{TRUE}))$

MEASURE	HOW THE MEASURE IS CALCULATED
Defective rate (ppm)	IF('Production order'[Total quantity] = 0, BLANK(), (SUM('Production order'[Defective quantity]) / 'Production order'[Total quantity]) * 1000000)
Delayed production rate	'Production order'[Late #] / 'Production order'[Completed]
Early & in full	COUNTROWS(FILTER('Production order', 'Production order'[Is in full] = TRUE && 'Production order'[Is early] = TRUE))
Early #	COUNTROWS(FILTER('Production order', 'Production order'[Is early] = TRUE))
Early %	IFERROR(IF('Production order'[Early #] <> 0, 'Production order'[Early #], IF('Production order'[Total orders] = 0, BLANK(), 0)) / 'Production order'[Total orders], BLANK())
Incomplete	COUNTROWS(FILTER('Production order', 'Production order'[Is in full] = FALSE && 'Production order'[Is RAF'ed] = TRUE))
Incomplete %	IFERROR(IF('Production order'[Incomplete] <> 0, 'Production order'[Incomplete], IF('Production order'[Total orders] = 0, BLANK(), 0)) / 'Production order'[Total orders], BLANK())
Is delayed	'Production order'[Is RAF'ed] = TRUE && 'Production order'[Delayed value] = 1
Is early	'Production order'[Is RAF'ed] = TRUE && 'Production order'[Days delayed] < 0
Is in full	'Production order'[Good quantity] >= 'Production order'[Scheduled quantity]
Is RAF'ed	'Production order'[Production status value] = 5 'Production order'[Production status value] = 7
Late & in full	COUNTROWS(FILTER('Production order', 'Production order'[Is in full] = TRUE && 'Production order'[Is delayed] = TRUE))
Late #	COUNTROWS(FILTER('Production order', 'Production order'[Is delayed] = TRUE))
Late %	IFERROR(IF('Production order'[Late #] <> 0, 'Production order'[Late #], IF('Production order'[Total orders] = 0, BLANK(), 0)) / 'Production order'[Total orders], BLANK())
On-time & in full	COUNTROWS(FILTER('Production order', 'Production order'[Is in full] = TRUE && 'Production order'[Is delayed] = FALSE && 'Production order'[Is early] = FALSE))

MEASURE	HOW THE MEASURE IS CALCULATED
On-time & in full %	IFERROR(IF('Production order'[On-time & in full] <> 0, 'Production order'[On-time & in full], IF('Production order'[Completed] = 0, BLANK(), 0)) / 'Production order'[Completed], BLANK())
Total orders	COUNTROWS('Production order')
Total quantity	SUM('Production order'[Good quantity]) + SUM('Production order'[Defective quantity])
Defect rate (ppm)	IF('Route transactions'[Processed quantity] = 0, BLANK(), (SUM('Route transactions'[Defective quantity]) / 'Route transactions'[Processed quantity]) * 1000000)
Defect ratio mixed (ppm)	IF('Route transactions'[Total mixed quantity] = 0, BLANK(), (SUM('Route transactions'[Defective quantity]) / 'Route transactions'[Total mixed quantity]) * 1000000)
Processed quantity	SUM('Route transactions'[Good quantity]) + SUM('Route transactions'[Defective quantity])
Total mixed quantity	SUM('Production order'[Good quantity]) + SUM('Route transactions'[Defective quantity])

The following table shows the key dimensions that are used as filters to slice the aggregate measurements, so that you can achieve greater granularity and gain deeper analytical insights.

ENTITY	EXAMPLES OF ATTRIBUTES
Reported as finished date	Completion (RAF) date, Month, and Year offset
Ended date	Ended month offset and Month
Requirement date	Requirement date month offset and Requirement date
Route transaction date	Route transaction month offset and Date
Sites	Sites ID, Site name, State, and City
Entities	Id and Name
Resources	Resource ID, Resource name, Resource type, and Resource group
Products	Product number, Product name, Item ID, and Item group

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Warehouse performance Power BI content

2/18/2021 • 10 minutes to read • [Edit Online](#)

This topic describes what's included in the **Warehouse performance** Microsoft Power BI content. It explains how to access the Power BI reports, and provides information about the data model and entities that are used to build the content.

Overview

The **Warehouse performance** Power BI content was created so that warehouse and operations managers can monitor important inbound, outbound, and inventory metrics. It uses Warehouse management, product, and other transactional data from your system, and provides both an aggregate view of warehouse performance and a breakdown for vendors, product groups and products, and site and warehouses.

Warehouse managers can use the **Warehouse performance** Power BI content to measure the following three areas:

- **Inbound performance** – Measure how well a vendor is performing against customer requirements (in other words, measure delivery performance), and measure put-away performance, so that you can identify issues that involve workers or items over a period. It's important that you know whether vendors are delivering on time, early, or late, so that you can determine how vendor performance is affecting overall put-away performance. A vendor that delivers outside the dates that were agreed on can put extra pressure on the warehouse because of unexpected work, and can increase the average put-away time.
- **Shipping performance** – Measure whether your warehouse is shipping in full and on time to customers (in other words, measure outbound shipping and delivery performance), so that you can identify any issues that involve products, sites or warehouses, or dedicated customers. If you find that you're shipping late to specific areas or towns, you might have to pay more attention to transportation or account management.
- **Location inventory accuracy** – Inventory accuracy is important internal warehouse business intelligence (BI). It's very important that you determine how accurately you're counting in general. However, it's also important that you determine how accurate you are at storing items in the correct locations, and that you highlight discrepancy data, so that you can find better positions for items or initiate total counting on specific items. (Currently, the new item-based counting functionality is delivered as a hotfix.) If you're using this Power BI content to determine the correctness of on-hand inventory data per location, you can also identify theft in your shops. You can also determine whether any locations have on-hand quantities that differ from enterprise resource planning (ERP) data. Those locations might be too large, or they might be impossible to count. Alternatively, some of the physical positioning might be bad, so that it's difficult to keep a single type of item in sync with on-hand data.

Accessing the Power BI content pack

The **Warehouse performance** Power BI content is shown on the **Warehouse performance** page (**Warehouse management > Inquiries and reports > Warehouse performance analysis > Warehouse performance**).

Metrics that are included in the Power BI content

The **Warehouse performance** Power BI content includes a report. This report consists of a set of metrics that are visualized as charts, tiles, and tables. The following table provides an overview of the visualizations in the **Warehouse performance** Power BI content.

REPORT PAGE	CHARTS	DESCRIPTION
Inbound Performance	Total put aways	The number of put-away work lines that are processed during a given time.
Inbound Performance	Put away average time	The average time, in hours, for all purchase order put-away lines that are processed, from registration of the items until the last put is processed.
Inbound Performance	Received early	The number of purchase order lines that are received early.
Inbound Performance	Received on time	The number of purchase order lines that are received on time.
Inbound Performance	Received late	The number of purchase order lines that are received late.
Inbound Performance	On time by vendor	A view of the percentage of purchase order lines that are received from a vendor or vendor group early, on time, and late.
Inbound Performance	Dock to stock average put away (hours)	The average dock-to-stock put-away time in hours over time.
Inbound Performance	Average put away by worker	The average time, in hours, that a worker has been taking for put-away processing of purchase order lines.
Inbound Performance	Average put away hour by vendor	The average put-away time in hours by vendor or vendor group.
Inbound Performance	Average put away hour by product	The average put-away time in hours by item or item group.
Location inventory accuracy	Total count	The number of counting work lines that are processed for a given period.
Location inventory accuracy	Discrepancy rate	The total discrepancy rate as a percentage of all lines that are counted for a given period.
Location inventory accuracy	Count without discrepancy	Of the total number of counting work lines that are processed, the number of lines that are processed without any discrepancy.
Location inventory accuracy	Items counted over time	The percentage of items that are counted with and without discrepancy over time.

REPORT PAGE	CHARTS	DESCRIPTION
Location inventory accuracy	Item quantity discrepancy greater than %	A table view of counting lines that have discrepancies that exceed a specified percentage. The table includes information about locations, items, the average discrepancy, the total counting work lines that are counted, the number of counting lines that have discrepancies for the location, the average quantity that is counted, the expected total quantity that will be counted, and the actual item quantity that is counted.
Location inventory accuracy	Item count by worker	The counting performance of workers. Performance is expressed as a percentage of counting work lines that have and don't have discrepancies.
Location inventory accuracy	Item count by site / warehouse	Counting performance by the number of processed counting work lines by site or warehouse that have and don't have discrepancies.
Location inventory accuracy	Discrepancy rate by product	The discrepancy rate for counting performance. The rate is expressed as a percentage of processed counting work lines by item or item group.
Shipping performance	Lines shipped	The total number of shipment lines that are shipped over a given period.
Shipping performance	Early	The percentage of shipment lines that are shipped early.
Shipping performance	On time	The percentage of shipment lines that are shipped on time.
Shipping performance	Late	The percentage of shipment lines that are shipped late.
Shipping performance	Shipments over time	The percentage of shipment lines that are shipped on time, early, or late over a given period. A trend line shows the trend for lines that are shipped on time.
Shipping performance	Shipped late by city	A map visualization of cities and areas that are affected by late shipments.
Shipping performance	Shipped by product	The percentage that is shipped early, on time, or late by item or item group.
Shipping performance	Shipped by customer	The percentage that is shipped early, on time, or late by customer or customer group.

REPORT PAGE	CHARTS	DESCRIPTION
Shipping performance	Shipped by site / warehouse	The percentage that is shipped early, on time, or late by site or warehouse.

Understanding the data model and calculations

The following data is used to fill the report pages in the **Warehouse performance** Power BI content. This data is represented as aggregate measurements that are staged in the Entity store. The Entity store is a Microsoft SQL Server database that is optimized for analytics. For more information, see [Power BI integration with Entity store](#).

The following key aggregate measurements are used as the basis of the content.

REPORT PAGE	CHARTS	TABLES	CALCULATION DESCRIPTIONS
Inbound Performance	Total put aways	WHSWorkLine	The count of work lines where the work type is put .
Inbound Performance	Put away average time	WHSWorkLine	The sum of work lines max. time divided by the count of work lines max. time, where work lines max. time is the maximum gap between the work created date and the closed date.
Inbound Performance	Received early	WHSWorkLine	The count of work lines where the work created date is earlier than the delivery date that is used. If the delivery confirmed date isn't set, use the default delivery date.
Inbound Performance	Received on time	WHSWorkLine	The count of work lines where the work created date is equal to the delivery date that is used. If the delivery confirmed date isn't set, use the default delivery date.
Inbound Performance	Received late	WHSWorkLine	The count of work lines where the work created date is later than the delivery date that is used. If the delivery confirmed date isn't set, use the default delivery date.
Inbound Performance	On time by vendor	WHSWorkLine	Received early, Received on time, and Received late (see the descriptions earlier in this table).

REPORT PAGE	CHARTS	TABLES	CALCULATION DESCRIPTIONS
Inbound Performance	Dock to stock average put away (hours)	WHSWorkLine	Put away average time (see the description earlier in this table).
Inbound Performance	Average put away by worker	WHSWorkLine	Put away average time (see the description earlier in this table).
Inbound Performance	Average put away hour by vendor	WHSWorkLine	Put away average time (see the description earlier in this table).
Inbound Performance	Average put away hour by product	WHSWorkLine	Put away average time (see the description earlier in this table).
Location inventory accuracy	Total count	WHSWorkLineCycleCount	Cycle counts where the absolute discrepancy quantity is equal to or more than 0 (zero).
Location inventory accuracy	Discrepancy rate	WHSWorkLineCycleCount	Cycle counts that have discrepancies, divided by the total count. A cycle count is considered to have discrepancies if the absolute discrepancy quantity is more than 0 (zero).
Location inventory accuracy	Count without discrepancy	WHSWorkLineCycleCount	Cycle counts where the absolute discrepancy quantity is more than 0 (zero).
Location inventory accuracy	Count with discrepancy	WHSWorkLineCycleCount	Cycle counts where the absolute discrepancy quantity is equal to 0 (zero).
Location inventory accuracy	Items counted over time	WHSWorkLineCycleCount	Count without discrepancy and Count with discrepancy (See the descriptions earlier in this table.)

REPORT PAGE	CHARTS	TABLES	CALCULATION DESCRIPTIONS
Location inventory accuracy	Item quantity discrepancy greater than %	WHSWorkLineCycleCount	The average discrepancy is the absolute discrepancy quantity divided by the expected quantity where the absolute discrepancy quantity is more than 0 (zero). The average discrepancy quantity is the average absolute discrepancy quantity where the absolute discrepancy quantity is more than 0 (zero). Count with discrepancy, Total count, Expected quantity, and Counted quantity where the whole quantity is grouped by item and location (see the descriptions earlier in this table).
Location inventory accuracy	Item count by worker	WHSWorkLineCycleCount	Count without discrepancy and Count with discrepancy (see the descriptions earlier in this table).
Location inventory accuracy	Item count by site / warehouse	WHSWorkLineCycleCount	Count without discrepancy and Count with discrepancy (see the descriptions earlier in this table).
Location inventory accuracy	Discrepancy rate by product	WHSWorkLineCycleCount	Discrepancy rate (see the description earlier in this table).
Shipping performance	Lines shipped	SalesLine	The count of sales lines where sales lines are shipped.
Shipping performance	Early	CustPackingSlipOnTimeStat us	Sales lines where the ship date status is 1 (Early) . Early means that the ship date of the packing slip is earlier than the confirmed ship date of the sales line. If the confirmed ship date isn't set, use the requested ship date.

REPORT PAGE	CHARTS	TABLES	CALCULATION DESCRIPTIONS
Shipping performance	On time	CustPackingSlipOnTimeStat us	Sales lines where the ship date status is 2 (On time) . On time means that the ship date of the packing slip is equal to the confirmed ship date of the sales line. If the confirmed ship date isn't set, use the requested ship date.
Shipping performance	Late	CustPackingSlipOnTimeStat us	Sales lines where the ship date status is 3 (Late) . Late means that the ship date of the packing slip is later than the confirmed ship date of the sales line. If the confirmed ship date isn't set, use the requested ship date.
Shipping performance	Shipments over time	SalesLine CustPackingSlipOnTimeStat us	Orders that are fully shipped, where the whole quantity of the sales line is shipped, plus Early, On time, and Late (see the descriptions earlier in this table).
Shipping performance	Shipped late by city	CustPackingSlipOnTimeStat us	Late (see the descriptions earlier in this table).
Shipping performance	Shipped by product	CustPackingSlipOnTimeStat us	Early, On time, and Late (see the descriptions earlier in this table).
Shipping performance	Shipped by customer	CustPackingSlipOnTimeStat us	Early, On time, and Late (see the descriptions earlier in this table).
Shipping performance	Shipped by site / warehouse	CustPackingSlipOnTimeStat us	Early, On time, and Late (see the descriptions earlier in this table).

NOTE

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Analytical Workspaces (using Power BI Embedded)

2/18/2021 • 2 minutes to read • [Edit Online](#)

Dynamics Finance and Operations apps now deliver rich, interactive reports seamlessly integrated into application workspaces. By using graphics and visuals supported by Power BI, workspaces can provide a highly-visual, yet interactive experiences for users.

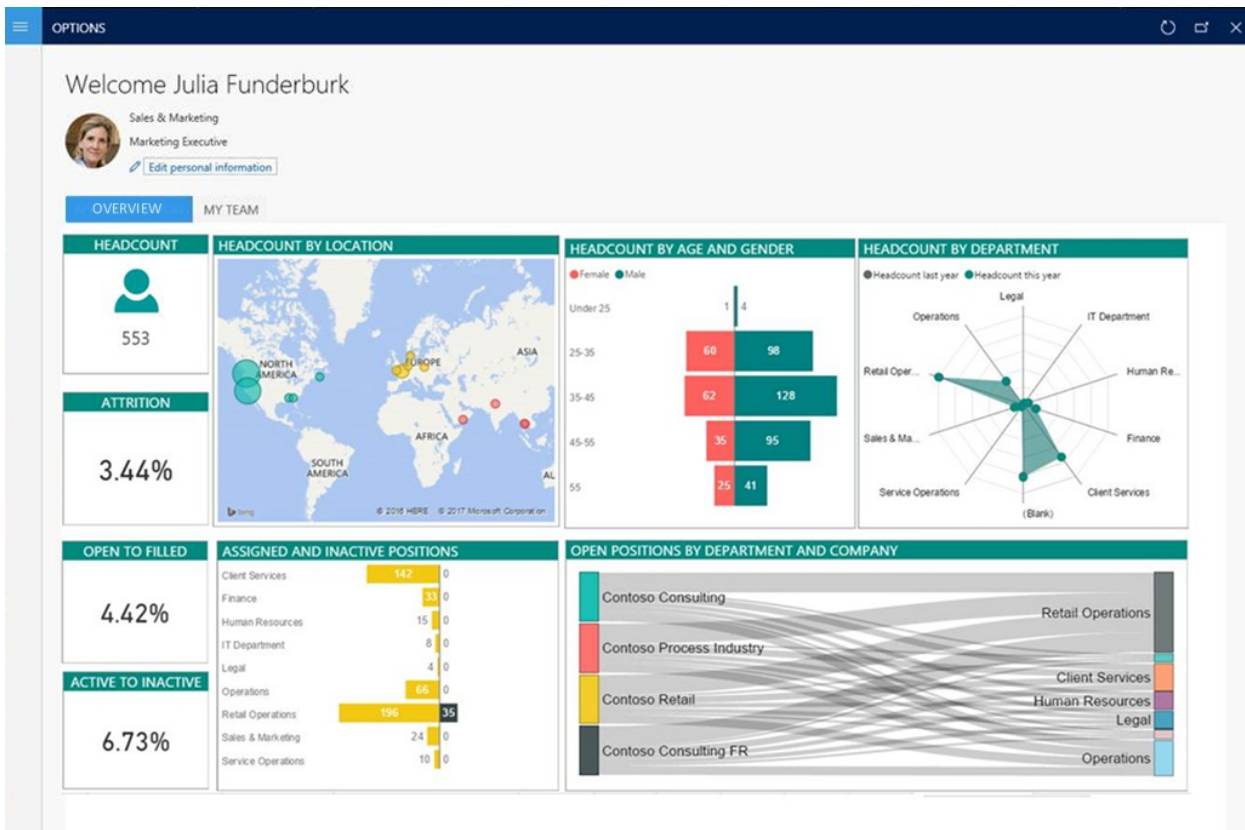
Overview

Workspaces in the application provide an overview of business processes or business units. With rich workspaces, users can get a bird's-eye view of the state of business before diving into details and taking action. Workspaces contain visuals, count tiles, and KPIs as well as quick links to reports and pages. Within a workspace, all controls are tightly integrated to provide a highly-productive and engaging work environment to the user. Power BI Embedded is a Microsoft Azure service that enables ISVs and app developers to surface Power BI data experiences within their applications. With Power BI Embedded, developers can deliver always-up-to-date views with Direct Query. To learn more about how the Power BI Embedded service integrates with the application, see [Power BI Embedded integration](#).

Power BI in workspaces

The application now delivers interactive reports that seamlessly integrate into application workspaces. By using rich infographics and visuals supported by Power BI (including the large number of controls provided by third parties), workspaces can provide a highly-visual, yet interactive experience for users. Using infographics in the overview page, users can get a quick glance of the state of the business. They can interact with data by simply clicking or touching visuals on the page. They can see the cause and effect, perform simple what-if operations without leaving the workspace. Thanks to stunning yet interactive visuals, your users will have fun exploring data and discovering hidden trends.

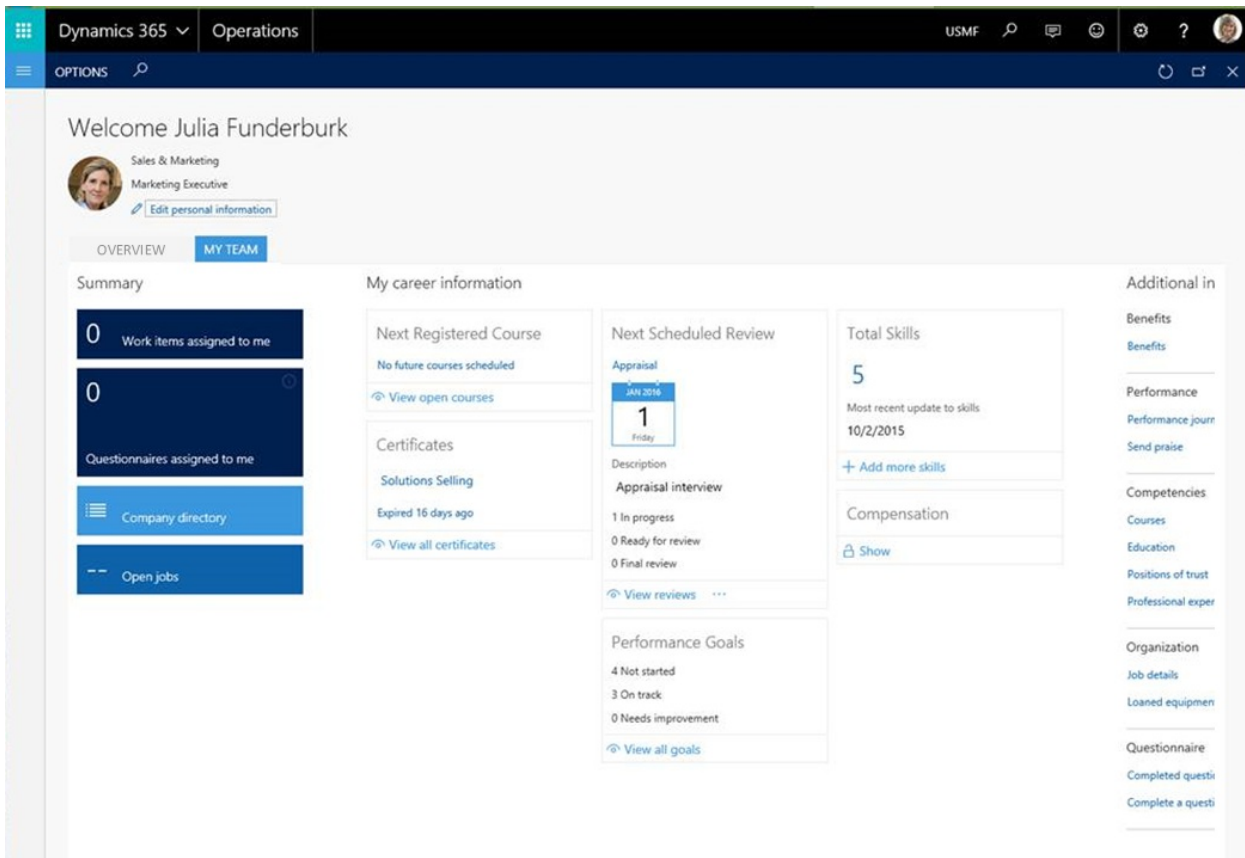
The following screenshot shows Power BI in a workspace.



Power BI vs operational workspaces

Power BI workspaces complement operational views with analytical insights based on near real-time information. The following offers a visual comparison of a Power BI workspace and an operational workspace.

The following screenshot shows an operational workspace.



Edit embedded reports in analytical workspaces

The [How to edit an embedded report in an analytical workspace](#) video (shown above) is included in the [Playlist](#) available on YouTube.

What's next?

Going forward, new cloud deployments will come bundled with the Power BI Embedded service. Additional documentation describing the Developer ALM process will be made available to help partners and ISVs create new solutions that take advantage of the Power BI Embedded service integration options that are available.

NOTE

Can you tell us about your documentation language preferences? [Take a short survey.](#)

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Power BI Embedded integration

2/18/2021 • 5 minutes to read • [Edit Online](#)

Microsoft Power BI content that partners and independent software vendors (ISVs) developed can be embedded directly into the Microsoft Dynamics 365 Finance. This topic describes some of the ways that you can use the Microsoft Power BI Embedded integration.

Overview

The integration of the application and [Power BI](#) enables data mash-up scenarios that require access to external data sources that are supported through Microsoft Power Query for Excel. Users can personalize workspaces by embedding tiles that are hosted on PowerBI.com. Users can also add direct links to reports that are hosted on PowerBI.com. In this way, users can access and interact with the reports without leaving the application. Power BI content (PBIX files) that partners and ISVs develop can be embedded directly into the application. PBIX files that are associated with a model file are automatically published in Power BI Embedded as part of the application deployment process. Additionally, you can add X++ extensions for embedded reporting scenarios that require the following functionality:

- Drill-down navigation into detailed pages in response to user interactions
- Report filters that are based on user and session context information, such as company or date range
- The ability to navigate directly to a specific tab on a Power BI report via menu items

For more information about customizations that use extensions, see [Customize through extension and overlaying](#).

Advantages of Power BI Embedded

- **Deliver Power BI workspaces and reports in the application.** If you're a power user or a business analyst, you can tweak ready-made reports or create new reports by using Power BI tools. As a developer, you can use the reports that your users create to provide rich navigation experiences in the product through workspaces. If you're in the partner and ISV community, you can build rich workspaces that include Power BI experiences, and then release those workspaces as part of your solution.
- **The Power BI Embedded service license is bundled with the application.** If you're an ISV or a systems integrator, you can package workspaces that are enabled for Power BI (and navigational experiences that those workspaces provide) as part of a Microsoft Dynamics Lifecycle Services (LCS) solution. Your customers get the same experience without having to have a PowerBI.com subscription. The workspaces just work with Finance and Operations applications.
- **Enable drill-down into detailed pages from Power BI.** The visuals are the starting point for action. Your users can drill down to business processes and pages to act immediately on issues that they uncover. The visuals let users filter data and uncover trends. Action pages reflect just the set of data that requires attention.
- **Help secure access to Power BI reports by using menu items.** As a developer, you can use familiar programming concepts that are available in Finance and Operations apps, because we have extended the same concepts to workspaces that are based on Power BI. You can create new workspaces or extend existing workspaces by adding an overview page that is driven by Power BI. Developers can associate menu items with Power BI reports and include them as links in workspaces. The role-based and task-based security in Finance and Operations apps can be used to help secure these menu items.
- **Filter reports based on application context.** You can build navigation experiences by passing one or more filters to Power BI reports. For example, depending on a user's actions or context, you can filter the Power BI report to reflect data from one business unit or a specific product. The user doesn't have to filter the

data. You can define drill-through links to Finance and Operations pages, so that users can go directly to the transactional details pages.

For more information about the Power BI Embedded service, see the [Power BI FAQ](#).

Service availability

The Power BI Embedded service is automatically deployed and configured for all cloud-hosted, multi-box deployments. Because the service relies on Microsoft Azure services, application analytical workspaces and reports are unavailable in one-box environments. The Power BI Embedded service is already available in most Azure datacenters. You can check the latest availability on the [Azure status](#) page.

Frequently asked questions

Can I customize the Power BI embedded reports?

Yes. To customize the Power BI embedded reports, just install Power BI Desktop in a one-box environment, and follow the steps in [Create analytical reports by using Power BI Desktop](#).

Do customers have to purchase a separate Power BI license to use the new embedded analytics?

No, customers don't have to purchase a separate Power BI license to use the new embedded analytics. However, a Power BI Pro license is required in order to connect to Entity Store from PowerBI.com by using DirectQuery.

Can I do data mash-ups by using external data in the embedded reports?

No, you can't currently do data mash-ups by using external data in the embedded reports.

Can I help secure data to only those companies that I have access to?

Yes, the single company view prevents users from accessing data from companies that they don't have access to. For more information about how to help secure custom solutions, see [Help secure analytical workspaces and reports by using Power BI Embedded](#).

How is currency shown across multiple companies?

Currency is shown as a system currency. The system currency is defined on the [System parameters](#) page.

Can I drill from summary balances back into Finance and Operations?

Yes, you can drill into the details on a Power BI report. However, there is limited support for drill-down into Finance and Operations apps.

What languages are currently supported?

Currently, only English is supported. However, the Power BI team plans to add support for other languages.

Can I access analytical workspaces and reports in the on-premises version of Finance and Operations?

No, you can't currently access analytical workspaces and reports in Dynamics 365 Finance + Operations (on-premises). Systems of Intelligence functions rely on cloud-hosted solutions.

NOTE

Can you tell us about your documentation language preferences? [Take a short survey](#).

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Customize embedded reports in analytical workspaces

2/18/2021 • 4 minutes to read • [Edit Online](#)

Analytical workspaces

Analytical workspaces are bundled with the application suite. Through reporting, they offer users insights into data that is based on standard business operations. The reports are generic reports that are defined by business professionals. They include metrics that are considered interesting to a wide range of users from any industry.

However, in some cases, the standard reports include data that isn't relevant to all customers. More often, customers might want to access data points or calculations that are left out of the standard reports.

Power users can use web-friendly design tools to customize the analytical reports that are embedded in the application. By using the free-form canvas designer, users who are familiar with the relevant business insights that are required can help make the organization successful.

IMPORTANT

Customizations that are made to the embedded analytical reports are automatically deployed by the service and made available to other users of the system.

Edit embedded reports in analytical workspaces

The [How to edit an embedded report in an analytical workspace](#) video (shown above) is included in the [Playlist](#) available on YouTube.

Important points about embedded analytical reports

Although the standard reports deliver insights that are tailored to a given business persona, customizations can often maximize the value of these standard reports.

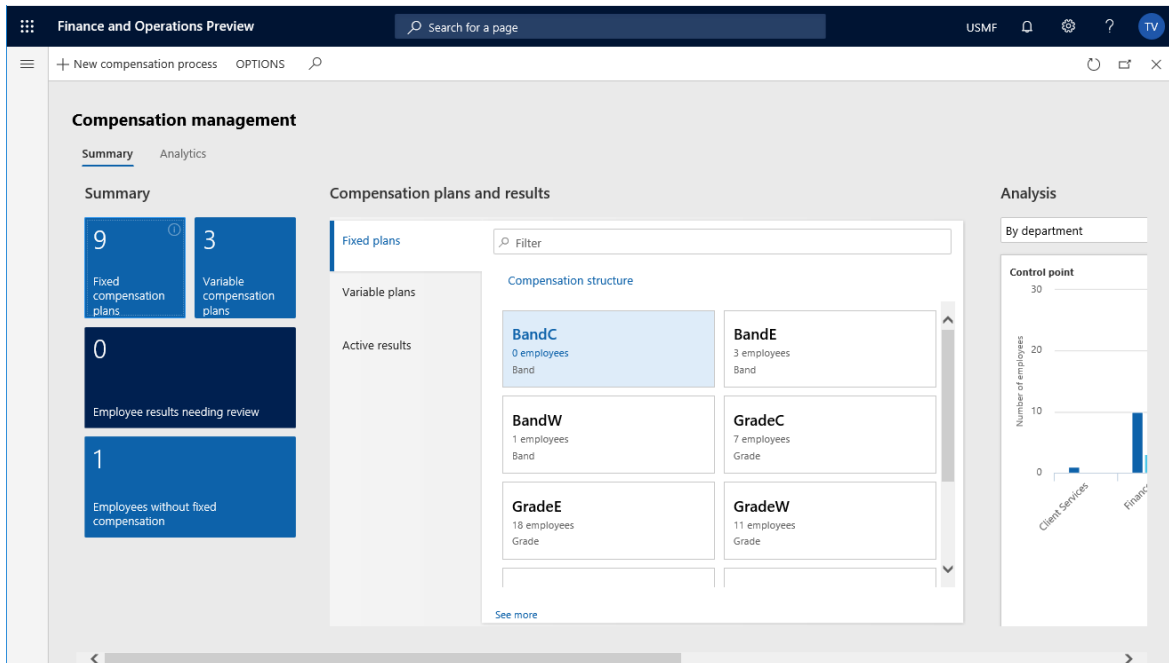
Here are some important points to note about this service capability:

- Customizations are limited to the report design canvas. Users can't change the definitions of report data sets.
- Report customizations that are made to the analytical workspace apply to all users in the environment.
- The service automatically preserves report customizations during product upgrades.
- The service doesn't support the export of customizations that are made to analytical workspaces.

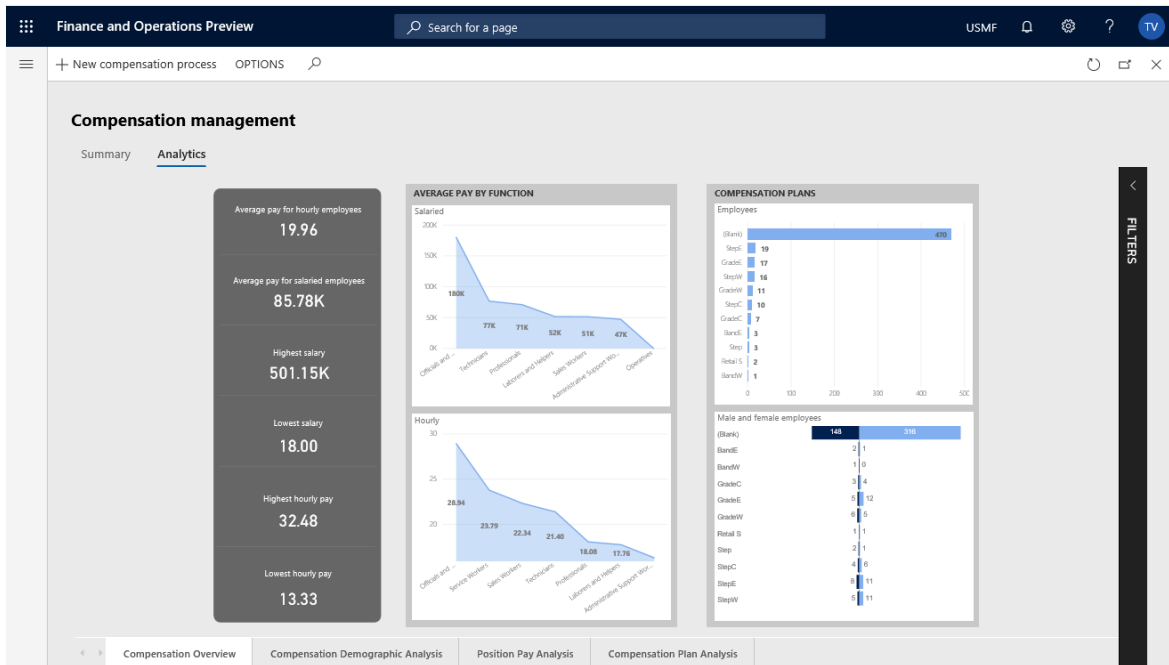
Customize an analytical workspace

To customize the embedded application solutions, a user must be a member of the System Report Editors security group. Members of this security group can do customizations by using the buttons on the **Options** tab on the Action Pane of the application workspaces. This example shows how to customize one of the standard analytical workspaces that are bundled with the application suite.

1. Sign in and open the application workspace that you want to customize. In this example, you will replace the standard analytical report that is embedded in the **Compensation management** workspace.



2. Select the **Analytics** tab to access the workspace's embedded analytical report.

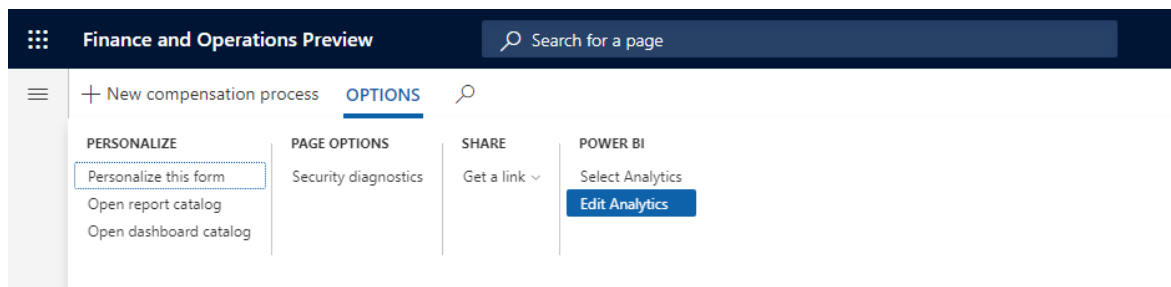


By default, you see the standard analytical workspace solution that is packaged with your application. The reports in this solution are automatically deployed and configured for your environment during the provisioning process.

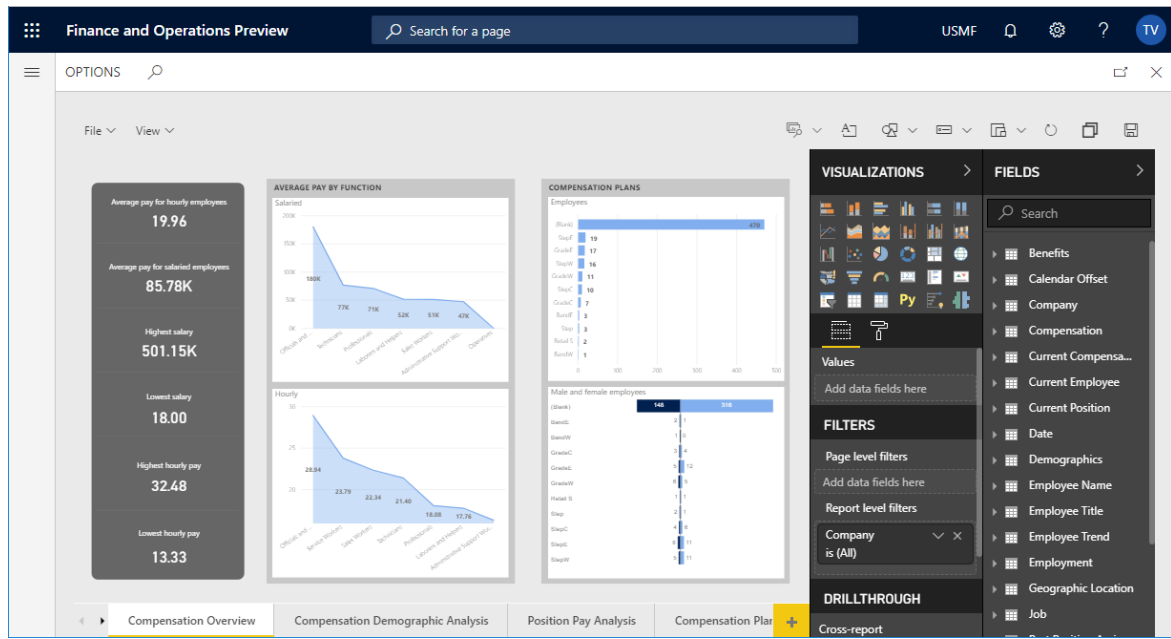
NOTE

The analytical workspaces require a hosted Microsoft Power BI service that is available only for dedicated environments. For more information, see [Accessing Analytical Workspaces and Reports on 1Box environment](#).

3. On the Action Pane, on the **Options** tab, in the **Power BI** group, select **Edit Analytics**.



The analytical workspace is opened in edit mode, and you have direct access to the Power BI web designer tools.



4. Use the Power BI web designer tools to customize the report canvas. The intuitive web controls let you perform typical actions such as adding and removing visuals, changing visual types, and formatting the content. You can also inspect the source of the report visualizations to make sure that decisions are based on the most relevant data that is available in the system. For more information, see [Add visualizations to a Power BI report](#).
5. After you've completed your report customizations, select the **Save** button to promote the report edits. Customizations to the report are reflected immediately in the service. Therefore, users in your organization have access to the latest innovations.

NOTE

Customizations made in the web editor are not saved back to the underlying PBIX report and are not retrievable if the PBIX report is later customized on a development environment.

Restore the standard application solution

Follow these steps to restore the analytical workspaces that are bundled with the application solution.

1. In the analytical workspace, on the Action Pane, on the **Options** tab, in the **Power BI** group, select **Restore Analytics**.
2. To view the updates to the workspace, reload the page. Either move away from the workspace and then return, or refresh your browser.
3. In the **Compensation management** workspace, select the **Analytics** tab to access the original analytical workspace that was packaged with the application.

Troubleshooting

Follow these steps to address common issues encountered while attempting to use analytical workspaces.

Error message: *Please log into Power BI to access its resource*

The Power BI service requires explicit permission from the user to allow access to hosted content. Use the following steps to ensure the current user is able to connect to reports hosted on PowerBI.com from the application suite.

1. Open any application workspace containing a section titled **Link**. For example, "Bank management".
2. Select **Options**, and then select **Open report catalog** on the top left.
3. Follow the steps in the dialog box to **Authorize to Power BI** to access Finance and Operations apps for the current user.

NOTE

Can you tell us about your documentation language preferences? [Take a short survey](#).

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Document Reporting Services

2/18/2021 • 3 minutes to read • [Edit Online](#)

This article describes the integrated reporting solution that are available. This solution simplifies service administration, increases developer productivity, and provides an enhanced report viewing experience for users.

Document Reporting Services

Document Reporting Services are based on Microsoft SQL Server Reporting Services (SSRS). In the current version of the application, these services are hosted in the Microsoft Azure compute service. If you're developing in a one-box environment, the services also run locally in the Azure compute emulator.

Service deployment – Local vs. cloud

In a one-box environment, developers can create, modify, and preview reports, from end to end, by using Microsoft Visual Studio. A separate process isn't required in order to add reports to the application's metadata store. Changes to reports are packaged together with other solution updates and then deployed to the cloud after development is completed in the local environment.

Viewing reports

The enhanced report viewing experience that provides for end users is the same as the report preview experience in Microsoft Visual Studio. You no longer use a separate design preview in Visual Studio. Instead, just press Ctrl+F5 to build and preview the report in an Internet Explorer window. The report appears exactly as it would appear in the client. Even the user's parameter experience is the same. The following screen shot shows an example of a report preview that is opened from Visual Studio.

The screenshot shows a web browser window with the URL `https://usnconeboxa...` and a tab titled 'Customer list -- Microsoft ...'. The page header includes 'Admin (DAT) Company accou...' and navigation icons. The main content area is titled 'Customer list' and features a 'Fleet Management' section with a car icon and the text 'FABRIKAM Fleet Management'. Below this, there is an address: '123 Second Street, City, St. 99909 USA', and phone/fax numbers: 'P: 0123456789, F: 0123456780'. A prominent orange box displays 'Customer details report' dated '11/13/2014 9:31:03 PM' and '6 active customers'. The page is divided into three sections for member groups:

- Members of our Non-Member group:** A table with columns 'FIRST', 'LAST', and 'LICENSE'. It lists three members: Adrian Lannin (license 5688-8944-8185), Andreas Dziegiel (license V347-3489-2984), and Tony Smith (license B923-2381-9954). Below the table, it states 'We have 3 members of this group'.
- Members of our Advantage Member group:** A table with columns 'FIRST', 'LAST', and 'LICENSE'. It lists two members: Josh Bailey (license B889-1128-6699) and Phil Spencer (license S468-3184-6541). Below the table, it states 'We have 2 members of this group'.
- Members of our Executive Member group:** A table with columns 'FIRST', 'LAST', and 'LICENSE'. It lists one member: Mirina Natarajan (license S615-3939-2354). Below the table, it states 'We have 1 members of this group'.

The page footer indicates 'Page 1 of 1'.

Service administration prerequisites

The following table compares the service administration prerequisites for Microsoft Dynamics AX 2012 and the current version of the application.

AX 2012	THE CURRENT VERSION OF THE APPLICATION
<p>A report development environment has the following prerequisites:</p> <ul style="list-style-type: none"> • SSRS must be installed. • SSRS must be configured by using Reporting Services Configuration Manager. • SSRS extensions for the application must be installed. 	<p>Reporting services run in the Azure compute emulator, together with the application server. Therefore, there are no SSRS service administration prerequisites. After reports have been deployed to the local reporting services, they can be accessed from the client.</p>

Developing application reports

The process for developing a report in the current version is easier than it is in AX 2012, because you can create and validate a reporting solution entirely in Visual Studio. The following table describes how the application simplifies the basic procedure for adding an automatic design report that is based on a query.

AX 2012	THE CURRENT VERSION OF THE APPLICATION
<ol style="list-style-type: none"> 1. In the application, create a query in the Application Object Tree (AOT). 2. In Visual Studio, create a reporting project, and add the query to it. 3. Edit the report in the Visual Studio model editor. 4. Preview the report design in Visual Studio by using the model editor toolbar. 5. Use Visual Studio to add the report to the AOT. 6. Use the AOT in the client to create a menu item for the report, and add the menu item to a menu. 7. Use the AOT to deploy the report to the report server. 8. Verify the report in the client. 	<ol style="list-style-type: none"> 1. In Visual Studio, create a reporting project and the query. 2. Edit the report in Visual Studio. 3. In Visual Studio, add the report to a menu item, and set the menu item as a startup object. 4. Use the AOT to deploy the report to the report server. 5. Press Ctrl+F5 to verify the report in the application. <div style="border: 1px solid gray; padding: 5px; margin: 10px 0;"> <p>[!NOTE] There is no longer a separate preview of the report design from the model editor.</p> </div> <ol style="list-style-type: none"> 6. When the whole solution is completed, deploy it to the cloud in one package.

NOTE

Can you tell us about your documentation language preferences? [Take a short survey.](#)

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Supported fonts

2/18/2021 • 13 minutes to read • [Edit Online](#)

Finance and Operations apps include access to hundreds of standard, business-ready fonts available for documents rendered by the cloud-hosted service.

This portfolio will continue to grow as the service expands into new regions and industries. However, the service no longer supports the installation of custom fonts in customer environments. Requests to expand the collection of fonts supported by the service will be considered on a case-by-case basis.

The following list captures the portfolio of font families available for documents produced using SQL Server Reporting Services (SSRS) services in Finance and Operations apps.

Supported fonts for application version 8.3 with Platform update 32 or later

FONT FAMILY	SOURCE
Agency FB	Office font
Algerian	Office font
Arial	Finance and Operations font
Arial Black	Finance and Operations font
Arial Narrow	Finance and Operations font
Arial Rounded MT Bold	Office font
Baskerville Old Face	Office font
Bauhaus 93	Office font
BC C128 HD Medium	Finance and Operations font
BC C128 HD Narrow	Finance and Operations font
BC C128 HD Wide	Finance and Operations font
BC C128 Medium	Finance and Operations font
BC C128 Narrow	Finance and Operations font
BC C128 Wide	Finance and Operations font
BC C39 2 to 1 HD Medium	Finance and Operations font
BC C39 2 to 1 HD Narrow	Finance and Operations font

FONT FAMILY	SOURCE
BC C39 2 to 1 HD Wide	Finance and Operations font
BC C39 2 to 1 Medium	Finance and Operations font
BC C39 2 to 1 Narrow	Finance and Operations font
BC C39 2 to 1 Wide	Finance and Operations font
BC C39 3 to 1 HD Medium	Finance and Operations font
BC C39 3 to 1 HD Narrow	Finance and Operations font
BC C39 3 to 1 HD Wide	Finance and Operations font
BC C39 3 to 1 Medium	Finance and Operations font
BC C39 3 to 1 Narrow	Finance and Operations font
BC C39 3 to 1 Wide	Finance and Operations font
BC CBar 2 to 1 HD Medium	Finance and Operations font
BC CBar 2 to 1 HD Narrow	Finance and Operations font
BC CBar 2 to 1 HD Wide	Finance and Operations font
BC CBar 2 to 1 Medium	Finance and Operations font
BC CBar 2 to 1 Narrow	Finance and Operations font
BC CBar 2 to 1 Wide	Finance and Operations font
BC CBar 3 to 1 HD Medium	Finance and Operations font
BC CBar 3 to 1 HD Narrow	Finance and Operations font
BC CBar 3 to 1 HD Wide	Finance and Operations font
BC CBar 3 to 1 Medium	Finance and Operations font
BC CBar 3 to 1 Narrow	Finance and Operations font
BC CBar 3 to 1 Wide	Finance and Operations font
BC I25 HD Medium	Finance and Operations font
BC I25 HD Narrow	Finance and Operations font
BC I25 HD Wide	Finance and Operations font

FONT FAMILY	SOURCE
BC I25 Medium	Finance and Operations font
BC I25 Narrow	Finance and Operations font
BC I25 Wide	Finance and Operations font
BC Postnet	Finance and Operations font
BC UPC HD Medium	Finance and Operations font
BC UPC HD Narrow	Finance and Operations font
BC UPC HD Wide	Finance and Operations font
BC UPC Medium	Finance and Operations font
BC UPC Narrow	Finance and Operations font
BC UPC Wide	Finance and Operations font
Bell MT	Office font
Berlin Sans FB	Office font
Berlin Sans FB Demi	Office font
Bernard MT Condensed	Office font
Blackadder ITC	Office font
Bodoni MT	Office font
Bodoni MT Black	Office font
Bodoni MT Condensed	Office font
Bodoni MT Poster Compres	Office font
Book Antiqua	Office font
Bookman Old Style	Office font
Bookshelf Symbol 7	Office font
Bradley Hand ITC	Office font
Britannic Bold	Office font
Broadway	Office font

FONT FAMILY	SOURCE
Brush Script MT	Office font
Buxton Sketch	Office font
Calibri	Finance and Operations font
Calibri Light	Finance and Operations font
Californian FB	Office font
Calisto MT	Office font
Cambria	Finance and Operations font
Cambria Math	Finance and Operations font
Candara	Finance and Operations font
Castellar	Office font
Centaur	Office font
Century	Office font
Century Gothic	Office font
Century Schoolbook	Office font
Chiller	Office font
Colonna MT	Office font
Comic Sans MS	Finance and Operations font
Consolas	Finance and Operations font
Constantia	Finance and Operations font
Cooper Black	Office font
Copperplate Gothic Bold	Office font
Copperplate Gothic Light	Office font
Corbel	Finance and Operations font
Courier New	Finance and Operations font
Curlz MT	Office font

FONT FAMILY	SOURCE
DengXian	Office font
Dotum	Finance and Operations font
DotumChe	Finance and Operations font
Ebrima	Finance and Operations font
Edwardian Script ITC	Office font
Elephant	Office font
Engravers MT	Office font
Eras Bold ITC	Office font
Eras Demi ITC	Office font
Eras Light ITC	Office font
Eras Medium ITC	Office font
Felix Titling	Office font
Footlight MT Light	Office font
Forte	Office font
Franklin Gothic Book	Office font
Franklin Gothic Demi	Office font
Franklin Gothic Demi Con	Office font
Franklin Gothic Heavy	Office font
Franklin Gothic Medium	Finance and Operations font
Franklin Gothic Medium C	Office font
Freestyle Script	Office font
French Script MT	Office font
Gabriola	Finance and Operations font
Gadugi	Finance and Operations font
Garamond	Office font

FONT FAMILY	SOURCE
Georgia	Finance and Operations font
Gigi	Office font
Gill Sans MT	Office font
Gill Sans MT Condensed	Office font
Gill Sans MT Ext Condens	Office font
Gill Sans Ultra Bold	Office font
Gill Sans Ultra Bold Con	Office font
Gloucester MT Extra Cond	Office font
Goudy Old Style	Office font
Goudy Stout	Office font
Gulim	Finance and Operations font
GulimChe	Finance and Operations font
Haettenschweiler	Office font
Harlow Solid Italic	Office font
Harrington	Office font
High Tower Text	Office font
IDAutomationMICR	Finance and Operations font
Impact	Finance and Operations font
Imprint MT Shadow	Office font
Informal Roman	Office font
Javanese Text	Finance and Operations font
Jokerman	Office font
Juice ITC	Office font
Kristen ITC	Office font
Kunstler Script	Office font

FONT FAMILY	SOURCE
Leelawadee	Office font
Leelawadee UI	Finance and Operations font
Leelawadee UI Semilight	Finance and Operations font
Lucida Bright	Office font
Lucida Calligraphy	Office font
Lucida Console	Finance and Operations font
Lucida Fax	Office font
Lucida Handwriting	Office font
Lucida Sans	Office font
Lucida Sans Typewriter	Office font
Lucida Sans Unicode	Finance and Operations font
Magneto	Office font
Maiandra GD	Office font
Malgun Gothic	Finance and Operations font
Malgun Gothic Semilight	Finance and Operations font
Marlett	Finance and Operations font
Matura MT Script Capital	Office font
MICR E13B 2.1	Finance and Operations font
Microsoft Himalaya	Finance and Operations font
Microsoft JhengHei	Finance and Operations font
Microsoft JhengHei Light	Finance and Operations font
Microsoft JhengHei UI	Finance and Operations font
Microsoft JhengHei UI Li	Office font
Microsoft MHei	Office font
Microsoft NeoGothic	Office font

FONT FAMILY	SOURCE
Microsoft New Tai Lue	Finance and Operations font
Microsoft PhagsPa	Finance and Operations font
Microsoft Sans Serif	Finance and Operations font
Microsoft Tai Le	Finance and Operations font
Microsoft Uighur	Office font
Microsoft YaHei	Finance and Operations font
Microsoft YaHei Light	Finance and Operations font
Microsoft YaHei UI	Finance and Operations font
Microsoft YaHei UI Light	Finance and Operations font
Microsoft Yi Baiti	Finance and Operations font
MingLiU	Finance and Operations font
MingLiU-ExtB	Finance and Operations font
MingLiU_HKSCS	Finance and Operations font
MingLiU_HKSCS-ExtB	Finance and Operations font
Mistral	Office font
Modern No. 20	Office font
Mongolian Baiti	Finance and Operations font
Monotype Corsiva	Office font
MS Gothic	Finance and Operations font
MS Outlook	Office font
MS PGothic	Finance and Operations font
MS Reference Sans Serif	Office font
MS Reference Specialty	Office font
MS UI Gothic	Finance and Operations font
MT Extra	Office font

FONT FAMILY	SOURCE
MV Boli	Finance and Operations font
Myanmar Text	Finance and Operations font
Niagara Engraved	Office font
Niagara Solid	Office font
Nirmala UI	Finance and Operations font
Nirmala UI Semilight	Finance and Operations font
NSimSun	Finance and Operations font
OCR A Extended	Office font
OCRB	Finance and Operations font
Old English Text MT	Office font
Onyx	Office font
Palace Script MT	Office font
Palatino Linotype	Finance and Operations font
Papyrus	Office font
Parchment	Office font
Perpetua	Office font
Perpetua Titling MT	Office font
Playbill	Office font
PMingLiU	Finance and Operations font
PMingLiU-ExtB	Finance and Operations font
Poor Richard	Office font
Pristina	Office font
Rage Italic	Office font
Ravie	Office font
Rockwell	Office font

FONT FAMILY	SOURCE
Rockwell Condensed	Office font
Rockwell Extra Bold	Office font
Script MT Bold	Office font
Segoe Marker	Office font
Segoe MDL2 Assets	Finance and Operations font
Segoe Print	Finance and Operations font
Segoe Script	Finance and Operations font
Segoe UI	Finance and Operations font
Segoe UI Black	Finance and Operations font
Segoe UI Emoji	Finance and Operations font
Segoe UI Historic	Finance and Operations font
Segoe UI Light	Finance and Operations font
Segoe UI Semibold	Finance and Operations font
Segoe UI Semilight	Finance and Operations font
Segoe UI Symbol	Finance and Operations font
Segoe WP	Office font
Segoe WP Black	Office font
Segoe WP Light	Office font
Segoe WP Semibold	Office font
Segoe WP SemiLight	Office font
Showcard Gothic	Office font
SimSun	Finance and Operations font
SimSun-ExtB	Finance and Operations font
Sitka Banner	Finance and Operations font
Sitka Display	Finance and Operations font

FONT FAMILY	SOURCE
Sitka Heading	Finance and Operations font
Sitka Small	Finance and Operations font
Sitka Subheading	Finance and Operations font
Sitka Text	Finance and Operations font
SketchFlow Print	Office font
Snap ITC	Office font
Stencil	Office font
Sylfaen	Finance and Operations font
Symbol	Finance and Operations font
Tahoma	Finance and Operations font
Tempus Sans ITC	Office font
Times New Roman	Finance and Operations font
Trebuchet MS	Finance and Operations font
Tw Cen MT	Office font
Tw Cen MT Condensed	Office font
Tw Cen MT Condensed Extr	Office font
Verdana	Finance and Operations font
Viner Hand ITC	Office font
Vivaldi	Office font
Vladimir Script	Office font
Webdings	Finance and Operations font
Wide Latin	Office font
Wingdings	Finance and Operations font
Wingdings 2	Office font
Wingdings 3	Office font

FONT FAMILY	SOURCE
Yu Gothic	Finance and Operations font
Yu Gothic Light	Finance and Operations font
Yu Gothic Medium	Finance and Operations font
Yu Gothic UI	Finance and Operations font
Yu Gothic UI Light	Finance and Operations font
Yu Gothic UI Semibold	Finance and Operations font
Yu Gothic UI Semilight	Finance and Operations font

Supported fonts for application version 8.0 with Platform update 23

NUMBER	FONT FAMILY
1	Agency FB
2	Algerian
3	Arial
4	Arial Black
5	Arial Narrow
6	Arial Rounded MT Bold
7	Baskerville Old Face
8	Bauhaus 93
9	BC C128 HD Medium
10	BC C128 HD Narrow
11	BC C128 HD Wide
12	BC C128 Medium
13	BC C128 Narrow
14	BC C128 Wide
15	BC C39 2 to 1 HD Medium
16	BC C39 2 to 1 HD Narrow

NUMBER	FONT FAMILY
17	BC C39 2 to 1 HD Wide
18	BC C39 2 to 1 Medium
19	BC C39 2 to 1 Narrow
20	BC C39 2 to 1 Wide
21	BC C39 3 to 1 HD Medium
22	BC C39 3 to 1 HD Narrow
23	BC C39 3 to 1 HD Wide
24	BC C39 3 to 1 Medium
25	BC C39 3 to 1 Narrow
26	BC C39 3 to 1 Wide
27	BC CBar 2 to 1 HD Medium
28	BC CBar 2 to 1 HD Narrow
29	BC CBar 2 to 1 HD Wide
30	BC CBar 2 to 1 Medium
31	BC CBar 2 to 1 Narrow
32	BC CBar 2 to 1 Wide
33	BC CBar 3 to 1 HD Medium
34	BC CBar 3 to 1 HD Narrow
35	BC CBar 3 to 1 HD Wide
36	BC CBar 3 to 1 Medium
37	BC CBar 3 to 1 Narrow
38	BC CBar 3 to 1 Wide
39	BC I25 HD Medium
40	BC I25 HD Narrow
41	BC I25 HD Wide

NUMBER	FONT FAMILY
42	BC I25 Medium
43	BC I25 Narrow
44	BC I25 Wide
45	BC Postnet
46	BC UPC HD Medium
47	BC UPC HD Narrow
48	BC UPC HD Wide
49	BC UPC Medium
50	BC UPC Narrow
51	BC UPC Wide
52	Bell MT
53	Berlin Sans FB
54	Berlin Sans FB Demi
55	Bernard MT Condensed
56	Blackadder ITC
57	Bodoni MT
58	Bodoni MT Black
59	Bodoni MT Condensed
60	Bodoni MT Poster Compres
61	Book Antiqua
62	Bookman Old Style
63	Bookshelf Symbol 7
64	Bradley Hand ITC
65	Britannic Bold
66	Broadway

NUMBER	FONT FAMILY
67	Brush Script MT
68	Buxton Sketch
69	Calibri
70	Calibri Light
71	Californian FB
72	Calisto MT
73	Cambria
74	Cambria Math
75	Candara
76	Castellar
77	Centaur
78	Century
79	Century Gothic
80	Century Schoolbook
81	Chiller
82	Colonna MT
83	Comic Sans MS
84	Consolas
85	Constantia
86	Cooper Black
87	Copperplate Gothic Bold
88	Copperplate Gothic Light
89	Corbel
90	Courier New
91	Curlz MT

NUMBER	FONT FAMILY
92	DengXian
93	Dotum
94	DotumChe
95	Ebrima
96	Edwardian Script ITC
97	Elephant
98	Engravers MT
99	Eras Bold ITC
100	Eras Demi ITC
101	Eras Light ITC
102	Eras Medium ITC
103	Felix Titling
104	Footlight MT Light
105	Forte
106	Franklin Gothic Book
107	Franklin Gothic Demi
108	Franklin Gothic Demi Con
109	Franklin Gothic Heavy
110	Franklin Gothic Medium
111	Franklin Gothic Medium C
112	Freestyle Script
113	French Script MT
114	Gabriola
115	Gadugi
116	Garamond

NUMBER	FONT FAMILY
117	Georgia
118	Gigi
119	Gill Sans MT
120	Gill Sans MT Condensed
121	Gill Sans MT Ext Condens
122	Gill Sans Ultra Bold
123	Gill Sans Ultra Bold Con
124	Gloucester MT Extra Cond
125	Goudy Old Style
126	Goudy Stout
127	Gulim
128	GulimChe
129	Haettenschweiler
130	Harlow Solid Italic
131	Harrington
132	High Tower Text
133	IDAutomationMICR
134	Impact
135	Imprint MT Shadow
136	Informal Roman
137	Javanese Text
138	Jokerman
139	Juice ITC
140	Kristen ITC
141	Kunstler Script

NUMBER	FONT FAMILY
142	Leelawadee
143	Leelawadee UI
144	Leelawadee UI Semilight
145	Lucida Bright
146	Lucida Calligraphy
147	Lucida Console
148	Lucida Fax
149	Lucida Handwriting
150	Lucida Sans
151	Lucida Sans Typewriter
152	Lucida Sans Unicode
153	Magneto
154	Maiandra GD
155	Malgun Gothic
156	Malgun Gothic Semilight
157	Marlett
158	Matura MT Script Capital
159	MICR E13B 2.1
160	Microsoft Himalaya
161	Microsoft JhengHei
162	Microsoft JhengHei Light
163	Microsoft JhengHei UI
164	Microsoft JhengHei UI Li
165	Microsoft MHei
166	Microsoft NeoGothic

NUMBER	FONT FAMILY
167	Microsoft New Tai Lue
168	Microsoft PhagsPa
169	Microsoft Sans Serif
170	Microsoft Tai Le
171	Microsoft Uighur
172	Microsoft YaHei
173	Microsoft YaHei Light
174	Microsoft YaHei UI
175	Microsoft YaHei UI Light
176	Microsoft Yi Baiti
177	MingLiU
178	MingLiU-ExtB
179	MingLiU_HKSCS
180	MingLiU_HKSCS-ExtB
181	Mistral
182	Modern No. 20
183	Mongolian Baiti
184	Monotype Corsiva
185	MS Gothic
186	MS Outlook
187	MS PGothic
188	MS Reference Sans Serif
189	MS Reference Specialty
190	MS UI Gothic
191	MT Extra

NUMBER	FONT FAMILY
192	MV Boli
193	Myanmar Text
194	Niagara Engraved
195	Niagara Solid
196	Nirmala UI
197	Nirmala UI Semilight
198	NSimSun
199	OCR A Extended
200	OCRB
201	Old English Text MT
202	Onyx
203	Palace Script MT
204	Palatino Linotype
205	Papyrus
206	Parchment
207	Perpetua
208	Perpetua Titling MT
209	Playbill
210	PMingLiU
211	PMingLiU-ExtB
212	Poor Richard
213	Pristina
214	Rage Italic
215	Ravie
216	Rockwell

NUMBER	FONT FAMILY
217	Rockwell Condensed
218	Rockwell Extra Bold
219	Script MT Bold
220	Segoe Marker
221	Segoe MDL2 Assets
222	Segoe Print
223	Segoe Script
224	Segoe UI
225	Segoe UI Black
226	Segoe UI Emoji
227	Segoe UI Historic
228	Segoe UI Light
229	Segoe UI Semibold
230	Segoe UI Semilight
231	Segoe UI Symbol
232	Segoe WP
233	Segoe WP Black
234	Segoe WP Light
235	Segoe WP Semibold
236	Segoe WP SemiLight
237	Showcard Gothic
238	SimSun
239	SimSun-ExtB
240	Sitka Banner
241	Sitka Display

NUMBER	FONT FAMILY
242	Sitka Heading
243	Sitka Small
244	Sitka Subheading
245	Sitka Text
246	SketchFlow Print
247	Snap ITC
248	Stencil
249	Sylfaen
250	Symbol
251	Tahoma
252	Tempus Sans ITC
253	Times New Roman
254	Trebuchet MS
255	Tw Cen MT
256	Tw Cen MT Condensed
257	Tw Cen MT Condensed Extr
258	Verdana
259	Viner Hand ITC
260	Vivaldi
261	Vladimir Script
262	Webdings
263	Wide Latin
264	Wingdings
265	Wingdings 2
266	Wingdings 3

NUMBER	FONT FAMILY
267	Yu Gothic
268	Yu Gothic Light
269	Yu Gothic Medium
270	Yu Gothic UI
271	Yu Gothic UI Light
272	Yu Gothic UI Semibold
273	Yu Gothic UI Semilight

NOTE

Can you tell us about your documentation language preferences? [Take a short survey.](#)

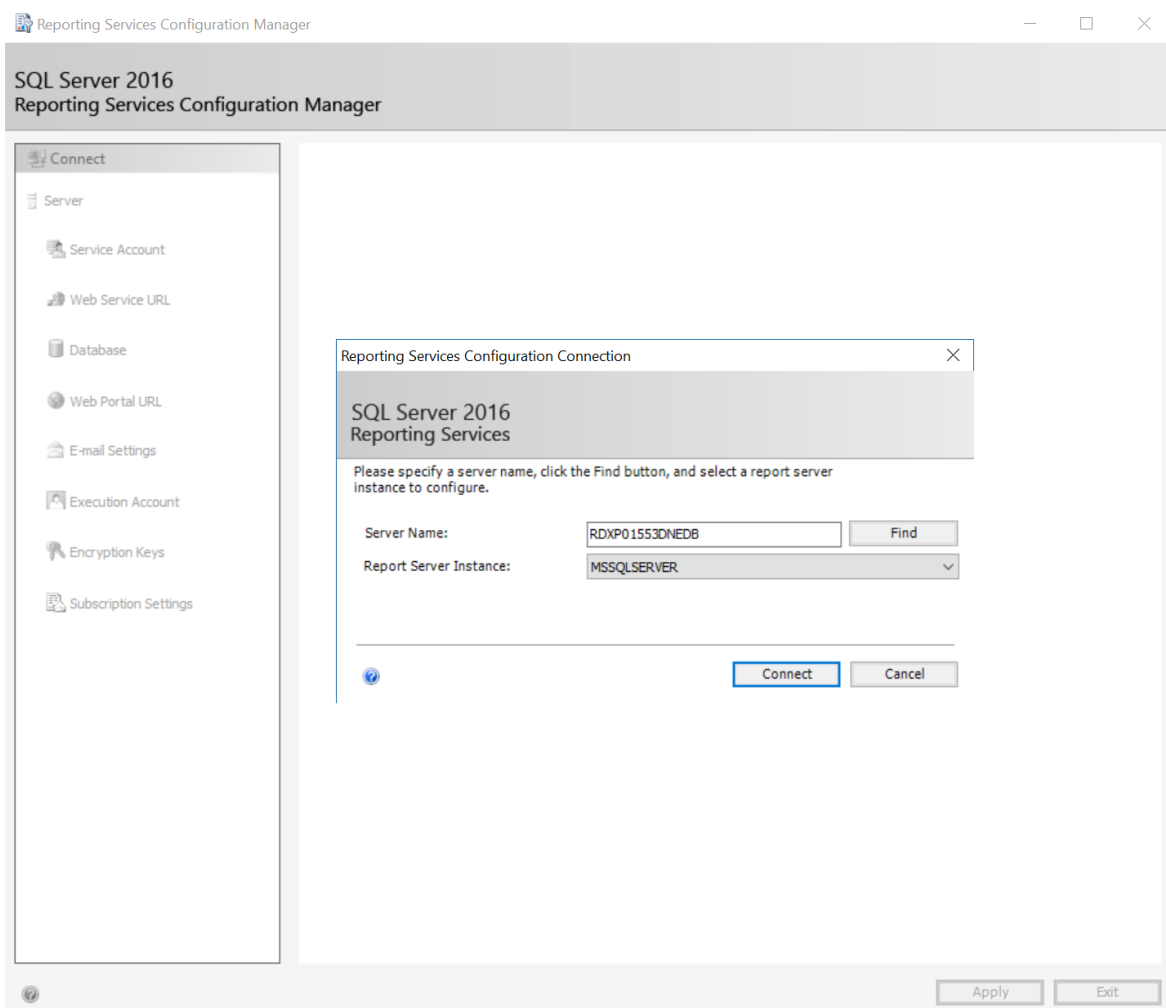
The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Configure SQL Server Reporting Services for on-premises deployments

2/18/2021 • 2 minutes to read • [Edit Online](#)

Use the steps in this topic to configure SQL Server Reporting Services (SSRS) for your Microsoft Dynamics 365 Finance + Operations (on-premises) deployment.

1. Open the Reporting Services Configuration Manager application.
2. Leave the default **Server name**, which should be the name of the current machine, and the **Report Server Instance**, **MSSQLSERVER**.
3. Click **Connect**.

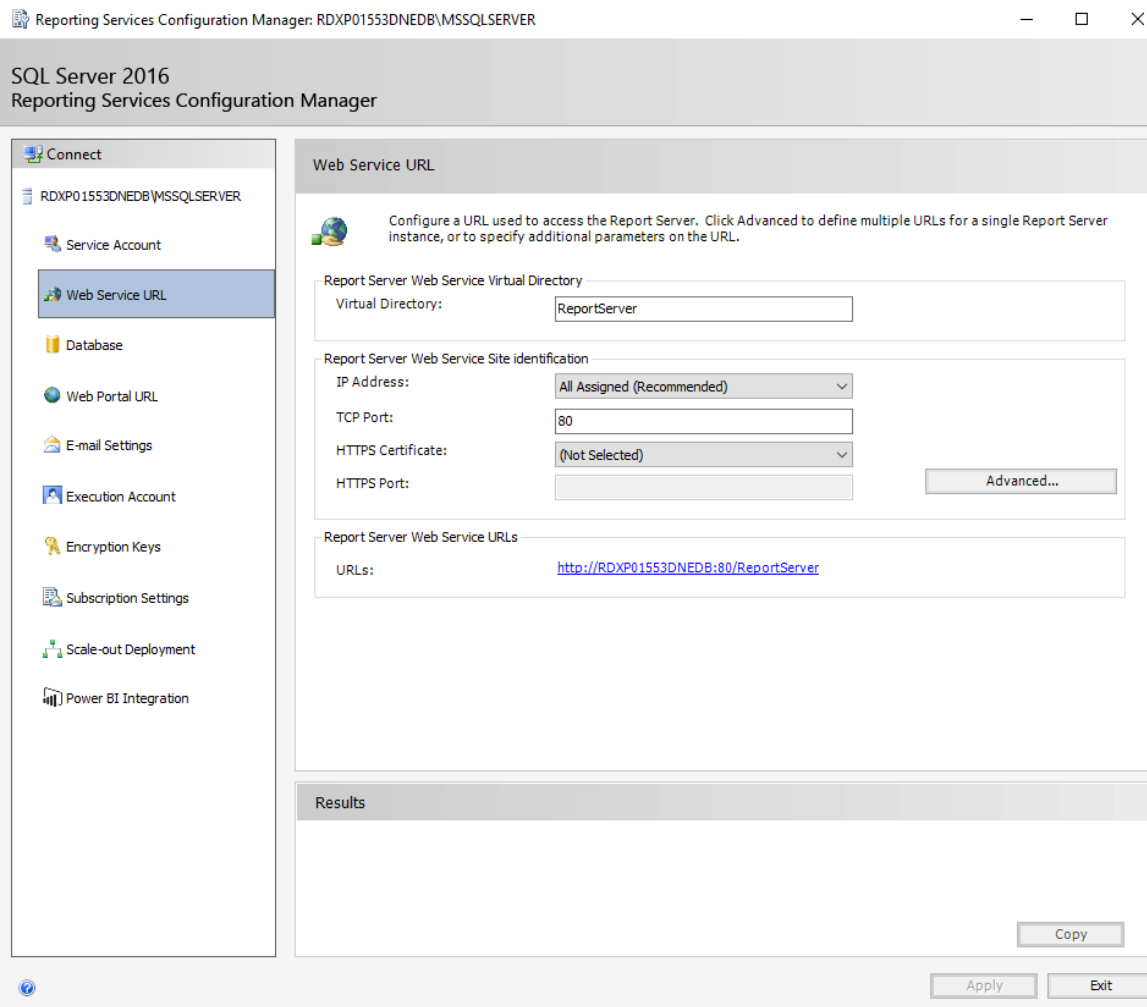


4. Click the **Service Account** tab and verify that the settings match the following graphic.

SQL Server 2016
Reporting Services Configuration Manager

The screenshot shows the 'Service Account' configuration window in the Reporting Services Configuration Manager. The left-hand navigation pane is visible, with the 'Service Account' tab selected. The main area is titled 'Service Account' and contains the following text: 'Specify a built-in account or Windows domain user account to run the report server service.' Below this, there is a section titled 'Report Server Service Account' with the instruction 'Choose an option to set the service account and then click Apply.' There are two radio button options: 'Use built-in account:' which is selected and has a dropdown menu showing 'Local System'; and 'Use another account:' which is unselected and has two text input fields labeled 'Account (Domain\user):' and 'Password:'. At the bottom right of the main area is a 'Copy' button. Below the main area is a 'Results' section, which is currently empty. At the very bottom of the window are 'Apply' and 'Exit' buttons.

5. Click the **Web Service URL** tab and verify that the settings match the following graphic.



6. Click the **Database** tab and verify that the **Database Name** and **Credential settings** match the following graphic.

NOTE

You will need to create a new database. To do this, click **Change Database**, and then verify that the new database name is: **DynamicsAxReportServer**.

SQL Server 2016
Reporting Services Configuration Manager

Connect

- Connect
- RDXP01553DNEDB\MSSQLSERVER
- Service Account
- Web Service URL
- Database**
- Web Portal URL
- E-mail Settings
- Execution Account
- Encryption Keys
- Subscription Settings
- Scale-out Deployment
- Power BI Integration

Report Server Database

Reporting Services stores all report server content and application data in a database. Use this page to create or change the report server database or update database connection credentials.

Current Report Server Database

Click: Change database to select a different database or create a new database in native or SharePoint integrated mode.

SQL Server Name:	rdxp01553Dnedb
Database Name:	DynamicsAxReportServer
Report Server Mode:	Native

Current Report Server Database Credential

The following credentials are used by the report server to connect to the report server database. Use the options below to choose a different account or update a password.

Credential:	Service Account
Login:	LocalSystem
Password:	*****

Results

7. Click the **Web Portal URL** tab and verify that the settings match the following graphic.

NOTE

You must click **Apply** to create and properly configure the Portal.

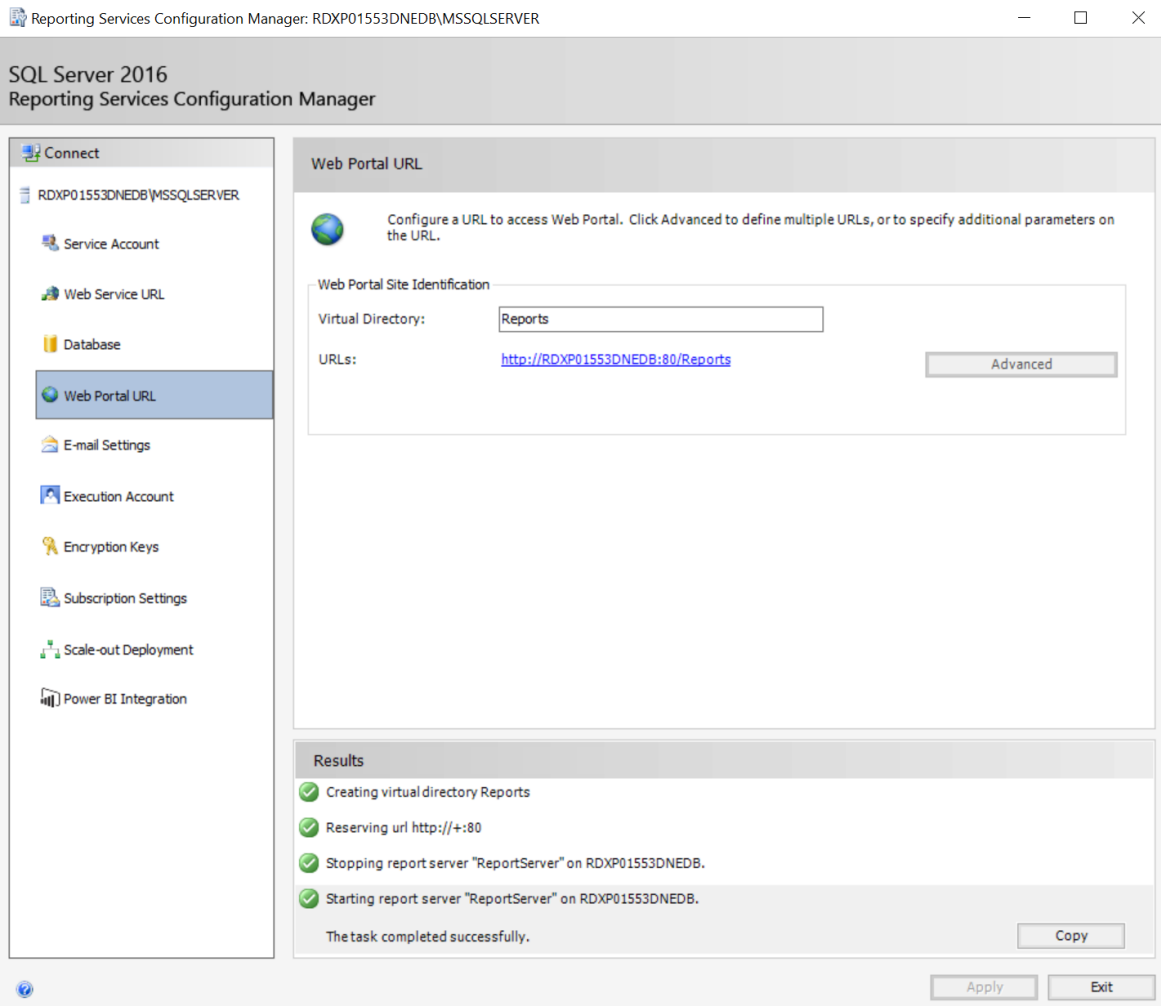
SQL Server 2016
Reporting Services Configuration Manager

The screenshot shows the 'Web Portal URL' configuration window in the Reporting Services Configuration Manager. The left-hand navigation pane is open to the 'Web Portal URL' tab. The main area contains the following elements:

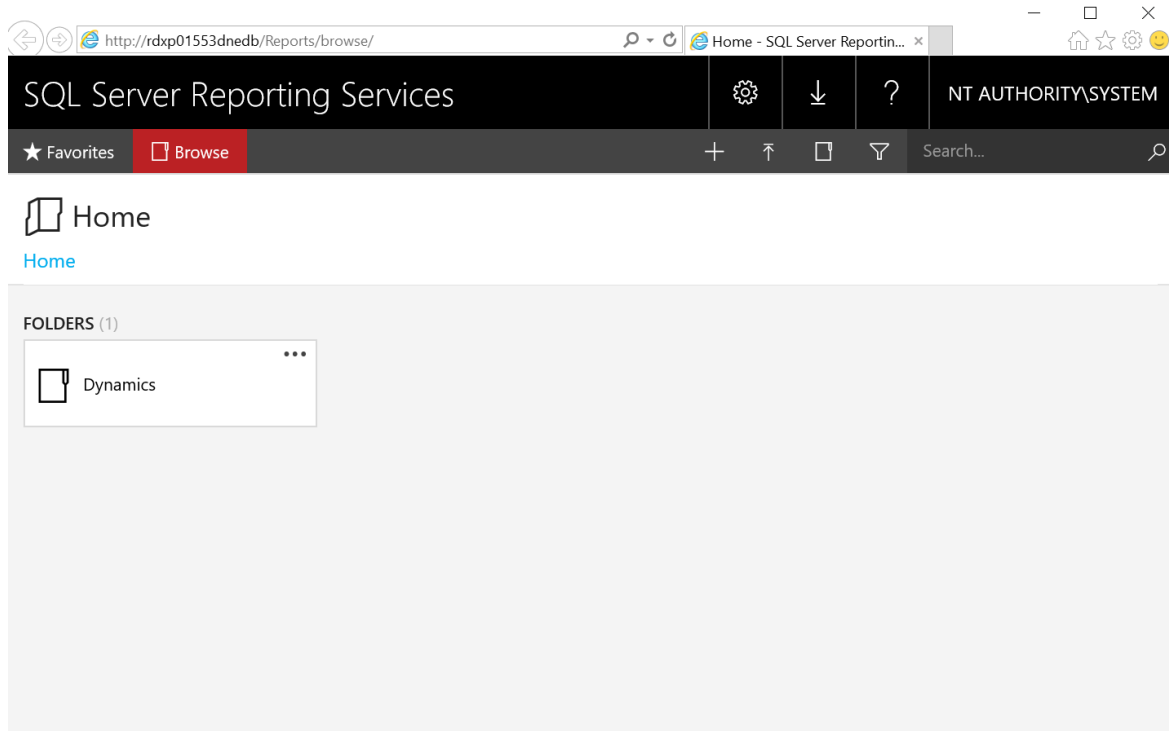
- Web Portal URL** header.
- Instructional text: "Configure a URL to access Web Portal. Click Advanced to define multiple URLs, or to specify additional parameters on the URL."
- Warning icon and text: "The Web Portal virtual directory name is not configured. To configure the directory, enter a name or use the default value that is provided, and then click Apply."
- Web Portal Site Identification** section with a scrollable area containing:
 - Virtual Directory:** A text box containing the value "Reports".
 - URLs:** A text box containing the value "http://RDXP01553DNEDB:80/Reports".
 - An **Advanced** button to the right of the URL text box.
- A horizontal scrollbar below the configuration area.
- Results** section, which is currently empty.
- A **Copy** button at the bottom right of the Results section.

At the bottom of the window, there are **Apply** and **Exit** buttons.

After the Portal is configured, the **Web Portal** tab will match the following graphic.



8. Click the reports URL to view the SQL Server Reporting Services web portal.
9. When you are in the portal, create a new folder named **Dynamics**.



10. In the **Reporting Services Configuration Manager**, click the **E-mail Settings** tab and verify that the settings match the following graphic.

SQL Server 2016
Reporting Services Configuration Manager

The screenshot shows the 'E-mail Settings' configuration window in the Reporting Services Configuration Manager. The left-hand navigation pane lists various configuration options, with 'E-mail Settings' currently selected. The main area is titled 'E-mail Settings' and contains a descriptive icon and text: 'To use report server e-mail, specify an existing SMTP server and an e-mail account that can send e-mail from that server.' Below this is a section for 'SMTP Settings' with the instruction: 'To edit, change the fields and click the Apply button.' The settings are as follows:

Field	Value
Sender Address:	<input type="text"/>
Current SMTP Delivery Method:	Use SMTP server
SMTP Server:	<input type="text"/>
Authentication:	No authentication

At the bottom of the window, there is a 'Results' section which is currently empty. A 'Copy' button is located in the bottom right corner of the main settings area. At the very bottom of the window, there are 'Apply' and 'Exit' buttons.

11. Click the **Execution Account** tab and verify that the settings match the following graphic.

SQL Server 2016
Reporting Services Configuration Manager

The screenshot shows the 'Execution Account' configuration window. On the left is a navigation pane with the following items: Connect, RDXP01553DNEDB\MSSQLSERVER, Service Account, Web Service URL, Database, Web Portal URL, E-mail Settings, Execution Account (selected), Encryption Keys, Subscription Settings, Scale-out Deployment, and Power BI Integration. The main area is titled 'Execution Account' and contains the following text: 'Specify this account to enable the use of report data sources that do not require credentials or to connect to remote servers that store external images used in reports. Be sure to specify a domain user account with minimal permissions for performing read-only operations. Avoid using an account that has more permissions than you actually need. The account you specify should be different from the service account to ensure you do not compromise security on your report server instance.' Below this is a section titled 'Execution Account' with the instruction 'Use the following options to set the account, then click Apply.' and a checkbox labeled 'Specify an execution account'. Underneath are three input fields: 'Account:', 'Password:', and 'Confirm Password:'. At the bottom right of the main area is a 'Copy' button. At the very bottom of the window are 'Apply' and 'Exit' buttons.

Execution Account

Specify this account to enable the use of report data sources that do not require credentials or to connect to remote servers that store external images used in reports. Be sure to specify a domain user account with minimal permissions for performing read-only operations. Avoid using an account that has more permissions than you actually need. The account you specify should be different from the service account to ensure you do not compromise security on your report server instance.

Execution Account

Use the following options to set the account, then click Apply.

Specify an execution account

Account:

Password:

Confirm Password:

Results

Copy

Apply Exit

Don't change the default settings on the **Encryption Keys** tab.

SQL Server 2016
Reporting Services Configuration Manager

The screenshot shows the Reporting Services Configuration Manager interface. On the left is a navigation pane with the following items: Connect, RDXP01553DNEDB\MSSQLSERVER, Service Account, Web Service URL, Database, Web Portal URL, E-mail Settings, Execution Account, Encryption Keys (highlighted), Subscription Settings, Scale-out Deployment, and Power BI Integration. The main area is titled 'Encryption Keys' and contains the following text: 'Reporting Services uses a symmetric key to encrypt credentials, connection strings, and other sensitive data that is stored in the report server database. You can manage this key by creating a backup. If you migrate or move the report server installation to another computer, you can restore the key to regain access to encrypted content.' Below this text are four sections, each with a button: 'Backup' (Backup the key to a password protected file for report server recovery in case of emergency. Backup), 'Restore' (To restore the encryption key, click the Restore button. You must know the password that was used to protect the encryption key file. Restore), 'Change' (This operation replaces the encryption key with a newer version. Change), and 'Delete Encrypted Content' (All stored connection strings, credentials, and encrypted values in a subscription will be deleted. After you delete this content, you must redefine all data source connections and subscriptions used on the report server. Delete). At the bottom right of the main area is a 'Copy' button. At the very bottom of the window are 'Apply' and 'Exit' buttons.

12. Click the **Subscription Settings** tab, and verify that the settings match the following graphic.

SQL Server 2016
Reporting Services Configuration Manager

Connect

- RDXP01553DNEDB\MSSQLSERVER
- Service Account
- Web Service URL
- Database
- Web Portal URL
- E-mail Settings
- Execution Account
- Encryption Keys
- Subscription Settings**
- Scale-out Deployment
- Power BI Integration

File Share Account

Configure an account to be used by subscriptions to access file shares. Use an account with as minimum permissions as possible and an account that is different from the account used for the Reporting Services service account.

File Share Account

Use the following options to set the account, then click Apply.

Specify a file share account

Account:

Password:

Confirm Password:

Results

Copy

Apply Exit

Don't change the default settings on the **Scale-out Deployment** tab.

SQL Server 2016
Reporting Services Configuration Manager

The screenshot shows the 'Scale-out Deployment' page in the Reporting Services Configuration Manager. The left-hand navigation pane includes options like 'Connect', 'Service Account', 'Web Service URL', 'Database', 'Web Portal URL', 'E-mail Settings', 'Execution Account', 'Encryption Keys', 'Subscription Settings', 'Scale-out Deployment' (which is selected), and 'Power BI Integration'. The main content area is titled 'Scale-out Deployment' and contains a descriptive paragraph, a 'Scale-out Deployment Status' section with key-value pairs, a table of server instances, and 'Add Server' and 'Remove Server' buttons. Below this is a 'Results' section with a 'Copy' button. At the bottom right, there are 'Apply' and 'Exit' buttons.

Scale-out Deployment

Use this page to view information about a scale-out deployment. Report Servers that are joined to the scale-out can store encrypted data in a common Report Server database. Servers that are waiting to join the scale-out deployment must be added by a Report Server instance that is already part of the deployment.

Scale-out Deployment Status

SQL Server Name: rdxp01553Dnedb
Database Name: DynamicsAxReportServer
Report Server Mode: Native

Server	Instance	Status
RDXP01553DNEDB	MSSQLSERVER	Joined

Add Server Remove Server

Results

Copy

Apply Exit

Don't change the default settings on the **Power BI Integration** tab.

SQL Server 2016 Reporting Services Configuration Manager

The screenshot shows the Reporting Services Configuration Manager interface. On the left is a 'Connect' sidebar with various configuration options. The main area is titled 'Power BI Integration' and contains instructions for registering the report server with Power BI. A 'Register with Power BI' button is visible, and the status is 'Not Registered'. At the bottom right, there are 'Apply' and 'Exit' buttons.

Connect

- RDXP01553DNEDB\MSSQLSERVER
- Service Account
- Web Service URL
- Database
- Web Portal URL
- E-mail Settings
- Execution Account
- Encryption Keys
- Subscription Settings
- Scale-out Deployment
- Power BI Integration**

Power BI Integration

When the report server is registered with Power BI, users can pin report items to their Power BI dashboards. Use this page to register or unregister the report server with Power BI.

Power BI Registration

Click Register with Power BI to register the Report server with Power BI.

Power BI Registration: Not Registered

Results

13. Click Exit to close the Reporting Services Configuration Manager.

SQL Server 2016 Reporting Services Configuration Manager

The screenshot displays the Reporting Services Configuration Manager interface. On the left is a navigation pane with the following options: Connect, RDXP01553DNEDB\MSSQLSERVER (selected), Service Account, Web Service URL, Database, Web Portal URL, E-mail Settings, Execution Account, Encryption Keys, Subscription Settings, Scale-out Deployment, and Power BI Integration. The main area is titled 'Report Server Status' and contains a warning icon and text: 'Use the Reporting Services Configuration Manager tool to define or modify settings for the Report Server and Report Manager. If you installed Reporting Services in files-only mode, you must configure the Web service URL, the database, and the Report Manager URL.' Below this is a section for 'Current Report Server' with the following details:

SQL Server Instance:	MSSQLSERVER
Instance ID:	MSRS13.MSSQLSERVER
Edition:	ENTERPRISE EDITION
Product Version:	13.0.4422.0
Report Server Database Name:	DynamicsAxReportServer
Report Server Mode:	Native
Report Service Status:	Started

At the bottom of this section are 'Start' and 'Stop' buttons. Below the status information is a 'Results' section, which is currently empty. At the bottom right of the Results section is a 'Copy' button. At the very bottom of the window are 'Apply' and 'Exit' buttons.

NOTE

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Document printing overview

2/18/2021 • 3 minutes to read • [Edit Online](#)

You can print documents by using either a local printer or a network-connected device. This article provides an overview of how documents are printed.

Printing overview

The application provides integrated services and client applications that make it easy to generate, store, and distribute documents that support business activity. You can print documents by using either a local printer or a network-connected device. In addition, you can export pages and reports directly from the client, as PDF files or Microsoft Office documents. Finally, the distributed workload lets you print business documents directly from a mobile device by using network resources. Although printing requirements might vary, all industries typically must create hard copies of business documents by using the application. Printing documents on network devices from hosted applications presents a unique set of challenges. Here are some examples:

- Print drivers might not be available on the user's device.
- The user's device might not be connected to the corporate network.

By using a dedicated host and following a few easy steps, system administrators can configure deployments so that users can print directly from business applications on network devices.

Application printing scenarios

The following table describes the three primary printing scenarios.

SCENARIO	GOAL	SOLUTION
1. Printing what you see	Print what is currently shown in the browser.	A "print-friendly" version of the webpage is generated for the browser.
2. Interactive printing	Print a precision document on a locally connected device.	You can export a PDF version of the report and download it to the browser.
3. Printing on a network device	Send a precision document to a domain printer device.	A precision document is sent to a client application that runs on a server that is hosted in the customer's domain.

Because the solution varies, depending on the scenario, applications provide built-in services and tooling to help users accomplish their goals:

- **Scenario 1** is supported by the browser's rendering of the HTML5 client.
- **Scenario 2** uses client applications and Microsoft 365 services.
- **Scenario 3** requires support from client applications and from services that are hosted in Microsoft Azure.

In addition to the platform that is deployed to the Azure subscription, Finance and Operations applications provide customers with an integrated, first-party Azure application that helps them more easily use domain-hosted devices to print documents.

Service overview

While documents that are produced by the hosted applications are waiting to be printed on a network-

connected device, they are stored in Azure blob storage. The [Install the Document Routing Agent to enable network printing](#) uses Azure authentication to establish a secure channel to the Azure services.

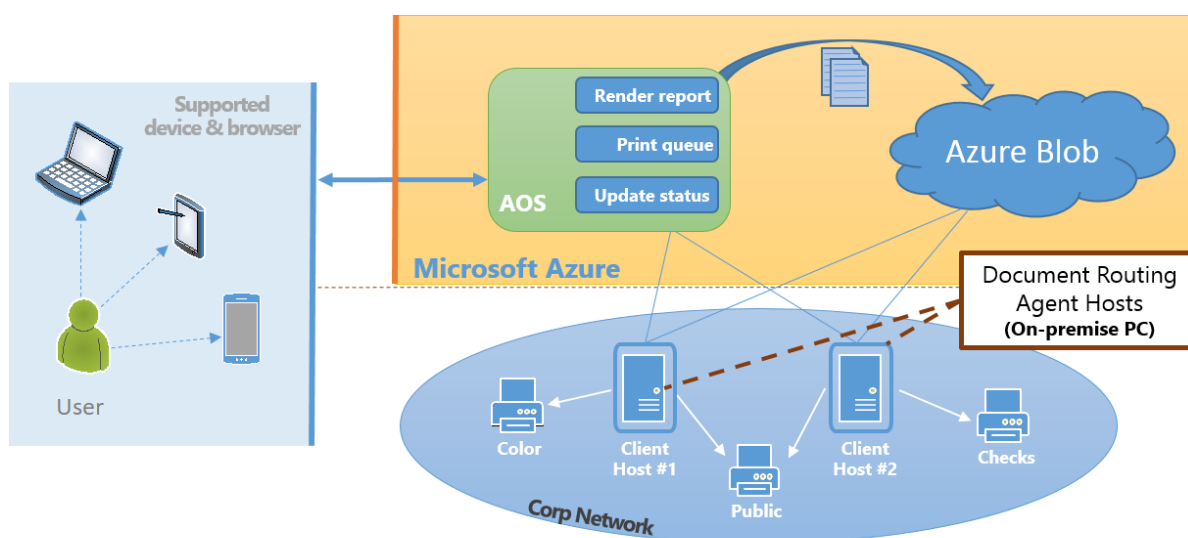
Execution sequence

1. The report is generated by Microsoft SQL Server Reporting Services (SSRS) and stored in Azure blob storage. Attached printer settings are stored together with the document.
2. The Document Routing Agent queries the Azure Service Bus queue for active jobs.
3. The document is downloaded by the Document Routing Agent and spooled to the network printer.

The client-based solution lets customers manage the scale of their printing needs. Customers who have heavy-volume printing workloads can install many Document Routing Agents to increase the number of concurrent printing operations. Alternatively, some customers require very few installations of the Document Routing Agent to handle their anticipated printing needs.

Service components for network printing

The following diagram shows the basic components that help support network printing operations.



Note that a single printer can be registered with multiple Document Routing Agents. To resolve the printer preferences, the hosted service uses the network path that uniquely identifies every network printer. As a result, even when a printer is registered by multiple clients, it appears as a single selection in the list of printers available in applications.

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Install the Document Routing Agent to enable network printing

2/18/2021 • 5 minutes to read • [Edit Online](#)

This topic describes how to install and configure the Document Routing Agent (DRA). The DRA is a downloadable application that you can use to enable network printing scenarios. You can enable network printers for specific companies by using in-client administrative pages.

Preparing to install the Document Routing Agent

- Supported on Windows 8.1, Windows 10, Microsoft Windows Server 2012 R2, or Microsoft Windows Server 2016.
- Access to network printing resources requires Active Directory Domain Services (AD DS) authentication.
- When installing the DRA, make sure you are logged in as the Admin user.
- The Microsoft Azure Active Directory (Azure AD) account that is used to configure the DRA must share the same domain as the Azure tenant.
- The DRA requires .NET 4.62 or later and Adobe Acrobat Reader on the client.
- Configure Adobe client print settings to prevent document scaling.

Network printers that are registered for applications can be used by all legal entities (also known as companies) that are defined in the environment. Network printer settings are company-specific. Therefore, administrators can restrict access, based on the user's active company. For example, users in the active company might have access to all the network printers that are registered by the Document Routing Agent. However, users in another company won't have access to those printers until access is explicitly enabled for that company.

Key concepts

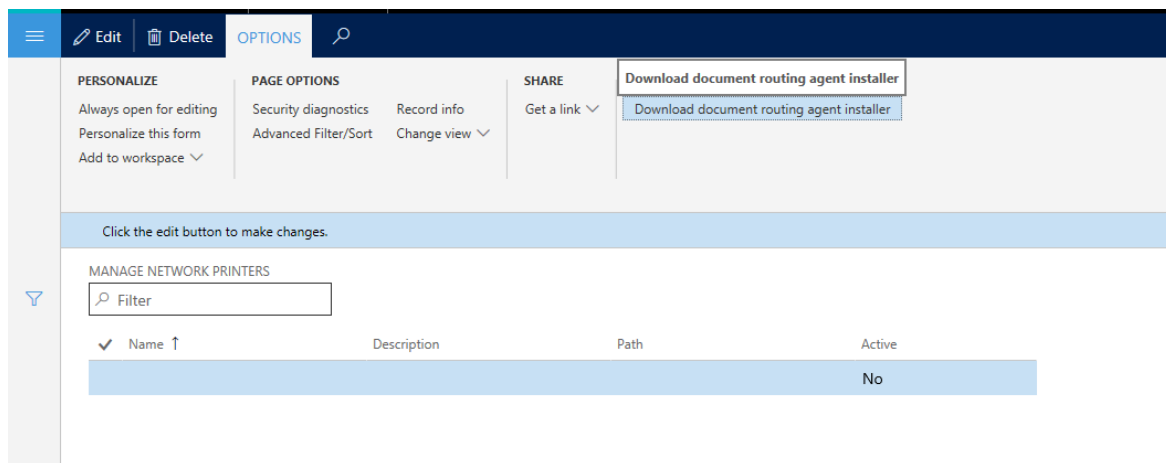
This topic will help you with the following tasks:

- Identify the key components that are involved in the support for network printing in applications.
- Learn about the function of the Document Routing Agent.
- Configure the Document Routing Agent to work against an existing application.
- Use administration pages to manage access to network printers.

Install the Document Routing Agent

Applications use the Document Routing Agent to manage the spooling of documents to network printer devices. You can obtain the client by using direct links that are embedded in the web application. Use the following procedure to download the application to your local computer. You will then be able to access both local and network printers that are connected to your computer, from a single deployment.

1. Open the **Manage network printers** page (**Organization administration > Setup > Network printers**).
2. On the **Options** tab, in the **Application** group, click **Download document routing agent installer**.



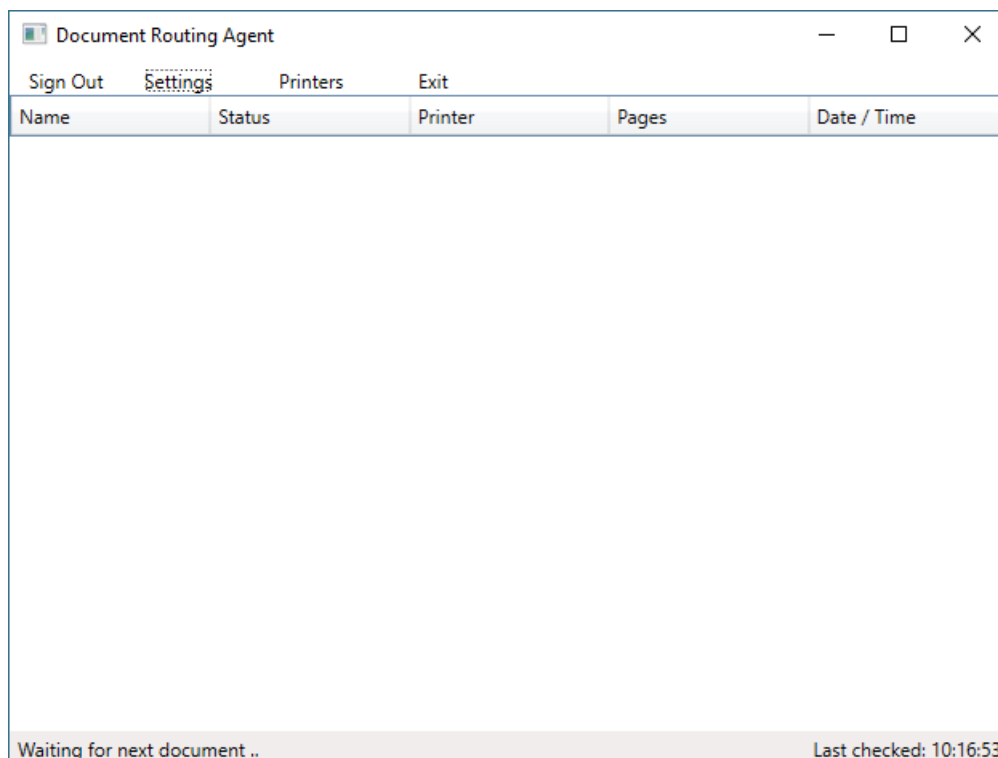
3. Run the downloaded file to begin the installation process.
4. Complete the setup process.

After the application is installed, you can begin to register local printers as network printers for the applications.

Configure the Document Routing Agent

Use the following procedure to configure the client application so that it can communicate with the Azure services that host the documents that are in-flight.

1. Close all browser instances that are running the application. This resets the local Azure authentication tokens.
2. On your desktop, run the Document Routing Agent.
3. On the toolbar, click **Settings**.



4. Add the following settings:
 - **Application ID** – The ID that is unique to the application and should be entered automatically.
 - **Finance and Operations URL** – The base URL of the application.
 - **Azure AD tenant** – The domain name of the Azure AD.

5. Click **OK**.
6. Click **Sign In** to sign in to your account.

NOTE

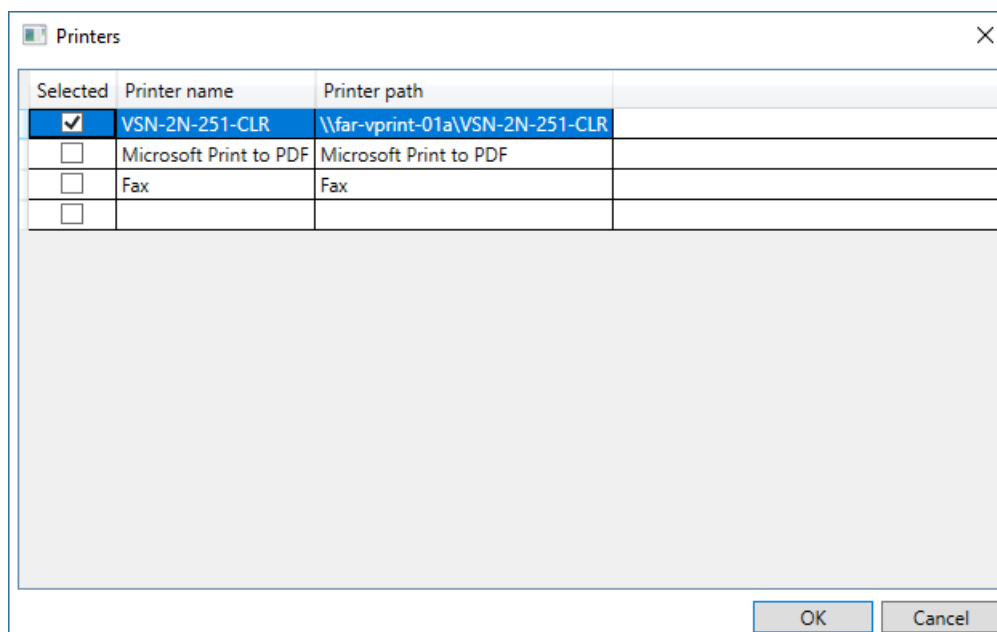
The account must share the same domain as the Azure AD that is associated with the application. The Document Routing Agent is now ready to process documents.

After you've successfully signed in, the **Printers** button becomes available on the toolbar.

Register network printers

Before you complete this procedure, make sure that you've installed all the network printers on the local host computer. All the printer devices that are installed will be available for service registration. Be sure to select only the printers that you want to expose in the applications.

1. On the toolbar, click **Printers**.
2. Select the printers to make available in the applications.



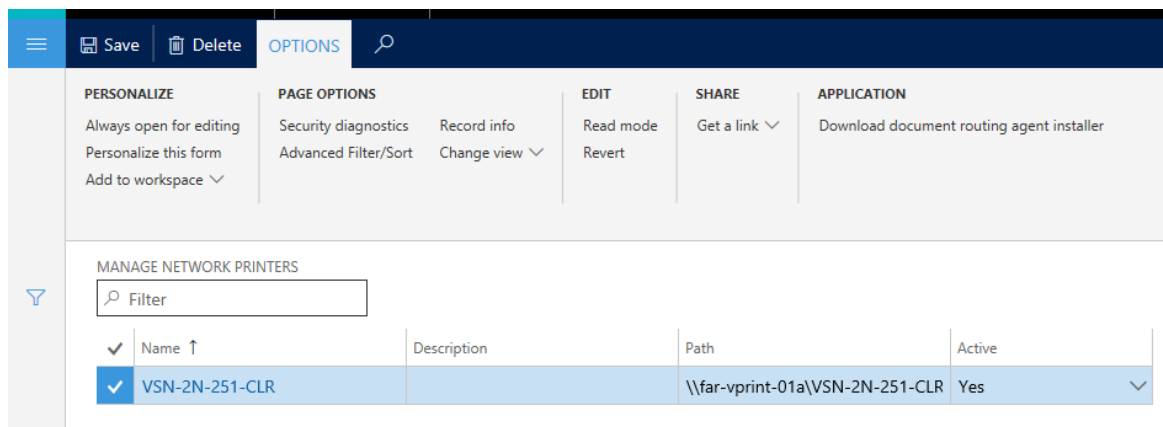
3. Specify a default name for the printer.
4. Click **OK**.

After you've completed this procedure, the selected printer devices are registered in the application's network printer catalog. System administrators can now enable the printers for access from within the application.

Administer network printers

Use client pages to manage access to the network printers that have been registered by one or more Document Routing Agents. Network printers are uniquely identified by their path. Therefore, printers are listed one time, even if they have been registered by more than one Document Routing Agent. Use the following procedure to activate the Application Object Server (AOS) network printers.

1. Open the **Manage network printers** page (**Organization administration > Setup > Network printers**).



2. Edit the existing entries that are mapped to each network printer. As part of your changes, edit the connection path.
3. To include a printer as an option in the **Print Destinations** field, set the **Active** field to **Yes**.

The network printers can now be used in the application.

Frequently asked questions

Does the Document Routing Agent have to be installed on each computer where a user connects by using a browser?

No. Client installations of the Document Routing Agent can be shared by individuals who access the provisioned environment. We recommend that you install agents on one or more Print Servers or other domain-hosted clients that have access to network printers.

If the Document Routing Agent belongs on a network Print Server, why doesn't the client run as a service?

The Document Routing Agent now supports running in the background as a service. You need to ensure that you have downloaded the latest version of the client. For more information, see [Run the Document Routing Agent as a Windows service](#).

Do I need to update credentials or refresh Azure authentication tokens on a recurring basis?

Yes. The Azure Active Directory token must be refreshed every 90 days. Failing to do so will prevent the DRA from being able to authenticate and retrieve printing instructions applications.

Is the Document Routing Agent supported on Microsoft Windows Server 2019?

Yes. The Document Routing Agent is supported on Microsoft Windows Server 2019.

NOTE

If the server is configured to prevent background service, the Document Routing Agent client will not be able to run as a service. For more information, see [Run the Document Routing Agent as a Windows service](#).

Will Microsoft add support for Microsoft Windows Server 2008 servers?

No, not at this time. There are several dependencies on Azure capabilities that are available only in Microsoft Windows Server 2012 R2 and Microsoft Windows Server 2016.

Does the user who installs the Document Routing Agent have to be part of a Finance and Operations apps security group?

Yes. To access the agent installation links, the user must be part of the **Document routing client** security role.

How many network printers can the Document Routing Agent support?

The number of supported network printers depends on the number of legal entities and the number of network printers deployed. If you have fifty printers and one legal entity, a single Document Routing Agent can handle

the load (although you'd want more than one to ensure high availability). If you have a large number of printers and legal entities, we recommend that you do some performance testing to determine the number of Document Routing Agents that you'll need.

NOTE

Can you tell us about your documentation language preferences? [Take a short survey](#).

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Update the Document Routing Agent

2/18/2021 • 2 minutes to read • [Edit Online](#)

The solution for managing the print job queue is designed to allow customers to properly scale Dynamics 365 Finance and Operations apps to satisfy high-volume printing requirements. Although public service endpoints used to manage print jobs are backward-compatible, we strongly recommend that customers update **all** existing Document Routing Agent (DRA) clients.

If you don't update existing installations of the DRA the most current version, you might experience issues such as:

- Observable performance degradation in applications
- Document loss that is associated with orphaned print jobs
- Inconsistent handling of printed documents that have custom margins

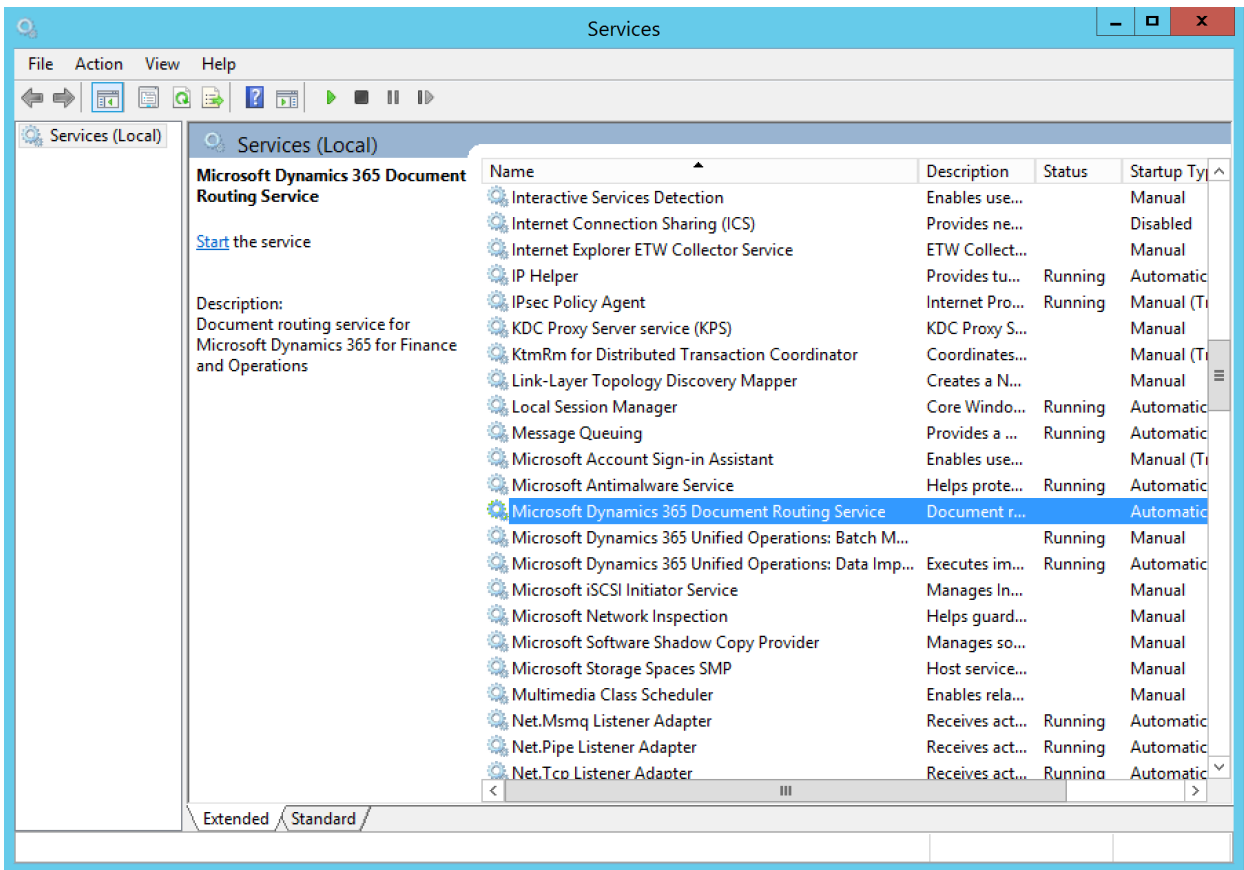
IT administrators must perform the following procedures on each domain resource that is used to host a DRA.

NOTE

When you complete a DRA update, IT administrators should register any printers that are connected through the host server. For network printers that are identified by their network paths, if the paths have not changed, updates are not required.

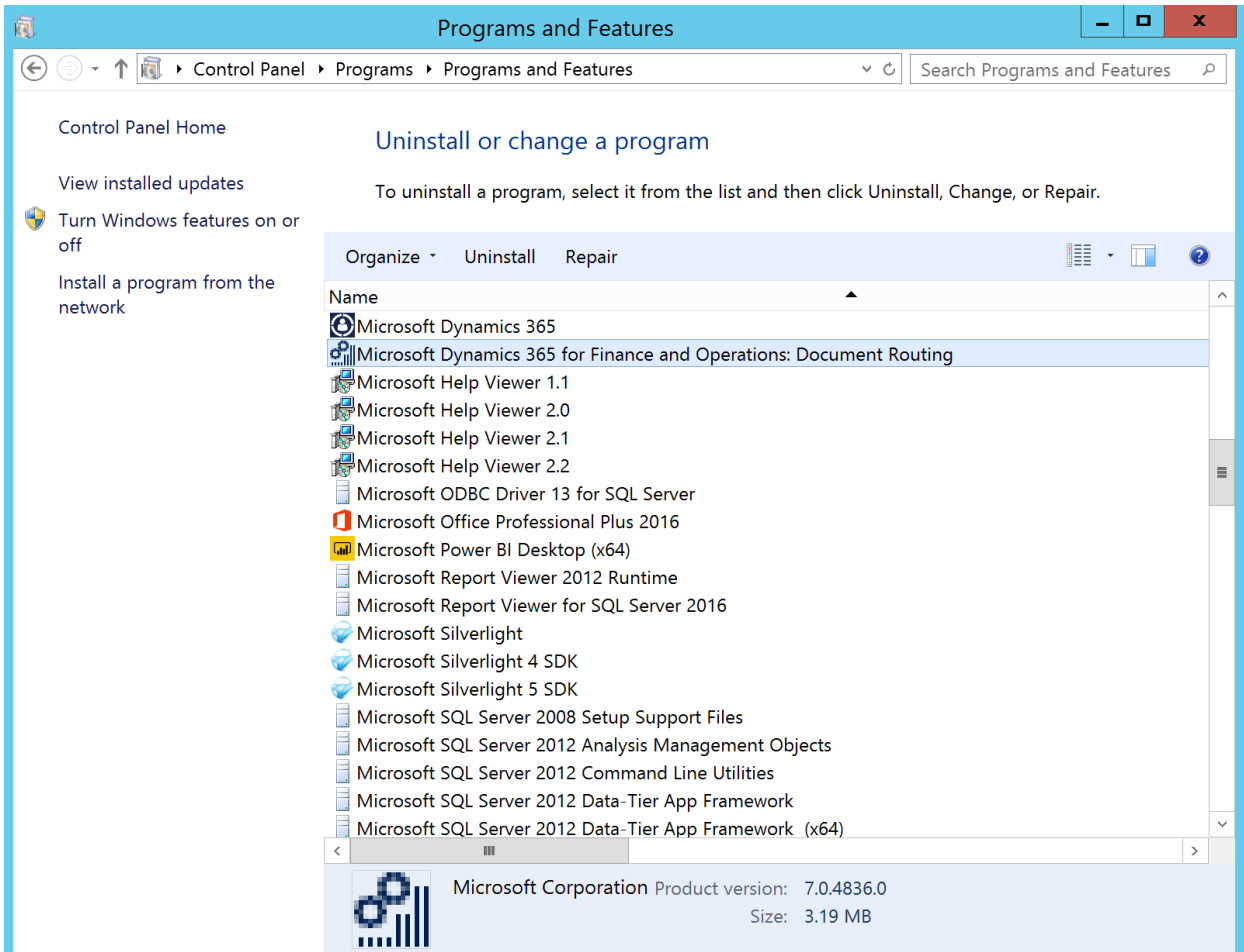
Get started

To continue to run the DRA as a Microsoft Windows service, you must have both the user name and the password of the domain account that is used to run the service. This information must be available after the update is completed. To find the information for the active service account, start the Microsoft Management Console (MMC) Services snap-in, and select **Microsoft Dynamics 365 Document Routing Service** in the list.

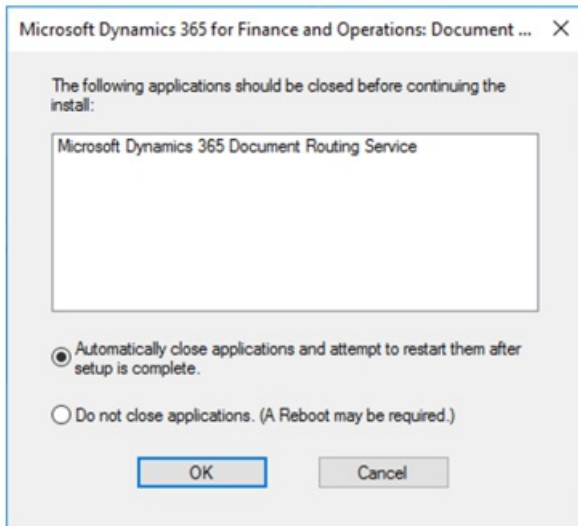


Uninstall an existing Document Routing Agent

Open **Programs and Features**, and then find and uninstall **Microsoft Dynamics 365 for Finance and Operations: Document Routing**.



During the uninstallation process, if you're prompted to close the Microsoft Dynamics 365 Document Routing Service application, select **Automatically close applications and attempt to restart them after setup is complete**.



Install the latest Document Routing Agent

For information about how to install the latest DRA that is available with your subscription, see [Install the Document Routing Agent to enable network printing](#).

NOTE

Be sure to open the DRA client after upgrading to refresh network user credentials.

NOTE

Can you tell us about your documentation language preferences? [Take a short survey](#).

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Install network printer devices in on-premises environments

2/18/2021 • 2 minutes to read • [Edit Online](#)

This topic explains how to connect an on-premises deployment of Microsoft Dynamics 365 Finance + Operations (on-premises) to existing network printer devices. Network printing in the on-premises application is supported by the [Print and Document Services](#) feature in Microsoft Windows Server 2016. This feature lets you centralize tasks that are related to printer management. To install and configure Print and Document Services, you must have administrative access to the server that hosts the primary instance of Application Object Server (AOS).

Two roles are associated with the configuration of network printing services:

- **Service Administrator** – The person who has this role is responsible for installing and configuring components of the platform infrastructure. Traditionally, this role is an Active Directory account that has elevated domain privileges. It has enough privileges to install components of Microsoft Windows Server.
- **Organization Administrator** – The person who has this role manages application security privileges. This Active Directory account is assigned to the **System Administrator** role.

Before the organization administrator can begin to add network printers, the service administrator must install and configure Print and Document Services on the server that hosts the primary AOS instance. The organization administrator can then begin to use built-in tools to configure network printer devices.

Install and configure Print and Document Services

The environment administrator uses the information in this section to enable network printing services.

1. Install Print and Document Services by following the instructions in [Install Print and Document Services](#).
2. Configure Print and Document Services by following the instructions in [Configure Print and Document Services](#).
3. Follow these steps for each server that is used to host the AXService application:
 - a. On the local server, start the **Local Users and Groups** manager.
 - b. Select the **Groups** node.
 - c. Right-click **Print Operators**, and then select **Add to Group**.
 - d. Add the network Active Directory account that is used to run the AXService application to the group.
 - e. Install network printers by using the AXService user account. This step helps guarantee that the printer driver is available to the AXService user account.
 - f. Print a test page on the installed printers to make sure that all the connections are correctly configured.
 - g. Restart the AXService application to help guarantee that the user's profile is correctly loaded so that it can look up the printer driver.

Manage network printers

The system administrator uses the information in this section to define network printers.

1. Go to **Organization administration > Setup > Network printers**.

2. On the **Network printers** page, add new printers. For each printer, specify a name, description, path, and status. Make sure that the printer path matches the network path of the installed printer.

Items that are marked **Active** immediately become available to application users, so that they can begin to print document-style reports on network printer devices.

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Document generation, publishing, and printing in on-premises deployments

2/18/2021 • 2 minutes to read • [Edit Online](#)

This topic describes the capabilities for generating, publishing, and printing documents in on-premises deployments of Microsoft Dynamics 365 Finance + Operations (on-premises). The application provides a fully integrated experience for enterprise document generation that is powered by Microsoft SQL Server Reporting Services (SSRS). From any supported device, users can produce standard industry documents that are linked to business processes. These documents include sales invoices, checks, and packing slips. Built-in tools let administrators configure the service so that users can securely connect to network printers.

You can upgrade solutions that are built on the Microsoft Dynamics AX 2012 SQL Reporting Services framework, or you can take advantage of the modern solutions that are available in [Microsoft Dynamics Lifecycle Services \(LCS\)](#).

Document publishing services: secure, reliable, and convenient

Employees spend lots of time on the go. Therefore, businesses depend on their employees' ability to stay productive while they work remotely. However, even today, documents remain critical for business transactions and record keeping.

From their mobile devices, users can print documents on network printers. Users can also automate the creation of business documents and use built-in tools to configure instructions for routing documents to multiple recipients.

The following options are available for document publishing:

- **Email** – Distribute mail via a server, and link reports as attachments.
- **Archive** – Store reports for future reference and regulatory compliance.
- **File** – Produce a PDF file that is downloaded directly to the browser for local printing.
- **Print** – Send documents directly to network printers from all supported platforms. These platforms include mobile devices.

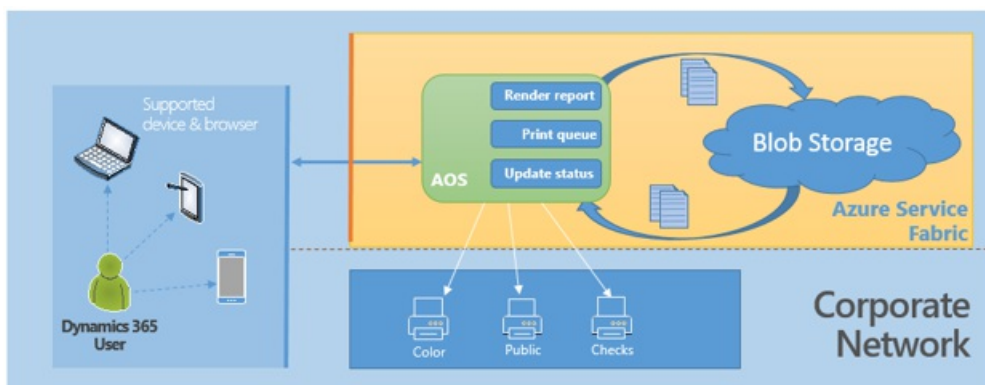


For a high-level summary of the options for information access that are available in the cloud-hosted solution, see [Document printing overview](#).

Comparing the cloud-hosted and on-premises services

Unlike the cloud-hosted service, the on-premises publishing service produces documents as PDF files that are automatically downloaded to the browser. Therefore, users can save documents or print hard copies by using local connected devices. Administrators can manage access to network printers directly from the application, by using built-in administrative pages. Users can interact with reports on demand, or they can schedule automatic jobs to securely generate and distribute documents on a recurring basis.

The following illustration shows the components that are involved in document printing.

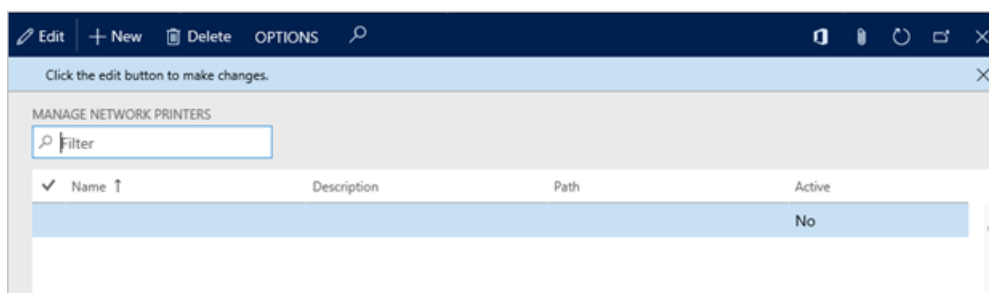


For information about how to use extensions to manage availability of the embedded drill-through links in application reports, see the Appendix.

Managing access to network printers

Administrators can use built-in administrative pages to manage access to network printers. Network printers are secured per company and shared by users of the application. Documents are then printed by using a privileged domain account, based on settings that the user provides. In on-premises deployments, you don't have to install an adapter to connect to domain resources such as printers and fax machines.

The following illustration shows the page that is used to manage network printers.



Appendix

Turning on embedded links in business documents

Here is the code that you can use to make embedded drill-through links available in PDF documents.


```
class Controller extends SrsReportRunController
{
    protected void preRunModifyContract()
    {
        this.parmReportContract().parmRdlContract().parmEnableFileDrillThrough(true);
        super();
    }
    static void main(Args _args)
    {
        ...
    }
}
```

NOTE

Can you tell us about your documentation language preferences? [Take a short survey.](#)

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Run the Document Routing Agent as a Windows service

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The Document Routing Agent includes an option that lets you select the mode of execution. The process can run as either a desktop application or a Microsoft Windows service. When the application runs as a Windows service, it can be started automatically after a computer restart. It can also be configured to run under the security context of a specific user account. This enhancement lets customers host the Document Routing Agent on secured domain resources such as network print servers.

This topic provides important information that will help you select the correct execution mode.

Service applications

An application is a program that a user interacts with on the desktop. A service is a process that runs in the background and doesn't have an active window. The Document Routing Agent now supports both execution modes. It's important that you understand why you might select one mode instead of the other and the steps that are involved in running the process as a service. For more information about Windows services, see [Introduction to Windows Service Applications](#). Here are some of the main benefits of running the Document Routing Agent as a background service:

- The service can be configured to start automatically after a computer restart. No user intervention is required.
- The service runs in the background. No active application runs in the notification area.
- The service routes documents without requiring that a user sign in by using cached credentials.

Although there are many benefits of running the Document Routing Agent as a Windows service, there are also limitations. The next section discusses an issue that affects the handling of document reports, such as checks, that require custom page margins.

Documents that require custom margins

When the Document Routing Agent runs as a Windows service, document reports, such as checks, that require custom margins can't be printed directly to network printers. Instead, the Document Routing Agent automatically routes those documents to a target folder. New configuration properties in the application's **Settings** dialog box let you define the target location for document reports that require custom margins.

When the Document Routing Agent runs as a desktop application, it continues to take advantage of Adobe Reader to spool the document to the shared printer device that is selected in Finance and Operations. To handle scenarios where documents that have custom margins must be printed, we recommend that you install the Document Routing Agent in multiple locations. Then install the printers that will handle those documents only on the Document Routing Agents that will run in desktop application mode. Alternatively, use a post-execution process to pick up the files in the target directory and direct them in the appropriate manner.

Install the latest build

1. Save a copy of the current Document Routing Agent configuration file. This file is located at C:\Users\\AppData\Local\Microsoft\Microsoft Dynamics 365 for Finance and Operations Document Routing\Microsoft.Dynamics.AX.Framework.DocumentRouting.config. In this path, <UserID> is the Active Directory Domain Services (AD DS) user name that the Document Routing Agent was installed under.

2. Uninstall the current version of the Document Routing Agent.
3. Install the latest version of the Document Routing Agent by following the instructions in [Install the Document Routing Agent to enable network printing](#).

NOTE

Although you install the application at this point, don't run it yet.

4. Copy the configuration file from step 1, and paste it into the following directory:
C:\ProgramData\Microsoft\Microsoft Dynamics 365 for Finance and Operations Document Routing. This step helps guarantee that all your previous configuration settings are used for the new version of the Document Routing Agent application.
5. Run the Document Routing Agent.
6. Sign in by using your Microsoft Azure Active Directory (Azure AD) or your credentials for your Finance and Operations apps.
7. View and verify your settings and printers by clicking the appropriate menu items.

The next section provides detailed instructions for selecting the Windows service execution mode.

Change the default execution mode

By default, the Document Routing Agent runs as a desktop application. To run the process as a Windows service, make sure that you're familiar with the process for [installing the Document Routing Agent to enable network printer devices](#). Then complete the following tasks.

Update the execution mode for the Document Routing Agent

1. Start the Document Routing Agent by using the desktop icon.
2. Select the **Sign In** option, and sign in by using your Azure AD credentials.
3. On the ribbon, select **Settings**.
4. Enable the **Run as a Windows Service** option.
5. Provide a target folder for PDF files that are produced for documents that have custom margins.
6. Select **OK**, and close the Document Routing Agent window.

Configure and start the Windows service

1. In Windows, start Service Manager.
2. In the list, select **Microsoft Dynamics 365 for Finance and Operations Document Routing Service**.
3. Right-click the name, and then select **Properties**.
4. On the **Log On** tab, select the **This account** option, and then supply the AD DS credentials that are used to run the service.

NOTE

The selected account must have access to the shared network devices. The windows domain account (or local machine account) used to run the windows service must be same as the account that starts the Document Routing Agent desktop app.

5. Select **OK**.

6. Start the service.

The Document Routing Agent is now running as a Windows service.

Troubleshooting tips

Verify the network printer connection

- Verify that the active account has enough access rights to the network printer.
- Verify that the user account can successfully print to the network device by using Notepad or another local application.

Verify security roles

- To access the application links that are used to install the Document Routing Agent, the user must be part of the **Document routing client** security role.

Review the service account's access rights

- Verify that the **DocumentRoutingService** service is running as a domain account that has access to the network devices.

Refresh the Azure service token

- Azure authentication tokens must be **refreshed every 90 days** while the Document Routing Agent is running as a Windows service. To refresh the service token, start the client, and then sign out and sign back in by using the menu items.

Disable shared printers for remote access

- When you connect to the host machine by using Microsoft Remote Desktop, make sure that you clear the **Printers** option in the **Local devices and resources** section on the **Local Resources** tab.

Review the event logs

1. On the host machine, start Event Viewer.
2. Review the logs at **Application and Services Logs > Microsoft > Dynamics > AX-DocumentRouting**.

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

SQL Server Reporting Services (SSRS) reports that are available

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This topic points you to a report that lists the SQL Server Reporting Services (SSRS) reports available.

Reports can be defined simply as any visualization of a structured data set. This may include transactional data presented in a tabular layout and advanced graphical views of aggregate information. To account for this broad definition, the application offers several tools to produce reports to satisfy complex business requirements. One of these tools is SQL Server Reporting Services. SSRS reports provide the following advantages:

- Back office document management capabilities including email support, scheduled executions via batches, and print archive functionality.
- Parameterized views with drill-through navigation to application pages and other reports.
- Used to produce precision documents for compliance with local regulatory business practices.

For more information, see [Create reporting solutions](#).

To view the report

The **SQL Server Reporting Services Reports report**, included with the [Technical reference reports](#), lists each SSRS report that is available. The report indicates the data set used for each report, as well as the filters and fields available on each report.

NOTE

Can you tell us about your documentation language preferences? [Take a short survey](#).

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Install modern report design templates

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This topic explains how to install the modern report design templates in the application suite. You can use these samples to create graphically rich business documents that have flexible branding in the header and footer.

Introduction

A new set of developer tools is available that takes the form of report designs for several core business documents in the application suite. These report designs have been re-imagined so that flexible branding appears in the header and footer of public-facing documents when transactions are generated in the application. The following illustration shows how an earlier design for a sales invoice differs from a modern sales invoice design.

The image shows two side-by-side sales invoice reports. The left report, titled 'LEGACY DESIGNS', is a 'SalesInvoice Report' for Contoso Entertainment Systems (West). It features a dense layout with multiple contact addresses, a detailed item list with columns for item number, description, quantity, unit, unit price, discount percent, discount, and amount, and a total amount of \$315,479.00. The right report is a modern Microsoft invoice for Owl Wholesale. It has a clean, professional layout with the Microsoft logo, a clear header with the invoice number (CIV-000676) and date (30 November 2012), and a table of items with columns for item, description, quantity, sales price, discount, and amount. The total amount is also \$315,479.00. The modern invoice includes a 'METHODS OF PAYMENT' section and 'OTHER INFORMATION' section.

After you complete the installation, you can use the built-in brand management tools to define brand settings that should be applied to the modern designs for application business documents. The brand management tools are available at [Organization administration > Setup > Document branding > Branding details](#).

Why aren't these designs the default designs for the application suite reports?

We are maintaining the legacy solutions for two primary reasons:

- **Modern designs don't include code.** Although the legacy solutions use embedded Microsoft Visual Basic (VB) code to recognize configuration keys and honor regulatory requirements that vary by region, the modern report designs offer much less flexibility. The benefit of a simple design that has minimal code behind it comes at the expense of reusability across regions.
- **Modern designs aren't available for all business documents.** There is a gap between the supported business documents and the availability of modern report designs. Although the legacy designs aren't as

aesthetically pleasing, they provide a sense of consistency.

IMPORTANT

The simple modern designs are **not** recommended for all types of deployments. They are intended for cases where the customer doesn't require runtime control over the layout of the document through existing application configuration settings.

Apply the modern designs

The modern report designs have been bundled into a model file and posted to Microsoft Dynamics Lifecycle Services (LCS). Therefore, you can easily access them from your existing subscription. Use the following procedure to obtain the modern report design solutions and install them in your local development environment. You must then apply some customizations to incorporate the modern report designs into the appropriate scenarios.

Follow these steps to install the modern report designs for the application suite.

1. Sign in to [LCS](#) to access the deployment dashboard. Then, on the **Shared asset library** page, select the **Model** asset type, and download the **ApplicationSuiteModernDesigns** model file. Save the model file to a location that is accessible from the development environment.

NOTE

Be sure to select the appropriate model file for the version of the application that you're using.

2. Import the model file into your local development environment. To install a model file in a development environment, use the ModelUtil.exe tool and the **-import** directive. Here is an example.

```
ModelUtil.exe -import -metadastorepath=[path of the metadata store] -file=[full path of the file to import]
```

3. Navigate to the `J:\AOSService\PackagesLocalDirectory\bin` folder.
4. Run the following command.

```
ModelUtil.exe -import -metadastorepath=J:\AOSService\PackagesLocalDirectory -file="E:\Test\AppSuiteModernDesigns.axmodel"
```

For more information about how to import model files, see [Export and import models](#). After you've imported the model file, start Microsoft Visual Studio. In Application Explorer, verify that the **Application Suite - Modern Designs** collection appears under the **AOT** node. For more information about how to use the Application Explorer, see [Development tools tutorial](#)

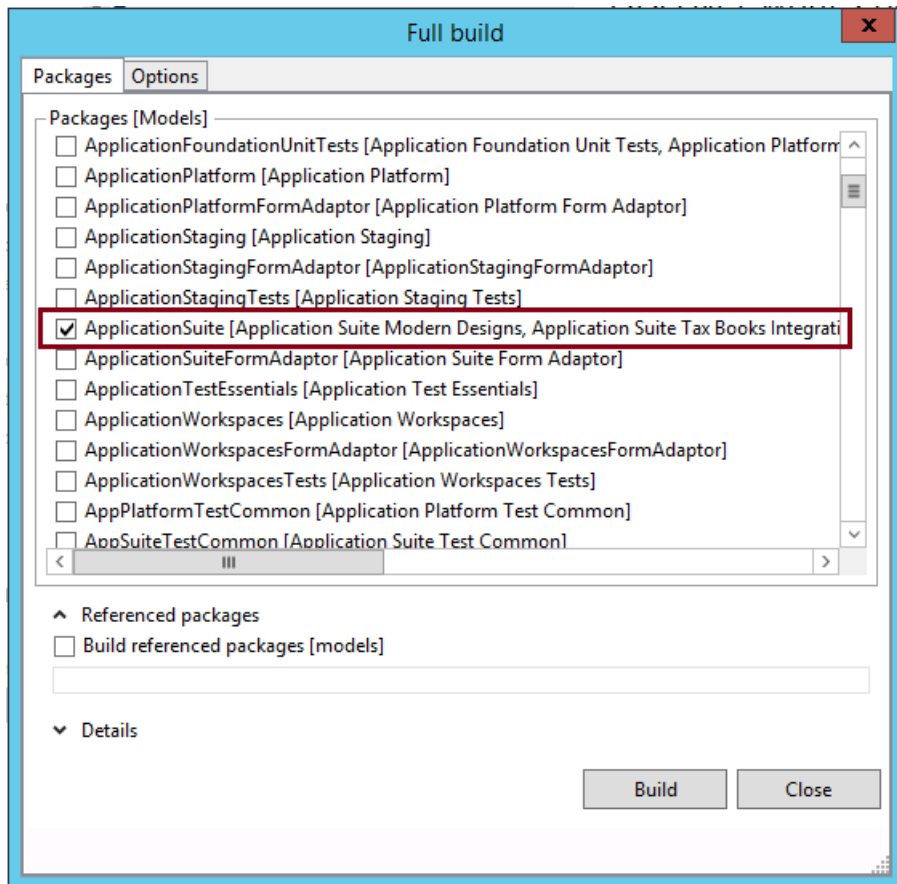
Now that you've successfully imported the Application Suite Modern Designs model, you must to rebuild the application suite to update the metadata elements.

Build the application suite

The Application Suite Modern Designs model is an extension of the Application Suite model. To help guarantee that all application references are updated so that they target the model extensions, you must build the Application Suite model by using Microsoft Visual Studio.

1. Start Visual Studio, or use the existing instance.

2. On the **Dynamics 365** menu, select **Build models**.
3. In the list, select the check box for the **ApplicationSuite** package.



NOTE

You will see that the Application Suite Modern Designs model is included in the package definition.

4. Select **Build** to do a full build of the application suite.

This process may take up to 20 minutes, depending on the size of your machine.

Deploy the modern designs (one-box environments)

After you've compiled the application suite that includes the modern report design templates, you should verify the changes locally. To verify the changes, you must deploy the new modern report design solutions to the instance of Microsoft SQL Server Reporting Services (SSRS) that is running locally.

Follow these steps to incorporate the modern report design into an existing application suite report.

1. Create a project that contains the application suite report. In Application Explorer, under the **Application Suite Modern Designs** model, expand the **Reports** node, and then expand the **Reports** subnode. Select all the items in the folder, right-click, and then select **Add to new project**.
2. Complete the **New Project** wizard. Accept all default values.
3. In Solution Explorer, select the project, right-click, and then select **Deploy reports** to deploy the build and deploy the reports locally.

When you add the modern report design to an existing report, you can reuse both the parameter handling and the data provider that the out-of-box solution uses.

Update Print management settings

At this point, you should be able to access the modern report designs from the application. Make sure that you do thorough test validations on the modern report design templates before you deploy them to production environments. To do test validations, you must activate the modern report designs for the application business process.

Follow these steps to update the Print management settings for customer sales orders by selecting the modern report design solution as the default report design.

1. Open the **Form setup** page for the module. For example, for Accounts receivable, select **Accounts receivable > Setup > Forms > Form Setup**.
2. Select **Print management** to open the **Print management setup** page.
3. Expand the tree, and find the settings for the **Sales order confirmation** document.
4. Select **Original <Default>** to begin to modify the default document routing.
5. In the **Report format** list, select **SalesConfirmModern.Report** to enable the modern report design solution.

Print management setup

The screenshot displays the 'Print management setup' interface. On the left, a tree view under 'Module - accounts receivable' shows 'Documents' expanded to 'Sales order confirmation', with 'Original <Default>' selected. The main panel shows the 'ORIGINAL OR COPY IDENTIFICATION' settings. A red box highlights the 'Report format' dropdown menu, which is currently set to 'All countries/regions'. The dropdown list shows 'SalesConfirm.Report' and 'SalesConfirmModern.Report'. The 'Original / copy' dropdown is set to 'Original'. The 'Name' field is 'Suspend printing for this document'. The 'Report format' and 'Default country/region' fields are visible below the dropdown.

6. Open another page. This step forces a save operation to occur.
7. Post a sales order to view the modern design in the application.

NOTE

Can you tell us about your documentation language preferences? [Take a short survey](#).

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Power BI integration with Entity store

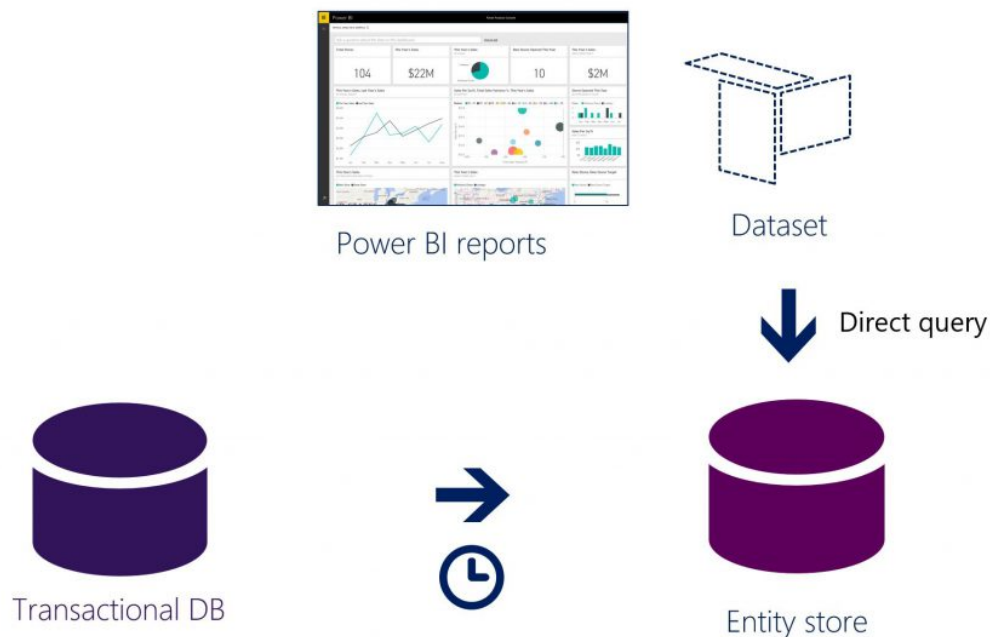
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Entity store is an operational data store that is included with Microsoft Dynamics 365 Finance. This topic describes how Entity store enables Power BI integration.

Entity store is an operational data store that is included with the application. The Entity store feature was introduced in the Microsoft Dynamics AX platform update 1 (May 2016) release. This feature lets an administrator or power user stage aggregate measurements in a dedicated data store for reporting and analytics. (Aggregate measurements are a star schema that is modeled by using entities.) We call this data store Entity store. It's a database that is optimized for reporting purposes. Entity store uses the in-memory, clustered columnstore index (CCI) functionality that is built into Microsoft SQL Server to optimize reporting and queries. Customers can use Microsoft Power BI DirectQuery models together with Entity store to enable high-volume, near-real-time analytical reporting over large volumes of data.

Power BI DirectQuery mode

In the February 2016 release of Microsoft Dynamics AX, you could create Power BI reports by using OData endpoints that are exposed via data entities (both aggregate data entities and detailed or regular data entities). Although this approach is still supported, Entity store also lets power users create Power BI DirectQuery reports.



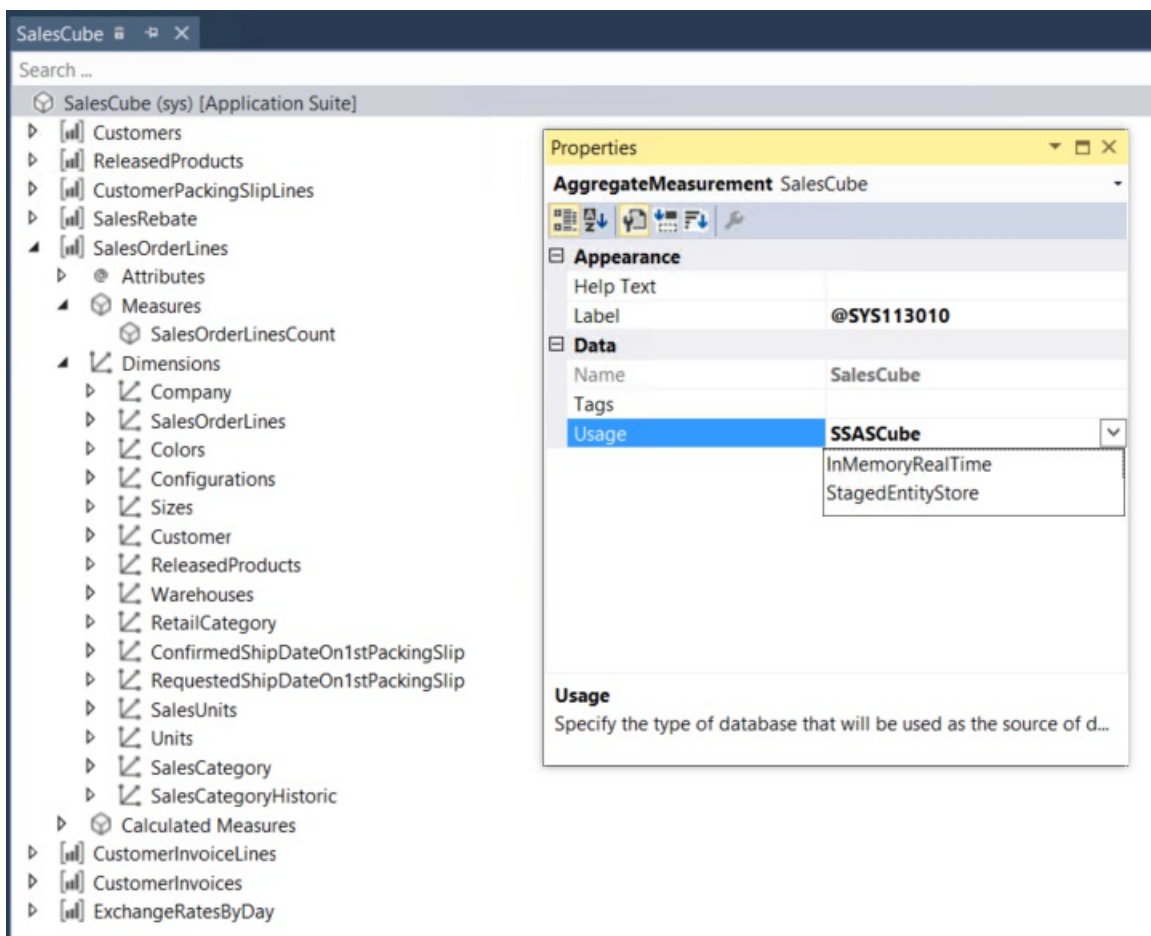
As the preceding illustration shows, DirectQuery is a reporting mode that runs reports directly on Entity store. In this reporting mode, data isn't staged in Power BI caches. This mode provides two immediate benefits:

- You can create Power BI reports over large data volumes.
- Reports don't have to be updated by using Power BI. When Entity store is updated, reports reflect the latest data.

Additionally, data doesn't leave your environment, because no data is cached in the Power BI service.

Stage aggregate measurements in Entity store

Aggregate measurements are a star schema that is modeled for analytical scenarios. In the February 2016 release, we enabled real-time, in-memory aggregate measurements. By using real-time aggregate measurements, you can enable embedded charts and key performance indicators (KPIs) that react to real-time operations on data. For information, see [Transition from Analysis Services cubes to aggregate models](#). Real-time aggregate measurements take advantage of the in-memory, non-clustered columnstore index (NCCI) technology. Visuals and aggregate calculations that are built over real-time aggregate measurements reflect transactions within seconds. In the platform update 1 (May 2016) release, we enabled aggregate measurements that can be staged in Entity store. Aggregate measurements that are staged in Entity store can be used for near-real-time analytical scenarios where large volumes of data must be explored by using Power BI. As a developer, you learned how to model an aggregate measurement for real-time analytics in [Model aggregate data](#). In the platform update 1 (May 2016) release, we also added the capability to model aggregate measurements that can be staged in Entity store. In Microsoft Visual Studio, you can specify **StagedEntityStore** as the usage property of an aggregate measurement. This new property was added in May 2016. Previously, **InMemoryRealTime** was available as the usage property.



However, you might wonder why you would model an aggregate measurement so that it can be staged? Why wouldn't you use in-memory real-time aggregate measurements all the time? There are several reasons for using the **StagedEntityStore** pattern:

- There might be large amounts of data that must be explored and analyzed.
- You might have Analysis projects (that is, cubes) that you migrated from Microsoft Dynamics AX 2012 R3 as part of the code upgrade process. Because of the complex views and joins that are present in the schema, query response times might not be acceptable for embedded visuals. However, you might not want to refactor the visuals to take advantage of NCCI technology immediately.
- Unlike the operational database schema, the schema in Entity store is modeled specifically for reporting. Therefore, it's much easier to build new reports from the schema in Entity store.
- Your scenario might not require that analytical data be updated within seconds of an operation. Most Power BI reports that are built to enable data exploration fall into this category. If data freshness of approximately

10 minutes is acceptable for your scenario, you might want to use the staged pattern.

If one of the preceding reasons covers your situation, you should stage your aggregate measurement in Entity store and it use for Power BI integration.

Update Entity store

Entity store refresh is automated and managed by the system. In the client, you can find the **Entity Store** page at **Systems administration > Setup > Entity Store**. For more information, see [Automated Entity store refresh](#).

Connecting to the Entity store database

For troubleshooting and diagnostics, you can connect to the Entity store database directly from a related sandbox environment. To connect:

1. Use Remote Desktop to access the sandbox. The RDP file can be downloaded from the **Environment Details** page after you have included your IP address in a safe list.
2. Open SQL Server Management Studio, and connect to the server specified on the **Environment Details** page.
 - Find the section titled **Database Accounts**. Locate the entry for the user with the name **axdwwadmin**.
 - The server name is the first portion of the **SQL Server\Database Name** field. This should be used in the format of **SQLServerName.database.windows.net** where **SQLServerName** is the value from **LCS**.
 - The authentication type should be changed from **Windows Authentication** to **SQL Server Authentication**.
 - The login will be **axdwwadmin** and the password will be the value from **LCS**.
3. Using the **Options** button or by browsing to the **Connection Properties** tab, change the **Connect to database** property from the default value to your **Database Name** value from **LCS**.
4. Click **Connect** to access the database.

NOTE

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Resolve issues after entity store maintenance

2/18/2021 • 2 minutes to read • [Edit Online](#)

When maintenance is performed on the entity store, it impacts the following components:

- Application analytical workspaces.
- Entity store-based reports that have been deployed to PowerBI.com.

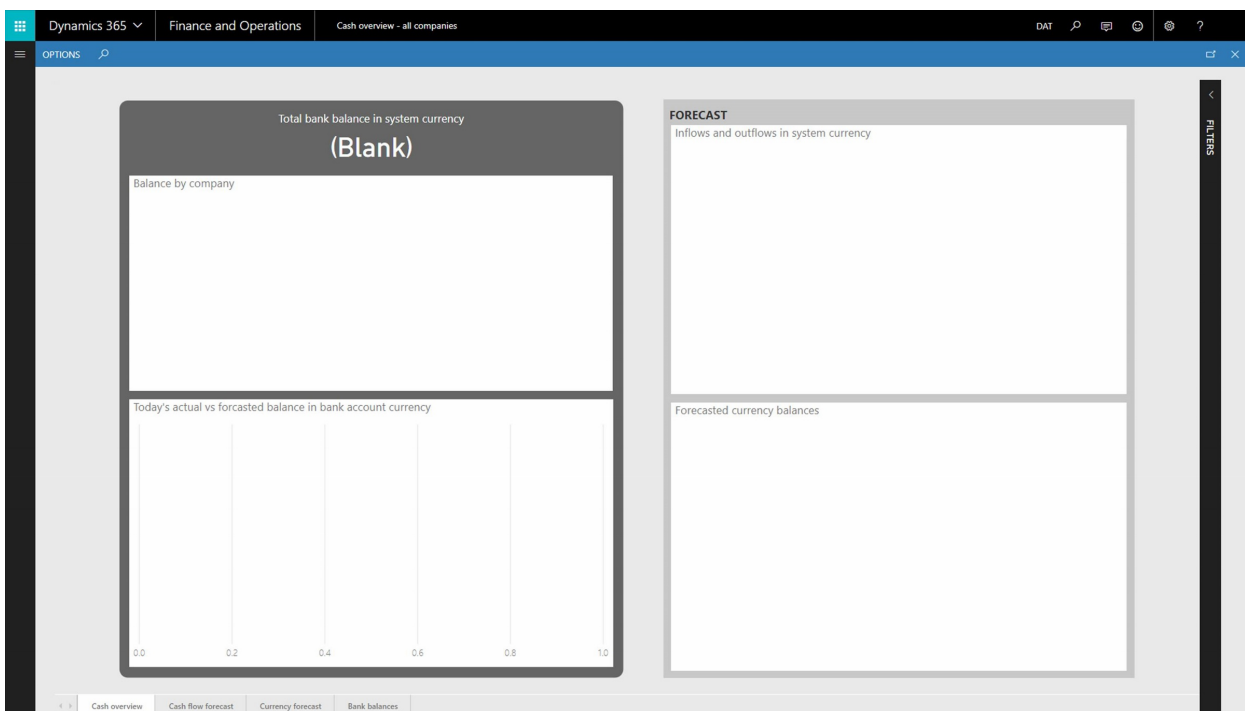
To resolve issues with these components, complete the procedures in this topic.

NOTE

There will be **no impact** to the normal operation of your application.

If you are using application analytical workspaces

Application analytical workspaces and reports may not render data after certain maintenance operations are completed. The following screenshot shows an example of this.



To resolve this issue:

1. Sign in to the application.
2. Go to the **Batch jobs** page (**System administration** > **Inquiries** > **Batch jobs**).
3. Delete all pending batch jobs associated with the entity store. These batch jobs:
 - Will have a status of **Waiting**.
 - Will typically have a description of **Deploy measurement**.

NOTE

The default description is **Deploy measurement**. If the description has been customized, you can verify whether a batch job is associated with the entity store by looking at the class name. Batch jobs associated with the entity store will have a class name of **BIMeasurementDeployManagementEntityBatchJob**.

4. Go to the **Entity store** page (**System Administration > Setup > Entity Store**).
5. Select all measurements that need to be refreshed.
6. Click **Refresh**, and then click **OK**.

After the refresh completes, the application analytical workspaces and reports will render data.

If you have deployed entity store-based reports to PowerBI.com and are using the reports within PowerBI.com

After refreshing the entity store (as described above), redeploy the reports using the **Deploy Power BI report files** page by selecting **System Administration > Setup > Deploy Power BI files**.

NOTE

Reports that were previously deployed to PowerBI.com may produce errors. If this occurs, you may need to delete and redeploy the report after the maintenance activity is completed.

NOTE

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Configure PowerBI.com integration

2/18/2021 • 5 minutes to read • [Edit Online](#)

Overview

Users can pin tiles, dashboards, and reports from their own PowerBI.com account to application workspace.

This functionality requires a one-time configuration of your environment. An administrator must do this step to enable Microsoft Power BI to communicate and authenticate correctly.

For a workspace to show a Power BI tile, the server must contact the Power BI service on behalf of a user and access the visualization. It must then redraw the visualization in the application workspace. The fact that the server contacts the Power BI service "on behalf of a user" is important. When a user, such as `D365User@contoso.com`, contacts the PowerBI.com service, Power BI should show only tiles and reports from the user's PowerBI.com subscription.

By completing this configuration step, you enable to contact the PowerBI.com service.

Things you must know before you start

- You must be a system administrator in the application. This option is available on the **System administration** menu.
- You must have a PowerBI.com account. You can create a trial account if you don't have an account. (A Pro license isn't required for this configuration step.)
- You must have at least one dashboard and one report in your Power BI account. Although the dashboard and report aren't required for this configuration step, you might not be able to validate the configuration if you don't have any content in your PowerBI.com account.
- You must be an administrator for your Microsoft Azure Active Directory (Azure AD) account. If you aren't the administrator, an administrative user must perform this configuration step for you.
- The Azure AD domain that is configured must be the same domain that you used for your PowerBI.com account. For example, if you provisioned the application in the Contoso.com domain, you must have Power BI accounts in that domain, such as `Tim@ContosoAX7.onmicrosoft.com`.
- Users navigating to these pinned tiles must have a valid Power BI.com license.

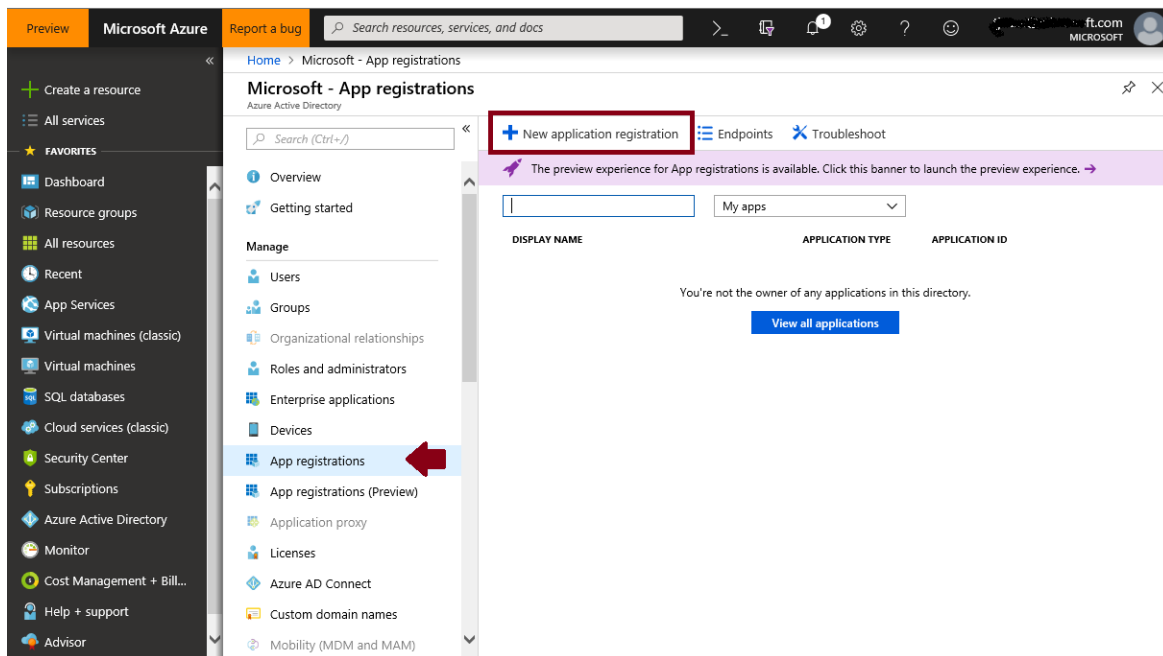
Registration process

1. Sign in to <https://portal.azure.com/> using an Azure tenant admin account.

NOTE

The user who completes this procedure must have Admin rights for the tenant to register applications.

2. Go to **Azure Active Directory > App registrations > New application registration**.



3. Enter the following values:

- **Name** - Your app name.
- **Application type** - Web app/API
- **Sign-on URL** - The base URL of your client. For example, `https://contosoax7.cloud.dynamics.com`.

NOTE

Depending on your version, you may need to add /oauth as a suffix to the URL, or use http instead of https as the protocol, such as: `https://contosoax7.cloud.dynamics.com/oauth` OR `http://contosoax7.cloud.dynamics.com/oauth`.

4. Click **Create**.
5. Copy the **Application ID**. This will be used to connect to the PowerBI.com service.
6. Click **Settings** > **Required permissions** > **Add** > **Select an API** > **Power BI Service (Power BI)**.
7. Click **Select**.
8. Enable Access and click **Select**.

Enable Access

<input type="checkbox"/>	APPLICATION PERMISSIONS	↑↓	REQUIRES ADMIN	↑↓
	View all content in tenant		✔ Yes	
<input checked="" type="checkbox"/>	DELEGATED PERMISSIONS	↑↓	REQUIRES ADMIN	↑↓
	View all datapools		✘ No	
	Read and write all datapools		✘ No	
	Read and Write all Reports		✘ No	
	View users Groups		✘ No	
<input checked="" type="checkbox"/>	View all Groups		✘ No	
<input checked="" type="checkbox"/>	View all Reports (preview)		✘ No	
<input checked="" type="checkbox"/>	Create content (preview)		✘ No	
<input checked="" type="checkbox"/>	View content properties (preview)		✘ No	
<input checked="" type="checkbox"/>	Read and Write all Datasets		✘ No	
<input checked="" type="checkbox"/>	View all Datasets		✘ No	
<input checked="" type="checkbox"/>	View all Dashboards (preview)		✘ No	
<input checked="" type="checkbox"/>	Add data to a user's dataset (preview)		✘ No	
	Read and Write all Dashboards		✘ No	
	View all content in tenant		✔ Yes	
	Read and write all workspaces		✘ No	
	View all workspaces		✘ No	

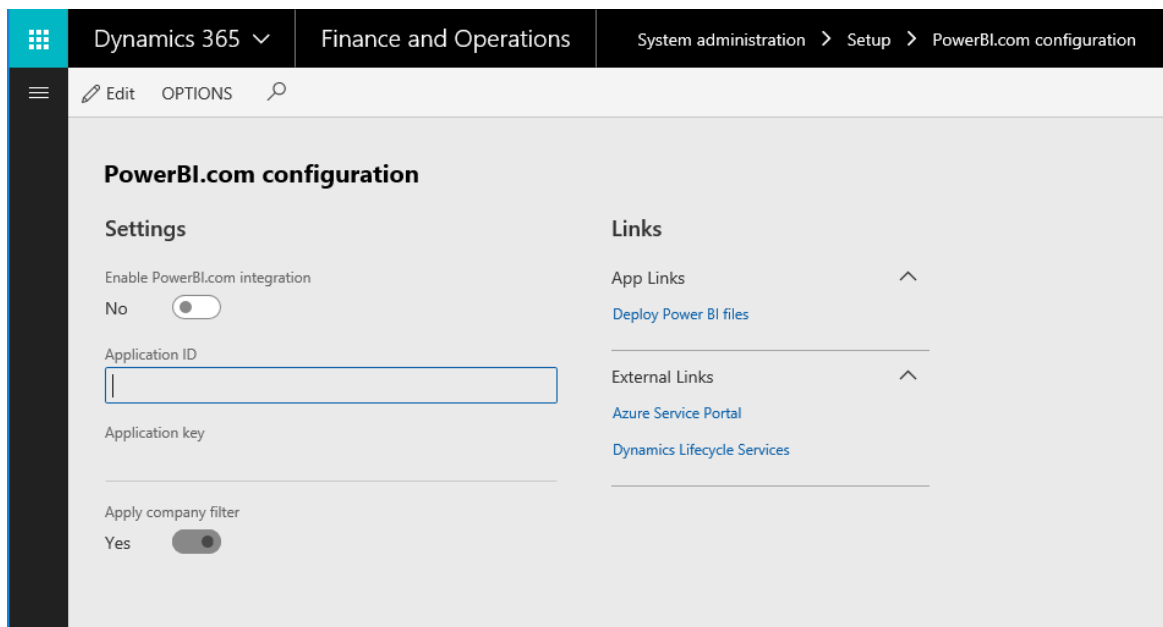
Select

9. Click **Done** and then click **Grant Permissions**.
10. Click **Settings > Keys**.
11. Enter a value for **Key description** and **Expires**, and then click **Save**.

Make a note of the **Application ID** and **Application Key**. You will use these values in the next procedure.

Specify Power BI settings in Finance and Operations

1. In the client, open the **Power BI configuration** page.



2. Select **Edit**.
3. Set the **Enabled** option to **Yes**.
4. In the **Application ID** field, enter the **Application ID** value that you got from Power BI in the previous procedure.
5. In the **Application Key** field, enter the **Application Key** value that you got from Power BI in the previous procedure.

You can apply the company filter only if your Power BI content has a table that is named **Company** and a column that is named **ID**. Ready-made Power BI content that is released uses this convention.

6. Click **Save**.

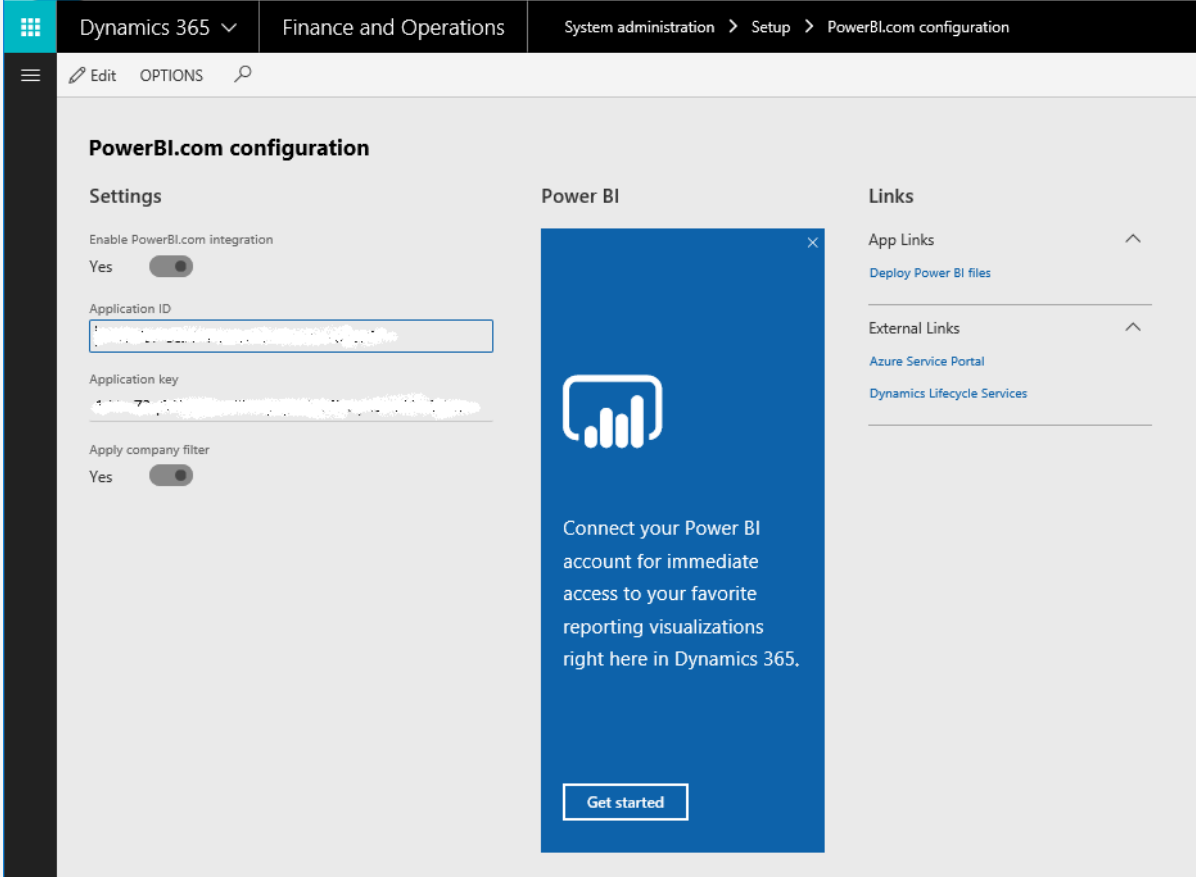
Complete the steps in the next section to verify the changes and enable PowerBI.com integrations.

Pin tiles to a workspace

1. To validate the PowerBI.com configuration, click **Get started**.

NOTE

You may need to refresh the browser to apply the changes.



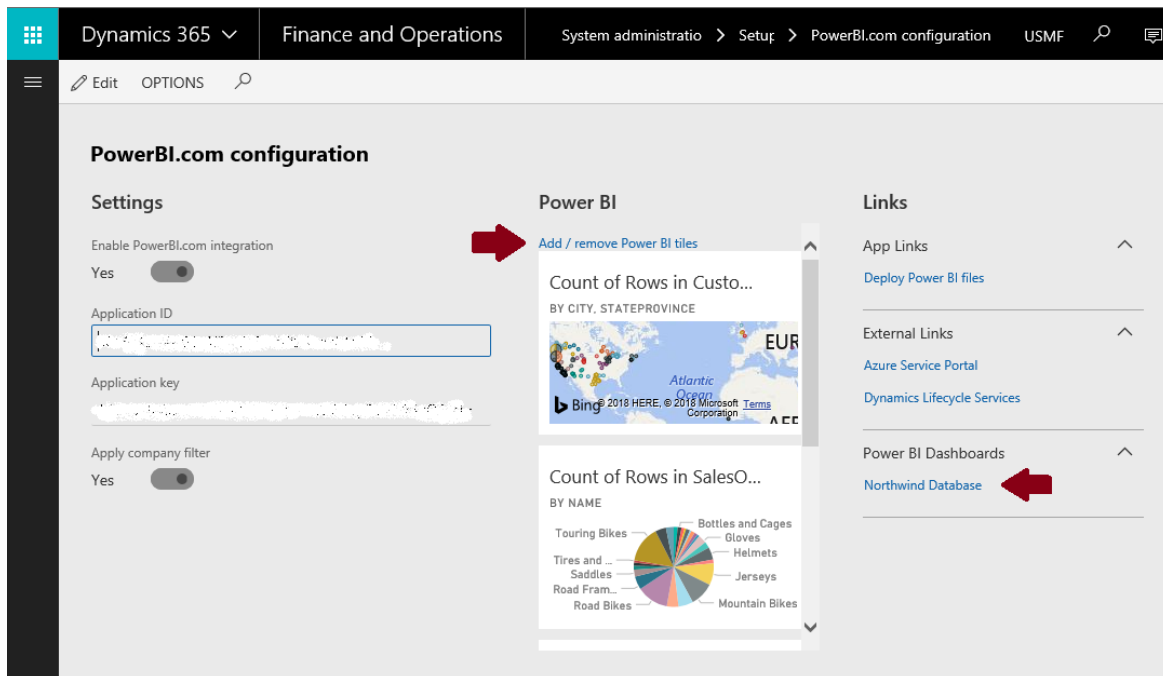
The screenshot displays the Dynamics 365 configuration interface for PowerBI.com. The breadcrumb trail at the top reads: Dynamics 365 > Finance and Operations > System administration > Setup > PowerBI.com configuration. The main content area is titled 'PowerBI.com configuration' and is divided into three sections:

- Settings:** Includes a toggle for 'Enable PowerBI.com integration' (set to 'Yes'), a text input for 'Application ID', a text input for 'Application key', and another toggle for 'Apply company filter' (set to 'Yes').
- Power BI:** A central blue panel with a bar chart icon. It contains the text: 'Connect your Power BI account for immediate access to your favorite reporting visualizations right here in Dynamics 365.' and a 'Get started' button.
- Links:** A sidebar on the right with two sections: 'App Links' containing 'Deploy Power BI files' and 'External Links' containing 'Azure Service Portal' and 'Dynamics Lifecycle Services'.

If you're starting Power BI from the application for the first time, you're prompted to authorize sign-in to Power BI from the client. Select **Click here to provide authorization to Power BI**.

Users must complete this step the first time they pin Power BI content.

2. The Azure AD consent page asks for your consent. User consent is required for the application to access PowerBI.com on behalf of the user. Select **Accept**.
3. Because you're already signed in to Azure AD, you don't have to enter your credentials again. A new tab appears, where you're prompted to authorize the connection between the application and Power BI. Authorize the connection, and then return to the original tab.
4. A list of tiles from your PowerBI.com account appears. Select one or more tiles to pin to the selected workspace.



Troubleshooting common errors

In the procedure above, after you click **Accept**, you might receive the following error message if the process is unsuccessful. Note that the details of the error appear at the bottom of the message. Additional technical information provides clues that can help you determine what went wrong.

Some common issues and the resolution steps

ERROR	RESOLUTION
The Power BI service is unavailable.	This issue doesn't occur very often, but the Power BI service might sometimes be unreachable. You don't have to re-register. Try to pin a tile to a workspace later.
You can't access the application.	You probably didn't select all the check boxes under Step 8 in the Registration process during the registration process. Start Power BI, and re-run the registration process.
The Power BI tiles page is empty (no content is shown).	Your PowerBI.com account might not have a dashboard or any tiles. Add a dashboard, such as a sample dashboard, and try to pin a tile again.
Error when authorizing Power BI	On the Azure Admin dashboard, under Users and Groups > User settings , make sure that the Users can consent to apps accessing company data on their behalf option is set to Yes .
Sorry, something went wrong. The authentication process was not successful. Please contact your system administrator.	This may occur in cases where service keys have expired. We recommend performing the registration process above, starting with step 3. When complete, be sure to update the PowerBI.com settings at AX client > System administration > Set up > PowerBI.com integration .

NOTE

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Bring your own database (BYOD)

2/18/2021 • 13 minutes to read • [Edit Online](#)

This topic explains how administrators can export data entities from the application into their own Microsoft Azure SQL database. This feature is also known as *bring your own database* (BYOD). The BYOD feature was released in Microsoft Dynamics AX with platform update 2 (August 2016). Minor improvements and bug fixes have been included in subsequent platform updates.

The BYOD feature lets administrators configure their own database, and then export one or more data entities that are available in the application into the database. (Currently, more than 1,700 data entities are available.) Specifically, this feature lets you complete these tasks:

- Define one or more SQL databases that you can export entity data into.
- Export either all the records (*full push*) or only the records that have changed or been deleted (*incremental push*).
- Use the rich scheduling capabilities of the batch framework to enable periodic exports.
- Access the entity database by using Transact-SQL (T-SQL), and even extend the database by adding more tables.

Entity store or BYOD?

If you followed the series of [blog posts about Microsoft Power BI integration](#), you will be familiar with Entity store. Entity store is the operational data warehouse. Entity store provides built-in integration of operational reports with Power BI. Ready-made reports and analytical workspaces use Entity store. If you write Power BI reports by using data in your application environment, you should use Entity store.

However, the BYOD feature is recommended for the following scenarios:

- You must export data into your own data warehouse.
- You use analytical tools other than Power BI, and those tools require T-SQL access to data.
- You must perform batch integration with other systems.

NOTE

The application doesn't allow T-SQL connections to the production database. If you're upgrading from a previous version of Finance and Operations, and you have integration solutions that require direct T-SQL access to the database, BYOD is the recommended upgrade path.

You can use either Entity store or BYOD. The default operational reports that are available take advantage of embedded Power BI and Entity store. We recommend that you use our default operational reports as your first choice. You can also extend the ready-made operational reports to meet your requirements. You should consider BYOD a complementary option that you use as you require.

Creating a SQL database

Before you can configure the entity export option and use the BYOD feature, you must create a SQL database by using Azure portal.

For one-box development environments, you can create a database in the local Microsoft SQL Server database. However, this database should be used only for development and testing purposes. For production

environments, you must create an Azure SQL database.

You should also create a SQL user account for sign-in to the database. Write down the server name, database name, and the SQL user ID and password. You will use this information when you configure the entity export option in the next section.

If you're using the BYOD feature for integration with a business intelligence (BI) tool, you should consider using clustered columnstore indexes (CCIs). CCIs are in-memory indexes that improve the performance of read queries that are typical in analytical and reporting workloads.

NOTE

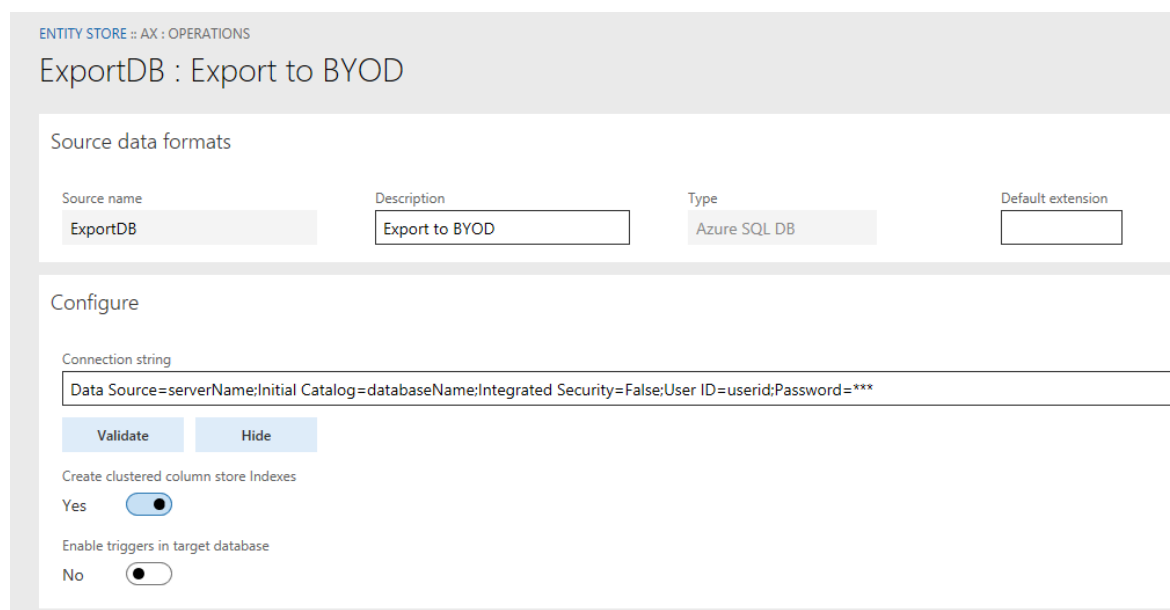
Your BYOD database must be accessible to Finance and Operations apps. If you encounter issues where you are unable access to access BYOD, you must ensure firewall rules in your BYOD are configured appropriately.

Configuring the entity export option

1. Start the client, and then, in the **Data management** workspace, select the **Configure Entity export to database** tile.
2. If you've configured any databases, a list is shown. Otherwise, you must configure a new database. In this case, select **New**, and then enter a unique name and a description for the new database. Note that you can export entities into multiple databases.
3. Enter the connection string in the following format:

```
Data Source=<logical server name>,1433; Initial Catalog=<your DB name>; Integrated Security=False; User ID=<SQL user ID>; Password=<password>
```

In this connection string, the logical server name should resemble **nnnn.database.windows.net**. You should be able to find the logical server name in Azure portal. The following illustration shows an example of a connection string.



Source name	Description	Type	Default extension
ExportDB	Export to BYOD	Azure SQL DB	

Configure

Connection string

Data Source=serverName;Initial Catalog=databaseName;Integrated Security=False;User ID=userid;Password=***

Validate Hide

Create clustered column store Indexes

Yes

Enable triggers in target database

No

NOTE

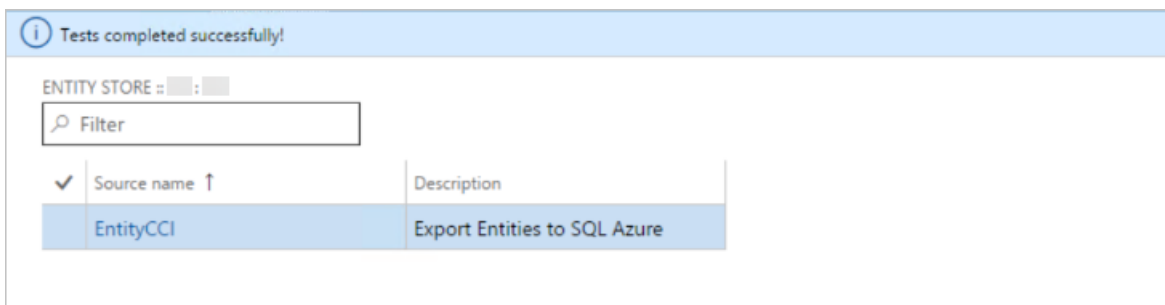
The default extension field shown in the image above does not apply to BYOD.

4. Select **Validate**, and make sure that the connection is successful.

- The **Create clustered column store indexes** option optimizes the destination database for selected queries by defining CCI for entities that are copied. However, CCI are currently supported only on SQL premium databases. Therefore, to enable this option, you must create a SQL premium database.
- The **Enable triggers in target database** option sets export jobs to enable SQL triggers in the target database. This option lets you hook downstream processes into the trigger to orchestrate actions that must be started after records have been inserted. One trigger is supported per bulk insert operation. The size of the bulk insert is determined by the **Maximum insert commit size** parameter in the Data management framework.

For scenarios in which reporting systems read data from BYOD, there is always the challenge of ensuring that the reporting systems get consistent data from BYOD while the sync is in progress. You can achieve this result by not having the reporting systems read directly from the staging tables created by the BYOD process. The staging tables hold the data while data is being synced from the instance and hence will be constantly changing. Use the SQL trigger feature to determine when the data sync has been completed, and then hydrate the downstream reporting systems.

When the validation is passed, the database that you configured for entity export appears in lists of databases, as shown in the following illustration.



You can now publish one or more entities to the new database by selecting the **Publish** option on the menu.

Publishing the entity schema to the database

The **Publish** page enables several scenarios:

- Publish new entities to the database.
- Delete previously published entities from the database. (For example, you might want to re-create the schema.)
- Compare published entities with the entity schema. (For example, if new fields are added later, you can compare the fields with your database schema.)
- Configure change tracking functionality that enables incremental updates of your data.

The following sections discuss each option.

Publish

The **Publish** option defines the entity database schema on the destination database. When you select one or more entities, and then select the **Publish** option, a batch job is started. This job creates the entities in the destination database. When the database definition job is completed, you receive a message, which you can access by using the bell symbol in the upper right.

The actual data update occurs when you export data. At this point, you're just creating the schema.

Drop entity

The **Drop entity** option deletes the data and the entity definition from the destination database.

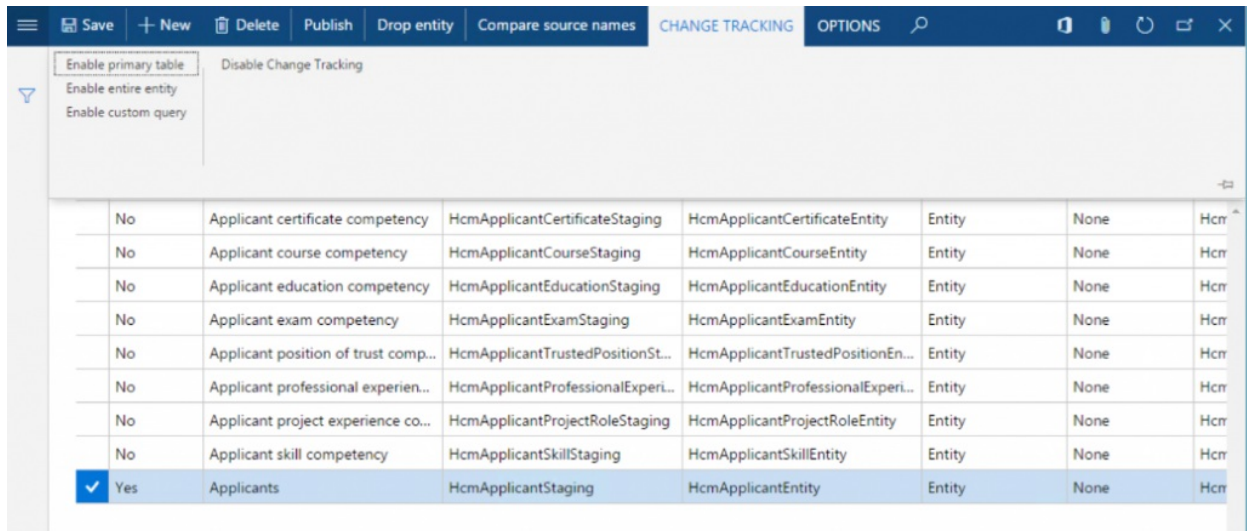
Compare source names

The **Compare source names** option lets you compare the entity schema in the destination with the entity schema in the application. This option is used for version management. You can also use this option to remove any unwanted columns from the destination table.

Configure change tracking

Change tracking is a feature that is provided in SQL Server and SQL Database. Change tracking enables the database to track changes including deletes that are made on tables. The system uses change tracking to identify changes that are made to tables as transactions. However, because the application must track changes at the data entity level, there is additional logic on top of SQL change tracking to make this functionality work. The steps to enable change tracking are explained later in this section.

The **Change tracking** option on the **Publish** page lets you configure how changes are tracked on the underlying entity.



Change Tracking	Entity Name	Staging Table	Entity Table	Type	Other	Other
No	Applicant certificate competency	HcmApplicantCertificateStaging	HcmApplicantCertificateEntity	Entity	None	Hcr
No	Applicant course competency	HcmApplicantCourseStaging	HcmApplicantCourseEntity	Entity	None	Hcr
No	Applicant education competency	HcmApplicantEducationStaging	HcmApplicantEducationEntity	Entity	None	Hcr
No	Applicant exam competency	HcmApplicantExamStaging	HcmApplicantExamEntity	Entity	None	Hcr
No	Applicant position of trust comp...	HcmApplicantTrustedPositionSt...	HcmApplicantTrustedPositionEn...	Entity	None	Hcr
No	Applicant professional experien...	HcmApplicantProfessionalExperi...	HcmApplicantProfessionalExperi...	Entity	None	Hcr
No	Applicant project experience co...	HcmApplicantProjectRoleStaging	HcmApplicantProjectRoleEntity	Entity	None	Hcr
No	Applicant skill competency	HcmApplicantSkillStaging	HcmApplicantSkillEntity	Entity	None	Hcr
<input checked="" type="checkbox"/>	Applicants	HcmApplicantStaging	HcmApplicantEntity	Entity	None	Hcr

The following table describes the change tracking options that are available.

OPTION	DESCRIPTION
Enable primary table	An entity consists of several tables. Select this option to track all changes that are made to the primary table of the entity. When changes are made to the primary table, the corresponding record is inserted into or updated in the destination database. Although data from the whole entity is written to the destination table, the system triggers the insert or update option only when the primary table is modified.
Enable entire entity	Select this option to track all changes to the entity. (These changes include changes to all the tables that make up the entity.) When changes are made to the entity, corresponding updates are made to the destination.
Enable custom query	This option lets a developer provide a custom query that the system runs to evaluate changes. This option is useful when you have a complex requirement to track changes from only a selected set of fields. You can also select this option when the entities that will be exported were built by using a hierarchy of nested views. For more information, see Enable change tracking for entities .

To use change tracking, you must enable the **Change tracking** option as shown above in data management. This action is available on the **Data entities** list page, by going to **Data management > Data entities**. You need to select an entity and select from one of the options listed above to enable change tracking on the data entity.

If you republish an entity that exists in the destination database, the system warns you that existing data will be

deleted because of the new operation.

When you confirm the publish operation, the system publishes the schema to the database, and you're notified when the operation is completed.

By selecting the **Show published only** option on the **Publish** page, you can show only the entities that were published to a given destination database. The Publish function creates the entity schema in the database. You can navigate to the database and see the table schemas that were created, together with corresponding indexes.

NOTE

Currently, you can't use BYOD to export composite entities into a database. You must export each entity in the composite entity.

Exporting data into your database

After entities are published to the destination database, you can use the Export function in the **Data management** workspace to move data. The Export function lets you define a Data movement job that contains one or more entities.

You can use the **Export** page to export data into many target data formats, such as a comma-separated values (CSV) file. This page also supports SQL databases as another destination.

Export

The screenshot shows the 'Export' configuration page. On the left, under 'JOB DETAILS', there are several settings: 'Name' is 'OneTimeExport'; 'Target data format' is 'EntityCCI'; 'Entity name' is empty; 'Use sample file' is 'No'; 'Skip staging' is 'Yes'; 'Default refresh type' is 'Incremental push only' (with a dropdown menu open showing 'Incremental push only' and 'Full push only'); and 'Generate data package' is 'No'. An 'Add entity' button is located below these settings. On the right, under 'SELECTED FILES AND ENTITIES', there is a search filter box, a trash icon, and up/down arrow icons. A blue card for 'Applicants' is shown with a checkmark and a 'View map' button.

You can create a data project that has multiple entities. You can schedule this data project to run by using the batch framework. You also schedule the data export job to run on a periodic basis by selecting the **Export in batch** option.

The same job can also be used to export data from all companies. In prior to Platform update 27, this feature can be enabled by enabling the flight `DMFEnableAllCompanyExport` as explained in [Data management overview](#). Starting in Platform update 27, this feature can be enabled in data management framework parameters. After the feature is enabled, a new option will appear when adding an entity to a data project. This option can be enabled to export data from all companies for the specific entity.

NOTE

Adding multiple entities to an export project for BYOD must be done carefully to ensure the overall reliability of the BYOD export is not compromised. Different parameters must be taken into consideration when deciding the number of entities that are added to the same project. Some of these parameters should be the degree of complexity of the entities, data volume per entity that is expected, and the overall time for export to complete at the job level. Adding hundreds of entities must be avoided, therefore creating multiple jobs with smaller number of entities is recommended.

Use of recurring exports in **Manage > Manage recurring data jobs** for BYOD is discouraged. You must use the **Export in batch** option.

Incremental export

When you add an entity for data export, you can select to do an incremental export (which is also known as incremental push) or a full push. For incremental push to work, you must enable the **Change tracking** option in the database and specify an appropriate change tracking option, as described earlier in this topic.

NOTE

A full push deletes all existing records from an entity and then inserts the current set of records from the selected entity.

If you select an incremental push, the first push is always going to be a full push. This is because SQL needs to know which records have been 'tracked' in order to be able to track subsequent changes. Whenever a new record is inserted, or a record is added or deleted, the corresponding change will be reflected in the destination entity.

Because the first push is always a full push, we do not recommend that you do an explicit full push before you enable change tracking.

We recommend that you first enable change tracking and schedule a export job with incremental push. This will take care of the first full push and the subsequent incremental exports.

Timeouts

The default timeouts for BYOD exports are set to ten minutes for truncation operations and one hour for actual bulk insert operations. When volumes are high, these timeout settings may not be sufficient and must be updated. Starting with the release of Platform update 18, you can update the timeout settings by navigating to **Data management > Framework parameters > Bring your own database**. These timeouts are company specific and must be set separately for each company.

Known limitations

The BYOD feature has the following limitations.

There should be no active locks on your database during synchronization

Because BYOD is your own database, you must ensure that there are no active locks on your Azure SQL database when data is being synced. Having active locks on your database during synchronization can result in slow writes or even failure to export to your Azure SQL database.

You can't export composite entities into your own database

Currently, composite entities aren't supported. You must export individual entities that make up the composite entity. However, you can export both the entities in the same data project.

Entities that don't have unique keys can't be exported by using incremental push

You might face this limitation especially when you try to incrementally export records from a few ready-made entities. Because these entities were designed to enable the import of data, they don't have a unique key. However, you can enable change tracking only for entities that have a unique key. Therefore, there is a limitation on incremental push. One workaround is to extend the required entity and define a unique key.

Troubleshooting

Incremental push not working correctly

Issue - When a full push occurs for some entity then a large set of records can be seen in BYOD using a select statement. However, an incremental push results in only a few records in BYOD. It seems as if the incremental push deleted all the records and added only the changed records in BYOD.

Solution - In cases like this it is recommended to disable and re-enable change tracking for the entity in question. The state of the SQL change tracking tables might not be in the expected state. Also verify that there are no other incremental exports that cover the same tables (DMF, MR, Retail).

SSIS Error Code DTS_E_OLEDBERROR. An OLE DB error has occurred. Error code: 0x80004005

Issue - Export to BYOD fails with an SSIS exception shown below.

```
An OLE DB error has occurred. Error code: 0x80004005.
```

```
An OLE DB record is available. Source: "Microsoft SQL Server Native Client 11.0" Hresult: 0x80004005  
Description: "Communication link failure".
```

```
An OLE DB record is available. Source: "Microsoft SQL Server Native Client 11.0" Hresult: 0x80004005  
Description: "TCP Provider: An existing connection was forcibly closed by the remote host."
```

```
Failed to open a fastload rowset for <entityStaging>. Check that the object exists in the database.
```

```
OLE DB Destination failed the pre-execute phase and returned error code 0xC0202040.
```

Solution - This can occur if the connection policy on the Azure SQL BYOD server is set to Proxy. This must be changed to 'Redirect' as explained in [SQL DB Connectivity Architecture](#)

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Preview PDF documents using a PDF viewer

2/18/2021 • 2 minutes to read • [Edit Online](#)

Streamline application experiences that result in the production of business documents by taking advantage of the embedded PDF Preview option. Finance and Operations applications deliver a modern experience to preview business documents that are produced by the service. You can use the built-in toolbar to navigate and download the document or to print to locally connected devices.

The embedded viewer offers consistency between the screen presentation and the printed output. In addition, report viewing times are drastically reduced when compared to the legacy experience. The Preview option is available on all supported devices and does not require any additional third-party software. Documents can be easily downloaded and navigated by using the built-in viewer toolbar options.

The following illustration shows a preview of the experience with a modern business document.

Contoso Entertainment System USA
123 Coffee Street
Suite 300
Redmond, WA 98052
USA
Telephone

Ship to:
Contoso Retail San Diego
456 Peach Road
San Diego, CA 92114
USA

Confirmation 000783-1
17 August 2017
Sales order 000783

\$110.00

ITEM	DESCRIPTION	QUANTITY	SALES PRICE	DISCOUNT	AMOUNT
M0030	Professional speaker cable	3 ea	20.00	0.00	60.00
M0030	Professional speaker cable	2 ea	25.00	0.00	50.00
NET AMOUNT					110.00
SALES TAX					0.00
USD TOTAL					\$110.00

This text is from the Sales Order Confirmation form notes

PDF formatted document is presented to the user within hosted viewer control

The legacy HTML-based preview experience is being replaced by a true document preview experience. There are several key advantages in the modern PDF preview experience. These advantages include:

- A fidelity between the screen presentation and the printed output.
- A consistent document report preview experience across devices and platforms, including on-premises deployments.
- The server-side rendering improves the performance when producing the document.
- A built-in tooling that allows users to quickly navigate the contents of the business document.

Accessing the PDF preview experience (Platform update 36 or later)

The PDF preview experience is enabled by default in [Self-Service deployments](#) and in environments hosted on Platform update 39 or later. To use the PDF preview experience in cloud-hosted and Microsoft-managed environments running Platform updates 36 thru 38, use Feature Management to enable the **Report PDF viewer** feature.

Additional feature information

- Expandable/collapsible sections are available by default. These interactive operations do not function after the PDF document has been created.
- The printer drop-down menu allows users to choose from locally connected devices. This list does not include network printers connected through the service.
- Documents are downloaded to the local device using the built-in toolbar actions.
- Use the **Print destination** options to produce documents in formats other than PDF.

Feature limitations

The Embedded PDF viewer experience delivers a closed document that exactly matches the printed output of the document. These documents cannot be modified by the recipient making the format ideal for business operations. However, as a closed format, the documents are far less interactive on the screen when compared to HTML presentations. The following end-user capabilities are not supported when previewing documents using the embedded PDF viewer.

- By default, embedded drill-thru navigation links are only available while previewing PDF documents.
- PDF documents do not support expandable and collapsible sections.

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Analytics, aggregate measurements, and KPI modeling

2/18/2021 • 6 minutes to read • [Edit Online](#)

This topic discusses the embedded business intelligence (BI), aggregate measurements, dimensions, and data entities, and aggregate programming model.

Embedded business intelligence

The term embedded business intelligence (BI) refers to experiences that use highly intuitive and fluid visualizations to provide insights that are relevant to a task, so that user is more informed and can make better choices. For example, a rental clerk in a car rental organization views the previous rental preferences of a customer when the customer makes a reservation. In this case, the clerk can see the vehicles and colors that the customer has selected in the past, and therefore can offer options that are likely to please the customer. Embedded BI is used throughout the user interface. At a technical level, building rich visualizations requires a powerful charting framework, and also an efficient way to access aggregated data that enables the display of fluid visualizations. Microsoft Dynamics 365 Finance and Operations meets both of these requirements, so that application developers can build rich and deep embedded BI-enabled scenarios.

Where are the perspectives?

Perspectives were a concept that was designed to present data from a reporting point of view. Perspectives have evolved over the past three releases for analytical scenarios.

VERSION	DESCRIPTION
Microsoft Dynamics AX 4.0	Perspectives provided the ability to model ad-hoc reporting models.
Microsoft Dynamics AX 2009	Perspectives added support for modeling analysis cubes.
Microsoft Dynamics AX 2012	Perspective modeling capabilities were improved through richer modeling support and deeper integration with the Application Object Tree (AOT).
Finance and Operations apps	Perspectives are a first-class citizen in the data access framework. They can be consumed via X++ or C# code, and also in a model-driven way.

Perspectives reside within the analytics collection in the Application Explorer. Perspectives have undergone a major upgrade and now incorporate the following improvements:

- You can model new aggregate models and customize existing aggregate models as a star schema within Application Explorer.
- Modeling for key performance indicators (KPIs) in Application Explorer is supported.
- You can model data entities by referencing aggregate models. Data entities can be exposed to external reporting tools, such as PowerBI, as OData endpoints. Data entities can also be consumed.
- You can consume aggregate models directly in the programming model by using X++ or C# code. You no longer have to write MDX code to consume aggregate data.

- Aggregate data is a first-class citizen within application data access. Its behavior is similar to the behavior of detailed data. For example, aggregate data can be enriched with extended data types (EDTs) and enumerations, and you can help secure them by using application security concepts.
- The aggregate data infrastructure is maintained completely within the environment. By default, aggregate measurements are real-time. As a system administrator, you can manage the latency of aggregate data and controls based on available resources and business needs, without having to deal with the complexity of scheduling and external tools.
- Developers can reuse existing business models, making the modeling process quicker and easier.

Projects that were generated by using perspectives from Dynamics AX 2012 and later can be upgraded to Finance and Operations metadata equivalents.

Aggregate measurements and aggregate dimensions

An aggregate measurement is a model that contains a collection of measures together with their corresponding dimensions. Measures are aggregate numbers, such as Total Sales or Number of Orders. Dimensions are slicers, such as Product, Vendor, or Customer, that help you analyze the measure. For example, the measure of Total Sales isn't useful unless it can be sliced by Product, Region, and Customer. Aggregate measurements are the evolution of AX 2012 analysis cubes. Whereas a cube was based on a multidimensional online analytical processing (OLAP) technology, an aggregate measurement abstracts the underlying technology. Therefore, you no longer have to know a lot about the underlying implementation technology. Additionally, the underlying technology infrastructure can take advantage of improvements in in-memory real-time technology without requiring the developer to rewrite the program. Aggregate dimensions are shared across an implementation. Aggregate measurements associate themselves with relevant aggregate dimensions. For example, Total Sales can be associated with Customer, Product, and Sales Region dimensions. However, Total Sales can't be associated with Vendor and Warehouse dimensions. Aggregate dimensions and aggregate measurements are modeled by using Visual Studio tools. The Upgrade tool lets customers and partners migrate existing Dynamics AX 2012 cubes to newer versions of the product.

Aggregate data entities

By using the model-driven approach, you can create data entities by directly referencing aggregate measurements and aggregate dimensions. These are known as aggregate data entities. Aggregate data entities are read-only data entities that are used for reporting purposes. To consume aggregate data when you build charts and other client controls, add the aggregate data to a form as a data source. You can also consume aggregate data entities programmatically in C# or X++ code.

Aggregate programming model

The Aggregate programming model lets a developer consume aggregate data programmatically by using either X++ or C# code. Data that you retrieve by using the Aggregate programming model can be used as a data source in forms and reports. A developer can add aggregate data that is modeled in perspectives to an **AXQuery** object. The developer can also use an existing aggregate data entity to create a query that can be extended by adding filters and additional columns that aren't present in the aggregate data entity. Bulk Move is a capability that is associated with the Aggregate programming model. When a query is run by the kernel, the developer can move all the records to a temporary or regular table without iterating row by row. Bulk Move provides a very efficient way to move data from aggregate models to temporary tables.

Method expressions

Method expressions are a programming model for constructing rich calculations that are used to define fields in a data entity. Method expressions enhance the computed column capability that was introduced in AX 2012 views. Method expressions let you build expressions by using the C# or X++ programming language. You can

also create calculations on aggregate data that was previously coded by using MDX. Method expressions can be shared across the program.

In-memory, near-real-time aggregate measurements

Aggregate measurements are deployed to Microsoft SQL Server non-clustered column store indexes (NCCI). Therefore, they can take advantage of the in-memory computing (IMC) engine that is built into Microsoft SQL Server 2016 as Azure DB. Aggregate measurements that have the IMC engine as their destination are referred to as in-memory, near-real-time (IM-NRT) aggregate measurements. These aggregate measurements don't require that a Microsoft SQL Server Analysis Services (SSAS) server be used. Because these models don't involve data updates, the queries that are sent to them reflect the latest state of data in the operational database. That is why it's referred to as near-real-time.

KPI modeling and customization

In AX 2012 and earlier versions, KPIs and business indicators had to be modeled by using native SQL Server development tools. Although users could pin a KPI or business indicator to a Role Center by using the **Business Overview** Web Part, they could not modify a KPI definition, such as the goal. Users can use a rich client form to modify a KPI definition that was built and shipped by a developer. Users can also define new KPIs by using the aggregate data that is contained in aggregate measurements. A developer can model a KPI definition in Microsoft Visual Studio and ship it to a customer, either as a project or together with an independent software vendor (ISV) solution. After a KPI is defined, users can customize it at run time.

NOTE

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Model aggregate data

2/18/2021 • 15 minutes to read • [Edit Online](#)

This tutorial will walk you through the process of modeling aggregate data.

Prerequisites

This tutorial requires you to access the environment using Remote Desktop, and be provisioned as an administrator. For more information, see the topic named [Deploy and access development environments](#).

Key concepts

- **Aggregate measurements**, similar to **perspectives** and **Cubes** from earlier versions, enable you to model and consume aggregate data.
- **Key Performance Indicators (KPIs)** are a form of analytic controls that track organizational performance against the current status. KPIs are represented as tiles in a **workspace** or the **dashboard**. In this tutorial, you will model a KPI in Visual Studio.
- KPIs that are modeled in Visual Studio can be modified in the client. A user also has the ability to model new KPIs using the client.
- A **workspace** is an overview page that is specific to a particular subject area. Workspaces are common to all users.
- The **dashboard** is the default home page for each user.
- **Tiles** are securable objects that can be pinned to a workspace or the dashboard. KPIs and aggregate data that are shown on the dashboard, or a workspace, can be secured by using menu items.
- Aggregate data can be consumed in building charts and other controls. Using the model driven approach, you have the ability to create data entities by directly referencing aggregate measurements and aggregate dimensions. These entities are referred to as **Aggregate data entities**. Aggregate data entities are read-only data entities used for reporting purposes.
- **The aggregate programming model** enables a developer to consume aggregate data programmatically using either X++ or C# code. Data retrieved using the aggregate programming model can be used as a data source in forms.
- **Method expressions** enable a developer to build rich expressions using aggregate data. Method expressions are an X++ class. KPIs can be modeled using method expressions, thereby eliminating the need to build MDX expressions.
- **Contextual BI** refers to providing required insights as part of the user experience such that the user has relevant insights to not only achieve the task at hand, but be highly-productive during the course of the day.
- **Embedded BI** refers to analytic content being embedded within the user experience. Contextual BI and embedded BI teams are closely related. Contextual BI implies the added notion that the context of analytic context revolves around the data or the task.
- **Self-service BI** refers to enabling a user to tweak existing and/or create new analytic content such as reports, KPIs, and dashboards.

Set up

If this is the first tutorial you are working on, make sure you have configured the administrator user if you are running on a local VM.

Import the tutorial project

If you have already imported the Fleet management tutorial project, skip to the next section. In Visual Studio, on the **Dynamics 365** menu, click **Import Project**.

1. Download the Fleet Management sample from <https://github.com/Microsoft/FMLab>, save it to c:\, and unzip it.
2. In the **Import Project** window, next to the **Filename** text box, click the ellipsis button.
3. In the **Select the file to import** window, browse to the location of the **FMLab** folder, click **FMTutorialDataModel.axpp**, and then click **Open**.
4. In the **Project file location** text box, enter **C:\FMLab**.
5. Select the **Overwrite Elements** check box, and then click **OK**.

Open the tutorial project

1. In Visual Studio, open the **FMTutorial** project. On the **File** menu, point to **Open**, and then click **Project/Solution**.
2. In the **Open Project** dialog box, browse to **C:\FMLab\FMTutorial**, and then click **FMTutorial**. Click **Open**. The **FMTutorial** project appears in **Solution Explorer**.
3. Use the **FMTDataHelper** class to load data for the Fleet Management tutorial. In **Solution Explorer**, in the **FMTutorial** project, expand **Classes**. Right-click **FMTDataHelper**, and then click **Set as Startup Object**.
4. On the **Build** menu, click **Rebuild Solution**. You use the rebuild to update the timestamps of the imported artifacts. You can view the build progress in the **Output** window.
5. Press **Ctrl+F5** to run the project and load the data.

Model an aggregate measurement for rental charges

Often, when a user asks for additional information, you get a request for one or more new reports. Imagine that the manager of a rental car company has called and asked for a report. The manager is interested in finding out how the rental business is performing. The manager wants a report that shows rental revenue by month. You soon find out that the manager is interested in a breakdown of rental revenues. The manager wants to know whether the rental revenue is high in cases where they have sold additional services, for example, car seats, GPS, re-fueling, as opposed to the base rental charge. As it turns out, the manager suspects that specific customer groups are driving revenue up, and this is why the manager wanted the report in the first place. The manager insists on adding **Customer group** to the report. Because the revenue must be considered in relation to the number of rentals, the manager doesn't want a few large corporate rentals to skew her analysis. You both agree that the number of rentals needs to be shown along with revenue. We could represent this requirement as a set of business questions using a matrix. Rows indicate the **measures** (or numbers) and the columns indicate the **dimensions** (or slicers). An "X" in the intersection between a measure and a dimension indicates that the measure needs to be "grouped by" the dimension.

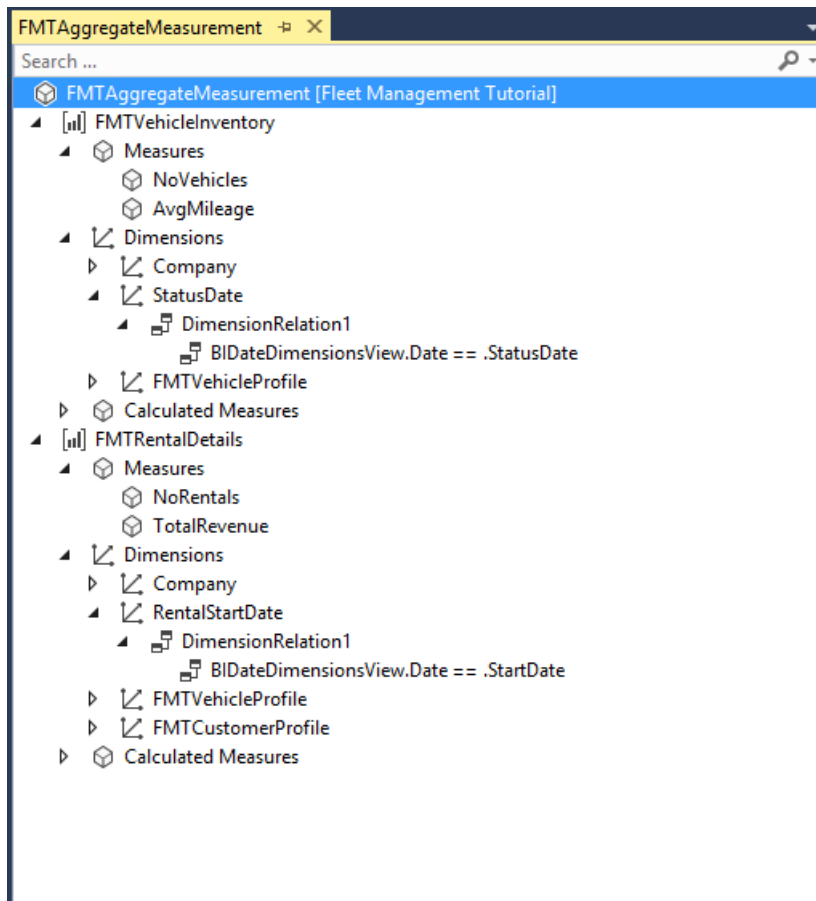
	RENTAL DATE	CUSTOMER GROUP	RENTAL CHARGE TYPE
Revenue	X	X	X
Number of rentals	X	X	X

Next, we will model an aggregate measurement to answer this business question.

Add a measure group for rental charges by using an existing view

In this section you will add a new measure group to an existing aggregate measurement.

1. In **Solution Explorer**, expand the **Analytics** folder of the project, and then double-click the aggregate measurement, **FMTAggregateMeasurement**. The aggregate measurement will be launched in the designer. Notice that the existing aggregate measurement contains two measure groups related to vehicle inventory and rental details. You will create a new measure group related to rental charges.



- In **Solution Explorer**, expand the **Views** folder of the project, and then select the **FMTRentalChargeExtendedView** view.
- Drag-and-drop the **FMTRentalChargeExtendedView** into the root node of the **FMTAggregateMeasurement** aggregate measurement in the designer. Notice that a new measure group is created and the values of properties have been applied as follows.

PROPERTY	VALUE
Name	FMRentalChargeExtendedView
Table	FMRentalChargeExtendedView

- In **Solution Explorer**, double-click the **FMRentalChargeExtendedView** view. When the designer form opens, expand the **Fields** node.
- Select the **ExtendedAmount** and **RentalID** fields, and then drag-and-drop the two fields onto the **Measures** node of the newly created **FMTAggregateMeasurement** measure group called **FMRentalChargeExtendedView**. As you drag the fields, hover your cursor over the **FMTAggregateMeasurement** tab to access the **Measures** node. By default, when you drag-and-drop the fields, the system assumes that you want counts of the measures. In this case, you need to modify default properties for the **ExtendedAmount** and **RentalId** measures as follows:

PROPERTY (EXTENDEDAMOUNT)	VALUE
Default Aggregate	Sum
Field	ExtendedAmount (no change required)
Name	Revenue

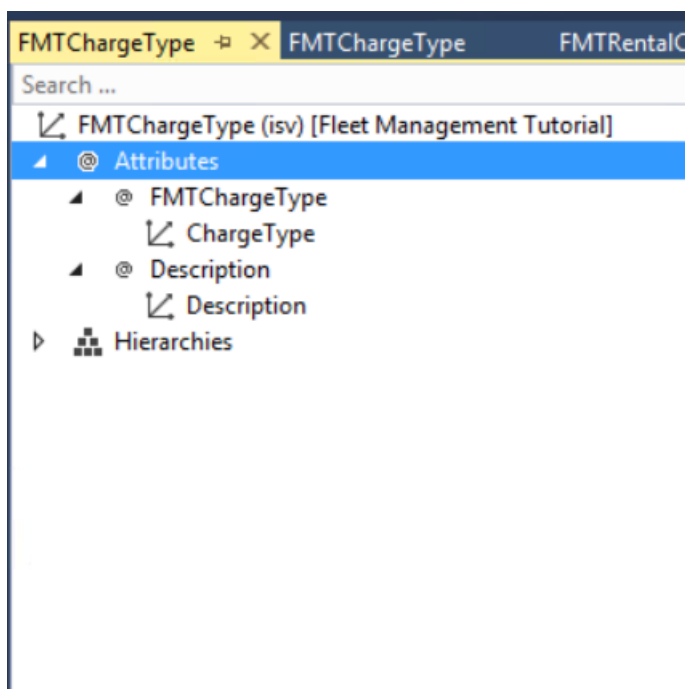
PROPERTY (RENTALID)	VALUE
Default Aggregate	DistinctCount
Field	RentalId (no change required)
Name	NumRentals

- Next let's create another measure which calculates **Revenue per Rental** by copying an existing measure. Select the **TotalRevenue** measure. Right-click and select **Copy** from the **Context** menu.
- Select the **FMRentals** measure group. Right-click and select paste. Rename the newly created measure to **RevenuePerRental**. Modify the aggregation function to **Average**.

Model an aggregate dimension charge type

To analyze rental revenue by the different charge types, you need to be able to slice revenue by the charge type. For this purpose, you will first model a charge type dimension.

- In **Solution Explorer**, under **FMTutorial**, right-click **Analytics**, point to **Add**, and then click **New Item**.
- Select **Dynamics 365 Artifacts > Analytics > Aggregate Dimension** from the list of items.
- In the **Name** property, enter **FMTChargeType**. This is the name of the aggregate dimension that will be created. This name must be unique. Click **Add**. The new dimension will appear in Visual Studio.
- In **Application Explorer**, expand the **AOT** and click **Data Model > Tables**. Drag-and-drop the **FMTChargeType** table from **Application Explorer** onto the root node of the newly created **FMTChargeType** dimension in the designer. Notice that dimension attributes and corresponding keys have been added using the AutoReport field group of the table.
- Expand the **Attributes** node of the new dimension. Notice that several attributes have been created for you by default. The system has also created a dimension key based on unique indexes of the table. You can add additional fields by dragging and dropping them into the **Fields** node.



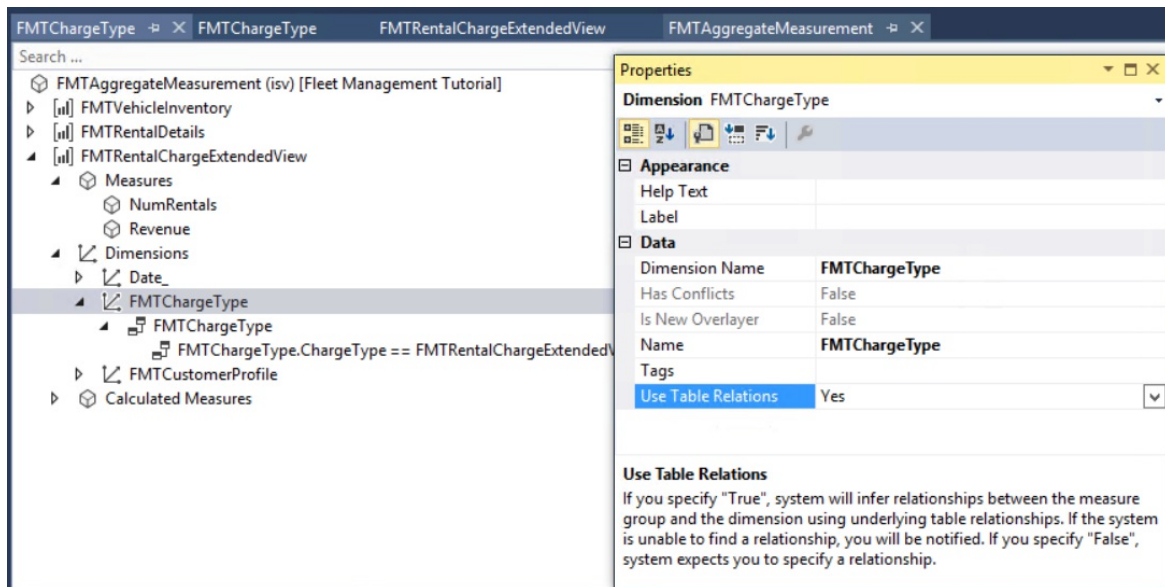
- Save the new dimension.
- You may get a warning asking you to rename the field name **Description** to avoid the MDX reserved word. Even though the aggregate dimension may not be deployed to SSAS in this aggregate

measurement, it's possible that this dimension may be used by an aggregate measurement deployed to SSAS in the future. To avoid potential issues in the future, rename the field name **Description** to **ChargeDescription**.

Model dimension references for customer profile and charge type dimensions

Next, create dimension references to new and existing dimensions so that revenue can be sliced by customer as well as charge type.

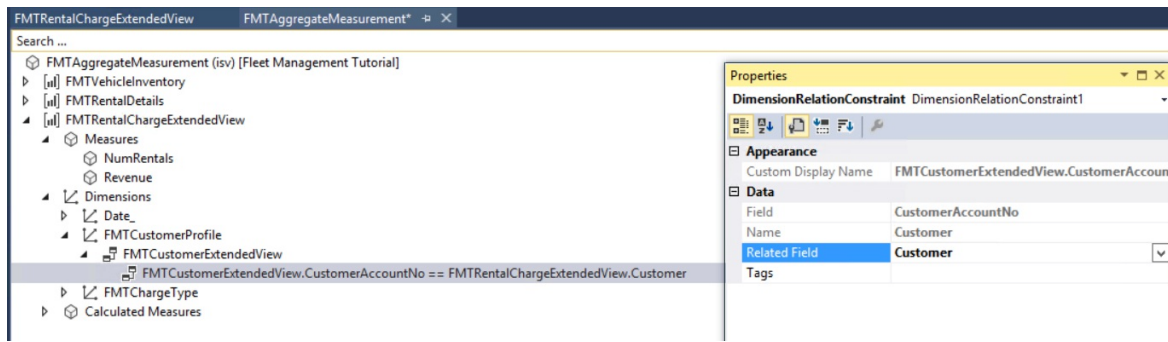
1. In **Solution Explorer**, double-click **FMTAggregateMeasurement** or, if you have it open, navigate to it in the designer.
2. In **Solution Explorer**, select the dimensions **FMTChargeType** and **FMTCustomerProfile**.
3. Drag-and-drop them into the **Dimensions** node of the **FMTRentalChargeExtendedView** measure group. Notice that dimension references have been created along with relations.
4. Save changes to **FMTAggregateMeasurement**. Review the property sheet for the dimension relation and notice that the **Use Table relations** property is set to **Yes**. Notice that the drag-and-drop operation created relationships between the measure group dimensions **FMTRentalChargeExtendedView** and **FMTChargeType**, **FMTCustomerProfile**. Review the property sheet for the dimension relation and notice that the **Use Table relations** property is set to **Yes**.



NOTE

In platform update 1611 and later, **UseTableRelations** property has been removed. When a new dimension reference is created, system will default existing relationships. You can continue to provide an explicit relationship by changing the relationship field that was defaulted. Providing an explicit relationship is equal to setting **UseTableRelationship** to **No**.

5. Expand the Dimension relations node for the **FMTCustomerProfile** dimension. Notice that the **UseTableRelations** property is set to **No**. In this case, the system has not been able to find a suitable relationship between the Measure group and dimension. You will need to specify one manually.
6. Expand the **FMTCustomerProfile** dimension reference if you have not done so already. Select the node **FMTCustomerExtendedView**. Right-click and see the property sheet.
7. Select **CustomerID** as the value for property **DimensionAttribute**. Select the relationship shown below. Select **Customer** for the property value **RelatedField**.
8. Save changes to **FMTAggregateMeasurement**.



9. In this scenario, we specified a relationship because the system was unable to find one. You could also specify a different relationship if you want to override the system choice by setting **Use Table Relations** property to **No**.

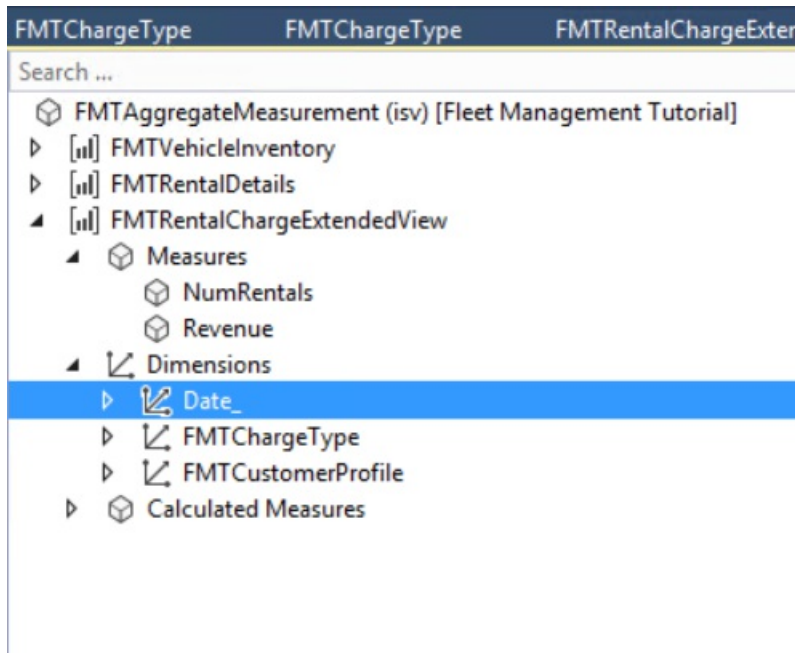
Model dimension references for the date dimension's rental start date and transaction date

Assume that for analysis purposes, you want to enable slicing by the start date of the rental; but for accounting purposes, you want to enable slicing by the transaction date for each of the charges. To do this, you need to associate the rental charges measure group with two date dimensions. In the BI world, this pattern is known as **Role Playing dimensions**. By default, a date dimension is added to the measure group. You can rename the default name appropriately and add new date dimensions as required.

1. Expand the **Dimensions** node of the **FMTRentalChargeExtendedView** measure group. Notice that the **Date_** dimension has already been included as dimension slicers.

NOTE

If the table or the view used to model the measure group is a Company-specific table, for example it contains DATAAREAID as part of the key), a **Company** dimension relation will be created by default. In this case, the view we used is not a company specific one.

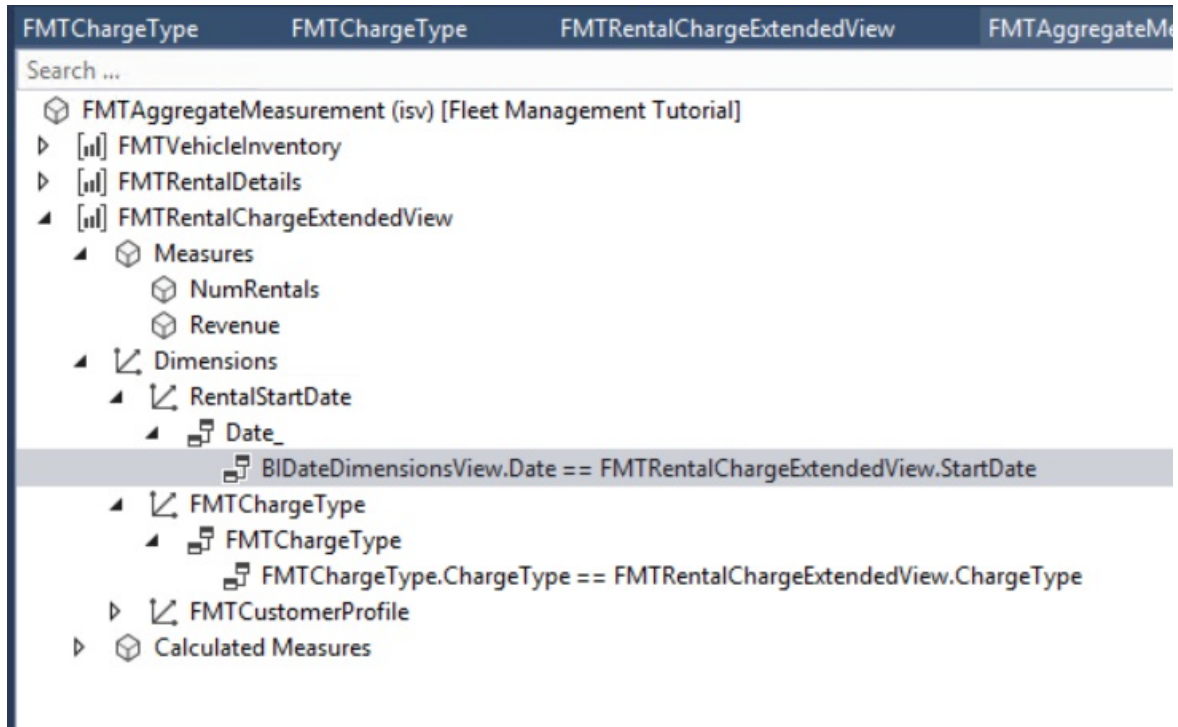


2. Select the **Date** dimension and specify the following properties.

PROPERTY	VALUE
Name	RentalStartDate

PROPERTY	VALUE
Use Table Relations	No (This is the default – no need to change)

- Define the table relationship. Expand **RentalStartDate**, and then expand the **Date** node.
- Select the Relationship shown. Right-click and select the property sheet. Select **StartDate** for the value of **Related field** property.
- The relationship you defined should look like the following screenshot.



- Next, enable slicing of measures by the TransactionDate dimension. TransactionDate is also a date dimension, so you will add another reference to the date dimension and associate that with the corresponding field that contains the transaction date. When more than one date dimension is used as a slicer, each date dimension is known as a **Role playing date dimension**.
- Under the **FMTRentalChargeExtendedView** measure group, right-click the **Dimensions** node, and then click **New Dimension**. A new dimension will be added to the list of dimension references.
- Specify the following properties for the new dimension reference.

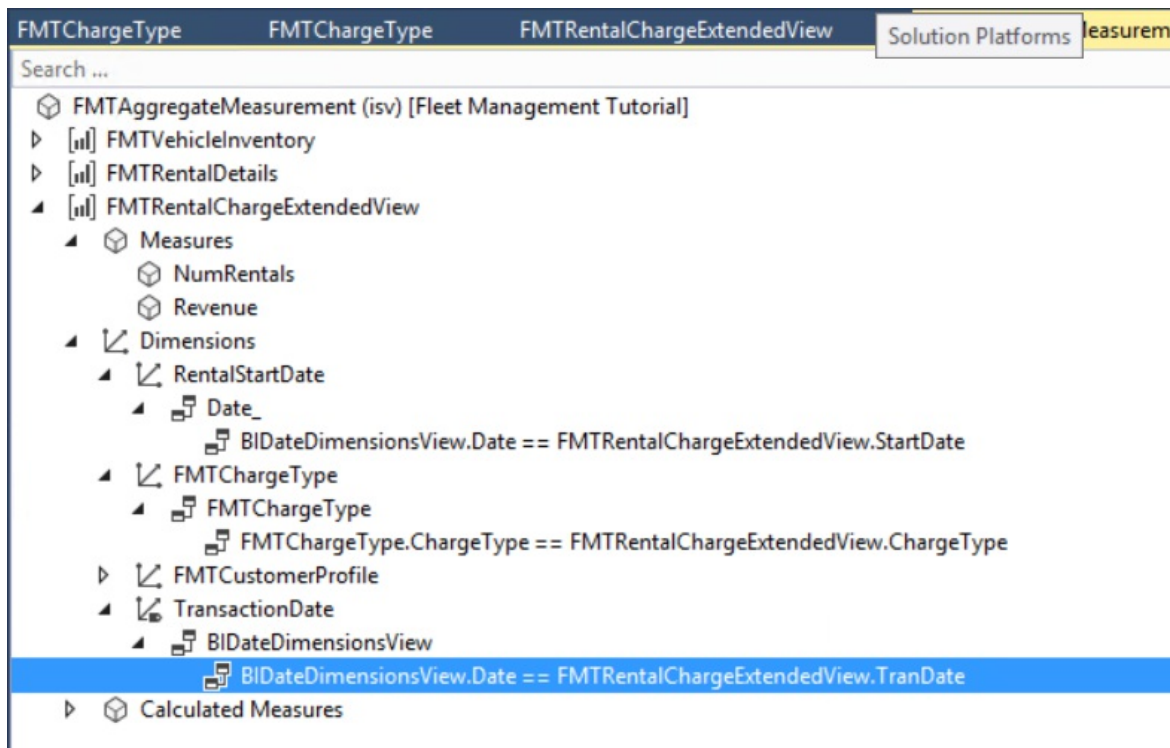
PROPERTY	VALUE
Dimension Name	Date_ <div style="border: 1px solid gray; padding: 5px; margin-top: 5px;"> <p>[!NOTE] If you select the Dimension Name in the wrong order, it will reset the other values you already set.</p> </div>
Name	TransactionDate
Use table relations	No
Tags	RolePlayingDate; Fleet

Notice the new property called **Tags**. This property enables the discovery of patterns within code and metadata from within the Visual studio environment. You can enter any number of tags and they can be searched using the hot keys or the **Dynamics 365** menu in Visual Studio.

9. Define the table relationship. Right-click **TransactionDate**, and then click **New Relation**. You do not need to specify any properties in the DimensionsRelation at this point.
10. Expand **BIDateDimensionValue**, and then select the **Relationship Constraint**. Right-click and select the property sheet.
11. Specify the following properties for the BIDateDimensionsView relation constraint.

PROPERTY	VALUE
Field	Date
Related Field	TranDate

The relationship you defined should look like the following screenshot.



12. Save the aggregate measurement.

Deploy the newly generated aggregate measurement

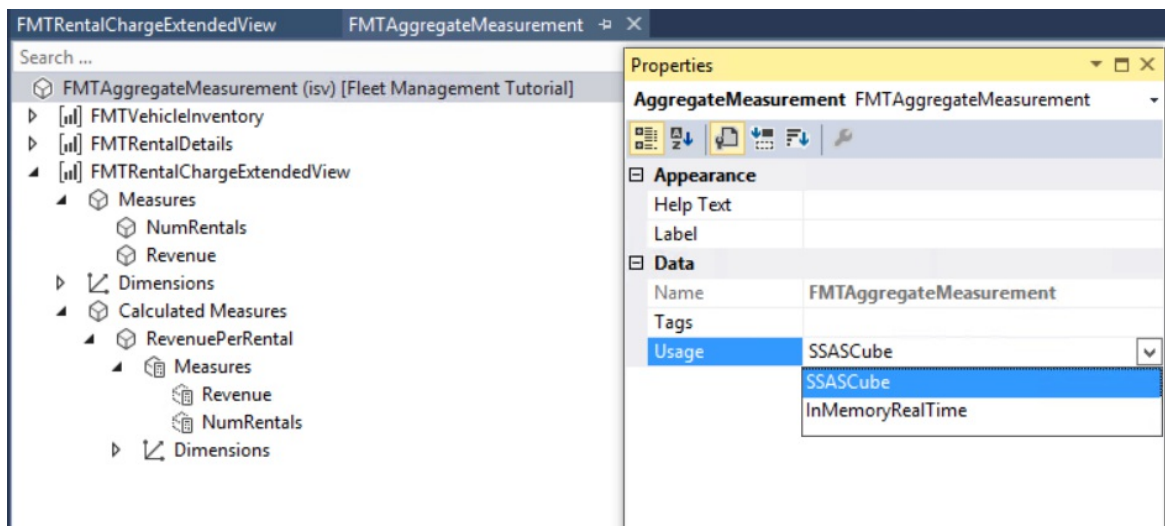
Now that you have completed modeling the aggregate measurement, you can deploy the aggregate measurement and continue with building KPIs and visualizations. You have 2 deployment choices as shown below.

OPTION	CONSIDERATIONS
In-memory real-time	This option will leverage the In-memory Column store indexes of SQL Server database to deploy Aggregate Measurements. This option is recommended when the Aggregate measurement is used for embedded analytics within the client where you need real-time analytics . For an overview of concepts on real-time analytics, see Analytics, aggregate measurements, and KPI modeling .

OPTION	CONSIDERATIONS
Stage in Entity Store	This option leverages Entity store, the operational data store that enables near real-time PowerBI reporting . If you choose this option, Aggregate measurement can be deployed to Entity store and you can schedule the data to be refreshed periodically. For an overview of this approach, refer to the blog post here: https://blogs.msdn.microsoft.com/dynamicsaxbi/2016/06/09/power-bi-integration-with-entity-store-in-dynamics-ax-7-may-update/

NOTE
 SSAS Cube option is no longer supported when modeling aggregate measurements.

1. Select the **FMTAggregateMeasurement** node. Right-click and select **Properties**. Select **InMemoryRealTime** as the value for the property **Usage**.



2. InMemoryRealTime aggregate models are deployed to SQL Server using Non-Clustered Column Store Index (NCCI) technology. NCCIs is an in-memory technology that enables analytical and operational workloads to be served from SQL server database. NCCI indexes can be defined on tables similar to any other index. While NCCI indexes can be defined manually, framework has the ability to analyze index requirements and add them to underlying tables where necessary.
3. Right-click **FMAggregateMeasurement** in Solution Explorer, and then click **Add Column store indices option**. You will notice several new indexes being added by the system.
4. Save and build the project.
5. InMemoryRealTime aggregate models do not require data processing as the models are queried real-time. If you have not enabled database synchronization along with the build, manually synchronize the database.

Model a KPI to show revenue per rental

Model a KPI in Visual Studio

Model a KPI definition in Visual Studio by using the aggregate measurement you defined above.

1. In **Solution Explorer**, right-click **FMTutorial**, point to **Add**, and then click **New Item**.

- Select **Dynamics 365 Artifacts > Analytics > Key Performance Indicator**. Enter **FMTRevenuePerRental** as the name of the KPI, and then click **Add**. The name must be unique across KPIs. The KPI is created.
- Select **FMTRevenuePerRental**, and specify the **Measurement**. Leave the default values for the other properties.

PROPERTY	VALUE
Measurement	FMTAggregateMeasurement
Bad Threshold	0
Good Threshold	0
Scoring Pattern	MoreIsBetter
Show Goal	Yes
Show Status and Trend	Yes
Threshold Type	Value

- Define the expression for the KPI value. Under **FMTRevenuePerRental**, select **Value**, and specify the following properties.

NOTE

The values must be entered in the order they appear in the table:

PROPERTY	VALUE
Value Type	BasedOnMeasure
Measure Group	FMTRentalChargeExtendedView
Measure	RevenuePerRental

- Define the expression for the KPI Goal. Select **Goal**, and specify the following properties.

PROPERTY	VALUE
Goal Type	BasedOnValue
Value	250

NOTE

You could have defined a goal based on an aggregate measure as well. In this case, we will define a number as the goal.

- Save the KPI definition.

Preview KPI in client

Next you will preview the KPI definition in the client.

1. Right-click **FMTutorial**, and then click **Re-Build**. On completion of the build, select the **Synchronize ... database** option.
2. Open Internet Explorer, and navigate to your Rainier instance base URL.
3. Navigate to the **Reservation Management workspace** under **App links > Fleet Management > Workspaces > Reservation Management**.
4. Select the KPI tile **Total Revenue**. KPI details page for **Total Revenue** KPI will be displayed.
5. To navigate to the newly defined KPI, select the **Show list** icon on top left. From the list of KPIs shown, select **FMTRevenuePerRental**.

Notice that the KPI details page for the new KPI, **FMTRevenuePerRental** is shown. Even though we did not define trend charts, the system created a set of charts based on the limited metadata defined by the developer. Users have the ability to modify KPI definitions and create new ones in the client. Next, you will modify the newly defined KPI.

6. To demonstrate this capability, you can change the KPI Goal. Click the **Edit** button on top left, and enter 900 as the Goal Value.
7. Modify the threshold properties as follows:

PROPERTY	VALUE
Threshold Type	Percentage
Red if less than	90
Green if more than	110

8. Click **Save** on the bottom left to save changes. Notice that the KPI status color has changed in the KPI tile shown.

NOTE

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Add financial dimensions to aggregate measurements

2/18/2021 • 6 minutes to read • [Edit Online](#)

This feature lets power users include financial dimensions in ready-made Microsoft Power BI reports. Power users can also create new Power BI reports that use financial dimensions.

Financial dimensions are user-defined configuration data that enables the ledger chart of accounts to retain additional information. By adding financial dimensions, a user can configure additional data fields that will be included with the chart of accounts and financial reports. Therefore, the ledger chart of accounts can be sliced and diced based on those fields. This feature provides powerful financial reporting. For example, you can explore ledger data by using the new financial dimensions that you've added. Because no financial dimensions are included in the ready-made Power BI reports when they are released, you must include these additional fields to the ready-made reports.

After financial dimension fields are included in the report, you can share the report with other users. Those other users can modify existing visuals, such as charts, by including all or some of the financial dimension fields.

NOTE

This feature is available in Microsoft Dynamics 365 for Finance and Operations, Enterprise edition (July 2017). Platform update 8 or later is also required.

How does this feature work?

The Entity store is an operational data warehouse that lets power users create reports. Whenever the Entity store is updated, all available financial dimensions are included in it. We will look at an example from the **Ledger Activity** aggregate measurement that contains General ledger journal-level details.

The following list shows some of the tables are filled in the Entity store when it's updated. Tables that have changed are bold.

- LedgerActivityMeasure_LedgerActivityMeasureGroup
- LedgerActivityMeasure_TransactionDate
- LedgerActivityMeasure_Currency
- LedgerActivityMeasure_FiscalPeriodDateAggregateDimension
- LedgerActivityMeasure_LedgerFactDimension
- LedgerActivityMeasure_FiscalYearOffsetDimension
- LedgerActivityMeasure_MainAccount
- **LedgerActivityMeasure_DimensionCombination**
- LedgerActivityMeasure_Ledger
- LedgerActivityMeasure_MainAccountCategory
- LedgerActivityMeasure_Company
- LedgerActivityMeasure_MainAccountLegalEntity
- **LedgerActivityMeasure_Agreement**
- **LedgerActivityMeasure_BankAccount**
- **LedgerActivityMeasure_BusinessUnit**

- LedgerActivityMeasure_Campaign
- LedgerActivityMeasure_Cargo
- LedgerActivityMeasure_Cargo_CN

Notice that, for each financial dimension that is defined in your system, you might see a corresponding table in the Entity store.

If you examine the LedgerActivityMeasure_DimensionCombination table, you will notice that the list of fields has been expanded and now includes additional fields. Each new field corresponds to a financial dimension. For an example, here are some of the additional fields:

- Agreement_FK
- Agreement_Description
- Agreement_Value
- BankAccount_FK
- BankAccount_Description
- BankAccount_Value
- BusinessUnit_FK
- BusinessUnit_Description
- BusinessUnit_Value

If a user defines a new financial dimension that is named **vendor**, when the Entity store is updated, a new table is added that is named LedgerActivityMeasure_Vendor.

The LedgerActivityMeasure_DimensionCombination table will also contain the following new set of fields:

- Vendor_FK
- Vendor_Description
- Vendor_Value

How a Power BI report author can create reports that use financial dimensions

A business user can create a new report that uses financial dimensions by using Power BI desktop. Existing reports that use financial dimensions can be updated so that they include additional fields.

In this example, we will use Power BI desktop to create a report that uses the Ledger Activity measure group.

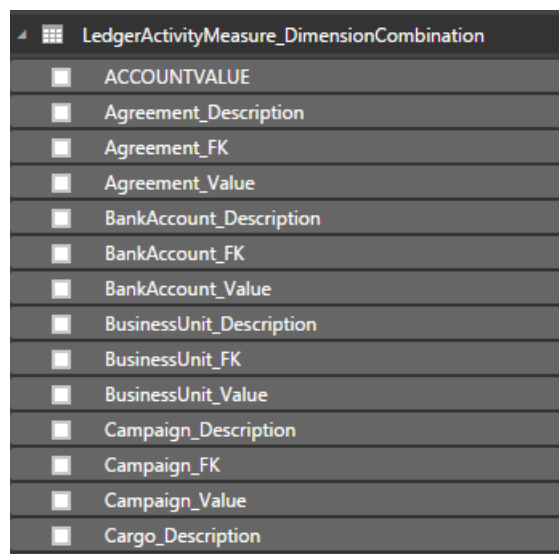
1. In a development environment, connect to the Entity store database by using Power BI desktop.
2. Select the following tables:
 - LedgerActivityMeasure_LedgerActivityMeasureGroup
 - LedgerActivityMeasure_FiscalPeriodDateAggregateDimension
 - LedgerActivityMeasure_DimensionCombination
3. Use the **Manage relationships** option in Power BI desktop to define the following relationships between table fields:
 - Define a join between **LedgerActivityMeasure_LedgerActivityMeasureGroup.LEDGERDIMENSION** and **LedgerActivityMeasure_DimensionCombination.DIMENSIONCOMBINATIONRECID**.
 - Define a join between **LedgerActivityMeasure_LedgerActivityMeasureGroup.LEDGERGREGORIANDATEID** and **LedgerActivityMeasure_FiscalPeriodDateAggregateDimension.LEDGERPERIODGREGORIANDATEID**.

4. Create a matrix report that uses the **Sales** and **YearName** fields. The report should resemble the following example.

YEARNAME	SALES
2015	355,958,240.86
2016	478,064,122.48
2017	10,712,838.30
Total	844,735,201.64

Next, we will add financial dimension values.

5. In the list of fields in Power BI desktop, expand the **LedgerActivityMeasure_DimensionCombination** table. You will see that the list of dimension fields is expanded into table fields, as shown here.

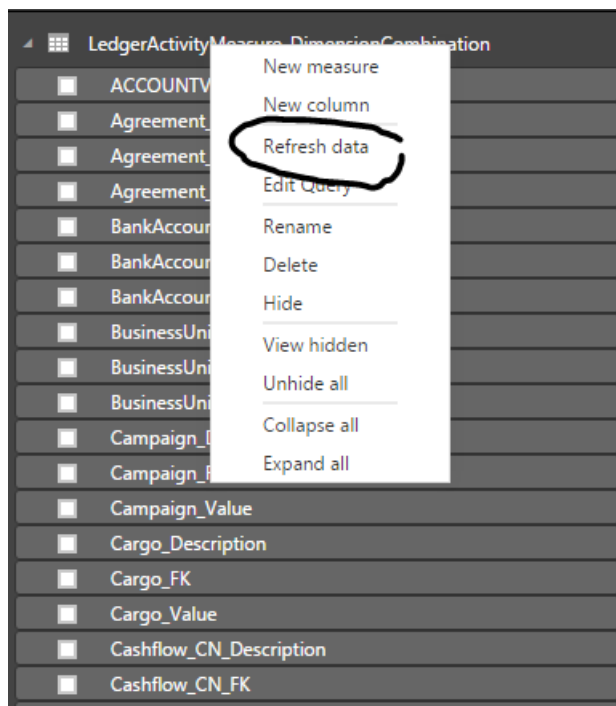


6. Include the **BusinessUnit_Description** field in the report. Your report should now show sales by business unit, as shown in the following example.

YEARNAME	Electronics	Home	IT Consulting Practice	Management Consulting Practice	Sporting	Total
2015	7,362,985.20	152,524,507.23	100,045,909.46	699,928.66	7,937,635.30	355,958,240.86
2016	6,374,315.40	167,483,885.95	115,009,475.39	769,787.36	7,622,420.20	478,064,122.48
2017	100,000.00	10,390,021.77	0.00	26,571.26		10,712,838.30
Total	13,837,300.60	330,398,414.95	215,055,384.85	1,496,287.28	15,560,055.50	844,735,201.64

Notice that you have the **BusinessUnit_description** field and the **BusinessUnit_Value** field. The value field lets you to get a numerical value that can be used to sort columns.

7. Define a new financial dimension, and update the Entity store.
8. When the update is completed, right-click the **LedgerActivityMeasure_DimensionCombination** table, and then select **Refresh data**. Notice that the new financial dimension that you defined is reflected in the list of fields that are available for reporting.



9. You can include the new financial dimension fields in the report.

Creating reports that use expanded Financial dimension tables

As we discussed earlier, new tables were created in the Entity store. Each financial dimension field is also added to a new table. The new tables contain individual fields for the name, value, and description.

Notice that the new tables contain a key that can be used to join them with the LedgerActivityMeasure_DimensionCombination table that is used to create the report. If you want to use fields from these additional tables, just include them in the report and relate them by using the keys.

1. Open the report that you created earlier.

We will now add a financial dimension table to the report.

2. In Power BI desktop, click **Recent Sources** on the menu, and then select the **AXDW** data connection.

Table navigator is shown.

3. Select the **LedgerActivityMeasure_LegalEntity** table for the report.

NOTE

If you're using a development or demo environment, you see this table because **LegalEntity** is a financial dimension that is defined in demo data. If you're working with your own data, the tables that you see will correspond to financial dimensions that you've defined.

We will now relate the selected table to existing tables in the report.

4. In the report, open the **Manage relationships** dialog box.

5. Join **LedgerActivityMeasure_DimensionCombination.LegalEntity_FK** to **LedgerActivityMeasure_LegalEntity.KEY_**.

If you select a different dimension table in step 3, you must relate the corresponding **FieldName_FK** field from the combination table to the **KEY_** field in the dimension table.

How a developer can enable financial dimensions

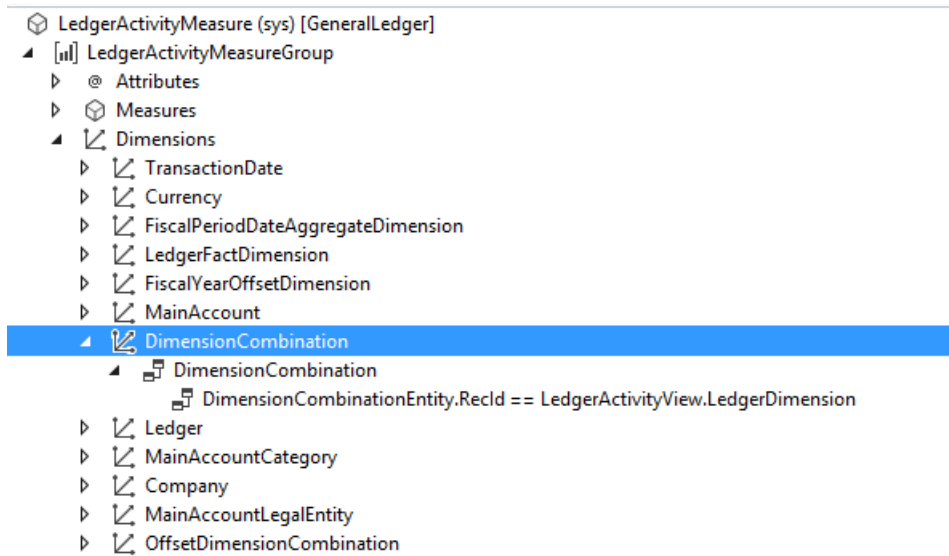
Before users can see expanded financial dimensions in the Entity store, a developer must enable the use of financial dimensions in aggregate measurements. As a best practice, financial dimensions should be included when you model any aggregate measurement that involves financial data. To include financial dimensions, create an aggregate dimension that is based on "financial dimension tables." As we saw earlier, an aggregate dimension that you create by using financial dimension tables will be expanded at runtime.

What are financial dimension tables?

Financial dimension tables are base tables that contain financial dimension data. Examples include `DimensionAttributeValueCombination` and `DimensionAttributeValueSet`.

If you use a table, a view, or an entity that is based on those two tables, the fields of the aggregate dimension will be expanded at runtime.

Consider the following example from the `LedgerActivityMeasure` aggregate measurement.



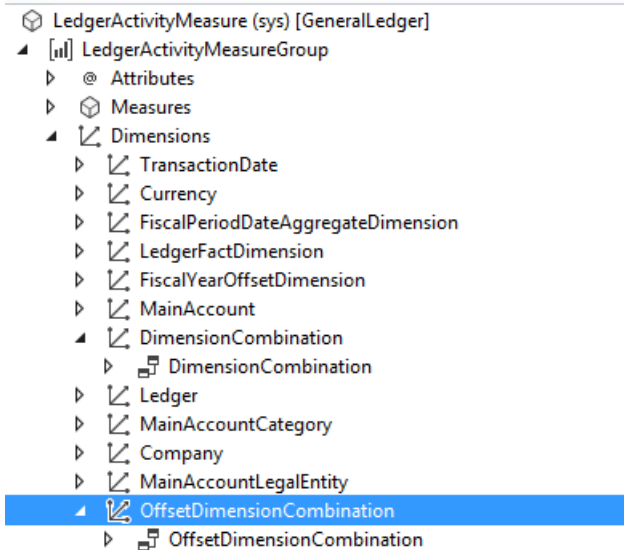
`DimensionCombination` is an aggregate dimension that is modeled by using the `DimensionAttributeValueCombination` base table. In this case, the developer has referenced the aggregate dimension by using the `LedgerActivityMeasureGroup` measure group.

At runtime, new dimension fields are added (that is, the `DimensionCombination` table is expanded) as new financial dimensions are defined in the system.

Creating role-playing financial dimensions

When you report by using ledger data, you might require reporting on primary accounts and offset accounts. For an example, if a ledger transaction involves the transfer of an amount from one account to another account, the primary account is the "from" account, whereas the offset account is the "to" account. This pattern is known as the *role-playing dimensions* pattern.

Both primary accounts and offset accounts must be associated with transaction data. Therefore, you must expand financial dimension fields of both primary accounts and offset accounts. We will now see how you can meet this requirement. Consider the following example.



We have modeled two dimension references for LedgerActivityMeaureGroup. The first reference, DimensionCombination, is joined by using the **LedgerDimension** field. We saw this pattern earlier in this topic.

The second reference, OffsetDimensionCombination, is another reference to the same dimension. We have reused the DimensionCombination aggregate dimension and given it a new name. In the second case, we can join by using the **OffsetLedgerDimension** field.

At runtime, the system will expand both these dimensions with additional fields. Therefore, you can report on primary and offset dimension fields.

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Create analytical reports by using Power BI Desktop

2/18/2021 • 4 minutes to read • [Edit Online](#)

If you're a power user or a business analyst, you probably create many reports for your organization. You might create these reports in Microsoft Excel by formatting and relating data before you share it with other people. People in your organization might even come to you when they require modifications to the report. This solution offers an easy way to create rich, interactive reports. As a report writer, you can use Microsoft Power BI Desktop as the reporting tool. The reports that you create can then be published to PowerBI.com. For more information about Power BI Desktop, see [Create stunning reports and visualizations with Power BI Desktop](#).

Accessing the local Entity Store by using DirectQuery

You can create Microsoft Power BI reports by using Open Data Protocol (OData) endpoints that are exposed via data entities. Despite the limitations of this approach, the Entity Store still supports it for legacy solutions. However, DirectQuery is now the preferred method for sourcing data for analytical solutions. For more information about the benefits and limitations of DirectQuery, see [Use DirectQuery in Power BI Desktop](#).

When you use Power BI Desktop, you can create a report in your development or test environment by connecting directly to the local Entity Store database. When you're satisfied with the report, your administrator can help you migrate it to your production environment. The rest of this section walks you through this process.

NOTE

To develop or extend analytical workspaces and reports in the application suite, customers must use a development environment running in their own subscription or on local machines. You won't be able to develop or extend embedded analytical reports in Microsoft-provided Tier-1 environments. You need administrator rights to install Power BI Desktop.

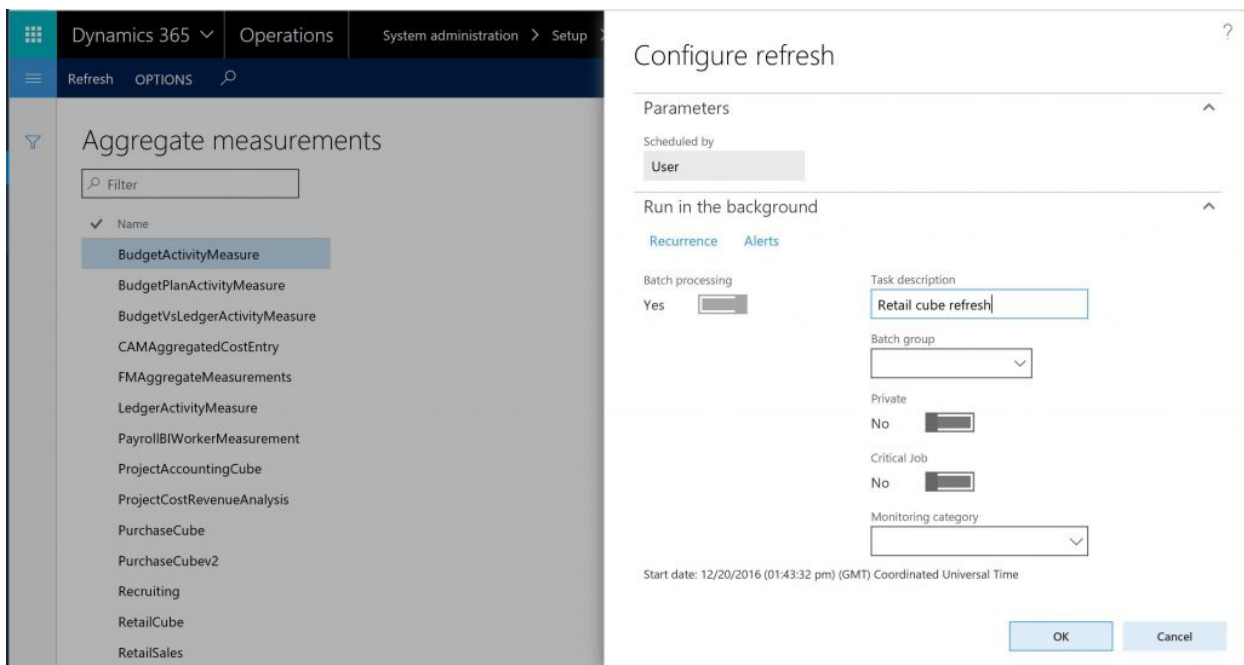
Tier-1 environments now include a service compatible version of Power BI Desktop. To develop or extend analytical workspaces and reports in the application suite, customers can use the Power BI Desktop application pre-installed on the development environment. Alternatively, you can use the latest compatible release of Power BI Desktop with Preview features turned off to author analytical reports for Finance and Operations apps. Download the August 2020 Update of Power BI Desktop at [Previous monthly updates to Power BI Desktop](#).

Step 1: Populate the local Entity Store database

For this example, we will stage the aggregate models that the Commerce analytical solution consumes in the local Entity Store. The models that the application uses are defined in the RetailCube aggregate measurement.

1. In the client, open the **Entity Store** page. (Select **System administration** > **Setup** > **Entity Store**.)
2. Select the **RetailCube** aggregate measurement, and then select **Refresh**.
3. Enter a name for the job that will be run in the background, and then select **OK**.

The following illustration shows the administrator dialog box that is used to configure the frequency of updates for the aggregate model.

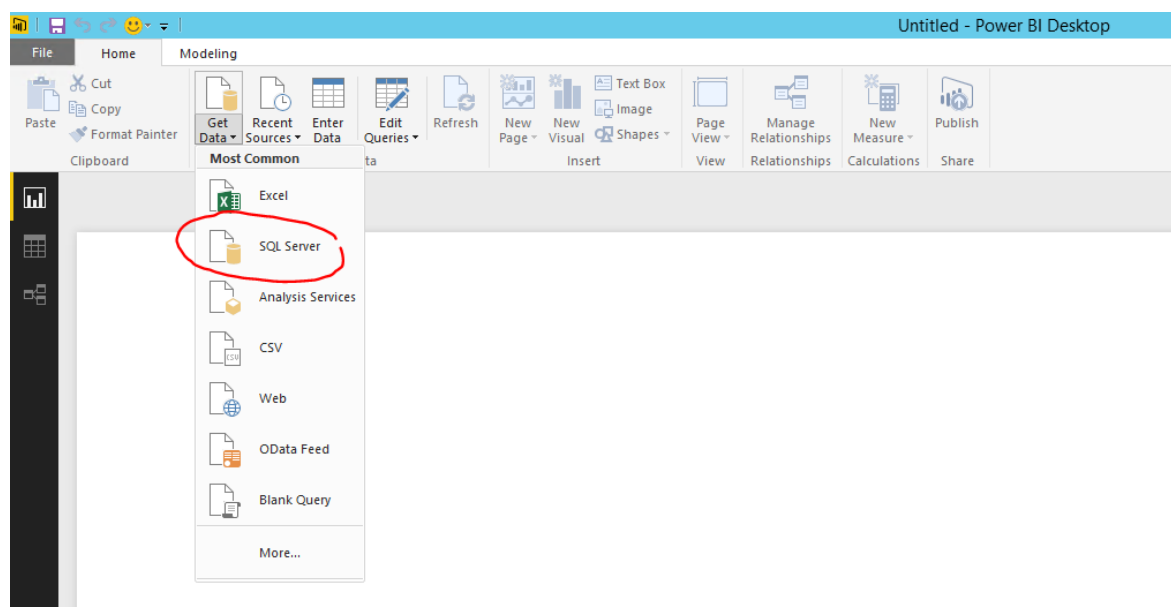


To monitor the progress of the job that stages the data, you can use the batch job monitoring page. (Select **System administration** > **Database** > **Batch jobs**.) If you're using demo data, the job should take about a minute. After the data is in the Entity Store, you can write reports.

Step 2: Connect to the local Entity Store database

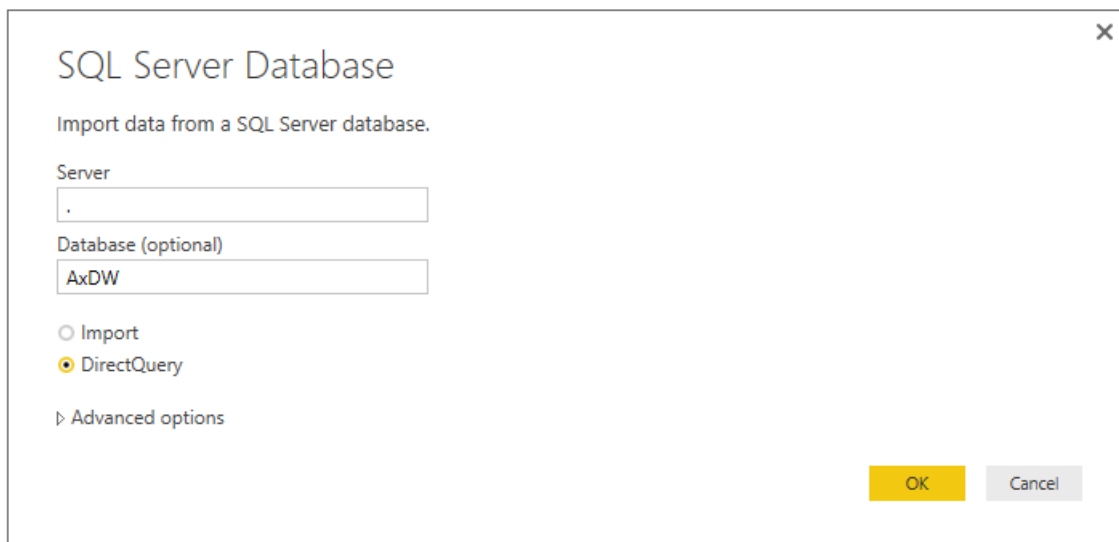
1. Start Power BI Desktop. If any updates are available for Power BI Desktop, you might have to download and apply them.
2. On the Power BI **Welcome** page, select **Get data**.

Alternatively, when Power BI Desktop starts, you can select **Get Data** > **SQL Server**.



3. In the **SQL Server Database** dialog box, enter . as the server name and **AxDW** as the database name. Then select the **DirectQuery** option.

The following illustration shows the settings that enable Power BI Desktop to access the local Entity Store database.



NOTE

The **Import** option isn't currently supported.

4. Select **OK**.

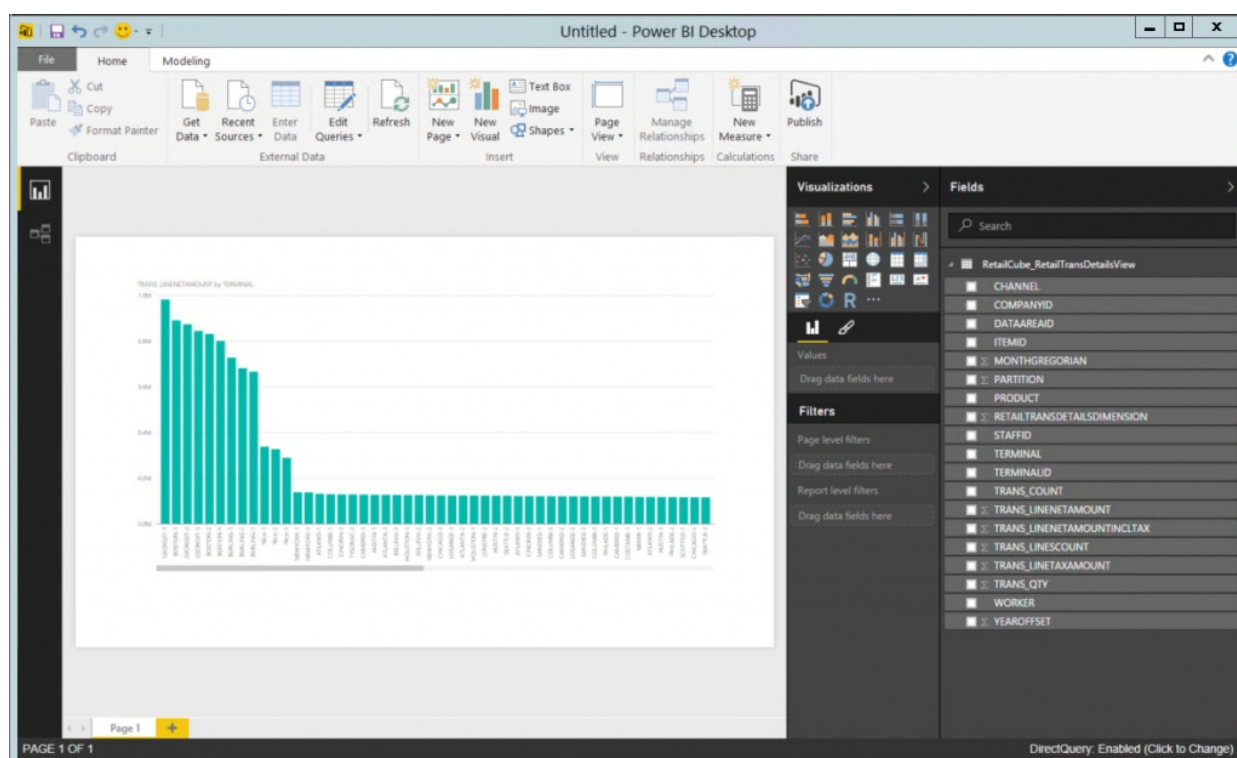
The **Navigator** dialog box appears. You use this dialog box to select which tables and views from the Entity Store you want to report on.

5. In the search box, enter **Retail** to filter for entities that are related to the RetailCube aggregate measurement.

6. Select the **RetailCube_RetailTransDetailsView** table that is shown in the navigator, and then select **Load**.

You can now create a report. You can drag measures and fields to the canvas, and can explore data and trends interactively.

The following illustration shows a basic report that uses the local Entity Store database as its source.



Power BI Desktop also supports the creation of calculations and lets you combine data from multiple aggregate measurements. Within minutes, you can create analytical reports by using data in the local development environment. When you're satisfied with the report, you can migrate it to the production environment, so that users can use the report to interact with production data.

Validating reports in a demo environment

The report shows the demo or test data in your developer environment. If you want to integrate the report into a demo environment, you can continue to publish this report to your PowerBI.com account and pin it to the client.

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Add analytics to workspaces by using Power BI Embedded

2/18/2021 • 5 minutes to read • [Edit Online](#)

NOTE

This feature is supported in Finance and Operations (version 7.2 and later).

Introduction

This topic shows how to embed a Microsoft Power BI report on the **Analytics** tab of a workspace. For the example that is given here, we will extend the **Reservation management** workspace in the Fleet Management application to embed an analytical workspace on an **Analytics** tab.

Prerequisites

- Access to a developer environment that runs Platform update 8 or later.
- An analytical report (.pbix file) that was created by using Microsoft Power BI Desktop, and that has a data model that is sourced from the Entity store database.

Overview

Whether you extend an existing application workspace or introduce a new workspace of your own, you can use embedded analytical views to deliver insightful and interactive views of your business data. The process for adding an analytical workspace tab has four steps.

1. Add a .pbix file as a Dynamics 365 resource.
2. Define an analytical workspace tab.
3. Embed the .pbix resource on the workspace tab.
4. Optional: Add extensions to customize the view.

NOTE

For more information about how to create analytical reports, see [Getting started with Power BI Desktop](#). This page is a great source for insights that can help you create compelling analytical reporting solutions.

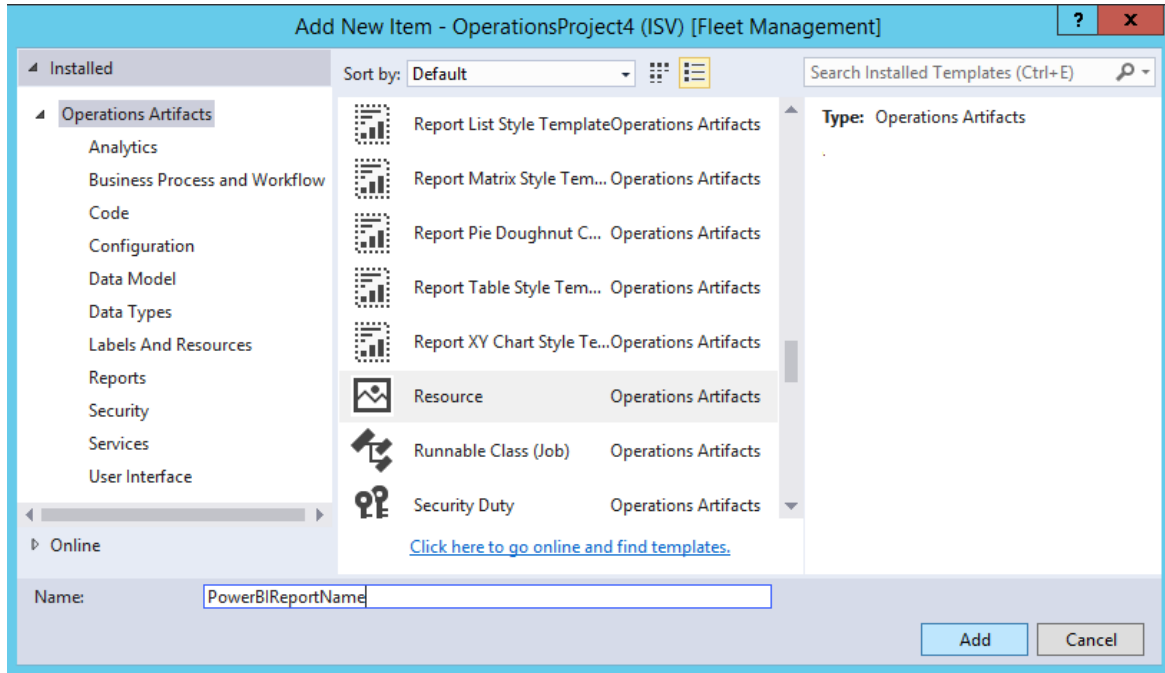
Add a .pbix file as a resource

Before you begin, you must create or obtain the Power BI report that you will embed in the workspace. For more information about how to create analytical reports, see [Getting started with Power BI Desktop](#).

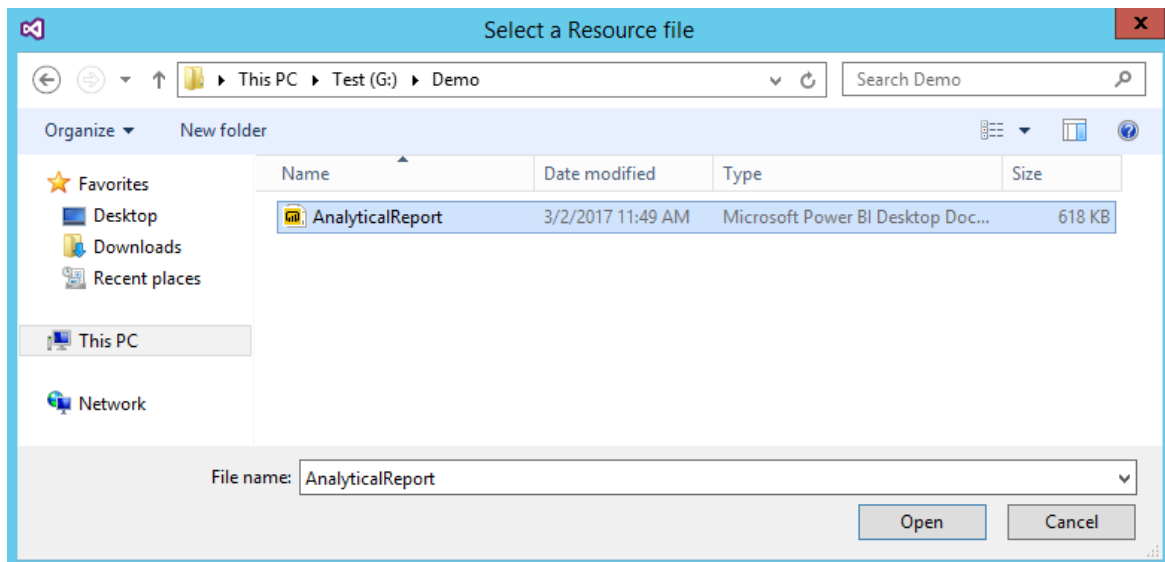
Follow these steps to add a .pbix file as a Visual Studio project artifact.

1. Create a new project in the appropriate model.
2. In Solution Explorer, select the project, right-click, and then select **Add > New Item**.
3. In the **Add New Item** dialog box, under **Operations Artifacts**, select the **Resource** template.

4. Enter a name that will be used to reference the report in X++ metadata, and then click **Add**.



5. Find the .pbix file that contains the definition of the analytical report, and then click **Open**.

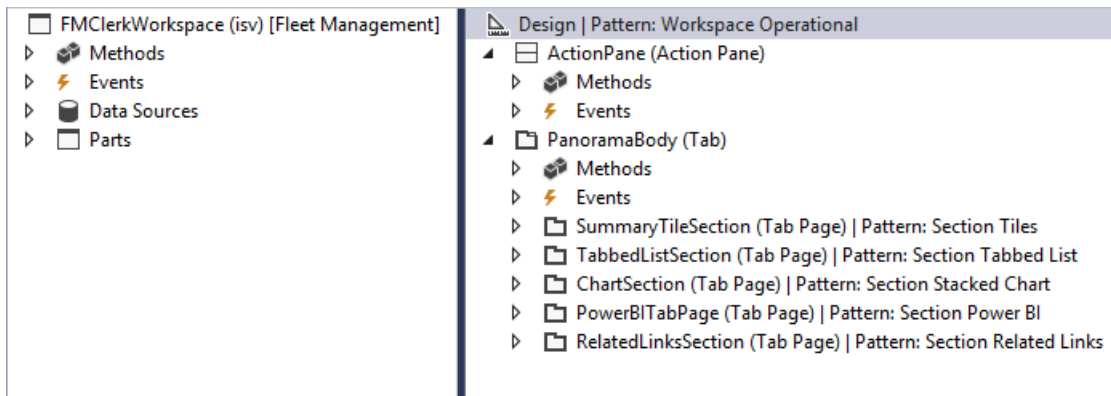


Now that you've added the .pbix file as a Dynamics 365 resource, you can embed the reports in workspaces and add direct links by using menu items.

Add a tab control to an application workspace

In this example, we will extend the **Reservation management** workspace in the Fleet Management model by adding the **Analytics** tab to the definition of the **FM ClerkWorkspace** form.

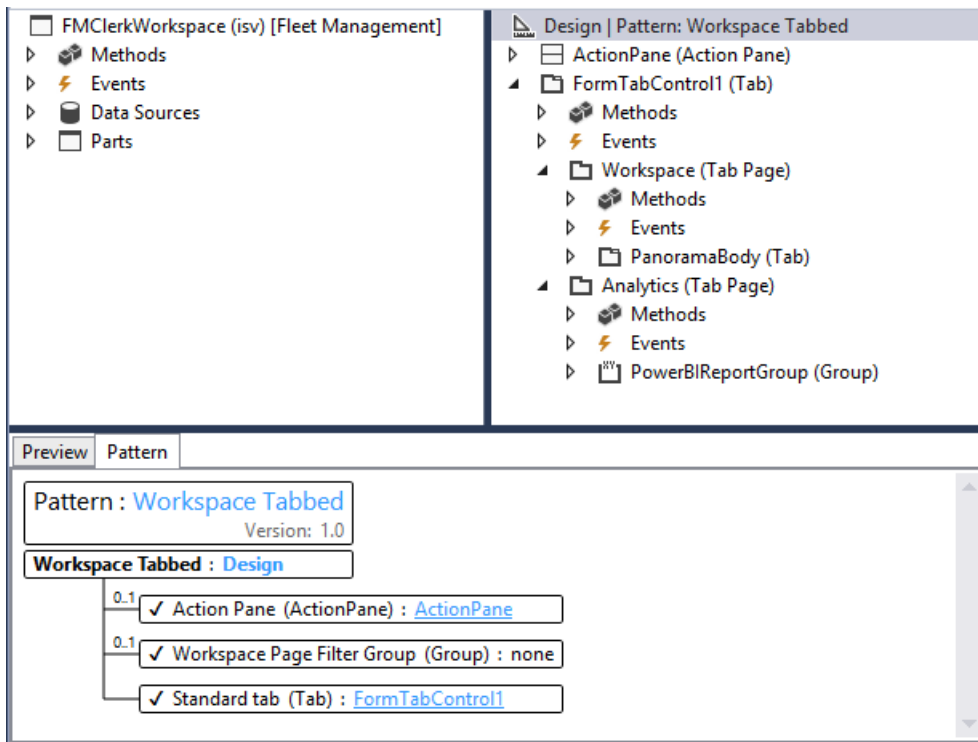
The following illustration shows what the **FM ClerkWorkspace** form looks like in the designer in Microsoft Visual Studio.



Follow these steps to extend the form definition for the **Reservation management** workspace.

1. Open the form designer to extend the design definition.
2. In the design definition, select the top element that is labeled **Design | Pattern: Workspace Operational**.
3. Right-click, and then select **New > Tab** to add a new control that is named **FormTabControl1**.
4. In the form designer, select **FormTabControl1**.
5. Right-click, and then select **New Tab Page** to add a new tab page.
6. Rename the tab page to something meaningful, such as **Workspace**.
7. In the form designer, select **FormTabControl1**.
8. Right-click, and then select **New Tab Page**.
9. Rename the tab page to something meaningful, such as **Analytics**.
10. In the form designer, select **Analytics (Tab Page)**.
11. Set the **Caption** property to **Analytics**, and set the **Auto Declaration** property to **Yes**.
12. Right-click the control, and then select **New > Group** to add a new form group control.
13. Rename the form group to something meaningful, such as **powerBIReportGroup**.
14. In the form designer, select **PanoramaBody (Tab)**, and then drag the control onto the **Workspace** tab.
15. In the design definition, select the top element that is labeled **Design | Pattern: Workspace Operational**.
16. Right-click, and then select **Remove pattern**.
17. Right-click again, and then select **Add pattern > Workspace Tabbed**.
18. Perform a build to verify your changes.

The following illustration shows what the design looks like after these changes are applied.



Now that you've added the form controls that will be used to embed the workspace report, you must define the size of the parent control so that it accommodates the layout. By default, both the **Filters Pane** page and the **Tab** page will be visible on the report. However, you can change the visibility of these controls as appropriate for the target consumer of the report.

NOTE

For embedded workspaces, we recommend that you use extensions to hide both the **Filters Pane** and **Tab** pages, for consistency.

You've now completed the task of extending the application form definition. For more information about how to use extensions to do customizations, see [Customize through extension and overlayering](#).

Add X++ business logic to embed a viewer control

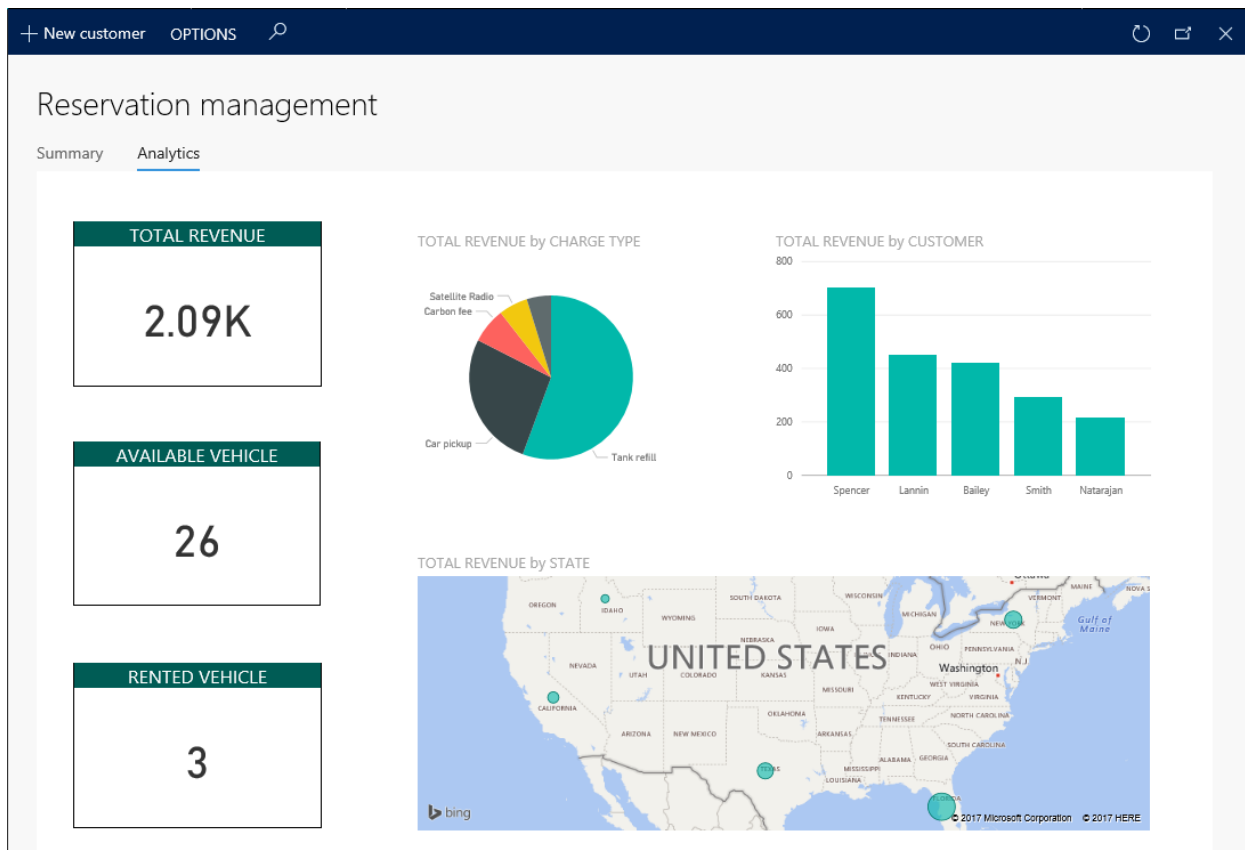
Follow these steps to add business logic that initializes the report viewer control that is embedded in the **Reservation management** workspace.

1. Open the **FM ClerkWorkspace** form designer to extend the design definition.
2. Press F7 to access the code behind the code definition.
3. Add the following X++ code.

```
[Form]
public class FMCLerkWorkspace extends FormRun
{
    private boolean initReportControl = true;
    protected void initAnalyticalReport()
    {
        if (!initReportControl)
        {
            return;
        }
        // Note: secure entry point into the Workspace's Analytics report
        if (Global::hasMenuItemAccess(menuItemDisplayStr(FMCLerkWorkspace), MenuItemType::Display))
        {
            // initialize the PBI report control using shared helper
            PBIReportHelper::initializeReportControl('FMPBIWorkspaces', powerBIReportGroup);
        }
        initReportControl = false;
    }
    /// <summary>
    /// Initializes the form.
    /// </summary>
    public void init()
    {
        super();
        this.initAnalyticalReport();
    }
}
}
```

4. Perform a build to verify your changes.

You've now completed the task of adding business logic to initialize the embedded report viewer control. The following illustration shows what the workspace looks like after these changes are applied.



NOTE

You can access the existing operational view by using the workspace tabs below the page title.

Reference

PBIReportHelper.initializeReportControl method

This section provides information about the helper class that is used to embed a Power BI report (.pbix resource) in a form group control.

Syntax

```
public static void initializeReportControl(  
    str                _resourceName,  
    FormGroupControl  _formGroupControl,  
    str                _defaultPageName = '',  
    boolean            _showFilterPane = false,  
    boolean            _showNavPane = false,  
    List               _defaultFilters = new List(Types::Class))
```

Parameters

NAME	DESCRIPTION
resourceName	The name of the .pbix resource.
formGroupControl	The form group control to apply the Power BI report control to.
defaultPageName	The default page name.
showFilterPane	A Boolean value that indicates whether the filter pane should be shown (true) or hidden (false).
showNavPane	A Boolean value that indicates whether the navigation pane should be shown (true) or hidden (false).
defaultFilters	The default filters for the Power BI report.

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Help secure analytical workspaces and reports by using Power BI Embedded

2/18/2021 • 5 minutes to read • [Edit Online](#)

NOTE

This feature is supported in Microsoft Dynamics 365 for Finance and Operations, Enterprise edition (July 2017) (version 7.2) and later releases.

Introduction

This topic provides a walk-through for application developers who want to help secure analytical workspaces and reports that are delivered by using Microsoft Power BI Embedded. It describes the recommended strategies for securing access to both the reports and the data set, based on viewer access rights. By using the techniques that are described in this topic, you can hide reports from users and filter reports to show the data set that is appropriate for a specific user, based on the active company context.

Prerequisites

- Access to a developer environment that runs Platform update 8 or later
- An analytical report (.pbix file) that was created by using Microsoft Power BI Desktop, and that has a data model that is sourced from the Entity store database

Overview

Whether you're extending an existing application workspace or adding your own workspace, you can use embedded analytical views to deliver insightful and interactive views of your business data. Before you add new analytical workspaces and reports, it's important that you establish a strategy to help secure the content.

There are several considerations that you should be aware of when you develop analytical solutions by using Power BI Embedded. Analytical reports are secured by using menu items. After they have access to a report, all viewers can access the underlying data model that is defined in the report. Although service options are available that automatically hide the fields that back a report data set, all viewers of the report have effective access to the fields in the data model. Additionally, X++ extensions are available that influence the way that the report is presented in the client. Both the **Filter** pane and the **Report** tabs can be hidden. However, Microsoft Power BI filters can be modified by using client-side script injections.

Recommendation

Create scenario-specific .pbix files to deliver analytical views:

- Area overviews that are delivered by using workspaces
- Subject matter-specific analytical reports

NOTE

These analytical reports are often used to deliver reports that contain medium-business-impact and high-business-impact data.

For more information about how to create analytical reports, see [Getting started with Power BI Desktop](#). This page is a great source for insights that can help you create compelling analytical reporting solutions.

Help secure analytical views that are provided through embedded Power BI reports

Power BI report filters and the **Filter** pane serve as a mechanism for passing session context into the report that is embedded on the **Analytics** tab. The capability to turn the visibility of the **Filter** pane on and off isn't a security feature. Power BI report filters and the capability to hide and show the **Filter** pane are user experience (UX) decisions that the application designer makes.

Row-level security that is defined isn't inherited by Power BI reports. Instead, application developers can help secure the workspace or the report.

Help secure analytical workspaces on the Analytics tab

Analytical workspaces are embedded Power BI reports that are shown in a form control. Unless you complete the following procedure, anyone who has access to the workspace can see the **Analytics** tab and access the Power BI reports.

1. Add a menu item for the analytical workspace.
2. Verify that the form initialization uses the **hasMenuItemAccess** application programming interface (API) to verify that the user has access to the menu item.

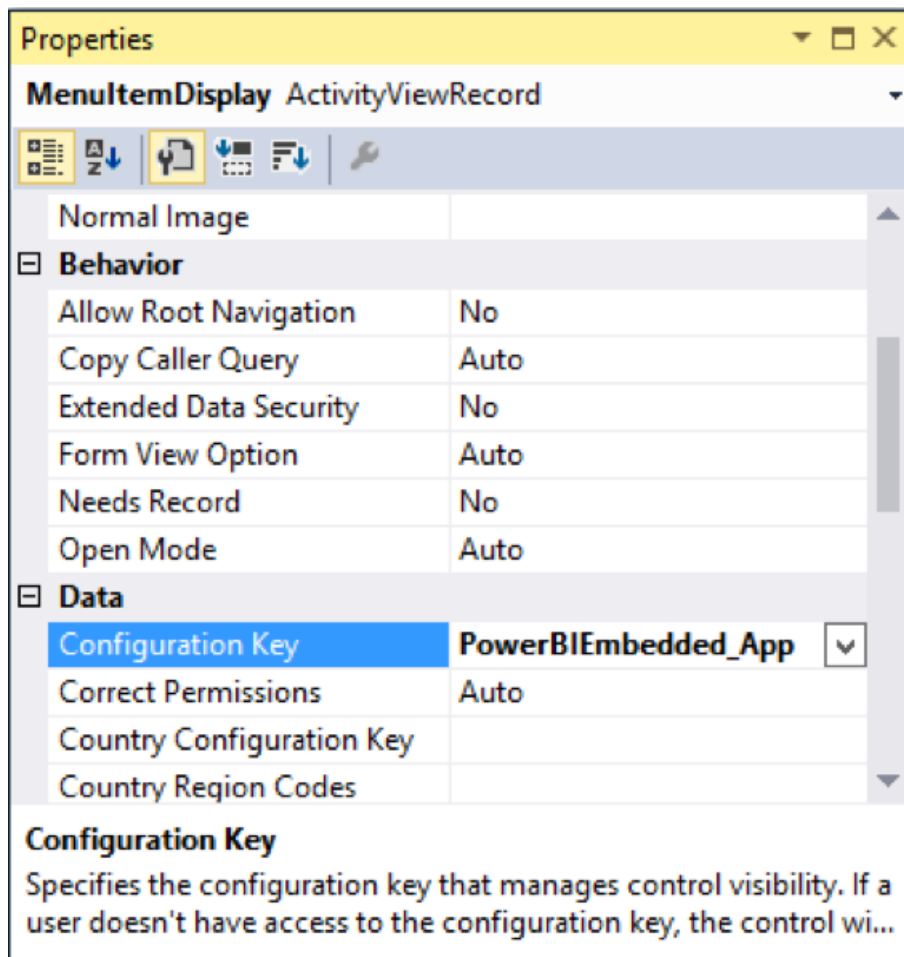
```
// Note: secure entry point into the Workspace's Analytics report
if (Global::hasMenuItemAccess(menuItemDisplayStr(FMClerkWorkspace), MenuItemType::Display))
{
    FMPBIWorkspaceController controller = new FMPBIWorkspaceController();
    PBIReportHelper::initializeReportControl('FMPBIWorkspaces', powerBIReportGroup);
}
```

The preceding logic will prevent the Power BI Viewer control from being initialized. Therefore, an empty tab will appear on the page. By default, the framework automatically hides empty tabs. Therefore, the **Analytics** tab is hidden and can't be access if the user doesn't have access to the menu item that is associated with the analytical workspace.

Help secure analytical reports

Embedded Power BI reports in the application are secured by using menu items. Users who try to access a Power BI report directly, by using a menu item in application, will receive an error. Follow these steps to help secure the analytical reports.

1. Add a menu item for the report or the appropriate tab. By default, the first tab of the report will be shown if no other tab is selected.
2. Link the menu item to the **PowerBIEmbedded_App** configuration key.



The menu item is now associated with the availability of the Power BI Embedded service. If the service is unavailable, the links for the menu items will be removed from the application.

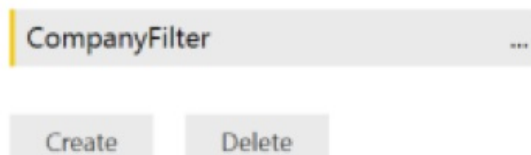
Help secure analytical workspaces and reports by company

Power BI workspaces and reports can be secured by company (for example, `DataAreaID` value). Application solutions must apply the following steps for company-level security in analytical workspaces and reports.

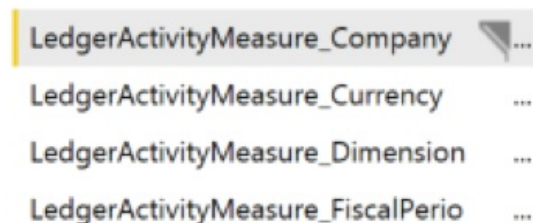
In this scenario, the workspaces and reports that the sales manager from Contoso USA sees are limited to data that is related to Contoso USA. The report viewer must not have access to data that associated with any other company, unless the company context is changed.

1. Open the analytical report in Power BI Desktop by double-clicking the resource in a Microsoft Visual Studio project.
2. On the **Modeling** tab, click **Manage Roles**.
3. Create a new role against a column in the data model that contains the **Company** field. Name the new role **CompanyFilter**. A **COMPANY** field must be present in the data model to restrict access by company.

Roles



Tables



4. In the **Table filter DAX expression** field, enter `[COMPANY]=username()`.
5. To make sure that the rules work, on the **Modeling** tab, click **View as Roles**. In the dialog box, set the following fields:
 - a. Clear the **None** check box.
 - b. Select the **Other user** check box, and then enter **USMF** in the text box.
 - c. Select the **CompanyFilter** check box.

The reports will now show data as if you're running the USMF company.

NOTE

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Create reporting solutions

2/18/2021 • 10 minutes to read • [Edit Online](#)

This tutorial shows how to export data and create a report, expand predefined views and add navigation to charts, use the free-form report designer, and customize the parameter experience.

Prerequisites

For this tutorial, you must access the application environment, and you must be provisioned as an administrator on the instance.

Key concepts

- Describe the various ways reports can be created and consumed
- Add interactivity to embedded aggregate reports in forms and workspaces
- Use framework extensions to customize the parameter experience for SSRS based business documents
- Export List Page data to create reports with external tools including Microsoft Excel
- Author modern report designs using enhanced developer tooling in Visual Studio

What's new in Reporting?

- Embedded report drill-through navigations to AX forms and reports
- Navigate between reports using embedded report drill-through links
- Several Document Routing Service enhancements including support for custom print settings
- Introduced Document Brand Management administrative tools
- Additional visualizations available through the Embedded Charting Control
- Dates and Amounts in the report body are formatted based on the "Date, time, and number format" user setting
- Network Print monitoring form
- Table extensions need to be supported through the VS Query picker

What is a report in Dynamics 365 Finance and Operations apps?

Reports can be defined simply as any visualization of a structured data set. This may include transactional data presented in a tabular layout and advanced graphical views of aggregate information. To account for this broad definition, the application offers several tools to produce reports to satisfy complex business requirements. Some common applications of reports in an ERP include:

- Creating and archiving transactional documents as part of a posting process
- Producing packing slips for tracking orders from Manufacturing to Warehousing to Sales
- Monitoring key performance metrics and surfacing trends in data
- Navigating the client through filtered searches
- Distributing heavily branded documents to customers and employees
- Extracting data in such a way that it articulates the health of a business

The most difficult task for developers is selecting the *right* Business Intelligence visualization tool for the job, given a customer's requirements. To accomplish this, it's important to understand the capabilities offered through the tools that are available for creating reports. We offer tooling to support the following basic

reporting requirements:

- **Excel Integration** – Allows data management and analysis using Microsoft Excel
- **Embedded Analytics** – Add aggregate data to a Workspaces using native controls like charts and grids
- **Reporting Services** – Create business documents that require precision using SSRS-based solutions
- **Power BI Integration** – Author and share reports that can be accessed anywhere
- **Management Reporter** – Designed to help users create financial reports

The following table can be used to compare the basic characteristics of these reporting tools:

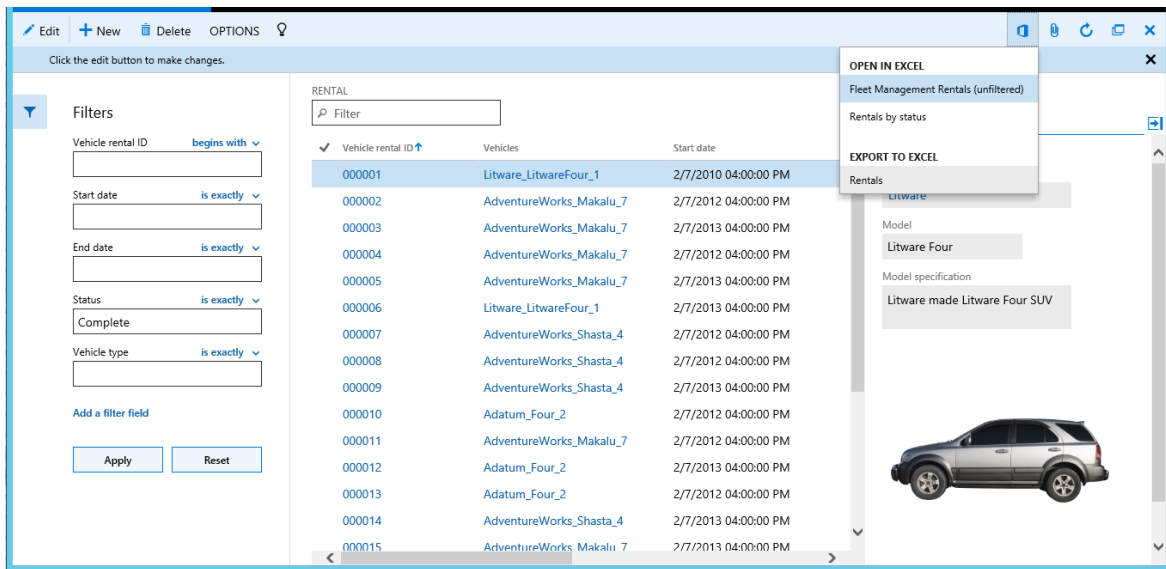
TOOL	AUTHOR	TARGET	DATA	CONSUMPTION	DESIGNER
Excel	Power User	Power User	Transactional	External	Free form
Embedded BI	Developer	All users	Aggregates	Internal	Modeled
SSRS Report	Developer	All users	Transactional and Aggregates	Internal/External	Free form
Power BI	Power User	All users	Aggregates	Internal/External	Free form
Management Reporter	Power User	Power User	Transactional	External	Modeled

Create a report using List Pages

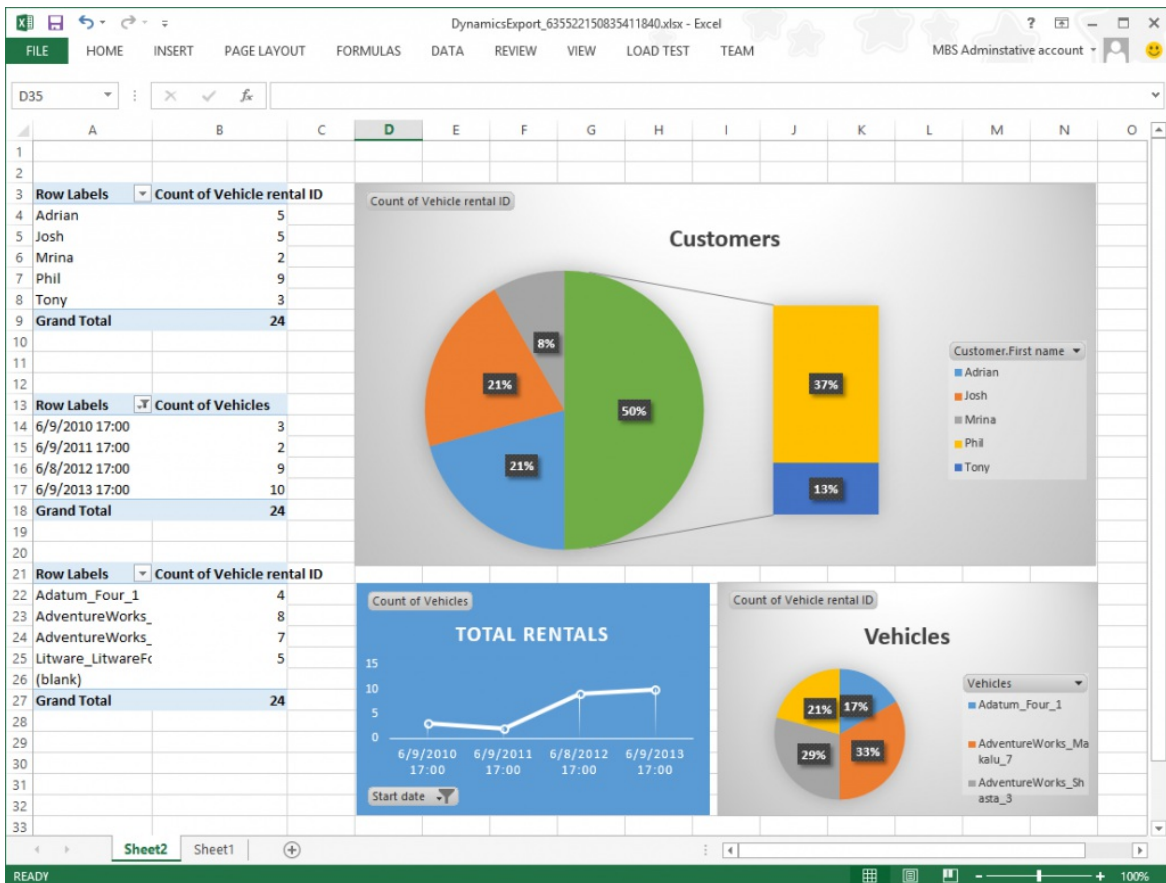
In this section, we'll walk you through the process of exporting data displayed in an entity details form. Here we'll demonstrate how every form in can be viewed as a source of data for management and analysis using the power of Excel.

Create an analysis report based on all rentals in Fleet Management that are marked as complete

1. Open Internet Explorer, and navigate to your instance base URL and sign in.
 - a. On the cloud environment, the base URL is obtained from LCS
 - b. On a local VM, the base URL is `https://usnconeboxax1aos.cloud.onebox.dynamics.com`.
2. On the Dashboard, scroll to the far right, and click the **Reservation management** tile.
3. Under the **Summary** section, click on the **All rentals** tile.
4. Expand the **Filters** pane by clicking on the Filters icon next to the main grid.
5. Click **Add a filter field**, and then select **Status** in the drop-down list.
6. Enter **Complete** in the Status filter field, and then click **Apply**.
7. Expand the page action bar, click **Open in Office**, and then select **Rentals**.



After the data has been exported, you can use the power and flexibility of the Excel tools to create reports for presentation or additional analysis. The following is an example of a self-service report authored with Excel.



8. Close the browser session and the exported Excel file.

Advantages of List Pages

- Flexible source for accessing transactional business data using external reporting and analytical tools like Excel
- Allows end-users to model the data sets they need without requiring a developer
- Direct access to real-time business information

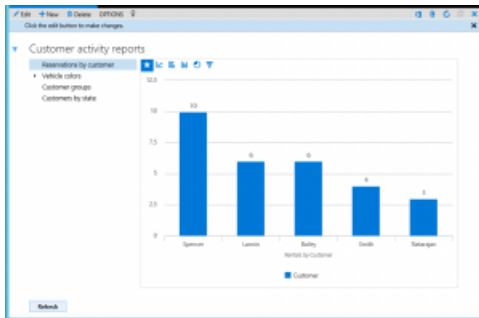
Expand predefined views and add navigation to charts

Business Intelligence can be useful at every level of an organization. Use embedded controls to elevate the most

relevant information based on the target persona. Native controls offer users an intuitive and convenient way of interacting with aggregate data allowing for informed decision making.

Create development project

1. On the Desktop, right-click the **Visual Studio** shortcut, and select **Run as administrator** to open the development environment.
2. On the toolbar, click **View**, and then select **Application Explorer**
3. Use the **Application Explorer** to search for the **FMReservationsReport** form in the **Fleet Management** module.
4. In the **Application Explorer's** search results, right-click **FMReservationsReport** form, and then select **Add to new project**.
5. Select the **Finance and Operations Project** template, and then click **OK** to create the project.
6. In **Solution Explorer**, right-click **FMReservationsReport** menu item, and then select **Set as startup object**.
7. Press **Ctrl+Shift+B** to save and build the project.
8. Press **Ctrl+F5** to load the form containing the report.

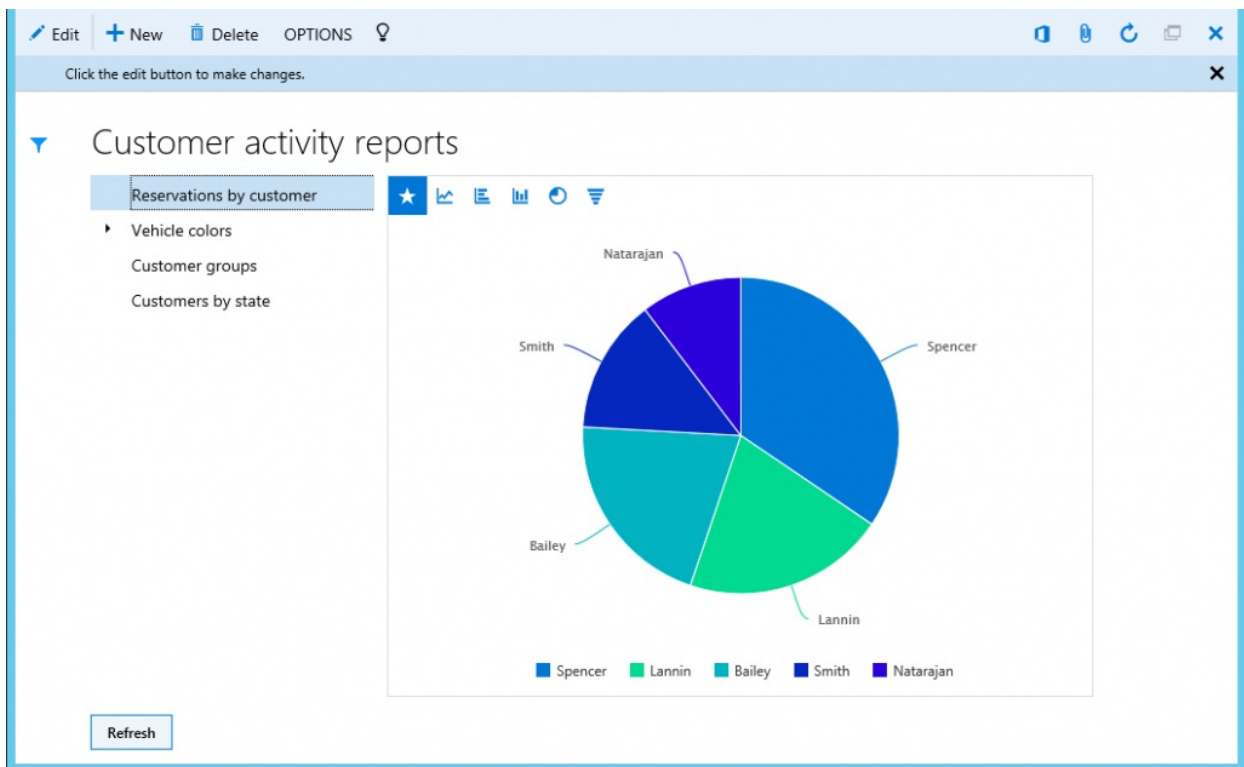


At this point, you have a collection of pre-defined chart visualizations of Aggregate data. The controls offer basic interactive features like hover text, series filtering, and touch expansion. However, it is often appropriate that a greater degree of user interactivity is required.

Change the default chart type for the visualization

1. Close the browser session and return to the Visual Studio project.
2. Open the **Application Explorer**, locate the **FMReservationsByCustPart** form, right-click, and then select **Add to project**.
3. Open the **FMReservationsByCustPart** form designer.
4. Access the **Series** collection in the **ReservationsByCust** chart definition.
5. Select the **SysBuildChatMeasure1** series definition
6. Locate the **Appearance** section in the **Properties** window.
7. Update the **Chart type** value and select **Pie**
8. Press **Ctrl+Shift+B** to save and rebuild the project.
9. Press **Ctrl+F5** to run the report.

The **Reservations by customer** view now visualizes the aggregate data set using a Pie chart to simplify the task of comparing rental activity across customers.



Additional functions include:

- Define contextual drill-through navigations using modeled properties
- Manage drill-through links using X++ form logic

Advantages of embedded aggregate visualizations

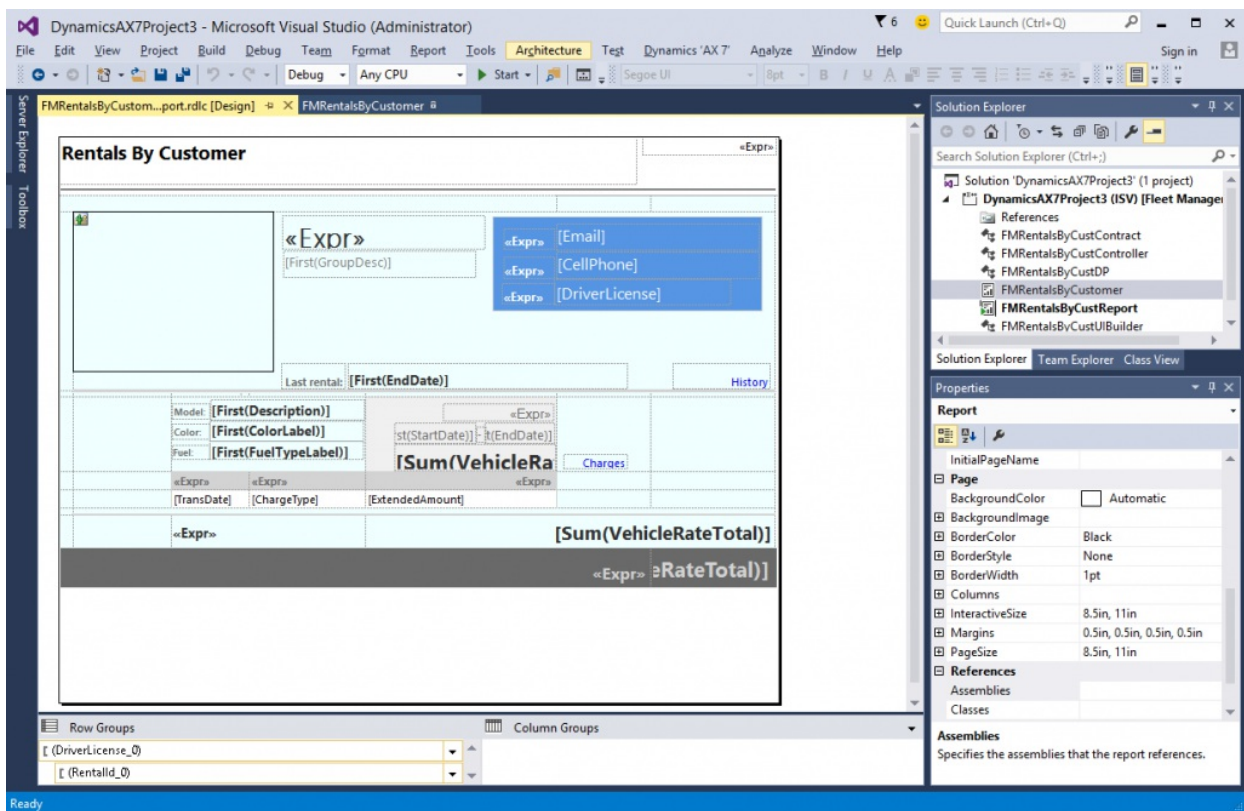
- Designed to be simple and intuitive to promote informed decisions at every level of the organization
- Pre-defined views tailored to meet the needs of the consumer
- Augments the user's ability to recognize key performance trends in the data

Using the freeform report designer

SSRS continues to be the platform for producing advanced Business Document solutions for your ERP application. The hosted service is designed for high volume and heavily transactional reports with an integrated parameter experience. Backed by the Document Printing & Distribution Services, these solutions are ideal for producing precision documents which are intended for email, printing, archive, and bulk distribution.

Open the Precision Designer

1. Close the browser session and return to the Visual Studio project.
2. Click **File > Close Solution**, to close the active project.
3. Use the **Application Explorer** to search for objects with **FMRentalsByCust** in the name
4. In the **Application Explorer's** search results, select all **Classes**, the **Output Menu Item**, and the **FMRentalsByCustomer** report
5. Right-click and then select **Add to new project**.
6. Select the **Dynamics 365** template, and then click **OK** to create the project.
7. In **Solution Explorer**, double-click on the **FMRentalsByCustomer** report to open the designer.
8. Expand the **Designs** collection in the designer to view the list of design definitions
9. Double-click on the **Report** design to view the report definition using the Precision Designer



The above is a screen-shot of the FMRentalsByCustomer report design definition as viewed using the Visual Studio Precision Designer. The Precision Designer offers a free-form design surface with built-in tools that allow you to customize the content and layout of the report. You can also take advantage of embedded VB code to create run-time design manipulations and support user interactions. As an integrated tool, developers are able to reference AX labels and public APIs to format data in the report body based on AX EDTs. MSDN offers a rich collection of developer documentation related to SSRS formatting capabilities. See the article [Reporting Services Reports \(SSRS\)](#) on for a good primer on designing effective SSRS reports.

Customizing the parameter experience

The Reporting Framework offers flexibility through service extensions to facilitate advanced solutions with requirements that cannot be addressed using a modeled solution. Use the VS designer to add basic parameter formatting, grouping, and input validation. X++ based data contract validation is available for more advanced scenarios. Consider adding User Interface (UI) Builder Classes to customize the parameter pane used to prompt for session inputs before running a report. These custom extensions are effective for addressing the following functions:

- Overriding dialog field events
- Validating report parameters inline
- Adding customized lookups to dialog fields
- Changing the layout of the dialog controls
- Adding custom controls including images

Defining parameters defaulting using code

1. In **Solution Explorer**, double-click on the **FMRentalsByCustUIBuilder** class to open the designer.
2. Locate the class **build** method and update the initialization code as follows

```

public void build()
{
    Dialog dialogLocal = this.dialog();
    contract = this.dataContractObject() as FMRentalsByCustContract;// associate dialog field with
data contract method
    this.addDialogField(methodStr(FMRentalsByCustContract, parmCustGroupId),
contract);dialogLocal.addGroup("@SYS41297");
    fromDateField = this.addDialogField(methodStr(FMRentalsByCustContract, parmFromDate), contract);
    toDateField = this.addDialogField(methodStr(FMRentalsByCustContract, parmToDate), contract);//
set the default date range values
    fromDateField.value(today() - 365);
    toDateField.value(today());
}

```

3. Press Ctrl+Shift+B to save and rebuild the project.

4. Press Ctrl+F5 to run the report.

The parameter initialization code above sets the default values of the report execution relative to today's date. Use the classes `UIBuilder` to override the framework's default handling of report parameters. Additional extension scenarios supported:

- Automatically set query ranges based on session context using `Controller` classes
- Select report designs at runtime using a shared menu item
- Modify report data contract values using business logic

NOTE

This example demonstrates a `UIBuilder` extension with an RDP-based based report. For a Query based example that includes a `UIBuilder` extension, view the `FMCustomerList` report.

Using VB code to manage running balances

The Reporting Framework offers flexibility through service extensions to facilitate advanced solutions with requirements that cannot be addressed using a modeled solution. Use the VS designer to add basic parameter formatting, grouping, and input validation. X++ based data contract validation is available for more advanced

scenarios. Consider adding User Interface (UI) Builder Classes to customize the parameter pane used to prompt for session inputs before running a report. These custom extensions are effective for addressing the following functions:

- Overriding dialog field events
- Validating report parameters inline
- Adding customized lookups to dialog fields
- Changing the layout of the dialog controls
- Adding custom controls including images

Import the section resources

1. Close the browser session and return to the Visual Studio project.
2. On the toolbar, click **DYNAMICS AX**, and then select **Import Project...**
3. In the File name window, browse to C:\FmLab\Lab10-3, select **FMrentalDetailsReport.axpp**, and then click **Open**.
4. In the Project file location text box, enter C:\FmLab\Lab10-3.
5. Select the **Current solution** radio button.
6. Click **OK** to close. Wait for the project to be imported and opened.
7. In the **Solution Explorer**, select the new project, right-click, and then select **Set as startup project**.
8. In the **Solution Explorer**, right-click **FMrentalDetails** menu item, and then select **Set as startup object**.
9. Select the Project in Solution Explorer, right-click, and then select **Deploy Reports**
10. Press **Ctrl+F5** to view the report.

Rental Details
Contoso Entertainment System USA

Labels!@SYS182566
11/17/2015
2:17 PM

Previous: \$1,575.00

Tony Smith

Counter	RentalID	Type	Description	Amount	Running balance
1	000005	Car pickup	2014 Adventure Works Makalu	\$35.00	\$1,610.00
2	000005	Child Seat	2014 Adventure Works Makalu	\$10.00	\$1,620.00
3	000005	Tank refill	2014 Adventure Works Makalu	\$40.00	\$1,660.00
4	000005	Carbon fee	2014 Adventure Works Makalu	\$5.00	\$1,665.00
5	000012	Tank refill	2014 Adatum Four	\$40.00	\$1,705.00
6	000012	Carbon fee	2014 Adatum Four	\$5.00	\$1,710.00
7	000026	Carbon fee	2014 Litware Four	\$5.00	\$1,715.00
8	000026	Tank refill	2014 Litware Four	\$40.00	\$1,755.00
9	000028	Car pickup	2014 Litware Four	\$35.00	\$1,790.00
10	000026	Car pickup	2014 Litware Four	\$35.00	\$1,825.00
11	000028	Carbon fee	2014 Litware Four	\$5.00	\$1,830.00
12	000028	Tank refill	2014 Litware Four	\$40.00	\$1,870.00

Total: \$295.00
Previous: \$1,575.00
Grand total: \$1,870.00

This report uses embedded VB script to keep track of running totals so that the balances from the previous page can be referenced on the active page. To inspect report's VB code, load the report design in the Precision Designer, access the **Report Properties**, and then select the **Code** section. Here you'll see several functions referenced by the report designs to surface running balances within the report headers and footers.

Advantages of SSRS reports

- Built-in back office document management capabilities including email support, scheduled executions via Batch, and Print Archive
- Parameterized views with drill-through navigations to forms and other reports
- Used to produce precision documents for compliance with local regulatory business practices

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Customize App Suite reports by using extensions

2/18/2021 • 2 minutes to read • [Edit Online](#)

This topic discusses a series of scenarios for customizing App Suite reports.

Finance and Operations offers an expanded set of tools to support custom solutions. Customizations to reporting solutions in the standard application are fully supported using a pure extension model. This topic contains guidance about how to add the most common customizations to standard application reports without overlayering Application Suite artifacts. Here are some of the key benefits of using an extension-based approach when customizing the application:

- It reduces the footprint of your application solutions by minimizing code duplication.
- Custom reports benefit from enhancements made to standard solutions including updates to business logic in Report Data Provider (RDP), data contracts, and UI Builder classes.
- Standard application solutions are unaffected and continue to be available in concert with custom reports.

Report extensions do not break or prevent access to standard application reports. Instead, the platform supports run-time selection of the target report allowing you to choose the appropriate report design based on the context of the user session. For more information about customizations using extensions, see [Customize through extension and overlayering](#)

Scenarios

There are four key scenarios which demonstrate the flexibility available. The first two scenarios involve extending existing RDP classes for custom reporting solutions.

- [Expand Application Suite report data sets](#) – Use table extensions and integrate custom business logic to add custom columns to an existing dataset.
- [Composing custom datasets](#) – Add more data to application reports by extending an existing RDP class to return a custom dataset.

The other two scenarios offer insights on how to use extensions to redirect application navigations to your custom solutions.

- [Extend report menu items to redirect user navigation](#) – Customize application menu items to redirect references to a custom report design.
- [Create custom designs for business documents](#) – Delegate handlers allow you to add custom report designs to an existing Print Management document instance.

NOTE

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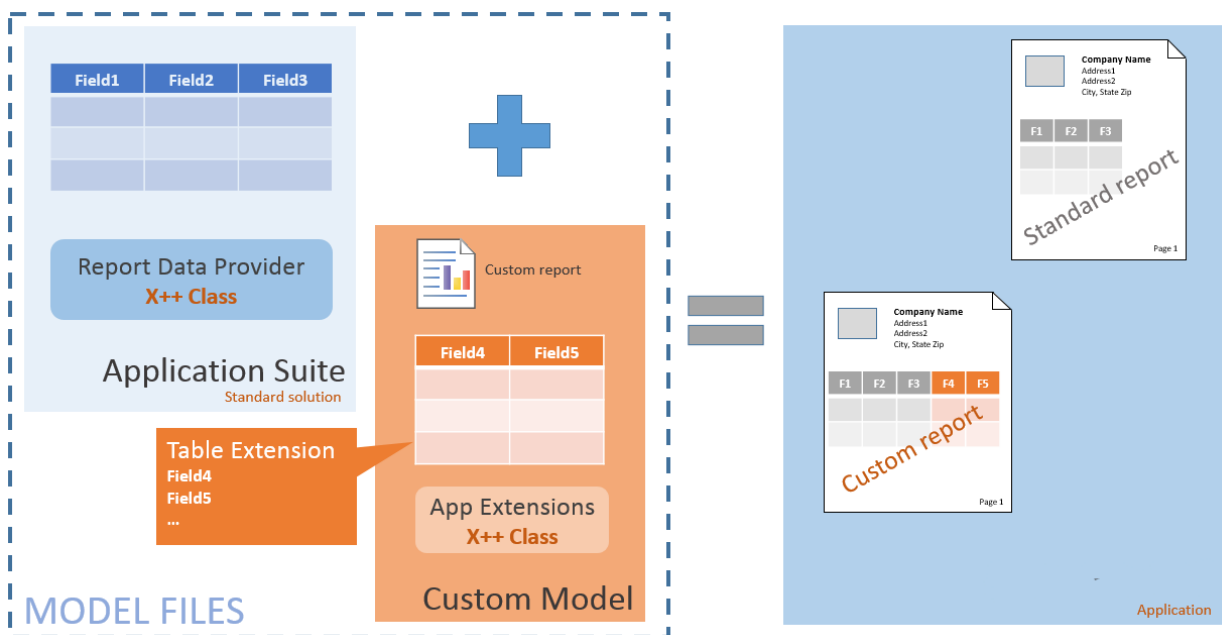
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Expand Application Suite report data sets

2/18/2021 • 5 minutes to read • [Edit Online](#)

This topic shows how to expand an existing report data set that is produced by using X++ business logic in a report data provider (RDP) class.

This topic focuses on the expansion of an existing report data set that is produced by using X++ business logic in a report data provider (RDP) class. You use custom delegate handlers and table extensions to include additional field data and/or calculations. You don't have to over-layer the Application Suite. You then create custom designs that replace the standard application solutions and present the data to users. The following illustration shows a typical application customization, as described in this topic.



What's important to know?

There are a few basic assumptions that you should be aware of before you apply this solution.

- **You can't directly extend RDP classes.** However, the platform provides extension points that enable data set expansion without duplicating business logic in the standard application.
- **There are two methods that can be used to expand report data sets.** Use the strategy that is appropriate for your solution:
 - **Data processing post-handler** – This method is called only one time, after the **ProcessReport** method is completed and before the data set is returned to the report server. Register for this post-handler to perform bulk updates on the temporary data set that is produced by the standard application solution.
 - **Temp table inserting event** – This method is called for each row that is added to the temporary table. It's more suitable for calculations and inline evaluations. Try to avoid expensive queries that have many joins and look-up operations.
- **Use event handlers to redirect menu items to your new report design.** You can customize all aspects of an application reporting solution by using event handlers. Add a **PostHandler** event for the controller class to reroute user navigations to a custom report design.

Expand a report data set

The following walkthrough shows the process of expanding an existing application data set by using a "pure" extension-based solution. The solution includes a custom **Rentals list** report for the Fleet Management application. The new report includes additional rental charge data in the rental details. The application customizations are defined in an extension model. The following illustrations show the standard design and the custom solution.

Before (standard design)

The screenshot shows the 'Rentals By Customer' report for Phil Spencer. It displays two rental records. The first record is for a 2014 Litware Four (Red, Standard fuel) with a total charge of \$480.00. The second record is for a 2012 Adventure Works Shasta (Gray). The report includes a table of charges for the first rental, such as Carbon fee, Tank refill, and Car pickup.

Date	Rental charge type	Extended amount
12/24/2010	Carbon fee	\$5.00
12/24/2010	Tank refill	\$40.00
	Car pickup	\$35.00

After (custom solution)

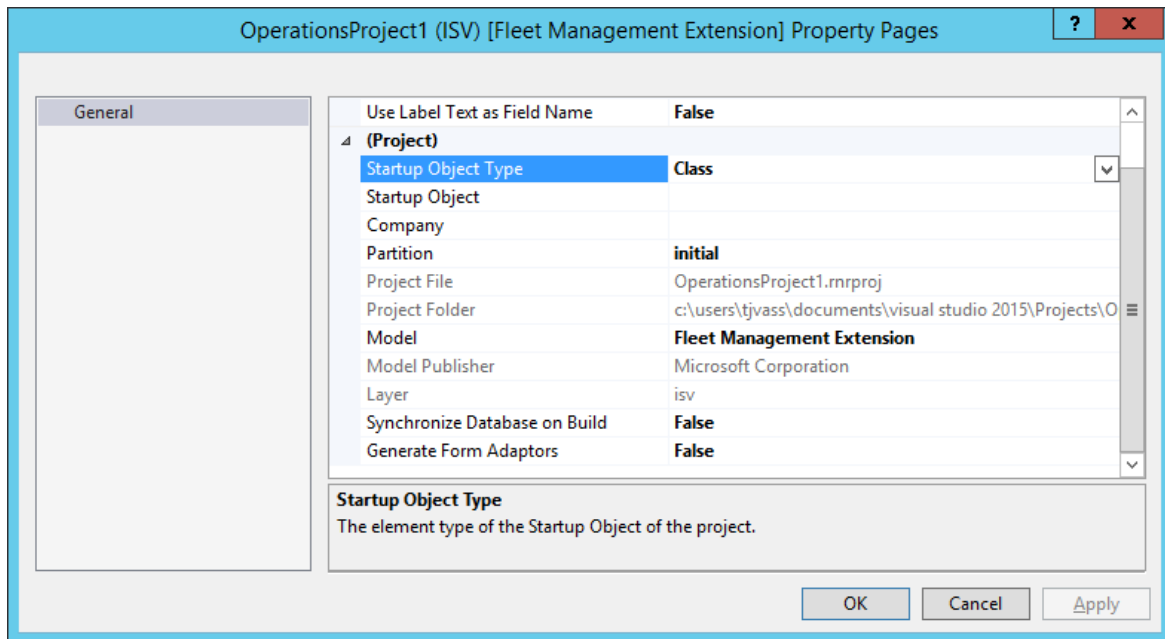
The screenshot shows the custom 'Rentals By Customer (CUSTOM)' report for Phil Spencer. It displays the same two rental records as the standard version. The first record is for a 2014 Litware Four (Red, Standard fuel) with a total charge of \$480.00. The second record is for a 2012 Adventure Works Shasta (Gray). The report includes a table of charges for the first rental, with a custom charge type 'We refill the gas tank' highlighted by a red arrow.

Date	Rental charge type	Extended amount
12/24/2010	Carbon fee	\$5.00
	Help offset carbon emissions.	
12/24/2010	Tank refill	\$40.00
	We refill the gas tank.	
	Car pickup	\$35.00
	We arrange pickup from another location.	

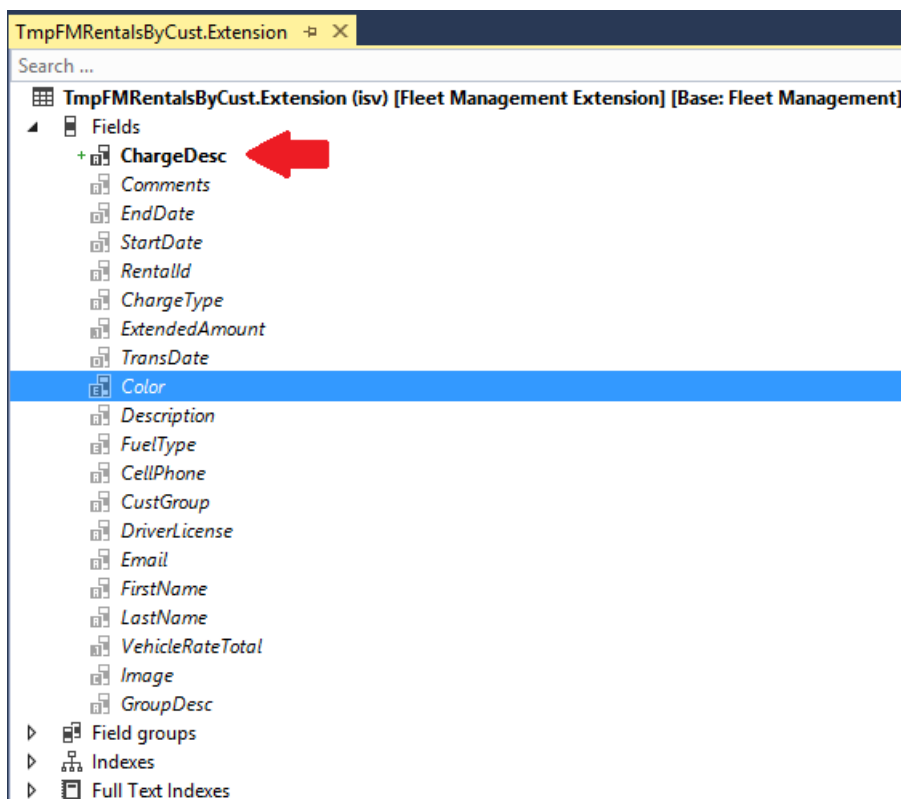
1. Create a new model for your application customizations. For more information about extension models, see [Customize through extension and overlaying](#). For this example, add a custom report to the

Fleet Management Extensions model.

2. Create a new project in Microsoft Visual Studio. Make sure that the project is associated with your extension model. The following illustration shows the project settings.



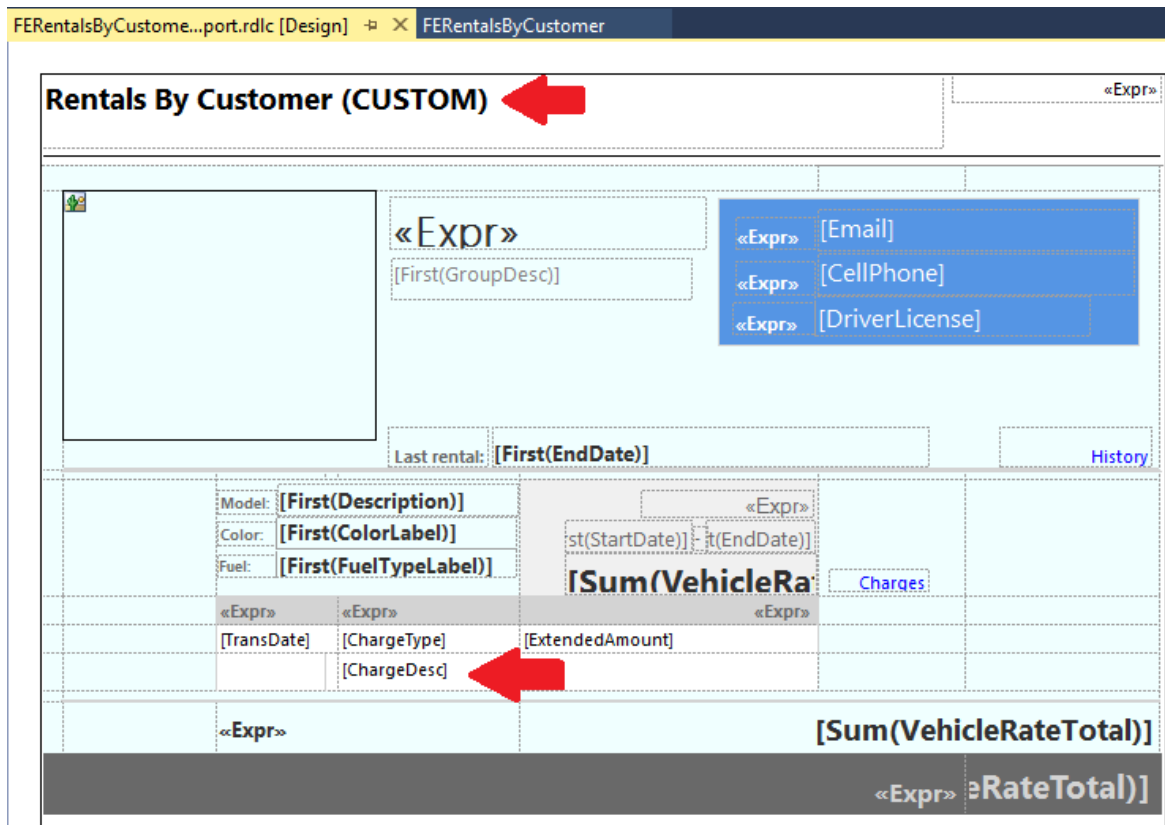
3. Add a table extension to store the custom report data. Find the temporary cache for the TmpFMRentalsByCust data set that is populated by the RDP class, and create an extension in your model. Define the fields that will be used to store the data for the report server, and then click **Save** to save your changes. The following illustration shows the table extension that is required for this example.



4. Add your custom report to the project. The custom design closely resembles the standard solution. Therefore, you can just duplicate the existing application report in the **Fleet Management Extension** model, and then update the report design so that it includes the custom title and additional text box in the Rental Charges container.
5. Rename the report so that it has a meaningful name. For this example, rename the custom report

FERentalsByCustomer to distinguish it from the standard solution.

6. **Restore the report data set references.** Open the report designer, expand the **Datasets** collection, right-click the data set that is named **FMRentalsByCustDS**, and then click **Restore**. The data set is expanded so that it includes the newly introduced columns. Therefore, these columns are now available in the report designer.
7. **Customize the report design.** The designer offers a free-form design surface that you can use to create the custom solution. The following illustration shows the custom design that is used for this example.



8. **Add a new report handler (X++) class to the project.** Give the class a name that appropriately describes that it's a handler for an existing application report. For this example, rename the class **FERentalsByCustomerHandler** to distinguish it from other report handlers.
9. **Add a PostHandler method to begin to use your custom report.** In this example, extend the controller class in the standard solution, **FMRentalsByCustController**, by using the following code.

```
class FERentalsByCustomerHandler
{
    [PostHandlerFor(classStr(FMRentalsByCustController), staticMethodStr(FMRentalsByCustController,
construct))]
    public static void ReportNamePostHandler(XppPrePostArgs arguments)
    {
        FMRentalsByCustController controller = arguments.getReturnValue();
        controller.parmReportName(ssrsreportstr(FERentalsByCustomer, Report));
    }
}
```

User navigations in the application will now be rerouted to the custom reporting solution. Take some time to deploy the custom report to the report server and verify that the application is using it. At this point, you just have to add the business logic that is used to populate the custom fields that you introduced in step 3. In the next step, you must select the method of data set expansion that is appropriate for your solution.

10. **Add X++ business logic to populate the custom field data.** Select the data processing technique that makes sense for the type of transformation that you require for the solution.

- **Option 1: Add a data processing post-handler.** Apply this technique for bulk insert operations that use a single pass over the result set of the standard solution. Here is the code that expands the data set by using a table lookup.

```
class FERentalsByCustomerHandler
{
    [PostHandlerFor(classStr(FMRentalsByCustDP), methodstr(FMRentalsByCustDP, processReport))]
    public static void TmpTablePostHandler(XppPrePostArgs arguments)
    {
        FMRentalsByCustDP dpInstance = arguments.getThis() as FMRentalsByCustDP;
        TmpFMRentalsByCust tmpTable = dpInstance.getTmpFMRentalsByCust();
        FMRentalCharge chargeTable;
        ttsbegin;
        while select forUpdate tmpTable
        {
            select * from chargeTable where chargeTable.RentalId == tmpTable.RentalId;
            tmpTable.ChargeDesc = chargeTable.Description;
            tmpTable.update();
        }
        ttscommit;
    }
}
```

- **Option 2: Add a temp table Inserting event.** Apply this technique for row-by-row calculations. Here is the code that expands the data set by using a table lookup.

```
class FERentalsByCustomerHandler
{
    [DataEventHandlerAttribute(tableStr(TmpFMRentalsByCust), DataEventType::Inserting)]
    public static void TmpFMRentalsByCustInsertEvent(Common c, DataEventArgs e)
    {
        TmpFMRentalsByCust tempTable = c;
        FMRentalCharge chargeTable;
        // update the value of the 'ChargeDesc' column during 'insert' operation
        select * from chargeTable where chargeTable.RentalId == tempTable.RentalId
        && chargeTable.ChargeType == tempTable.ChargeType;
        tempTable.ChargeDesc = chargeTable.Description;
    }
}
```

You've now finished expanding the report data set. After the application is compiled, it will begin to reroute user navigations to the new report design by using the custom X++ business logic that you defined in the report class handler that is defined in the extension model.

NOTE

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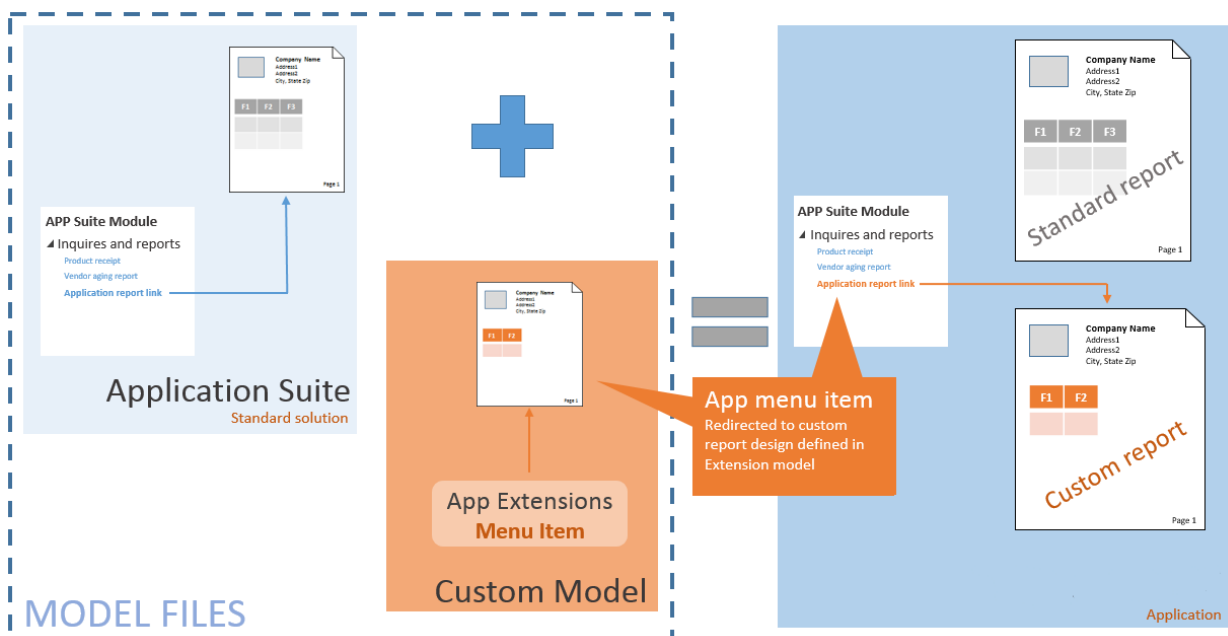
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Extend report menu items to redirect user navigation

2/18/2021 • 2 minutes to read • [Edit Online](#)

This topic shows how to extend existing application menu items so that, after only minimal code changes, navigations are redirected to a custom reporting solution.

This topic focuses on the process of extending existing application menu items so that, after only minimal code changes, navigations are redirected to a custom reporting solution. By using this technique, you will avoid the inconvenience of tracking down and replacing all references to an existing application report. Just extend an existing application menu item to redirect application navigations to reports that are defined in an extension model. The following illustration shows a typical application customization.



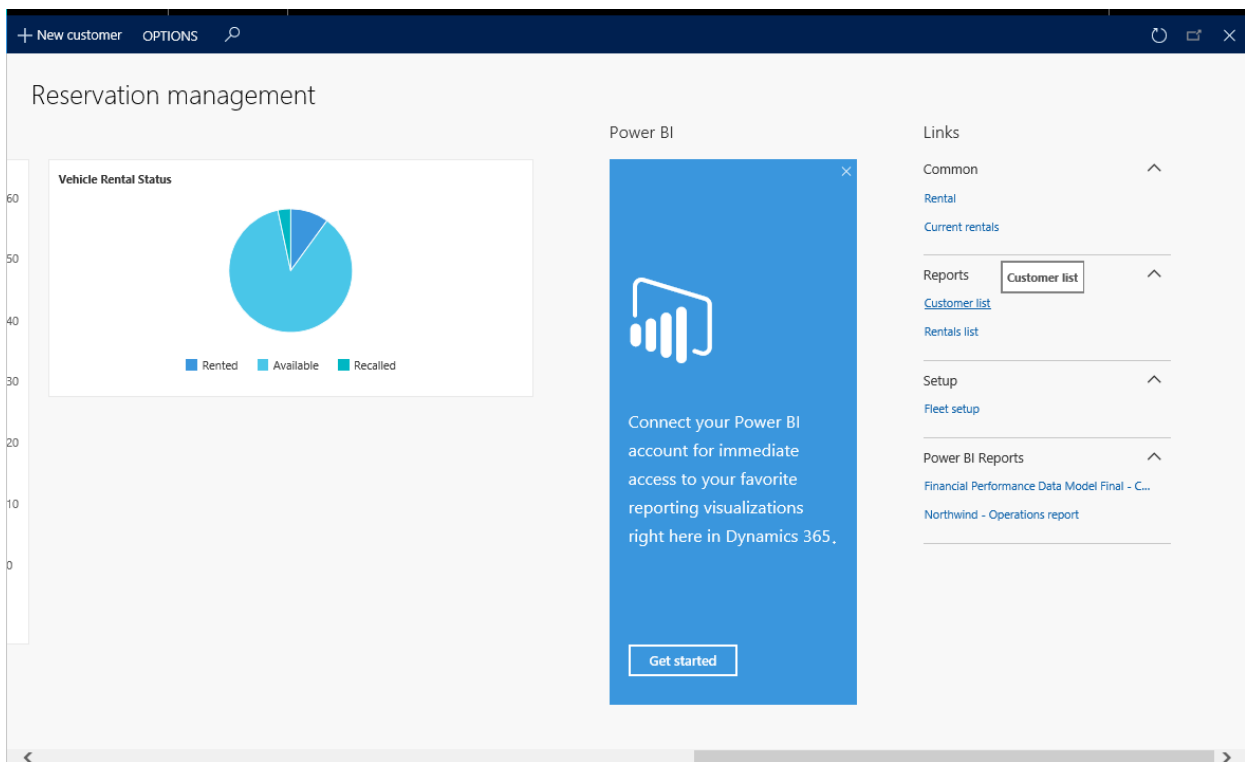
What's important to know?

There are a few basic assumptions that you should be aware of before you apply this solution.

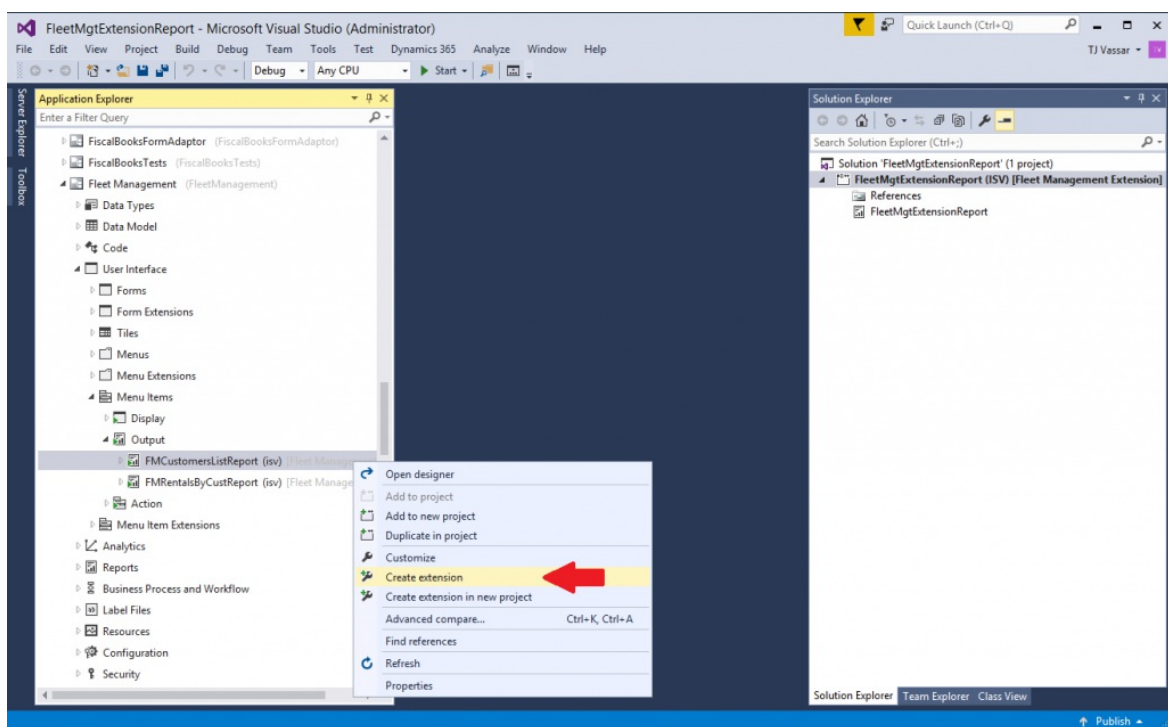
- Extended menu items let you override both the display string and the target.
- This technique can be used for all types of reports, from simple query-based reports to complex report data provider (RDP)-based reports.
- Extended menu items are available for direct references to reports and solutions that orchestrate the reporting session by using a controller class.

Extend report menu items

The following walkthrough shows how to use menu item extensions to redirect user navigations in the application to a custom solution. The solution includes a custom **Customer list** report for the Fleet Management application and defines all the application customizations in a pure extension model. The following illustration shows the menu item that you use to access the custom **Customer list** report.



1. Create a new model for your application customizations. For more information about extension models, see [Customize through extension and overlaying](#).
2. Create a new project in Microsoft Visual Studio, and add your custom report. Additionally, add all the solution artifacts. These artifacts include the RDP class or source query, the controller class, and UI builders, if they are present.
3. Create an extension of the menu item that is used to access the report. In this example, the output menu item is named `FMCustomerListReport`. Use the menu item structure to find the menu item name that is exposed in the application. The following illustration shows the action in Application Explorer.



4. Modify the properties of the menu item extension. Update the report design or controller reference in the menu item to direct navigations to your custom solution.

NOTE

The property changes that you can make on the object depend on the original application solution. If the application report manages the solution by using a controller, a controller class is required for the report.

5. Rebuild the solution, and deploy the custom report.

You've now finished extending the report menu item. Navigations to the standard menu item will now be redirected to your custom reporting solution.

NOTE

Can you tell us about your documentation language preferences? [Take a short survey.](#)

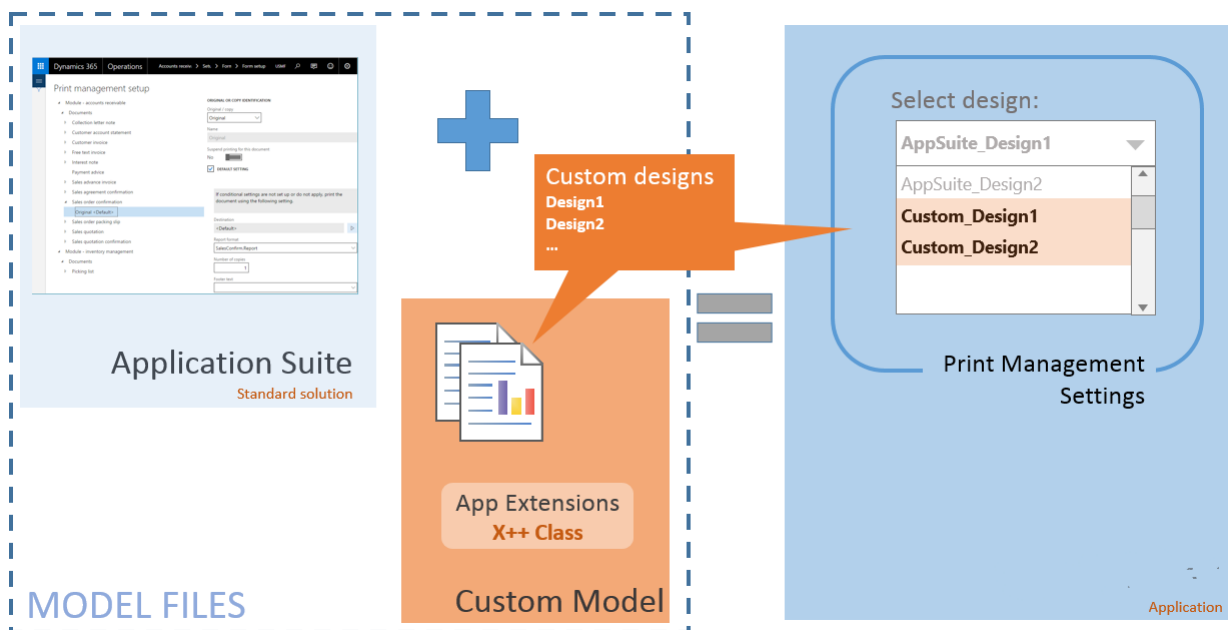
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Create custom designs for business documents

2/18/2021 • 4 minutes to read • [Edit Online](#)

This topic shows how to create a custom report design for an existing application business document by using a pure extension model.

Microsoft Dynamics 365 Finance includes an expanded set of tools to support custom solutions. This topic focuses on the steps for creating a custom report design for an existing application business document by using a pure extension model. Follow the steps later in this topic to associate a custom report design with an instance of an application document. When you've finished, users can configure Print management settings to select the custom design whenever it's appropriate, based on transaction details. The following illustration shows a typical application customization.



What's important to know?

Here are some important points that you should be aware of before you apply this solution:

- Print management settings are scoped to the active legal entity. Custom designs can be associated with one or more Print management settings.
- Standard report designs continue to be available alongside custom solutions. Use Print management settings to select the appropriate design, based on transaction details.
- If you introduce a business document for a custom business process, more work is required. For more information about how to create a custom business document solution, see the [Print Management Integration Guide](#).

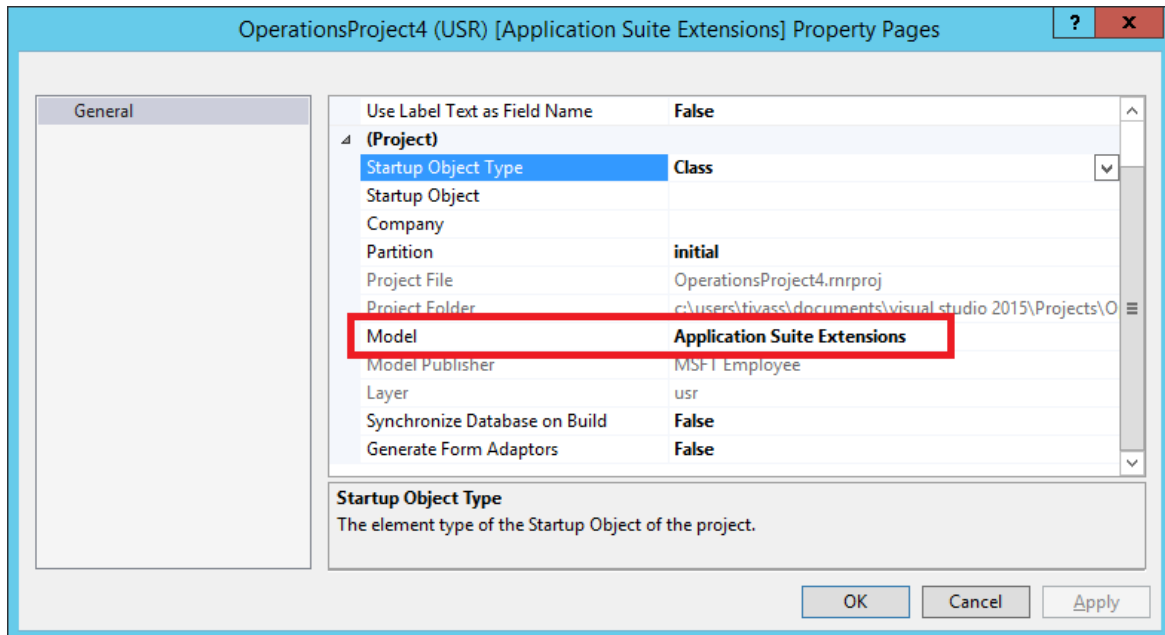
Customize a business document

The following walkthrough shows the process of introducing a custom report design for an existing application business document and then using Print management to select the new design. The solution includes a custom design definition for the **Sales confirmation** report that is provided in the standard application as part of the Application Suite model. The application customizations will be defined in an extension model.

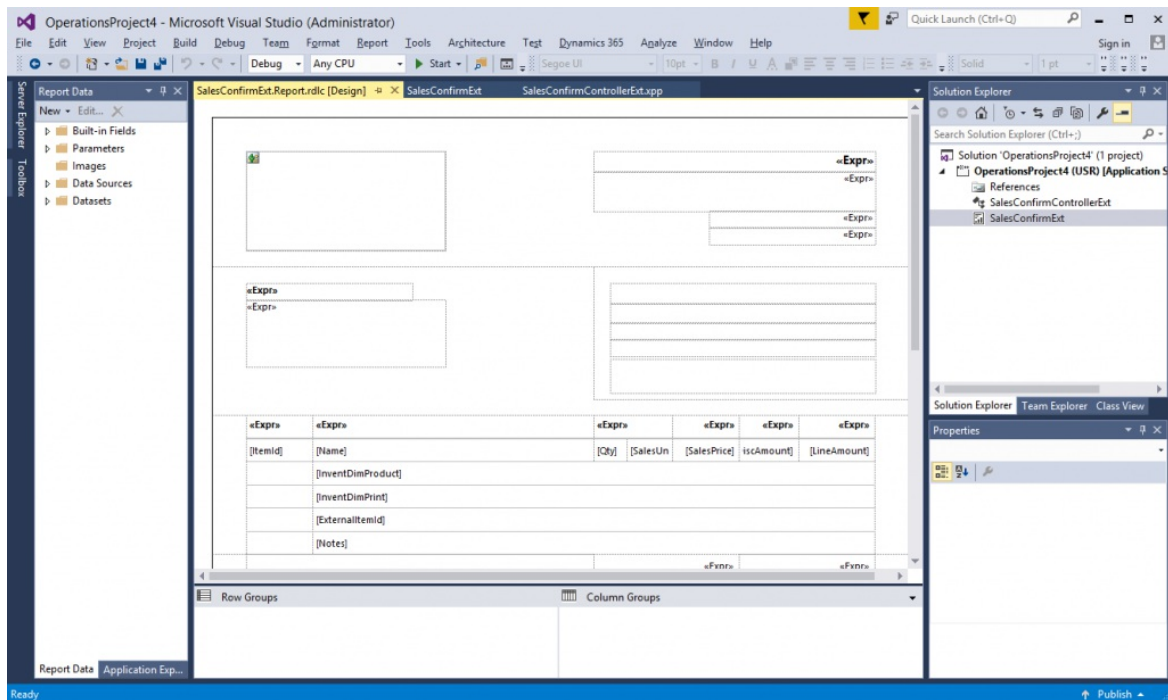
1. **Create a new model for your application customizations.** For more information about extension

models, see [Customize through extension and overlaying](#). For this example, you add a model that is named **Application Suite Extensions**, and that references the Application Suite, Application Platform, and Application Foundation packages.

2. **Create a new project in Microsoft Visual Studio.** Make sure that the project is associated with your extension model. The following illustration shows the project settings.



3. **Create a custom report design for the business document.** You must make sure that your custom solution consumes the correct report data contract. Find the existing Application Suite report in Application Explorer. This report is named **SalesConfirm**. Right-click it, and then click **Duplicate in project** to create the custom solution.
4. **Rename the report so that it has a meaningful name.** For this example, name the custom report **SalesConfirmExt** to distinguish it from the standard solution. Compile the project, and deploy the report to verify that the changes have no errors.
5. **Use the free-form designer to customize the report design.** Select the report design that is named **Report**, right-click it, and open the precision designer. Customize the design to satisfy the organization's business requirements. The following illustration shows a custom design definition for the **Sales confirmation** report.



6. Add a new X++ class that extends the standard report controller. Give the class a name that appropriately describes that it's a handler for an existing application report. For this example, rename the class `SalesConfirmControllerExt` to distinguish it from other report controllers.
7. Use the extended class to load the custom design. Add a `main` method that refers to the custom report design. (You can just copy the `main` method from the standard solution and add references to the new `Controller` class.) Here is the code that extends the standard solution.

```

class SalesConfirmControllerExt extends SalesConfirmController
{
    public static SalesConfirmControllerExt construct()
    {
        return new SalesConfirmControllerExt();
    }
    public static void main(Args _args)
    {
        SrsReportRunController formLetterController = SalesConfirmControllerExt::construct();
        SalesConfirmControllerExt controller = formLetterController; controller.initArgs(_args,
        srsReportStr(SalesConfirmExt, Report));
        if (classIdGet(_args.caller()) == classNum(SalesConfirmJournalPrint))
        {
            formLetterController.renderingCompleted +=
            eventhandler(SalesConfirmJournalPrint::renderingCompleted);
        }
        formLetterController.startOperation();
    }
}

```

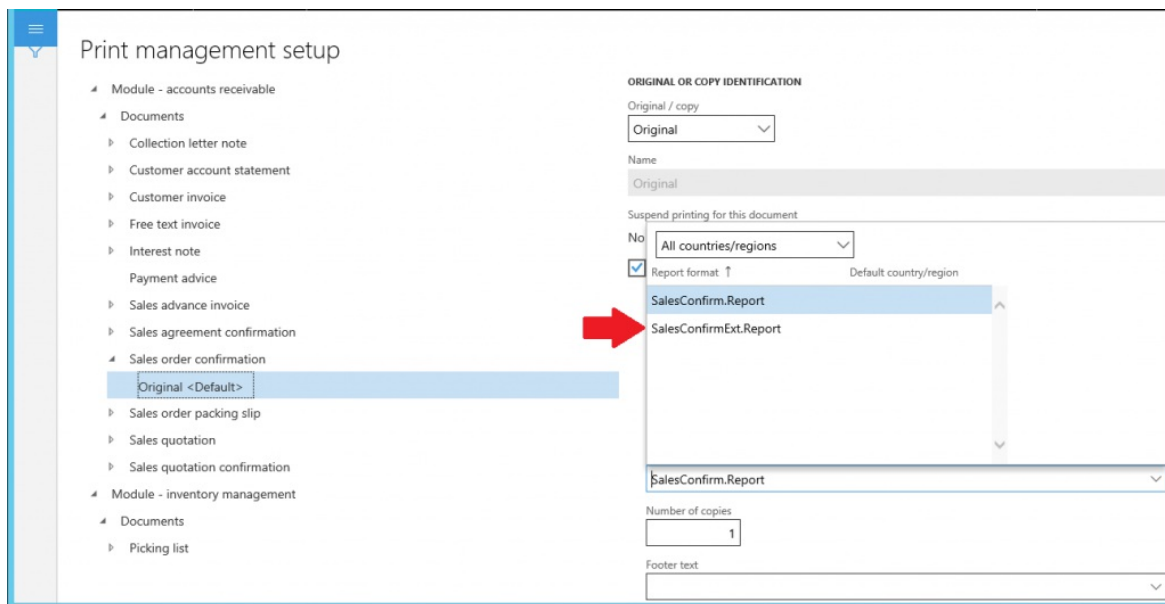
8. Add a new report handler (X++) class to the project. Give the class a name that appropriately describes that it's a handler for Print management–based documents. For this example, rename the class `PrintMgtDocTypeHandlerExt` to distinguish it from other object handlers.
9. Add a delegate handler method to start to use your custom report. In this example, extend the `getDefaultReportFormatDelegate` method in the `PrintMgtDocTypeHandlerExt` class by using the following code.

```

class PrintMgtDocTypeHandlersExt
{
    [SubscribesTo(classstr(PrintMgmtDocType), delegatestr(PrintMgmtDocType,
getDefaultReportFormatDelegate))]
    public static void getDefaultReportFormatDelegate(PrintMgmtDocumentType _docType,
EventHandlerResult _result)
    {
        switch (_docType)
        {
            case PrintMgmtDocumentType::SalesOrderConfirmation:
                _result.result(ssrsReportStr(SalesConfirmExt, Report));
                break;
        }
    }
}

```

10. **Extend the menu item for the application report.** Find the existing Application Suite menu item in Application Explorer. This menu item is named **SalesConfirmation**. Right-click it, and then click **Create extension**. Open the new extension object in the designer, and set the value of the **Object** property to **SalesConfirmControllerExt** to redirect user navigations to the extended solution.
11. **Update the Print management settings to use the custom business document.** For this example, go to **Accounts receivable > Setup > Forms > Form setup**. Click **Print Management**, find the document configuration settings, and then select the custom design. The following illustration shows the Print management settings after the changes have been compiled.



You've now finished customizing the business document. Users will now be presented with the custom report design for the business document when they process transactions in the application.

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Help prevent long-running reports from timing out

2/18/2021 • 2 minutes to read • [Edit Online](#)

This article provides tips that can help you prevent reports that run for a long time from timing out.

Paginated reports and documents are generated by using Microsoft SQL Server Reporting Services. Reporting Services retrieves report data from Application Object Server (AOS) by using a custom extension that uses Windows Communication Foundation (WCF) to communicate with AOS. The size of the data set and the complexity of the report that is generated can affect the time that is required to display the report. Additionally, if various time-outs and other thresholds are reached, report generation might fail. Service time-outs in deployments are fixed and limit interactive connections to 10 minutes. Any data set generation process that exceeds this service time-out limit won't be completed. This article describes the extensions that support long-running reports. These extensions help guarantee that long-running reports can be generated even if the process exceeds the 10-minute service time-out limit.

Preprocess the data source

If the report uses the Report Data Provider (RDP) to retrieve data, the report should be modified to use a pre-processed RDP class as the data source. In this way, processing logic is invoked before a call is made to Reporting Services. For more information about RDP classes, see [Using Report Data Provider Classes to Access Report Data](#) and [Report Programming Guide](#).

When is this necessary?

SYMPTOMS

Reports are failing due to timeouts

"A connection attempt failed because the connected party did not properly respond after a period of time...."

CAUSE

Default timeout only **10 minutes**

RESOLUTION

Pre-process the report data sets

How do I migrate a regular RDP to a pre-process data access solution by using TempDB?

1. Change the RDP base class from `SRSReportDataProviderBase` to `SRSReportDataProviderPreProcessTempDB`.
2. Update the table type from `InMemory` to `TempDB`.
3. Rebuild the report's RDP class.
4. Restore the data source that is linked to the RDP class in the report designer.

5. Redeploy the report.
6. Introduce a **Controller** class to run the report.
7. Update the Output Menu Item so that it points to the **Controller** class instead of the report.

Use batch processing

To improve performance when you print statements or reports that include large amounts of data, use batch processing. When you use batch processing, you can run specific tasks as batch jobs and then schedule those batch jobs to run on a different computer (a batch server). By moving the processing of these tasks to a batch server, you can improve the report performance on the client computer. You can also apply range restrictions to limit the size of each batch.

To further improve performance, don't submit one large batch. Instead submit multiple smaller batches for processing at the same time on different servers. Many tasks can be run as part of batch jobs. For more information, see [Batch processing overview](#).

NOTE

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Electronic reporting (ER) overview

2/18/2021 • 20 minutes to read • [Edit Online](#)

This topic provides an overview of the Electronic reporting (ER) tool. It includes information about key concepts, the scenarios that ER supports, and a list of formats that have been designed and released as part of the solution.

ER is a tool that you can use to configure formats for both incoming and outgoing electronic documents in accordance with the legal requirements of various countries/regions. ER lets you manage these formats during their lifecycle. For example, you can adopt new regulatory requirements, and generate business documents in the required format to electronically exchange information with government bodies, banks, and other parties.

The ER engine is targeted at business users instead of developers. Because you configure formats instead of code, the processes for creating and adjusting formats for electronic documents are faster and easier.

ER currently supports the TEXT, XML, Microsoft Word document, and OPENXML worksheet formats. However, an extension interface provides support for additional formats.

Capabilities

The ER engine has the following capabilities:

- It represents a single shared tool for electronic reporting in different domains and replaces more than 20 different engines that do some type of electronic reporting for Finance and Operations.
- It makes a report's format insulated from the current implementation. In other words, the format is applicable for different versions.
- It supports the creation of a custom format that is based on an original format. It also includes capabilities for automatically upgrading the customized format when the original format is changed because of localization/customization requirements.
- It becomes the primary standard tool to support localization requirements in electronic reporting, both for Microsoft and for Microsoft partners.
- It supports the ability to distribute formats to partners and customers through Microsoft Dynamics Lifecycle Services (LCS).

Key concepts

Components

ER supports two types of components: **Data model** and **Format**.

Data model and model mapping components

A data model component is an abstract representation of a data structure. It's used to describe a specific business domain area with enough detail to satisfy the reporting requirements for that domain. A data model component consists of the following parts:

- A data model, as a set of domain-specific business entities and a hierarchically structured definition of relations between those entities.
- A model mapping that links selected application data sources to individual elements of a data model that specifies, at run time, the data flow and rules of business data population to a data model component.

A business entity of a data model is represented as a container (record). Business entity properties are represented as data items (fields). Each data item has a unique name, label, description, and value. The value of

each data item can be designed so that it's recognized as a string, integer, real, date, enumeration, Boolean, and so on. Additionally, it can be another record or records list.

A single data model component can contain several hierarchies of domain-specific business entities. It can also contain model mappings that support a report-specific data flow at run time. The hierarchies are differentiated by a single record that has been selected as a root for model mapping. For example, the data model of the payment domain area might support the following mappings:

- Company > Vendor > Payment transactions of the AP domain
- Customer > Company > Payment transactions of the AR domain

Note that business entities such as company and payment transactions are designed one time. Different mappings then reuse them.

A model mapping that supports outgoing electronic documents has the following capabilities:

- It can use different data types as data sources for a data model. For example, it can use tables, data entities, methods, or enums.
- It supports user input parameters that can be defined as data sources for a data model when some data must be specified at run time.
- It supports the transformation of data into required groups. It also lets you filter, sort, and sum data, and append logical calculated fields that are designed through formulas that resemble Microsoft Excel formulas. For more information, see [Formula designer in Electronic reporting \(ER\)](#).

A model mapping that supports incoming electronic documents has the following capabilities:

- It can use different updatable data elements as targets. These data elements include tables, data entities, and views. The data can be updated by using the data from incoming electronic documents. Multiple targets can be used in a single model mapping.
- It supports user input parameters that can be defined as data sources for a data model when some data must be specified at run time.

A data model component is designed for each business domain that should be used as a unified data source for reporting that isolates reporting from the physical implementation of data sources. It represents domain-specific business concepts and functionalities in a form that makes a reporting format's initial design and further maintenance more efficient.

Format components for outgoing electronic documents

A format component is the scheme of the reporting output that will be generated at run time. A scheme consists of the following elements:

- A format that defines the structure and content of the outgoing electronic document that is generated at run time.
- Data sources, as a set of user input parameters and a domain-specific data model that uses a selected model mapping.
- A format mapping, as a set of bindings of format data sources that have individual elements of a format that specify, at run time, the data flow and rules for format output generation.
- A format validation, as a set of configurable rules that control report generation at run time, depending on the running context. For example, there might be a rule that stops output generation of a vendor's payments and throws an exception when specific attributes of the selected vendor are missing, such as the bank account number.

A format component supports the following functions:

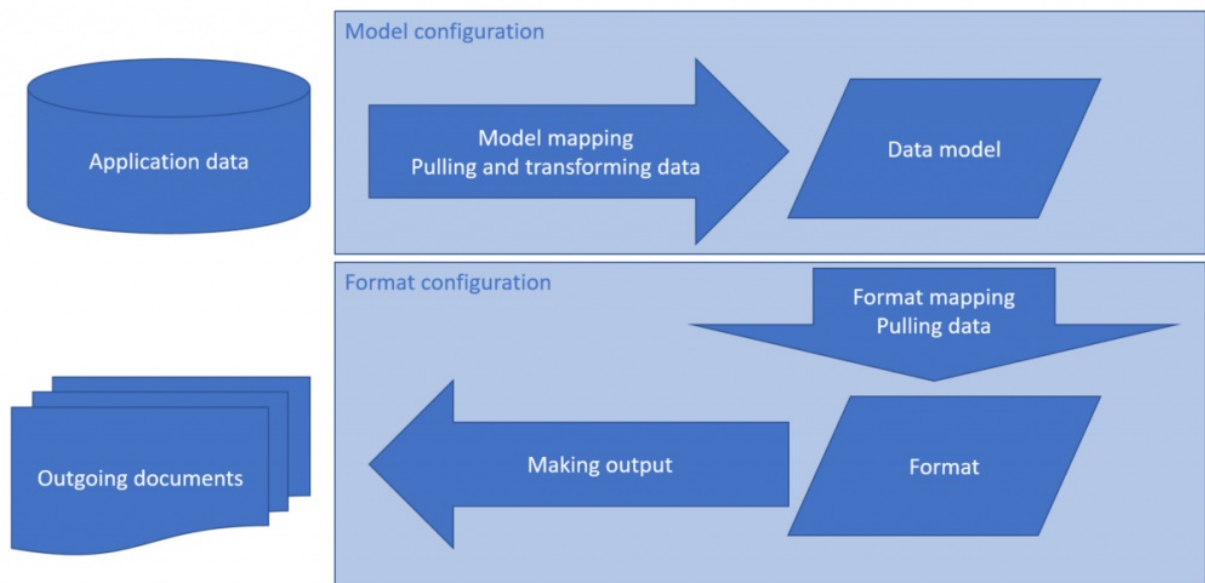
- Creation of reporting output as individual files in various formats, such as text, XML, Microsoft Word document, or worksheet.

- Creation of multiple files separately and encapsulation of those files into zip files.

A format component lets you attach specific files that can be used in the reporting output:

- Excel workbooks that contain a worksheet that can be used as a template for output in the OPENXML worksheet format
- Word files that contain a document that can be used as a template for output in the Microsoft Word document format
- Other files that can be incorporated into the format's output as predefined files

The following illustration shows how the data flows for these formats.



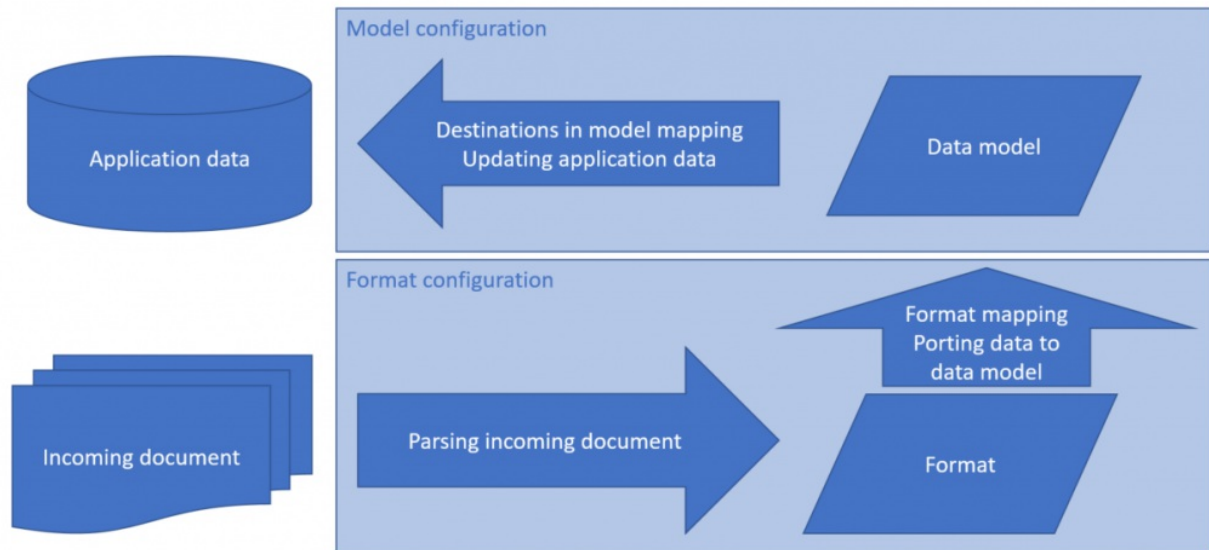
To run a single ER format configuration and generate an outgoing electronic document, you must identify the mapping of the format configuration.

Format components for incoming electronic documents

A format component is the scheme of the incoming document that is imported at run time. A scheme consists of the following elements:

- A format that defines the structure and content of the incoming electronic document that contains data that is imported at run time. A format component is used to parse an incoming document in various formats, such as text and XML.
- A format mapping that binds individual format elements to elements of a domain-specific data model. At run time, the elements in the data model specify the data flow and the rules for importing data from an incoming document, and then store the data in a data model.
- A format validation, as a set of configurable rules that control data import at run time, depending on the running context. For example, there might be a rule that stops data import of a bank statement that has a vendor's payments and throws an exception when a specific vendor's attributes are missing, such as the vendor identification code.

The following illustration shows how the data flows for these formats.



To run a single ER format configuration to import data from an incoming electronic document, you must identify the desired mapping of a format configuration, and also the integration point of a model mapping. You can use the same model mapping and destinations together with different formats for different type of incoming documents.

Component versioning

Versioning is supported for ER components. The following workflow is provided to manage changes in ER components:

1. The version that is originally created is marked as a **Draft** version. This version can be edited and is available for test runs.
2. The **Draft** version can be converted to a **Completed** version. This version can be used in local reporting processes.
3. The **Completed** version can be converted to a **Shared** version. This version is published on LCS and can be used in global reporting processes.
4. The **Shared** version can be converted to a **Discontinued** version. This version can then be deleted.

Versions that have either **Completed** or **Shared** status are available for other data interchange. The following actions can be performed on a component that has these statuses:

- The component can be serialized in XML format and exported as a file in XML format.
- The component can be reserialized from an XML file and imported into the application as a new version of an ER component.

Component date effectivity

ER component versions are date-effective. You can set the **Effective from** date for an ER component to specify the date that the component becomes effective for reporting processes. The application session date is used to define whether a component is valid for execution. If more than one version is valid for a particular date, the latest version is used for reporting processes.

Component access

Access to ER format components depends on the setting for the ISO country/region code. When this setting is blank for a selected version of a format configuration, a format component can be accessed from any company at run time. When this setting contains ISO country/region codes, a format component is available only from companies that have a primary address that is defined for one of a format component's ISO country/region codes.

Different versions of a data format component can have different settings for ISO country/region codes.

Configuration

An ER configuration is the wrapper of a particular ER component. That component can be either a data model component or a format component. A configuration can include different versions of an ER component. Each configuration is marked as owned by a specific configuration provider. The **Draft** version of a component of a configuration can be edited when the owner of the configuration has been selected as an active provider in the ER settings in the application.

Each model configuration contains a data model component. A new format configuration can be derived from a specific data model configuration. In the configuration tree, the format configuration that is created appears as a child of the original data model configuration.

The format configuration that is created contains a format component. The data model component of the original model configuration is automatically inserted into the format component of the child format configuration as a default data source.

An ER configuration is shared for application companies.

Provider

The ER provider is the party identifier that is used to indicate the author (owner) of each ER configuration. ER lets you manage the list of configuration providers. Format configurations that are released for electronic documents as part of the Finance and Operations solution are marked as owned by the **Microsoft** configuration provider.

To learn how to register a new ER provider, play the task guide, **ER Create a configuration provider and mark it as active** (part of the **7.5.4.3 Acquire/Develop IT service/solution components (10677)** business process).

Repository

An ER repository stores ER configurations. The following types of ER repositories are currently supported:

- LCS shared library
- LCS project
- File system
- RCS
- Operations resources
- Global repository

An **LCS shared library** repository provides access to the list of configurations within the Shared asset library in Lifecycle Services (LCS). This type of ER repository can only be registered for the Microsoft provider. From the LCS Shared asset library you can import the latest versions of ER configurations into the current instance.

An **LCS project** repository provides access to the list of configurations of a specific LCS project (LCS project assets library) that was selected when the repository was registered. ER lets you upload shared configurations from the current instance to a specific **LCS project** repository. You can also import configurations from an **LCS project** repository into the current instance of your Finance and Operations apps.

A **File system** repository provides access to the list of configurations that are located as xml files in the specific folder of the local file system of the machine where the AOS service is hosted. Required folder is selected at the repository registration stage. You can import configurations from a **File system** repository into the current instance.

Note that this repository type is accessible in the following environments:

- Cloud-hosted environments deployed for development purposes (containing test models of enclosed suites)
- Locally deployed environments (on-premises)

For more information, see [Import Electronic reporting \(ER\) configurations](#).

An RCS repository provides access to the list of configurations of a specific instance of [Configuration service \(RCS\)](#) that was selected at the repository registration stage. ER lets you import completed or shared configurations from the selected RCS instance into the current instance so you can use them for electronic reporting.

For more information, see [Import Electronic reporting \(ER\) configurations from RCS](#).

A **Global repository** repository provides access to the list of configurations within the global repository in the [Configuration service](#). This type of ER repository can only be registered for the Microsoft provider. From the global repository, you can import the latest versions of ER configurations into the current instance.

For more information, see [Import Electronic reporting \(ER\) configurations from Global repository of Configuration service](#).

An **Operations resources** repository provides access to the list of configurations that Microsoft, as an ER configuration provider, initially releases as part of the application solution. These configurations can be imported into the current instance and used for electronic reporting or playing sample task guides. They can also be used for additional localizations and customizations. Note that the latest versions provided by Microsoft ER configurations must be imported from the LCS Shared asset library by using corresponding the ER repository.

Required **LCS project**, **File system**, and **Regulatory Configuration Services (RCS)** repositories can be registered individually for each configuration provider of the current instance. Each repository can be dedicated to a specific configuration provider.

Supported scenarios

Building a data model

ER provides a model designer that you can use to build a data model for a particular business domain. All domain-specific business entities, and the relations between them, can be presented in a data model as a hierarchical structure.

To become familiar with the details of this scenario, play the **ER Design domain specific data model** task guide (part of the **7.5.4.3 Acquire/Develop IT service/solution components (10677)** business process).

Translating data model content

Data model content (labels and descriptions) can be translated into other languages that the applications support. You might want to translate data model content for the following reasons:

- At design time, to make the content more intelligible for format designers who speak other languages, and who will use the data model for data mapping of format components.
- At run time, to make the content more user-friendly by presenting prompts and help for run-time parameters, and configured validation messages (errors and warnings), in the language that the currently signed-in user prefers.

Configuring data model mappings for outgoing documents

ER provides a model mapping designer that lets users map data models that they have designed to specific application data sources. Based on the mapping, the data will be imported at run time from selected data sources into the data model. The data model is then used as an abstract data source of ER formats that generate outgoing electronic documents.

To become familiar with the details of this scenario, play the **ER Define model mapping and select data sources** and **ER Map data model to selected data sources** task guides (part of the **7.5.4.3 Acquire/Develop IT service/solution components (10677)** business process).

Configuring data model mappings for incoming documents

ER provides a model mapping designer that lets users map data models that they have designed to specific destinations. For example, data models can be mapped to the updatable data components (tables, data entities, and views). Based on the mapping, the data will be updated at run time by using the data from the data model. As abstract storage of the ER format, the data model is filled with data that is imported from an incoming electronic document.

Storing a designed model component as a model configuration

ER can store a designed data model, together with associated data mappings, as a model configuration of the current instance. The following illustration shows an example of this type of data model configuration (the payment model configuration).

To become familiar with the details of this scenario, play the **ER Map data model to selected data sources** task guide (part of the **7.5.4.3 Acquire/Develop IT service/solution components (10677)** business process).

Building a format that uses a data model as a base

ER supports a format designer that you can use to build the format of an electronic document for a selected business domain by selecting the model component as a base. The same ER format designer lets you map a format that you create to a selected domain's data model mapping as a data source.

To become familiar with the details of this scenario, play the **ER Design domain specific format** task guide (part of the **7.5.4.3 Acquire/Develop IT service/solution components (10677)** business process).

Building a configuration to generate electronic documents in OPENXML worksheet format

The ER format designer can be used to build an electronic document in OPENXML worksheet format.

To become familiar with the details of this scenario, play the **ER Create a configuration for reports in OPENXML format** task guide (part of the **7.5.4.3 Acquire/Develop IT service/solution components (10677)** business process). As part of the task guide step for importing a template, use the [Template of Payment Report \(SampleVendPaymWsReport.xlsx\)](#) Excel file as a template.

Building a configuration to generate electronic documents in a Word document format

The ER format designer can be used to build an electronic document in a Word document format. The following illustration shows an example of this type of format. Note that this format reuses the existing ER configuration that was originally designed to generate the report output in OPENXML format.

To become familiar with the details of this scenario, play the **ER Design a configuration for generating reports in Microsoft WORD format** task guide (part of the **7.5.4.3 Acquire/Develop IT service/solution components (10677)** business process). As part of the task guide step for importing a template, use the following Word files as templates for the ER format:

- [Template of Payment Report \(SampleVendPaymDocReport.docx\)](#)
- [Bounded template of Payment Report \(SampleVendPaymDocReportBounded.docx\)](#)

Building a configuration to import data from incoming electronic documents

The ER format designer can be used to describe an electronic document that is planned for data import in either XML or text format. The designed format is used to parse an incoming document. The ER format mapping designer can be used to define the binding of the elements of the designed format to the data model.

To become familiar with the details of this scenario, play the **Create required ER configurations to import data from an external file** task guide (part of the **7.5.4.3 Acquire/Develop IT service/solution components (10677)** business process). Use the following files to play this guide:

- [ER data model configuration \(1099model.xml\)](#)
- [ER format configuration \(1099format.xml\)](#)
- [Sample of the incoming document in XML format \(1099entries.xml\)](#)

- [Sample of the workbook to manage data of incoming document \(1099entries.xlsx\)](#)

Storing a designed format component in a format configuration

ER can store a designed format together with the configured data mappings as a format configuration of the current instance. The preceding illustration shows an example of this type of format configuration (**BACS (UK)**, which is a child of the **Payment model** configuration). To become familiar with the details of this scenario, play the **ER Design domain specific format task guide** (part of the **7.5.4.3 Acquire/Develop IT service/solution components (10677)** business process).

Configuring Finance to start to use a created format internally

The application can be configured to start to use a created format to generate electronic reports. The reference to the created format configuration should be defined in the settings of a specific domain. For example, to start to use an ER format configuration for electronic vendor payments in BACS format, the format configuration should be referenced in specific methods of payment.

To become familiar with the details of this scenario, play the **ER Use format to generate electronic document for payments task guide** (part of the **7.5.4.3 Acquire/Develop IT service/solution components (10677)** business process).

Handling ER components

Publishing an ER component in LCS to offer it externally (localization)

The owner of a component (model or format) that has been created can use ER to publish the completed version of the component to LCS. A repository of the **LCS project** type for the current ER configuration provider is required. When the status of the completed version of a component is changed from **COMPLETED** to **SHARED**, that version is published in LCS. When a component has been published to LCS, the owner of that component becomes a provider of the service to support the component. For example, if the format component is designed to generate an electronic document that is legally required (for example, in accordance with a localization scenario), it's assumed that the format will be kept compliant with legislative changes, and that the provider will issue new versions of the component whenever new legislative requirements arise. To become familiar with the details of this scenario, play the **ER Upload a configuration into Lifecycle Services task guide** (part of the **7.5.4.3 Acquire/Develop IT service/solution components (10677)** business process).

Importing an ER component from LCS to use it internally

ER lets you import ER components from LCS to the current instance. A repository of the **LCS project** type is required. When an ER component has been imported from LCS to the current instance, the owner of the instance becomes a consumer of the service that is provided by the owner (author) of the imported component. For example, if a format component is designed to generate a specific electronic document from the application in a country/region-specific format (localization scenario), it's assumed that the service consumer will be able to obtain any updates that are made to that format, to keep it compliant with legislative requirements. To become familiar with the details of this scenario, play the **ER Import a configuration from Lifecycle Services task guide** (part of the **7.5.4.3 Acquire/Develop IT service/solution components (10677)** business process).

Building a format selecting another format as a base (customization)

ER lets you create (derive) a new component from the current version of a component (base) that was imported from LCS. For example, a user wants to derive a new format to implement some special requirements for an electronic document (such as an additional field or an extensive description) to support a customization scenario. To become familiar with the details of this scenario, play the **ER Upgrade format by adoption of new base version of it task guide** (part of the **7.5.4.3 Acquire/Develop IT service/solution components (10677)** business process).

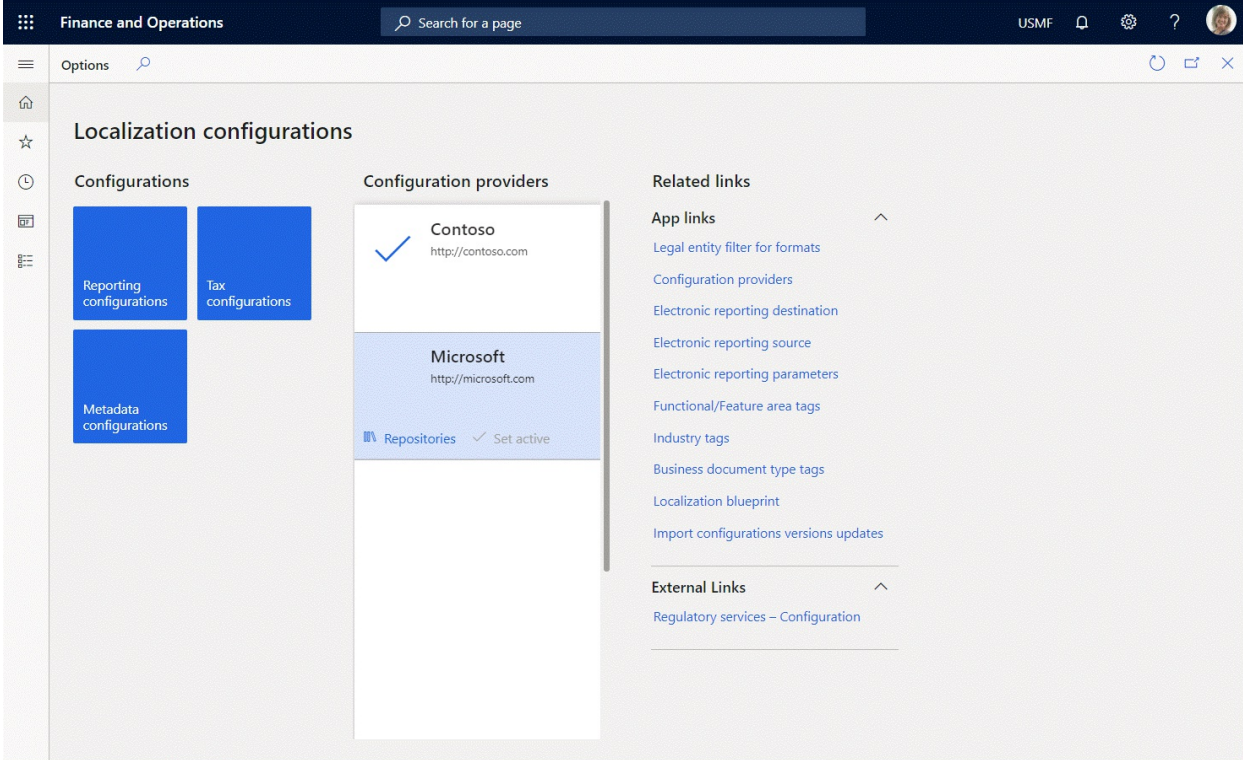
Upgrading a format selecting a new version of base format (rebase)

ER lets you automatically adopt changes of the latest version of the base component in the current draft version

of the derived component. This process is known as *rebasing*. For example, a new regulatory change that has been introduced in the latest version of the format that was imported from LCS can be automatically merged into the customized version of this format of the electronic document. Any changes that can't be merged automatically are considered conflicts. These conflicts are presented for manual resolution in the designer tool for the appropriate component. To become familiar with the details of this scenario, play the **ER Upgrade format by adoption of new base version of that format** task guide (part of the 7.5.5.3 Acquire/Develop changed IT service/solution component (10683) business process).

List of ER configurations that have been released in Finance

The list of ER configurations for Finance is constantly updated. Open the [Global repository](#) to review the list of ER configurations that are currently supported. On the **Discontinuation details** FastTab, you can review the information about configurations that have been discontinued or that are no longer being maintained.



The screenshot shows the 'Localization configurations' page in the Finance and Operations application. The page is divided into three main sections: 'Configurations', 'Configuration providers', and 'Related links'. The 'Configurations' section on the left contains three blue tiles: 'Reporting configurations', 'Tax configurations', and 'Metadata configurations'. The 'Configuration providers' section in the center lists two providers: 'Contoso' (http://contoso.com) and 'Microsoft' (http://microsoft.com). The 'Microsoft' provider is highlighted in blue and has a 'Repositories' button and a 'Set active' checkbox. The 'Related links' section on the right is divided into 'App links' and 'External Links'. The 'App links' section includes links for 'Legal entity filter for formats', 'Configuration providers', 'Electronic reporting destination', 'Electronic reporting source', 'Electronic reporting parameters', 'Functional/Feature area tags', 'Industry tags', 'Business document type tags', 'Localization blueprint', and 'Import configurations versions updates'. The 'External Links' section includes a link for 'Regulatory services - Configuration'.

Additional resources

- [Create Electronic reporting \(ER\) configurations](#)
- [Manage the Electronic reporting \(ER\) configuration lifecycle](#)

NOTE

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Create Electronic reporting (ER) configurations

2/18/2021 • 13 minutes to read • [Edit Online](#)

As part of the requirements for LCS solutions for localization and translation, localization ISV solution providers must implement country/region-specific or solution-specific features by using the Electronic reporting tool. This article provides background information that will help you start to use Electronic reporting to create configurations. This article isn't meant to replace any available and upcoming Electronic reporting documentation, but is intended as a supplemental view from the perspective of localization requirements.

Electronic reporting

General electronic reporting (GER) is a new configurable tool that helps you create and maintain regulatory electronic reporting and payments, based on the following three concepts.

Configuration instead of coding

- Configuration can be done by a business user and doesn't require a developer.
- The data model is defined in business terms.
- Visual editors are used to author all components of the GER configuration.
- A Microsoft Excel-like formula language is used for data transformation.

One configuration for multiple Dynamics 365 Finance releases

- Manage one domain specific data model that is defined in business terms.
- Isolate application release specifics in release-dependent data model mappings.
- Maintain one format configuration for multiple releases of the current version, based on the data model.

Easy or automatic upgrade

- Versioning of GER configurations is supported.
- The Microsoft Dynamics Lifecycle Services (LCS) Assets library can be used as a repository for GER configurations for version exchange.
- Localizations that are based on origin GER configurations can be introduced as child versions.
- A GER configuration tree is provided as a tool that helps control dependencies for versions.
- Only differences in localization (delta configuration) are recorded to enable automatic upgrade to a new version of the origin GER configuration.
- It's easy to manually resolve conflicts that are discovered during automatic upgrade of localization versions.

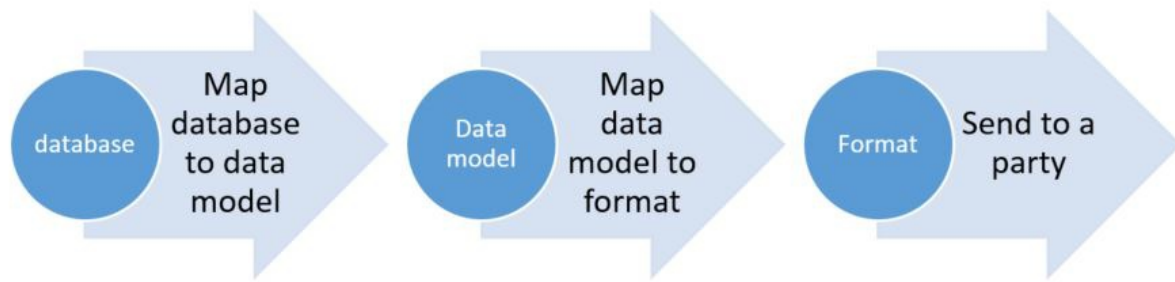
GER lets users define electronic format structures, and then describe how those structures should be filled by using data and algorithms. Users can use a formula language that is very similar to the Excel language for data transformation. To make the database-to-format mapping more manageable, reusable, and independent of format changes, an intermediate data model concept is introduced. This concept enables implementation details to be hidden from the format mapping and also enables a single data model to be reused for multiple format mappings.

What's new here

WHAT CAN YOU DO?	MICROSOFT DYNAMICS AX 2012	CURRENT VERSION OF FINANCE	WHY IS THIS IMPORTANT?
Configure and generate electronic documents to meet the legal requirements in various countries/regions.	Electronic documents are hard-coded in X++ or as Extensible Stylesheet Language Transformations (XSLTs).	GER is a new tool for configuring and generating electronic documents that target a business user instead of a developer.	GER simplifies the creation, maintenance, and upgrade of electronic document formats to meet legal requirements in various countries/regions.
Configure regulatory updates to formats.	Any format adjustments require development effort.	A business user can configure the formats, based on domain-specific data models (for example, for payments, Intrastat reports, or tax reports).	GER makes the process of creating or changing electronic document formats faster and easier. These changes can be made by business users instead of developers.
Separation of data and formats makes updates easier.	Access to data and access to formatting aren't isolated.	GER lets you set up data models that are domain-specific and independent of the database as data sources for document formats. Formats can be configured based on these domain-specific data models by using simple visual tools that are similar to Excel. Data models and formats support versioning, and formats can be date-effective.	GER makes it faster and easier for partners and customers to upgrade their format and customizations to new versions of formats that are released by Microsoft or other partners.
Distribute data models and formats.	An adjusted format deployment requires a new hotfix package that overrides the existing format.	Each data model or format version is stored in a separate configuration, and is distributed to partners and customers through LCS. By using LCS, partners can share their data model and format configurations with other partners and customers, who can customize and share them further.	GER provides one common way (through LCS) for Microsoft and partners to distribute electronic document configurations to other partners and customers. GER also makes it easier for partners and customers to customize, upgrade, and distribute electronic document formats for their specific business requirements.
Customization and upgrade are easier.	Custom modification of each format must be manually ported to the source code of a new hotfix package.	Partners and customers can customize Microsoft data models and formats, or create their own. GER saves partner and customer configuration changes as deltas to Microsoft configurations to simplify upgrades to new versions of Microsoft configurations. Delta customization and easy upgrade are supported through the whole customization chain.	GER provides one common way (through LCS) for Microsoft and partners to distribute electronic document configurations to other partners and customers. GER also makes it easier for partners and customers to customize, upgrade, and distribute electronic document formats for their specific business requirements.

Basic concepts

Main data flow



Data model configuration creation

It's a good idea to reuse and customize data models that are released by Microsoft whenever you can, or to create a business domain area-specific data model that will introduce the abstract model of required entities and their relations. In this way, you will be aligned with future updates that are released by Microsoft, or can at least reuse your model for the design and maintenance of multiple domain-specific electronic documents that have different formats that are required in different scenarios or countries/regions.

Design the data model of the created model configuration

A data model is designed to recognize and describe the required business entities and the relations between them in the selected domain. A data model consists of descriptors that express entities by using data containers (records). Properties of entities are expressed by using data items. A record definition is an entity that contains fields (the data items). Each data item has a unique name, label, description, and value. The value of each data item can be designed so that it's recognized as string, integer, real, date, enumerate type, and so on. Additionally, the value can be another record or record list. A single record definition can be selected as a root of the data model. (A root is the starting point of the entire model for data source mapping.) In this case, the model is used as a data source that delivers data according to the single predefined data flow. If no record definition was selected as a root of the data model, the data model contains record definitions that can be assigned as a root at the format mapping stage. The data flow of such a model can be defined as a data source in multiple ways, depending on the nature of the format. For example, a single data model can be designed for the payments domain area. This data model can include data record definitions for the company as a legal entity, for vendors and customers, and also for payments. However, according to the nature of the format, the data must be presented in the following way: payer > payee > payments. Therefore, a single data model can offer data according to the following alternative paths:

- Company > vendor > payment for the Accounts payable domain when the company record definition is selected as a root.
- Customer > company > payment for the Accounts receivable domain when the customer record definition is selected as a root.

Format configuration creation

You use the data model configuration that is created to hold abstract data for a new electronic format that you want to design. If you intend to consume a data model that was prepared earlier when you create a new format, make sure that you select the **Format based on data model** option for **Create configuration**. After you have a format configuration, you must define a format structure. The structure can be created manually or automatically by importing an example of an XML file or an Excel template. The data model of the parent configuration is automatically offered for format mapping, together with a proper root container. Nevertheless,

a format might require that data be represented in a specific way. Therefore, you can use formula designer to define expressions as virtual data items (calculated fields) for our data containers.

NOTE

Although GER allows for direct mapping of format components to database artifacts (tables or data entities), we don't recommend this approach, because it's likely that multiple formats will be maintained in some business domain areas that use the same data sources. Whenever the structure of such database artifacts is changed, the format mapping to the database artifacts must also be changed, and the cost of these changes will be multiplied by the number of maintained formats. Therefore, we recommend that you work through the data model as the abstract description of the domain-specific data structure, and that you use the direct binding of format elements to database components only for simplification and for coverage for specific customizations (for example, to refer to custom tables when these references are required in a limited number of maintained formats).

Version control

One of the principles behind the design of Electronic reporting is that it should be easy to distribute a data model and formats together with an enhanced maintenance model for their customizations. All the configurations are versioned, and an existing customization can be "cloned" to derive a new configuration for localization or customization implementation. For example, we represent a company that is named Proseware, Inc. We have subscribed to the service of a company that is named Litware Inc., which provides us with the Intrastat returns configuration and supports all legal requirements in it. We have already received specific configurations, from Litware Inc., together with data model and formats, and have deployed them. Our company is working in a district where, in addition to the federal requirements, we must support the following regional requirements:

- As part of Intrastat transactions details, our XML file must show the statistical procedure code that isn't required anywhere else.
- We must limit the length of the company name that is presented in the Intrastat returns header block to 200 characters.

To support these requirements and comply with local district authorities, we must implement this localization as a localized configuration. However, we must keep the link with the origin configuration, so that we can adopt any future changes that are introduced at the federal level as new versions of the origin configuration. Therefore, we import the Litware Inc. origin configuration from LCS, derive it as a new localized configuration, introduce the required changes, complete this work by introducing a first version of the localized format, and start to use it internally. Whenever Litware Inc. offers us a new version of the origin configuration, we import it from LCS, rebase our localized configuration to this version, adopt changes to support new federal requirements, complete this work by introducing a next version of the localized format, and continue to use it internally.

NOTE

The draft version of any configuration must be "completed" before it can become available locally for further action, such as the following:

- Make it available so that it can be referenced as a data source from a new format.
- Enable configuration exchange between companies or instances via configuration import/export, and so on.

Electronic reporting domain coverage

Several out-of-box configurations can be used to meet electronic reporting requirements for specific countries/regions. The following list show some examples of format configurations that are grouped into business domains. To get a complete, up-to-date list of available and supported configurations, open a

configuration repository setup to show the configurations that are available for import from either resources or an LCS Assets library.

- Audit file
 - FEC
 - GDPdU...
- Payments (ISO20022)
 - SEPA CT
 - SEPA DD
 - JBA
 - BACS...
- Statistical reports
 - EU Intrastat...
- Tax reports
 - CIS
 - BAS
 - ELSTER
 - EU Sales list...
- Customer e-Invoice
 - OIOUBL...

Your solution uptake

You can choose how to move your electronic reporting functionality into GER. However, you should consider the following high-level steps when you plan that move.

1. Review the electronic reporting functionality that your solution currently provides.
2. Identify domain areas that your solution covers, such as Payments and E-Invoices.
3. Review the configurations that are provided by Microsoft. It's likely that you'll find a configuration that you can use as a base. For example, if your solution customizes the SEPA CT payment format, you should extend the SEPA CT configuration.
4. Create new configurations that are based on either an existing model or format, or a new model or format.
5. Define input parameters that users must select when they run the report, and validations for the content of the report.
6. Define mappings with the model by using arithmetic, string, data, or other available Excel-like functions.
7. Define labels and translation to different languages, where applicable.
8. Define templates that have named ranges, and set links from the configuration for the Excel report, if applicable.

Terminology

TERM	DEFINITION
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TERM	DEFINITION
GER	Electronic reporting is an engine that simplifies the creation of electronic reports for information interchange with governments, banks, and other parties. Currently, Electronic reporting supports text, XML, and OpenXML spreadsheet formats, and provides an extension interface to support more formats.
Transformation	If you have a typical action that must be done on the source of data before it is sent as output to a format, you can introduce a transformation and attach it to format components. Transformation is a GER formula that takes one value as a parameter and returns another value. For example, you have many format fields that contain spaces, and the spaces should be replaced by spaces when the fields are exported. In this case, you can create a transformation that takes a string argument and uses the REPLACE function to do the job. You can then create string components and associate them with that transformation.
Data model	A data model provides a structure for data. This structure is used to abstractly describe certain business domain areas at sufficient detail to satisfy the reporting requirements in this domain.
Configuration	A container for either a data model or a format, together with its mappings to data sources, that can be maintained and executed, and that supports versioning. The configuration is the entity that will be imported or exported to organize electronic document format exchange between Finance and Operations instances.
Derive action	An operation that uses a configuration that already exists as a basis to create a new configuration.
Rebase action	An operation that updates a derived configuration with changes that were introduced in a new version of the base configuration. The version number is selected at the rebase initialization stage.
Update conflict	A conflict that is discovered during the rebase action, where the new base version contains adjustments of a format/mapping element (name, property, and so on) that has also been adjusted in the derived version.
Relocation conflict	A conflict that is discovered during the rebase action, where the new base version contains a new position (parent element) of a format element (name, property, and so on) that has also been relocated to a different position in the derived version.
Duplication conflict	A conflict that is discovered during the rebase action, where the new base version introduced a new format element that is the same as an element (in other word, it has the same name and child components) that has also been entered in the derived version.

Additional resources

Electronic reporting (ER) overview

Manage the Electronic reporting (ER) configuration lifecycle

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

ER Design domain specific data model

2/18/2021 • 5 minutes to read • [Edit Online](#)

The following steps explain how a user in the System Administrator or Electronic Reporting Developer role can create a new Electronic reporting (ER) configuration that contains a data model for electronic payment documents. This data model will later be used as a data source when you create the format of the payment documents.

In this example, you will create a configuration for sample company, Litware, Inc. These steps can be performed in any company as ER configurations are shared among companies. To complete these steps, you must first complete the steps in the "Create a configuration provider and mark it as active" procedure.

1. Go to Organization administration > Workspaces > Electronic reporting.

Select the configuration provider for sample company, 'Litware, Inc.' If you don't see this configuration provider, you must first complete the steps in the "Create a configuration provider and mark it as active" procedure.

2. Click Reporting configurations.

You will create a configuration that contains a data model for electronic payment documents. This data model will be used later as a data source when you create the format for the payment documents.

Create a new data model configuration

1. Click Create configuration to open the drop dialog.
2. In the Name field, type 'Payments (simplified model)'.
3. In the Description field, type 'Payment model configuration'.

The active configuration provider is automatically entered here. This provider will be able to maintain this configuration. Other providers can use this configuration, but will not be able to maintain it.

4. Click 'Create configuration' button to complete the configuration creation task

Create a data model

You're creating a new data model for the selected configuration. This configuration version will have a status of Draft.

1. Click Designer.

Define the structure of a party participating in a payment process

1. Click New to open the drop dialog.
2. In the Name field, type 'Party'.
3. Click Add.
4. Click New to open the drop dialog.
5. In the Name field, type 'Name'.
6. In the Item type field, select 'String'.
7. Click Add.
8. In the Find field, type 'Party'.

9. Click Find previous.

Define the bank structure for this model

1. Click New to open the drop dialog.
2. In the Name field, type 'Agent'.
3. In the Item type field, select 'Record'.
4. Click Add.
5. In the Description field, enter 'Financial institution (for instance, a bank) servicing an account for the party (debtor/creditor).'

Financial institution (for instance, a bank) servicing an account for the party (debtor/creditor).

6. Click New to open the drop dialog.
7. In the Name field, type 'Name'.
8. In the Item type field, select 'String'.
9. Click Add.
10. Click New to open the drop dialog.
11. In the Name field, type 'SWIFT'.
12. Click Add.
13. In the Description field, enter 'Bank identification code'.
14. Click New to open the drop dialog.
15. In the Name field, type 'RoutingNumber'.
16. Click Add.
17. In the Description field, enter 'Routing number'.
18. Click Find previous.

Define the bank account structure for this model

1. Click New to open the drop dialog.
2. In the Name field, type 'Account'.
3. In the Item type field, select 'Record'.
4. Click Add.
5. In the Description field, enter 'Identification of an account of a party in a financial institution (for instance, a bank).'

Identification of an account of a party in a financial institution (for instance, a bank).

6. Click New to open the drop dialog.
7. In the Name field, type 'Currency'.
8. In the Item type field, select 'String'.

9. Click Add.
10. In the Description field, enter 'Currency code'.
11. Click New to open the drop dialog.
12. In the Name field, type 'Number'.
13. Click Add.
14. Click New to open the drop dialog.
15. In the Name field, type 'IBAN'.
16. Click Add.
17. In the Description field, enter 'International bank account number'.

Define the payment message structure for credit transfer payment type

1. Click New to open the drop dialog.
2. In the New node as a field, enter 'Model root'.
3. In the Name field, type 'CustomerCreditTransferInitiation'.
4. Click Add.
5. In the Find field, type 'CustomerCreditTransferInitiation'.
6. Click Find previous.
7. Click New to open the drop dialog.
8. In the Name field, type 'MessageIdentification'.
9. Click Add.
10. In the Description field, enter 'The point-to-point reference assigned by the instructing party (and sent to the next party) to identify a message.'.

The point-to-point reference assigned by the instructing party (and sent to the next party) to identify a message.

11. Click New to open the drop dialog.
12. In the Name field, type 'ProcessingDateTime'.
13. In the Item type field, select 'DateTime'.
14. Click Add.
15. In the Description field, enter 'Date and time at which the payment message was created.'.
16. Click New to open the drop dialog.

Define the payment transaction structure for this model.

17. In the Name field, type 'Payments'.
18. In the Item type field, select 'Record list'.
19. Click Add.

20. In the Description field, enter 'Payment lines of the current message'.
21. Click New to open the drop dialog.
22. In the Name field, type 'Creditor'.
23. In the Item type field, select 'Record'.
24. Click Add.
25. In the Description field, enter 'Party to which an amount of money is due.'.
26. Click Switch item reference.
27. In the Find field, type 'Party'.
28. Click Find next.
29. Click OK.
30. In the Find field, type 'Payments'.
31. Click Find next.
32. Click New to open the drop dialog.
33. In the Name field, type 'Debtor'.
34. Click Add.
35. In the Description field, enter 'Party that owes an amount of money to the (ultimate) creditor.'.
36. Click Switch item reference.
37. In the Find field, type 'Party'.
38. Click Find next.
39. Click OK.
40. Click Find next.
41. Click New to open the drop dialog.
42. In the Name field, type 'Description'.
43. In the Item type field, select 'String'.
44. Click Add.
45. Click New to open the drop dialog.
46. In the Name field, type 'Currency'.
47. Click Add.
48. In the Description field, enter 'Currency code'.
49. Click New to open the drop dialog.
50. In the Name field, type 'TransactionDate'.
51. In the Item type field, select 'Date'.
52. Click Add.

53. In the Description field, enter 'Transaction date'.
54. Click New to open the drop dialog.
55. In the Name field, type 'InstructedAmount'.
56. In the Item type field, select 'Real'.
57. Click Add.
58. In the Description field, enter 'The amount of money to be moved between the debtor and creditor, before deduction of charges. The amount should be expressed in the currency as ordered by the initiating party.'

The amount of money to be moved between the debtor and creditor, before deduction of charges. The amount should be expressed in the currency as ordered by the initiating party.
59. Click New to open the drop dialog.
60. In the Name field, type 'End2EndID'.
61. In the Item type field, select 'String'.
62. Click Add.
63. In the Description field, enter 'The unique identification assigned by the initiating party. This identification is passed on, unchanged, throughout the entire end-to-end chain.'
64. In the Name field, type 'PaymentModel'.

The PaymentModel name aligns with predefined interfaces of payment forms.
65. Click Save.
66. Close the page.

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Prepare application metadata to be used in RCS

2/18/2021 • 2 minutes to read • [Edit Online](#)

The following steps explain how a user in the System Administrator or Electronic Reporting Developer role can create a new Electronic reporting (ER) configuration that contains application metadata for designing ER model mapping configurations in Regulatory configuration service (RCS). This configuration will be used for designing a sample ER model mapping configuration to access foreign trade transactions. In this example, you will create a configuration for sample company, Litware, Inc. These steps can be performed in any company. To complete these steps, you must first complete the steps in the topic, [Create configuration providers and mark them as active](#).

Prerequisites

1. Go to **Organization administration > Workspaces > Electronic reporting**.
2. Make sure that the configuration provider for the sample company, Litware, Inc., is available and marked as **Active**. If you don't see this configuration provider, complete the steps in the procedure [Create configuration providers and mark them as active](#).
3. Click **Metadata configurations**.
4. Assume that RCS will be used to design an ER solution for a Finance and Operation application that will generate electronic documents that contain information from foreign trade business domain. To specify the mapping between ER data model and sources of required data, in RCS we need to have access to metadata of the Finance and Operation application. Therefore, as part of designing ER solution we configure a new ER metadata configuration containing all metadata that is currently required for generation ER reports for selected business domain.

Add metadata configuration

1. Click **Create configuration** to open the drop dialog.
2. In the **Name** field, type 'Foreign trade metadata'.
3. Click **Create configuration**.
4. Click **Designer**.
5. Click **Add**.

NOTE

You can select all metadata for the entire application or selected models or selected modules. Be aware that in this case the following metadata will be automatically added: tables of records, enumerations, and extended data types. When additional types of metadata are needed, they must be added manually.

We have some foreign trade transactions related metadata by selecting metadata items manually.

6. Click **Add data source**.
7. Click **Table records**.
8. Use the Quick Filter to filter on the **Name** field with a value of 'Intrastat'.
9. Select the **Intrastat** table record.
10. Click **OK**.

We added metadata information about the Intrastat table of records.

11. In the tree, expand **Table records Intrastat>Relations**.
12. In the tree, select **Table records Intrastat>Relations\IntrastatCommodity (Table records EcoResCategory)**.
13. Click **Add metadata**.

NOTE

Metadata about required relations for selected table of records must be added manually.

16. Click **Add data source**.
17. Click **Enumeration**.
18. Use the Quick Filter to filter on the **Name** field with a value of 'IntrastatDirection'.
19. Select the **IntrastatDirection enumeration** record.
20. Click **OK**.
21. Click **Save**.
22. Close the page.

Complete the draft version of metadata configuration

1. Click **Change status**.
2. Click **Complete**.
3. Click **OK**.
4. Select the completed version 1.

Export the completed version of metadata configuration from application as XML file

1. Click **Exchange**.
2. Click **Export as XML file**.
3. Click **OK**.

The created ER metadata configuration has been saved as XML file that can be imported to RCS and used as the source of information about metadata for the foreign trade business domain. Based on this information, we can specify the mapping between application metadata and ER data model.

NOTE

Can you tell us about your documentation language preferences? [Take a short survey](#).

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Access application metadata by using ER configuration

2/18/2021 • 3 minutes to read • [Edit Online](#)

The following steps explain how a Regulatory configuration service (RCS) user in the System Administrator or Electronic Reporting Developer role can design a new Electronic reporting (ER) model mapping by using the application metadata. Application metadata will be accessed by using an ER metadata configuration that contains a sample set of metadata to access foreign trade transactions. To complete these steps, in RCS you must first complete the steps in the topic, [Create configuration providers and mark them as active](#) procedure. Then complete the steps in the topic, [Prepare application metadata to be used in RCS](#).

Prerequisites

1. Go to **All workspaces > Electronic reporting**.
2. Make sure that the configuration provider for the sample company, Litware, Inc., is available and marked as **Active**. If you don't see this configuration provider, complete the steps in the procedure [Create configuration providers and mark them as active](#).

Import metadata configuration

1. Click **Metadata configurations**.
2. Import the ER metadata configuration that contains metadata that has been configured to generate electronic documents for foreign trade business. This ER metadata configuration has been exported as XML file while the steps in the [Prepare application metadata to be used in RCS](#) procedure have been completed.
3. Click **Exchange**.
4. Click **Load from XML file**.
5. Click **Browse** and select the 'Foreign trade metadata.xml' file.
6. Click **OK**.
7. Close the page.

Create data model configuration

1. Click **Reporting configurations**.
2. Click **Create configuration** to open the drop dialog.
3. In the **Name** field, type 'Foreign trade model'.
4. Click **Create configuration**.
5. Click **Designer**.
6. Click **New** to open the drop dialog.
7. In the **Name** field, type 'Root'.
8. Click **Add**.
9. Click **New** to open the drop dialog.
10. In the **Name** field, type 'Transaction'.
11. In the **Item type** field, select **Record list**.
12. Click **Add**.
13. Click **New** to open the drop dialog.
14. In the **Name** field, type 'Commodity code'.

15. In the **Item type** field, select **String**.
16. Click **Add**.
17. Click **New** to open the drop dialog.
18. In the **Name** field, type 'Invoiced amount'.
19. In the **Item type** field, select **Real**.
20. Click **Add**.
21. Click **New** to open the drop dialog.
22. In the **Name** field, type 'Date'.
23. In the **Item type** field, select **Date**.
24. Click **Add**.
25. Click **Root reference**.
26. Click **OK**.
27. Click **Save**.
28. Close the page.
29. Click **Change status**.
30. Click **Complete**.
31. Click **OK**.

Create model mapping configuration

1. Click **Create configuration** to open the drop dialog.
2. In the **New** field, enter 'Model Mapping based on data model Foreign trade model'.
3. In the **Name** field, type 'Foreign trade mapping'.
4. Click **Create configuration**.
5. Expand the **Prerequisites** section.
6. Click **Edit**.
7. Click **New**.
8. In the list, mark the selected row.
9. In the **Prerequisite component type** field, select **Configuration**.
10. Select **Foreign trade metadata** configuration.
11. Click **Save**.
12. We added the reference to the version 1 of the 'Foreign trade metadata' configuration. Application metadata from this configuration will be offered while this model mapping will be designed.
13. Close the page.
14. Click **Designer**.
15. Click **Designer**.
16. In the tree, select **Dynamics 365 for Operations\Table records**.
17. Click **Add root**.
18. In the **Name** field, type 'Intrastat'.
19. Select **Intrastat** table records.
20. Click **OK**.

NOTE

The only 2 tables were offered as the only 2 tables were added into the set of metadata which is currently in use.

21. Click **Bind**.
22. In the tree, expand **Intrastat**.

23. In the tree, select **Intrastat\AmountMST**.
24. In the tree, expand **Transaction = Intrastat**.
25. In the tree, select **Transaction = Intrastat\Invoiced amount**.
26. Click **Bind**.
27. In the tree, select **Intrastat\TransDate**.
28. In the tree, select **Transaction = Intrastat\Date**.
29. Click **Bind**.
30. In the tree, expand **Intrastat> Relations**.
31. In the tree, expand **Intrastat> Relations\IntrastatCommodity**.
32. In the tree, select **Intrastat> Relations\IntrastatCommodity\Code**.
33. In the tree, select **Transaction = Intrastat\Commodity code**.
34. Click **Bind**.
35. Click **Validate**.

NOTE

We have successfully bound elements of data model with items of data sources that are described by using details of application metadata from the referred ER metadata configuration. 36. Click **Save**. 37. Close the page. 38. Close the page. 39. When needed, you can extend the existing set of metadata and then export the new completed version of ER metadata configuration. You can then import it to RCS, and update the prerequisites of the configured model mapping configuration referring to a new version of imported metadata configuration.

NOTE

This way of getting information about application metadata is the only one available for locally deployed applications (when local business data (LBD), or on-premises, deployment model is used).

NOTE

Can you tell us about your documentation language preferences? [Take a short survey](#).

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Access application metadata by using connected applications

2/18/2021 • 3 minutes to read • [Edit Online](#)

The following steps explain how a Regulatory configuration service (RCS) user in the System Administrator or Electronic Reporting Developer role can design a new Electronic reporting (ER) model mapping by using metadata in Finance and Operations. Application metadata will be accessed online by using the RCS connected application. Sample ER model mapping will be configured to access foreign trade transactions. To complete these steps, in RCS you must first complete the steps in the topic, [Create configuration providers and mark them as active](#). If you have not completed the steps in the topic, [Access application metadata by using ER configuration](#), go to the [Electronic reporting examples page](#) to download and save the following ER configurations: Foreign trade metadata.xml; Foreign trade model.xml; Foreign trade mapping.xml, and then complete the steps in the procedure.

Prerequisites

1. Go to **All workspaces > Electronic reporting**.
2. Make sure that the configuration provider for the sample company, Litware, Inc., is available and marked as **Active**. If you don't see this configuration provider, complete the steps in the procedure [Create configuration providers and mark them as active](#).

Get required ER configurations

1. Click **Reporting configurations**.
2. If you already completed the steps in the [Access application metadata by using ER configuration](#) procedure, you already have all necessary ER configurations (foreign trade metadata, model and mapping configurations) in the current RCS instance. You can skip all the remaining steps of this sub-task.
3. Click **Exchange**.
4. Click **Load from XML file**.
5. Click **Browse** and select the **Foreign trade metadata.xml** file.
6. Click **OK**.
7. Click **Exchange**.
8. Click **Load from XML file**.
9. Click **Browse** and select the **Foreign trade model.xml** file.
10. Click **OK**.
11. Click **Exchange**.
12. Click **Load from XML file**.
13. Click **Browse** and select the **Foreign trade mapping.xml** file.
14. Click **OK**.

Register a connected application

1. Close the page.
2. Close the page.
3. Go to **All workspaces > Electronic reporting**.
4. Click **Connected applications**.

5. Make sure that the configured application is Azure based and accessible for the current RCS user. It is also required that the current RCS user has access to the selected application and has been registered as a user of this application playing a role giving them privileges to access application's metadata.
6. Click **New**.
7. In the **Name** field, type 'MyConnectedApp'.
8. In the **Application** field, type 'https:// mycompany.operations.dynamics.com'.
9. In the **Tenant** field, type 'mycompany.onmicrosoft.com'.
10. Click **Save**.
11. When you check connection to configured application, on the **Connect to remote application** page click **Click here to connect to selected remote application** link.
12. Click **Check connection**.
13. Click **Close**.
14. When the connection validation succeeded, version and tenant details will be updated for the configured application in the current grid.

Review existing model mapping configuration

1. Close the page.
2. Click **Reporting configurations**.
3. In the tree, expand **Foreign trade model**.
4. In the tree, select **Foreign trade model\Foreign trade mapping**.
5. Expand the **Prerequisites** section.

NOTE

Currently, this mapping refers to the metadata configuration. Application metadata from this configuration will be offered while this model mapping will be designed.

6. Click **Designer**.
7. Click **Designer**.
8. In the tree, select **Dynamics 365 for Operations\Table records**.
9. Click **Add root**.
10. In the **Table** field, enter or select a value.

NOTE

Currently, this mapping refers to the metadata configuration. Application metadata from this configuration will be offered while this model mapping will be designed.

11. Click **Cancel**.
12. Close the page.
13. Close the page.

Assign connected application to model mapping

1. Click **Edit**.
2. Select **MyConnectedApp** application.

NOTE

Currently, this mapping refers to the metadata of the selected connected application. When the same mapping refers to metadata configuration and connected application at the same time, metadata of the connected application will be used.

3. Click **Designer**.
4. Click **Designer**.
5. In the tree, select **Dynamics 365 for Operations\Table records**.
6. Click **Add root**.
7. In the **Table** field, enter or select a value.

NOTE

More than two application tables were offered now as this mapping uses all the metadata of the connected application that has been assigned for it.

8. Click **Cancel**.
9. Click **Validate**.

NOTE

We successfully bound elements of data model with items of data sources that are described by using details of metadata of the connected application that has been assigned for this mapping.

10. Close the page.
11. Close the page.

When you need to evaluate this model mapping by using metadata of a different version application, register another connected application, assign it to this model mapping and validate it against new metadata.

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Define ER model mappings and select data sources for them

2/18/2021 • 4 minutes to read • [Edit Online](#)

The following steps explain how a user in the System Administrator or Electronic Reporting Developer role can select data sources for an Electronic reporting (ER) data model. The data sources will be bound to individual components of the selected data model at design time and populate business data to that data model at run-time. In this example, you will select data sources for an existing data model that has been created for sample company, Litware, Inc. To complete these steps, you must first complete the steps in the "Create a new data model" procedure.

Open the Electronic Reporting configurations tree

1. Go to Organization administration > Workspaces > Electronic reporting.
2. Click Reporting configurations.

Insert a new model mapping

1. In the tree, select 'Payments (simplified model)'.
2. Click Designer.
3. Click Map model to datasource.
4. Click New.
 - This will create a new record that will map the data model to data sources. In this example, you will map the data model to data sources for the desired payment type: credit transfer. It is possible to design more than one mapping for a particular data model. For example, you could create a mapping for the different types of payments, such as for direct debit or for credit transfers. In this example, you will create a mapping for credit transfers.
5. In the Name field, type 'CT mapping'.
 - CT mapping
6. In the Description field, type 'Payment model mapping CT'.
 - Payment model mapping CT
7. In the Definition field, type 'CustomerCreditTransferInitiation'.
 - CustomerCreditTransferInitiation
8. ResolveChanges the Definition.
9. Click Save.

Define required data sources for the current model mapping

1. Click Designer.
2. In the tree, select 'Dynamics 365 for Operations\Table records'.
3. Click Add root.
 - Enter this data source to access payment transactions.
4. In the Name field, type 'Transactions'.
 - Transactions
5. In the Label field, enter 'Transactions'.
 - Transactions

6. In the Help field, enter 'Ledger journal lines'.
 - Ledger journal lines
7. Select Yes in the Ask for query field.
 - Select Yes.
8. In the Table field, type 'LedgerJournalTrans'.
 - LedgerJournalTrans
9. Click OK.
 - Select the LedgerJournalTrans table as a data source for the current data model.
10. In the tree, select 'Functions\Calculated field'.
11. Click Add.
 - Click Add to add a new calculated field.
12. In the Name field, type '\$EndToEndID'.
 - \$EndToEndID
13. Click Edit formula.
14. In the tree, select 'String\CONCATENATE'.
15. Click Add function.
16. In the tree, expand 'Transactions'.
17. In the tree, select 'Transactions\Voucher'.
18. Click Add data source.
19. In the Formula field, enter 'CONCATENATE(Transactions.Voucher, "-", ' '.
 - Type [, "-",] at the end of the formula.
20. In the tree, select 'String\TEXT'.
21. Click Add function.
22. In the tree, select 'Transactions\Record-ID(ReclId)'.
23. Click Add data source.
24. In the Formula field, enter 'CONCATENATE(Transactions.Voucher, "-", TEXT(Transactions.ReclId))'.
 - Type [)])] at the end of the formula.
25. Click Save.
 - Make sure that no errors have been discovered for the created formula. See the ERRORS tab below the formula editor control.
26. Close the page.
27. Click OK.
 - Add the calculated field to this data source.
28. Click Add.
 - Click Add to add a new calculated field.
29. In the Name field, type '\$Amount'.
 - \$Amount
30. Click Edit formula.
31. In the tree, expand 'Transactions'.
32. In the tree, select 'Transactions\Debit(AmountCurDebit)'.
33. Click Add data source.
34. In the Formula field, enter 'Transactions.AmountCurDebit - '.
 - Type [-] at the end of the formula.
35. In the tree, select 'Transactions\Credit(AmountCurCredit)'.
36. Click Add data source.
37. Click Save.
38. Close the page.

39. Click OK.
 - This will add the \$Amount calculated field to the selected data source for the current data model.
40. In the tree, select 'Transactions\$Amount'.
41. In the tree, expand 'Transactions'.
42. In the tree, expand or collapse 'Transactions\$Amount'.
43. In the tree, expand or collapse 'Transactions'.
44. In the tree, select 'Dynamics 365 for Operations\Table records'.
45. Click Add root.
 - Enter this data source to access the company's bank account details.
46. In the Name field, type 'BankAccount'.
 - BankAccount
47. In the Label field, enter 'Bank Account'.
 - Bank Account
48. In the Help field, enter 'Bank Account'.
 - Bank Account
49. Select Yes in the Ask for query field.
 - Select Yes.
50. In the Table field, type 'BankAccountTable'.
 - BankAccountTable
51. Click OK.
 - Select the BankAccountTable table as a data source for the current data model.
52. Click Add root.
 - Enter this data source to access the company's requisites.
53. In the Name field, type 'Company'.
 - Company
54. In the Label field, type a value.
 - Company information
55. In the Help field, enter 'Company information'.
 - Company information
56. Select Yes in the Ask for query field.
 - Select Yes.
57. In the Table field, type 'CompanyInfo'.
 - CompanyInfo
58. Click OK.
 - Select the CompanyInfo table as a data source for the current data model.
59. In the tree, select 'Functions\Calculated field'.
60. Click Add root.
 - Insert a calculated field as a new data source.
61. In the Name field, type 'ProcessingDateTime'.
 - ProcessingDateTime
62. In the Label field, enter 'Processing date & time'.
 - Processing date & time
63. Click Edit formula.
64. In the tree, select 'Date/time\SESSIONNOW'.
65. Click Add function.
66. Click Save.

67. Close the page.

68. Click OK.

- Add the ProcessingDateTime calculated field as a data source for the current data model.

69. Click Save.

70. Close the page.

71. Close the page.

72. Close the page.

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

ER Map data model to selected data sources

2/18/2021 • 3 minutes to read • [Edit Online](#)

The following steps explain how a user in the System Administrator or Electronic Reporting Developer role can map an Electronic reporting (ER) data model to selected data sources. This model mapping will later be used as a data source in a format configuration that will be used to manage electronic payment documents. In this example, you map a data model for sample company, Litware, Inc. to data sources. To complete these steps, you must first complete the steps in the "Select data sources for model mapping" procedure.

Open ER configurations tree

1. Go to Organization administration > Workspaces > Electronic reporting.
2. Click Configurations.

Select created model mapping

1. In the tree, select 'Payments (simplified model)'.
 - Make sure that the model configuration "Payments (simplified model)" has been created in advance. Otherwise, stop now and return after completion of the task guide 'Create a new configuration with data model of the selected domain'.
2. Click Model designer.
3. Click Map model to datasource.
4. Select the 'CT mapping' record.
 - CT mapping

Bind created data sources to data model elements

1. Click Designer.
2. In the tree, select 'Processing date & time(ProcessingDateTime)'.
3. In the tree, select 'Processing date(ProcessingDateTime)'.
4. Click Bind.
5. In the tree, select 'Payment message identification(MessageIdentification)'.
6. In the tree, expand 'Transactions'.
7. In the tree, select 'Transactions\Journal batch number(JournalNum)'.
8. Click Bind.
9. In the tree, select 'Payments'.
10. In the tree, select 'Transactions'.
11. Click Bind.
12. In the tree, expand 'Payments= Transactions'.
13. In the tree, expand 'Payments= Transactions\Creditor'.
14. In the tree, expand 'Payments= Transactions\Creditor\Account'.
15. In the tree, select 'Payments= Transactions\Creditor\Account\Currency code(Currency)'.
16. In the tree, expand 'Transactions\vendBankAccountInTransactionCompany()'.
17. In the tree, select 'Transactions\vendBankAccountInTransactionCompany()\Currency(CurrencyCode)'.
18. Click Bind.
19. In the tree, select 'Payments= Transactions\Creditor\Account\IBAN code(IBAN)'.

20. In the tree, select 'Transactions\vendBankAccountInTransactionCompany()\IBAN(BankIBAN)'.
21. Click Bind.
22. In the tree, select 'Payments= Transactions\Creditor\Account\Number'.
23. In the tree, select 'Transactions\vendBankAccountInTransactionCompany()\Bank account number(AccountNum)'.
24. Click Bind.
25. In the tree, expand 'Payments= Transactions\Creditor\Agent'.
26. In the tree, select 'Payments= Transactions\Creditor\Agent\Name'.
27. In the tree, select 'Transactions\vendBankAccountInTransactionCompany()\Name'.
28. Click Bind.
29. In the tree, select 'Payments= Transactions\Creditor\Agent\Routing number(RoutingNumber)'.
30. In the tree, select 'Transactions\vendBankAccountInTransactionCompany()\Routing number(RegistrationNum)'.
31. Click Bind.
32. In the tree, select 'Payments= Transactions\Creditor\Agent\SWIFT code(SWIFT)'.
33. In the tree, select 'Transactions\vendBankAccountInTransactionCompany()\SWIFT code(SWIFTNo)'.
34. Click Bind.
35. In the tree, select 'Payments= Transactions\Creditor\Name'.
36. In the tree, expand 'Transactions\findVendTable()'.
37. In the tree, select 'Transactions\findVendTable()\name()'.
38. Click Bind.
39. In the tree, select 'Payments= Transactions\Currency code(Currency)'.
40. In the tree, expand 'Transactions>Relations'.
41. In the tree, expand 'Transactions>Relations\Currency table(Currency)'.
42. In the tree, select 'Transactions>Relations\Currency table(Currency)\Currency code(CurrencyCodeISO)'.
43. Click Bind.
44. In the tree, expand 'Payments= Transactions\Debtor'.
45. In the tree, expand 'Payments= Transactions\Debtor\Account'.
46. In the tree, select 'Payments= Transactions\Debtor\Account\Currency code(Currency)'.
47. In the tree, select 'Bank Account(BankAccount)'.
48. In the tree, expand 'Bank Account(BankAccount)'.
49. In the tree, select 'Bank Account(BankAccount)\Currency(CurrencyCode)'.
50. Click Bind.
51. In the tree, select 'Bank Account(BankAccount)\IBAN'.
52. In the tree, select 'Payments= Transactions\Debtor\Account\IBAN code(IBAN)'.
53. Click Bind.
54. In the tree, select 'Payments= Transactions\Debtor\Account\Number'.
55. In the tree, select 'Bank Account(BankAccount)\Bank account number(AccountNum)'.
56. Click Bind.
57. In the tree, expand 'Payments= Transactions\Debtor\Agent'.
58. In the tree, select 'Payments= Transactions\Debtor\Agent\Name'.
59. In the tree, select 'Bank Account(BankAccount)\Name'.
60. Click Bind.
61. In the tree, select 'Payments= Transactions\Debtor\Agent\Routing number(RoutingNumber)'.
62. In the tree, select 'Bank Account(BankAccount)\Routing number(RegistrationNum)'.
63. Click Bind.
64. In the tree, select 'Payments= Transactions\Debtor\Agent\SWIFT code(SWIFT)'.

65. In the tree, select 'Bank Account(BankAccount)\SWIFT code(SWIFTNo)'.
66. Click Bind.
67. In the tree, select 'Payments= Transactions\Debtor\Name'.
68. In the tree, select 'Company information(Company)'.
69. In the tree, expand 'Company information(Company)'.
70. In the tree, select 'Company information(Company)\Name'.
71. Click Bind.
72. In the tree, select 'Payments= Transactions\Description'.
73. In the tree, select 'Transactions\Description(Txt)'.
74. Click Bind.
75. In the tree, select 'Payments= Transactions\End to end identification code(End2EndID)'.
76. In the tree, select 'Transactions\$EndToEndID'.
77. Click Bind.
78. In the tree, select 'Payments= Transactions\Instructed amount(InstructedAmount)'.
79. In the tree, select 'Transactions\$Amount'.
80. Click Bind.
81. In the tree, select 'Payments= Transactions\Transaction date(TransactionDate)'.
82. In the tree, select 'Transactions\Date(TransDate)'.
83. Click Bind.

Validate created mapping

1. Click Validate.
 - Validate the new mapping to ensure that all bindings are okay.
2. Click the arrow to expand or collapse the Error List section.
3. Click Save.
4. Close the page.
5. Close the page.
6. Close the page.

Change the status of the current version of model configuration

1. Click Change status.
 - Change the status of designed model configuration – from Draft to Completed to make it available for payment format design.
2. Click Complete.
 - Select Complete.
3. In the Description field, type a value.
 - For example, 'version 1'.
4. Click OK.
5. Select the completed version of the current configuration.
 - Note that the created configuration is saved as completed version 1.

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

ER Create a format configuration (November 2016)

2/18/2021 • 3 minutes to read • [Edit Online](#)

This topic explains how a user in the System Administrator or Electronic Reporting Developer role can create a format configuration for Electronic reporting (ER). This format configuration will define the format of electronic documents that are used for processing payments. In this example, you will create a format configuration for sample company, Litware, Inc. To complete these steps, you must first complete the steps in the "Map model to selected datasources" procedure.

Create a new format configuration

1. Go to **Organization administration > Workspaces > Electronic reporting**.
2. Click **Reporting configurations**.
3. In the tree, select **Payments (simplified model)**.
4. Click **Create configuration** to open the drop dialog.

NOTE

If you don't see **Create configuration**, you must enable design mode on the **Electronic reporting parameters** page.

5. In the **New** field, enter **Format based on data model PaymentModel**.
6. In the **Name** field, type **BACS (UK fictitious)**.
7. In the **Description** field, type **BACS vendor payment format (UK fictitious)**.
 - The active configuration provider is automatically entered here. This provider will be able to maintain this configuration. Other providers can use this configuration, but will not be able to maintain it.
 - A particular format of electronic document can be defined. Leave this field blank if you want to select a format at run-time.
8. In the **Data model definition** field, enter or select a value.
9. Click **Create configuration**. A new configuration has been created. The draft version can be used to store the design format for managing electronic documents.

Design the format of an electronic document

1. Click **Designer**.
2. Click **Add root** to open the drop dialog.
3. In the tree, select **Common\File**.
4. In the **Name** field, type **Xml**.
5. In the **Encoding** field, type **UTF-8**.
6. Click **OK**.
7. Click **Add**.
8. In the tree, select **XML\Element**.
9. In the **Name** field, type **Message**.
10. Click **OK**.
11. In the tree, select **Xml\Message**.
12. Click **Add Element**.
13. In the **Name** field, type **ProcessingDate**.

14. Click **OK**.
15. Click **Add Element**.
16. In the **Name** field, type **MessageId**.
17. Click **OK**.
18. Click **Add Element**.
19. In the **Name** field, type **Payments**.
20. Click **OK**.
21. In the tree, select **Xml\Message\Payments**.
22. Click **Add Element**.
23. In the **Name** field, type **Item**.
24. Click **OK**.
25. In the tree, select **Xml\Message\Payments\Item**.
26. Click **Add**.
27. In the tree, select **XML\Attribute**.
28. In the **Name** field, type **Id**.
29. Click **OK**.
30. Click **Add**.
31. In the tree, select **XML\Element**.
32. In the **Name** field, type **Vendor**.
33. Click **OK**.
34. In the tree, select **Xml\Message\Payments\Item\Vendor**.
35. Click **Add Element**.
36. In the **Name** field, type **Name**.
37. Click **OK**.
38. Click **Add Element**.
39. In the **Name** field, type **Bank**.
40. Click **OK**.
41. In the tree, select **Xml\Message\Payments\Item\Vendor\Bank**.
42. Click **Add Element**.
43. In the **Name** field, type **RoutingNumber**.
44. Click **OK**.
45. Click **Add Element**.
46. In the **Name** field, type **AccountNumber**.
47. Click **OK**.
48. In the tree, select **Xml\Message\Payments\Item\Vendor**.
49. Click **Copy**.
50. In the tree, select **Xml\Message\Payments\Item**.
51. Click **Paste**.
52. In the **Name** field, type **Payer**.
53. In the tree, select **Xml\Message\Payments\Item**.
54. Click **Add Element**.
55. In the **Name** field, type **Currency**.
56. Click **OK**.
57. Click **Add Element**.
58. In the **Name** field, type **Description**.
59. Click **OK**.

60. Click **Add Element**.
61. In the Name field, type **TransDate**.
62. Click **OK**.
63. Click **Add Element**.
64. In the Name field, type **Amount**.
65. Click **OK**.

Prepare format components for mapping to data model elements

1. In the tree, select **Xml\Message\ProcessingDate**.
2. Click **Add** to open the drop dialog.
3. In the tree, select **Text\DateTime**.
4. In the **Format** field, type **yyyy-MM-dd**.
5. Click **OK**.
6. In the tree, select **Xml\Message\Payments\Item\TransDate**.
7. Click **Add DateTime**.
8. In the **Format** field, type **yyyy-MM-dd**.
9. In the **DateTime** type field, select **Date**.
10. Click **OK**.
11. In the tree, select **Xml\Message\Messageld**.
12. Click **Add** to open the drop dialog.
13. In the tree, select **Text\String**.
14. Click **OK**.
15. In the tree, select **Xml\Message\Payments\Item\Vendor\Name**.
16. Click **Add String**.
17. Click **OK**.
18. In the tree, select **Xml\Message\Payments\Item\Vendor\Bank\RoutingNumber**.
19. Click **Add String**.
20. Click **OK**.
21. In the tree, select **Xml\Message\Payments\Item\Vendor\Bank\AccountNumber**.
22. Click **Add String**.
23. Click **OK**.
24. In the tree, select **Xml\Message\Payments\Item\Payer\Name**.
25. Click **Add String**.
26. Click **OK**.
27. In the tree, select **Xml\Message\Payments\Item\Payer\Bank\RoutingNumber**.
28. Click **Add String**.
29. Click **OK**.
30. In the tree, select **Xml\Message\Payments\Item\Payer\Bank\AccountNumber**.
31. Click **Add String**.
32. Click **OK**.
33. In the tree, select **Xml\Message\Payments\Item\Currency**.
34. Click **Add String**.
35. Click **OK**.
36. In the tree, select **Xml\Message\Payments\Item\Description**.
37. Click **Add String**.
38. Click **OK**.

39. In the tree, select **Xml\Message\Payments\Item\Amount**.
40. Click **Add String**.
41. Click **OK**.
42. Click **Save**.
43. Close the page.

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

ER Map components of the created format to data model elements (November 2016)

2/18/2021 • 3 minutes to read • [Edit Online](#)

The following procedure shows how a user in either the System administrator or Electronic reporting developer role can map data model elements to components of the created Electronic reporting (ER) configuration, which defines an electronic document format for the payments business domain. This format will be used later to generate electronic documents for processing payments. In this example, you will create a format configuration for the sample company, 'Litware, Inc.'. These steps can be performed in any company as ER configurations are shared for all companies. To complete these steps, you must first complete the steps in the "Create a format configuration" task guide.

Select a format configuration

1. Go to Organization administration > Workspaces > Electronic reporting.
2. Click Reporting configurations.
3. In the tree, expand 'Payments (simplified model)'.
4. In the tree, select 'Payments (simplified model)\BACS (UK fictitious)'.
5. Click Designer.

Map format components to data model elements

1. Click Expand/collapse.
2. Click the Mapping tab.
3. In the tree, expand 'model'.
4. In the tree, select 'Xml\Message\ProcessingDate\DateTime'.
5. In the tree, select 'model\ProcessingDateTime'.
6. Click Bind.
7. In the tree, select 'Xml\Message\Messageld\String'.
8. In the tree, select 'model\Messageldentification'.
9. Click Bind.
10. In the tree, expand 'model\Payments'.
11. In the tree, select 'Xml\Message\Payments\Item\Amount\String'.
12. In the tree, select 'model\Payments\InstructedAmount'.
13. Click Bind.
14. In the tree, select 'Xml\Message\Payments\Item\TransDate\DateTime'.
15. In the tree, select 'model\Payments\TransactionDate'.
16. Click Bind.
17. In the tree, select 'Xml\Message\Payments\Item\Description\String'.
18. In the tree, select 'model\Payments\Description'.
19. Click Bind.
20. In the tree, select 'Xml\Message\Payments\Item\Currency\String'.
21. In the tree, select 'model\Payments\Currency'.
22. Click Bind.
23. In the tree, select 'Xml\Message\Payments\Item\ld'.

24. In the tree, select 'model\Payments\End2EndID'.
25. Click Bind.
26. In the tree, expand 'model\Payments\Creditor'.
27. In the tree, expand 'model\Payments\Creditor\Account'.
28. In the tree, expand 'model\Payments\Creditor\Agent'.
29. In the tree, select 'Xml\Message\Payments\Item\Vendor\Name\String'.
30. In the tree, select 'model\Payments\Creditor\Name'.
31. Click Bind.
32. In the tree, select 'Xml\Message\Payments\Item\Vendor\Bank\RoutingNumber\String'.
33. In the tree, select 'model\Payments\Creditor\Agent\RoutingNumber'.
34. Click Bind.
35. In the tree, select 'Xml\Message\Payments\Item\Vendor\Bank\AccountNumber\String'.
36. In the tree, select 'model\Payments\Creditor\Account\Number'.
37. Click Bind.
38. In the tree, select 'Xml\Message\Payments\Item\Payer\Name\String'.
39. In the tree, expand 'model\Payments\Debtor'.
40. In the tree, expand 'model\Payments\Debtor\Account'.
41. In the tree, expand 'model\Payments\Debtor\Agent'.
42. In the tree, select 'model\Payments\Debtor\Name'.
43. Click Bind.
44. In the tree, select 'Xml\Message\Payments\Item\Payer\Bank\RoutingNumber\String'.
45. In the tree, select 'model\Payments\Debtor\Agent\RoutingNumber'.
46. Click Bind.
47. In the tree, select 'Xml\Message\Payments\Item\Payer\Bank\AccountNumber\String'.
48. In the tree, select 'model\Payments\Debtor\Account\Number'.
49. Click Bind.
50. In the tree, select 'Xml\Message\Payments\Item'.
51. In the tree, select 'model\Payments'.
52. Click Bind.
53. Click Save.

Validate format mapping

1. Click Validate.
 - Validate the new mapping to ensure that all bindings are okay.
2. Close the page.

Change status of the current version of format configuration

In the next steps, you'll change the status of the format configuration from Draft to Completed to make it available for payment document generation.

1. Click Change status.
2. Click Complete.
3. In the Description field, type a value.
 - For example, 'version 1'.
4. Click OK.
5. Select completed version of the current configuration.

- Note that the configuration is saved as completed version 1.1: version 1 of the format based on the version 1 of the data model.

Define effective date for completed version of format

Each format version can be configured as available for usage starting from a certain date. When more than one format version is active on a certain date, the latest format (based on version number) will be selected for usage. The session date value is used for proper version selection.

Restrict access to created format from companies

1. Expand the ISO Country/region codes section.

- Each format access can be restricted by identifying particular countries/regions in which a format is applicable. When the list of countries/regions for particular format is empty, this format can be used in any company. When some ISO country/region codes are inserted in the list of countries/regions, the format can only be use in companies if the primary address is in the country/region.

NOTE

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(ER) Import configurations from RCS

2/18/2021 • 2 minutes to read • [Edit Online](#)

The following steps explain how a user in the System Administrator or Electronic Reporting Developer role can import a new version of an Electronic reporting (ER) configuration from Microsoft Regulatory Configuration Services (RCS). In this example, you will select the version of the ER configuration that has been configured in an RCS instance and import it into the current instance for sample company, Litware, Inc. These steps can be performed in any company because ER configurations are shared among companies. To complete these steps, you must first complete the steps in the topic, [Create configuration providers and mark them as active](#). To complete these steps, you must also have access to an RCS instance containing at least one ER configuration in either **Completed** or **Shared** status.

1. Go to **Organization administration > Workspaces > Electronic reporting**.
2. Make sure that the configuration provider for the sample company, Litware, Inc., is available and marked as **Active**. If you don't see this configuration provider, complete the steps in the topic, [Create configuration providers and mark them as active](#).
3. If you have no RCS environment provisioned to your company, select **Regulatory services – Configuration** external link and follow the instructions to provision an RCS environment.
4. Select **Electronic reporting parameters**.
5. Select the **RCS** tab.
6. If RCS environment has been already provisioned to your company, use presented on the page URLs to access it.
7. Close the page.

Register a new ER repository.

1. In the list, mark the selected row.
2. Select Litware, Inc. provider.
3. Select Repositories.
4. Select Add to open the drop dialog.
5. In the Configuration repository type field, enter 'RCS'.
6. Select Create repository.
7. In the RCS environment display name field, enter or select a value.
8. Select the desired RCS instance. You can have several of them.
9. Select OK.

Import ER configurations from RCS-based repository

1. Select **Show filters**.
2. Enter a filter value of "RCS" on the **Name** field using the **begins with** filter operator.
3. When you open the selected repository, on the **Connect to Regulatory Configuration Services** page, select **Select here to connect to Regulatory Configuration Services** link.
4. Select **Open**.
5. Select **Close**.
6. Select the desired version of ER configuration and select **Import** to bring it in the current instance.

NOTE

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ER Generate electronic documents for payments using a format configuration

2/18/2021 • 2 minutes to read • [Edit Online](#)

The following steps explain how a user in the System Administrator or Electronic Reporting Developer role can use a new Electronic reporting (ER) format configuration to generate electronic documents for processing payments. These steps can be performed in the GBSI sample company.

To complete these steps, you must first complete the steps in the "Create a configuration with format of payment document" procedure.

Change the configuration of the electronic payment method

1. Go to Accounts payable > Payment setup > Methods of payment.
2. Toggle the File format section to expand it, if needed.
3. Use the Quick Filter to find records. For example, filter on the Method of payment field with a value of 'Electronic'.
4. Click Edit.
5. Set the General electronic reporting field to Yes.
 - Select Yes to use the General electronic reporting pattern for payment files generation.
6. In the Name field, click the drop-down button to open the lookup.
7. Select BACS (UK fictitious) format configuration.
8. Click Save.
9. Close the page.

Test the format of generated payment files

1. Go to Accounts payable > Payments > Payment journal.
2. Click New.
3. In the list, mark the selected row.
4. In the Name field, click the drop-down button to open the lookup.
5. In the list, click the link in the selected row.
 - Select VendPay.
6. Click Save.
7. Click Lines.
8. In the Company field, type 'DEMF'.
 - DEMF
9. In the Account field, specify the values 'DE-01001'.
 - DE-01001
10. In the Description field, type 'Payment'.
 - Payment
11. In the Debit field, enter a number.
 - 1000
12. Click the Payment tab.
13. In the Method of payment field, click the drop-down button to open the lookup.

14. In the list, find and select the desired record.
 - Select the Electronic value.
15. In the list, click the link in the selected row.
16. Click Save.
17. Click Generate payments.
18. In the Method of payment field, click the drop-down button to open the lookup.
19. In the list, find and select the desired record.
 - Select the Electronic value.
20. In the list, click the link in the selected row.
 - Select the Electronic value.
21. In the File name field, type a value.
 - For example, type 'payments'.
22. In the Bank account field, click the drop-down button to open the lookup.
23. In the list, click the link in the selected row.
 - Select the value GBSI OPER.
24. Click OK.
25. Click OK.
 - Analyze the created payment file in XML format. Compare it with the designed document layout and defined payment transaction attributes.

NOTE

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ER Upgrade your format by adopting a new, base version of that format

2/18/2021 • 9 minutes to read • [Edit Online](#)

The following steps explain how a user in the System Administrator or Electronic Reporting Developer role can maintain an Electronic reporting (ER) format configuration. This procedure explains how a custom version of a format can be created based on the format received from a configuration provider (CP). It also explains how to adopt a new, base version of that format.

To complete these steps, you must first complete the steps in the "Create a configuration provider and mark it as active" and "Use created format to generate electronic documents for payments" procedures. These steps can be performed in the GBSI company.

Select format configuration for customization

1. Go to Organization administration > Workspaces > Electronic reporting.

In this example, sample company Litware, Inc. (<https://www.litware.com>) will act as a configuration provider that supports format configurations for electronic payments for a particular country. Sample company Proseware, Inc. (<http://www.proseware.com>) will act as a consumer of the format configuration that Litware, Inc. provided. Proseware, Inc. uses formats in certain regions of that country.

2. Click Reporting configurations.
3. Click Show filters.
4. Apply the following filters: Enter a filter value of "BACS (UK fictitious)" on the "Name" field using the "begins with" filter operator.

The selected format configuration BACS (UK fictitious) is owned by provider Litware, Inc.

5. Click Show filters.
6. In the list, find and select the desired record.

The version of the format with the status of Completed will be used by Proseware, Inc. for customization.

Create a new configuration for your custom format of electronic document

Proseware, Inc. received version 1.1 of BACS (UK fictitious) configuration that contains the initial format to generate electronic payment documents from Litware, Inc. in accordance to their service subscription. Proseware, Inc. wants to start using this as a standard for their country but some customization is required to support specific regional requirements. Proseware, Inc. also wants to keep the ability to upgrade a custom format as soon as a new version of it (with changes to support new country-specific requirements) comes from Litware, Inc. and they want to perform this upgrade with the lowest cost.

To do this, Proseware, Inc. needs to create a configuration using the Litware, Inc. configuration BACS (UK fictitious) as a base.

1. Close the page.
2. Select Proseware, Inc. to make it an active provider.

3. Click Set active.
4. Click Reporting configurations.
5. In the tree, expand 'Payments (simplified model)'.
6. In the tree, select 'Payments (simplified model)\BACS (UK fictitious)'.

Select the BACS (UK fictitious) configuration from Litware, Inc. Proseware, Inc. will use version 1.1 as a base for the custom version.

7. Click Create configuration to open the drop dialog.

This lets you create a new configuration for a custom payment format.

8. In the New field, enter 'Derive from Name: BACS (UK fictitious), Litware, Inc.'.

Select the Derive option to confirm the usage of BACS (UK fictitious) as the base for creating the custom version.

9. In the Name field, type 'BACS (UK fictitious custom)'.

10. In the Description field, type 'BACS vendor payment (UK fictitious custom)'.

The active configuration provider (Proseware, Inc.) is automatically entered here. This provider will be able to maintain this configuration. Other providers can use this configuration, but will not be able to maintain it.

11. Click Create configuration.

Customize your format for the electronic document

1. Click Designer.
2. Click Expand/collapse.
3. Click Expand/collapse.
4. In the tree, select 'Xml\Message\Payments\Item\Vendor\Bank'.
5. Click Add to open the drop dialog.
6. In the tree, select 'XML\Element'.
7. In the Name field, type 'IBAN'.
8. Click OK.
9. In the tree, select 'Xml\Message\Payments\Item\Vendor\Bank\IBAN'.
10. Click Add to open the drop dialog.
11. In the tree, select 'Text\String'.
12. Click OK.
13. In the tree, select 'Xml\Message\Payments\Item\Vendor\Name\String'.
14. In the Maximum length field, enter '60'.
15. Click the Mapping tab.
16. In the tree, expand 'model'.
17. In the tree, expand 'model\Payments'.
18. In the tree, expand 'model\Payments\Creditor'.
19. In the tree, expand 'model\Payments\Creditor\Account'.
20. In the tree, select 'model\Payments\Creditor\Account\IBAN'.
21. In the tree, select 'Xml\Message\Payments\Item = model.Payments\Vendor\Bank\IBAN\String'.
22. Click Bind.
23. Click Save.

Validate the customized format

1. Click Validate.

Validate the customized format layout and data mapping changes to make sure that all bindings are okay.

2. Close the page.

Change the status of the current version of the custom format configuration

Change the status of the designed format configuration from Draft to Completed to make it available for payment document generation.

1. Click Change status.

Note that the current version of the selected configuration is in Draft status.

2. Click Complete.
3. In the Description field, type a value.
4. Click OK.
5. In the list, find and select the desired record.

Note that the created configuration is saved as completed version 1.1.1. This means it is version 1 of the custom BACS (UK fictitious custom) format, which is based on version 1 of the BACS (UK fictitious) format, which is based on version 1 of the Payments (simplified model) data model.

Test the customized format to generate payment files

Complete the steps in the "Use created format to generate electronic documents for payments" procedure in a parallel Finance and Operations session. Select the BACS (UK fictitious custom) format in electronic payment method parameters. Make sure that the created payment file contains the recently introduced XML node presenting IBAN code in accordance to regional requirements.

Update the existing country-specific configuration

Litware, Inc. needs to update the BACS (UK fictitious) configuration and adopt new country requirements for managing the format of the electronic document. Later, this will be enclosed in a new version of this configuration that will be offered for service subscribers, including Proseware, Inc.

In real service provision related processes, each new version of BACS (UK fictitious) can be imported by Proseware, Inc. from Litware, Inc. configurations' LCS repository. In this procedure we will simulate this by updating BACS (UK fictitious) on behalf of a service provider.

1. Close the page.
2. Select Litware, inc. provider.
3. Click Set active.
4. Click Reporting configurations.
5. In the tree, expand 'Payments (simplified model)'.
6. In the tree, select 'Payments (simplified model)\BACS (UK fictitious)'.

The draft version owned by Litware, Inc. provider BACS (UK fictitious) is selected to bring in changes to

support new country-specific requirements.

Localize the base format of the electronic document

Assume that there are new country-specific requirements to be supported by Litware, Inc.:

- A value for the creditor's bank SWIFT code in each payment transaction.
- A limit of 100 characters for the length of text for the vendor's name in a generating file.
- New country-specific requirements
- Select the draft version of the desired configuration to introduce required changes.

1. Click Designer.
2. Click Expand/collapse.
3. Click Expand/collapse.
4. In the tree, select 'Xml\Message\Payments\Item\Vendor\Bank'.
5. Click Add to open the drop dialog.
6. In the tree, select 'XML\Element'.
7. In the Name field, type 'SWIFT'.
8. Click OK.
9. In the tree, select 'Xml\Message\Payments\Item\Vendor\Bank\SWIFT'.
10. Click Add to open the drop dialog.
11. In the tree, select 'Text\String'.
12. Click OK.
13. In the tree, select 'Xml\Message\Payments\Item\Vendor\Name\String'.
14. In the Maximum length field, enter '100'.
15. Click the Mapping tab.
16. In the tree, expand 'model'.
17. In the tree, expand 'model\Payments'.
18. In the tree, expand 'model\Payments\Creditor'.
19. In the tree, expand 'model\Payments\Creditor\Agent'.
20. In the tree, select 'model\Payments\Creditor\Agent\SWIFT'.
21. In the tree, select 'Xml\Message\Payments\Item = model.Payments\Vendor\Bank\SWIFT\String'.
22. Click Bind.
23. Click Save.

Validate the localized format

1. Click Validate.
2. Close the page.

Change the status of the current version of the base format configuration

Change the status of the updated base format configuration from Draft to Completed to make it available for generation of payment documents and updates of format configurations derived from it.

1. Click Change status.

Note that the current version of the selected configuration is in Draft status.

2. Click Complete.

3. In the Description field, type a value.
4. Click OK.
5. In the list, find and select the desired record.

Change the base version for the custom format configuration

Proseware, Inc. is informed that a new version 1.2 of BACS (UK fictitious) configuration is available to generate electronic payment documents in accordance to recently announced country-specific requirements. Proseware, Inc. wants to start using it as a standard for the country.

To do this, Proseware, Inc. needs to change the base configuration version for the custom configuration BACS (UK fictitious custom). Instead of version 1.1 of BACS (UK fictitious) use new version 1.2.

1. Go to Organization administration > Workspaces > Electronic reporting.
2. Select the Proseware, Inc. provider to mark it as active.
3. Click Set active.
4. Click Reporting configurations.
5. In the tree, expand 'Payments (simplified model)'.
6. In the tree, expand 'Payments (simplified model)\BACS (UK fictitious)'.
7. In the tree, select 'Payments (simplified model)\BACS (UK fictitious)\BACS (UK fictitious custom)'.

Select the BACS (UK fictitious custom) configuration, which is owned by Proseware, Inc.

Use the draft version of the selected configuration to introduce required changes.

8. Click Rebase.

Select the new version 1.2 of the base configuration to be applied as a new base for updating the configuration.

9. Click OK.

Note that some conflicts have been discovered between merging the custom version and a new base version representing some format changes that can't be merged automatically.

Resolve rebase conflicts

1. Click Designer.

Note that changes to the vendor's name text length limit couldn't be resolved automatically. Therefore, this is presented in a conflicts list. For each conflict of type Update, the following options are available: - Apply a prior base value (button on top of the grid) to bring in the previous base version value (0 in our case). - Apply a base value (button on top of the grid) to bring in the new base version value (100 in our case). - Keep your own (custom) value (60 in our case). Click Apply base value to apply a country-specific limit of 100 characters for vendor's name text length.

Note that Proseware, Inc. and Litware, Inc. have custom and local versions of this format using IBAN and SWIFT codes with related components that are automatically merged in the managing format.

2. Click Apply base value.

Click Apply base value to apply the country-specific limit of 100 characters for vendor names.

3. Click Save.

Saving the format will remove resolved conflicts from the conflicts list.

4. Close the page.

Change the status of the new version of the custom format configuration

1. Click Change status.

Change the status of the updated, custom format configuration from Draft to Completed. This will make the format configuration available for generating payment documents. Note that the current version of the selected configuration is in Draft status.

2. Click Complete.

3. In the Description field, type a value.

4. Click OK.

Note that the created configuration is saved as completed version 1.2.2: version 2 of base BACS (UK fictitious custom) format, which is based on version 2 of base BACS (UK fictitious) format, which is based on version 1 of Payments (simplified model) data model.

Test the customized format for payment files generation

Complete the steps in the "Use created format to generate electronic documents for payments" procedure in parallel Finance and Operations session. Select the created 'BACS (UK fictitious custom)' format in electronic payment method parameters. Make sure that the created payment file contains recently introduced by Proseware, Inc. XML node presenting IBAN account code in accordance to regional requirements. The file also should contain the recently introduced by Litware, Inc. XML node presenting SWIFT bank code in accordance to country requirements.

NOTE

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Formula designer in Electronic reporting (ER)

2/18/2021 • 8 minutes to read • [Edit Online](#)

This topic explains how to use the formula designer in Electronic reporting (ER). When you design a format for a specific electronic document in ER, you can use formulas to transform data so that it meets the requirements for the document's fulfillment and formatting. These formulas resemble formulas in Microsoft Excel. Various types of functions are supported in the formulas: text, date and time, mathematical, logical, information, and data type conversion functions, and also other, business domain-specific functions.

Formula designer overview

ER supports the formula designer. Therefore, at design time, you can configure expressions that can be used for the following tasks at runtime:

- Transform data that is received from an application database and that should be entered in an ER data model that is designed to be a data source for ER formats. (For example, these transformations might include filtering, grouping, and data type conversion.)
- Format data that must be sent to a generating electronic document in accordance with the layout and conditions of a specific ER format. (For example, the formatting might be done in accordance with the requested language or culture, or the encoding).
- Control the process of creating electronic documents. (For example, the expressions can enable or disable the output of specific elements of the format, depending on processing data. They can also interrupt the document creation process or throw messages to users.)

You can open the **Formula designer** page when you perform any of the following actions:

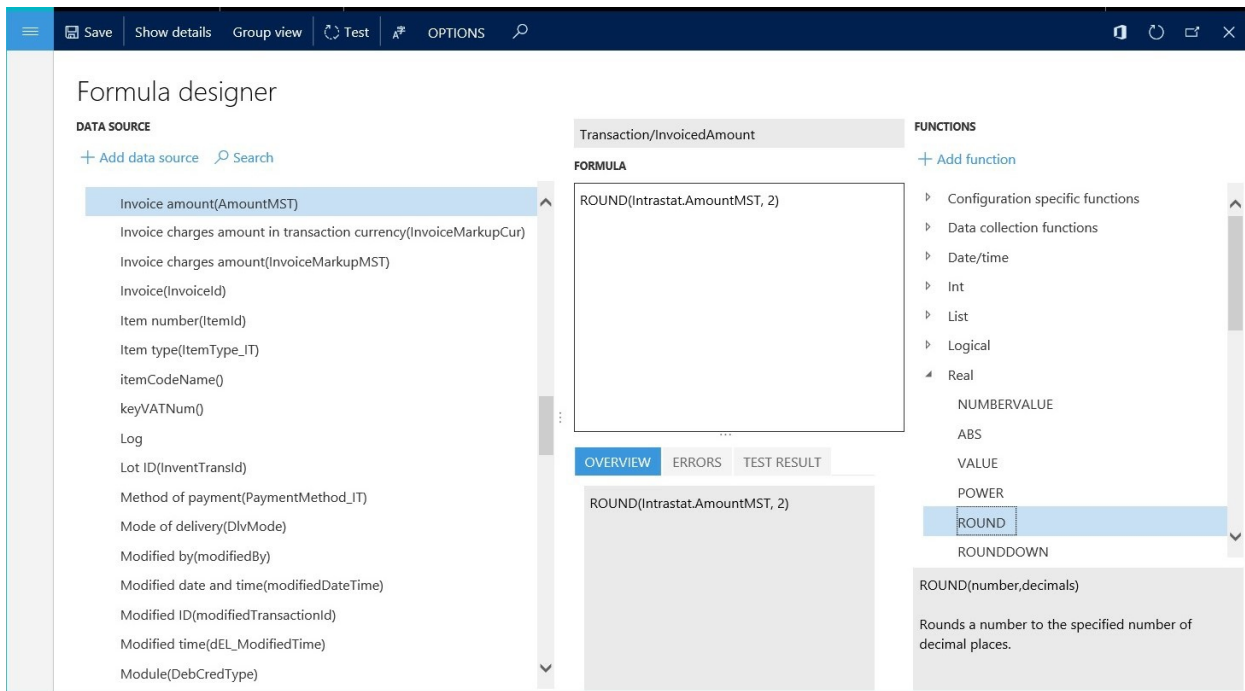
- Bind data source items to data model components.
- Bind data source items to format components.
- Complete maintenance of calculated fields that are part of data sources.
- Define the visibility conditions for user input parameters.
- Design a format's transformations.
- Define the enabling conditions for the format's components.
- Define the file names for the format's FILE components.
- Define the conditions for process control validations.
- Define the message text for process control validations.

Data binding

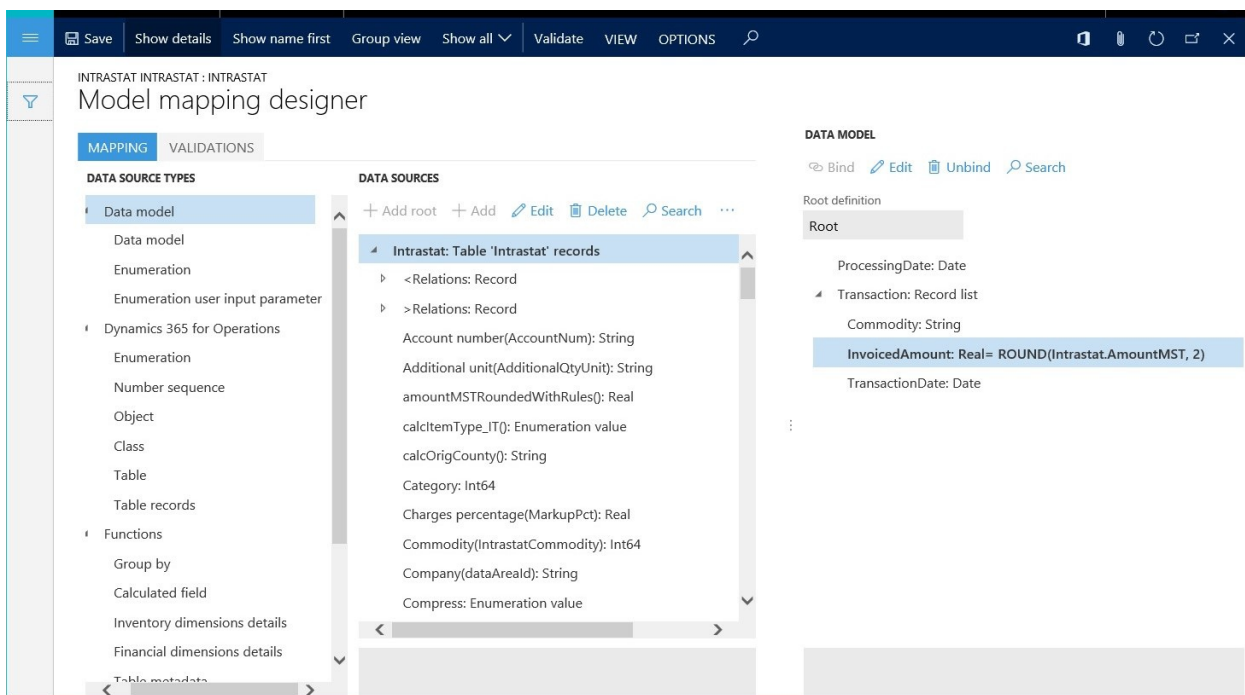
The ER formula designer can be used to define an expression that transforms data that is received from data sources, so that the data can be entered in the data consumer in the following ways at runtime:

- From application data sources and runtime parameters to an ER data model
- From an ER data model to an ER format
- From application data sources and runtime parameters to an ER format

The following illustration shows the design of an expression of this type. In this example, the expression rounds the value of the **Intrastat.AmountMST** field in the Intrastat table to two decimal places and then returns the rounded value.



The following illustration shows how an expression of this type can be used. In this example, the result of the designed expression is entered in the **Transaction.InvoicedAmount** component of the **Tax reporting model** data model.

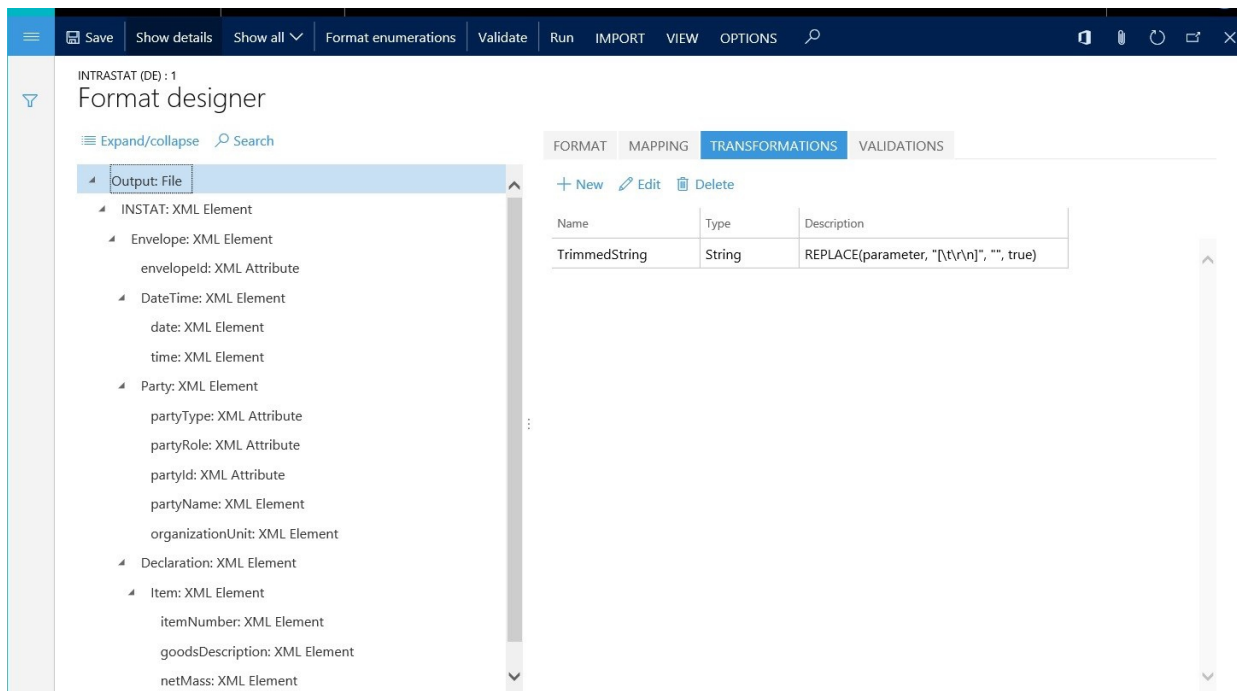


At runtime, the designed formula, `ROUND (Intrastat.AmountMST, 2)`, rounds the value of the **AmountMST** field for each record in the **Intrastat** table to two decimal places. It then enters the rounded value in the **Transaction.InvoicedAmount** component of the **Tax reporting** data model.

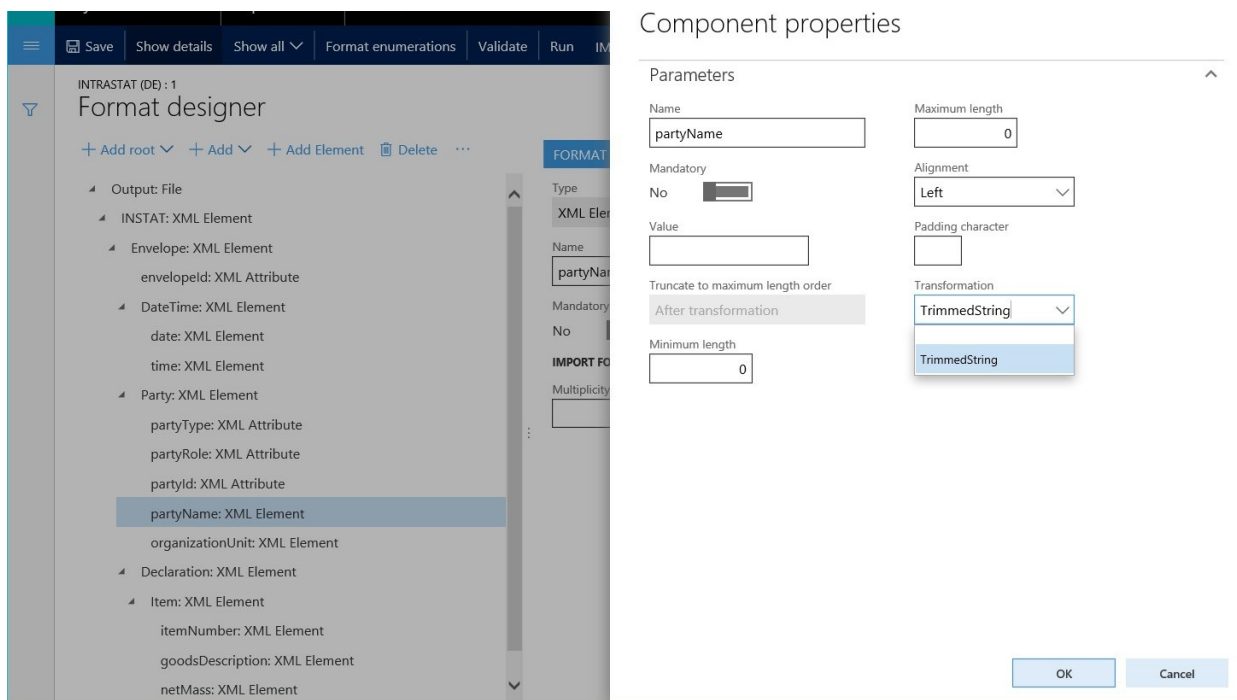
Data formatting

The ER formula designer can be used to define an expression that formats data that is received from data sources, so that the data can be sent as part of the generating electronic document. You might have formatting that must be applied as a typical rule that should be reused for a format. In this case, you can introduce that formatting one time in the format configuration, as a named transformation that has a formatting expression. This named transformation can then be linked to many format components where the output must be formatted according to the formatting expression that you created.

The following illustration shows the design of a transformation of this type. In this example, the `TrimmedString` transformation truncates incoming data of the `String` data type by removing leading and trailing spaces. It then returns the truncated string value.

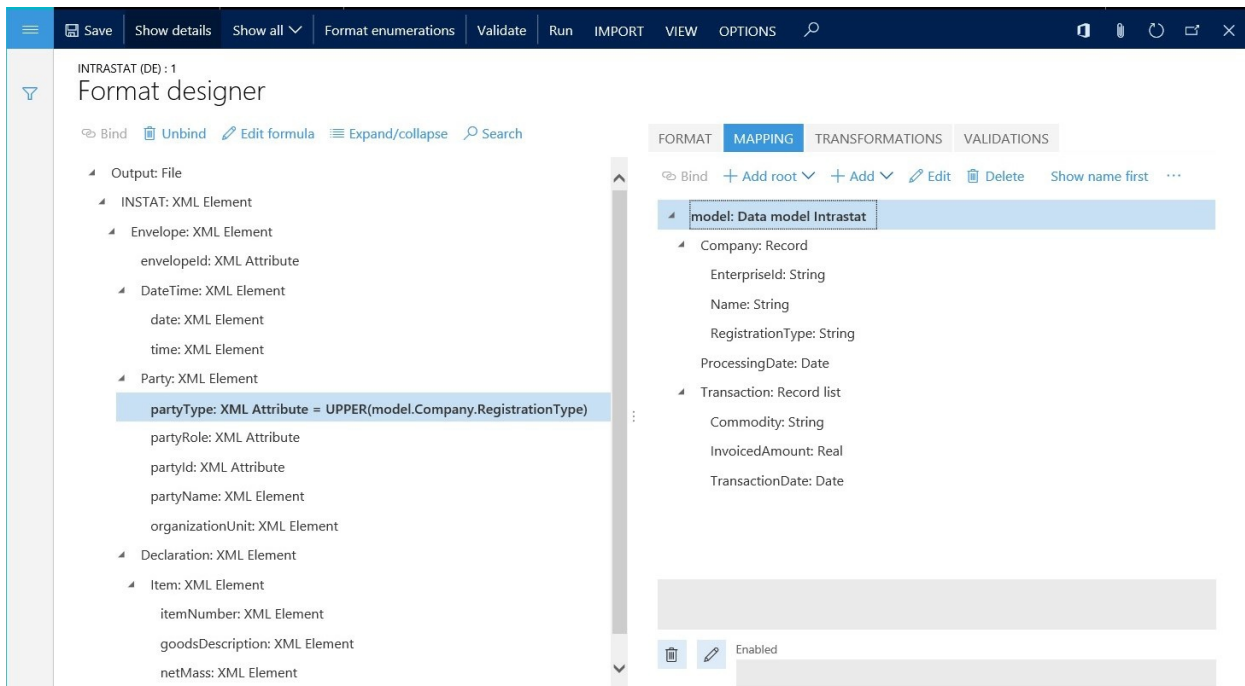


The following illustration shows how a transformation of this type can be used. In this example, several format components send text as output to the generating electronic document at runtime. All these format components refer to the `TrimmedString` transformation by name.



When format components, such as the `partyName` component in the preceding illustration, refer to the `TrimmedString` transformation, the transformation sends text as output to the generating electronic document. This text doesn't include leading and trailing spaces.

If you have formatting that must be applied individually, you can introduce that formatting as an individual expression of a binding of a specific format component. The following illustration shows an expression of this type. In this example, the `partyType` format component is bound to the data source via an expression that converts incoming data from the `Model.Company.RegistrationType` field in the data source to uppercase text. The expression then sends that text as output to the electronic document.



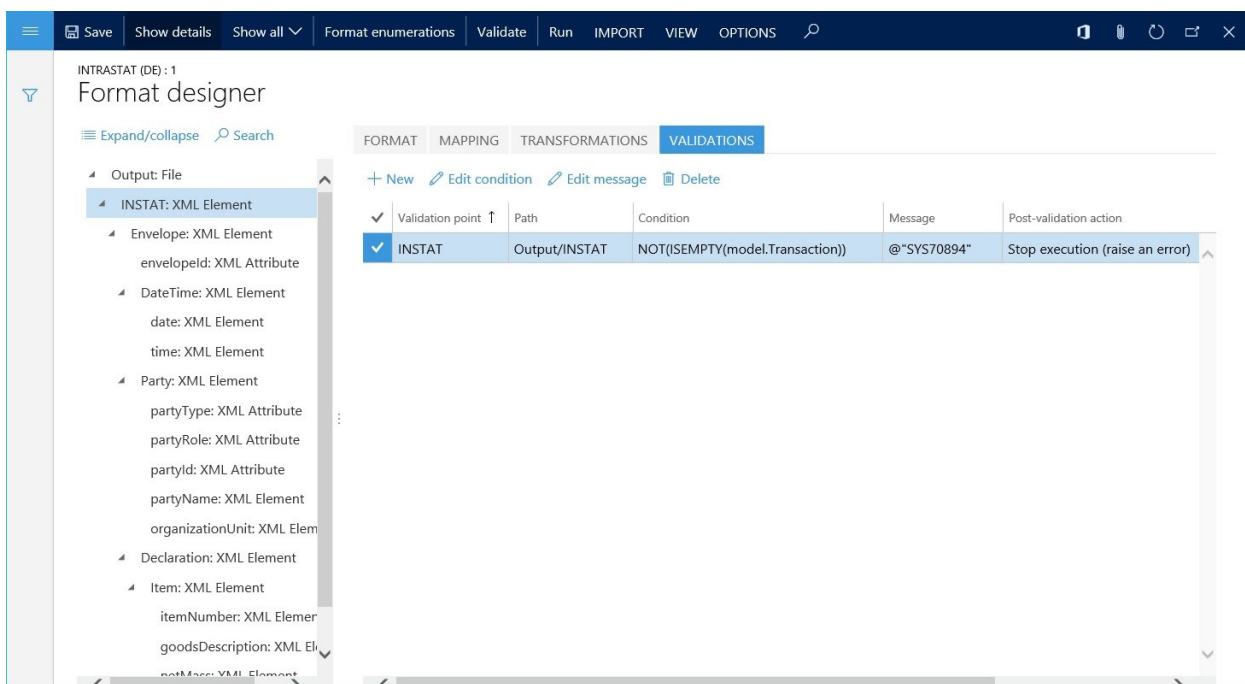
Process flow control

The ER formula designer can be used to define expressions that control the process flow of generating electronic documents. You can perform the following tasks:

- Define conditions that determine when a document creation process must be stopped.
- Specify expressions that either create messages for the user about stopped processes or throw execution log messages about the continuing process of report generation.
- Specify the file names of generating electronic documents, and control the conditions of their creation.

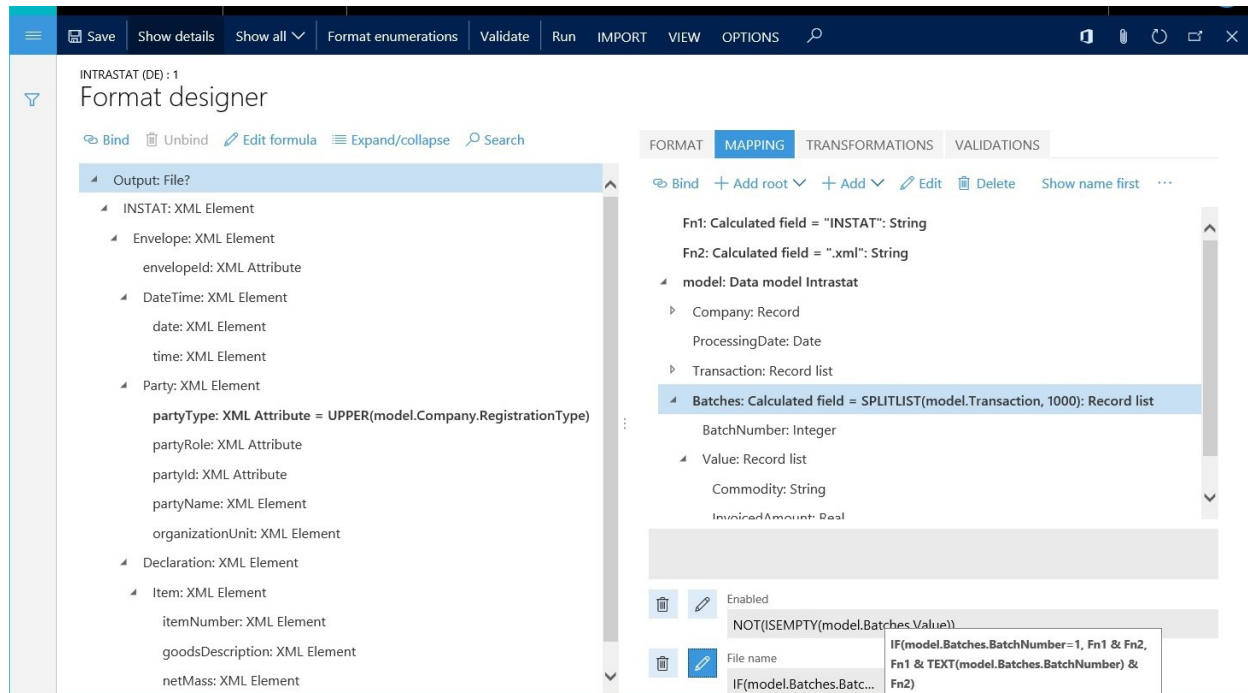
Each rule of the process flow control is designed as an individual validation. The following illustration shows a validation of this type. Here is an explanation of the configuration in this example:

- The validation is evaluated when the **INSTAT** node is created during generation of the XML file.
- If the list of transactions is empty, the validation stops the execution process and returns **FALSE**.
- The validation returns an error message that includes the text of label SYS70894 in the user's preferred language.



The ER formula designer can also be used to generate a file name for a generating electronic document and to control the file creation process. The following illustration shows the design of a process flow control of this type. Here is an explanation of the configuration in this example:

- The list of records from the **model.Intrastat** data source is divided into batches. Each batch contains up to 1,000 records.
- The output creates a zip file that contains one file in XML format for every batch that was created.
- An expression returns a file name for generating electronic documents by concatenating the file name and the file name extension. For the second batch and all subsequent batches, the file name contains the batch ID as a suffix.
- An expression enables (by returning **TRUE**) the file creation process for batches that contain at least one record.



Document content control

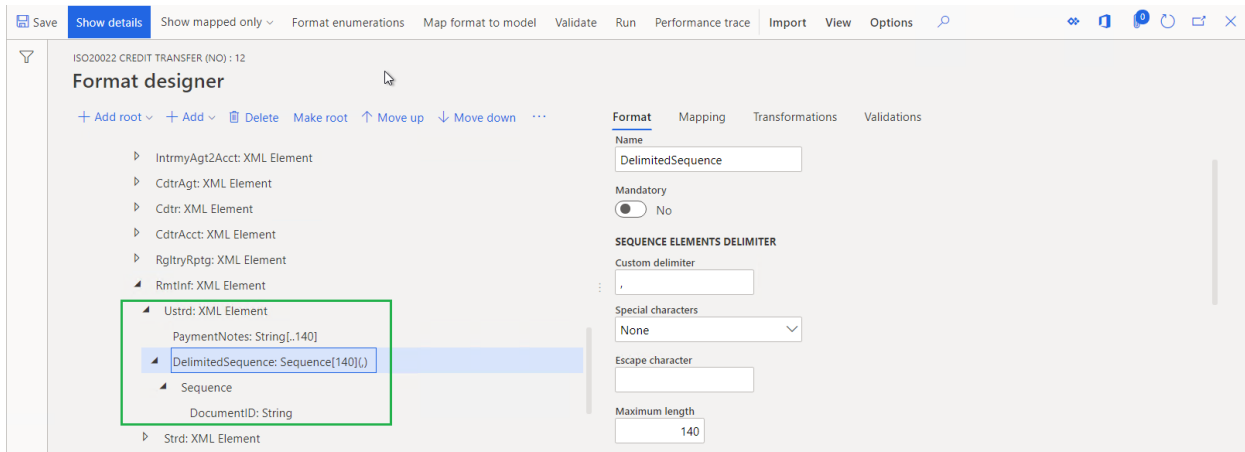
The ER formula designer can be used to configure expressions that control what data will be put into generated electronic documents at runtime. The expressions can enable or disable the output of specific elements of the format, depending on processing data and configured logic. These expressions can be entered for a single format element in the **Enabled** field on the **Mapping** tab of the **Operations designer** page. You can enter the expressions as a logic condition that returns a *Boolean* value:

- If the condition returns **True**, the current format element is run.
- If the condition returns **False**, the current format element is skipped.

The following illustration shows expressions of this type. (Version 11.12.11 of the **ISO20022 Credit transfer (NO)** format configuration that is provided by Microsoft is used as an example.) The **XMLHeader** format component is configured to describe the structure of the credit transfer message according to the ISO 20022 XML message standards. The

XMLHeader/Document/CstmrCdtTrfInitt/PmtInf/CdtTrfTxInf/RmtInf/Ustrd format component is configured to add the **Ustrd** XML element to the generated message and to put the remittance information in an unstructured format as text of the following XML elements:

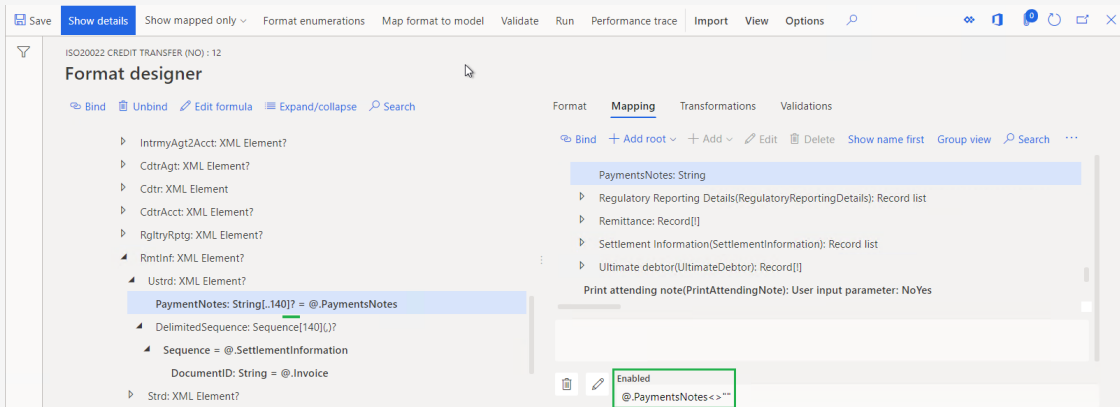
- The **PaymentNotes** component is used to generate the text of payment notes.
- The **DelimitedSequence** component generates comma-separated invoice numbers that are used to settle the current credit transfer.



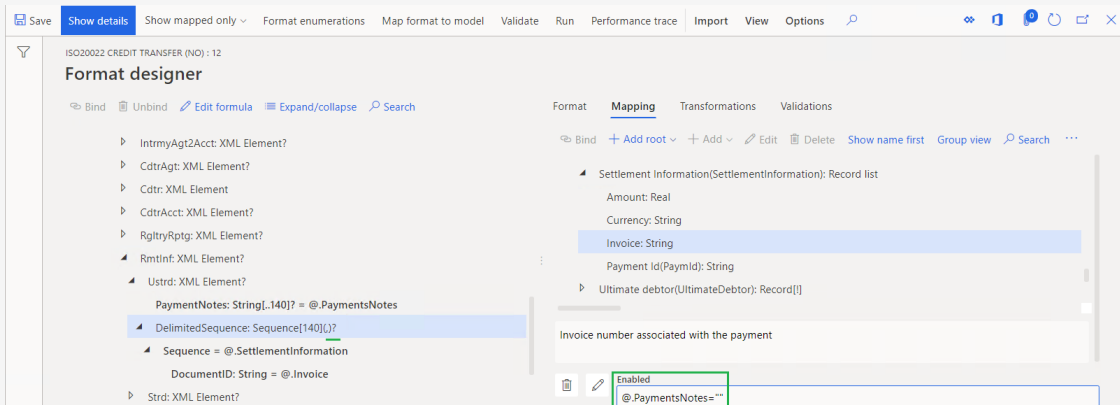
NOTE

The **PaymentNotes** and **DelimitedSequence** components are labeled by using a question mark. A question mark indicates that the use of a component is conditional. In this case, use of the components is based on the following criteria:

- The `@.PaymentsNotes <> ""` expression that is defined for the **PaymentNotes** component enables (by returning **TRUE**) the **Ustrd** XML element to be filled with the text of payment notes, if that text isn't blank for the current credit transfer.



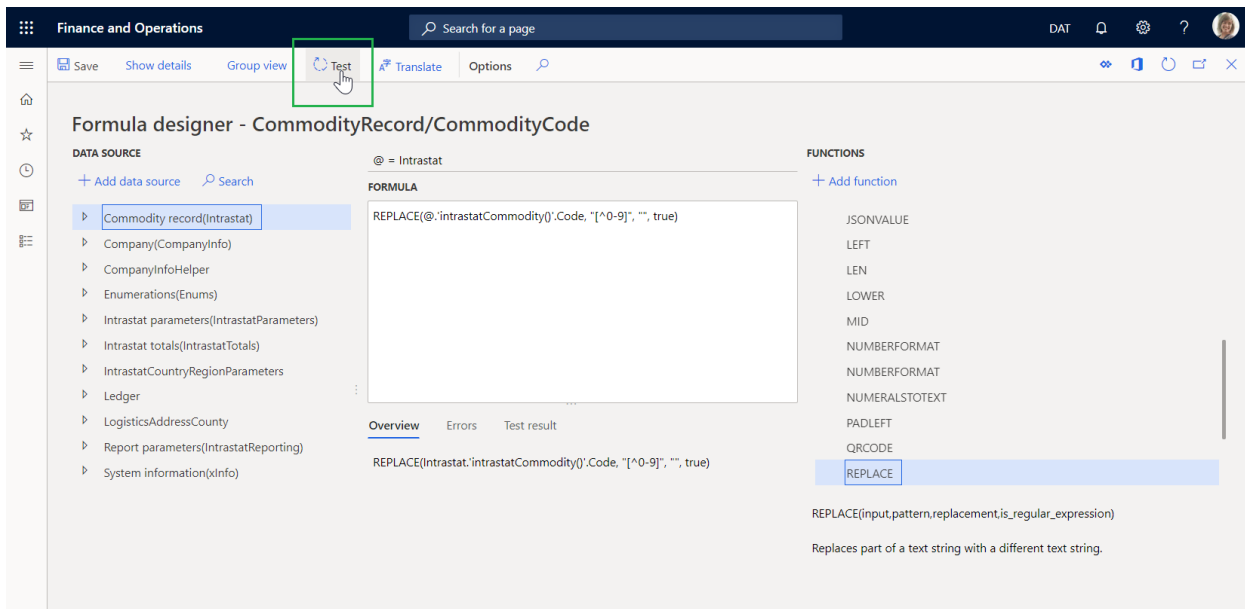
- The `@.PaymentsNotes = ""` expression that is defined for the **DelimitedSequence** component enables (by returning **TRUE**) the **Ustrd** XML element to be filled with a comma-separated list of the invoice numbers that are used to settle the current credit transfer, if the text of payment notes for that credit transfer is blank.



Based on this setup, the message that is generated for each debtor payment, the **Ustrd** XML element, will contain either the text of payment notes or, when that text is blank, a comma-separated list of the invoice numbers that are used to settle the payment.

Validation of configured formulas

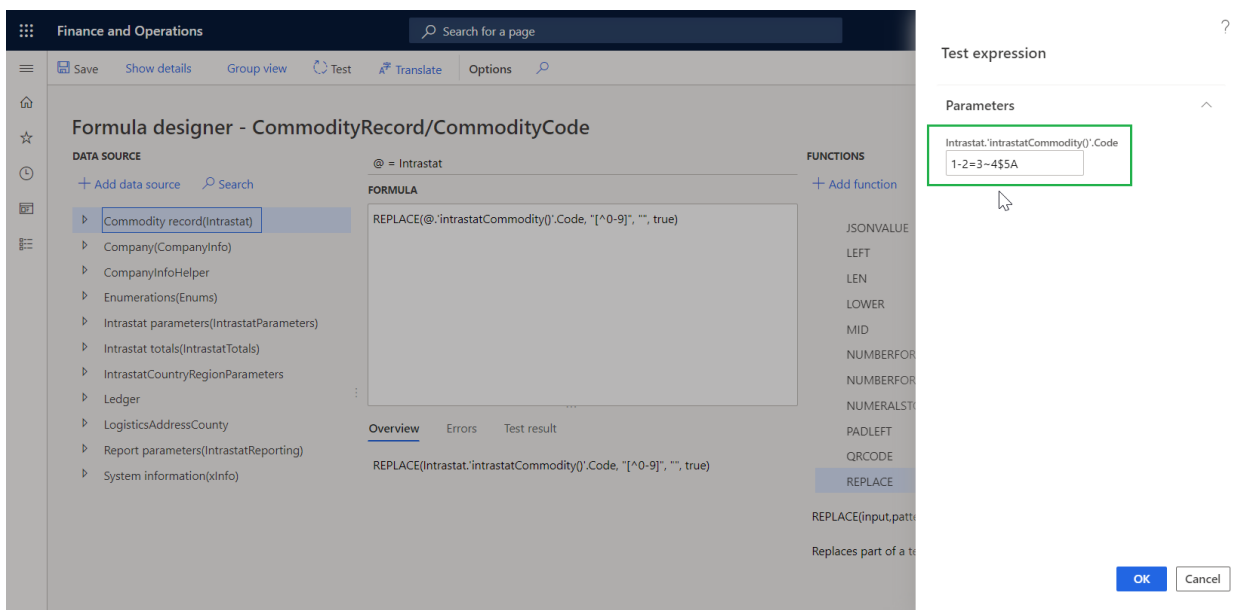
On the **Formula designer** page, select **Test** to validate how the configured formula works.



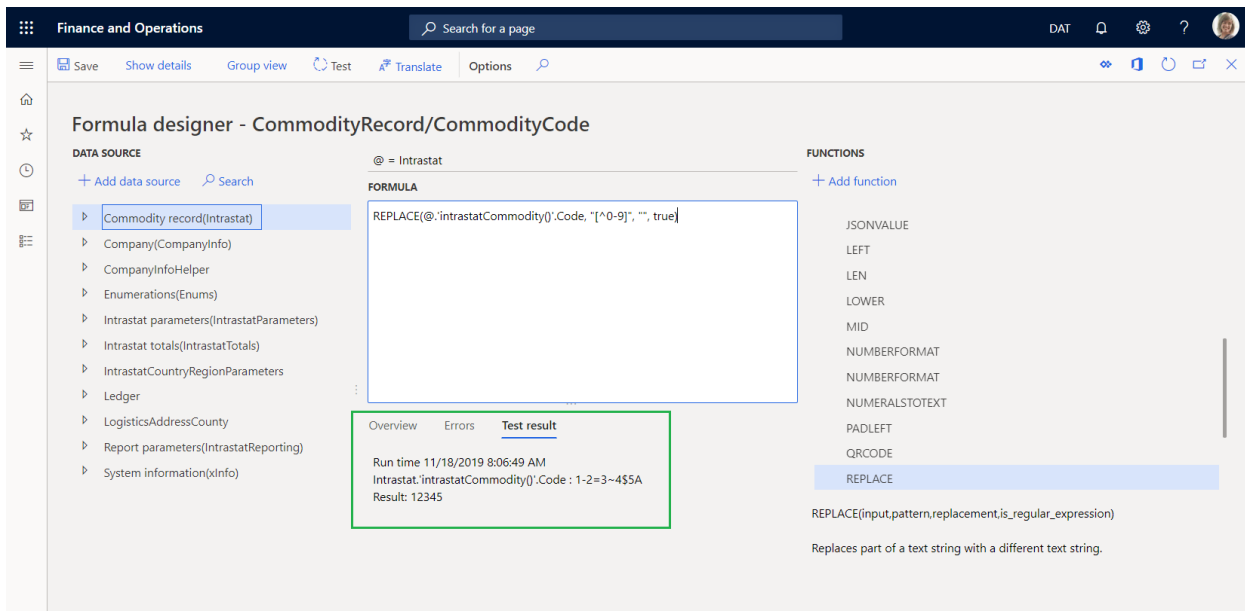
When the values of formula arguments are required, you can open the **Test expression** dialog box from the **Formula designer** page. In most cases, these arguments must be manually defined, because the configured bindings aren't run at design time. The **Test result** tab on the **Formula designer** page shows the result from execution of the configured formula.

The following example shows how you can test the formula that is configured for the foreign trade domain to make sure that the Intrastat commodity code contains only digits.

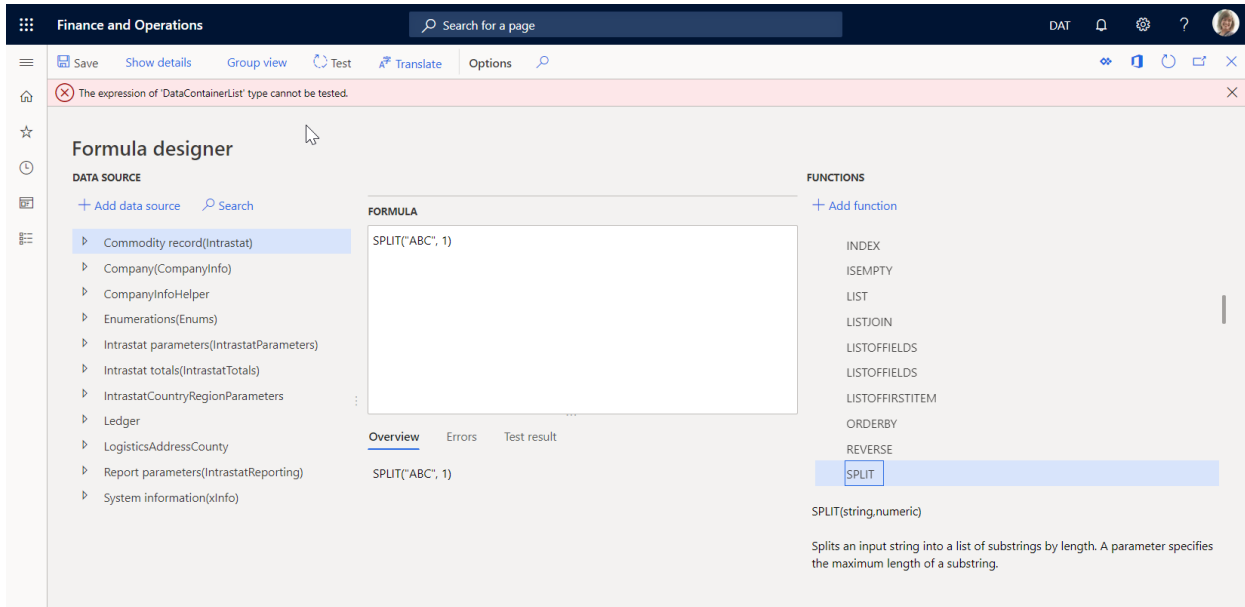
When you test this formula, you can use the **Test expression** dialog box to specify the value of the Intrastat commodity code for testing.



After you specify the Intrastat commodity code and select **OK**, the **Test result** tab on the **Formula designer** page shows the result of execution of the configured formula. You can then evaluate whether the result is acceptable. If the result isn't acceptable, you can update the formula and test it again.



Some formulas can't be tested at design time. For example, a formula might return a result of a data type that can't be shown on the Test result tab. In this case, you receive an error message that states that the formula can't be tested.



Additional resources

- [Electronic Reporting overview](#)
- [Electronic reporting formula language](#)

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Electronic reporting advanced formula editor

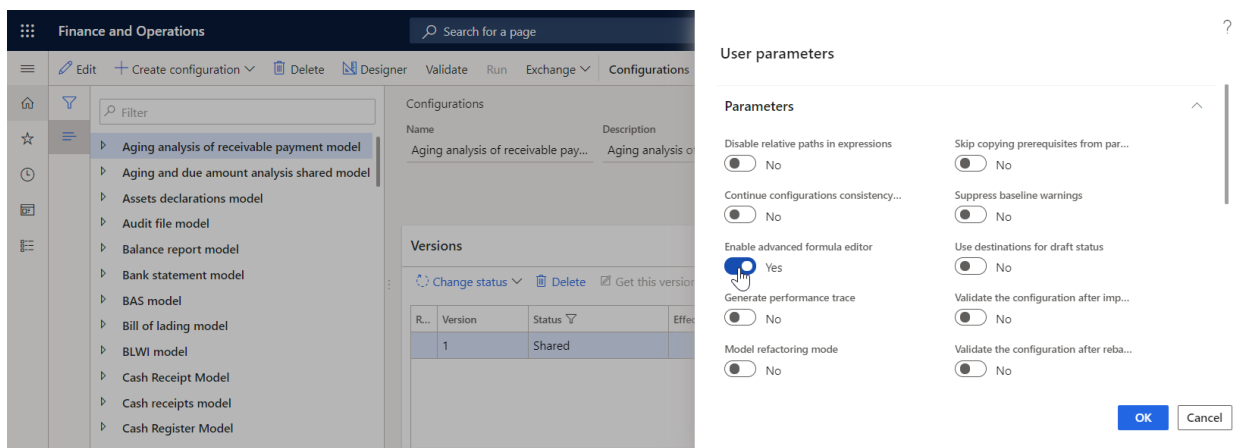
2/18/2021 • 4 minutes to read • [Edit Online](#)

In addition to the [Electronic reporting formula editor](#), you can use the advanced Electronic reporting formula editor to improve the experience of configuring Electronic reporting (ER) expressions. The advanced editor is browser-based and powered by the [Monaco editor](#). The most commonly used advanced editor features are described in this topic:

- [Code autoformatting](#)
- [IntelliSense](#)
- [Code completion](#)
- [Code navigation](#)
- [Code structuring](#)
- [Find and replace](#)
- [Data pasting](#)
- [Syntax colorization](#)

Complete the following steps to start using the advanced formula editor in your instance of Microsoft Dynamics 365 Finance.

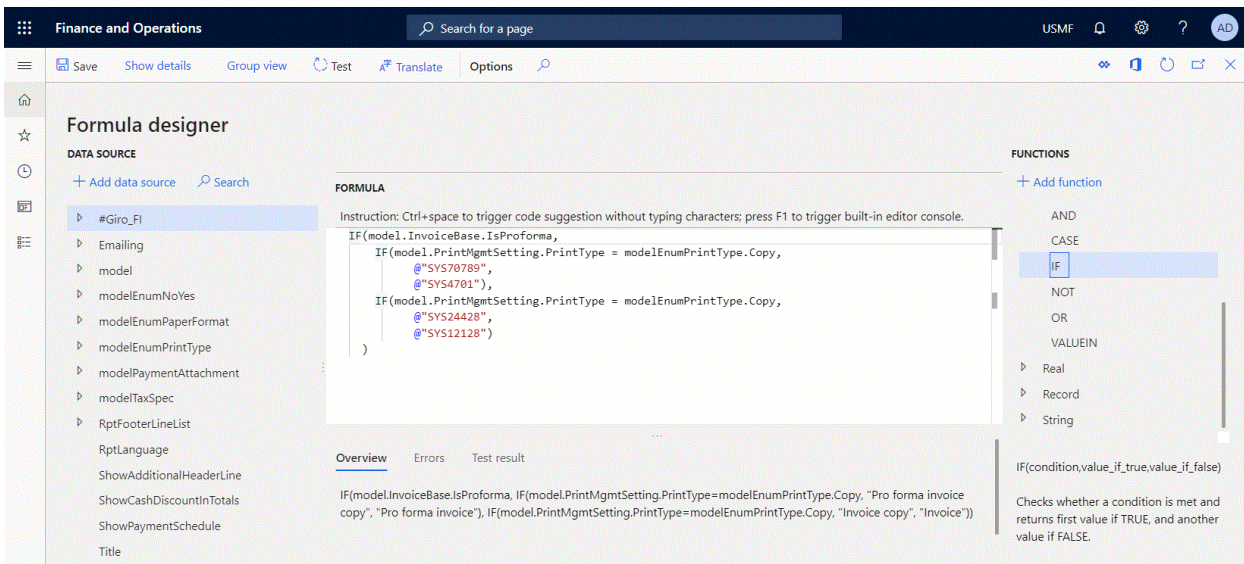
1. Go to **Organization administration > Electronic reporting > Configurations**.
2. On the **Configurations** page, on the Action Pane, on the **Configurations** tab, in the **Advanced settings** group, select **User parameters**.
3. In the **User parameters** dialog box, in the **Execution tracing** section, set the **Enable advanced formula editor** parameter to **Yes**.



NOTE

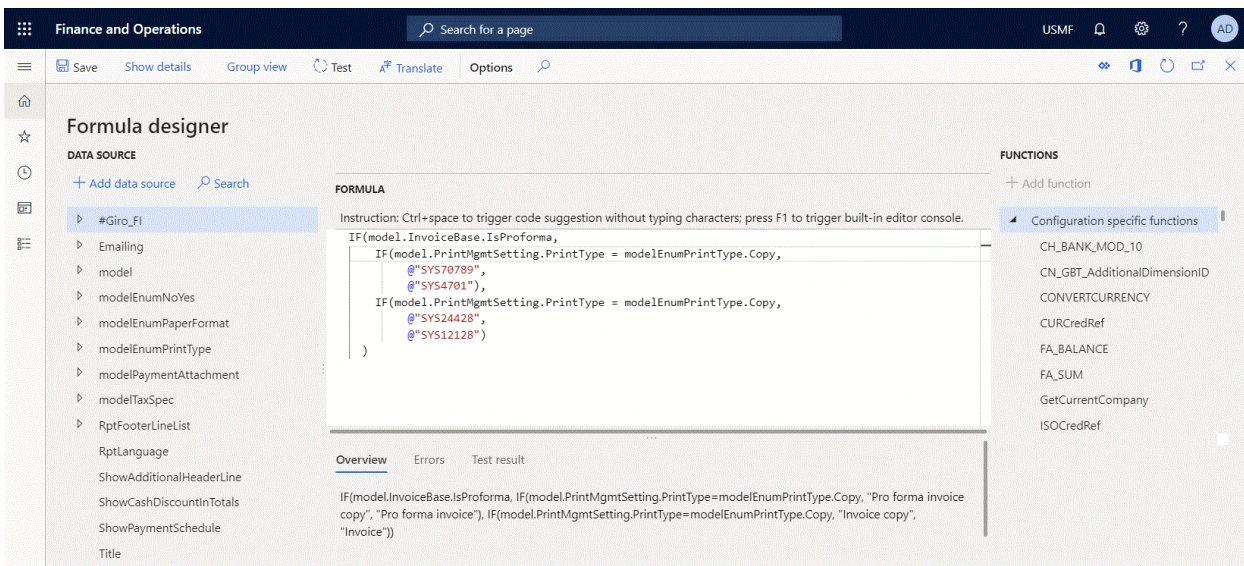
Be aware that this parameter is user specific and company specific.

When you write a complex expression that consists of multiple rows of code, the indentation of a new entered line will be automatic based on the indentation of the previous row. You can select lines and change their indentation by typing **Tab** or **Shift+ Tab**.



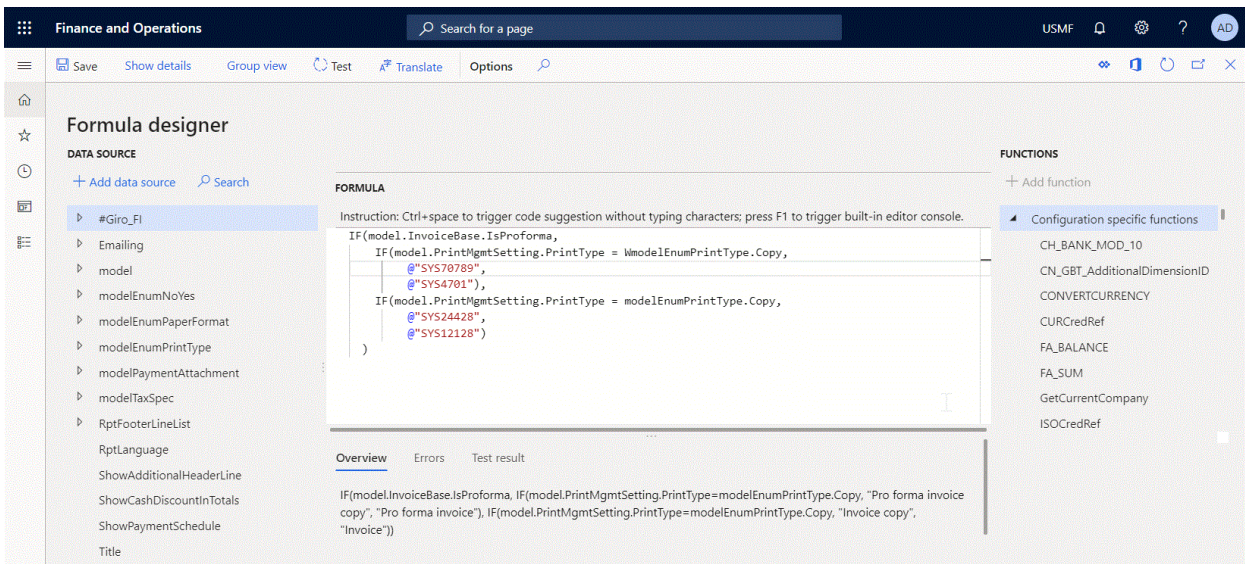
Autoformatting allows you to keep the entire expression well formatted to make further maintenance easier and to simplify understanding of the configured logic.

The editor provides word completion to help you write expression faster and avoid typos. When you start adding new text, the editor automatically offers a list of functions supported in ER functions that contain the characters you have entered. You can also trigger IntelliSense in any place of a configured expression by typing **Ctrl+Space**.



The editor automatically provides code completion by:

- Inserting a closing bracket when an opening bracket is entered, keeping the cursor inside the brackets.
- Inserting the second quotation symbol when the first one is entered, keeping the cursor inside the quotations.
- Inserting the second double quotation symbol when the first one is entered, keeping the cursor inside the quotations.

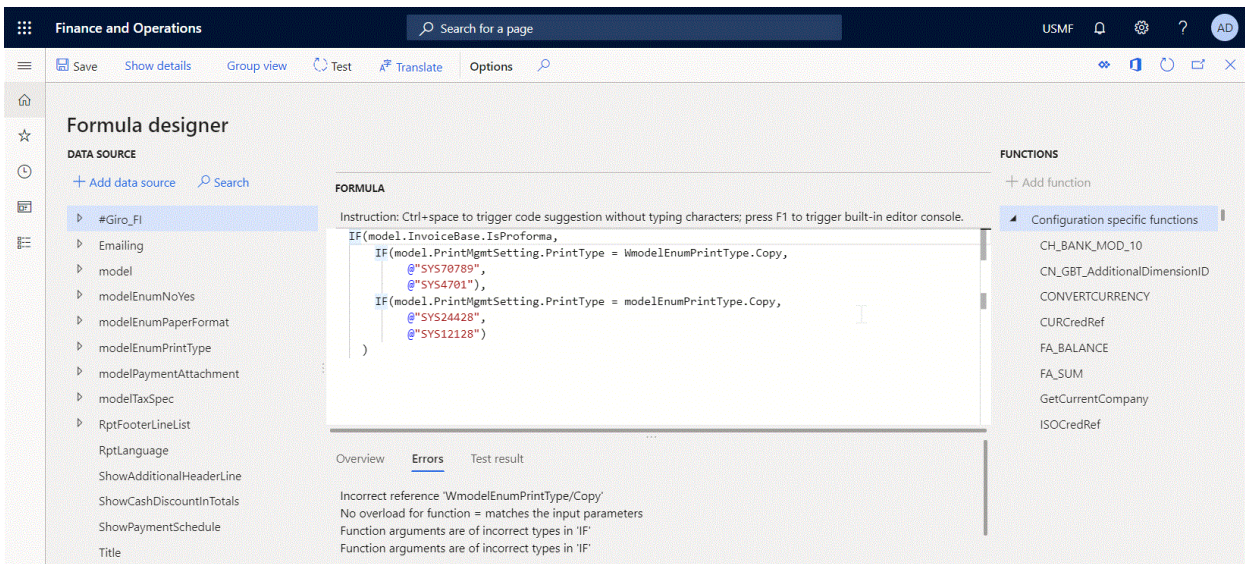


When you point to the typed bracket, the second bracket of this pair is automatically highlighted to show the construct that they support.

You can locate required symbols or lines in your expression by typing the Go to command using the command palette or the context menu.

For example, to jump to line 8, do the following:

- Press **Ctrl+G**, enter the value **8**, and then press **Enter**.
- or-
- Press **F1**, type **G**, select **Go to line**, enter the value **8**, and the press **Enter**.



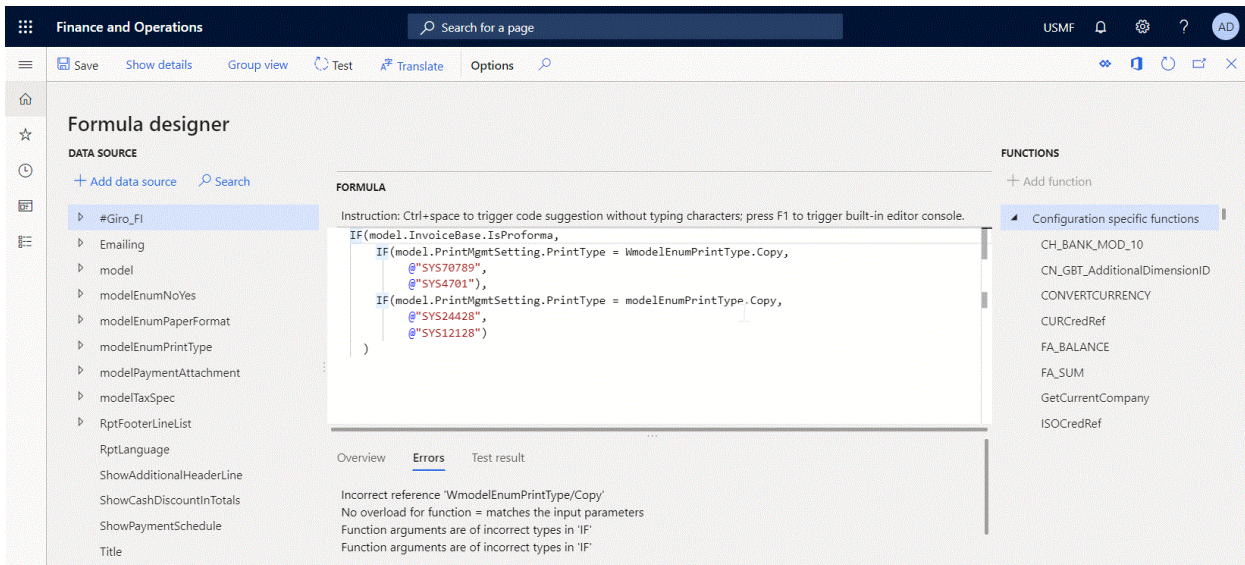
The code for some functions, such as **IF** or **CASE**, is automatically structured. You can expand and collapse any or all of the folding regions of this code to reduce the editable part of an expression in order to focus on only the piece of code that requires your attention. The toggle fold/unfold commands can be used for that.

For example, to fold all regions, do the following:

- Press **Ctrl+K**
- or-
- Press **F1**, press **FO**, select **Fold all**, and then press **Enter**

To unfold all regions, do the following:

- Press **Ctrl+J**
- or-
- Press **F1**, type **UN**, select **Unfold all**, and then press **Enter**



To find occurrences of certain text, select the text in your expression, and do the following:

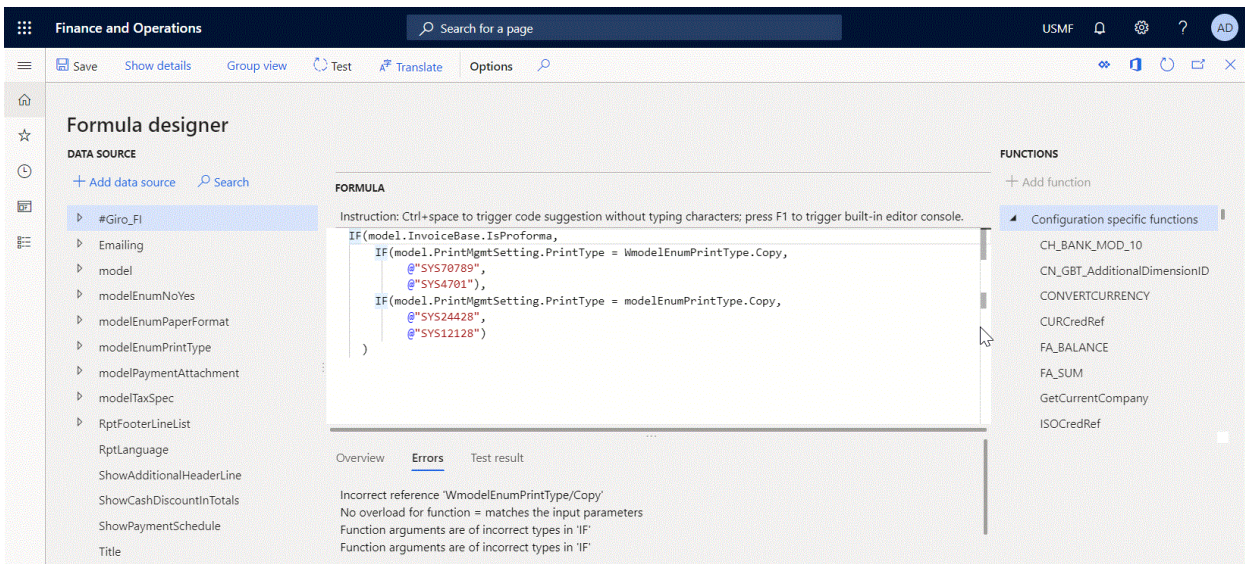
- Press **Ctrl+F** and then press **F3** to find the next occurrence of the selected text, or press **Shift+F3** to find the previous occurrence.
- or-
- Press **F1**, type **F**, and then select the required option to find the selected text.

To replace occurrences of a certain text, select the text in your expression, and do the following:

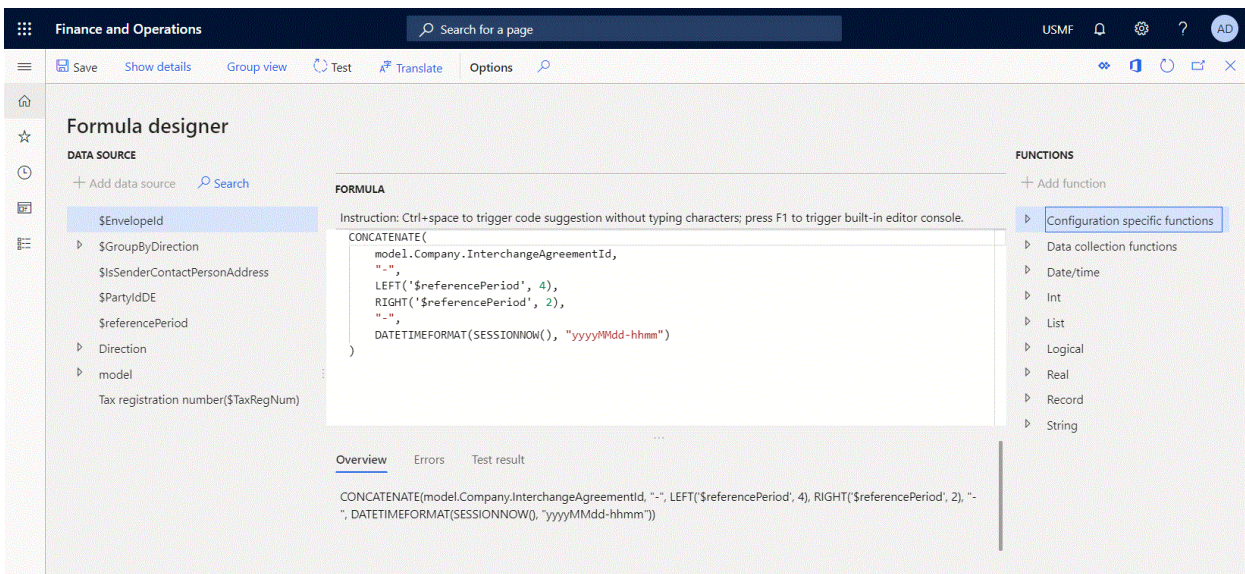
- Press **Ctrl+H**. Enter the alternative text and select the replacement option to replace either the selected text or all occurrences of this text in the current expression.
- or-
- Press **F1**, type **R**, and then select the required option to replace the selected text. Enter the alternative text and select the replacement option to replace either the selected text or all occurrences of this text in the current expression.

To change all occurrences of a certain text, select the text in your expression, and do the following:

- Press **Ctrl+F2** and then enter the alternative text.
- or-
- Press **F1**, type **C**, and then select the required option to change the selected text. Enter the alternative text.

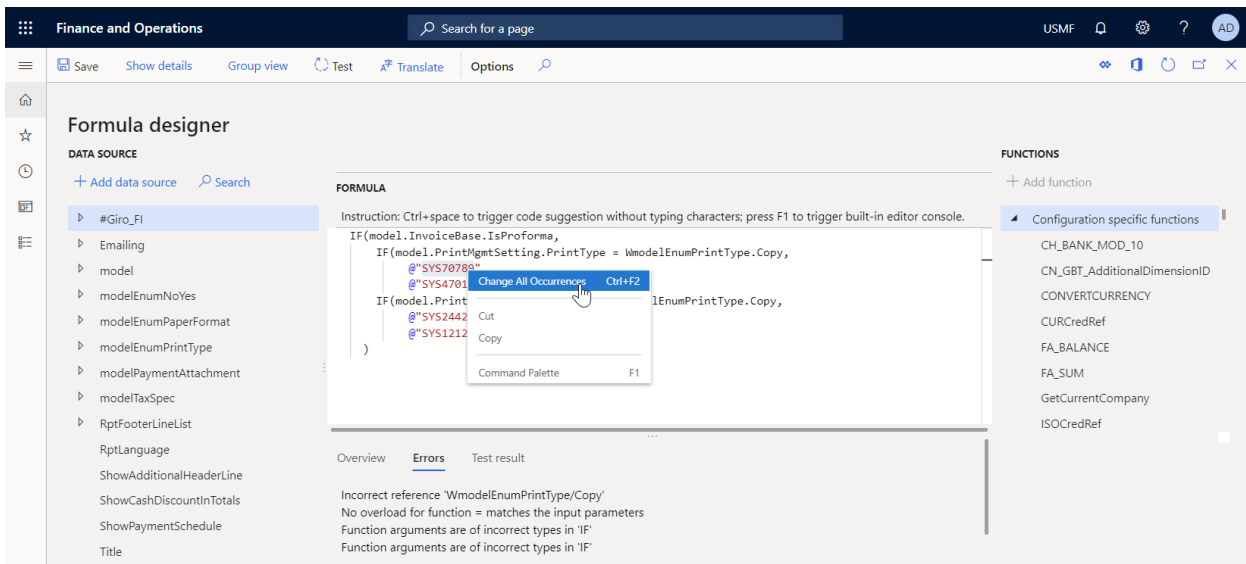


You can select **Add data source**, which pastes to the current expression a data source that is currently selected on the **Data source** left panel. Similarly, you can select **Add function**, which pastes to the current expression a function that is currently selected on the **Functions** right panel. If you use the ER formula editor, a selected function or a selected data source will always be pasted to the end of the configured expression. When you use the advanced ER formula editor, a selected function or a selected data source can be pasted to any part of the configured expression. You will need to use the cursor to specify where you want to paste the data.



Currently, different colors are used to highlight the following parts of expressions:

- The text in double brackets that can represent a label ID of a text constant.



Limitations

The editor is currently supported in the following web browsers:

- Chrome
- Edge
- Firefox
- Opera
- Safari

Additional resources

- [Electronic reporting \(ER\) overview](#)
- [Formula designer in Electronic reporting](#)
- [Monaco editor](#)

NOTE

Can you tell us about your documentation language preferences? [Take a short survey](#).

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Electronic reporting formula language

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Electronic reporting (ER) provides a powerful data transformation experience. The language that is used to express the required data manipulations in the [ER formula designer](#) resembles the formula language in Microsoft Excel.

Basic syntax

ER expressions can contain any or all of the following elements:

- [Constants](#)
- [Operators](#)
- [References](#)
- [Paths](#)
- [Functions](#)

When you design expressions, you can use text and numeric constants (that is, values that aren't calculated). For example, the expression `VALUE ("100") + 20` uses the numeric constant **20** and the string constant **"100"**, and it returns the numeric value **120**.

The ER formula designer supports escape sequences. Therefore, you can specify an expression string that should be handled differently. For example, the expression `"Leo Tolstoy ""War and Peace"" Volume 1"` returns the text string **Leo Tolstoy "War and Peace" Volume 1**.

The following table shows the arithmetic operators that you can use to do basic mathematical operations, such as addition, subtraction, multiplication, and division.

OPERATOR	MEANING	EXAMPLE
+	Addition	<code>1+2</code>
-	Subtraction, negation	<code>5-2</code> , <code>-1</code>
*	Multiplication	<code>7*8</code>
/	Division	<code>9/3</code>

The following table shows the comparison operators that are supported. You can use these operators to compare two values.

OPERATOR	MEANING	EXAMPLE
=	Equal	<code>X=Y</code>
>	Greater than	<code>X>Y</code>
<	Less than	<code>X<Y</code>

OPERATOR	MEANING	EXAMPLE
>=	Greater than or equal to	<code>X>=Y</code>
<=	Less than or equal to	<code>X<=Y</code>
<>	Not equal to	<code>X<>Y</code>

Additionally, you can use an ampersand (&) as a text concatenation operator. In this way, you can join, or concatenate, one or more text strings into a single piece of text.

OPERATOR	MEANING	EXAMPLE
&	Concatenate	<code>"Nothing to print:" & " " & "no records found"</code>

Operator precedence

The order in which the parts of a compound expression are evaluated is important. For example, the result of the expression `1 + 4 / 2` varies, depending on whether the addition or division operation is done first. You can use parentheses to explicitly define how an expression is evaluated. For example, to indicate that the addition operation should be done first, you can change the preceding expression to `(1 + 4) / 2`. If you don't explicitly indicate the order of operations in an expression, the order is based on the default precedence that is assigned to the supported operators. The following table shows the precedence that is assigned to each operator. Operators that have a higher precedence (for example, 7) are evaluated before operators that have a lower precedence (for example, 1).

PRECEDENCE	OPERATORS	SYNTAX
7	Grouping	<code>(...)</code>
6	Member access	<code>...</code>
5	Function call	<code>... (...)</code>
4	Multiplicative	<code>... * ...</code> <code>... / ...</code>
3	Additive	<code>... + ...</code> <code>... - ...</code>
2	Comparison	<code>... < ...</code> <code>... <= ...</code> <code>... = > ...</code> <code>... > ...</code> <code>... = ...</code> <code>... <> ...</code>
1	Separation	<code>... / ...</code>

If an expression includes multiple consecutive operators that have the same precedence, those operations are evaluated from left to right. For example, the expression `1 + 6 / 2 * 3 > 5` returns **true**. We recommend that you use parentheses to explicitly indicate the desired order of operations in expressions, so that the expressions are easier to read and maintain.

All data sources of the current ER component that are available during the design of an expression can be used as named references. The current ER component can be either a model mapping or a format. For example, the current ER model mapping contains the **ReportingDate** data source, which returns a value of the *DateTime* data type. To correctly format that value in the generating document, you can reference the data source in the expression as `DATETIMEFORMAT (ReportingDate, "dd-MM-yyyy")`.

All characters in the name of a referencing data source that don't represent a letter of the alphabet must be preceded by a single quotation mark ('). If the name of a referencing data source contains at least one symbol that doesn't represent a letter of the alphabet, the name must be enclosed in single quotation marks. For example, these non-alphabetic symbols can be punctuation marks or other written symbols. Here are some examples:

- The **Today's date & time** data source must be referred to in an ER expression as `'Today''s date & time'`.
- The **name()** method of the **Customers** data source must be referred to in an ER expression as `Customers.'name()'`.

If the methods of application data sources have parameters, the following syntax is used to call those methods:

- If the **isLanguageRTL** method of the **System** data source has an **EN-US** parameter of the *String* data type, this method must be referred to in an ER expression as `System.isLanguageRTL("EN-US")`.
- Quotation marks aren't required when a method name contains only alphanumeric symbols. However, they are required for a method of a table if the name includes brackets.

When the **System** data source is added to an ER mapping that refers to the **Global** application class, the expression `System.isLanguageRTL("EN-US ")` returns the *Boolean* value **FALSE**. The modified expression `System.isLanguageRTL("AR")` returns the *Boolean* value **TRUE**.

You can limit the way that values are passed to the parameters of this type of method:

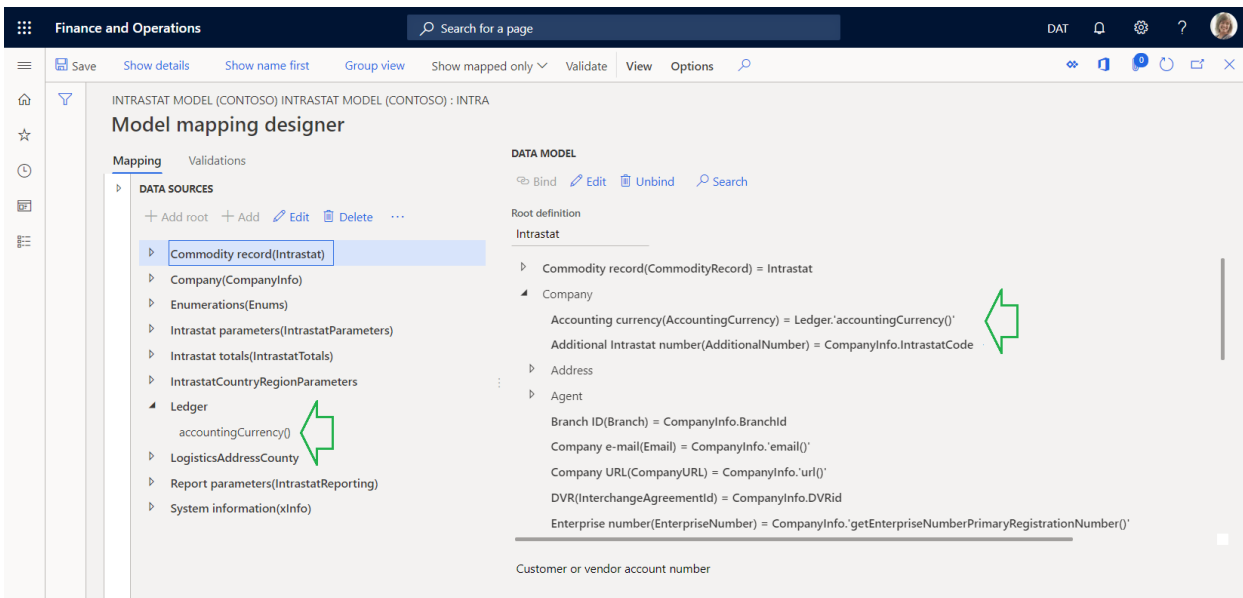
- Only constants can be passed to methods of this type. The values of the constants are defined at design time.
- Only primitive (basic) data types are supported for parameters of this type. The primitive data types include *Integer*, *Real*, *Boolean*, and *String*.

When an expression references a structured data source, you can use the path definition to select a specific primitive element of that data source. A dot character (.) is used to separate individual elements of a structured data source. For example, the current ER model mapping contains the **InvoiceTransactions** data source, and this data source returns a list of records. The **InvoiceTransactions** record structure contains the **AmountDebit** and **AmountCredit** fields, and both these fields return numeric values. Therefore, you can design the following expression to calculate the invoiced amount:

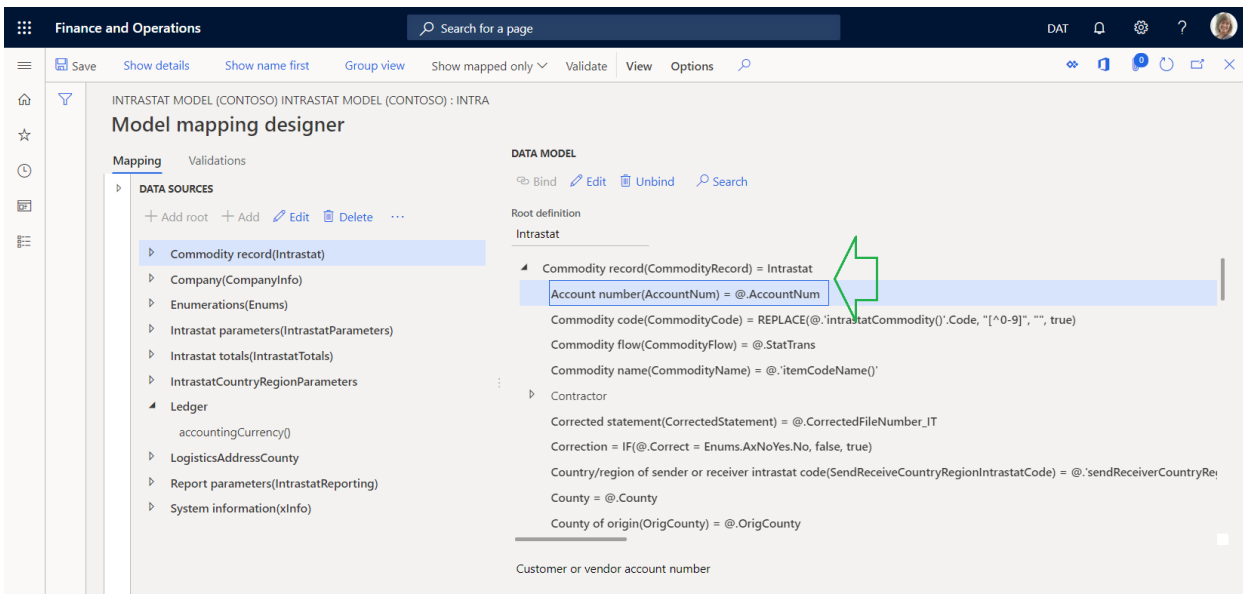
`InvoiceTransactions.AmountDebit - InvoiceTransactions.AmountCredit`. The `InvoiceTransactions.AmountDebit` construction in this expression is the path that is used to access the **AmountDebit** field of the **InvoiceTransactions** data source of the *Record list* type.

Relative path

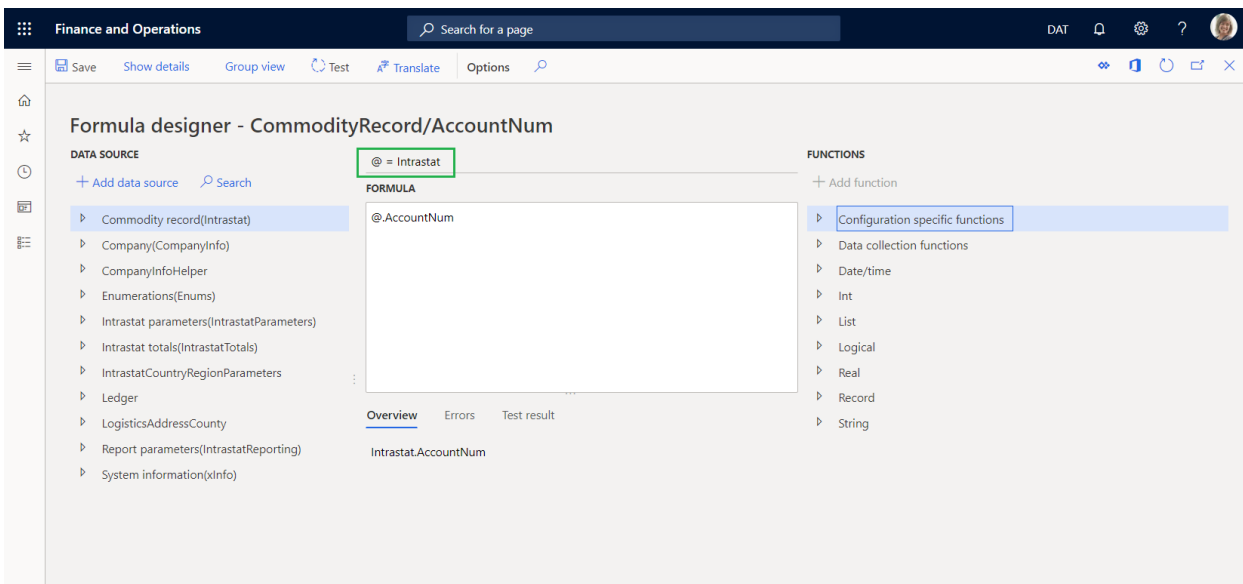
If the path of a structured data source starts with an "at" sign (@), it's a relative path. The "at" sign is shown instead of the remaining part of the absolute path of the hierarchical tree structure that is used. The following illustration shows an example. Here, the absolute path `Ledger.'accountingCurrency()'` indicates that the accounting currency value from the **Ledger** data source is entered in the **AccountingCurrency** field of the data model.



The example in the following illustration shows how a relative path is used. The relative path `@.AccountNum` indicates that the `AccountNum` field of the `Intrastat` data source (which appears one level above the `AccountNum` field in the data model's hierarchical tree) is used to enter the customer or vendor account number in the data model's `AccountNum` field.



The remaining part of the absolute path is also shown in the [ER formula editor](#).



For more information, see [Use a relative path in data bindings of ER models and formats](#).

ER built-in functions can be used in ER expressions. All data sources of the expression context (that is, the current ER model mapping or ER format) can be used as parameters of calling functions, in accordance with the list of arguments for calling functions. Constants can also be used as parameters of calling functions. For example, the current ER model mapping contains the **InvoiceTransactions** data source, and this data source returns a list of records. The **InvoiceTransactions** record structure contains the **AmountDebit** and **AmountCredit** fields, and both these fields return numeric values. Therefore, to calculate the invoiced amount, you can design the following expression that uses the built-in ER rounding function:

```
ROUND (InvoiceTransactions.AmountDebit - InvoiceTransactions.AmountCredit, 2) .
```

When you design ER model mappings and ER reports, you can use ER functions from the following categories:

- [Date and time functions](#)
- [List functions](#)
- [Logical functions](#)
- [Mathematical functions](#)
- [Record functions](#)
- [Text functions](#)
- [Data collection functions](#)
- [Other \(business domain–specific\) functions](#)
- [Type conversion functions](#)

Functions list extension

ER lets you extend the list of functions that are used in ER expressions. Some engineering effort is required. For detailed information, see [Extend the list of Electronic reporting \(ER\) functions](#).

Compound expressions

You can create compound expressions that use functions from different categories, provided that the data types match. When you use functions together, match the data type of the output from one function to the input data type that is required by another function. For example, to avoid a possible "list-is-empty" error in a binding of a field to an ER format element, combine functions from the [List](#) category with a function from the [Logical](#) category, as the following example shows. Here, the formula uses the [IF](#) function to test whether the **IntrastatTotals** list is empty before it returns the value of the required aggregation from that list. If the **IntrastatTotals** list is empty, the formula returns **0** (zero).

```
IF(ISEMPTY(IntrastatTotals), 0.0, IntrastatTotals.aggregated.'$AmountMSTRounded')
```

Multiple solutions

Often, you can get the same data transformation result in multiple ways, by using functions from different categories or different functions from the same category. For example, the previous expression can also be configured by using the [COUNT](#) function from the [List](#) category.

```
IF(COUNT (IntrastatTotals)=0, 0.0, IntrastatTotals.aggregated.'$AmountMSTRounded')
```

Additional resources

[Electronic Reporting overview](#)

Formula designer in Electronic reporting

Extend the list of Electronic reporting functions

NOTE

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List of ER functions in the Date and time category

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Electronic reporting (ER) date and time functions can be used to extract information from date and time values, and to perform operations on them. This topic provides a summary of these functions.

List of supported functions

FUNCTION	DESCRIPTION
AddDays	This function returns a <i>DateTime</i> value that is the specified number of days before or after a specified start date.
DateFormat	This function returns a <i>String</i> value that presents a given date value as text in the specified format and in an optionally specified culture.
DateTimeFormat	This function returns a <i>String</i> value that presents a given date/time value as text in the specified format and in an optionally specified culture.
DateTimeValue	This function returns a <i>DateTime</i> value that is converted from a given text value in the specified format and in an optionally specified culture to a date/time value.
DateToDateTime	This function returns a <i>DateTime</i> value that is converted from a given date value to a date/time value in Coordinated Universal Time (Greenwich Mean Time [GMT]).
DateValue	This function returns a <i>Date</i> value that is converted from a given text value in the specified format and in an optionally specified culture to a date value.
DayOfYear	This function returns an <i>Integer</i> value that represents the number of days between January 1 and the specified date.
Days	This function returns an <i>Integer</i> value that represents the number of days between one specified date and a second specified date.
Now	This function returns a <i>DateTime</i> value that represents the current application server date and time.
NullDate	This function returns a <i>Date</i> value that represents the null date (January 1, 1900).
NullDateTime	This function returns a <i>DateTime</i> value that represents the null date/time value (January 1, 1900) in Coordinated Universal Time.
SessionNow	This function returns a <i>DateTime</i> value that represents the current application session date and time.

FUNCTION	DESCRIPTION
SessionToday	This function returns a <i>Date</i> value that represents the current application session date.
Today	This function returns a <i>Date</i> value that represents the current application server date.

Additional resources

[Electronic Reporting overview](#)

[Formula designer in Electronic reporting](#)

[Electronic reporting formula language](#)

NOTE

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ADDDAYS ER function

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The `ADDDAYS` function calculates a *DateTime* value that is the specified number of days before or after a specified start date.

Syntax

```
ADDDAYS (datetime, days)
```

Arguments

`datetime` : *DateTime*

A date/time value that represents the start date.

`days` : *Integer*

The number of days before or after `datetime`.

Return values

DateTime

The resulting date/time value.

Usage notes

A positive value for `days` yields a future date. A negative value yields a past date.

Example 1

`ADDDAYS (NOW(), 7)` returns the date and time seven days in the future.

Example 2

`ADDDAYS (NOW(), -3)` returns the date and time three days in the past.

Additional resources

[Date and time functions](#)

NOTE

Can you tell us about your documentation language preferences? [Take a short survey](#).

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

DATEFORMAT ER function

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The `DATEFORMAT` function returns a *String* value that presents a given date value as text in the specified format and in an optionally specified *culture*. For information about the supported formats, see [standard](#) and [custom](#).

Syntax 1

```
DATEFORMAT (date, format)
```

Syntax 2

```
DATEFORMAT (date, format, culture)
```

Arguments

`date` : *Date*

A date value that represents the date to format.

`format` : *String*

The format of the output string.

NOTE

The format string is case-sensitive when you use either a standard format or a custom format. For example, the [standard](#) "d" format specifier returns the date by using the short date pattern, whereas the standard "D" format specifier returns the date by using the long date pattern. Additionally, the [custom](#) "M" format specifier returns the month from 1 through 12, whereas the custom "m" format specifier returns the minute from 0 through 59.

`culture` : *String*

The culture to use for formatting.

Return values

String

The resulting string value.

Usage notes

If the culture isn't defined as an argument of the called function, the value of `culture` is defined by the calling context. For example, if the `DATEFORMAT` function is called by using syntax 1 in an Electronic reporting (ER) format for a **FILE** element that is configured to use the German culture, the conversion will be done by using the German culture. The default `culture` value is **EN-US**.

Example 1

`DATEFORMAT (TODAY (), "dd-MM-yyyy")` returns the current application server date, December 24, 2015, as the string "24-12-2015", based on the specified custom format.

Example 2

`DATEFORMAT (SESSIONTODAY (), "d", "DE")` returns the current application session date, December 24, 2015, as the string "24-12-2015", based on the selected German culture and the specified format.

Additional resources

[Date and time functions](#)

NOTE

Can you tell us about your documentation language preferences? [Take a short survey](#).

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

DATETIMEFORMAT ER function

2/18/2021 • 2 minutes to read • [Edit Online](#)

The `DATETIMEFORMAT` function returns a *String* value that presents a given date/time value as text in the specified format and in an optionally specified *culture*. For information about the supported formats, see [standard](#) and [custom](#).

Syntax 1

```
DATETIMEFORMAT (datetime, format)
```

Syntax 2

```
DATETIMEFORMAT (datetime, format, culture)
```

Arguments

`datetime` : *DateTime*

A date/time value that represents the date and time to format.

`format` : *String*

The format of the output string.

NOTE

The format string is case-sensitive when you use either a standard format or a custom format. For example, the [standard](#) "d" format specifier returns the date by using the short date pattern, whereas the standard "D" format specifier returns the date by using the long date pattern. Additionally, the [custom](#) "M" format specifier returns the month from 1 through 12, whereas the custom "m" format specifier returns the minute from 0 through 59.

`culture` : *String*

The culture to use for formatting.

Return values

String

The resulting string value.

Usage notes

If the culture isn't defined as an argument of the called function, the value of `culture` is defined by the calling context. For example, if the `DATETIMEFORMAT` function is called by using syntax 1 in an Electronic reporting (ER) format for a **FILE** element that is configured to use the German culture, the conversion will be done by using the German culture. The default `culture` value is **EN-US**.

When the `DATETIMEFORMAT` function converts a given date/time value, it considers the time zone setting of the application user who is running the ER format that the function is called in the context of.

Example 1

`DATETIMEFORMAT (NOW(), "dd-MM-yyyy")` returns the current application server date/time value, December 24, 2015, as "24-12-2015", based on the specified custom format.

Example 2

`DATETIMEFORMAT (SESSIONNOW(), "d", "DE")` returns the current application session date/time value, December 24, 2015, as "24.12.2015", based on the selected German culture and the specified format.

Example 3

`DATETIMEFORMAT (DATETIMEVALUE("2019-11-12T09:00:00.0000000-07:00", "O"), "O")` returns the string value **2019-11-12T08:00:00.0000000-08:00** when the function is called during a process that was initiated by an application user who has the time zone value **(GMT-08:00) Pacific Time (US & Canada)** in the **Language and country/region preferences** section.

Additional resources

[Date and time functions](#)

NOTE

Can you tell us about your documentation language preferences? [Take a short survey](#).

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

DATETIMEVALUE ER function

2/18/2021 • 2 minutes to read • [Edit Online](#)

The `DATETIMEVALUE` function returns a *DateTime* value that is converted from a given text value in the specified format and in an optionally specified *culture* to a date/time value. For information about the supported formats, see [standard](#) and [custom](#).

Syntax 1

```
DATETIMEVALUE (text, format)
```

Syntax 2

```
DATETIMEVALUE (text, format, culture)
```

Arguments

`text` : *String*

Text that represents the value to format.

`format` : *String*

The format of the given text.

`culture` : *String*

The culture that is used for formatting of the given text.

Return values

DateTime

The resulting date/time value.

Usage notes

When the culture isn't defined as an argument of the called function, the value of `culture` is defined by the calling context. For example, if the `DATETIMEVALUE` function is called by using syntax 1 in an Electronic reporting (ER) format for a FILE element that is configured to use the German culture, the conversion will be done by using the German culture. The default `culture` value is **EN-US**.

Example 1

`DATETIMEVALUE ("21-Dec-2016 02:55:00", "dd-MMM-yyyy hh:mm:ss")` returns **2:55:00 AM on December 21, 2016**, based on the specified custom format and the default application's **EN-US** culture.

Example 2

`DATETIMEVALUE ("21-Jan-2016 02:55:00", "dd-MMM-yyyy hh:mm:ss", "IT")` returns **2:55:00 AM on December 21, 2016**, based on the specified custom format and culture.

However, `DATETIMEVALUE ("21-Jan-2016 02:55:00", "dd-MMM-yyyy hh:mm:ss", "EN-US")` throws an exception to inform the user that the specified string isn't recognized as a valid date/time value for the specified culture.

Additional resources

[Date and time functions](#)

NOTE

Can you tell us about your documentation language preferences? [Take a short survey](#).

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

DATEODATETIME ER function

2/18/2021 • 2 minutes to read • [Edit Online](#)

The `DATEODATETIME` function returns a *DateTime* value that is converted from a given date value to a date/time value in Coordinated Universal Time (Greenwich Mean Time [GMT]).

Syntax

```
DATEODATETIME (date)
```

Arguments

`date` : *Date*

A date value that represents the date to convert.

Return values

DateTime

The resulting date/time value.

Example 1

`DATEODATETIME (CompInfo. 'getCurrentDate()')` returns the date of the current Microsoft Dynamics 365 Finance session, December 24, 2015, as **12/24/2015 12:00:00 AM**. In this example, **CompInfo** is an Electronic reporting (ER) data source of the **Finance and Operations/Table** type, and it refers to the **CompanyInfo** table.

Example 2

`DATEODATETIME (DATEVALUE ("2019-11-12T16:00:00.0000000-07:00", "0"))` returns the date/time value **11/12/2019 12:00:00 AM**.

Additional resources

[Date and time functions](#)

NOTE

Can you tell us about your documentation language preferences? [Take a short survey](#).

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

DATEVALUE ER function

2/18/2021 • 2 minutes to read • [Edit Online](#)

The `DATEVALUE` function returns a *Date* value that is converted from a given text value in the specified format and in an optionally specified *culture* to a date value. For information about the supported formats, see [standard](#) and [custom](#).

Syntax 1

```
DATEVALUE (text, format)
```

Syntax 2

```
DATEVALUE (text, format, culture)
```

Arguments

`text` : *String*

Text that represents the value to format.

`format` : *String*

The format of the given text.

`culture` : *String*

The culture that is used for formatting of the given text.

Return values

Date

The resulting date value.

Usage notes

When the culture isn't defined as an argument of the called function, the value of `culture` is defined by the calling context. For example, if the `DATEVALUE` function is called by using syntax 1 in an Electronic reporting (ER) format for a FILE element that is configured to use the German culture, the conversion will be done by using the German culture. The default `culture` value is **EN-US**.

Example 1

`DATEVALUE ("21-Dec-2016", "dd-MMM-yyyy")` returns the date value **December 21, 2016**, based on the specified custom format and the default application's **EN-US** culture.

Example 2

`DATEVALUE ("21-Jan-2016", "dd-MMM-yyyy", "IT")` returns the date value **January 21, 2016**, based on the specified custom format and culture.

However, `DATEVALUE ("21-Jan-2016", "dd-MMM-yyyy", "EN-US")` throws an exception to inform the user that the specified string isn't recognized as a valid date for the specified culture.

Additional resources

[Date and time functions](#)

NOTE

Can you tell us about your documentation language preferences? [Take a short survey](#).

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

DAYOFYEAR ER function

2/18/2021 • 2 minutes to read • [Edit Online](#)

The `DAYOFYEAR` function returns an *Integer* value that represents the number of days between January 1 and the specified date.

Syntax

```
DAYOFYEAR (date) as Integer
```

Arguments

`date` : *Date*

A date value that represents the date to use for the calculation of the number of days.

Return values

Integer

The resulting numeric value.

Example 1

```
DAYOFYEAR (DATEVALUE ("01-03-2016", "dd-MM-yyyy")) returns 61.
```

Example 2

```
DAYOFYEAR (DATEVALUE ("01-01-2016", "dd-MM-yyyy")) returns 1.
```

Additional resources

[Date and time functions](#)

NOTE

Can you tell us about your documentation language preferences? [Take a short survey](#).

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

DAYS ER function

2/18/2021 • 2 minutes to read • [Edit Online](#)

The `DAYS` function returns an *Integer* value that represents the number of days between one specified date and a second specified date.

Syntax

```
DAYS (date 1, date 2) as Integer
```

Arguments

`date 1` : *Date*

A date value that represents the start date for the calculation of the number of days.

`date 2` : *Date*

A date value that represents the end date for the calculation of the number of days.

Return values

Integer

The resulting numeric value.

Usage notes

The `DAYS` function returns a positive value when the first date is later than the second date, it returns **0** (zero) when the first date equals the second date, and it returns a negative value when the first date is earlier than the second date.

Example

```
DAYS (TODAY (), DATEVALUE( DATETIMEFORMAT( ADDDAYS ( NOW(), 1), "yyyyMMdd"), "yyyyMMdd")) returns -1.
```

Additional resources

[Date and time functions](#)

NOTE

Can you tell us about your documentation language preferences? [Take a short survey.](#)

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

NOW ER function

2/18/2021 • 2 minutes to read • [Edit Online](#)

The `NOW` function returns a *DateTime* value that represents the current application server date and time.

Syntax

```
NOW ( )
```

Return values

DateTime

The resulting date/time value.

Example

`DATETIMEFORMAT (NOW(), "dd-MM-yyyy")` returns the current application server date/time value, December 24, 2015, as "24-12-2015", based on the specified custom format.

Additional resources

[Date and time functions](#)

NOTE

Can you tell us about your documentation language preferences? [Take a short survey](#).

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

NULLDATE ER function

2/18/2021 • 2 minutes to read • [Edit Online](#)

The `NULLDATE` function returns a *Date* value that represents the **null** date (January 1, 1900).

Syntax

```
NULLDATE () as
```

Return values

Date

The resulting date value.

Example 1

`DATEFORMAT (NULLDATE(), "yyyy-MM-dd")` returns the **null** date, January 1, 1900, as "1900-01-01", based on the specified custom format.

Example 2

The expression `IF(Invoice.DocumentDate = NULLDATE(), true, false)` returns **True** when the value of the **DocumentDate** field equals the **null** date. In this example, **Invoice** is an Electronic reporting (ER) data source of the **Finance/Table records** type, and it refers to the **CustInvoiceJour** table.

Additional resources

[Date and time functions](#)

NOTE

Can you tell us about your documentation language preferences? [Take a short survey](#).

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

NULLDATETIME ER function

2/18/2021 • 2 minutes to read • [Edit Online](#)

The `NULLDATETIME` function returns a *DateTime* value that represents the **null** date/time value (January 1, 1900) in Coordinated Universal Time (Greenwich Mean Time [GMT]).

Syntax

```
NULLDATETIME ( )
```

Return values

DateTime

The resulting date/time value.

Example

`DATETIMEFORMAT(NULLDATETIME(), "O")` returns the string value `1900-01-01T00:00:00.0000000+00:00` when it's called during a process that was initiated by an application user who has the time zone value (GMT) Coordinated Universal Time in the **Language and country/region preferences** section.

Additional resources

[Date and time functions](#)

NOTE

Can you tell us about your documentation language preferences? [Take a short survey](#).

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

SESSIONNOW ER function

2/18/2021 • 2 minutes to read • [Edit Online](#)

The `SESSIONNOW` function returns a *DateTime* value that represents the current application session date and time.

Syntax

```
SESSIONNOW ()
```

Return values

DateTime

The resulting date/time value.

Example

`DATETIMEFORMAT (SESSIONNOW(), "d", "DE")` returns the current application session date/time value, December 24, 2015, as "24.12.2015", based on the selected German culture and the specified format.

Additional resources

[Date and time functions](#)

NOTE

Can you tell us about your documentation language preferences? [Take a short survey](#).

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

SESSIONTODAY ER function

2/18/2021 • 2 minutes to read • [Edit Online](#)

The `SESSIONTODAY` function returns a *Date* value that represents the current application session date.

Syntax

```
SESSIONTODAY ()
```

Return values

Date

The resulting date value.

Example

`DATEFORMAT (SESSIONTODAY (), "d", "DE")` returns the current application session date, December 24, 2015, as the string "24-12-2015", based on the selected German culture and the specified format.

Additional resources

[Date and time functions](#)

NOTE

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List of ER functions in the list category

2/18/2021 • 3 minutes to read • [Edit Online](#)

Electronic reporting (ER) list functions can be used to extract information from, and perform operations on, data sources of the *Record list* and *Container (record)* data types. This topic provides a summary of these functions.

List of supported functions

FUNCTION	DESCRIPTION
AllItems	This function runs as an in-memory selection. It returns a new flattened <i>Record list</i> value that consists of a list of records that represents all items that match the specified path.
AllItemsQuery	This function runs as a joined SQL query. It returns a new flattened <i>Record list</i> value that consists of a list of records that represents all items that match the specified path.
Count	This function returns an <i>Integer</i> value that represents the number of records in the specified list, if the list isn't empty. If the list is empty, this function returns 0 (zero).
EmptyList	This function returns an empty <i>Record list</i> value by using the specified list as a source for the list structure.
Enumerate	This function returns a new <i>Record list</i> value that consists of enumerated records of the specified list.
Filter	This function returns the specified list as a <i>Record list</i> value after the query has been changed so that it filters for the specified condition.
First	This function returns the first record of the specified list as a <i>Container (record)</i> value, if that list isn't empty. If the list is empty, this function throws an exception.
FirstOrDefault	This function returns the first record of the specified list as a <i>Container (record)</i> value, if that record isn't empty. If the record is empty, this function returns a null <i>Container (record)</i> value.
Index	This function returns a <i>Container (record)</i> value that is selected by using the specified numeric index in the specified list. If the index is out of range for the records in the specified list, this function throws an exception.
IsEmpty	This function returns a <i>Boolean</i> value of TRUE if the specified list contains no records. Otherwise, it returns a <i>Boolean</i> value of FALSE .
List	This function returns a <i>Record list</i> value that consists of a new list that is created from the specified arguments.

FUNCTION	DESCRIPTION
ListDistinct	This function calculates the specified expression as a selector for every record of the specified list. It returns a new <i>Record list</i> value that contains a single record for each unique selector value.
ListJoin	This function returns a <i>Record list</i> value that represents a new joined list that is created from the specified arguments.
ListOfFields	This function returns a <i>Record list</i> value that is created based on the structure of the specified argument of the <i>Enumeration</i> or <i>Container (record)</i> type.
ListOfFirstItem	This function returns a <i>Record list</i> value that consists of only the first record of the specified list.
OrderBy	This function returns the specified list as a <i>Record list</i> value after it has been sorted according to the specified arguments. These arguments can be defined as expressions.
Reverse	This function returns the specified list as a <i>Record list</i> value in reversed sort order.
Split	This function splits the specified input string into substrings and returns the result as a new <i>Record list</i> value.
SplitList	This function splits the specified list into sublists (or batches), each of which contains the specified number of records. It then returns the result as a new <i>Record list</i> value that consists of the batches.
SplitListByLimit	This function splits the specified list into a new list of sublists (batches). The number of records in each batch is dynamically calculated. The function then returns the result as a new <i>Record list</i> value that consists of the batches.
StringJoin	This function returns a <i>String</i> value that consists of concatenated values of the specified field from the specified list. The values can be separated by the specified delimiter.
Where	This function returns the specified list as a <i>Record list</i> value after it has been filtered according to the specified condition.

Additional resources

[Electronic Reporting overview](#)

[Formula designer in Electronic reporting](#)

[Electronic reporting formula language](#)

NOTE

Can you tell us about your documentation language preferences? [Take a short survey.](#)

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

ALLITEMS ER function

2/18/2021 • 2 minutes to read • [Edit Online](#)

The `ALLITEMS` function runs as an in-memory selection and returns a new flattened *Record list* value as a list of records that represents all items that match the specified path.

Syntax

```
ALLITEMS (path)
```

Arguments

`path` : *Record list*

The valid path of a data source of the *Record list* data type.

Return values

Record list

The resulting list of records.

Usage notes

The path must be defined as a valid data source path of a data source element of the *Record list* data type. Data elements such as the path string and date should raise an error in the Electronic reporting (ER) expression builder at design time.

We don't recommend that you use this function for transactional data sources that might contain a large volume of data. Instead, consider using the [ALLITEMSQUERY](#) function.

Example 1

If you enter `SPLIT("abcdef" , 2)` as data source `DS`, the expression `COUNT(ALLITEMS (DS))` returns 3.

Example 2

If you enter `Vend` as the data source of the *Record list* data type that refers to the `VendTable` application table, the expression `ALLITEMS (Vend.'<Relations'.ContactPerson)` returns a flattened list of records that has the `ContactPerson` table structure and contains all contact persons that can be accessed by using the `ContactPerson.ContactForParty == VendTable.Party` relation, and that is available for all vendors from the referenced vendor table.

Additional resources

[List functions](#)

NOTE

Can you tell us about your documentation language preferences? [Take a short survey](#).

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

ALLITEMSQUERY ER function

2/18/2021 • 2 minutes to read • [Edit Online](#)

The `ALLITEMSQUERY` function runs as a joined SQL query. It returns a new flattened *Record list* value that consists of a list of records that represent all items that match the specified path.

Syntax

```
ALLITEMSQUERY (path)
```

Arguments

`path` : *Record list*

The valid path of a data source of the *Record list* data type. It must contain at least one relation.

Return values

Record list

The resulting list of records.

Usage notes

The specified path must be defined as a valid data source path of a data source element of the *Record list* data type. It must also contain at least one relation. Data elements such as the path *String* and *Date* should raise an error in the Electronic reporting (ER) expression builder at design time.

When this function is applied to data sources of the *Record list* data type that refer to an application object that can be directly called by using SQL (for example, an table, entity, or query), it runs as a joined SQL query. Otherwise, it runs in memory as the `ALLITEMS` function.

Example

You define the following data sources in your model mapping:

- A `CustInv` data source of the *Table records* type that refers to the `CustInvoiceTable` table
- A `FilteredInv` data source of the *Calculated field* type that contains the expression

```
FILTER (CustInv, CustInv.InvoiceAccount = "US-001")
```

- A `JourLines` of the *Calculated field* type that contains the expression

```
ALLITEMSQUERY ( FilteredInv.'<Relations'.CustInvoiceJour.'<Relations'.CustInvoiceTrans)
```

When you run the model mapping to call the `JourLines` data source, the following SQL statement is run:

```
SELECT ... FROM CUSTINVOICETABLE T1 CROSS JOIN CUSTINVOICEJOUR T2 CROSS JOIN  
CUSTINVOICETRANS T3 WHERE...
```

Additional resources

List functions

NOTE

Can you tell us about your documentation language preferences? [Take a short survey](#).

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

COUNT ER function

2/18/2021 • 2 minutes to read • [Edit Online](#)

The `COUNT` function returns an *Integer* value that represents the number of records in the specified list, if the list isn't empty. If the list is empty, this function returns **0** (zero).

Syntax

```
COUNT (list)
```

Arguments

`list` : *Record list*

The valid path of a data source of the *Record list* data type.

Return values

Integer

The resulting numeric value.

Example

`COUNT (SPLIT("abcd" , 3))` returns 2, because the `SPLIT` function that is used in this example creates a list that consists of two records.

Additional resources

[List functions](#)

NOTE

Can you tell us about your documentation language preferences? [Take a short survey](#).

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

EMPTYLIST ER function

2/18/2021 • 2 minutes to read • [Edit Online](#)

The `EMPTYLIST` function returns an empty *Record list* value by using the specified list as a source for the list structure.

Syntax

```
EMPTYLIST (list)
```

Arguments

`list` : *Record list*

The valid path of a data source of the *Record list* data type.

Return values

Record list

The resulting list of records.

Example

`EMPTYLIST (SPLIT ("abc", 1))` returns a new empty list that has the same structure as the list that is returned by the `SPLIT` function that is used.

Additional resources

[List functions](#)

NOTE

Can you tell us about your documentation language preferences? [Take a short survey](#).

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

ENUMERATE ER function

2/18/2021 • 2 minutes to read • [Edit Online](#)

The `ENUMERATE` function returns a new *Record list* value that consists of enumerated records of the specified list.

Syntax

```
ENUMERATE (list)
```

Arguments

`list`: *Record list*

The valid path of a data source of the *Record list* data type.

Return values

Record list

The resulting list of records.

Usage notes

The list of enumerated records that is returned exposes the following additional elements:

- The record of fields (**Value** component)
- The current record index (**Number** component)

Example

In the following illustration, an **Enumerated** data source is created as an enumerated list of vendor records from the **Vendors** data source that refers to the `VendTable` table.

```
└─ Enumerated: = ENUMERATE(Vendors):Record list
```

```
  └─ Number: Integer
```

```
    └─ Value: Record
```

```
      └─ Vendors: Table 'VendTable' records
```

The following illustration shows the Electronic reporting (ER) format. In this format, data bindings are created to generate output in XML format. This output presents individual vendors as enumerated nodes.

```
└─ root: XML Element
```

```
  └─ vendor: XML Element= Enumerated
```

```
    └─ name: XML Attribute= Enumerated.Value.'name()'
```

```
      └─ index: XML Attribute= Enumerated.Number
```

The following illustration shows the result when the designed format is run.

```
<?xml version="1.0" encoding="UTF-8"?>
- <root>
  <vendor index="1" name="Contoso Asia"/>
  <vendor index="2" name="Finanzamt Berlin"/>
  <vendor index="3" name="Opal Audio"/>
  <vendor index="4" name="Property Management"/>
  <vendor index="5" name="City-wide Advertising"/>
  <vendor index="6" name="Contoso Entertainment System"/>
</root>
```

Additional resources

List functions

NOTE

Can you tell us about your documentation language preferences? [Take a short survey.](#)

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

FILTER ER function

2/18/2021 • 2 minutes to read • [Edit Online](#)

The `FILTER` function returns the specified list as a *Record list* value after the query has been changed so that it filters for the specified condition.

Syntax

```
FILTER (list, condition)
```

Arguments

`list` : *Record list*

The valid path of a data source of the *Record list* data type.

`condition` : *Boolean*

A valid conditional expression that is used to filter records of the specified list.

Return values

Record list

The resulting list of records.

Usage notes

This function differs from the [WHERE](#) function, because the specified condition is applied to any Electronic reporting (ER) data source of the *Table records* type at the database level. The list and condition can be defined by using tables and relations.

If one or both arguments that are configured for this function (`list` and `condition`) don't allow this request to be translated to the direct SQL call, an exception is thrown at design time. This exception informs the user that either `list` or `condition` can't be used to query the database.

Example 1

If **Vendor** is configured as an ER data source that refers to the VendTable table, the expression

```
FILTER (Vendors, Vendors.VendGroup = "40")
```

 returns a list of only vendors that belong to vendor group 40.

Example 2

If **Vendor** is configured as an ER data source that refers to the VendTable table, and if **parmVendorBankGroup** is configured as an ER data source that returns a value of the *String* data type, the expression

```
FILTER ( Vendor.'<Relations'.VendBankAccount, Vendor.'<Relations'.VendBankAccount.BankGroupID = parmVendorBankGroup)
```

returns a list of only vendor accounts that belong to a specific bank group.

Example 3

You enter data source *DS* of the *Calculated field* type, and it contains the expression `SPLIT ("A,B,C", ",")`. You then enter another expression, `FILTER(DS, DS.Value = "B")`. When you try to save this expression in the ER formula designer, the following exception is thrown: "Validation error: The list expression of FILTER function is not queryable."

Additional resources

List functions

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

FIRST ER function

2/18/2021 • 2 minutes to read • [Edit Online](#)

The `FIRST` function returns the first record of the specified list as a *Container (record)* value, if that list isn't empty. If the list is empty, this function throws an exception.

Syntax

```
FIRST (list)
```

Arguments

`list` : *Record list*

The valid path of a data source of the *Record list* data type.

Return values

Container (record)

The resulting record value.

Example 1

The expression `FIRST(SPLIT("ABC",1)).Value` returns the text value "A".

Example 2

The expression `FIRST(SPLIT("",1)).Value` throws an exception at runtime.

Additional resources

[List functions](#)

NOTE

Can you tell us about your documentation language preferences? [Take a short survey](#).

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

FIRSTORNULL ER function

2/18/2021 • 2 minutes to read • [Edit Online](#)

The `FIRSTORNULL` function returns the first record of the specified list as a *Container (record)* value, if that record isn't empty. If the record is empty, this function returns a null *Container (record)* value.

Syntax

```
FIRSTORNULL (list)
```

Arguments

`list` : *Record list*

The valid path of a data source of the *Record list* data type.

Return values

Container (record)

The resulting record value.

Example

The expression `FIRSTORNULL(SPLIT("",1)).Value` returns an empty string ("").

Additional resources

[List functions](#)

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

INDEX ER function

2/18/2021 • 2 minutes to read • [Edit Online](#)

The `INDEX` function returns a *Container (record)* value that is selected by using the specified numeric index in the specified list. If the index is out of range for the records in the specified list, an exception is thrown.

Syntax

```
INDEX (list, index)
```

Arguments

`list` : *Record list*

The valid path of a data source of the *Record list* data type.

`index` : *Integer*

A numeric index that indicates the position of the desired record in the specified list.

Return values

Container (record)

The resulting record value.

Example 1

If you enter data source `DS` of the *Calculated field* type, and it contains the expression `SPLIT ("A|B|C", "|")`, the expression `DS.Value` returns the text value "B" for the second record of this record list. The expression `INDEX (SPLIT ("A|B|C", "|"), 2).Value` also returns the text value "B".

Example 2

If you enter data source `DS` of the *Calculated field* type, and it contains the expression `SPLIT ("A|B|C", "|")`, the expression `INDEX (SPLIT ("A|B|C", "|"), 4).Value` throws an exception at runtime.

Additional resources

[List functions](#)

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

IEMPTY ER function

2/18/2021 • 2 minutes to read • [Edit Online](#)

The `IEMPTY` function returns a *Boolean* value of **TRUE** if the specified list contains no records. Otherwise, it returns a *Boolean* value of **FALSE**.

Syntax

```
IEMPTY (list)
```

Arguments

`list` : *Record list*

The valid path of a data source of the *Record list* data type.

Return values

Boolean

The resulting *Boolean* value.

Example 1

If you enter data source `DS` of the *Calculated field* type, and it contains the expression `SPLIT ("A|B|C", "|")`, the expression `IEMPTY(DS)` returns **FALSE**.

Example 2

The expression `IEMPTY (SPLIT ("",1))` returns **TRUE**.

Additional resources

[List functions](#)

NOTE

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LIST ER function

2/18/2021 • 2 minutes to read • [Edit Online](#)

The `LIST` function returns a *Record list* value that consists of a new list of records that is created from the specified arguments.

Syntax

```
LIST (record 1 [, record 2, ..., record N])
```

Arguments

`record 1` : *Container (record)*

A reference to a data source of the *Record* data type. This argument is required.

`record N` : *Container (record)*

A reference to a data source of the *Record* data type. These additional arguments are optional.

Return values

Record list

The resulting list of records.

Usage notes

The structure of the list that is created contains only the fields that are presented in the structure of every record that is mentioned in the arguments.

Example

You enter data source **Record 1** of the *Container* type. This data source contains the following nested fields of the *Calculated field* type:

- **Code**: This field contains an expression that returns a value of the *String* type.
- **Amount**: This field contains an expression that returns a value of the *Real* type.

You then enter data source **Record 2** of the *Container* type. This data source contains the following nested fields of the *Calculated field* type:

- **Amount**: This field contains an expression that returns a value of the *Real* type.
- **IsValid**: This field contains an expression that returns a value of the *Boolean* type.

In this case, the expression `LIST('Record 1', 'Record 2')` returns a new list that contains two records. The structure of this list consists of a single **Amount** field of the *Real* type, because this field is the only field that is presented in every argument of the called function.

Additional resources

List functions

NOTE

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LISTJOIN ER function

2/18/2021 • 2 minutes to read • [Edit Online](#)

The `LISTJOIN` function returns a *Record list* value that represents a new joined list of records that is created from the specified arguments.

Syntax

```
LIST (list 1 [, list 2, ..., list N])
```

Arguments

`list 1` : *Record list*

A reference to a data source of the *Record list* data type. This argument is mandatory.

`list N` : *Record list*

A reference to a data source of the *Record list* data type. These additional arguments are optional.

Return values

Record list

The resulting list of records.

Usage notes

The structure of the list that is created contains only the fields that are present in the structure of every record list that is referenced in the arguments.

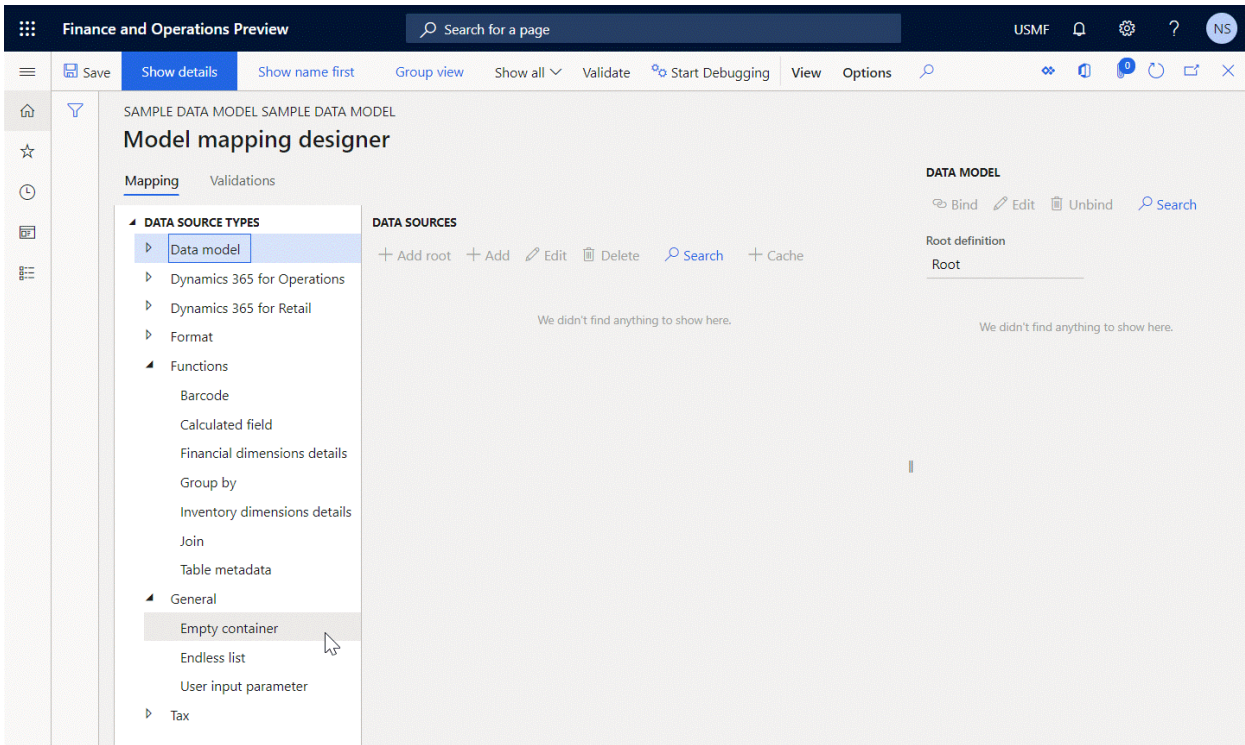
Example

You enter data source **Record 1** of the `Container` type. This data source contains the following nested fields of the `Calculated field` type:

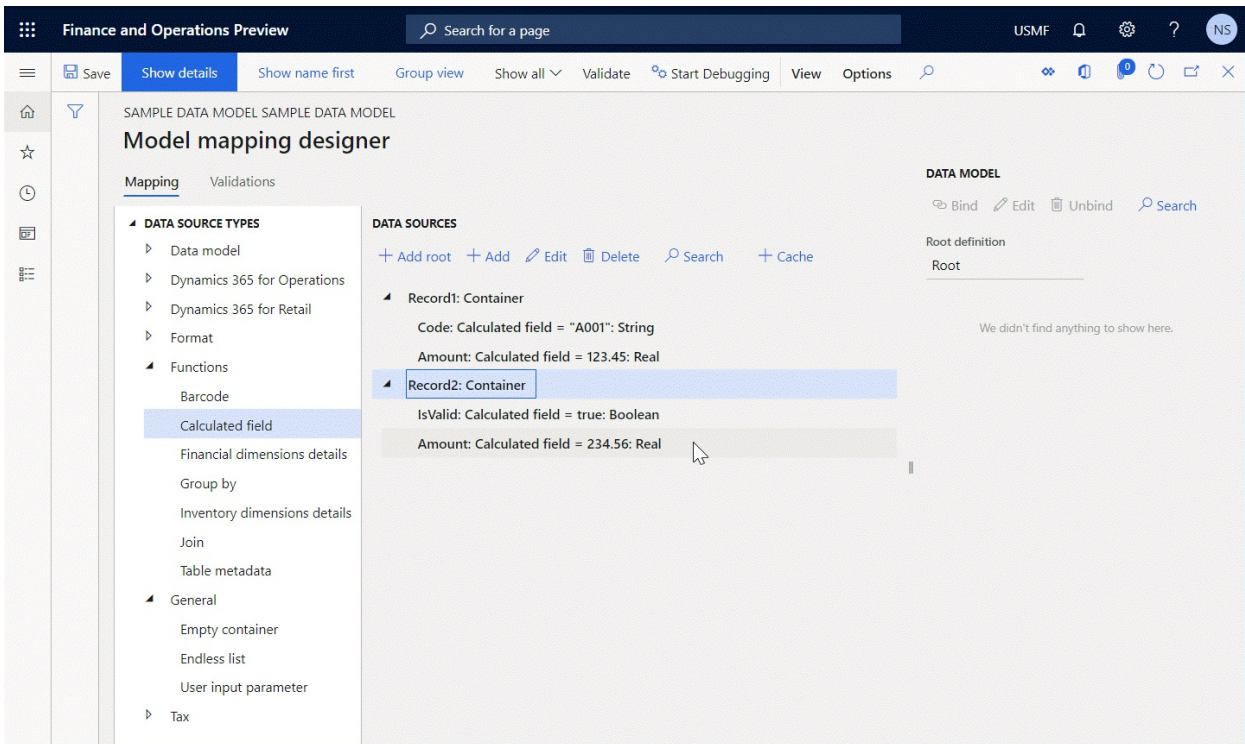
- **Code**: This field contains an expression that returns a value of the `String` type.
- **Amount**: This field contains an expression that returns a value of the `Real` type.

You then enter data source **Record 2** of the `Container` type. This data source contains the following nested fields of the `Calculated field` type:

- **Amount**: This field contains an expression that returns a value of the `Real` type.
- **IsValid**: This field contains an expression that returns a value of the `Boolean` type.



In this case, the expression `LISTJOIN(LIST('Record 1'), LIST('Record 2'))` returns a new list that contains two records.



The structure of this list consists of a single **Amount** field of the `Real` type, because this field is the only field that is presented in every argument of the called function.

Additional resources

[List functions](#)

[Debug data sources of an executed ER format to analyze data flow and transformation](#)

NOTE

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LISTOFFIELDS ER function

2/18/2021 • 3 minutes to read • [Edit Online](#)

The `LISTOFFIELDS` function returns a *Record list* value that is created based on the structure of the specified argument of the *Enumeration* or *Container (record)* type.

Syntax 1

```
LISTOFFIELDS (path)
```

Syntax 2

```
LISTOFFIELDS (path, language)
```

Arguments

`path` : Data source reference

The valid reference path of a data source of one of the following data types:

- Model enumeration
- Format enumeration
- Application enumeration
- Container (record)

`language` : *String*

Text that represents a language code.

Return values

Record list

The resulting list of records.

Usage notes

The list that is created consists of records that have the following fields:

- **Name** (*String* data type)
- **Label** (*String* data type)
- **Description** (*String* data type)
- **IsTranslated** (*Boolean* data type)

If the `path` argument refers to a data source of the *Container (Record)* type, for every field of the referenced container record, a new record is added to the list that is created. For every record that is created, the **Name** field returns the name of the field of the referenced container record that the current record was created for.

If the `path` argument refers to a data source of one of the *Enumeration* types, for every enumeration value of

the referenced enumeration, a new record is added to the list that is created. For every record that is created, the **Name** field returns the value of the referenced enumeration that the current record was created for, the **Description** field returns the description of that enumeration, and the **Label** field returns the label of that enumeration.

At runtime, when syntax 1 is used, the **Label** and **Description** fields must return values that are based on the language settings of the Electronic reporting (ER) format that is running:

- If the labels and descriptions for the requested language are available, the **Label** and **Description** fields return values that are based on that language, and the **IsTranslated** field returns **True**.
- If the labels and descriptions for the requested language aren't available, the **Label** and **Description** fields return values that are based on the default EN-US language, and the **IsTranslated** field returns **False**.

At runtime, when syntax 2 is used, the **Label** and **Description** fields must return values that are based on the language that is defined as the second argument of the called function:

- If the labels and descriptions for the requested language are available, the **Label** and **Description** fields return values that are based on that language, and the **IsTranslated** field returns **True**.
- If the labels and descriptions for the requested language aren't available, the **Label** and **Description** fields return values that are based on the **EN-US** language, and the **IsTranslated** field returns **False**.

Example 1

In the following illustration, an enumeration is introduced in an ER data model.

ReportDirection		
Enumeration values		
Name	Label (*Recommended to use labels)	Description
Both	Both	
Export	Dispatches	
Import	Arrivals	

The following illustration shows these details:

- The model enumeration is inserted into a report as a data source.
- An ER expression uses the model enumeration as a parameter of the `LISTOFFIELDS` function.
- A data source of the *Record list* type is inserted into a report by using the ER expression that is created.

FORMAT **MAPPING** TRANSFORMATIONS VALIDATIONS

Bind + Add root + Add Edit Delete Show name first Group view

- enumDirectionInReport: Data model enumeration ReportDirection
 - Arrivals(Import): Enumeration value
 - Both: Enumeration value
 - Dispatches(Export): Enumeration value
 - listDirectionInReport: Calculated field = LISTOFFIELDS(enumDirectionInReport): Record list**
 - Description: String
 - Label: String
 - Name: String
- model: Data model Intrastat

The following example shows the ER format elements that are bound to the data source of the *Record list* type that was created by using the `LISTOFFIELDS` function.

- Root: XML Element
 - Directions: XML Element = listDirectionInReport
 - name: XML Attribute = listDirectionInReport.Name
 - label: XML Attribute = listDirectionInReport.Label
 - desc: XML Attribute = listDirectionInReport.Description

The following illustration shows the result when the designed format is run.

```
<?xml version="1.0" encoding="UTF-8"?>
- <Root>
  <Directions desc="" label="Both" name="Both"/>
  <Directions desc="" label="Dispatches" name="Export"/>
  <Directions desc="" label="Arrivals" name="Import"/>
</Root>
```

NOTE

Based on the language settings of the parent FILE and FOLDER format elements, translated text for labels and descriptions is entered in the output of the ER format.

Example 2

You use the *Calculated field* data source type to configure `enumType_de` and `enumType_deCH` data sources for the `enumType` data model enumeration:

- `enumType_de` = LISTOFFIELDS (enumType, "de")
- `enumType_deCH` = LISTOFFIELDS (enumType, "de-CH")

In this case, you can use the following expression to get the label of the enumeration value in Swiss German, if that translation is available. If the Swiss German translation isn't available, the label is in German.

```
IF (NOT (enumType_deCH.IsTranslated), enumType_de.Label, enumType_deCH.Label)
```

Additional resources

[List functions](#)

NOTE

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LISTOFFIRSTITEM ER function

2/18/2021 • 2 minutes to read • [Edit Online](#)

The `LISTOFFIRSTITEM` function returns a *Record list* value that consists of only the first record of the specified list.

Syntax

```
LISTOFFIRSTITEM (list)
```

Arguments

`list`: *Record list*

The valid path of a data source of the *Record list* data type.

Return values

Record list

The resulting list of records.

Example

The expression `FIRST(LISTOFFIRSTITEM (SPLIT ("ABC",1))).Value` returns the text value "A".

Additional resources

[List functions](#)

NOTE

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ORDERBY ER function

2/18/2021 • 2 minutes to read • [Edit Online](#)

The `ORDERBY` function returns the specified list as a *Record list* value after it has been sorted according to the specified arguments. These arguments can be defined as expressions.

Syntax

```
ORDERBY (list , expression 1[, expression 2, ..., expression N])
```

Arguments

`list` : *Record list*

The valid path of a data source of the *Record list* data type.

`expression 1` : *Field*

The valid path of a field of the data source that is referenced by the `list` argument of the called function. The referenced field must be a field of the primitive data type. This argument is required.

`expression N` : *Field*

The valid path of a field of the data source that is referenced by the `list` argument of the called function. The referenced field must be a field of the primitive data type. These additional arguments are optional.

Return values

Record list

The resulting list of records.

Example 1

If you enter data source `DS` of the *Calculated field* type, and it contains the expression `SPLIT ("C|B|A", "|")`, the expression `FIRST(ORDERBY(DS, DS. Value)).Value` returns the text value "A".

Example 2

If `Vendor` is configured as an Electronic reporting (ER) data source that refers to the `VendTable` table, the expression `ORDERBY (Vendors, Vendors.'name()')` returns a list of vendors that is sorted by name in ascending order.

Additional resources

[List functions](#)

NOTE

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REVERSE ER function

2/18/2021 • 2 minutes to read • [Edit Online](#)

The `REVERSE` function returns the specified list as a *Record list* value in reversed sort order.

Syntax

```
REVERSE (list)
```

Arguments

`list`: *Record list*

The valid path of a data source of the *Record list* data type.

Return values

Record list

The resulting list of records.

Example 1

If you enter data source `DS` of the *Calculated field* type, and it contains the expression `SPLIT ("C|B|A", "|")`, the expression `FIRST(REVERSE(ORDERBY(DS, DS. Value)))` returns the text value "C".

Example 2

If `Vendor` is configured as an Electronic reporting (ER) data source that refers to the `VendTable` table, the expression `REVERSE (ORDERBY (Vendors, Vendors.'name()'))` returns a list of vendors that is sorted by name in descending order.

Additional resources

[List functions](#)

NOTE

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SPLIT ER function

2/18/2021 • 2 minutes to read • [Edit Online](#)

The `SPLIT` function splits the specified input string into substrings and returns the result as a new *Record list* value.

Syntax 1

```
SPLIT (input, length)
```

This syntax is used to split the specified input string into substrings, each of which has the specified length.

Syntax 2

```
SPLIT (input, delimiter)
```

This syntax is used to split the specified input string into substrings, based on the specified delimiter.

Arguments

`input` : *String*

The text to split.

`length` : *Integer*

The maximum length of a single substring.

`delimiter` : *String*

A delimiter that is used to separate substrings.

Return values

Record list

The resulting list of records.

Usage notes

The record structure of the list that is returned consists of the **Value** field of the *String* type. Every record of the list that is returned contains generated substrings in this field.

If the `delimiter` argument is empty, the new list that is returned consists of one record that has the **Value** field of the *String* type. This field contains the input text.

If the `input` argument is empty, a new empty list is returned. If either the `input` or `delimiter` argument is unspecified (null), an application exception is thrown.

Example 1

`SPLIT ("abcd", 3)` returns a new list that consists of two records that have the **Value** field of the *String* type. The **Value** field in the first record contains the text "abc", and the **Value** field in the second record contains the text "d".

Example 2

`SPLIT ("XAb aBy", "aB")` returns a new list that consists of three records that have the **Value** field of the *String* type. The **Value** field in the first record contains the text "X", the **Value** field in the second record contains the text " ", and the **Value** field in the third record contains the text "y".

Additional resources

[List functions](#)

NOTE

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SPLITLIST ER function

2/18/2021 • 2 minutes to read • [Edit Online](#)

The `SPLITLIST` function splits the specified list into sublists (or batches), each of which contains the specified number of records. It then returns the result as a new *Record list* value that consists of the batches.

Syntax

```
SPLITLIST (list, number)
```

Arguments

`list` : *Record list*

The valid path of a data source of the *Record list* data type.

`number` : *Integer*

The maximum number of records per batch.

Return values

Record list

The resulting list of records.

Usage notes

The list of batches that is returned contains the following elements:

- **Value:** *List*

The list of records that belong to the current batch.

- **BatchNumber:** *Integer*

The number of the current batch in the returned list.

Example

In the following illustration, a **Lines** data source is created as a record list that has three records. This list is divided into batches, each of which contains up to two records.

```
← Lines: = SPLITLIST(SPLIT("abcdef", 2), 2):Record list
```

```
    BatchNumber: Integer
```

```
    ← Value: Record list
```

```
        Value: String
```

The following illustration shows the designed format layout. In this format layout, bindings to the **Lines** data source are created to generate output in XML format. This output presents individual nodes for each batch and the records in it.

- └─ root: XML Element
 - └─ batch: XML Element= Lines
 - number: XML Attribute= Lines.BatchNumber
 - └─ record: XML Element= Lines.Value
 - value: XML Attribute= Lines.Value.Value

The following illustration shows the result when the designed format is run.

```
<?xml version="1.0" encoding="UTF-8"?>
- <root>
  - <batch number="1">
    <record value="ab"/>
    <record value="cd"/>
  </batch>
  - <batch number="2">
    <record value="ef"/>
  </batch>
</root>
```

Additional resources

List functions

NOTE

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SPLITLISTBYLIMIT ER function

2/18/2021 • 2 minutes to read • [Edit Online](#)

The `SPLITLISTBYLIMIT` function splits the specified list into a new list of sublists (batches). The number of records in each batch is dynamically calculated. The function then returns the result as a new *Record list* value that consists of the batches.

Syntax

```
SPLITLISTBYLIMIT (list, limit value, limit source)
```

Arguments

`list` : *Record list*

The valid path of a data source of the *Record list* data type.

`limit value` : *Integer or Real*

The maximum value of the limit that is used to split the original list into batches.

`limit source` : *Field*

The valid path of a field of the *Integer* or *Real* type in the specified list. The value of this field defines the step that the total sum is increased on.

Return values

Record list

The resulting list of records.

Usage notes

The list of batches that is returned contains the following elements:

- **Value:** *List*

The list of records that belong to the current batch.

- **BatchNumber:** *Integer*

The number of the current batch in the returned list.

The limit isn't applied to a single item of the original list if the limit source exceeds the defined limit.

Example

The following illustration shows an Electronic reporting (ER) format.

Bind Unbind Edit formula Expand/collapse

- Root: XML Element
 - ListOfItems: XML Element
 - Item: XML Element = model.Item
 - Name: XML Attribute = model.Item.Name
 - Weight: XML Attribute = model.Item.Weight

The following illustration shows the data sources that are used for the format.

FORMAT **MAPPING** TRANSFORMATIONS

Bind + Add root + Add Edit

- model: Data model Intrastat
 - Item: Record list
 - Name: String
 - Weight: Real

The following illustration shows the result when the format is run. In this case, the output is a flat list of commodity items.

```
<?xml version="1.0" encoding="UTF-8"?>
- <Root>
  - <ListOfItems>
    <Item Weight="1" Name="Speaker"/>
    <Item Weight="2" Name="Projector"/>
    <Item Weight="3" Name="Radio receiver"/>
    <Item Weight="4" Name="Monitor"/>
    <Item Weight="5" Name="Transmitter or receiver"/>
    <Item Weight="6" Name="Parts and components"/>
    <Item Weight="11" Name="Hardware"/>
  </ListOfItems>
</Root>
```

In the following illustrations, the same format has been adjusted so that it presents the list of commodity items in batches if a single batch must include commodities and the total weight should not exceed a limit of 9.

Bind Unbind Edit formula Expand/collapse Search

- Root: XML Element
 - ListOfItems: XML Element
 - Item: XML Element = model.Item
 - Name: XML Attribute = model.Item.Name
 - Weight: XML Attribute = model.Item.Weight
 - ListOfBatches: XML Element
 - Batch: XML Element = batches
 - Id: XML Attribute = batches.BatchNumber
 - TotalWeight: XML Attribute = batches.total.aggregated.total
 - ListOfItems: XML Element
 - Item: XML Element = batches.Value
 - Name: XML Attribute = batches.Value.Name
 - Weight: XML Attribute = batches.Value.Name

4 batches: Calculated field = SPLITLISTBYLIMIT(model.Item, 9, model.Item.Weight): Record list

BatchNumber: Integer

4 total: Record list 'batches/Value' group by

4 aggregated: Record

total: Real

grouped: Record

▸ lines: Record list

4 Value: Record list

Name: String

Weight: Real

4 model: Data model Intrastat

4 Item: Record list

Name: String

Weight: Real

The following illustration shows the result when the adjusted format is run.

```
<?xml version="1.0" encoding="UTF-8"?>
- <Root>
  - <ListOfItems>
    <Item Weight="1" Name="Speaker"/>
    <Item Weight="2" Name="Projector"/>
    <Item Weight="3" Name="Radio receiver"/>
    <Item Weight="4" Name="Monitor"/>
    <Item Weight="5" Name="Transmitter or receiver"/>
    <Item Weight="6" Name="Parts and components"/>
    <Item Weight="11" Name="Hardware"/>
  </ListOfItems>
  - <ListOfBatches>
    - <Batch TotalWeight="6.0" Id="1">
      - <ListOfItems>
        <Item Weight="Speaker" Name="Speaker"/>
        <Item Weight="Projector" Name="Projector"/>
        <Item Weight="Radio receiver" Name="Radio receiver"/>
      </ListOfItems>
    </Batch>
    - <Batch TotalWeight="9.0" Id="2">
      - <ListOfItems>
        <Item Weight="Monitor" Name="Monitor"/>
        <Item Weight="Transmitter or receiver" Name="Transmitter or receiver"/>
      </ListOfItems>
    </Batch>
    - <Batch TotalWeight="6.0" Id="3">
      - <ListOfItems>
        <Item Weight="Parts and components" Name="Parts and components"/>
      </ListOfItems>
    </Batch>
    - <Batch TotalWeight="11.0" Id="4">
      - <ListOfItems>
        <Item Weight="Hardware" Name="Hardware"/>
      </ListOfItems>
    </Batch>
  </ListOfBatches>
</Root>
```

NOTE

The limit isn't applied to the last item of the original list, because the value (11) of the limit source (**weight**) exceeds the defined limit (9). To ignore sublists during report generation, use either the `WHERE` function or the **Enabled** expression of the corresponding format element, as you require.

Additional resources

List functions

NOTE

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STRINGJOIN ER function

2/18/2021 • 2 minutes to read • [Edit Online](#)

The `STRINGJOIN` function returns a *String* value that consists of concatenated values of the specified field from the specified list. The values can be separated by the specified delimiter.

Syntax

```
STRINGJOIN (list, field, delimiter)
```

Arguments

`list` : *Record list*

The valid path of a data source of the *Record list* data type.

`field` : *Field*

The valid path of a field of the *String* data type in the specified list.

`delimiter` : *String*

A delimiter that is used to separate substrings.

Return values

String

The resulting text value.

Example

If you enter `SPLIT("abc" , 1)` as data source `DS`, the expression `STRINGJOIN (DS, DS.Value, "-")` returns "a-b-c".

Additional resources

[List functions](#)

NOTE

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WHERE ER function

2/18/2021 • 2 minutes to read • [Edit Online](#)

The `WHERE` function returns the specified list as a *Record list* value after it has been filtered according to the specified condition.

Syntax

```
WHERE (list, condition)
```

Arguments

`list` : *Record list*

The valid path of a data source of the *Record list* data type.

`condition` : *Boolean*

A valid conditional expression that is used to filter records of the specified list.

Return values

Record list

The resulting list of records.

Usage notes

This function differs from the `FILTER` function, because the specified condition is applied to any Electronic reporting (ER) data source of the *Record list* type that is present in memory.

If the arguments that are configured for this function (`list` and `condition`) allow this request to be translated to the direct SQL call, a warning message is thrown at design time. This message informs the user that performance might be improved if the `FILTER` function is used instead of `WHERE`.

Example 1

If `Vendor` is configured as an ER data source that refers to the `VendTable` table, the expression

```
WHERE (Vendors, Vendors.VendGroup = "40")
```

 returns a list of only vendors that belong to vendor group 40.

Example 2

If you enter data source `DS` of the *Calculated field* type, and it contains the expression `SPLIT ("A|B|C", "|")`, the expression `WHERE(DS, DS.Value = "B")` returns a list of only one record that contains the text `"B"` in the `Value` field.

Additional resources

[List functions](#)

NOTE

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List of ER functions in the logical category

2/18/2021 • 2 minutes to read • [Edit Online](#)

Electronic reporting (ER) logical functions can be used to work with logical values to perform more than one comparison in a single expression or test multiple conditions. This topic provides a summary of these functions.

List of supported functions

FUNCTION	DESCRIPTION
And	This function returns a <i>Boolean</i> value of TRUE if all the specified conditions are true. Otherwise, it returns a <i>Boolean</i> value of FALSE .
Case	This function evaluates the value of the specified expression against the specified alternative options and returns the result of the first option that equals the value of the specified expression. Otherwise, it returns an optional default result, if a default result is specified as the last argument of the called function that isn't preceded by an option. The value that is returned can be a value of any of the supported data types.
If	This function returns the first specified value if the specified condition is met. Otherwise, it returns the second specified value. The value that is returned can be a value of any of the supported data types.
Not	This function returns the reversed logical value of the specified condition as a <i>Boolean</i> value.
Or	This function returns a <i>Boolean</i> value of FALSE if all the specified conditions are false. If any specified condition is true, the function returns a <i>Boolean</i> value of TRUE .
ValueIn	This function determines whether the specified input matches any value of a specified item in the specified list. It returns a <i>Boolean</i> value of TRUE if the specified input matches the result of running the specified expression for at least one record of the specified list. Otherwise, it returns a <i>Boolean</i> value of FALSE .
ValueInLarge	This function determines whether the specified input of the <i>Int64</i> or <i>Integer</i> type matches any value of a specified item in the specified list. It returns a <i>Boolean</i> value of TRUE if the specified input matches the result of running the specified expression for at least one record of the specified list. Otherwise, it returns a <i>Boolean</i> value of FALSE .

Additional resources

[Electronic Reporting overview](#)

[Formula designer in Electronic reporting](#)

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NOTE

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AND ER function

2/18/2021 • 2 minutes to read • [Edit Online](#)

The `AND` function returns a *Boolean* value of **TRUE** if all the specified conditions are true. Otherwise, it returns a *Boolean* value of **FALSE**.

Syntax

```
AND (condition 1[, condition 2, ..., condition N])
```

Arguments

`condition 1` : *Boolean*

A valid conditional expression that must be tested. This argument is required.

`condition N` : *Boolean*

A valid conditional expression that must be tested. These additional arguments are optional.

Return values

Boolean

The resulting *Boolean* value.

Usage notes

In the arguments of logical functions, you can use data source references, numeric and text values, Boolean values, comparison operators, and other Electronic reporting (ER) functions. However, all the arguments must be evaluated to a *Boolean* value of **TRUE** or **FALSE**.

Example

`AND (1=1, "a"="a")` returns **TRUE**.

`AND (1=2, "a"="a")` returns **FALSE**.

Additional resources

[Logical functions](#)

NOTE

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CASE ER function

2/18/2021 • 2 minutes to read • [Edit Online](#)

The `CASE` function evaluates the value of the specified expression against the specified alternative options and returns the result of the first option that equals the value of the specified expression. Otherwise, it returns the optional default result, if a default result is specified as the last argument of the called function that isn't preceded by an option. The value that is returned can be a value of any of the supported data types.

Syntax

```
CASE (expression, option 1, result 1[, option 2, result 2, ..., option N, result N, default result])
```

Arguments

`expression` : *Primitive data type* (Boolean, numeric, or text)

A valid expression that returns a value of the primitive data type.

`option 1` : *Primitive data type* (Boolean, numeric, or text)

A valid expression that returns a value of the same primitive data type as the `expression` argument of the called function. This argument is required.

`result 1` : *Any of the supported data types*

The returned result that corresponds to the preceding option. This argument is required.

`option N` : *Primitive data type* (Boolean, numeric, or text)

A valid expression that returns a value of the same primitive data type as the `expression` argument of the called function. This argument is optional.

`result N` : *Any of the supported data types*

The returned result that corresponds to the preceding option. This argument is optional.

`default result` : *Any of the supported data types*

The result that should be returned if there is no match. This argument is optional.

Return values

Any of the supported data types

The resulting value of any of the supported data types.

Usage notes

An exception is thrown at runtime if there is no match and an optional default result isn't defined.

All results must be specified by using the same data type. An exception is thrown at design time if the data types of the configured results don't match.

If the first result value and the *N*th result value are values of the *Container (record)* or *Record list* data type, the

result has only the fields that exist in both values.

Example

`CASE(DATETIMEFORMAT(NOW(), "MM"), "10", "WINTER", "11", "WINTER", "12", "WINTER", "")` returns the string "WINTER" if the current application session date is between October and December. Otherwise, it returns a blank string.

Additional resources

[Logical functions](#)

NOTE

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IF ER function

2/18/2021 • 2 minutes to read • [Edit Online](#)

The `IF` function returns the first specified value if the specified condition is met. Otherwise, it returns the second specified value. The value that is returned can be a value of any of the supported data types.

Syntax

```
IF (condition, first value, second value) as any of the supported data types
```

Arguments

`condition` : *Boolean*

A valid conditional expression that must be tested.

`first value` : *Any of the supported data types*

The result that is returned if the condition is met.

`second value` : *Any of the supported data types*

The result that is returned if the condition isn't met.

Return values

Any of the supported data types

The resulting value of any of the supported data types.

Usage notes

The `first value` and `second value` arguments must be specified by using the same data type. An exception is thrown at design time if the data types of the configured values don't match.

If the first value and the second value are values of the *Container (record)* or *Record list* data type, the result has only the fields that exist in both values.

Example

```
IF (1=2, "condition is met", "condition is not met") returns the string "condition is not met".
```

Additional resources

[Logical functions](#)

NOTE

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NOT ER function

2/18/2021 • 2 minutes to read • [Edit Online](#)

The `NOT` function returns the reversed logical value of the specified condition as a *Boolean* value.

Syntax

```
NOT (condition)
```

Arguments

`condition`: *Boolean*

A valid conditional expression that must be reversed.

Return values

Boolean

The resulting *Boolean* value.

Example

`NOT (TRUE)` returns `FALSE`.

Additional resources

[Logical functions](#)

NOTE

Can you tell us about your documentation language preferences? [Take a short survey](#).

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OR ER function

2/18/2021 • 2 minutes to read • [Edit Online](#)

The `OR` function returns a *Boolean* value of **FALSE** if all the specified conditions are false. If any specified condition is true, the function returns a *Boolean* value of **TRUE**.

Syntax

```
OR (condition 1[, condition 2, ..., condition N])
```

Arguments

`condition 1` : *Boolean*

A valid conditional expression that must be tested. This argument is required.

`condition N` : *Boolean*

A valid conditional expression that must be tested. These additional arguments are optional.

Return values

Boolean

The resulting *Boolean* value.

Example

`OR (1=2, "a"="a")` returns **TRUE**.

Additional resources

[Logical functions](#)

NOTE

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VALUEIN ER function

2/18/2021 • 3 minutes to read • [Edit Online](#)

The `VALUEIN` function determines whether the specified input matches any value of a specified item in the specified list. It returns a *Boolean* value of **TRUE** if the specified input matches the result of running the specified expression for at least one record of the specified list. Otherwise, it returns a *Boolean* value of **FALSE**.

Syntax

```
VALUEIN (input, list, list item expression)
```

Arguments

`input`: *Field*

The valid path of an item of a data source of the *Record list* type. The value of this item will be matched.

`list`: *Record list*

The valid path of a data source of the *Record list* data type.

`list item expression`: *Boolean*

A valid conditional expression that either points to or contains a single field of the specified list that should be used for the matching.

Return values

Boolean

The resulting *Boolean* value.

Usage notes

In general, the `VALUEIN` function is translated to a set of **OR** conditions. If the list of **OR** conditions is large and the maximum total length of an SQL statement might be exceeded, consider using the `VALUEINLARGE` function.

```
(input = list.item1.value) OR (input = list.item2.value) OR ...
```

In some cases, it can be translated to a database SQL statement by using the `EXISTS JOIN` operator.

Example 1

In your model mapping, you define the **List** data source of the *Calculated field* type. This data source contains the expression `SPLIT ("a,b,c", ",")`.

When a data source is called, if it has been configured as the `VALUEIN ("B", List, List.Value)` expression, it returns **TRUE**. In this case, the `VALUEIN` function is translated to the following set of conditions:

```
((("B" = "a") or ("B" = "b") or ("B" = "c")), where ("B" = "b") equals TRUE.
```

When a data source is called, if it has been configured as the `VALUEIN ("B", List, LEFT(List.Value, 0))`

expression, it returns **FALSE**. In this case, the `VALUEIN` function is translated to the following condition: `("B" = "")`, which doesn't equal **TRUE**.

The upper limit for the number of characters in the text of such a condition is 32,768 characters. Therefore, you should not create data sources that might exceed this limit at runtime. If the limit is exceeded, the application stops running, and an exception is thrown. For example, this situation can occur if the data source is configured as `WHERE (List1, VALUEIN (List1.ID, List2, List2.ID))`, and the `List1` and `List2` lists contain a large volume of records.

In some cases, the `VALUEIN` function is translated to a database statement by using the `EXISTS JOIN` operator. This behavior occurs when the `FILTER` function is used and the following conditions are met:

- The **ASK FOR QUERY** option is turned off for the data source of the `VALUEIN` function that refers to the list of records. No additional conditions will be applied to this data source at runtime.
- No nested expressions are configured for the data source of the `VALUEIN` function that refers to the list of records.
- A list item of the `VALUEIN` function refers to a field of the specified data source, not to an expression or method of that data source.

Consider using this option instead of the `WHERE` function that is described earlier in this example.

Example 2

You define the following data sources in your model mapping:

- The `In` data source of the *Table records* type. This data source refers to the `Intrastat` table.
- The `Port` data source of the *Table records* type. This data source refers to the `IntrastatPort` table.

When a data source is called that has been configured as the `FILTER (In, VALUEIN(In.Port, Port, Port.PortId))` expression, the following SQL statement is generated to return filtered records of the `Intrastat` table.

```
select ... from Intrastat
exists join TableId from IntrastatPort
where IntrastatPort.PortId = Intrastat.Port
```

For `dataAreaId` fields, the final SQL statement is generated by the using `IN` operator.

Example 3

You define the following data sources in your model mapping:

- The `Le` data source of the *Calculated field* type. This data source contains the expression `SPLIT ("DEMF,GBSI,USMF", ",")`.
- The `In` data source of the *Table records* type. This data source refers to the `Intrastat` table, and the **Cross-company** option is turned on for it.

When a data source is called that has been configured as the `FILTER (In, VALUEIN (In.dataAreaId, Le, Le.Value))` expression, the final SQL statement contains the following condition.

```
Intrastat.dataAreaId IN ('DEMF', 'GBSI', 'USMF')
```

Additional resources

Logical functions

VALUEINLARGE functions

NOTE

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List of ER functions in the mathematical category

2/18/2021 • 2 minutes to read • [Edit Online](#)

Electronic reporting (ER) mathematical functions can be used to do many common mathematical calculations. This topic provides a summary of these functions.

List of supported functions

FUNCTION	DESCRIPTION
Abs	This function returns the absolute value (modulus) of the specified number as a <i>Real</i> value. In other words, it returns the number without its sign.
Power	This function returns a <i>Real</i> value that represents the result of raising the specified positive number to the specified power.
Round	This function returns the specified number as a <i>Real</i> value after it has been rounded to the specified number of decimal places.
RoundDown	This function returns the specified number as a <i>Real</i> value after it has been rounded down to the specified number of decimal places.
RoundUp	This function returns the specified number as a <i>Real</i> value after it has been rounded up to the specified number of decimal places.

Additional resources

[Electronic Reporting overview](#)

[Formula designer in Electronic reporting](#)

[Electronic reporting formula language](#)

NOTE

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ABS ER function

2/18/2021 • 2 minutes to read • [Edit Online](#)

The `ABS` function returns the absolute value (modulus) of the specified number as a *Real* value. In other words, it returns the number without its sign.

Syntax

```
ABS (number)
```

Arguments

`number` : *Real*

A numeric value that you want the modulus of.

Return values

Real

The resulting numeric value.

Example

`ABS (-1)` returns 1.

Additional resources

[Mathematical functions](#)

NOTE

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POWER ER function

2/18/2021 • 2 minutes to read • [Edit Online](#)

The `POWER` function returns a *Real* value that represents the result of raising the specified positive number to the specified power.

Syntax

```
POWER (number, power)
```

Arguments

`number` : *Real* or *Integer*

A numeric value that must be raised to the specified power.

`power` : *Real* or *Integer*

A numeric value that represents the specific power.

Return values

Real

The resulting numeric value.

Example 1

`POWER (10, 2)` returns 100.

Example 2

`POWER (4, 0.5)` returns 2.

Additional resources

[Mathematical functions](#)

NOTE

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ROUND ER function

2/18/2021 • 2 minutes to read • [Edit Online](#)

The `ROUND` function returns the specified number as a *Real* value after it has been rounded to the specified number of decimal places.

Syntax

```
ROUND (number, decimals)
```

Arguments

`number` : *Real*

A numeric value that must be rounded.

`decimals` : *Integer*

A numeric value that represents the number of decimal places.

Return values

Real

The resulting numeric value.

Usage notes

If the value of the `decimals` argument is more than 0 (zero), the specified number is rounded to that many decimal places.

If the value of the `decimals` argument is 0 (zero), the specified number is rounded to the nearest even integer.

If the value of the `decimals` argument is less than 0 (zero), the specified number is rounded to the left of the decimal point.

Example 1

`ROUND (1200.767, 2)` rounds to two decimal places and returns **1200.77**.

Example 2

`ROUND (1200.767, -3)` rounds to the nearest multiple of 1,000 and returns **1000**.

Example 3

`ROUND (1200.5, 0)` rounds to the nearest even integer and returns **1200**, while `ROUND (1201.5, 0)` does the same and returns **1202**.

Additional resources

NOTE

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ROUNDDOWN ER function

2/18/2021 • 2 minutes to read • [Edit Online](#)

The `ROUNDDOWN` function returns the specified number as a *Real* value after it has been rounded down to the specified number of decimal places.

Syntax

```
ROUNDDOWN (number, decimals)
```

Arguments

`number` : *Real*

A numeric value that must be rounded down.

`decimals` : *Integer*

A numeric value that represents the number of decimal places.

Return values

Real

The resulting numeric value.

Usage notes

This function behaves like `ROUND`, but it always rounds the specified number down (toward zero).

Example 1

`ROUNDDOWN (1200.767, 2)` rounds down to two decimal places and returns **1200.76**.

Example 2

`ROUNDDOWN (1700.767, -3)` rounds down to the nearest multiple of 1,000 and returns **1000**.

Additional resources

[Mathematical functions](#)

NOTE

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ROUNDUP ER function

2/18/2021 • 2 minutes to read • [Edit Online](#)

The `ROUNDUP` function returns the specified number as a *Real* value after it has been rounded up to the specified number of decimal places.

Syntax

```
ROUNDUP (number, decimals)
```

Arguments

`number` : *Real*

A numeric value that must be rounded up.

`decimals` : *Integer*

A numeric value that represents the number of decimal places.

Return values

Real

The resulting numeric value.

Usage notes

This function behaves like `ROUND`, but it always rounds the specified number up (away from zero).

Example 1

`ROUNDUP (1200.763, 2)` rounds up to two decimal places and returns **1200.77**.

Example 2

`ROUNDUP (1200.767, -3)` rounds up to the nearest multiple of 1,000 and returns **2000**.

Additional resources

[Mathematical functions](#)

NOTE

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List of ER functions in the record category

2/18/2021 • 2 minutes to read • [Edit Online](#)

Electronic reporting (ER) record functions can be used to extract information from, and perform operations on, data sources of the *Container (record)* data type. This topic provides a summary of these functions.

List of supported functions

FUNCTION	DESCRIPTION
NullContainer	This function returns a null <i>Container (record)</i> value that has the same structure as the specified record list or record.
EmptyRecord	This function returns a null <i>Container (record)</i> value that has the same structure as the specified record list or record.

Additional resources

[Electronic Reporting overview](#)

[Formula designer in Electronic reporting](#)

[Electronic reporting formula language](#)

NOTE

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EMPTYRECORD ER function

2/18/2021 • 2 minutes to read • [Edit Online](#)

The `EMPTYRECORD` function returns a null *Container (record)* value that has the same structure as the specified record list or record.

Syntax

```
EMPTYRECORD (list)
```

Arguments

`list` : *Record list* or *Container (record)*

The valid path of a data source of either the *Record list* or *Container (record)* type.

Return values

Container (record)

The resulting record value.

Usage notes

NOTE

A null record is a record where all fields have an empty value. An empty value is 0 (zero) for numbers, an empty string for strings, and so on.

Example

`EMPTYRECORD (SPLIT ("abc", 1))` returns a new empty record that has the same structure as the list that is returned by the `SPLIT` function. For more information, see [SPLIT](#).

Additional resources

[Record functions](#)

NOTE

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NULLCONTAINER ER function

2/18/2021 • 2 minutes to read • [Edit Online](#)

The `NULLCONTAINER` function returns a null *Container (record)* value that has the same structure as the specified record list or record.

Syntax

```
NULLCONTAINER (list)
```

Arguments

`list` : *Record list* or *Container (record)*

The valid path of a data source of either the *Record list* or *Container (record)* type.

Return values

Container (record)

The resulting record value.

Usage notes

NOTE

This function is obsolete. Use the `EMPTYRECORD` function instead. For more information, see [EMPTYRECORD](#).

Example

`NULLCONTAINER (SPLIT ("abc", 1))` returns a new empty record that has the same structure as the list that is returned by the `SPLIT` function. For more information, see [SPLIT](#).

Additional resources

[Record functions](#)

NOTE

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List of ER functions of the text category

2/18/2021 • 2 minutes to read • [Edit Online](#)

Electronic reporting (ER) text functions can be used to perform operations on data sources of the *String* data type. This topic provides a summary of these functions.

List of supported functions

FUNCTION	DESCRIPTION
Char	This function returns a <i>String</i> value that presents a single character that is referenced by the specified Unicode number.
Concatenate	This function returns all the specified text strings as a <i>String</i> value after they have been joined into one string.
Format	This function returns the specified string a <i>String</i> value after it has been formatted by substituting any occurrences of %N with the Mth argument.
GetEnumValueByName	This function searches for a specific <i>Enum</i> value in the specified enumeration data source by using the enumeration name that is specified as a <i>String</i> value. If the <i>Enum</i> value is found, the function returns it.
GuidValue	This function converts the specified input of the <i>String</i> type to a data item of the <i>GUID</i> type.
JsonValue	This function parses data in JavaScript Object Notation (JSON) format that is accessed at the specified path, and it extracts a scalar value that is based on the specified ID. It then returns the extracted scalar value as a <i>String</i> value.
Left	This function returns a <i>String</i> value that presents the specified number of characters from the start of the specified string.
Len	This function returns an <i>Integer</i> value that presents the number of characters in the specified string.
Lower	This function returns the specified text string as a <i>String</i> value after it has been converted to lowercase letters.
Mid	This function returns a <i>String</i> value that presents the specified number of characters from the specified string, starting at the specified position.
NumberFormat	This function returns a <i>String</i> value that presents the specified number in the specified format and in an optionally specified culture.

FUNCTION	DESCRIPTION
NumeralsToText	This function returns the specified number as a <i>String</i> value after it has been spelled out (that is, converted to text strings) in the specified language.
PadLeft	This function returns a <i>String</i> value of the specified length, where the start of the specified string is padded with one or more instances of the specified characters.
QrCode	This function returns a <i>Container</i> value that presents the Quick Response code (QR code) image for the specified string in binary format.
Replace	This function returns the specified text string as a <i>String</i> value after all or part of it has been replaced with another string.
Right	This function returns a <i>String</i> value that presents the specified number of characters from the end of the specified string.
Text	This function returns the specified number as a <i>String</i> value after it has been converted to a text string that is formatted according to the server locale settings of the current application instance.
Translate	This function returns a <i>String</i> value that contains the result of the replacement the specified text in characters for another provided set of characters.
Trim	This function returns the specified text string as a <i>String</i> value after leading and trailing spaces have been truncated, and after multiple spaces between words have been removed.
Upper	This function returns the specified text string as a <i>String</i> value after it has been converted to uppercase letters.

Additional resources

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[Formula designer in Electronic reporting](#)

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NOTE

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CHAR ER function

2/18/2021 • 2 minutes to read • [Edit Online](#)

The `CHAR` function returns a *String* value that presents a single character that is referenced by the specified Unicode number.

Syntax

```
CHAR (number)
```

Arguments

`number` : *Integer*

A number that corresponds to an expected single character.

Return values

String

The resulting text value.

Usage notes

The string that this function returns depends on the encoding that is selected in the parent **FILE** format element. For a list of the supported encodings, see [Encoding class](#).

Example

`CHAR (255)` returns "ÿ".

Additional resources

[Text functions](#)

NOTE

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CONCATENATE ER function

2/18/2021 • 2 minutes to read • [Edit Online](#)

The `CONCATENATE` function returns all the specified text strings as a *String* value after they have been joined into one string.

Syntax

```
CONCATENATE (text 1[, text 2, ..., text N])
```

Arguments

`text 1` : *String*

A reference to a data source of the *String* data type. This argument is required.

`text N` : *String*

A reference to a data source of the *String* data type. These additional arguments are optional.

Return values

String

The resulting text value.

Example

```
CONCATENATE ("abc", "def") returns "abcdef".
```

Usage notes

The expression `"abc" & "def"` also returns **"abcdef"**.

Additional resources

[Text functions](#)

NOTE

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FORMAT ER function

2/18/2021 • 2 minutes to read • [Edit Online](#)

The `FORMAT` function returns the specified string as a *String* value after it has been formatted by substituting any occurrences of %N with the *N*th argument.

Syntax

```
FORMAT (string, argument 1[, argument 2, ..., argument N])
```

Arguments

`string` : *String*

A reference to a data source of the *String* type that must be formatted. This argument is required.

`argument 1` : *String*

The first argument, which is used to replace occurrences of %1. This argument is required.

`argument N` : *String*

The *N*th argument, which is used to replace occurrences of %2, %3, and so on. These additional arguments are optional.

Return values

String

The resulting text value.

Usage notes

If an argument isn't provided for a parameter, the parameter is returned as "%N" in the string. For values of the *Real* type, the default string conversion is limited to two decimal places.

Example

In the following illustration, the **PaymentModel** data source returns a list of customer records by using the **Customer** component. It returns the processing date value by using the **ProcessingDate** field.

▲ model: Data model PaymentModel

▲ Customer: Record list

Name: String

ProcessingDate: DateTime

In the Electronic reporting (ER) format that is designed to generate an electronic file for selected customers, **PaymentModel** is selected as a data source, and it controls the process flow. If a selected customer is stopped for the date when the report is processed, an exception is thrown to notify the user. The formula that is designed

for this type of processing control can use the following resources:

- Label SYS70894, which has the following text:
 - For the EN-US language: "Nothing to print"
 - For the DE language: "Nichts zu drucken"
- Label SYS18389, which has the following text:
 - For the EN-US language: "Customer %1 is stopped for %2."
 - For the DE language: "Debitor '%1' wird für %2 gesperrt."

Here is the expression that can be designed.

```
FORMAT (CONCATENATE (@"SYS70894", ". ", @"SYS18389"), model.Customer.Name, DATETIMEFORMAT  
(model.ProcessingDate, "d"))
```

If a report is processed for the **Litware Retail** customer on December 17, 2015, in the **EN-US** culture and the **EN-US** language, this formula returns the following text, which can be presented to the user as an exception message:

Nothing to print. Customer Litware Retail is stopped for 12/17/2015.

If the same report is processed for the **Litware Retail** customer on December 17, 2015, in the **DE** culture and the **DE** language, the formula returns the following text, which uses a different date format:

Nichts zu drucken. Debitor 'Litware Retail' wird für 17.12.2015 gesperrt.

NOTE

The following syntax is applied in ER formulas for labels:

- For labels from resources in the Microsoft Dynamics 365 Finance app: @X, where X is the label ID in the Application Object Tree (AOT)
- For labels that reside in ER configurations: @"GER_LABEL:X", where X is the label ID in the ER configuration

Additional resources

Text functions

NOTE

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GETENUMVALUEBYNAME ER function

2/18/2021 • 2 minutes to read • [Edit Online](#)

The `GETENUMVALUEBYNAME` function searches for a specific *Enum* value in the specified enumeration data source by using the enumeration name that is specified as a *String* value. If the *Enum* value is found, the function returns it. Otherwise, the function returns the **null** enumeration value.

Syntax

```
GETENUMVALUEBYNAME (enumeration data source path, enumeration value text)
```

Arguments

enumeration data source path : *Enumeration*

The valid path of a data source of one of the following enumeration types:

- Electronic reporting (ER) model enumeration
- ER format enumeration
- Microsoft Dynamics 365 Finance enumeration

enumeration value text : *String*

A string value that represents the name of a single enumeration value.

Return values

Nullable *Enum*

The resulting enumeration value.

Usage notes

No exception is thrown if an *Enum* value isn't found by using the name of the enumeration value that is specified as a *String* value.

Example 1

In the following illustration, the **ReportDirection** enumeration is introduced in a data model. Notice that labels are defined for the enumeration values.

Report direction(ReportDirection)

Enumeration values

[+ New](#) [Delete](#)

Name	Label (*Recommended to use labels)	Description
Both	Both	
Export	Dispatches	
Import	Arrivals	

The following illustration shows these details:

- The **\$Direction** data source is configured in an ER report. This data source is configured based on the **ReportDirection** model enumeration.
- The `$IsArrivals` expression is designed to use the model enumeration–based **\$Direction** data source as a parameter of this function.
- The value of this comparison expression is **TRUE**.

Bind + Add root + Add Edit Delete Show name first Group view Search ...

\$IsArrivals: Calculated field = GETENUMVALUEBYNAME('\$Direction', "Arrivals")='\$Direction'.Import: Boolean

▾ **\$Direction:** Data model enumeration ReportDirection

- Arrivals(Import): Enumeration value
- Both: Enumeration value
- Dispatches(Export): Enumeration value

▸ model: Data model Intrastat

Example 2

The `GETENUMVALUEBYNAME` and `LISTOFFIELDS` functions let you fetch values and labels of supported enumerations as text values. (The supported enumerations are application enumerations, data model enumerations, and format enumerations.)

In the following illustration, the **TransType** data source is introduced in a model mapping. This data source refers to the **LedgerTransType** application enumeration.

Finance and Operations Preview Search for a page USMF ? NS

Save Show details Show name first Group view Show all Validate Start Debugging View Options

SAMPLE MODEL SAMPLE MODEL

Model mapping designer

Mapping Validations

DATA SOURCE TYPES

- Data model
- ▾ Dynamics 365 for Operations
 - Class
 - Enumeration
 - Number sequence
 - Object
 - Table
 - Table records
- Dynamics 365 for Retail
- Format
- Functions
- General

DATA SOURCES

+ Add root + Add Edit Delete Search + Cache

- ▾ Dynamics 365 for Operations enumerations
 - ▾ **TransType: Dynamics 365 for Operations enumeration LedgerTransType**
 - Advance adjustment(AdvanceAdjustment_RU): LedgerTransType Enumeration value
 - Allocation: LedgerTransType Enumeration value
 - AP amortization(RTax25_BadDebtCreditAmortisation): LedgerTransType Enumeration value
 - AR amortization(RTax25_BadDebtDebitAmortisation): LedgerTransType Enumeration value
 - Asset impairment reversal(AssetLeaseLeaseAssetImpairmentReversal): LedgerTransType Enumeration value
 - Bank: LedgerTransType Enumeration value

DATA MODEL

Bind Edit Unbind

Root definition

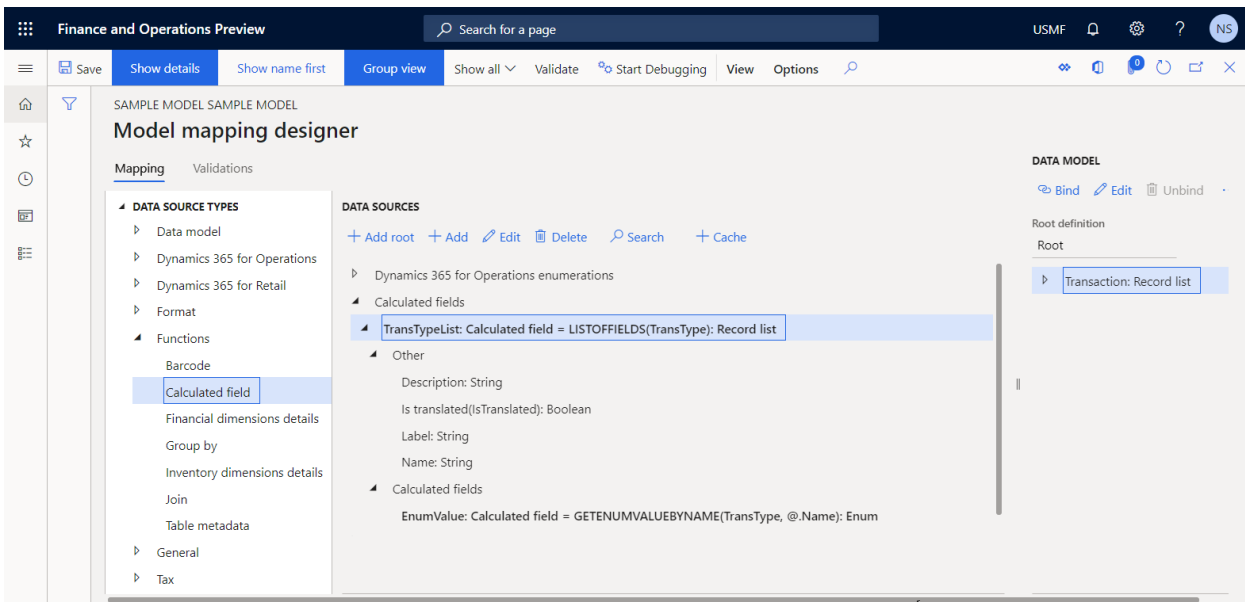
Root

▸ Transaction: Record list

The following illustration shows the **TransTypeList** data source that is configured in a model mapping. This data source is configured based on the **TransType** application enumeration. The `LISTOFFIELDS` function is used to return all enumeration values as a list of records that contain fields. In this way, the details of every enumeration value are exposed.

NOTE

The **EnumValue** field is configured for the **TransTypeList** data source by using the `GETENUMVALUEBYNAME(TransType, TransTypeList.Name)` expression. This field returns an enumeration value for every record in this list.

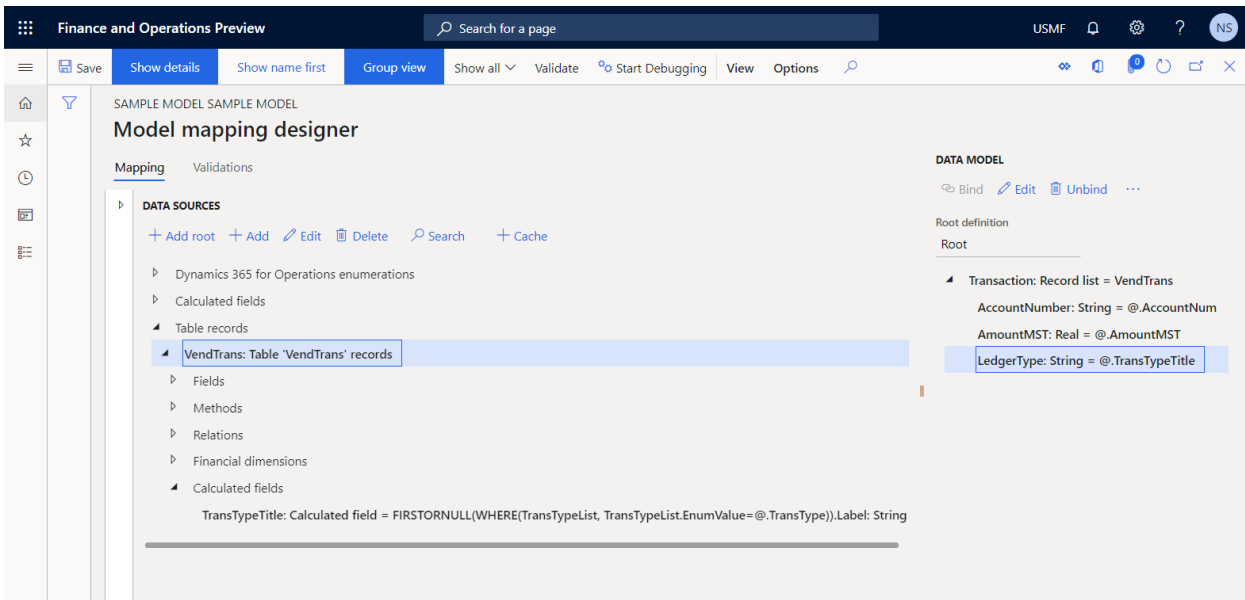


The following illustration shows the **VendTrans** data source that is configured in a model mapping. This data source returns vendor transaction records from the **VendTrans** application table. The ledger type of every transaction is defined by the value of the **TransType** field.

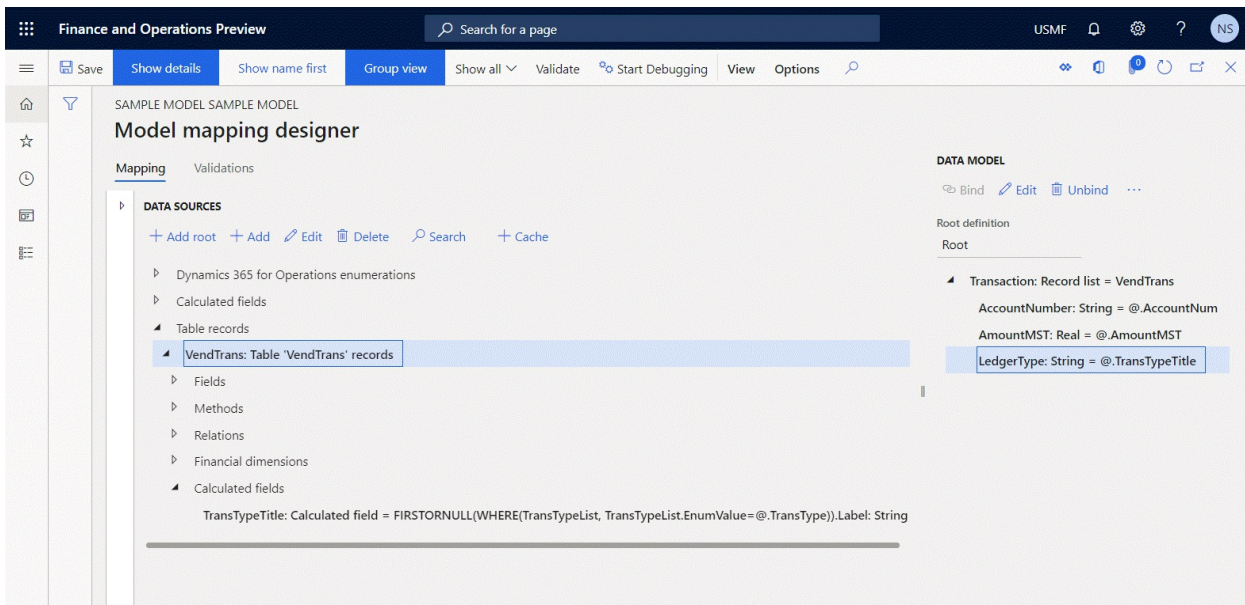
NOTE

The **TransTypeTitle** field is configured for the **VendTrans** data source by using the `FIRSTORNULL(WHERE(TransTypeList, TransTypeList.EnumValue = @.TransType)).Label` expression. This field returns the label of an enumeration value of the current transaction as text, if this enumeration value is available. Otherwise, it returns a blank string value.

The **TransTypeTitle** field is bound to the **LedgerType** field of a data model that enables this information to be used in every ER format that uses the data model as a source of data.



The following illustration shows how you can use the [data source debugger](#) to test the configured model mapping.



The **LedgerType** field of a data model exposes labels of transaction types as expected.

If you plan to use this approach for a large amount of transactional data, you must consider execution performance. For more information, see [Trace the execution of ER formats to troubleshoot performance issues](#).

Additional resources

[Text functions](#)

[Trace the execution of ER formats to troubleshoot performance issues](#)

[LISTOFFIELDS ER function](#)

[FIRSTORNULLE ER function](#)

[WHERE ER function](#)

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

GUIDVALUE ER function

2/18/2021 • 2 minutes to read • [Edit Online](#)

The `GUIDVALUE` function converts the specified input of the *String* type to a data item of the *GUID* type.

Syntax

```
GUIDVALUE (input)
```

Arguments

`input`: *String*

The valid path of a data source of the *String* type.

Return values

GUID

The resulting globally unique identifier (GUID) value.

Usage notes

To do a conversion in the opposite direction (that is, to convert specified input of the *GUID* data type to a data item of the *String* data type), you can use the [TEXT](#) function.

Example

You define the following data sources in your model mapping:

- A `myID` data source of the *Calculated field* type that contains the expression `GUIDVALUE ("AF5CCDAC-F728-4609-8C8B-A4B30B0C0AA0")`
- A `Users` data source of the *Table records* type that refers to the `UserInfo` table

You can then use an expression such as `FILTER (Users, Users.objectId = myID)` to filter the `UserInfo` table by the `objectId` field of the *GUID* data type.

Additional resources

[Text functions](#)

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

JSONVALUE ER function

2/18/2021 • 2 minutes to read • [Edit Online](#)

The `JSONVALUE` function parses data in JavaScript Object Notation (JSON) format that is accessed at the specified path, and it extracts a scalar value that has the specified ID. It then returns the extracted scalar value as a *String* value.

Syntax

```
JSONVALUE (input, path)
```

Arguments

`input`: *String*

The valid path of a data source of the *String* type that contains JSON data.

`path`: *String*

The identifier of a scalar value of JSON data.

Return values

String

The resulting text value.

Example

The `JsonField` data source contains the following data in JSON format: `{"BuildNumber":"7.3.1234.1", "KeyThumbprint":"7366E"}`. In this case, the expression `JSONVALUE (JsonField, "BuildNumber")` returns the following value of the *String* data type: `"7.3.1234.1"`.

Additional resources

[Text functions](#)

NOTE

Can you tell us about your documentation language preferences? [Take a short survey](#).

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

LEFT ER function

2/18/2021 • 2 minutes to read • [Edit Online](#)

The `LEFT` function returns a *String* value that presents the specified number of characters from the start of the specified string.

Syntax

```
LEFT (text, number)
```

Arguments

`text` : *String*

A *String* value that represents the original text.

`number` : *Integer*

The number of characters that must be returned from the start of the original text.

Return values

String

The resulting text value.

Example

`LEFT ("Sample", 3)` returns "Sam".

Additional resources

[Text functions](#)

NOTE

Can you tell us about your documentation language preferences? [Take a short survey](#).

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

LEN ER function

2/18/2021 • 2 minutes to read • [Edit Online](#)

The `LEN` function returns the number of characters in the specified string as an *Integer* value.

Syntax

```
LEN (text)
```

Arguments

`text` : *String*

A *String* value that specifies the text.

Return values

Integer

The resulting numeric value.

Example

`LEN ("Sample")` returns 6.

Additional resources

[Text functions](#)

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

LOWER ER function

2/18/2021 • 2 minutes to read • [Edit Online](#)

The `LOWER` function returns the specified text string as a *String* value after it has been converted to lowercase letters.

Syntax

```
LOWER (text)
```

Arguments

`text` : *String*

A *String* value that specifies the text.

Return values

String

The resulting text value.

Example

```
LOWER ("Sample") returns "sample".
```

Additional resources

[Text functions](#)

NOTE

Can you tell us about your documentation language preferences? [Take a short survey](#).

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

MID ER function

2/18/2021 • 2 minutes to read • [Edit Online](#)

The `MID` function returns a *String* value that presents the specified number of characters from the specified string, starting at the specified position.

Syntax

```
MID (text, starting position, number of characters)
```

Arguments

`text` : *String*

A *String* value that specifies the text to return characters from.

`starting position` : *Integer*

An *Integer* value that specifies the position of the first character that must be returned from the specified text.

`number of characters` : *Integer*

An *Integer* value that specifies the number of characters that must be returned, starting at the specified starting position.

Return values

String

The resulting text value.

Usage notes

If the value of the `starting position` argument is less than 0 (zero), the characters that are returned are counted from the first position in the specified string.

If the value of the `starting position` argument exceeds length of the specified string, an empty string is returned.

Example

`MID ("Sample", 2, 3)` returns **"amp"**.

Additional resources

[Text functions](#)

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

NUMBERFORMAT ER function

2/18/2021 • 2 minutes to read • [Edit Online](#)

The `NUMBERFORMAT` function returns a *String* value that presents the specified number in the specified format and in an optionally specified *culture*. For information about the supported formats, see [standard](#) and [custom](#).

Syntax 1

```
NUMBERFORMAT (number, format)
```

Syntax 2

```
NUMBERFORMAT (number, format, culture)
```

Arguments

`number` : *Integer* or *Real*

A numeric value that specifies the number that must be formatted.

`format` : *String*

A *String* value that represents the format.

`culture` : *String*

A *String* value that represents the culture to use for formatting.

Return values

String

The resulting text value.

Usage notes

If the culture isn't defined as an argument of the called function, the context that this function is run in determines the culture that is used to format numbers.

Example 1

For the **EN-US** culture, `NUMBERFORMAT (0.45, "p")` returns "45.00 %", and `NUMBERFORMAT (10.45, "#")` returns "10".

Example 2

`NUMBERFORMAT (10/3, "F2", "de")` returns 3,33, whereas `NUMBERFORMAT (10/3, "F2", "en-us")` returns 3.33.

Additional resources

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

NUMERALSTOTEXT ER function

2/18/2021 • 2 minutes to read • [Edit Online](#)

The `NUMERALSTOTEXT` function returns the specified number as a *String* value after it has been spelled out (that is, converted to text strings) in the specified language.

Syntax

```
NUMERALSTOTEXT (number, language, currency, print currency name flag, decimal points)
```

Arguments

`number` : *Integer or Real*

A numeric value that specifies the number that must be spelled out.

`language` : *String*

A *String* value that represents the language code.

`currency` : *String*

A *String* value that represents the currency code.

`print currency name flag` : *Boolean*

A *Boolean* value that indicates whether a currency name must be added to the spelled-out text.

`decimal points` : *Integer*

An *Integer* value that indicates the number of decimal places that the spelled-out text should have.

Return values

String

The resulting text value.

Usage notes

The language code is optional. If it's defined as an empty string, the language code for the running context is used. The default language code is **EN-US**. The language code for the running context is defined in a **Folder** or **File** element of the Electronic reporting (ER) format that is running.

The currency code is optional. If it's defined as an empty string, the company currency for the running context is used.

NOTE

The `print currency name flag` and `decimal points` arguments are analyzed only for the following language codes: **CS**, **ET**, **HU**, **LT**, **LV**, **PL**, and **RU**. Additionally, the `print currency name flag` argument is analyzed only for companies where the country's or region's context supports declension of currency names.

Example 1

`NUMERALSTOTEXT (1234.56, "EN-US", "", false, 2)` returns "One Thousand Two Hundred Thirty Four and 56".

Example 2

`NUMERALSTOTEXT (120, "PL", "", false, 0)` returns "Sto dwadzieścia".

Example 3

`NUMERALSTOTEXT (120.21, "RU", "EUR", true, 2)` returns "Сто двадцать евро 21 евроцент".

Additional resources

[Text functions](#)

NOTE

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PADLEFT ER function

2/18/2021 • 2 minutes to read • [Edit Online](#)

The `PADLEFT` function returns a *String* value of the specified length, where the start of the specified string is padded with the specified characters.

Syntax

```
PADLEFT (text, length, padding chars)
```

Arguments

`text` : *String*

A *String* value that represents the original text.

`length` : *Integer*

An *Integer* value that represents the final number of characters in the padded string.

`padding chars` : *String*

The characters to use for padding.

Return values

String

The resulting text value.

Example

`PADLEFT ("1234", 10, " ")` returns the text string " 1234".

Additional resources

[Text functions](#)

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

QR CODE ER function

2/18/2021 • 2 minutes to read • [Edit Online](#)

The `QR CODE` function returns a *Container* value that presents the Quick Response code (QR code) image for the specified string in binary format.

Syntax

```
QR CODE (text)
```

Arguments

`text` : *String*

A *String* value that represents the original text.

Return values

Container

The resulting binary stream.

Example

You can configure an Electronic reporting (ER) format to generate an outbound document in Microsoft Office format (Excel workbooks or Word documents) by using a predefined template. This template may contain a **Picture** object (Excel workbook) or a **Picture Content Control** (Word document) as a placeholder for a QR code image. You need to add to the configured ER format a **Cell** element that will be used to fill this placeholder in. To specify what information will be stored in a QR code, you need to define a binding for this **Cell** element. For example, you can configure such binding as containing the following expression:

```
QR CODE (model.ListOfShelfLabels.LabelText)`
```

When you run the configured ER format, the text value of the **LabelText** field of the **model.ListOfShelfLabels** data source will be used to generate a QR code image. This image will replace a QR code image placeholder in the document template using to generate an outbound document. When this image of the generated document is scanned, it returns the text that was taken from the **LabelText** field of the **model.ListOfShelfLabels** data source. For more information, see [Embed images and shapes in documents that you generate by using ER](#).

Additional resources

[Text functions](#)

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

REPLACE ER function

2/18/2021 • 2 minutes to read • [Edit Online](#)

The `REPLACE` function returns the specified text string as a *String* value after all or part of it has been replaced with another string.

Syntax

```
REPLACE (text, pattern, replacement, regular expression flag)
```

Arguments

`text` : *String*

The valid path of a data source of the *String* type.

`pattern` : *String*

If the `regular expression flag` argument is **FALSE**, this argument contains the text that must be replaced.

If the `regular expression flag` argument is **TRUE**, this argument contains a regular expression that defines both a search pattern and the replacement text.

`replacement` : *String*

If the `regular expression flag` argument is **FALSE**, this argument contains the text to use as a replacement.

If the `regular expression flag` argument is **TRUE**, this argument isn't used.

`regular expression flag` : *Boolean*

A *Boolean* value that indicates whether a regular expression is used to do the replacement.

Return values

String

The resulting text value.

Usage notes

If the `regular expression flag` argument is **TRUE**, this function returns the specified string after it has been changed by applying the regular expression that is specified by the `pattern` argument. The regular expression is used to find the characters that must be replaced.

If the `regular expression flag` argument is **FALSE**, this function returns the specified string after the set of characters that are defined in the `pattern` argument have been replaced by characters of the `replacement` argument.

Example 1

```
REPLACE ("+1 923 456 4971", "[^0-9]", "", true)
```

 applies a regular expression that removes all non-numeric

symbols, and it returns "19234564971".

Example 2

`REPLACE ("abcdef", "cd", "GH", false)` replaces the pattern "cd" with the string "GH" and returns "abGHef".

Additional resources

[Text functions](#)

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

RIGHT ER function

2/18/2021 • 2 minutes to read • [Edit Online](#)

The `RIGHT` function returns a *String* value that presents the specified number of characters from the end of the specified string.

Syntax

```
RIGHT (text, number)
```

Arguments

`text` : *String*

A *String* value that represents the original text.

`number` : *Integer*

The number of characters that must be returned from the end of the original text.

Return values

String

The resulting text value.

Example

```
RIGHT ("Sample", 3) returns "ple".
```

Additional resources

[Text functions](#)

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

TEXT ER function

2/18/2021 • 2 minutes to read • [Edit Online](#)

The `TEXT` function returns the specified number as a *String* value after it has been converted to a text string that is formatted according to the server locale settings of the current application instance.

Syntax

```
TEXT (number)
```

Arguments

`number`: *Integer* or *Real*

A number that must be converted to a text string.

Return values

String

The resulting text value.

Usage notes

For values of the *Real* type, the string conversion is limited to two decimal places.

Example

If the server locale of the Microsoft Dynamics 365 Finance instance is defined as EN-US, `TEXT (NOW ())` returns the current Finance session date, December 17, 2015, as the text string "12/17/2015 07:59:23 AM".

`TEXT (1/3)` returns "0.33".

Additional resources

[Text functions](#)

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

TRANSLATE ER function

2/18/2021 • 2 minutes to read • [Edit Online](#)

The `TRANSLATE` function returns a *String* value that contains the result of the character replacement of specified text in characters of another provided set.

Syntax

```
TRANSLATE (text , pattern, replacement)
```

Arguments

`text` : *String*

The valid path of a data source of the *String* type.

`pattern` : *String*

The text that must be replaced.

`replacement` : *String*

The text to use as a replacement.

Return values

String

The resulting text value.

Usage notes

The `TRANSLATE` function replaces one character at a time. The function replaces the first character of the `text` argument with the first character of the `pattern` argument and then the second character and follows the same flow until finished. When a character from the `text` and `pattern` arguments match, it is replaced by a character from the `replacement` argument that is located in the same position as the character from the `pattern` argument. If a character appears multiple times in the `pattern` argument, the `replacement` argument mapping that corresponds to the first occurrence of this character is used.

Example 1

`TRANSLATE ("abcdef", "cd", "GH")` replaces the "c" character of the specified "abcdef" text with the "G" character of the `replacement` text due to the following:

- The "c" character is presented in the `pattern` text in the first position.
- The first position of the `replacement` text contains the "G" character.

Example 2

`TRANSLATE ("abcdef", "ccd", "GH")` returns "abGdef".

Example 3

`TRANSLATE ("abccba", "abc", "123")` returns `"123321"`.

Additional resources

[Text functions](#)

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

TRIM ER function

2/18/2021 • 2 minutes to read • [Edit Online](#)

The `TRIM` function returns the specified text string as a *String* value after leading and trailing spaces have been truncated, and after multiple spaces between words have been removed.

Syntax

```
TRIM (text )
```

Arguments

`text` : *String*

The valid path of a data source of the *String* type.

Return values

String

The resulting text value.

Example

`TRIM (" Sample text ")` returns "Sample text".

Additional resources

[Text functions](#)

NOTE

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UPPER ER function

2/18/2021 • 2 minutes to read • [Edit Online](#)

The `UPPER` function returns the specified text string as a *String* value after it has been converted to uppercase letters.

Syntax

```
UPPER (text )
```

Arguments

`text` : *String*

The valid path of a data source of the *String* type.

Return values

String

The resulting text value.

Example

`UPPER ("Sample")` returns "SAMPLE".

Additional resources

[Text functions](#)

NOTE

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List of ER functions in the data collection category

2/18/2021 • 2 minutes to read • [Edit Online](#)

Electronic reporting (ER) data collection functions are used to do counting and summing in an ER format that is being run, based on data of the output that has already been generated in **Text** or **Xml** format. This approach is used to help improve performance of an ER format that is run, to enter values of running totals in generated documents, and for other purposes. This topic provides a summary of these functions.

List of supported functions

FUNCTION	DESCRIPTION
CollectedList	This function returns a <i>Record list</i> value that contains the list of values that were returned by the Collected data key value property of format elements and collected when the format elements were used to generate an outbound document during the format run, and that satisfies the specified conditions. Each condition consists of a key range and a key value.
CountIF	This function returns an <i>Integer</i> value that represents the number of format elements that was collected when the format elements were used to generate an outbound document during the format run, and that satisfies the specified condition. The condition consists of a key range and a key value.
CountIFs	This function returns an <i>Integer</i> value that represents the number of format elements that was collected when the format elements were used to generate an outbound document during the format run, and that satisfies the specified conditions. Each condition consists of a key range and a key value.
FormatElementName	This function returns a <i>String</i> value that represents the name of the current ER format's element.
SumIF	This function returns a <i>Real</i> value that represents the sum of values that were returned by bindings of format elements and collected when the format elements were used to generate an outbound document during the format run, and that satisfies the specified condition. The condition consists of a key range and a key value.
SumIFs	This function returns a <i>Real</i> value that represents the sum of values that were returned by bindings of format elements and collected when the format elements were used to generate an outbound document during the format run, and that satisfies the specified conditions. Each condition consists of a key range and a key value.

Additional resources

[Electronic Reporting overview](#)

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

COLLECTEDLIST ER function

2/18/2021 • 2 minutes to read • [Edit Online](#)

The `COLLECTEDLIST` function a *Record list* value that contains the list of values that were returned by the **Collected data key value** property of format elements and collected when the format elements were used to generate outbound documents during the format run, and that satisfies the specified conditions. Each condition consists of a key range and a key value.

Syntax

```
COLLECTEDLIST (condition 1 range, condition 1 value[, condition 2 range, condition 2 value, ..., condition N range, condition N value])
```

Arguments

`condition 1 range`: *String*

A value that is returned by the expression that has been configured in the **Collected data key name** property of an Electronic reporting (ER) format component. This argument is mandatory.

`condition 1 value`: *String*

A value that is returned by the expression that has been configured in the **Collected data key value** property of an ER format component. This argument is mandatory.

`condition N range`: *String*

A value that is returned by the expression that has been configured in the **Collected data key name** property of an ER format component. These additional arguments are optional.

`condition N value`: *String*

A value that is returned by the expression that has been configured in the **Collected data key value** property of an ER format component. These additional arguments are optional.

Return values

Record list

The resulting list of records.

Usage notes

The **Collected data key name** and **Collected data key value** properties can be configured for either the **Sequence** component or the **XML Element** component of an ER format that resides under the **Common\File** component where the **Collect output details** option is turned on.

This function returns an empty list when the **Collect output details** option of the current **Common\File** component is turned off.

In `condition range` arguments, the wildcard character "*" can be used to represent any multiple characters.

In `condition value` arguments, the wildcard character "*" can be used to represent any multiple characters.

Example

For more information about how to use this function, see the [ER Use data of format output for counting and summing](#) task guide, which is part of the **Acquire/Develop IT service/solution components** business process.

Additional resources

[Data collection functions](#)

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

COUNTIF ER function

2/18/2021 • 2 minutes to read • [Edit Online](#)

The `COUNTIF` function returns an *Integer* value that represents the number of format elements that was collected when the format elements were used to generate an outbound document during the format run, and that satisfies the specified condition. The condition consists of a key range and a key value.

Syntax

```
COUNTIF (condition range, condition value)
```

Arguments

`condition range`: *String*

A value that is returned by the expression that has been configured in the **Collected data key name** property of an Electronic reporting (ER) format component.

`condition value`: *String*

A value that is returned by the expression that has been configured in the **Collected data key value** property of an ER format component.

Return values

Integer

The resulting numeric value.

Usage notes

The **Collected data key name** and **Collected data key value** properties can be configured for either the **Sequence** component or the **XML Element** component of an ER format that resides under the **Common\File** component where the **Collect output details** option is turned on.

This function returns a 0 (zero) value when the **Collect output details** option of the current **Common\File** component is turned off.

In the `condition range` argument, the wildcard character "*" can be used to represent any multiple characters.

In the `condition value` argument, the wildcard character "*" can be used to represent any multiple characters.

Example

For more information about how to use this function, see the [ER Use data of format output for counting and summing](#) task guide, which is part of the **Acquire/Develop IT service/solution components** business process.

Additional resources

[Data collection functions](#)

NOTE

Can you tell us about your documentation language preferences? [Take a short survey](#).

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

COUNTIFS ER function

2/18/2021 • 2 minutes to read • [Edit Online](#)

The `COUNTIFS` function returns an *Integer* value that represents the number of format elements that was collected when the format elements were used to generate an outbound document during the format run, and that satisfies the specified conditions. Each condition consists of a key range and a key value.

Syntax

```
COUNTIFS (condition 1 range, condition 1 value[, condition 2 range, condition 2 value, ..., condition N range, condition N value])
```

Arguments

`condition 1 range`: *String*

A value that is returned by the expression that has been configured in the **Collected data key name** property of an Electronic reporting (ER) format component. This argument is mandatory.

`condition 1 value`: *String*

A value that is returned by the expression that has been configured in the **Collected data key value** property of an ER format component. This argument is mandatory.

`condition N range`: *String*

A value that is returned by the expression that has been configured in the **Collected data key name** property of an ER format component. These additional arguments are optional.

`condition N value`: *String*

A value that is returned by the expression that has been configured in the **Collected data key value** property of an ER format component. These additional arguments are optional.

Return values

Integer

The resulting numeric value.

Usage notes

The **Collected data key name** and **Collected data key value** properties can be configured for either the **Sequence** component or the **XML Element** component of an ER format that resides under the **Common\File** component where the **Collect output details** option is turned on.

This function returns a 0 (zero) value when the **Collect output details** option of the current **Common\File** component is turned off.

In `condition range` arguments, the wildcard character "*" can be used to represent any multiple characters.

In `condition value` arguments, the wildcard character "*" can be used to represent any multiple characters.

Example

For more information about how to use this function, see the [ER Use data of format output for counting and summing](#) task guide, which is part of the **Acquire/Develop IT service/solution components** business process.

Additional resources

[Data collection functions](#)

NOTE

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FORMATELEMENTNAME ER function

2/18/2021 • 2 minutes to read • [Edit Online](#)

The `FORMATELEMENTNAME` function returns a *String* value that represents the name of the current Electronic reporting (ER) format's element.

Syntax

```
FORMATELEMENTNAME ()
```

Return values

String

The resulting text value.

Usage notes

This function can be called in ER expressions that were configured for the **Collected data key name** and **Collected data key value** properties of an ER format component from the **Text** group that resides under the **Common\File** component where the **Collect output details** option is turned on.

Example

For more information about how to use this function, see the [ER Use data of format output for counting and summing](#) task guide, which is part of the **Acquire/Develop IT service/solution components** business process.

Additional resources

[Data collection functions](#)

NOTE

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SUMIF ER function

2/18/2021 • 2 minutes to read • [Edit Online](#)

The `SUMIF` function returns a *Real* value that represents the sum of values that were returned by bindings of format elements and collected when the format elements were used to generate an outbound document during the format run, and that satisfies the specified condition. The condition consists of a key range and a key value.

Syntax

```
SUMIF (key name for summing, condition range, condition value)
```

Arguments

`key name for summing`: *String*

A value that is returned by the expression that has been configured in the **Collected data key name** property of the Electronic reporting (ER) format component for which the value of the binding must be used for summing purposes.

The **Collected data key value** property can be configured for either a **Sequence** component or an **XML Element** component of an ER format that resides under the **Common\File** component where the **Collect output details** option is turned on.

Return values

Real

The resulting numeric value.

Usage notes

This function returns a 0 (zero) value when the **Collect output details** option of the current **Common\File** component is turned off.

In the `condition range` argument, the wildcard character "*" can be used to represent any multiple characters.

In the `condition value` argument, the wildcard character "*" can be used to represent any multiple characters.

Example

For more information about how to use this function, see the [ER Use data of format output for counting and summing](#) task guide, which is part of the **Acquire/Develop IT service/solution components** business process.

For more information and examples about using this function, see [Defer the execution of sequence elements in ER formats](#) and [Defer the execution of XML elements in ER formats](#).

Additional resources

[Data collection functions](#)

NOTE

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SUMIFS ER function

2/18/2021 • 2 minutes to read • [Edit Online](#)

The `SUMIFS` function returns a *Real* value that represents the sum of values that were returned by bindings of format elements and collected when the format elements were used to generate an outbound document during the format run, and that satisfies the specified conditions. Each condition consists of a key range and a key value.

Syntax

```
SUMIFS (key name for summing, condition 1 range, condition 1 value[, condition 2 range, condition 2 value, ..., condition N range, condition N value])
```

Arguments

`key name for summing`: *String*

A value that is returned by the expression that has been configured in the **Collected data key name** property of the Electronic reporting (ER) format component for which the value of the binding must be used for summing purposes.

The **Collected data key name** property can be configured for either a **Numeric** component or a **String** component of an ER format that resides under the **Common\File** component where the **Collect output details** option is turned on.

`condition 1 range`: *String*

A value that is returned by the expression that has been configured in the **Collected data key name** property of an ER format component. This argument is mandatory.

The **Collected data key name** property can be configured for either a **Sequence** component or an **XML Element** component of an ER format that resides under the **Common\File** component where the **Collect output details** option is turned on.

`condition 1 value`: *String*

A value that is returned by the expression that has been configured in the **Collected data key value** property of an ER format component. This argument is mandatory.

The **Collected data key value** property can be configured for either a **Sequence** component or an **XML Element** component of an ER format that resides under the **Common\File** component where the **Collect output details** option is turned on.

`condition N range`: *String*

A value that is returned by the expression that has been configured in the **Collected data key name** property of an ER format component. These additional arguments are optional.

The **Collected data key name** property can be configured for either a **Sequence** component or an **XML Element** component of an ER format that resides under the **Common\File** component where the **Collect output details** option is turned on.

`condition N value`: *String*

A value that is returned by the expression that has been configured in the **Collected data key value** property of an ER format component. These additional arguments are optional.

The **Collected data key value** property can be configured for either a **Sequence** component or an **XML Element** component of an ER format that resides under the **Common\File** component where the **Collect output details** option is turned on.

Return values

Real

The resulting numeric value.

Usage notes

This function returns a 0 (zero) value when the **Collect output details** option of the current **Common\File** component is turned off.

In the `condition range` arguments, the wildcard character "*" can be used to represent any multiple characters.

In the `condition value` arguments, the wildcard character "*" can be used to represent any multiple characters.

Example

For more information about how to use this function, see the [ER Use data of format output for counting and summing](#) task guide, which is part of the **Acquire/Develop IT service/solution components** business process.

Additional resources

[Data collection functions](#)

NOTE

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List of ER functions in the business domain-specific category

2/18/2021 • 2 minutes to read • [Edit Online](#)

Electronic reporting (ER) domain-specific functions can be used to perform calculations and data access requests that are specific to the implementation of Microsoft Dynamics 365 Finance. This topic provides a summary of these functions.

List of supported functions

FUNCTION	DESCRIPTION
CH_Bank_Mod_10	This function returns a <i>String</i> value that represents a creditor reference as an MOD10 expression, based on the digits of the specified invoice number.
CN_GBT_AdditionalDimensionID	This function returns a <i>String</i> value that represents a single financial dimension ID that is taken from the specified string. The specified string presents all dimensions as a comma-separated list of IDs.
ConvertCurrency	This function returns a <i>Real</i> value that represents the result of converting the specified monetary amount from the specified source currency to the specified target currency by using the settings of the specified company on the specified date.
CurCredRef	This function returns a <i>String</i> value that represents a creditor reference, based on the digits of the specified invoice number.
FA_Balance	This function returns a <i>Container (record)</i> value that consists of data for the fixed asset balance for the specified fixed asset item, value model code, reporting year, and reporting date.
FA_Sum	This function returns a <i>Container (record)</i> value that consists of data for the fixed asset amounts for the specified fixed asset item, value model code, and period of dates.
GetCurrentCompany	This function returns a <i>String</i> value that represents the code for the legal entity (company) that a user is currently signed in to.
ISOCredRef	This function returns a <i>String</i> value that represents an International Organization for Standardization (ISO) creditor reference, based on the digits and alphabetic symbols of the specified invoice number.

FUNCTION	DESCRIPTION
IsValidCharacterISO7064	This function returns a <i>Boolean</i> value of TRUE if the specified string represents a valid international bank account number (IBAN). Otherwise, it returns a <i>Boolean</i> value of FALSE .
Mod_97	This function returns a <i>String</i> value that represents a creditor reference as a MOD97 expression, based on the digits of the specified invoice number.
NumSeqValue	This function returns a <i>String</i> value that represents the new generated value of a number sequence, based on the specified number sequence, scope, and scope ID. The scope ID equals the company code that is supplied by the context that the ER format is run under.
RoundAmount	This function returns a <i>Real</i> value that represents the result of rounding the specified amount to the specified number of decimal places according to the specified rounding rule.
TableName2ID	This function returns a numeric representation of the table ID for the specified table name as an <i>Integer</i> value.

Additional resources

[Electronic Reporting overview](#)

[Formula designer in Electronic reporting](#)

[Electronic reporting formula language](#)

NOTE

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CH_BANK_MOD_10 ER function

2/18/2021 • 2 minutes to read • [Edit Online](#)

The `CH_BANK_MOD_10` function returns a *String* value that represents a creditor reference as an MOD10 expression, based on the digits of the specified invoice number.

Syntax

```
CH_BANK_MOD_10 (invoice number digits)
```

Arguments

`invoice number digits` : *String*

A text value that represents the digits of an invoice number.

Return values

String

The resulting text value.

Example

`CH_BANK_MOD_10 ("VEND-200002")` returns 3.

Additional resources

[Other \(business domain-specific\) functions](#)

NOTE

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CN_GBT_ADDITIONALDIMENSIONID ER function

2/18/2021 • 2 minutes to read • [Edit Online](#)

The `CN_GBT_ADDITIONALDIMENSIONID` function returns a *String* value that represents a single financial dimension ID that is taken from the specified string. The specified string presents all dimensions as a comma-separated list of IDs.

Syntax

```
CN_GBT_ADDITIONALDIMENSIONID (text, number)
```

Arguments

`text` : *String*

A *String* value that presents all dimensions as a comma-separated list of IDs.

`number` : *Integer*

An *Integer* value that defines the sequence code of the requested dimension in the specified string.

Return values

String

The resulting text value.

Example

```
CN_GBT_AdditionalDimensionID ("AA,BB,CC,DD,EE,FF,GG,HH", 3) returns "CC".
```

Additional resources

[Other \(business domain-specific\) functions](#)

NOTE

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CONVERTCURRENCY ER function

2/18/2021 • 2 minutes to read • [Edit Online](#)

The `CONVERTCURRENCY` function returns a *Real* value that represents the result of converting the specified monetary amount from the specified source currency to the specified target currency by using the settings of the specified company on the specified date.

Syntax

```
CONVERTCURRENCY (amount, source currency, target currency, date, company)
```

Arguments

`amount` : *Integer or Real*

A numeric value that represents the monetary amount that must be converted.

`source currency` : *String*

The code of the source currency.

`target currency` : *String*

The code of the target currency.

`date` : *Date*

A *Date* value that represents the date that is used to determine the exchange rate for the conversion.

`company` : *String*

A *String* value that represents the code of a company that supplies the settings that are used for the conversion.

Return values

Real

The resulting numeric value.

Example

`CONVERTCURRENCY (1, "EUR", "USD", TODAY(), "DEMF")` returns the equivalent of one euro in US dollars on the current session date, based on settings for the **DEMF** company.

Additional resources

[Other \(business domain-specific\) functions](#)

NOTE

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CURCREDREF ER function

2/18/2021 • 2 minutes to read • [Edit Online](#)

The `CURCREDREF` function returns a *String* value that represents a creditor reference, based on the digits of the specified invoice number.

Syntax

```
CURCREDREF (invoice number digits)
```

Arguments

`invoice number digits` : *String*

A text value that represents the digits of an invoice number.

Return values

String

The resulting text value.

Example

`CURCredRef ("VEND-200002")` returns "2200002".

Additional resources

[Other \(business domain-specific\) functions](#)

NOTE

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FA_BALANCE ER function

2/18/2021 • 2 minutes to read • [Edit Online](#)

The `FA_BALANCE` function returns a *Container (record)* value that consists of data for the fixed asset balance for the specified fixed asset item, value model code, reporting year, and reporting date.

Syntax

```
FA_BALANCE (fixed asset code, value model code, reporting year, reporting date)
```

Arguments

`fixed asset code` : *String*

A *String* value that represents the code of a fixed asset item that the balance is calculated for.

`value model code` : *String*

A *String* value that represents the code of a value model that the balance is calculated for.

`reporting year` : *Enumeration value*

An enumeration value of the **AssetYear** application enumeration that defines a period for the balance calculation.

`reporting date` : *Date*

A *Date* value that defines a date for the balance calculation.

Return values

Container (record)

The resulting record value.

Example

`FA_BALANCE ("COMP-000001", "Current", AxEnumAssetYear.ThisYear, SESSIONTODAY ())` returns the data container of balances for fixed asset **COMP-000001** that has been prepared for the **Current** value model on the current application session date.

Additional resources

[Other \(business domain-specific\) functions](#)

NOTE

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FA_SUM ER function

2/18/2021 • 2 minutes to read • [Edit Online](#)

The `FA_SUM` function returns a *Container (record)* value that consists of data for the fixed asset amounts for the specified fixed asset item, value model code, and period of dates.

Syntax

```
FA_SUM (fixed asset code, value model code, start date, end date)
```

Arguments

`fixed asset code` : *String*

A *String* value that represents the code of a fixed asset item that the balance is calculated for.

`value model code` : *String*

A *String* value that represents the code of a value model that the balance is calculated for.

`start date` : *Date*

A *Date* value that represents the start date of a period that the fixed asset amounts are calculated for.

`end date` : *Date*

A *Date* value that represents the end date of a period that the fixed asset amounts are calculated for.

Return values

Container (record)

The resulting record value.

Example

`FA_SUM ("COMP-000001", "Current", Date1, Date2)` returns the data container for fixed asset **COMP-000001** that has been prepared for the **Current** value model and for a period from **Date1** to **Date2**.

Additional resources

[Other \(business domain-specific\) functions](#)

NOTE

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GETCURRENTCOMPANY ER function

2/18/2021 • 2 minutes to read • [Edit Online](#)

The `GETCURRENTCOMPANY` function returns a *String* value that represents the code for the legal entity (company) that a user is currently signed in to.

Syntax

```
GETCURRENTCOMPANY ()
```

Return values

String

The resulting text value.

Example

`GETCURRENTCOMPANY ()` returns **USMF** for a user who is signed in to the **Contoso Entertainment System USA** company.

Additional resources

[Other \(business domain–specific\) functions](#)

NOTE

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ISOCREDREF ER function

2/18/2021 • 2 minutes to read • [Edit Online](#)

The `ISOCREDREF` function returns a *String* value that represents an International Organization for Standardization (ISO) creditor reference, based on the digits and alphabetic symbols of the specified invoice number.

Syntax

```
ISOCREDREF (invoice number digits)
```

Arguments

`invoice number digits` : *String*

A text value that represents the digits of an invoice number.

Return values

String

The resulting text value.

Usage notes

NOTE

To eliminate symbols from alphabets that aren't ISO-compliant, the `invoice number digits` argument must be translated before it's passed to this function.

Example

`ISOCredRef ("VEND-200002")` returns "RF23VEND-200002".

Additional resources

[Other \(business domain-specific\) functions](#)

NOTE

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ISVALIDCHARACTERISO7064 ER function

2/18/2021 • 2 minutes to read • [Edit Online](#)

The `ISVALIDCHARACTERISO7064` function returns a *Boolean* value of **TRUE** if the specified string represents a valid international bank account number (IBAN). Otherwise, it returns a *Boolean* value of **FALSE**.

Syntax

```
ISVALIDCHARACTERISO7064 (text)
```

Arguments

`text` : *String*

A text value that represents an IBAN.

Return values

String

The resulting text value.

Example

```
ISVALIDCHARACTERISO7064 ("AT61 1904 3002 3457 3201") returns TRUE.
```

```
ISVALIDCHARACTERISO7064 ("AT61") returns FALSE.
```

Additional resources

[Other \(business domain-specific\) functions](#)

NOTE

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MOD_97 ER function

2/18/2021 • 2 minutes to read • [Edit Online](#)

The `MOD_97` function returns a *String* value that represents a creditor reference as a MOD97 expression, based on the digits of the specified invoice number.

Syntax

```
MOD_97 (invoice number digits)
```

Arguments

`invoice number digits` : *String*

A text value that represents the digits of an invoice number.

Return values

String

The resulting text value.

Example

`MOD_97 ("VEND-200002")` returns "20000285".

Additional resources

[Other \(business domain-specific\) functions](#)

NOTE

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NUMSEQVALUE ER function

2/18/2021 • 2 minutes to read • [Edit Online](#)

The `NUMSEQVALUE` function returns a *String* value that represents the new generated value of a number sequence, based on the specified number sequence, scope, and scope ID. The scope ID equals the company code that is supplied by the context that the Electronic reporting (ER) format is run under.

Syntax 1

```
NUMSEQVALUE (number sequence code)
```

Syntax 2

```
NUMSEQVALUE (number sequence record ID)
```

Syntax 3

```
NUMSEQVALUE (number sequence code, scope type, scope ID)
```

Arguments

`number sequence code` : *String*

A text value that represents the code of the number sequence that a new value is required in.

`number sequence record ID` : *Int64*

An *Int64* value that represents the record ID of a record in the `NumberSequenceTable` table that contains the definition of the number sequence that a new value is required in.

`scope type` : *Enum value*

An enumeration value of the `ERExpressionNumberSequenceScopeType` enumeration that defines the scope of the number sequence that a new value is required in. The available scope types are **Shared**, **Legal entity**, and **Company**.

`scope ID` : *String*

A *String* value that identifies the scope, based on the specified scope type.

Return values

String

The resulting text value.

Usage notes

For the **Shared** scope type, specify an empty string as the scope ID.

For the **Company** and **Legal entity** scope types, specify the company code as the scope ID. If you specify an empty string as the scope ID for these scope types, the current company code is used.

When syntax 1 is used, the number sequence is requested for the **Company** scope type, and the company code is supplied by the context that the ER format is run under.

Example 1

In your ER format, you define the **AskNumSeq** data source of the *User input parameter* type. This data source refers to the **Description** extended data type (EDT). Next, you define the **NumSeq** data source of the *Calculated field* type. This data source contains the expression `NUMSEQVALUE (AskNumSeq)`. When the **NumSeq** data source is called, it returns the new generated value of the number sequence that was specified at runtime by entering its code in the dialog box. The number sequence is requested for the **Company** scope type. The company code is supplied by the context that the ER format is run under.

Example 2

The following data sources are defined in your model mapping:

- The **LedgerParms** data source of the *Table* type. This data source refers to the LedgerParameters table.
- The **NumSeq** data source of the *Calculated field* type. This data source contains the expression

```
NUMSEQVALUE ( LedgerParameters.'numRefJournalNum()'.NumberSequenceId )
```

When the **NumSeq** data source is called, it returns the new generated value of the number sequence that has been configured in the General ledger parameters for the company that supplies the context that the ER format is run under. This number sequence uniquely identifies journals and acts as a batch number that links the transactions together.

Example 3

The following data sources are defined in your model mapping:

- The **enumScope** data source of the Microsoft Dynamics 365 Finance *enumeration* type. This data source refers to the **ERExpressionNumberSequenceScopeType** enumeration.
- The **NumSeq** data source of the *Calculated field* type. This data source contains the expression

```
NUMSEQVALUE ("Gene_1", enumScope.Company, "")
```

When the **NumSeq** data source is called, it returns the new generated value of the **Gene_1** number sequence that has been configured for the company that supplies the context that the ER format is run under.

Additional resources

[Other \(business domain-specific\) functions](#)

NOTE

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ROUNDAMOUNT ER function

2/18/2021 • 2 minutes to read • [Edit Online](#)

The `ROUNDAMOUNT` function returns a *Real* value as the result of the rounding of the specified number to the nearest multiple of another number according to the specified rounding rule.

Syntax

```
ROUNDAMOUNT (number, decimals, round rule)
```

Arguments

`number` : *Int* or *Real*

A numeric value that must be rounded.

`decimals` : *Int* or *Real*

The number that the value of the `number` parameter must be rounded to a multiple of.

`round rule` : *Enum value*

An enumeration value of the `RoundOffType` enumeration that defines the rounding rule. This enumeration offers the following values:

- Normal (Ordinary)
- Downward (RoundDown)
- Rounding-up (RoundUp)

Return values

Real

The resulting numeric value is a multiple of the value specified by the `decimals` parameter and is closest to the value specified by the `number` parameter.

Usage notes

When the `number` parameter is zero, this function always returns zero.

When the `decimals` parameter is zero, this function rounds to the default round-off value. When the `round rule` parameter is set to `RoundOffType.Ordinary`, the default round-off value is `0.01`. Otherwise, the default round-off value is `1.0`.

When the `round rule` parameter is set to `RoundOffType.Ordinary`, this function rounds to the nearest round-off amount.

When the `round rule` parameter is set to `RoundOffType.RoundDown`, this function rounds towards zero to the nearest round-off amount.

When the `round rule` parameter is set to `RoundOffType.RoundUp`, this function rounds away from zero to the nearest round-off amount.

When the `round rule` parameter is set to **RoundOffType.Ordinary**, this function behaves like the [MROUND](#) Excel function and the [ROUND](#) X++ function.

Remarks

To round a numeric value to a specified number of decimal places, use the [ROUND](#) function.

Example

If the `model.RoundOff` parameter is set to **RoundOffType.Ordinary**,

```
ROUNDAMOUNT (7.45, 1.05, model.RoundOff) returns 7.35.
```

If the `model.RoundOff` parameter is set to **RoundOffType.RoundDown**,

```
ROUNDAMOUNT (7.45, 1.05, model.RoundOff) returns 7.35.
```

If the `model.RoundOff` parameter is set to **RoundOffType.RoundUp**,

```
ROUNDAMOUNT (7.45, 1.05, model.RoundOff) returns 8.4.
```

Additional resources

[Other \(business domain-specific\) functions](#)

[Mathematical functions](#)

NOTE

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TABLENAME2ID ER function

2/18/2021 • 2 minutes to read • [Edit Online](#)

The `TABLENAME2ID` function returns a numeric representation of the table ID for the specified table name as an *Integer* value.

Syntax

```
TABLENAME2ID (text)
```

Arguments

`text` : *String*

A text value that represents a valid table name.

Return values

Integer

The resulting numeric value.

Usage notes

Execution of this function can have different results in different instances of Microsoft Dynamics 365 Finance, even if the same company name is used.

Example

`TABLENAME2ID ("Intrastat")` returns 1510.

Additional resources

[Other \(business domain-specific\) functions](#)

NOTE

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List of ER functions in the type conversion category

2/18/2021 • 2 minutes to read • [Edit Online](#)

Electronic reporting (ER) type conversion functions can be used to convert values between types. This topic provides a summary of these functions.

Type conversion functions

FUNCTION	DESCRIPTION
Int64Value	This function returns an <i>Int64</i> value that represents the specified string.
IntValue	This function returns an <i>Int</i> value that represents the specified string.
NumberValue	This function returns a <i>Real</i> value that is converted from the specified <i>String</i> value. During the conversion, the specified decimal and digit grouping separators are considered.
Value	This function returns a <i>Real</i> value that is converted from the specified <i>String</i> value.

Type conversion functions in the container category

The following table describes the type conversion functions in the [container](#) category.

FUNCTION	DESCRIPTION
Base64StringToContainer	This function converts the specified input of the <i>String</i> type to a data item of the <i>Container</i> type.

Type conversion functions in the date and time category

The following table describes the type conversion functions in the [date and time](#) category.

FUNCTION	DESCRIPTION
DateTimeValue	This function returns a <i>DateTime</i> value that is converted from a given <i>String</i> value in the specified format and in an optionally specified culture to a date/time value.
DateToDateTime	This function returns a <i>DateTime</i> value that is converted from a given <i>Date</i> value to a date/time value in Coordinated Universal Time (Greenwich Mean Time [GMT]).
DateValue	This function returns a <i>Date</i> value that is converted from a given <i>String</i> value in the specified format and in an optionally specified culture to a date value.

Type conversion functions in the list category

The following table describes the type conversion functions in the [list category](#).

FUNCTION	DESCRIPTION
List	This function returns a <i>Record list</i> value as a new list that is created from specified arguments of the <i>Container (record)</i> type.
ListOfFields	This function returns a <i>Record list</i> value that is created based on the structure of a given argument of the <i>Enumeration</i> or <i>Container (record)</i> type.
Split	This function splits the specified <i>String</i> value into substrings and returns the result as a new <i>Record list</i> value.
StringJoin	This function returns a <i>String</i> value that consists of concatenated values of the specified field from the specified <i>Record list</i> value. The values can be separated by the specified delimiter.

Type conversion functions in the text category

The following table describes the type conversion functions in the [text category](#).

FUNCTION	DESCRIPTION
Char	This function returns a <i>String</i> value that represents a single character that is referenced by the specified Unicode number.
GuidValue	This function converts the specified input of the <i>String</i> type to a data item of the <i>GUID</i> type.
NumberFormat	This function returns a <i>String</i> value that represents the specified number in the specified format and in an optionally specified culture.
QrCode	This function returns a <i>Container</i> value that presents the Quick Response code (QR code) image for the specified string in binary format.
Text	This function returns a <i>String</i> value that represents the specified number after it has been converted to a text string that is formatted according to the server locale settings of the current application instance.

Additional resources

[Electronic Reporting overview](#)

[Formula designer in Electronic reporting](#)

[Electronic reporting formula language](#)

NOTE

Can you tell us about your documentation language preferences? [Take a short survey.](#)

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

INT64VALUE ER function

2/18/2021 • 2 minutes to read • [Edit Online](#)

The `INT64VALUE` function returns an *Int64* value that represents the specified string.

Syntax 1

```
INT64VALUE (text)
```

Syntax 2

```
INT64VALUE (number)
```

Arguments

`text` : *String*

A text value that must be converted to an *Int64* number.

`number` : *Real or Integer*

A numeric *Real* or *Integer* value that must be converted to an *Int64* number.

Return values

Int64

The resulting numeric value.

Usage notes

Any decimal places are truncated.

Example 1

```
INT64VALUE ("22565422744") returns the Int64 value 22565422744.
```

Example 2

```
INT64VALUE ( VALUE("22565422744.77")) returns the Int64 value 22565422744.
```

Additional resources

[Type conversion functions](#)

NOTE

Can you tell us about your documentation language preferences? [Take a short survey](#).

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

INTVALUE ER function

2/18/2021 • 2 minutes to read • [Edit Online](#)

The `INTVALUE` function returns an *Int* value that represents the specified string.

Syntax 1

```
INTVALUE (text)
```

Syntax 2

```
INTVALUE (number)
```

Arguments

`text` : *String*

A text value that must be converted to an *Int* number.

`number` : *Real or Integer*

A numeric *Real* or *Integer* value that must be converted to an *Int* number.

Return values

Int

The resulting numeric value.

Usage notes

Any decimal places are truncated.

Example 1

```
INTVALUE ("100.77")
```

 returns the *Int* value 100.

Example 2

```
INTVALUE (-100.77)
```

 returns the *Int* value -100.

Additional resources

[Type conversion functions](#)

NOTE

Can you tell us about your documentation language preferences? [Take a short survey](#).

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

NUMBERVALUE ER function

2/18/2021 • 2 minutes to read • [Edit Online](#)

The `NUMBERVALUE` function returns a *Real* value that is converted from the specified *String* value. During the conversion, the specified decimal and digit grouping separators are considered.

Syntax

```
NUMBERVALUE (text, decimal separator, digit grouping separator)
```

Arguments

`text` : *String*

A text value that must be converted to a *Real* number.

`decimal separator` : *String*

A decimal separator. It's used to separate the integer and fractional parts of a decimal number.

`digit grouping separator` : *String*

A digit grouping separator. It's used as the thousands separator.

Return values

Real

The resulting numeric value.

Example

`NUMBERVALUE("1 234,56", ",", " ")` returns 1234.56.

Additional resources

[Type conversion functions](#)

NOTE

Can you tell us about your documentation language preferences? [Take a short survey](#).

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

VALUE ER function

2/18/2021 • 2 minutes to read • [Edit Online](#)

The `VALUE` function returns a *Real* value that is converted from the specified string.

Syntax

```
VALUE (text)
```

Arguments

`text` : *String*

A string value that must be converted to a numeric value.

Return values

Real

The resulting numeric value.

Usage notes

Commas and dot characters (.) are considered decimal separators, and a leading hyphen (-) is used as a negative sign. An exception is thrown at runtime if the specified string contains other non-numeric characters.

Example 1

`VALUE ("1 234,56")` throws an exception.

Example 2

`VALUE ("1234,56")` returns **1234.56**.

Additional resources

[Type conversion functions](#)

NOTE

Can you tell us about your documentation language preferences? [Take a short survey](#).

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

DATETIMEVALUE ER function

2/18/2021 • 2 minutes to read • [Edit Online](#)

The `DATETIMEVALUE` function returns a *DateTime* value that is converted from a given text value in the specified format and in an optionally specified `culture` to a date/time value. For information about the supported formats, see [standard](#) and [custom](#).

Syntax 1

```
DATETIMEVALUE (text, format)
```

Syntax 2

```
DATETIMEVALUE (text, format, culture)
```

Arguments

`text` : *String*

Text that represents the value to format.

`format` : *String*

The format of the given text.

`culture` : *String*

The culture that is used for formatting of the given text.

Return values

DateTime

The resulting date/time value.

Usage notes

When the culture isn't defined as an argument of the called function, the value of `culture` is defined by the calling context. For example, if the `DATETIMEVALUE` function is called by using syntax 1 in an Electronic reporting (ER) format for a FILE element that is configured to use the German culture, the conversion will be done by using the German culture. The default `culture` value is **EN-US**.

Example 1

`DATETIMEVALUE ("21-Dec-2016 02:55:00", "dd-MMM-yyyy hh:mm:ss")` returns 2:55:00 AM on December 21, 2016, based on the specified custom format and the default application's **EN-US** culture.

Example 2

`DATETIMEVALUE ("21-Jan-2016 02:55:00", "dd-MMM-yyyy hh:mm:ss", "IT")` returns **2:55:00 AM on December 21, 2016**, based on the specified custom format and culture.

However, `DATETIMEVALUE ("21-Jan-2016 02:55:00", "dd-MMM-yyyy hh:mm:ss", "EN-US")` throws an exception to inform the user that the specified string isn't recognized as a valid date/time value for the specified culture.

Additional resources

[Date and time functions](#)

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

DATE TODATETIME ER function

2/18/2021 • 2 minutes to read • [Edit Online](#)

The `DATE TODATETIME` function returns a *DateTime* value that is converted from a given date value to a date/time value in Coordinated Universal Time (Greenwich Mean Time [GMT]).

Syntax

```
DATE TODATETIME (date)
```

Arguments

`date` : *Date*

A date value that represents the date to convert.

Return values

DateTime

The resulting date/time value.

Example 1

`DATE TODATETIME (CompInfo. 'getCurrentDate()')` returns the date of the current Microsoft Dynamics 365 Finance session, December 24, 2015, as **12/24/2015 12:00:00 AM**. In this example, **CompInfo** is an Electronic reporting (ER) data source of the **Finance and Operations/Table** type, and it refers to the CompanyInfo table.

Example 2

`DATE TODATETIME (DATEVALUE ("2019-11-12T16:00:00.0000000-07:00", "O"))` returns the date/time value **11/12/2019 12:00:00 AM**.

Additional resources

[Date and time functions](#)

NOTE

Can you tell us about your documentation language preferences? [Take a short survey](#).

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

DATEVALUE ER function

2/18/2021 • 2 minutes to read • [Edit Online](#)

The `DATEVALUE` function returns a *Date* value that is converted from a given text value in the specified format and in an optionally specified *culture* to a date value. For information about the supported formats, see [standard](#) and [custom](#).

Syntax 1

```
DATEVALUE (text, format)
```

Syntax 2

```
DATEVALUE (text, format, culture)
```

Arguments

`text` : *String*

Text that represents the value to format.

`format` : *String*

The format of the given text.

`culture` : *String*

The culture that is used for formatting of the given text.

Return values

Date

The resulting date value.

Usage notes

When the culture isn't defined as an argument of the called function, the value of `culture` is defined by the calling context. For example, if the `DATEVALUE` function is called by using syntax 1 in an Electronic reporting (ER) format for a FILE element that is configured to use the German culture, the conversion will be done by using the German culture. The default `culture` value is EN-US.

Example 1

`DATEVALUE ("21-Dec-2016", "dd-MMM-yyyy")` returns the date value **December 21, 2016**, based on the specified custom format and the default application's EN-US culture.

Example 2

`DATEVALUE ("21-Jan-2016", "dd-MMM-yyyy", "IT")` returns the date value **January 21, 2016**, based on the specified custom format and culture.

However, `DATEVALUE ("21-Jan-2016", "dd-MMM-yyyy", "EN-US")` throws an exception to inform the user that the specified string isn't recognized as a valid date for the specified culture.

Additional resources

[Date and time functions](#)

NOTE

Can you tell us about your documentation language preferences? [Take a short survey](#).

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

LIST ER function

2/18/2021 • 2 minutes to read • [Edit Online](#)

The `LIST` function returns a *Record list* value that consists of a new list of records that is created from the specified arguments.

Syntax

```
LIST (record 1 [, record 2, ..., record N])
```

Arguments

`record 1` : *Container (record)*

A reference to a data source of the *Record* data type. This argument is required.

`record N` : *Container (record)*

A reference to a data source of the *Record* data type. These additional arguments are optional.

Return values

Record list

The resulting list of records.

Usage notes

The structure of the list that is created contains only the fields that are presented in the structure of every record that is mentioned in the arguments.

Example

You enter data source **Record 1** of the *Container* type. This data source contains the following nested fields of the *Calculated field* type:

- **Code**: This field contains an expression that returns a value of the *String* type.
- **Amount**: This field contains an expression that returns a value of the *Real* type.

You then enter data source **Record 2** of the *Container* type. This data source contains the following nested fields of the *Calculated field* type:

- **Amount**: This field contains an expression that returns a value of the *Real* type.
- **IsValid**: This field contains an expression that returns a value of the *Boolean* type.

In this case, the expression `LIST('Record 1', 'Record 2')` returns a new list that contains two records. The structure of this list consists of a single **Amount** field of the *Real* type, because this field is the only field that is presented in every argument of the called function.

Additional resources

List functions

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

LISTOFFIELDS ER function

2/18/2021 • 3 minutes to read • [Edit Online](#)

The `LISTOFFIELDS` function returns a *Record list* value that is created based on the structure of the specified argument of the *Enumeration* or *Container (record)* type.

Syntax 1

```
LISTOFFIELDS (path)
```

Syntax 2

```
LISTOFFIELDS (path, language)
```

Arguments

`path`: Data source reference

The valid reference path of a data source of one of the following data types:

- Model enumeration
- Format enumeration
- Application enumeration
- Container (record)

`language`: *String*

Text that represents a language code.

Return values

Record list

The resulting list of records.

Usage notes

The list that is created consists of records that have the following fields:

- **Name** (*String* data type)
- **Label** (*String* data type)
- **Description** (*String* data type)
- **IsTranslated** (*Boolean* data type)

If the `path` argument refers to a data source of the *Container (Record)* type, for every field of the referenced container record, a new record is added to the list that is created. For every record that is created, the **Name** field returns the name of the field of the referenced container record that the current record was created for.

If the `path` argument refers to a data source of one of the *Enumeration* types, for every enumeration value of

the referenced enumeration, a new record is added to the list that is created. For every record that is created, the **Name** field returns the value of the referenced enumeration that the current record was created for, the **Description** field returns the description of that enumeration, and the **Label** field returns the label of that enumeration.

At runtime, when syntax 1 is used, the **Label** and **Description** fields must return values that are based on the language settings of the Electronic reporting (ER) format that is running:

- If the labels and descriptions for the requested language are available, the **Label** and **Description** fields return values that are based on that language, and the **IsTranslated** field returns **True**.
- If the labels and descriptions for the requested language aren't available, the **Label** and **Description** fields return values that are based on the default **EN-US** language, and the **IsTranslated** field returns **False**.

At runtime, when syntax 2 is used, the **Label** and **Description** fields must return values that are based on the language that is defined as the second argument of the called function:

- If the labels and descriptions for the requested language are available, the **Label** and **Description** fields return values that are based on that language, and the **IsTranslated** field returns **True**.
- If the labels and descriptions for the requested language aren't available, the **Label** and **Description** fields return values that are based on the **EN-US** language, and the **IsTranslated** field returns **False**.

Example 1

In the following illustration, an enumeration is introduced in an ER data model.

ReportDirection		
Enumeration values		
+ New Delete		
Name	Label (*Recommended to use labels)	Description
Both	Both	
Export	Dispatches	
Import	Arrivals	

The following illustration shows these details:

- The model enumeration is inserted into a report as a data source.
- An ER expression uses the model enumeration as a parameter of the `LISTOFFIELDS` function.
- A data source of the *Record list* type is inserted into a report by using the ER expression that is created.

FORMAT **MAPPING** TRANSFORMATIONS VALIDATIONS

Bind + Add root + Add Edit Delete Show name first Group view

- enumDirectionInReport: Data model enumeration ReportDirection
 - Arrivals(Import): Enumeration value
 - Both: Enumeration value
 - Dispatches(Export): Enumeration value
 - listDirectionInReport: Calculated field = LISTOFFIELDS(enumDirectionInReport): Record list**
 - Description: String
 - Label: String
 - Name: String
- model: Data model Intrastat

The following example shows the ER format elements that are bound to the data source of the *Record list* type that was created by using the `LISTOFFIELDS` function.


```

Root: XML Element
├── Directions: XML Element = listDirectionInReport
    ├── name: XML Attribute = listDirectionInReport.Name
    ├── label: XML Attribute = listDirectionInReport.Label
    └── desc: XML Attribute = listDirectionInReport.Description
  
```

The following illustration shows the result when the designed format is run.

```

<?xml version="1.0" encoding="UTF-8"?>
- <Root>
  <Directions desc="" label="Both" name="Both"/>
  <Directions desc="" label="Dispatches" name="Export"/>
  <Directions desc="" label="Arrivals" name="Import"/>
</Root>
  
```

NOTE

Based on the language settings of the parent FILE and FOLDER format elements, translated text for labels and descriptions is entered in the output of the ER format.

Example 2

You use the *Calculated field* data source type to configure `enumType_de` and `enumType_deCH` data sources for the `enumType` data model enumeration:

- `enumType_de` = `LISTOFFIELDS (enumType, "de")`
- `enumType_deCH` = `LISTOFFIELDS (enumType, "de-CH")`

In this case, you can use the following expression to get the label of the enumeration value in Swiss German, if that translation is available. If the Swiss German translation isn't available, the label is in German.

```
IF (NOT (enumType_deCH.IsTranslated), enumType_de.Label, enumType_deCH.Label)
```

Additional resources

[List functions](#)

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

SPLIT ER function

2/18/2021 • 2 minutes to read • [Edit Online](#)

The `SPLIT` function splits the specified input string into substrings and returns the result as a new *Record list* value.

Syntax 1

```
SPLIT (input, length)
```

This syntax is used to split the specified input string into substrings, each of which has the specified length.

Syntax 2

```
SPLIT (input, delimiter)
```

This syntax is used to split the specified input string into substrings, based on the specified delimiter.

Arguments

`input` : *String*

The text to split.

`length` : *Integer*

The maximum length of a single substring.

`delimiter` : *String*

A delimiter that is used to separate substrings.

Return values

Record list

The resulting list of records.

Usage notes

The record structure of the list that is returned consists of the **Value** field of the *String* type. Every record of the list that is returned contains generated substrings in this field.

If the `delimiter` argument is empty, the new list that is returned consists of one record that has the **Value** field of the *String* type. This field contains the input text.

If the `input` argument is empty, a new empty list is returned. If either the `input` or `delimiter` argument is unspecified (null), an application exception is thrown.

Example 1

`SPLIT ("abcd", 3)` returns a new list that consists of two records that have the **Value** field of the *String* type. The **Value** field in the first record contains the text "abc", and the **Value** field in the second record contains the text "d".

Example 2

`SPLIT ("XAb aBy", "aB")` returns a new list that consists of three records that have the **Value** field of the *String* type. The **Value** field in the first record contains the text "X", the **Value** field in the second record contains the text " ", and the **Value** field in the third record contains the text "y".

Additional resources

[List functions](#)

NOTE

Can you tell us about your documentation language preferences? [Take a short survey](#).

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

STRINGJOIN ER function

2/18/2021 • 2 minutes to read • [Edit Online](#)

The `STRINGJOIN` function returns a *String* value that consists of concatenated values of the specified field from the specified list. The values can be separated by the specified delimiter.

Syntax

```
STRINGJOIN (list, field, delimiter)
```

Arguments

`list` : *Record list*

The valid path of a data source of the *Record list* data type.

`field` : *Field*

The valid path of a field of the *String* data type in the specified list.

`delimiter` : *String*

A delimiter that is used to separate substrings.

Return values

String

The resulting text value.

Example

If you enter `SPLIT("abc" , 1)` as data source `DS`, the expression `STRINGJOIN (DS, DS.Value, "-")` returns "a-b-c".

Additional resources

[List functions](#)

NOTE

Can you tell us about your documentation language preferences? [Take a short survey](#).

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

CHAR ER function

2/18/2021 • 2 minutes to read • [Edit Online](#)

The `CHAR` function returns a *String* value that presents a single character that is referenced by the specified Unicode number.

Syntax

```
CHAR (number)
```

Arguments

`number` : *Integer*

A number that corresponds to an expected single character.

Return values

String

The resulting text value.

Usage notes

The string that this function returns depends on the encoding that is selected in the parent **FILE** format element. For a list of the supported encodings, see [Encoding class](#).

Example

`CHAR (255)` returns "ÿ".

Additional resources

[Text functions](#)

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

GUIDVALUE ER function

2/18/2021 • 2 minutes to read • [Edit Online](#)

The `GUIDVALUE` function converts the specified input of the *String* type to a data item of the *GUID* type.

Syntax

```
GUIDVALUE (input)
```

Arguments

`input` : *String*

The valid path of a data source of the *String* type.

Return values

GUID

The resulting globally unique identifier (GUID) value.

Usage notes

To do a conversion in the opposite direction (that is, to convert specified input of the *GUID* data type to a data item of the *String* data type), you can use the [TEXT](#) function.

Example

You define the following data sources in your model mapping:

- A `myID` data source of the *Calculated field* type that contains the expression `GUIDVALUE ("AF5CCDAC-F728-4609-8C8B- A4B30B0C0AA0")`
- A `Users` data source of the *Table records* type that refers to the `UserInfo` table

You can then use an expression such as `FILTER (Users, Users.objectId = myID)` to filter the `UserInfo` table by the `objectId` field of the *GUID* data type.

Additional resources

[Text functions](#)

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

NUMBERFORMAT ER function

2/18/2021 • 2 minutes to read • [Edit Online](#)

The `NUMBERFORMAT` function returns a *String* value that presents the specified number in the specified format and in an optionally specified *culture*. For information about the supported formats, see [standard](#) and [custom](#).

Syntax 1

```
NUMBERFORMAT (number, format)
```

Syntax 2

```
NUMBERFORMAT (number, format, culture)
```

Arguments

`number` : *Integer or Real*

A numeric value that specifies the number that must be formatted.

`format` : *String*

A *String* value that represents the format.

`culture` : *String*

A *String* value that represents the culture to use for formatting.

Return values

String

The resulting text value.

Usage notes

If the culture isn't defined as an argument of the called function, the context that this function is run in determines the culture that is used to format numbers.

Example 1

For the EN-US culture, `NUMBERFORMAT (0.45, "p")` returns "45.00 %", and `NUMBERFORMAT (10.45, "#")` returns "10".

Example 2

`NUMBERFORMAT (10/3, "F2", "de")` returns 3,33, whereas `NUMBERFORMAT (10/3, "F2", "en-us")` returns 3.33.

Additional resources

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

QRCODE ER function

2/18/2021 • 2 minutes to read • [Edit Online](#)

The `QRCODE` function returns a *Container* value that presents the Quick Response code (QR code) image for the specified string in binary format.

Syntax

```
QRCODE (text)
```

Arguments

`text` : *String*

A *String* value that represents the original text.

Return values

Container

The resulting binary stream.

Example

You can configure an Electronic reporting (ER) format to generate an outbound document in Microsoft Office format (Excel workbooks or Word documents) by using a predefined template. This template may contain a **Picture** object (Excel workbook) or a **Picture Content Control** (Word document) as a placeholder for a QR code image. You need to add to the configured ER format a **Cell** element that will be used to fill this placeholder in. To specify what information will be stored in a QR code, you need to define a binding for this **Cell** element. For example, you can configure such binding as containing the following expression:

```
QRCODE (model.ListOfShelfLabels.LabelText)`
```

When you run the configured ER format, the text value of the **LabelText** field of the **model.ListOfShelfLabels** data source will be used to generate a QR code image. This image will replace a QR code image placeholder in the document template using to generate an outbound document. When this image of the generated document is scanned, it returns the text that was taken from the **LabelText** field of the **model.ListOfShelfLabels** data source. For more information, see [Embed images and shapes in documents that you generate by using ER](#).

Additional resources

[Text functions](#)

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

TEXT ER function

2/18/2021 • 2 minutes to read • [Edit Online](#)

The `TEXT` function returns the specified number as a *String* value after it has been converted to a text string that is formatted according to the server locale settings of the current application instance.

Syntax

```
TEXT (number)
```

Arguments

`number` : *Integer* or *Real*

A number that must be converted to a text string.

Return values

String

The resulting text value.

Usage notes

For values of the *Real* type, the string conversion is limited to two decimal places.

Example

If the server locale of the Microsoft Dynamics 365 Finance instance is defined as **EN-US**, `TEXT (NOW ())` returns the current Finance session date, December 17, 2015, as the text string "12/17/2015 07:59:23 AM".

`TEXT (1/3)` returns "0.33".

Additional resources

[Text functions](#)

NOTE

Can you tell us about your documentation language preferences? [Take a short survey](#).

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Manage ER model mapping in separate ER configurations

2/18/2021 • 5 minutes to read • [Edit Online](#)

The following steps explain how a user assigned to the System administrator or Electronic reporting developer role can manage Electronic reporting (ER) model mappings in separate ER configurations. In this task guide, you will create required ER configurations for the sample company, Litware, Inc. To complete this task guide, you must first complete the steps in the task guide, "ER Create a configuration provider" and mark it as active.

Because ER configurations are shared among companies, you can complete this task guide using the company data set of your choice. The functionality for this task guide is available if you have installed one of the following hotfixes: <https://fix.lcs.dynamics.com/Issue/Resolved?kb=4012872> for the Dynamics AX 7.0 version or <https://fix.lcs.dynamics.com/Issue/Resolved?kb=4012871> for the Dynamics 365 for Operations version.

1. Go to Organization administration > Workspaces > Electronic reporting.
 - Verify that the configuration provider for the sample company Litware, Inc. is available and marked as active. If you don't see this configuration provider, you must first complete the steps in the task guide, Create a configuration provider, and mark it as active.

Add a new ER model configuration

1. Click Reporting configurations.
 - Add a new model configuration. The name must be unique in the configurations tree.
2. Click Create configuration to open the drop dialog.
3. In the Name field, type 'Sample data model'.
 - Sample data model
4. Click Create configuration.
5. Click Designer.
6. Click New to open the drop dialog.
7. In the Name field, type 'Root'.
 - Root
8. Click Add.
9. Click New to open the drop dialog.
10. In the Name field, type 'Company'.
 - Company
11. Click Add.
12. In the Description field, enter the text, Description of the legal entity or company in which a user logged at run-time.
 - Description of the legal entity or company in which a user logged at run-time.
13. Click Root reference.
14. Click OK.
15. Click Save.
16. Close the page.
17. Click Change status.
18. Click Complete.
19. Click OK.

Add a new ER model-mapping configuration

1. Click Create configuration to open the drop dialog.
2. In the New field, enter 'Model Mapping based on data model Sample data model'.
3. In the Name field, type 'Sample mapping'.
 - Sample mapping
4. Click Create configuration.
5. Expand the Prerequisites section.
 - The Implementations prerequisites group has been added automatically. The group contains the prerequisite component that refers to the parent data model configuration and is marked as Implementation. This means that this Sample-mapping model-mapping configuration is considered the implementation of the data model, Sample data model. Therefore, this component will force ER to download the model-mapping configuration, Sample mapping from an ER repository when the model configuration, Sample data model, is downloaded.
6. Click Designer.
 - The created model-mapping configuration contains a new blank mapping with the same name as the created configuration. When a selected parent model configuration contains model mappings, they will be copied to a new model-mapping configuration.
7. Click Designer.
8. In the tree, select 'Dynamics 365 for Operations\Table'.
9. Click Add root.
10. In the Name field, type 'Company'.
 - Company
11. In the Table field, type 'CompanyInfo'.
 - CompanyInfo
12. Click OK.
13. In the tree, expand 'Company'.
14. In the tree, expand 'Company\find()'.
15. In the tree, select 'Company\find()\Name'.
16. Click Bind.
17. Click Save.
18. Close the page.
19. Close the page.
20. On the Action Pane, click Configurations.
21. Click User parameters.
22. Select Yes in the Run settings field.
23. Click OK.
24. Click Edit.
25. Select Yes in the Run Draft field.

Add a new ER format configuration

1. In the tree, select 'Sample data model'.
2. Click Create configuration to open the drop dialog.
3. In the New field, enter 'Format based on data model Sample data model'.
4. In the Name field, type 'Sample format'.
 - Sample format
5. Click Create configuration.

6. Click Designer.
7. Click Add root to open the drop dialog.
8. In the tree, select 'Text\String'.
9. Click OK.
10. Click the Mapping tab.
11. In the tree, expand 'model'.
12. In the tree, select 'model\Company'.
13. Click Bind.
14. Click Save.
15. Close the page.
 - Run the draft version of the created format for testing purposes.
16. Click Run.
 - On the Versions FastTab, click Run.
17. Click OK.
 - Review the output that contains the name of the company in which the user who is running this format configuration is logged into. The created model-mapping configuration is used by this format configuration because there is only one configuration available that contains required model mappings.

Add alternative ER model-mapping configuration

1. In the tree, select 'Sample data model'.
2. Click Create configuration to open the drop dialog.
3. In the New field, enter 'Model Mapping based on data model Sample data model'.
4. In the Name field, type 'Sample mapping (alternative)'.
 - Sample mapping (alternative)
5. Click Create configuration.
6. Click Designer.
7. Click Designer.
8. In the tree, select 'Dynamics 365 for Operations\Table'.
9. Click Add root.
10. In the Name field, type 'Company'.
 - Company
11. In the Table field, type 'CompanyInfo'.
 - CompanyInfo
12. Click OK.
13. Click Edit.
14. In the tree, select 'String\CONCATENATE'.
15. Click Add function.
16. In the tree, expand 'Company'.
17. In the tree, expand 'Company\find()'.
18. In the tree, select 'Company\find()\Name'.
19. Click Add data source.
20. In the Formula field, type a value.
 - CONCATENATE(Company.'find()'.Name, ";",
21. In the tree, select 'Company\find()\Company(DataArea)'.
22. Click Add data source.

23. In the Formula field, type a value.
 - `CONCATENATE(Company.find().Name, ";", Company.find().DataArea)`
24. Click Save.
25. Close the page.
26. Click Save.
27. Close the page.
28. Close the page.
29. Select Yes in the Run Draft field.

Use an existing ER model-mapping configuration

1. In the tree, select 'Sample data model\Sample format'.
2. Click Run.
 - The selected draft version of the ER format configuration can't be executed because there is more than one model-mapping configuration available for the undefined data model that has been selected as the data source of the running ER format.
 - Next, you will define the alternative model-mapping configuration as the one from which model mappings will be used as data sources for running ER format.
3. In the tree, select 'Sample data model\Sample mapping (alternative)'.
4. Select Yes in the Default for model-mapping field.
5. In the tree, select 'Sample data model\Sample format'.
6. Click Run.
7. Click OK.
 - The default model-mapping configuration is used by this format configuration for generating the electronic document (the created output contains the company code).

NOTE

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Select data model definitions when you create formats

2/18/2021 • 3 minutes to read • [Edit Online](#)

To complete the steps in this procedure, you must first complete the procedure, ER Create a configuration provider and mark it as active.

This procedure shows how a model's root item can be selected as a data model definition for inserting an Electronic reporting (ER) format configuration that is designed to generate electronic documents. In this procedure, you will add a new ER format configuration for the sample company Litware, Inc.

This procedure is intended for users who have the System administrator or Electronic reporting developer role assigned to them. The steps can be completed by using any dataset.

1. Go to Organization administration > Workspaces > Electronic reporting.
 - Make sure that the configuration provider for the sample company, Litware, Inc., is available and marked as Active. If you don't see this configuration provider, complete the steps in the procedure, Create a configuration provider and mark it as active.
2. Click Reporting configurations.

Add a new ER data model configuration

1. Click Create configuration to open the drop dialog.
 - We add a new ER model configuration containing a data model that is designed to be used as data source for generation ER reports.
2. In the Name field, type 'Payment model (fictitious)'.
 - Payment model (fictitious)
3. Click Create configuration.
4. Click Designer.
 - Open the ER designer to specify the structure of data model of this configuration.
 - Assume that we design the data model for payments business domain to support 2 payment methods – credit transfer and direct debit ones.
5. Click New to open the drop dialog.
6. In the Name field, type 'Payments – credit transfer'.
 - Payments – credit transfer
7. Click Add.
8. Click New to open the drop dialog.
9. In the New node as a field, enter 'Model root'.
10. In the Name field, type 'Payments – direct debit'.
 - Payments – direct debit
11. Click Add.
12. Click Save.
13. Close the page.
14. Click Change status.
 - Complete the draft version of the model to make it available in new model mappings and formats.
15. Click Complete.

16. Click OK.

Start to enter a new ER format configuration

1. Click Create configuration to open the drop dialog.
2. In the New field, enter 'Format based on data model Payment model (fictitious)'.
3. In the Data model definition field, enter or select a value.
 - Note that all root items of the selected data model are currently available for selection as a data model definition. You can continue to design your format by using any of the required root items of the data model. A missing model mapping for the selected root item doesn't prevent you from continuing.
4. Close the page.

Add a new ER model mapping configuration

1. Click Create configuration to open the drop dialog.
2. In the New field, enter 'Model Mapping based on data model Payment model (fictitious)'.
3. In the Name field, type 'Payment model mappings (fictitious)'.
 - Payment model mappings (fictitious)
4. In the Data model definition field, enter or select a value.
5. Click Create configuration.

Design ER model mappings

1. Click Designer.
 - Use the ER designer to specify the model mappings for the required root items.
2. Click Designer.
 - Simulate setting of selected model mapping for the selected model's root item.
3. In the tree, select 'Dynamics 365 for Operations\Table records'.
4. Click Add root.
5. In the Name field, type 'Ledger'.
6. In the Table field, type 'LedgerJournalTrans'.
 - LedgerJournalTrans
7. Click OK.
8. Click Save.
9. Close the page.
10. Close the page.

Start to enter another new ER format configuration

1. In the tree, select 'Payment model (fictitious)'.
2. Click Create configuration to open the drop dialog.
3. In the New field, enter 'Format based on data model Payment model (fictitious)'.
4. In the Data model definition field, enter or select a value.
 - Note that now only one root item is available to map to the application data sources. When at least one model mapping is introduced, only the model's root items that are mapped to application data sources can be selected as a model definition while the ER format is added.
5. Close the page.

NOTE

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RCS enhanced filtering options for finding configurations in the RCS/Global repository

2/18/2021 • 2 minutes to read • [Edit Online](#)

This topic describes enhanced filtering capabilities for Regulatory Configuration Services (RCS) Global repository, which have been improved to include the ability to filter with the following criteria:

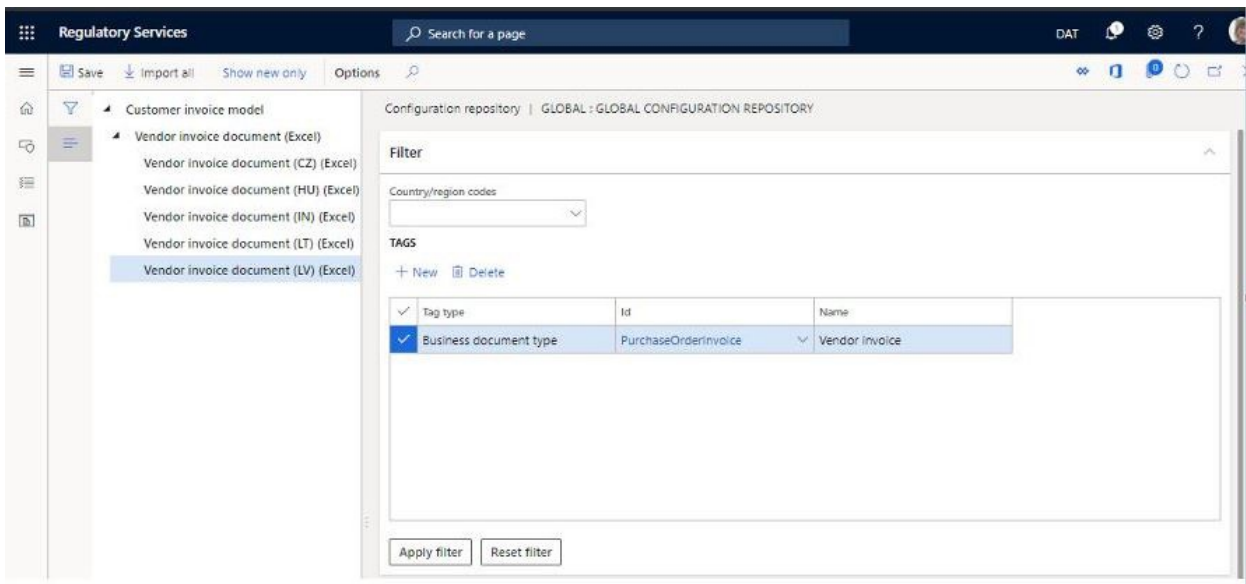
- **Country/region** - Based on ISO country codes
- **Tags** types for:
 - Functional area
 - Feature area
 - Industry
 - Business document

To make it easier to discover specific or related configurations you can apply filters, either individually or as a group. For example, to find a single type of 'configurable business documents that are related to vendor invoices, you could apply a **Business document type** filter to search for that type of document.

The screenshot shows the 'Filter' section of the 'GLOBAL : GLOBAL CONFIGURATION REPOSITORY'. It includes a 'Country/region codes' dropdown, a 'TAGS' section with '+ New' and 'Delete' buttons, and a table with columns 'Tag type', 'Id', and 'Name'. The 'Tag type' column has a dropdown menu open showing options: 'Functional area', 'Feature area', 'Industry', and 'Business document type'. The 'Functional area' option is selected. Below the table are 'Apply filter' and 'Reset filter' buttons.

Tag type	Id	Name
Functional area		

You can further refine the search by selecting document type, for example 'vendor invoice' and clicking **Apply filter**. The following example shows the results when filtering on **Business document type** with the document type added.



Filtered results can be imported into a users RCS repository or a Dynamics 365 Finance environment, either individually or as a set. To do this, select the group of configurations, and click **Import**.

NOTE

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Generate reports by adding content as raw XML

2/18/2021 • 2 minutes to read • [Edit Online](#)

You can use the new **RAW XML** format element to design Electronic reporting (ER) formats that generate outgoing documents in XML format. In some cases, you might prefer to add raw XML data to these reports for one or more of the following reasons:

- It's more convenient to use raw XML for the original design and ongoing maintenance of a report, because the XML structure can be automatically generated by executing a runtime expression. Therefore, multiple bindings don't have to be determined for multiple format elements at design time. It is possible when the data sources that you're using contain information that can be used to make XML elements while the report is generated.
- No other method can be used to fill the report with XML content that was previously received and stored in the system. For example, the XML response that is generated might have to contain the content of an XML request that was sent earlier.
- No other method can be used to insert characters into the generated document based on their numeric codes. For some languages and characters, codes of this type don't exist. Examples include the Greek letter rho (ρ) and HTML entity codes such as é for an *e* that has an acute accent (é).

NOTE

Be aware that the framework doesn't control whether the XML content that is placed to the generated document by using the **RAW XML** format element is correct.

To learn more about this feature, play the **ER Use raw XML data to generate XML reports (Part 1: Design data model)** and **ER Use raw XML data to generate XML reports (Part 2: Design and run report)** task guides, which are part of the **7.5.4.3 Acquire/Develop IT service/solution components (10677)** business process, and can be downloaded from the [Microsoft Download Center](#). These task guides walk you through the process of configuring an ER format to insert raw XML data into generated files.

NOTE

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Cross-company data sources in Electronic reporting (ER)

2/18/2021 • 4 minutes to read • [Edit Online](#)

You can design Electronic reporting (ER) formats to generate outgoing documents in various formats. When a document is generated, an ER format calls data sources that were configured in a corresponding ER model mapping. To configure access to application tables for record retrieval, you can use ER data sources of the **Table records** type. When the accessing table is a shared table (that is, a table where data is saved without a company identifier), this data source returns all records. When the accessing table is a company-dependent table (that is, a table where data is saved per company), this data source returns only the records that have been saved for the current company (that is, the company context that the ER format is running under).

Every data source of the **Table records** type in a model mapping can be now marked as a cross-company data source. Therefore, you can use data sources of the **Table records** type to access cross-company data in application tables.

If you mark a data source as cross-company, the following behavior occurs:

- For a data source that refers to any shared table except CompanyInfo, the data source returns all records that exist in the referenced table.
- For a data source that refers to the CompanyInfo table, even though CompanyInfo is a shared table, the data source returns the records that contain the identifier of a company from the defined scope.
- For any company-dependent table, the data source returns the records of the referenced table that contain the identifier of a company from the defined scope.

In the system query dialog box, when the **Ask for query** option is turned on for any data source that is marked as cross-company, you can manually select one or more companies to include on the **Company range** tab.

IMPORTANT

Like other filters, the company filter is persisted as a last-used value for queries when you run an ER format. The filter isn't automatically changed if you change the cross-company value for a data source. To use a different cross-company value for another data source, delete the corresponding user-specific selection.

For every data source that is marked as cross-company, you can select the records that you want by using the **FILTER** and **WHERE** functions in ER expressions. The **dataAreaID** field can also be used as a company identifier. Currently, the **dataAreaID** field is limited to the following types of conditions when the **FILTER** function is used:

- Only conditions that have a single **dataAreaID** field comparison are supported.
- Only comparisons that have expressions that don't depend on records list items are allowed.

Therefore, the following expression is valid.

```
FILTER (MyTable, MyTable.dataAreaID = $StringUserInputParameter)
While shown below expressions will not pass the validation:
FILTER (MyTable, MyTable.dataAreaID = MyTable2RecordsList.MyField)
FILTER (MyTable,
    OR(
        MyTable.dataAreaID = $StringUserInputParameter1,
        MyTable.dataAreaID = $StringUserInputParameter2
    )
)
```

By default, the scope includes all companies of the current application. However, it can be restricted. To restrict the scope of cross-company data access for a single ER format, assign a specific organization hierarchy to the format. When a hierarchy is defined for an ER format, only records for legal entities that are presented in the assigned hierarchy are returned, even though the format calls cross-company data sources. When a reference to a hierarchy that no longer exists is defined for an ER format, the default scope is applied, and the format calls cross-company data sources. In this situation, records for all application companies are returned.

Note that when the **Use draft** option is turned on for the assigned to a single ER format organization hierarchy, the legal entities from the draft version of this hierarchy will be used to identify the scope for cross-company data sources. If the draft version does not exist, the legal entities from the last published version of this organization hierarchy will be used for this.

Note that when the **Use draft** option is turned off for the assigned to a single ER format organization hierarchy, the legal entities from the last published version of this organization hierarchy will be used to identify the scope for cross-company data sources. Date effectiveness of organization hierarchies is not supported yet in the ER framework.

The hierarchy can be assigned to a format in a specific page that can be accessed from the ER workspace or by using the **Organization administration > Electronic reporting > Legal entity filter for formats** menu item. To access the page, the **Maintain legal entity filters for format** privilege (ERMaintainFormatMappingLegalEntityFilters) must be granted to a user. The scope restriction of hierarchy-based legal entities for the format is applied in addition to the restriction that the user can manually specify in the system query dialog box. The intersection of these restrictions is used when the format is run.

To learn more about this feature, play the task guide, **ER Access records of company dependent tables in cross-company mode**, which is part of the 7.5.4.3 Acquire/Develop IT service/solution components (10677) business process, and can be downloaded from the [Microsoft Download Center](#). This task guide walks you through the process of configuring an ER model mapping and ER format to access application tables in cross-company mode.

Download the following files to complete the task guide:

- [ER model configuration - CrossCompanyDataAccessModel.xml](#)
- [ER format configuration - CrossCompanyDataAccessFormat.xml](#)

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

ER Design a configuration for generating reports in OPENXML format (November 2016)

2/18/2021 • 4 minutes to read • [Edit Online](#)

This topic explains how a user in the System Administrator or Electronic Reporting Developer role can create a new Electronic reporting (ER) configuration that contains a template for generating electronic documents in OPENXML format. This configuration will be used for processing vendor payments.

In this example, you will create a configuration for sample company, Litware, Inc. These steps can be performed in GBSI company.

To complete these steps, you must first complete the steps in the "Create a configuration provider and mark it as active" procedure. You must also have an Excel file which will be imported when creating the template. This file can be accessed from the [Template of Payment Report](#).

Upload the Payments data model configuration

1. In the navigation pane, go to **Modules > Organization administration > Workspaces > Electronic reporting**.
2. In the list, mark the configuration provider for sample company, Litware, Inc. If you don't see this configuration provider, you must first complete the steps in [Create configuration providers and mark them as active](#).
3. Select **Set active**.
4. Select **Repositories**. Select a repository for the Operations Resources type, if available. If its available, skip the following steps about creating a new repository.
5. Select **Add** to open the drop dialog.
6. In the **Configuration repository type** field, enter `Operations resourcesdd`.
7. Select **Create repository**.
8. Select **OK**.
9. Select **Open**.
10. In the tree, select **Payment model**.
11. Select **Import**. Import this data model. It will be used as a data source in a new format configuration. Skip this step if this configuration has been already imported.
12. Select **Yes**.
13. Close the pages until you return to the Electronic reporting page.

Create a new format configuration

1. Select **Reporting configurations**.
2. In the tree, select **Payment model**.
3. Select **Create configuration** to open the drop dialog.
4. In the **New** field, enter `Format based on data model PaymentModel`. Create a format that is based on the PaymentModel data model.
5. In the **Name** field, type `Sample worksheet report`. Sample worksheet report
6. In the **Description** field, type `Sample worksheet report for vendors' payments`. Sample worksheet report for vendors' payments.
7. In the **Data model definition** field, enter or select a value. Select the **CustomerCreditTransferInitiation**

definition.

8. Select **Create configuration**.

Design a new document in OPENXML worksheet format

1. In the tree, select **Payment model\Sample worksheet report**.
2. Select **Designer**.
3. On the Action Pane, select **Import**.
4. Select **Import from Excel**.
5. Select **Attachments**. Attach the existing Excel document as a template.
6. Select **New**.
7. Select **File**. Point to the existing Excel file.
8. Close the page.
9. In the **Template** field, enter or select a value. Select the attached Excel file to be used as a template.
10. Select **OK**. Note that ER format components have been created in the designing format based on the structure of the referring MS Excel document (named ranges).

Create a new data source to calculate totals by currency codes

1. Select the **Mapping** tab.
2. Select **Add root** to open the drop dialog.
3. In the tree, select **Functions\Group by**.
4. In the **Name** field, type `PaymentByCurrency`.
5. Select **Edit group by**.
6. In the tree, expand **model**, then select **model\Payments**.
7. Select **Add field to**.
8. Select **What to group**.
9. In the tree, expand **model\Payments**, then select **model\Payments\Currency**.
10. Select **Add field to**.
11. Select **Grouped fields**.
12. In the tree, select **model\Payments\Instructed Amount(InstructedAmount)**.
13. Select **Add field to**, then select **Aggregation fields**.
14. In the **Method** field, select an option. Select the **SUM aggregation** function.
15. In the **Name** field, type `TotalInstructedAmount`.
16. Select **Save**.
17. Close the page.
18. Select **OK**.

Map format components to data sources

1. In the tree, select **model\Payments\Initiating Party(InitiatingParty)\Name** and **Excel\ReportHeader\CompanyName**.
2. Select **Bind**.
3. In the tree, select **model\Payments\Creditor\Identification\Source ID(SourceID)** and **Excel\PaymLines\VendAccountName**.
4. Select **Bind**.
5. In the tree, select **model\Payments\Creditor\Name** and **Excel\PaymLines\VendName**.
6. Select **Bind**.

7. In the tree, select `model\Payments\Creditor Agent(CreditorAgent)\Name` and `Excel\PaymLines\Bank`.
8. Select **Bind**.
9. In the tree, select `model\Payments\Creditor Agent(CreditorAgent)\Routing Number(RoutingNumber)` and `Excel\PaymLines\RoutingNumber`.
10. Select **Bind**.
11. In the tree, select `model\Payments\Creditor Account(CreditorAccount)\Identification\Number` and `Excel\PaymLines\AccountNumber`.
12. Select **Bind**.
13. In the tree, select `model\Payments\Instructed Amount(InstructedAmount)` and `Excel\PaymLines\Debit`.
14. Select **Bind**.
15. In the tree, select `model\Payments\Currency` and `Excel\PaymLines\Currency`.
16. Select **Bind**.
17. In the tree, select `PaymentByCurrency\grouped\Currency` and `Excel\SummaryLines\SummaryCurrency`.
18. Select **Bind**.
19. In the tree, select `PaymentByCurrency\aggregated\TotalInstructedAmount` and `Excel\SummaryLines\SummaryAmount`.
20. Select **Bind**.
21. In the tree, select `PaymentByCurrency` and `Excel\SummaryLines`.
22. Select **Bind**.
23. In the tree, select `model\Payments` and `Excel\PaymLines`.
24. Select **Bind**.
25. Select **Save**, then close the page.

Use the created configuration for payments processing

1. Select **Change status**.
2. Select **Complete**.
3. Select **OK**.
4. In the navigation pane, go to **Modules > Accounts payable > Payment setup > Methods of payment**.
5. Use the Quick Filter to filter on the **Method of payment** field with a value of **Electronic**.
6. Select **Edit**.
7. Expand the **File formats** section.
8. Select **Yes** in the **Generic electronic reporting** field.
9. In the **Export format configuration** field, enter or select a value. Select the **Sample worksheet report** configuration.
10. Select **Save**.
11. Close the page.

Use the created configuration for testing of payment journals processing

1. In the navigation pane, go to **Modules > Accounts payable > Payments > Payment journal**.
2. Select **New** to create a new payment journal.
3. In the **Name** field, type **VendPay**.
4. Select **Lines**.

5. In the **Account** field, specify the values `GB_SI_000001`.
6. Set **Debit** to `1000`.
7. Select **New**.
8. In the **Account** field, specify the values `GB_SI_000005`.
9. Set **Debit** to `2000`.
10. In the **Currency** field, type `EUR`.
11. In the **Offset account** field, specify the values `GBSI OPER`.
12. In the **Method of payment** field, type `Electronic`.
13. Select **Save**.
14. Select **Generate payments**.
15. In the **Method of payment** field, type `Electronic`.
16. In the **File name** field, type `Payments`.
17. In the **Bank account** field, type `GBSI OPER`.
18. Select **OK**, then select **OK** again. Review the created worksheet, including details of payment lines as well as totals for each currency code used in this payment message.

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Reuse ER configurations with Excel templates to generate reports in Word format

2/18/2021 • 6 minutes to read • [Edit Online](#)

To generate reports as Microsoft Word documents, you can [configure](#) a new [Electronic reporting \(ER\) format](#). Alternatively, you can reuse an ER format that was originally designed to generate reports as Excel workbooks. In this case, you must replace the Excel template with a Word template.

The following procedures show how a user in either the System administrator role or the Electronic reporting developer role can configure an ER format to generate reports as Word files by reusing an ER format that was designed to generate reports as Excel files.

These procedures can be completed in the GBSI company.

Prerequisites

To complete these procedures, you must first follow the steps in the [Design a configuration for generating reports in OPENXML format](#) task guide.

You must also download and locally save the following templates for the sample report:

- [Template of Payment Report \(SampleVendPaymDocReport.docx\)](#)
- [Bounded Template of Payment Report \(SampleVendPaymDocReportBounded.docx\)](#)

These procedures are for a feature that was added in Dynamics 365 for Operations version 1611 (November 2016).

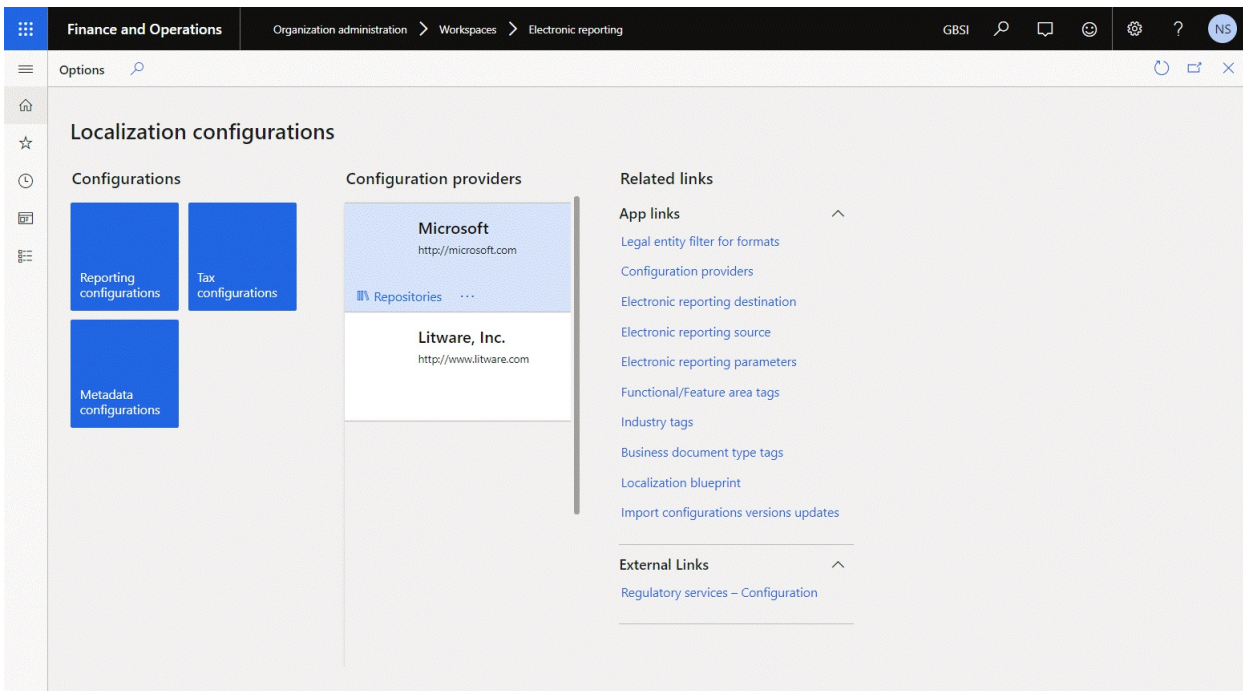
Select the existing ER report configuration

1. In Dynamics 365 Finance, go to **Organization administration** > **Workspaces** > **Electronic reporting**.
2. Make sure that the **Litware, Inc.** configuration provider is selected as **Active**. If it isn't, follow the steps in the [Create configuration providers and mark them as active](#) task guide.
3. Select **Reporting configurations**. You will reuse the existing ER configuration that was designed to generate the report output in OPENXML format.
4. On the **Configurations** page, in the configuration tree in the left pane, expand **Payment model**, and select **Sample worksheet report**.

NOTE

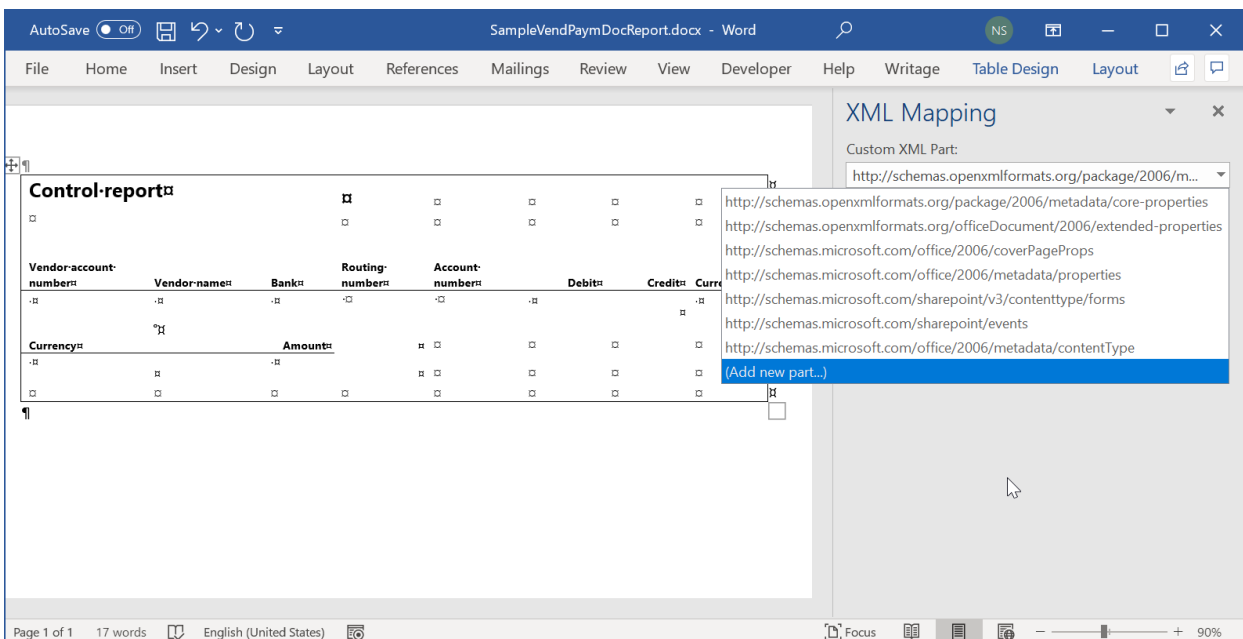
The draft version of the selected ER format can be edited on the **Versions** FastTab.

5. Select **Designer**.
6. On the **Format designer** page, notice that the title of the root format element indicates that an Excel template is currently used.



Review the downloaded Word template

1. In the Word desktop application, open the **SampleVendPaymDocReport.docx** template file that you downloaded earlier.
2. Verify that the template contains only the layout of the document that you want to generate as ER output.



Replace the Excel template with the Word template and add a custom XML part

Currently, the Excel document is used as a template to generate the output in OPENXML format. You will replace this template with the **SampleVendPaymDocReport.docx** Word template file that you downloaded earlier. You will also extend the Word template by adding a custom XML part.

1. In Finance, on the **Format designer** page, on the **Format** tab, select **Attachments**.
2. On the **Attachments** page, select **Delete** to remove the existing Excel template. Select **Yes** to confirm the change.

3. Select **New > File**.

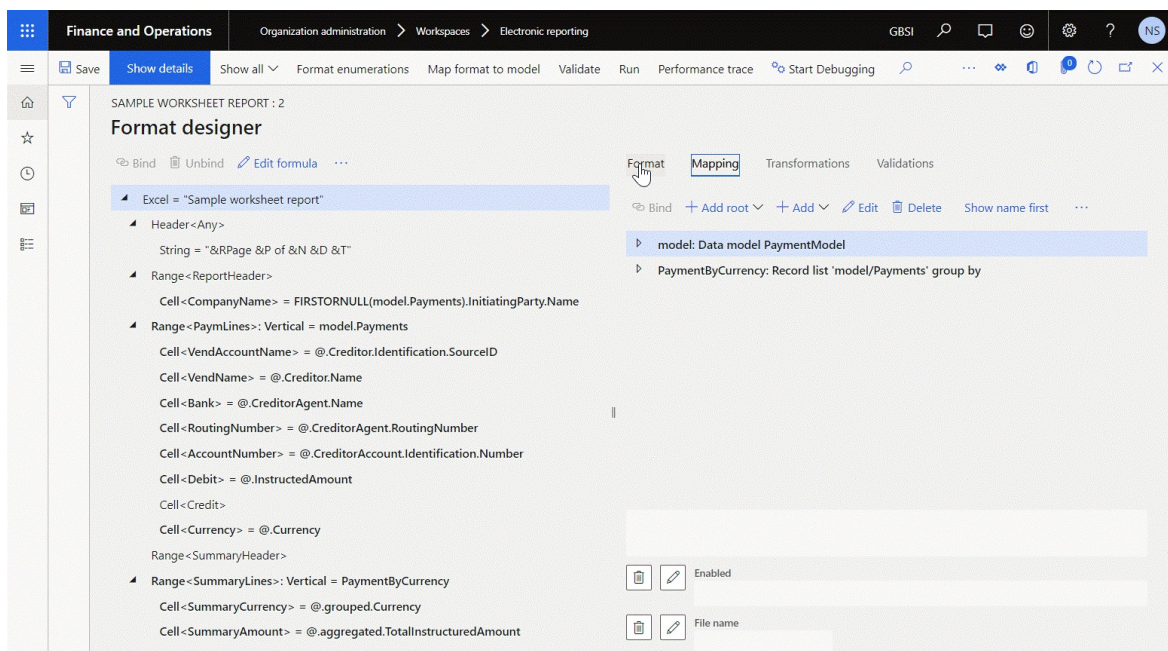
NOTE

You must select a document type that has been [configured](#) in the ER parameters to store templates of ER formats.

4. Select **Browse**, and then browse to and select the **SampleVendPaymDocReport.docx** file that you downloaded earlier.
5. Select **OK**.
6. Close the **Attachments** page.
7. On the **Format designer** page, in the **Template** field, enter or select the **SampleVendPaymDocReport.docx** file to use that Word template instead of the Excel template that was previously used.
8. Select **Save**.

In addition to storing configuration changes, the **Save** action updates the attached Word template. The hierarchical structure of the designed format is added to the attached Word document as a new custom XML part that is named **Report**. The attached Word template contains the layout of the document that will be generated as ER output and the structure of data that ER will enter in that template at runtime.

9. Notice that the title of the root format element indicates that a Word template is currently used.



10. On the **Format** tab, select **Attachments**.

You can now map the elements of the **Report** custom XML part to the content controls of the Word document.

If you're familiar with the process of designing Word documents as forms that contain [content controls](#) that are mapped to elements of [custom XML parts](#), complete all steps in the next procedure to create the document. For more information, see [Create forms that users complete or print in Words](#). Otherwise, skip the next procedure.

Get a Word document that has a custom XML part and do data mapping

1. In Finance, on the **Attachments** page, select **Open** to download the selected template from Finance and store it locally as a Word document.

2. In the Word desktop application, open the document that you just downloaded.
3. On the **Developer** tab, select **XML Mapping Pane**.

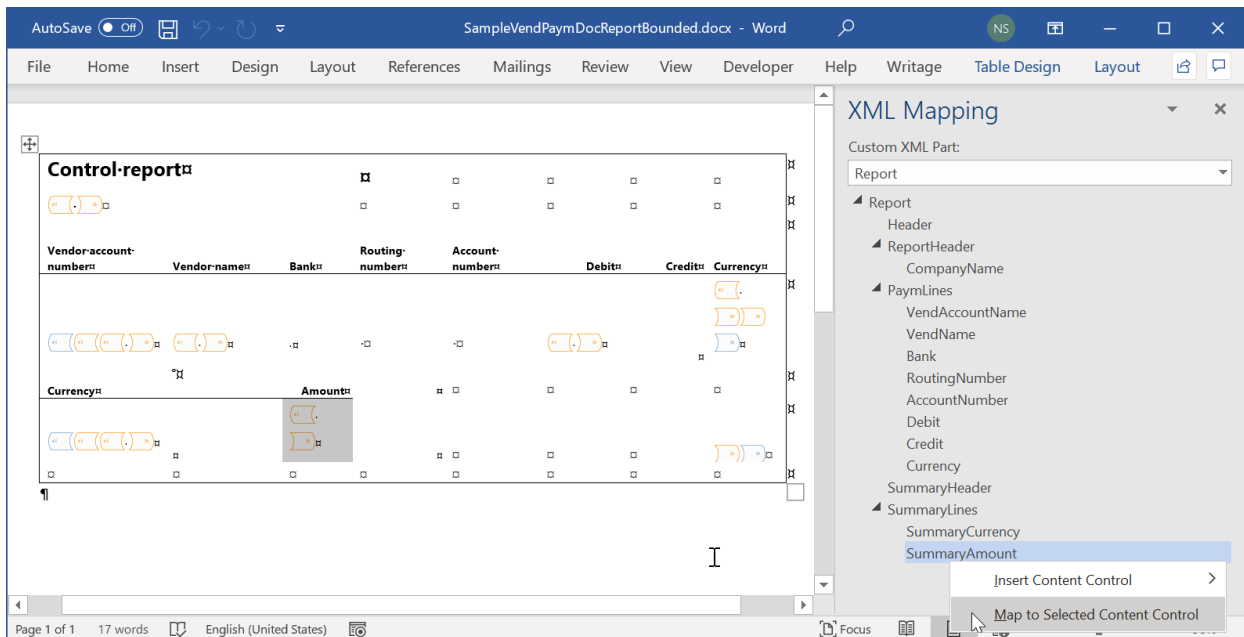
NOTE

If the **Developer** tab doesn't appear on the ribbon, customize the ribbon to add it.

4. In the **XML Mapping** pane, in the **Custom XML Part** field, select the **Report** custom XML part.
5. Map the elements of the selected **Report** custom XML part and the content controls of the Word document.
6. Save the updated Word document locally as **SampleVendPaymDocReportBounded.docx**.

Review the Word template where the custom XML part is mapped to content controls

1. In the Word desktop application, open the **SampleVendPaymDocReportBounded.docx** template file.
2. Verify that the template contains the layout of the document that you want to generate as ER output. The content controls that are used as placeholders for data that ER will enter in this template at runtime are based on the mappings that are configured between elements of the **Report** custom XML part and the content controls of the Word document.



Upload the Word template where the custom XML part is mapped to content controls

1. In Finance, on the **Attachments** page, select **Delete** to remove the Word template that has no mappings between elements of the **Report** custom XML part and content controls. Select **Yes** to confirm the change.
2. Select **New > File** to add a new template file that contains mappings between elements of the **Report** custom XML part and content controls.

NOTE

You must select a document type that has been [configured](#) in the ER parameters to store templates of ER formats.

3. Select **Browse**, and then browse to and select the **SampleVendPaymDocReportBounded.docx** file that you downloaded or prepared by completing the procedure in the [Get a Word that has a custom XML part to do data mapping](#) section.
4. Select **OK**.
5. Close the **Attachments** page.
6. On the **Format designer** page, in the **Template** field, select the document that you just downloaded.
7. Select **Save**.
8. Close the **Format designer** page.

Mark the configured format as runnable

To run the draft version of the editable format, you must make it [runnable](#).

1. In Finance, on the **Configurations** page, on the Action Pane, on the **Configurations** tab, in the **Advanced settings** group, select **User parameters**.
2. In the **User parameters** dialog box, set the **Run settings** option to **Yes**, and then select **OK**.
3. Select **Edit** to make the current page editable, as required.
4. For the currently selected **Sample worksheet report** configuration, set the **Run Draft** option to **Yes**.
5. Select **Save**.

Run the format to create output in Word format

1. In Finance, go to **Accounts payable > Payments > Payment journal**.
2. In a payment journal that you entered earlier, select **Lines**.
3. On the **Vendor payments** page, select all rows in the grid.
4. Select **Payment status > None**.

	DEBIT	CREDIT	BALANCE	DEBIT	CREDIT	BALANCE
VOUCHER	2,000.00	2,000.00	0.00	3,151.10	3,151.10	0.00
JOURNAL	3,000.00	3,000.00	0.00	4,726.60	4,726.60	0.00

5. On the Action Pane, select **Generate payments**.
6. In the dialog box that appears, follow these steps:
 - a. In the **Method of payment** field, select **Electronic**.

- b. In the **Bank account** field, select **GBSI OPER**.
 - c. Select **OK**.
7. In the **Electronic report parameters** dialog box, select **OK**.
 8. The generated output is presented in Word format and contains the details of the processed payments. Analyze the generated output.

Control report
Contoso Consulting GB

Vendor account number	Vendor name	Bank	Routing number	Account number	Debit	Credit	Currency
GB_SI_000005	West Side Mart				2000		GBP
GB_SI_000001	Consumer Equipment				1000		GBP

Currency	Amount
GBP	3000.0

Additional resources

- [Design a new ER configuration to generate reports in Word format](#)
- [Embed images and shapes in documents that you generate by using ER](#)

NOTE

Can you tell us about your documentation language preferences? [Take a short survey](#).

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Design ER configurations to fill in PDF templates

2/18/2021 • 14 minutes to read • [Edit Online](#)

The procedures in this topic are examples that show how a user in either the **System administrator** role or the **Electronic reporting developer** role can configure an Electronic reporting (ER) format that generates reports as PDF files by using fillable PDF documents as report templates. These steps can be performed in any company of Dynamics 365 Finance or Regulatory Configuration Services (RCS).

Prerequisites

Before you begin, you must have one of the following types of access, depending on the service that you use to complete the procedures in this topic:

- Access to Finance for one of the following roles:
 - Electronic reporting developer
 - Electronic reporting functional consultant
 - System administrator
- Access to RCS for one of the following roles:
 - Electronic reporting developer
 - Electronic reporting functional consultant
 - System administrator

You must also complete the [Create configuration providers and mark them as active](#) procedure.

Finally, you must download the following files from [CustomerSource](#).

CONTENT DESCRIPTION	FILE NAME
Template for the first page of the report	IntrastatReportTemplate1.pdf
Template for other pages of the report	IntrastatReportTemplate2.pdf
Sample ER format - PDF	Intrastat report (PDF).version.1.1.xml
Sample ER format - Excel	Intrastat (import from Excel).version.1.1.xml
Sample dataset	Intrastat sample data.xlsx

Design the format configuration

Get access to the list of configurations provided by Microsoft

1. Go to **Organization administration > Workspaces > Electronic reporting**.
2. Make sure that the **Litware, Inc.** provider is available and marked as active.
3. On the tile for the **Microsoft** provider, select **Repositories**.

NOTE

If a repository of the LCS type already exists, skip the remaining steps of this procedure.

4. Select **Add**.
5. In the drop-down dialog box, in the **Configuration repository type** field group, select the **LCS** option.
6. Select **Create repository**.
7. Select **OK**.

Get the model configurations provided by Microsoft

1. On the left side of the **Configuration repositories** page, select the **Show filters** button (the funnel symbol).
2. Add a filter for a value of **LCS** in the **Type** field, and use the **begins with** operator.
3. Select **Apply**.
4. Select **Open**.
5. In the tree, select **Intrastat model**.
6. On the **Versions** FastTab, select version **1**.

NOTE

If the **Import** button on the **Versions** FastTab is unavailable, skip the remaining steps of this procedure.

7. Select **Import**.
8. Select **Yes** to confirm the import of the selected version of the **Intrastat model** model configuration.

Create a new format configuration

1. In the **Electronic reporting** workspace, select the **Reporting configurations** tile.
2. In the tree, select **Intrastat model**.
3. Select **Create configuration**.

NOTE

If the **Create configuration** button isn't available, you must turn on design mode on the **Electronic reporting parameters** page that can be opened from the **Electronic reporting** workspace.

4. In the drop-down dialog box, in the **New** field group, select the **Format based on data model Intrastat** option.
5. In the **Name** field, enter **Intrastat report (PDF)**.
6. In the **Description** field, enter **Intrastat report in PDF format**.

NOTE

The active configuration provider is automatically entered. This provider will be able to maintain this configuration. Although other providers can use this configuration, they won't be able to maintain it.

7. Optional: In the **Format type** field, you can select a specific format of electronic document. If you select **PDF**, at design time, the ER Operations designer will offer just the format elements that are applicable only to documents that are generated in PDF format (**PDF\File**, **PDF\PDF Merger**, etc.). If you leave this field blank, a format of electronic document will be specified at design time in the ER Operations designer when a first format element will be added. For example, if you add the **Excel\File** as the first format element, the ER Operations designer will offer you just the format elements that are applicable only to documents that are generated in Excel format (**Excel\Cell**, **Excel\Range**, etc.). format.

8. Select **Create configuration**.

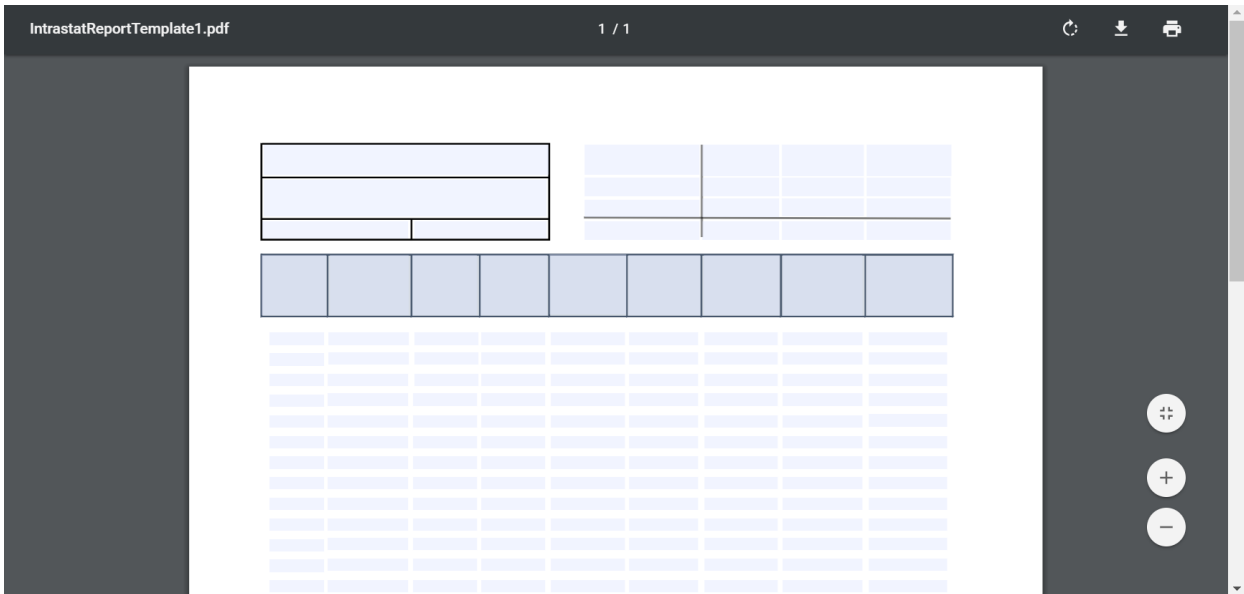
A new ER format configuration is created. You can use the draft version of this configuration to store the ER format component that is designed to generate electronic documents in PDF format.

Design the format of an electronic document

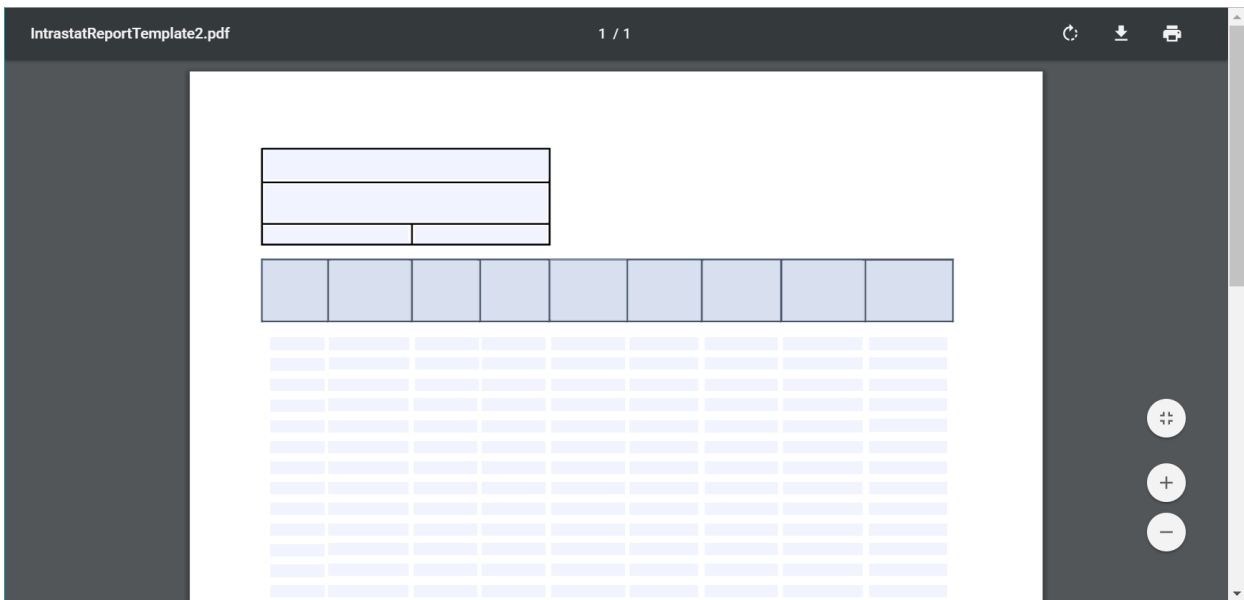
Next, in the ER format configuration that you created, you will design the ER format that generates the **Intrastat control** report in PDF format. The first page of this report must show a summary of the report and details of the foreign trade transactions that are reported on. The other pages must show only details of the foreign trade transactions that are reported on. Because the report pages that are generated must have different layouts, two different templates in PDF format will be used in the ER format.

In any PDF viewer, open the PDF templates that you downloaded. Notice that each template contains multiple fields that must be filled in. In each template, details of foreign trade transactions are presented as 42 rows, each of which has nine fields. The row number appears at the end of each field's name (for example, **Date 1...Date 42** and **Commodity 1...Commodity 42**).

The following illustration shows the PDF template for the first page of the report.



The following illustration shows the PDF template for other pages of the report.



1. On the **Configurations** page, select **Designer**.
2. Select **Add root**.
3. In the drop-down dialog box, in the tree, select **PDF > PDF Merger**.

When you select the **PDF Merger** element as the root element of the format, all PDF documents that are generated at run time will be merged into a single final PDF document. If you need only one PDF template to generate all the required documents by using the ER format that you design, you can select **PDF file** as the root element.

4. In the **Name** field, enter **Output**.
5. In the **Language preferences** field, select **User preference**. The report will be generated in the preferred language of the user who runs it.
6. In the **Culture preferences** field, select **User preference**. Values and dates that are presented on the pages of the report will be formatted based on the preferred locale of the user who runs the report.
7. Select **OK**.
8. On the Action Pane, on the **Import** tab, select **Import from PDF**.

When a fillable PDF document is imported as a template for this ER format, all the required ER format elements (**PDF file**, **Field group**, and **Field** elements) are automatically created in the format that is designed, based on the structure of the PDF document that is imported.

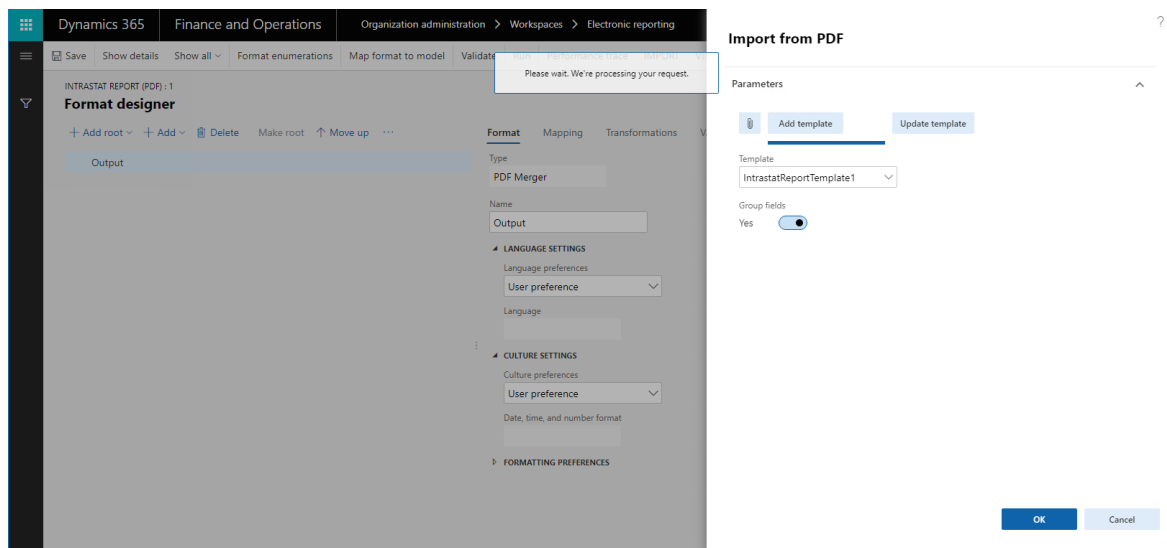
9. Select **Browse**. Navigate to and select the **IntrastatReportTemplate1.pdf** file that you downloaded earlier as a prerequisite.
10. Select **OK**.

The selected file is loaded, and the **Template** field in the **Import from PDF** dialog box is filled in.

11. Set the **Group fields** option to **Yes**. If the selected PDF document contains any field groups, they will be used to group the ER format elements that are created. A **Field group** format element will be created for this purpose.

If this option is set to **No**, the required ER format elements will be created as a flat list of elements that are nested under the **PDF File** format element that is created.

12. Select **OK**.



- In the tree, expand **Output**.

Notice that the **PDF File** component has been automatically created to manage the creation of the first page of the report that is generated at run time.

- In the tree, expand **Output > PDF File**.

Notice that the structured list of format elements has been automatically created in this ER format, based on the structure of the fillable PDF document that you imported earlier.

- In the tree, select **Output > PDF File**.

- In the **Name** field, enter **Page 1**.

This format element will be used to generate the first page of the **Intrastat control** report. That page will show a summary of the report and details of foreign trade transactions.

If you leave the **Language preferences** field blank, the **Language preferences** setting of the parent **PDF Merger** element will determine the language of the report that is generated by using this format element. You can select another value to override the setting of the parent element.

If you leave the **Culture preferences** field blank, the **Culture preferences** setting of the parent **PDF Merger** element will determine the locale of the report that is generated by using this format element. The locale determines the format of values and dates on the pages of the report. You can select another value to override the setting of the parent element.

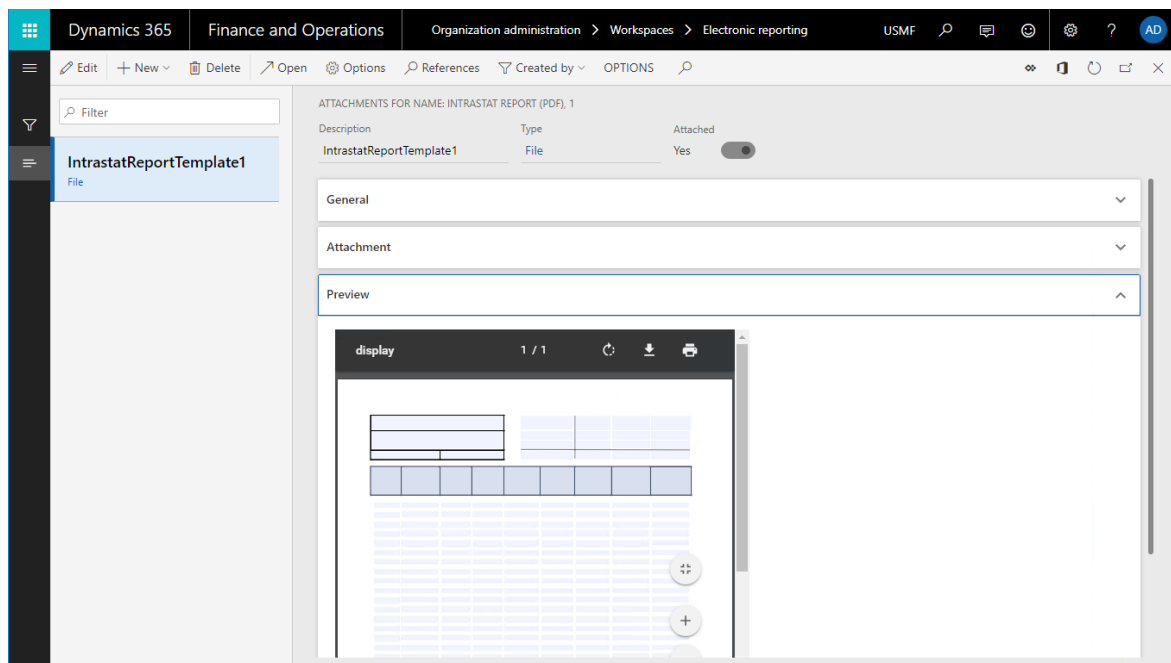
- On the Action Pane, select the **Import** tab. Notice that the **Update from PDF** button has become available for selected format element, **PDF File**.

You can use this button to import the updated PDF template to the edited format. When the updated PDF template is imported, the list of format elements will be changed accordingly:

- For any new fields in the updated PDF template, new format elements are created in the edited ER format.
- If the updated PDF template no longer includes fields that correspond to any existing format elements in the edited ER format, those format elements are deleted from the ER format.

- On the **Format** tab, select **Attachments**.

Notice that the imported PDF document is attached to the edited ER format.



19. Continue to design this format by importing the second PDF template, adding necessary bindings to data sources, and so on.
20. Select **Save**.
21. Close the page.
22. Select **Delete**.
23. Select **Yes**.

To learn how new **PDF Merger**, **PDF File**, **Field group** and **Field** format elements can be used to generate documents in PDF format, you can import and analyze the sample ER format.

Import the format configuration

Next, you will import the sample ER format that you previously downloaded to generate the **Intradat control** report in PDF format. The first page of the report must show a summary of the report and details of the foreign trade transactions that are reported on. The other pages must show only details of the foreign trade transactions that are reported on.

1. On the **Configurations** page, select **Exchange > Load from XML file**.
2. Select **Browse**. Navigate to and select the **Intradat report (PDF).version.1.1.xml** file that you downloaded earlier as a prerequisite.
3. Select **OK**.

Analyze the format configuration

Format layout

1. On the **Configurations** page, in the tree, select **Intradat model > Intradat report (PDF)**.
2. Select **Designer**.
3. Select **Show details**.
4. In the tree, expand **Output: PDF Merger**.

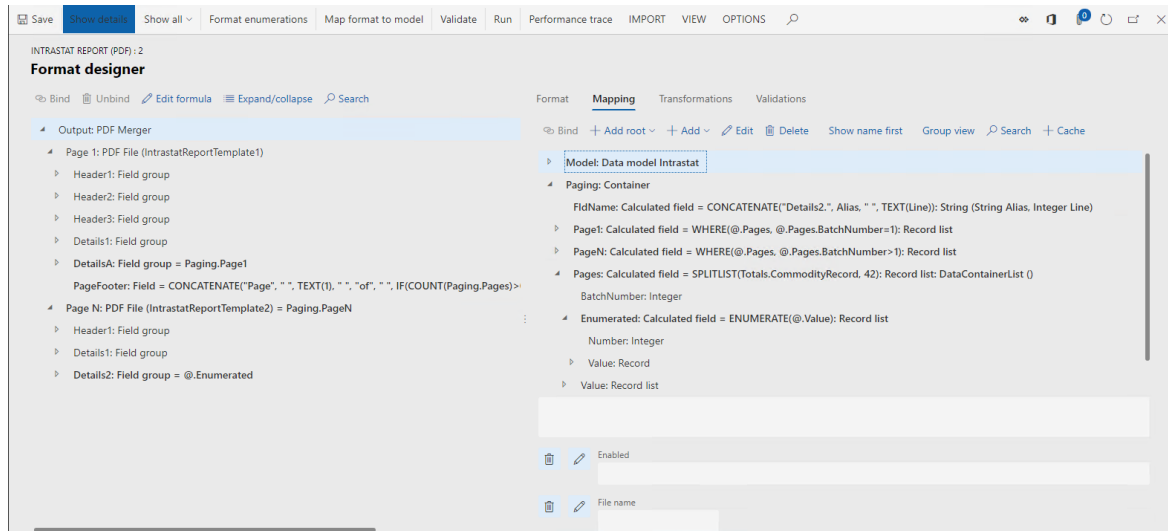
Notice that this ER format contains two **PDF File** elements, each of which uses a different PDF template. One template is used to generate the first page of the report in PDF format, and the other template is used to generate the other pages.

- In the tree, expand **Output: PDF Merger > Page 1: PDF File (IntrastatReportTemplate1)**.
- In the tree, expand **Output: PDF Merger > Page N: PDF File (IntrastatReportTemplate2)**.

Notice that, because the content of the two PDF templates differs, the structure of the nested format elements for the two **PDF File** elements also differs.

Format mapping

- On the **Format designer** page, select the **Mapping** tab.
- In the tree, expand **Paging > Pages**.



Note the following details:

- The **Output > Page 1** format element of the **PDF File** type isn't bound to any data source, and the **Enabled** expression of this format element is empty. Therefore, at run time, the **IntrastatReportTemplate1** PDF template will be filled in only one time when an individual PDF document is generated.
- The **Output > Page N** format element of the **PDF File** type is bound to the **Paging.PageN** data source of the **Record list** type, and the **Enabled** expression of this format element is empty. Therefore, at run time, the **IntrastatReportTemplate2** PDF template will be filled in for each record from the bound record list when an individual PDF document is generated.
- Because the **Page 1: PDF File** and **Page N: PDF File** format elements are children of the **Output: PDF Merger** format element, all PDF documents that are filled in will be merged into a single final PDF document.
- The **Paging.Page1** and **Paging.PageN** data sources are configured as filters of records from the **Paging.Pages** data source. This data source is configured to split the whole set of foreign trade transactions into batches. Each batch contains up to 42 records. The following ER expression is used to split the transactions into batches:

`SPLITLIST(Totals.CommodityRecord,42)`
- The **Paging.Pages** data source contains the **Paging.Pages.Enumerated** element that returns the details of each record that is included in a batch. These details include the record's sequence in the current batch (the **Paging.Pages.Enumerated.Number** field). The **Paging.Pages.Enumerated.Number** field is used in the **Name** expression of **PDF Field** format elements to dynamically generate a field name that is based on the transaction number in a batch. The field name that is generated is then used to fill in the correct PDF field in the PDF template that is used.

- The **Output > Page N > Details 2** format element of the **PDF Group** type is bound to the **Paging.PageN.Enumerated** data source (or **@.Enumerated** if the **Relative path** view mode is used) of the **Record list** type. Therefore, at run time, the nested elements of this PDF group will be filled in for each record from the bound record list. In this way, individual PDF lines are virtually generated when for each Nth of 42 records of the **Paging.PageN.Enumerated** list the following PDF fields are filled in: **Date N**, **Direction N**, **Commodity N**, etc. Therefore, in this respect, the behavior of this **Field group** format element resembles the behavior of the **XML > Sequence** and **Text > Sequence** format elements.

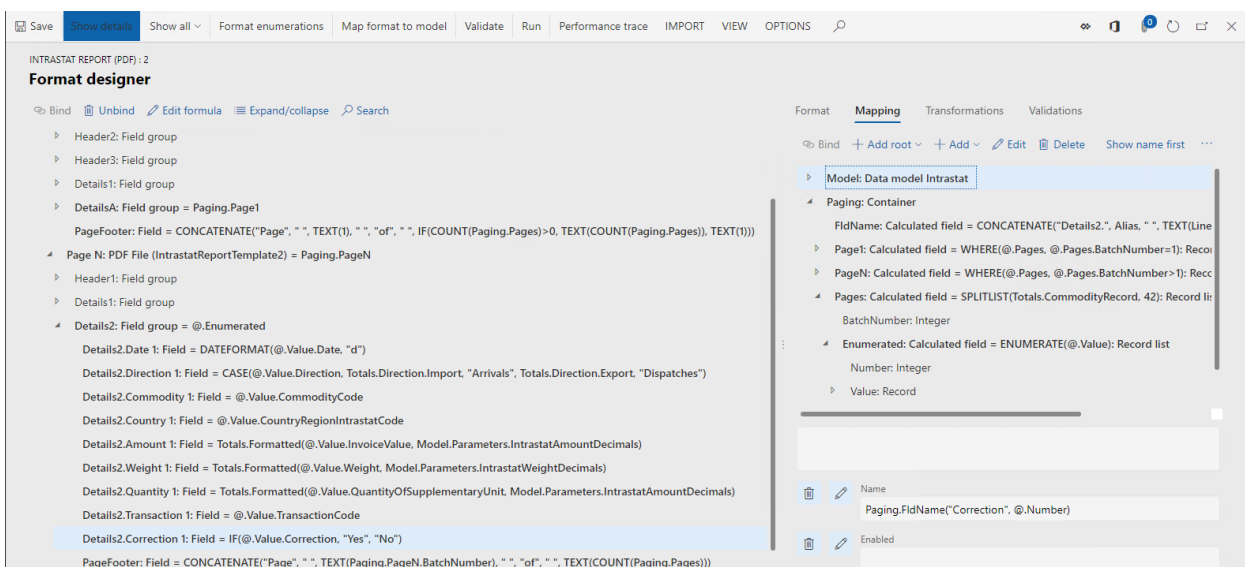
3. In the tree, expand **Output > Page N > Details2**.

4. In the tree, select **Output > Page N > Details2 > PageFooter**.

Notice that the **Name** attribute of this format element is defined as **PageFooter**. Also notice that the **Name** expression of the format element is empty.

5. In the tree, select **Output > Page N > Details2 > Correction 1**.

Notice that the **Name** attribute of this format element is defined as **Correction 1**. Also notice that the **Name** expression of the format element is defined as **Paging.FldName("Correction",@.Number)**.



Note that the **Field** format element is used to fill in an individual field of a fillable PDF document that is defined as a template of the parent **PDF File** format element. The binding of the **PDF File** format element or its nested elements, if it has any nested elements, specifies the value that is entered in corresponding PDF fields. Different properties of the **Field** format element can be used to specify which PDF field is filled in by an individual format element:

- On the **Format** tab, the **Name** attribute of the format element
- On the **Mapping** tab, the **Name** expression of the format element

Because both properties are optional for a **Field** format element, the following rules are applied to specify the target PDF field:

- If the **Name** attribute is blank, and the **Name** expression returns an empty string at run time, an exception is thrown at run time to notify the user that a PDF field can't be found in the PDF template that is being used to fill in the PDF document.
- If the **Name** attribute is defined, and the **Name** expression is blank, the PDF field that has the same name as the **Name** attribute of the format element is filled in.
- If the **Name** attribute is defined, and the **Name** expression is configured, the PDF field that has the same name as the value that is returned by the **Name** expression of the format element is filled in.

NOTE

A PDF check box can be filled in as selected in the following ways:

- When the corresponding **Field** format element is bound to a data source field of the **Boolean** data type that has the **True** value
- When the corresponding **Field** format element contains a nested **String** format element that is bound to a data source field that has a text value of **1**, **True**, or **Yes**

Run the format configuration

Import the format configuration

Next, you will load the **Intrastat (import from Excel)** sample ER format. This format is designed to parse a user-selected Microsoft Excel workbook that simulates foreign trade transactions.

1. On the **Configurations** page, select **Exchange > Load from XML file**.
2. Select **Browse**. Navigate to and select the **Intrastat (import from Excel).version.1.1.xml** file that you downloaded earlier as a prerequisite.
3. Select **OK**.
4. In the tree, select **Intrastat model > Intrastat (import from Excel)**.
5. Select **Edit**.
6. Set the **Default for model mapping** option to **Yes**.

NOTE

If you previously set the **Default for model mapping** option to **Yes** for the **Intrastat model** configuration or another configuration that is nested under the **Intrastat model** configuration, set this option to **No**.

When the **Default for model mapping** option is set to **Yes**, the imported **Intrastat (import from Excel)** ER format is assigned as the default data source for the **Intrastat report (PDF)** format configuration. Then, when the **Intrastat report (PDF)** format configuration is run, the content of the Excel workbook that is parsed by the **Intrastat (import from Excel)** ER format will simulate foreign trade transactions that must be reported. The following illustration shows an example of an Excel workbook.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	9202001	FALSE	1/31/2018	Import	IT	DE	100.11	GRM		1 Speaker	100.00	100.00	11	2		300
2	9202002	FALSE	2/1/2018	Import	FR	AT	102.34	GRM		2 Monitor	102.00	102.00	12	3		299
3	9202003	FALSE	2/2/2018	Import	ES	AT	104.57	GRM		3 Headset	105.00	105.00	11	4		298
4	9202004	FALSE	2/3/2018	Export	AT	IT	106.80	GRM		4 Notebook	107.00	107.00	23	5		297
5	9202005	FALSE	2/4/2018	Import	IT	DE	109.03	GRM		5 Speaker	109.00	109.00	11	2		296
6	9202006	FALSE	2/5/2018	Import	FR	AT	111.26	GRM		6 Monitor	111.00	111.00	12	3		295
7	9202007	FALSE	2/6/2018	Import	ES	AT	113.49	GRM		7 Headset	113.00	113.00	11	4		294
8	9202008	FALSE	2/7/2018	Export	AT	IT	115.72	GRM		8 Notebook	116.00	116.00	23	5		293
9	9202009	FALSE	2/8/2018	Import	IT	DE	117.95	GRM		9 Speaker	118.00	118.00	11	2		292
10	9202010	FALSE	2/9/2018	Import	FR	AT	120.18	GRM		10 Monitor	120.00	120.00	12	3		291
11	9202011	FALSE	2/10/2018	Import	ES	AT	122.41	GRM		11 Headset	122.00	122.00	11	4		290
12	9202012	FALSE	2/11/2018	Export	AT	IT	124.64	GRM		12 Notebook	125.00	125.00	23	5		289
13	9202013	FALSE	2/12/2018	Import	IT	DE	126.87	GRM		13 Speaker	127.00	127.00	11	2		288
14	9202014	FALSE	2/13/2018	Import	FR	AT	129.10	GRM		14 Monitor	129.00	129.00	12	3		287
15	9202015	FALSE	2/14/2018	Import	ES	AT	131.33	GRM		15 Headset	131.00	131.00	11	4		286
16	9202016	FALSE	2/15/2018	Export	AT	IT	133.56	GRM		16 Notebook	134.00	134.00	23	5		285
17	9202017	FALSE	2/16/2018	Import	IT	DE	135.79	GRM		17 Speaker	136.00	136.00	11	2		284
18	9202018	FALSE	2/17/2018	Import	FR	AT	138.02	GRM		18 Monitor	138.00	138.00	12	3		283
19	9202019	FALSE	2/18/2018	Import	ES	AT	140.25	GRM		19 Headset	140.00	140.00	11	4		282
20	9202020	FALSE	2/19/2018	Export	AT	IT	142.48	GRM		20 Notebook	142.00	142.00	23	5		281
21	9202021	FALSE	2/20/2018	Import	IT	DE	144.71	GRM		21 Speaker	145.00	145.00	11	2		280
22	9202022	FALSE	2/21/2018	Import	FR	AT	146.94	GRM		22 Monitor	147.00	147.00	12	3		279
23	9202023	FALSE	2/22/2018	Import	ES	AT	149.17	GRM		23 Headset	149.00	149.00	11	4		278
24	9202024	FALSE	2/23/2018	Export	AT	IT	151.40	GRM		24 Notebook	151.00	151.00	23	5		277
25	9202025	FALSE	2/24/2018	Import	IT	DE	153.63	GRM		25 Speaker	154.00	154.00	11	2		276
26	9202026	FALSE	2/25/2018	Import	FR	AT	155.86	GRM		26 Monitor	156.00	156.00	12	3		275
27	9202027	FALSE	2/26/2018	Import	ES	AT	158.09	GRM		27 Headset	158.00	158.00	11	4		274
28	9202028	FALSE	2/27/2018	Export	AT	IT	160.32	GRM		28 Notebook	160.00	160.00	23	5		273
29	9202029	FALSE	2/28/2018	Import	IT	DE	162.55	GRM		29 Speaker	163.00	163.00	11	2		272

Run the format configuration

1. On the Configurations page, in the tree, select **Intrastat model > Intrastat report (PDF)**.
2. Select **Run**.
3. Select **Browse**. Navigate to and select the **Intrastat sample data.xlsx** file that you downloaded earlier as a prerequisite.
4. Select **OK**.
5. In the **Report direction** field, select **Both** to fill in all transactions from the imported Excel workbook in the PDF report that is generated.
6. Select **OK**.
7. Review the PDF document that is generated.

The follow illustration shows an example of the first page of the report that is generated.

out.Admin.pdf 1 / 3

Intrastat report				Number of lines	Amount	Weight	
Contoso Entertainment System Germany				Subtotal for arrivals	76	15946.33	19061.00
Reporting date				Subtotal for dispatches	24	5103.17	5989.00
2/4/2019				Total for report	100	21049.50	25050.00

Date	Direction	Commodity code	Country of dispatch/destination	Amount	Weight	Quantity of supplementary unit	Transaction code	Correction
1/31/2018	Arrivals	9202001	IT	100.11	300.00	1.00	11	No
2/1/2018	Arrivals	9202002	FR	102.34	299.00	2.00	12	No
2/2/2018	Arrivals	9202003	ES	104.57	298.00	3.00	11	No
2/3/2018	Dispatches	9202004	AT	106.80	297.00	4.00	23	No
2/4/2018	Arrivals	9202005	IT	109.03	296.00	5.00	11	No
2/5/2018	Arrivals	9202006	FR	111.26	295.00	6.00	12	No
2/6/2018	Arrivals	9202007	ES	113.49	294.00	7.00	11	No
2/7/2018	Dispatches	9202008	AT	115.72	293.00	8.00	23	No
2/8/2018	Arrivals	9202009	IT	117.95	292.00	9.00	11	No
2/9/2018	Arrivals	9202010	FR	120.18	291.00	10.00	12	No
2/10/2018	Arrivals	9202011	ES	122.41	290.00	11.00	11	No
2/11/2018	Dispatches	9202012	AT	124.64	289.00	12.00	23	No

The following illustration shows an example of another page of the report that is generated.

out.Admin.pdf 2 / 3

3/9/2018	Arrivals	9202038	IT	182.62	263.00	38.00	11	No
3/10/2018	Arrivals	9202039	FR	184.85	262.00	39.00	12	No
3/11/2018	Arrivals	9202040	ES	187.08	261.00	40.00	11	No
3/12/2018	Dispatches	9202041	AT	189.31	260.00	41.00	23	No
3/13/2018	Arrivals	9202042	IT	191.54	259.00	42.00	11	No

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Intrastat report				Number of lines	Amount	Weight	
Contoso Entertainment System Germany				Subtotal for arrivals	76	15946.33	19061.00
Reporting date				Subtotal for dispatches	24	5103.17	5989.00
2/4/2019				Total for report	100	21049.50	25050.00

Date	Direction	Commodity code	Country of dispatch/destination	Amount	Weight	Quantity of supplementary unit	Transaction code	Correction
3/14/2018	Arrivals	9202043	FR	193.77	258.00	43.00	12	No
3/15/2018	Arrivals	9202044	ES	196.00	257.00	44.00	11	No
3/16/2018	Dispatches	9202045	AT	198.23	256.00	45.00	23	No

Additional resources

- [ER Design a configuration for generating reports in OPENXML format \(November 2016\)](#)
- [Design ER configurations to generate reports in Word format](#)

NOTE

Can you tell us about your documentation language preferences? [Take a short survey.](#)

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Embed images and shapes in documents that you generate by using ER

2/18/2021 • 6 minutes to read • [Edit Online](#)

You can use the Electronic reporting (ER) tool to design reports that you can run to generate required electronic documents. You can use Microsoft Excel or Microsoft Word documents to specify the layout of a report. The ER Operations designer lets you attach the Excel or Word document as a template for the report. The named elements in the attached template are associated with the format elements of the ER report. Format elements of the report are bound to data sources. These elements specify the data that will be entered, at run time, in the documents that are generated.

This new functionality goes beyond existing ER capabilities for creating documents in Microsoft Office formats. For more information, play the following task guides. You can find these task guides under the 7.5.4.3 Acquire/Develop IT service/solution components (10677) business process.

- ER Design a configuration for generating reports in OPENXML format
- ER Design a configuration for generating reports in Microsoft WORD format

Embed an image in an Excel document

First, you must add a placeholder for the image in an Excel document. Open an Excel workbook, and add a picture as a placeholder for the image that you will add later. Then use the ER tool to add a new ER format configuration to include the report that you're designing. Attach the Excel workbook as a template for the format of the report, and then import the content of the workbook into the ER format. The format definition will be created automatically. The image placeholder that you added will be included in the ER format definition as a **CELL** element.

NOTE

You can manually specify the format definition instead of importing it. When you save your changes, the format will be validated.

Next, bind the **CELL** element of the ER format to the field from the format's data source that provides the picture's data in binary format at run time. When an ER data model is used as a format's data source, the data type of the field must be **CONTAINER**. Currently, an ER data model field that has the **CONTAINER** data type can be bound to several types of data sources that return images in binary format. You can access a field in a data table and a file that is attached to the data table's record by using the Document management framework.

IMPORTANT

- If you want to fill the image placeholder in the document that you're creating by using the Excel template, the ER format must contain the **CELL** element that refers to the named picture element in the Excel template. Otherwise, no image placeholder will appear in the report's output. If the binding of a **CELL** element returns no data at run time, the document that is generated will show the image placeholder from the template. To hide an image in the document that you're generating, define a **CELL** element, and specify that the **Enabling** expression should return a value of **FALSE**.
- In the Excel template, use a unique name for every element. These elements include pictures and cells. If you duplicate an element name, the content of the report that is generated will be ambiguous and confusing.

Embed a shape in an Excel document

First, you must add a placeholder for the shape in an Excel document. Open an Excel workbook, and select **Shape**, **Text box**, or **WordArt** as a placeholder for the shape. Then use the ER tool to add a new ER format configuration to include the report that you're designing. Attach the Excel workbook as a template for the format of the report, and then import the content of the workbook into the ER format. The format definition will be created automatically. The shape placeholder that you added will be included in the ER format definition as a **CELL** element that refers to the named Excel shape element.

NOTE

You can manually specify the format definition instead of importing it. When you save your changes, the format will be validated.

Next, bind the **CELL** element in the ER format to the field from the format's data source that provides the data at run time. This data can be converted to a text string. When the **CELL** element in the ER format refers to a shape element in the Excel template that supports text, the text that is provided through this binding at run time will be shown in a shape in the document that is generated.

IMPORTANT

- If you want to use the Excel template that includes the shape placeholder to generate a new document, the ER format must contain a **CELL** element that refers to the Excel shape element. Otherwise, no shape placeholder will appear in the report's output. If the binding of a **CELL** element that refers to the named Excel shape element returns no data at run time, the document that is generated will show the text of the shape placeholder from the Excel template. To hide a shape in the document that you're generating, define a **CELL** element that refers to the named Excel shape element, and specify that the **Enabling** expression should return a value of **FALSE**.
- In the Excel template, use a unique name for every element. These elements include shapes and cells. If you duplicate an element name, the content of the report that is generated will be ambiguous and confusing.

Embed an image in a Word document

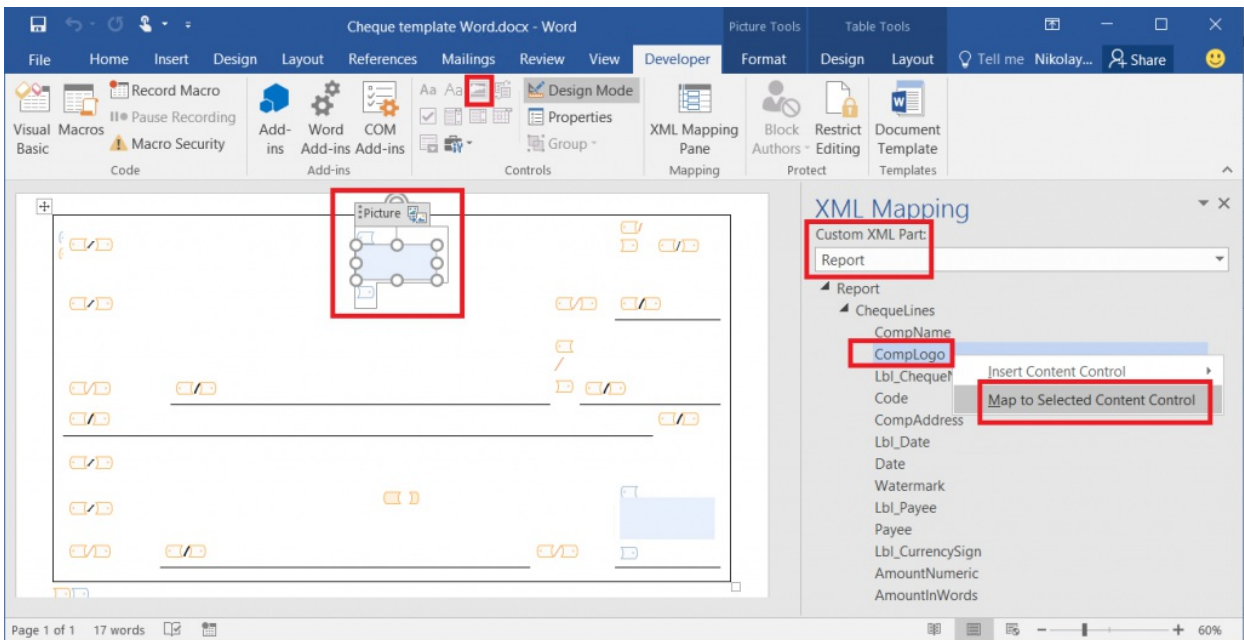
IMPORTANT

You can reuse the ER format that uses an Excel template to create documents that include embedded images. In the ER format, make sure that a name is specified for the **CELL** element that refers to a named picture element in Excel, and that is bound to a data source that returns a picture at run time.

First, you must configure the Word document's layout. Use the **Picture Content** control to create a placeholder for the embedded image. To access this control, you must first make the **Developer** tab visible on the Word Ribbon.

Next, delete the Excel template from the ER format, and attach the Word template document. Update the reference to the template, and save your changes. The structure of the current ER format is saved to the Word template as a new custom XML part that is named **Report**.

Next, save the Word template for the current ER format to your local computer. Open the template, and open the **XML Mapping** pane. Find the custom XML part that is named **Report**, and then point to the **CELL** element in the ER report that is bound to a data source that returns an image in binary format. Map this XML part's item to the selected **Picture Content** control, and save your changes.



Finally, delete the Word template from the ER format, and attach the Word document that includes the mapped custom XML parts. Update the format reference to the template, and save the changes that you made to this ER format.

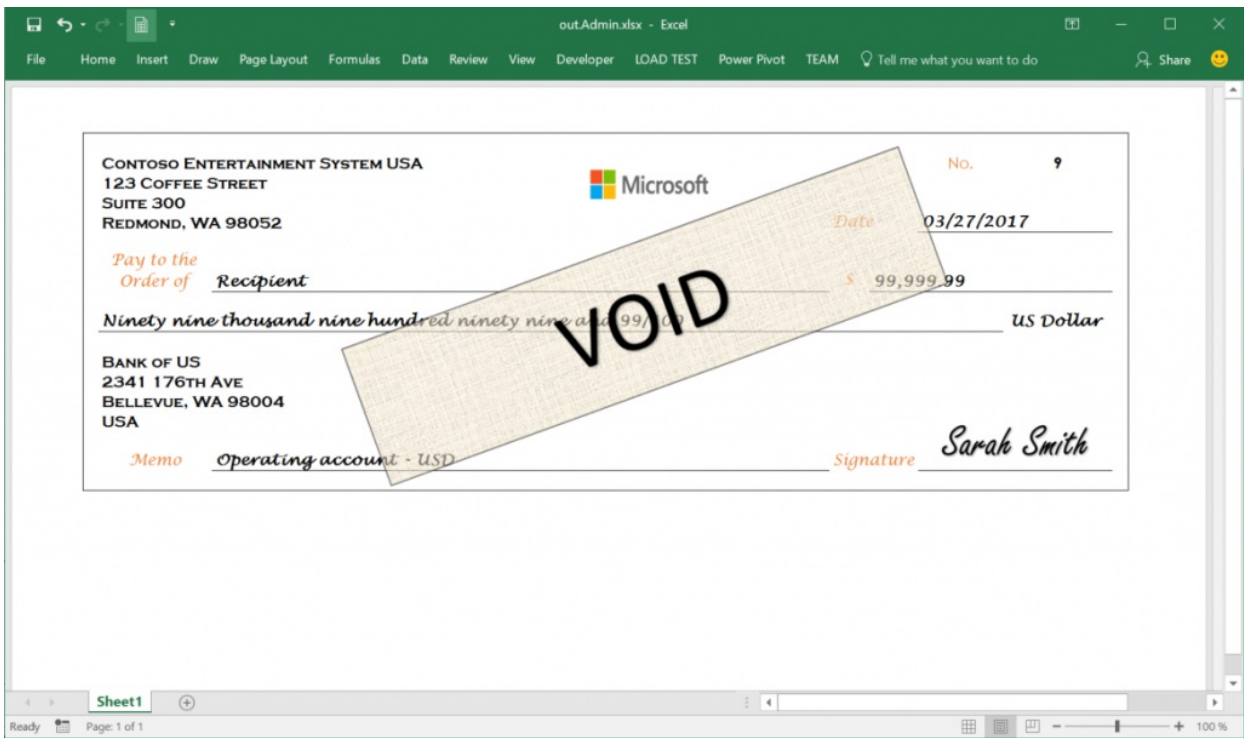
More information

To become familiar with the details of this feature, play the set of task guides, **ER Make reports in MS Office formats with embedded images**. These task guides show how you can embed the images of a company logo and an authorized person's signature in the payment checks that are generated by using the ER tool in Excel and Word documents.

The following table lists the files that are required in order to complete the **ER Make reports in MS Office formats with embedded images** task guides. [Download](#) and save the files to your local computer.

DESCRIPTION	FILE NAME
ER data model configuration	Model for cheques.xml
ER format configuration	Cheques printing format.xml
Company logo image	Company logo.png
Signature image	Signature image.png
Alternative signature image	Signature image 2.png
Microsoft Word template for printing payment checks	Cheque template Word.docx
Microsoft Excel template for printing payment checks	Cheque template.xlsx

The following graphic provides an example of the test printout for a payment check that is generated from the Excel template.



NOTE

Can you tell us about your documentation language preferences? [Take a short survey.](#)

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Design configurations to generate reports in Office format that have embedded images

2/18/2021 • 3 minutes to read • [Edit Online](#)

To complete the steps in this procedure, first complete the procedure, "ER Create a configuration provider and mark it as active." This procedure explains how to design Electronic reporting (ER) configurations to generate a Microsoft Excel or Word document that contains embedded images. In this procedure, you will create the required ER configurations for the sample company, Litware, Inc. These steps can be completed using the USMF dataset. This procedure is created for users with the assigned role of system administrator or electronic reporting developer. Before you begin, download and save the files listed in the Help topic, [Embed images and shapes in documents that you generate by using ER](#). The files are: Model for cheques.xml, Cheques printing format.xml, Company logo.png, Signature image.png, Signature image 2.png, and Cheque template Word.docx.

Verify prerequisites

1. Go to Organization administration > Workspaces > Electronic reporting.
2. Make sure that the configuration provider for the sample company, Litware, Inc., is available and marked as Active. If you don't see this configuration provider, complete the steps in the procedure, "Create a configuration provider and mark it as active."
3. Click Reporting configurations.

Add a new ER model configuration

1. Instead of creating a new model, you can load the ER model configuration file (Model for cheques.xml) that you saved earlier. This file contains the sample data model for payment cheques and the mapping of the data model to the data components of the Dynamics 365 for Operations application.
2. On the Versions FastTab, click Exchange.
3. Click Load from XML file.
4. Click Browse, and then select Model for cheques.xml.
5. Click OK.
6. The loaded model will be used as a data source of information to generate documents that contain images in Excel and Word.

Add a new ER format configuration

1. Instead of creating a new format, you can load the ER format configuration file (Cheques printing format.xml) that you saved earlier. This file contains the sample layout of the format to print cheques using the pre-printed form and the mapping of this format to the 'Model for cheques' data model.
2. Click Exchange.
3. Click Load from XML file.
4. Click Browse and select the Cheques printing format.xml file.
5. Click OK.
6. In the tree, expand 'Model for cheques'.
7. In the tree, select 'Model for cheques\Cheques printing format'.
8. The loaded format will be used to generate documents that contain images in Excel and Word.

Configure ER user parameters

1. On the Action Pane, click Configurations.
2. Click User parameters.
3. Select Yes in the Run settings field.
Turn on the 'Run draft' flag to start the draft version of the selected format instead of the completed one.
4. Click OK.

Configure Cash & bank management parameters

1. Go to Cash and bank management > Bank accounts > Bank accounts.
2. Use the Quick Filter to filter on the Bank account field with a value of 'USMF OPER'.
3. On the Action Pane, click Set up.
4. Click Check.
5. Expand the Setup section.
6. Click Edit.
7. Select Yes in the Company logo field.
8. Click Company logo.
9. Click Change.
10. Click Browse and select the file that you downloaded earlier, Company logo.png.
11. Click Save.
12. Close the page.
13. Expand the Signature section.
14. Select Yes in the Print first signature field.
15. Click Change.
16. Click Browse and select the file that you downloaded earlier, Signature image.png.
17. Expand the Copies section.
18. In the Watermark field, select an option.
19. Select Yes in the Generic electronic Export format field.
20. Select 'Cheques printing form' configuration.
21. Now the selected ER format will be used for printing cheques.
22. Click Attach.
23. Click New.
24. Click File.
25. Click Browse and select the file that you downloaded earlier, Signature image 2.png.
26. Close the page.
27. Close the page.
28. Close the page.
29. Go to Cash and bank management > Setup > Cash and bank management parameters.
30. Select Yes in the Allow prenote creation on inactive bank accounts: field.
31. Click Save.
32. Close the page.

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Review configurations to generate reports in Office format that have embedded images

2/18/2021 • 3 minutes to read • [Edit Online](#)

To complete these steps, you must first complete the steps in the "ER Make reports in MS Office formats with embedded images (Part 1: Set up parameters)" task guide.

This procedure shows how to design Electronic reporting (ER) configurations to generate electronic documents that contain embedded images in Microsoft Excel and Microsoft Word. In this example, you will review ER configurations for the sample company Litware, Inc.

This procedure is intended for users who have the System administrator or Electronic reporting developer role assigned to them. The steps can be completed by using the USMF data set.

Review the imported data model

1. Go to Organization administration > Electronic reporting > Configurations.
2. In the tree, select 'Model for cheques'.
3. Click Designer.
 - This model is designed to represent payment cheques from the business standpoint and the mapping of this model to the application's data sources. Review this model by the ER Operations designer. Note the attributes of the model elements that are presented: structure, name, description, data type, and so on.
4. In the tree, expand 'root'.
5. In the tree, select 'root\cheques'.
6. In the tree, expand 'root\cheques'.
7. In the tree, expand 'root\cheques\attributes'.
8. In the tree, expand 'root\payer'.
9. In the tree, select 'root\istestrun'.
10. In the tree, select 'root\layout'.
 - The layout element of this model represents the details of the printing cheque form layout for the selected bank account. It also includes two nodes of the Container data type to store images.
11. In the tree, expand 'root\layout'.
12. In the tree, select 'root\layout\company logo'.
13. In the tree, expand 'root\layout\company logo'.
14. In the tree, select 'root\layout\company logo\image'.
15. In the tree, select 'root\layout\company logo\isprinted'.
16. In the tree, select 'root\layout\signature'.
17. In the tree, expand 'root\layout\signature'.
18. In the tree, select 'root\layout\signature\image'.
19. In the tree, select 'root\layout\signature\isprinted'.
 - Note that two image data model elements are bound to the fields of the tables that contain images of the company logo and the authorized person's signature in binary format.
20. In the tree, expand 'root\layout\watermark'.
21. Click Map model to datasource.
22. Click Designer.

23. In the tree, expand 'chequeselected'.
24. In the tree, expand 'layout'.
25. In the tree, expand 'layout\company logo'.
26. In the tree, expand 'layout\signature'.
27. In the tree, expand 'layout\watermark'.
28. Toggle 'Show details' on.
 - Note that the cheques data model element is bound to the TmpChequePrintout table that, at runtime, will contain records for cheques that the user has selected for printing.
29. Close the page.
30. Close the page.
31. Close the page.

Review the imported format

1. In the tree, expand 'Model for cheques'.
2. In the tree, select 'Model for cheques\Cheques printing format'.
3. Click Designer.
4. Click Attachments.
5. Click Open.
 - Open the attached report's template in Excel.
 - Review the attached report's Excel template that will be used to print cheques. The template contains two cheques per page and is designed to print cheques to the preprinted form. Note that two blank images are embedded. These blank images are for the company logo and the signature of the person who is authorizing a payment. Verify that the images are named CompLogo and SignatureImage, respectively, in Excel.
6. Close the page.
7. In the tree, expand 'Report'.
8. In the tree, expand 'Report\ChequeLines'.
9. In the tree, select 'Report\ChequeLines\CompLogo'.
10. Toggle 'Show details' on.
 - Note that the 'CompLogo' format's cell element represents the Excel item that is used to populate the company logo image in the report. This format element is bound to the image data model element that, at runtime, contains a company logo image in binary format.
11. Click the Mapping tab.
12. Click Edit enabled.
 - Note that you can make the 'CompLogo' format's cell element so that it's no longer enabled. In this case, the associated Excel image element will hide a company logo in the generated report. If the enabled expression returns TRUE and the defined binding brings no image, the associated Excel image element will show an image that has been saved in the Excel template.
13. Close the page.
14. In the tree, expand 'labels: Container'.
 - Some labels that are presented in the preprinted cheque form will be included in the report when it's created for testing purposes. However, those labels won't be printed during real printing, because the preprinted form already includes them.
15. Close the page.

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Generate reports in Office format that have embedded images

2/18/2021 • 3 minutes to read • [Edit Online](#)

The following steps explain how a user playing either 'System administrator' or 'Electronic reporting developer' role can design Electronic reporting (ER) configurations to generate electronic documents in MS office formats (Excel and Word) containing embedded images.

In this example, you will use created ER configurations for sample company, 'Litware, Inc.'. To complete these steps, you must first complete the steps in the "ER Make reports in MS Office formats with embedded images (Part 2: Review configurations)" task guide. These steps can be performed in 'USMF' company.

Run format with initial model mapping

1. Go to Cash and bank management > Bank accounts > Bank accounts.
2. Use the Quick Filter to filter on the Bank account field with a value of 'USMF OPER'.
3. On the Action Pane, click Set up.
4. Click Check.
5. Click Print test.
 - Run the format for testing purposes.
6. Select Yes in the Negotiable check format field.
7. Click OK.
 - Review the created output. The company logo is presented in the report as well as the authorized person's signature. The signature image is taken from the field of the 'Container' data type of the cheque layout record that is associated with the selected bank account.
8. Expand the Copies section.
9. Click Edit.
10. In the Watermark field, enter 'Print watermark as Void'.
 - Change the watermark layout setting to show the watermark text in generating document in an Excel shape element.
11. Click Print test.
12. Click OK.
 - Review the created output. The watermark is shown in the created report in accordance to the selection option.
13. Close the page.
14. On the Action Pane, click Manage payments.
15. Click Checks.
16. Click Show filters.
17. Apply the following filters: Enter a filter value of "381","385","389" on the "Check number" field using the "is one of" filter operator.
18. In the list, mark all rows.
19. Click Print check copy.
 - Run the format to reprint the selected cheques.
 - Review the created output. The selected cheques have been reprinted. The company logo and labels are not printed out since they are presented on the pre-printed form.

Modify the mapping of the imported data model

1. Close the page.
2. Close the page.
3. Go to Organization administration > Electronic reporting > Configurations.
4. In the tree, select 'Model for cheques'.
5. Click Designer.
6. Click Map model to datasource.
7. Click Designer.
 - We will change the binding of the data model's signature item to get the signature image from the file that has been attached to the cheque layout record that is associated with the selected bank account.
8. Turn off Show details.
9. In the tree, expand 'layout'.
10. In the tree, expand 'layout\signature'.
11. In the tree, select 'layout\signature\image = chequesaccount.<Relations'.BankChequeLayout.Signature1Bmp'.
12. In the tree, expand 'chequesaccount'.
13. In the tree, expand 'chequesaccount<Relations'.
14. In the tree, expand 'chequesaccount<Relations\BankChequeLayout'.
15. In the tree, expand 'chequesaccount<Relations\BankChequeLayout<Relations'.
16. In the tree, expand 'chequesaccount<Relations\BankChequeLayout<Relations<Documents'.
17. In the tree, select 'chequesaccount<Relations\BankChequeLayout<Relations<Documents\getFileContentAsContainer()'.
18. Click Bind.
19. Click Save.
20. Close the page.
21. Close the page.
22. Close the page.
23. Close the page.

Run format using the adjusted model mapping

1. Go to Cash and bank management > Bank accounts > Bank accounts.
2. Use the Quick Filter to find records. For example, filter on the Bank account field with a value of 'USMF OPER'.
3. On the Action Pane, click Set up.
4. Click Check.
5. Click Print test.
6. Click OK.
 - Review the created output. The image from the Document Management attachment is presented as the signature of an authorized person.

Use MS Word document as a template in the imported format

1. Close the page.
2. Close the page.
3. Go to Organization administration > Electronic reporting > Configurations.
4. In the tree, expand 'Model for cheques'.
5. In the tree, select 'Model for cheques\Cheques printing format'.

6. Click Designer.
7. Click Attachments.
8. Click Delete.
9. Click Yes.
10. Click New.
11. Click File.
 - Click Browse and select the downloaded in advance 'Cheque template Word.docx' file.
12. Close the page.
13. In the Template field, enter or select a value.
14. Click Save.
15. Close the page.
16. Click Edit.
17. Select Yes in the Run Draft field.
18. Close the page.
19. Go to Cash and bank management > Bank accounts > Bank accounts.
20. Use the Quick Filter to filter on the Bank account field with a value of 'USMF OPER'.
21. Click Check.
22. Click Print test.
23. Click OK.
 - Review the created output. The output has been generated as a Word document with embedded images presenting the company logo, the signature of an authorized person and the selected text of the watermark.

NOTE

Can you tell us about your documentation language preferences? [Take a short survey](#).

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Modify Electronic reporting formats by reapplying Excel templates

2/18/2021 • 2 minutes to read • [Edit Online](#)

The Electronic reporting (ER) tool is used to generate business documents in an electronic format. To generate a business document, you must create an ER format, and then use the ER designer to define the layout of the business document and specify the data that should be included in it. You can then run the ER format to generate the business document.

The ER tool can be used to generate business documents as Microsoft Excel files. You can use an Excel document as a template for these documents. To define the document layout in the ER designer, you can import the contents of the Excel document that you want to use as a template into the defined ER format. For more details, and to practice this scenario, play the task guide **ER Design a configuration for generating reports in OPENXML format** (part of the 7.5.4.3 Acquire/Develop IT service/solution components (10677) business process).

If you edit the Excel document that is used as a template for a business document, new ER functionality lets you reapply the updated template to the ER format. The ER format is then updated so that it adheres to the updated template. For more details about this functionality, play the task guide **ER Modify a format by reapplying an Excel template** (part of the 7.5.5.3 Acquire/Develop IT service/solution components (10683) business process). In the task guide step where you import an updated template, use the modified template of the Payment Report Excel file, SampleVendPaymWsReport2, as a template.

NOTE

Can you tell us about your documentation language preferences? [Take a short survey.](#)

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Define the dependency of ER configurations on other components

2/18/2021 • 6 minutes to read • [Edit Online](#)

To complete these steps, you must first complete the steps in the task guide, ER Manage model mapping configurations, and you must have access to Microsoft Dynamics Lifecycle Services (LCS).

This procedure shows how to design an Electronic reporting (ER) configuration and specify its dependency from other software components, so that you can help guarantee that the configuration is correctly downloaded to a specific version of Finance and Operations. In this example, you will create required ER configurations for the sample company Litware, Inc.

This procedure is intended for users who have the System administrator or Electronic reporting developer role assigned to them. The steps can be performed in any company, because ER configurations are shared among companies.

1. Go to Organization administration > Electronic reporting > Configurations.
 - Make sure that the configurations tree contains the 'Sample data model' configuration and subordinate items. Otherwise, complete the steps in the task guide, ER Manage model mapping configurations, and then start this guide again.

Define the dependency of ER configurations from other components

1. In the tree, expand 'Sample data model'.
2. In the tree, select 'Sample data model\Sample mapping'.
 - We selected the draft version of the 'Sample mapping' model mapping configuration. We will now define its dependency from other software components. This step is considered a prerequisite for controlling the download of this configuration's version from an ER repository and any further use of this version.
3. Expand the Prerequisites section.
 - Note that the 'Implementations' prerequisites group has been added automatically at this stage. This group contains the prerequisite component that refers to the data model configuration and has the Implementation flag turned on. This flag indicates that the 'Sample mapping' mapping configuration is considered the implementation of the 'Sample data model' data model. This component will force ER to download the 'Sample mapping' mapping configuration from an ER repository whenever the 'Sample data model' model configuration is downloaded.
4. Click Edit.
 - A single dependency of the current version of a configuration from a software component can be specified by using the definition of the component's type, and either the component version or a range of component versions.
 - Desired dependencies can be grouped together. When the 'All of' grouping type is selected, the dependency condition of this group is considered satisfied when each dependency condition from this group and subordinate group is satisfied. When the 'One of' grouping type is selected, the dependency condition of this group is considered satisfied when at least one dependency condition from this group is satisfied.
5. Click New.
6. Select Product prerequisite component.
7. Select Microsoft Dynamics 365 for Operations (1611).

8. In the Version field, type '[7.1.1541.3036,8)'.
 - [7.1.1541.3036,8)
 - Dependencies that you enter will be evaluated when this configuration is downloaded from any ER repository. This configuration version will be downloaded from the ER repository when version 1 of the 'Sample data model' configuration is either already in place or downloaded in advance. If it's downloaded in advance, it must be completed in Finance and Operations version 7.1.1541.3036 or later, but must not exceed major version 8.
9. Click Save.
10. Close the page.
11. Click Change status.
12. Click Complete.
13. Click OK.
14. In the tree, select 'Sample data model\Sample mapping (alternative)'.- 15. Click Edit.
- 16. Click New.
- 17. Select Product prerequisite component.
- 18. Select Microsoft Dynamics AX 7.0 RTW.
- 19. In the Version field, type '[7.0.1265.3015,7.1)'.
 - [7.0.1265.3015,7.1)
 - Dependencies will be evaluated when the configuration is downloaded from any ER repository. This configuration version will be downloaded from the ER repository when version 1 of the 'Sample data model' configuration is either already in place or downloaded in advance. If it's downloaded in advance, it must be completed in Microsoft Dynamics 365 for Finance and Operations, Enterprise edition, the version of which must be 7.0.1265.3015 or later, but must not exceed minor version 1.
- 20. Click Save.
- 21. Close the page.
- 22. Click Change status.
- 23. Click Complete.
- 24. Click OK.

Configure the ER repository

1. Close the page.
2. Go to Organization administration > Workspaces > Electronic reporting.
 - Open the list of ER repositories for the current ER provider, Litware, Inc.
3. In the list, mark the selected row.
4. Click Repositories.
5. Click Show filters.
6. Enter a filter value of "LCS" on the "Type name" field using the "contains" filter operator.
 - If the LCS repository is already registered for the current ER provider, you can skip the remaining steps in this sub-task. If the LCS repository isn't already registered, complete the remaining steps.
7. Click Add to open the drop dialog.
8. In the Configuration repository type field, enter 'LCS'.
9. Click Create repository.
10. In the Project field, enter or select a value.
 - Select the desired LCS project from the lookup of the 'Project' field.
11. Click OK.
12. Close the page.

Upload configurations to LCS

1. Click Reporting configurations.
2. In the tree, select 'Sample data model'.
3. Select the completed version of this configuration.
4. Click Change status.
5. Click Share.
6. Click OK.
 - Version 1 of this model configuration has been uploaded to LCS by using the LCS project for the ER repository that was previously configured.
7. In the tree, expand 'Sample data model'.
8. In the tree, select 'Sample data model\Sample mapping'.
9. Select the completed version of this configuration.
10. Click Change status.
11. Click Share.
12. Click OK.
 - Version 1.1 of this model mapping configuration has been uploaded to LCS by using the LCS project for the ER repository that was previously configured.
13. In the tree, select 'Sample data model\Sample mapping (alternative)'.
14. Select the completed version of this configuration.
15. Click Change status.
16. Click Share.
17. Click OK.
 - Version 1.1 of this model mapping configuration has been uploaded to LCS by using the LCS project for the ER repository that was previously configured.

Evaluate ER configuration dependencies

We will delete created configurations from the system and download them back from the LCS repository.

1. In the tree, select 'Sample data model\Sample mapping'.
2. Click Delete.
3. Click Yes.
4. In the tree, select 'Sample data model\Sample mapping (alternative)'.
5. Click Delete.
6. Click Yes.
7. In the tree, select 'Sample data model\Sample format'.
8. Click Delete.
9. Click Yes.
10. In the tree, select 'Sample data model'.
11. Click Delete.
12. Click Yes.
13. Close the page.
 - Open the list of ER repositories for the current ER provider, Litware, Inc.
14. Click Repositories.
15. Click Show filters.
16. Enter a filter value of "LCS" on the "Type name" field using the "contains" filter operator.
17. Click Open.

18. In the tree, select 'Sample data model'.
 - Note that you can view an evaluation of whether prerequisite conditions have been satisfied for each version of the ER configurations for the current repository. To view this evaluation, click Check prerequisites.
19. Click Check prerequisites.
20. Click Import.
21. Click Yes.
22. Close the page.
23. Close the page.
24. Close the page.
25. Go to Organization administration > Electronic reporting > Configurations.
26. In the tree, expand 'Sample data model'.
 - Note that the model 'Sample mapping' mapping configuration has been downloaded together with the selected data model configuration. The two files are downloaded together because 'Sample mapping' has been defined as implementing the selected data model, and because it's applicable for the application. The 'Sample mapping (alternative)' configuration hasn't been downloaded because the condition for the required application version isn't satisfied.
 - If you sign in to Finance and Operations, register the same provider, access the same LCS project, and download the same data model configuration, the 'Sample mapping (alternative)' configuration will download, whereas the 'Sample mapping' configuration will be skipped.

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

ER Use financial dimensions as a data source (Part 1 - Design data model)

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The following steps explain how either a system administrator or electronic reporting developer can configure an Electronic reporting (ER) model to use financial dimensions as a data source for ER reports. These steps can be performed in any company.

To complete these steps, you must first complete the steps in the procedure, "Create a configuration provider and mark it as active".

Create a new data model

1. Go to Organization administration > Workspaces > Electronic reporting.
 - Make sure that the "Litware, Inc." provider is available and marked as active.
2. Click Reporting configurations.
3. Click Create configuration to open the drop dialog.
4. In the Name field, type 'Financial dimensions sample model'.
5. Click Create configuration.
6. Click Designer.
7. Click New to open the drop dialog.
8. In the Name field, type 'Entry'.
9. Click Add.
10. Click New to open the drop dialog.
11. In the Name field, type 'Company'.
12. Click Add.
 - We will add to our model a new record list. This list will expose (for any ER reports using this model as data source) the settings of selected financial dimensions. Each financial dimension will be presented in this list as a record with appropriate fields representing dimension's setting.
13. Click New to open the drop dialog.
14. In the Name field, type 'Dimensions setting'.
15. In the Item type field, select 'Record list'.
16. Click Add.
17. Click New to open the drop dialog.
18. In the Name field, type 'Code'.
19. In the Item type field, select 'String'.
20. Click Add.
21. Click New to open the drop dialog.
22. In the Name field, type 'Name'.
23. Click Add.
24. In the tree, select 'Entry'.
25. Click New to open the drop dialog.
26. In the Name field, type 'Journal'.
27. In the Item type field, select 'Record list'.
28. Click Add.

29. Click New to open the drop dialog.
30. In the Name field, type 'Batch'.
31. In the Item type field, select 'String'.
32. Click Add.
33. Click New to open the drop dialog.
34. In the Name field, type 'Transaction'.
35. In the Item type field, select 'Record list'.
36. Click Add.
37. Click New to open the drop dialog.
38. In the Name field, type 'Date'.
39. In the Item type field, select 'Date'.
40. Click Add.
41. Click New to open the drop dialog.
42. In the Name field, type 'Debit'.
43. In the Item type field, select 'Real'.
44. Click Add.
45. Click New to open the drop dialog.
46. In the Name field, type 'Credit'.
47. Click Add.
48. Click New to open the drop dialog.
49. In the Name field, type 'Currency'.
50. In the Item type field, select 'String'.
51. Click Add.
52. Click New to open the drop dialog.
53. In the Name field, type 'Voucher'.
54. Click Add.
55. Click New to open the drop dialog.
56. In the Name field, type 'Dimensions data'.
57. In the Item type field, select 'Record list'.
58. Click Add.
 - We added to our model a new record list. This list will expose (for any ER reports using this model as data source) the values of selected financial dimensions. Each financial dimension will be presented in this list as a record with appropriate fields representing dimension's values. Dimension name will be also presented in this record as a field to be used, if needed, for selection purposes.
59. Click New to open the drop dialog.
60. In the Name field, type 'Code'.
61. In the Item type field, select 'String'.
62. Click Add.
63. Click New to open the drop dialog.
64. In the Name field, type 'Description'.
65. Click Add.
66. Click New to open the drop dialog.
67. In the Name field, type 'Name'.
68. Click Add.
69. Click Save.
70. Close the page.

Finance and Operations Preview Search for a page USMF

Save Create model Compare Map model to datasource Translate Options

Data model | FINANCIAL DIMENSIONS SAMPLE MODEL : 1

Financial dimensions sample model

SEARCH

- Entry
 - Company
- Dimensions setting
 - Code
 - Name
- Journal
 - Batch
- Transaction
 - Credit
 - Currency
 - Date
 - Debit
 - Dimensions data**
 - Code
 - Description
 - Name
 - Voucher

Data model

Root reference

GENERAL

Name: Financial dimensions sample m...

Description:

Node

Go to referenced item Switch item reference

GENERAL

Name: Dimensions data

Type: Record list

Label (*Recommended to use labels):

Description:

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

ER Use financial dimensions as a data source (Part 2 - Model mapping)

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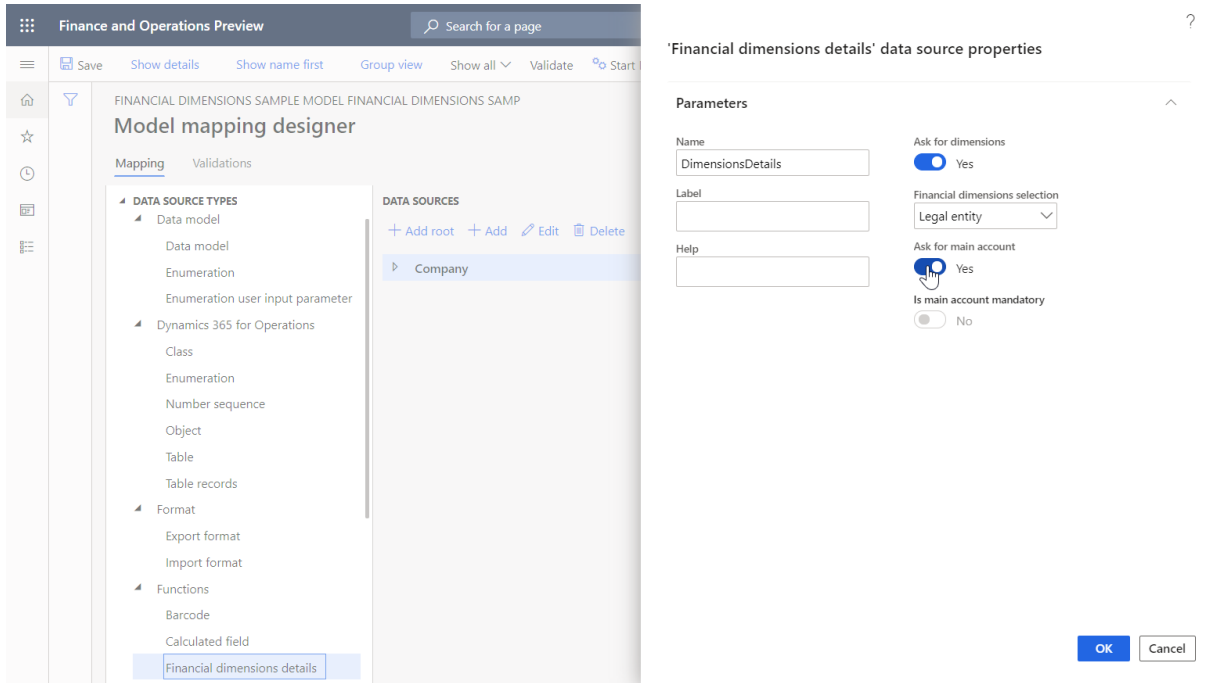
The following steps explain how a user assigned to the system administrator or electronic reporting developer role can configure an Electronic reporting (ER) model to use financial dimensions as a data source for ER reports. These steps can be performed in any company.

To complete these steps, you must first complete the steps in the "ER Use financial dimensions as a data source (Part 1: Design data model)" procedure.

Add required data sources to model mapping

1. Go to Organization administration > Electronic reporting > Configurations.
2. In the tree, select 'Financial dimensions sample model'.
3. Click Designer.
4. Click Map model to datasource.
5. Click New.
6. In the Definition field, select Entry.
7. In the Name field, type 'Dimensions data mapping'.
8. In the Description field, type 'Dimensions data mapping'.
9. Click Save.
10. Click Designer.
11. In the tree, select 'Dynamics 365 for Operations\Table'.
12. Click Add root.
13. In the Name field, type 'Company'.
14. In the Table field, type 'CompanyInfo'.
15. Click OK.
16. In the tree, select 'Functions\Financial dimensions details'.
17. Click Add root.
 - This data source specifies how the scope of financial dimensions will be defined for any report that will use this model as a data source.
18. In the Name field, type a value.
19. Select Yes in the Ask for dimensions field.
 - Select Yes to allow the user to select dimensions at run-time on the User dialog form. If set to No, all financial dimensions of the current instance will be used by default.
20. In the Financial dimensions selection field, select 'Legal entity'.
 - Select All to allow the user to select desired dimensions for the current instance in the Lookup field. Select Legal entity to allow the user to select dimensions for the company in the Lookup field. Select Dimension to allow the user to select dimensions using a single dimension set.
21. Select Yes in the Ask for main account field.
 - Set 'Ask for main account' to Yes to allow users to select the main account as part of the list of dimensions. If set to No, the main account will not be included to the list of dimensions and the 'Is main account mandatory' option is enabled. If 'Is main account mandatory' is set to Yes, include the main account in the list of dimensions regardless of the user's selection.

22. Click OK.



23. In the tree, select 'Dynamics 365 for Operations\Table records'.

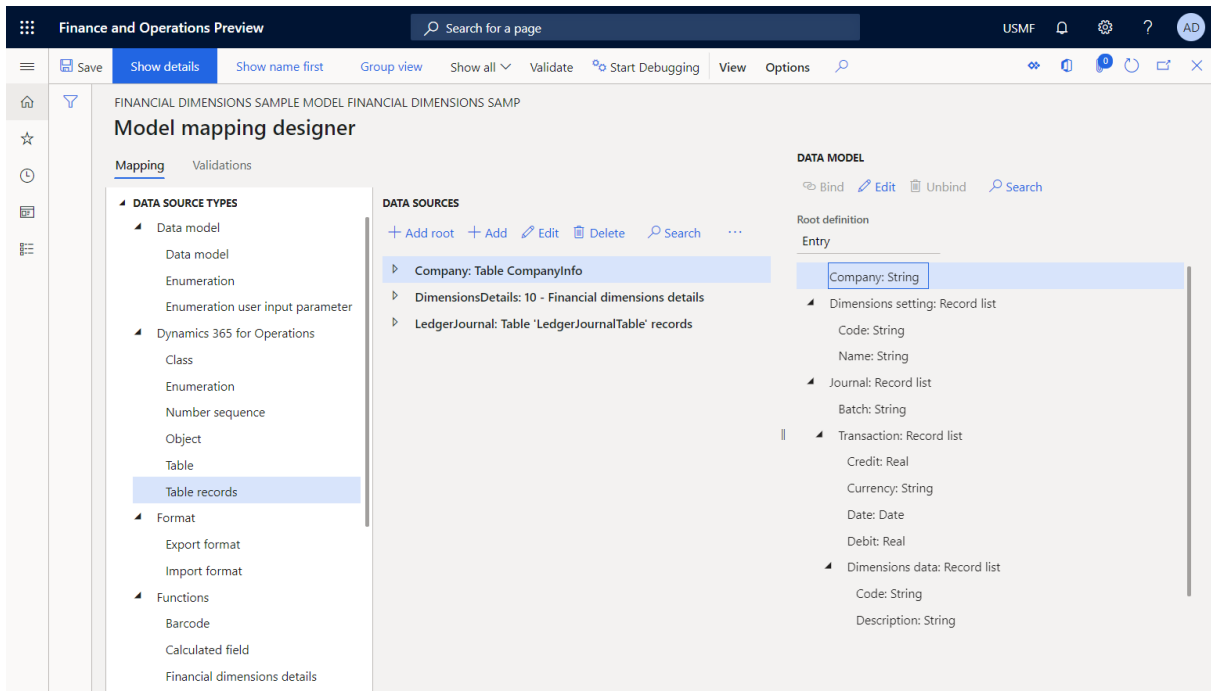
24. Click Add root.

25. In the Name field, type 'LedgerJournal'.

26. Select Yes in the Ask for query field.

27. In the Table field, type 'LedgerJournalTable'.

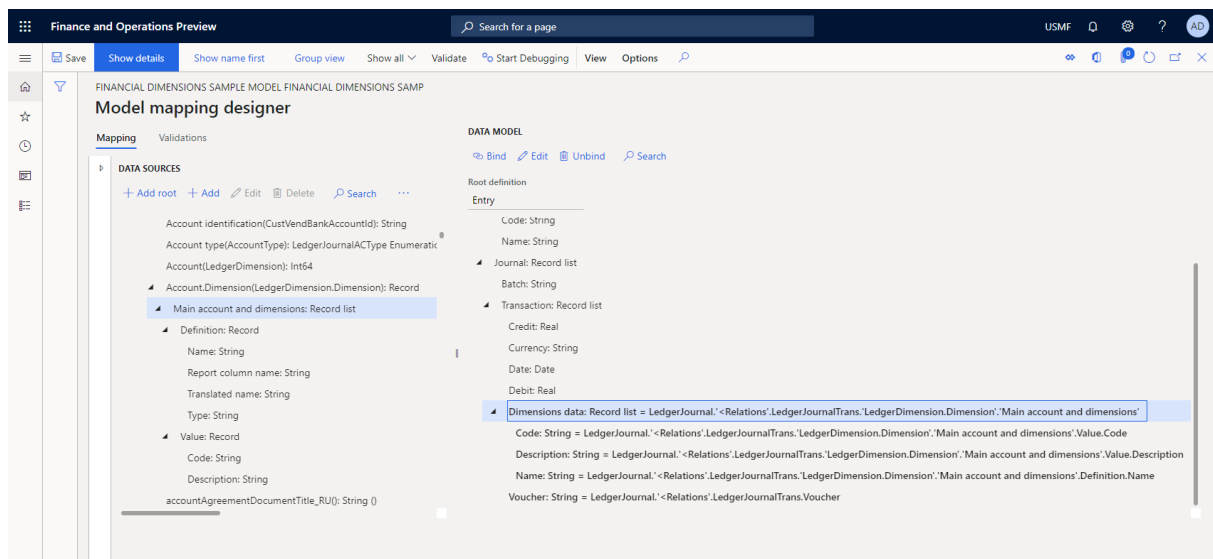
28. Click OK.



Map data model elements to added data sources

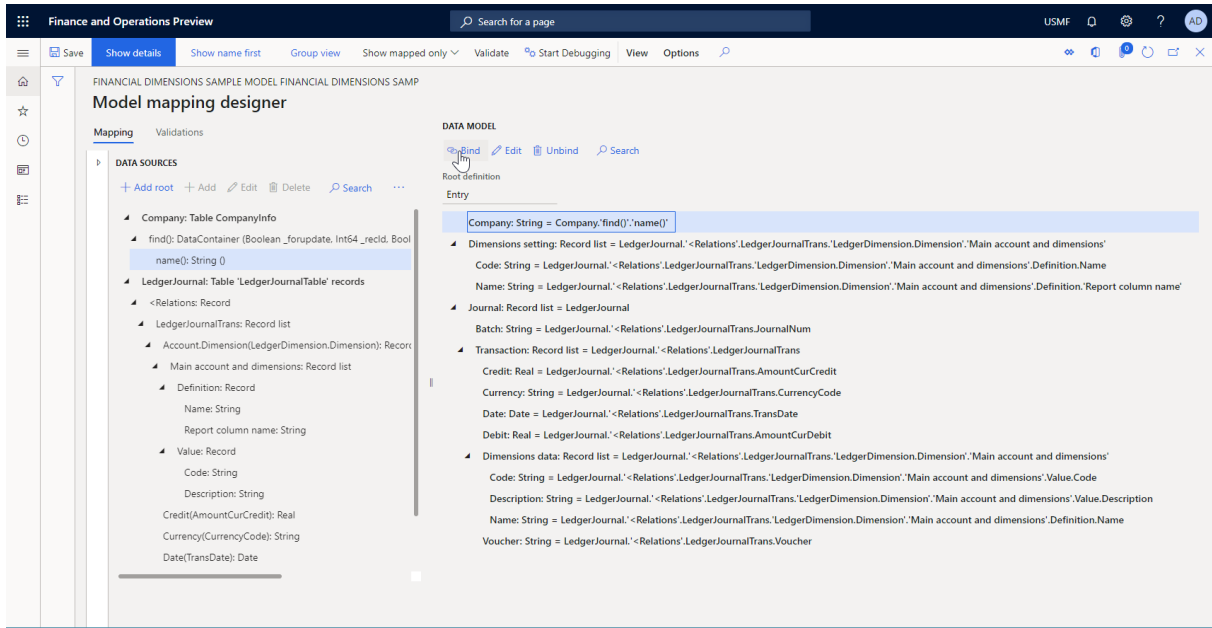
1. In the tree, expand 'Journal'.
2. In the tree, expand 'Journal\Transaction'.
3. In the tree, expand 'Journal\Transaction\Dimensions data'.
4. In the tree, expand 'Dimensions setting'.
5. In the tree, expand 'LedgerJournal'.
6. In the tree, expand 'LedgerJournal<Relations'.

7. In the tree, expand 'LedgerJournal<Relations\LedgerJournalTrans'.
8. In the tree, select 'LedgerJournal<Relations\LedgerJournalTrans\Voucher'.
9. In the tree, select 'Journal\Transaction\Voucher'.
10. Click Bind.
11. In the tree, select
'LedgerJournal<Relations\LedgerJournalTrans\Account.Dimension(LedgerDimension.Dimension)'.
 - Note that for any reference to financial dimensions that is set to, for instance, LedgerDimension, a corresponding data source item is available (LedgerDimension.Dimension). This data source item offers the financial dimensions of that dimensions set as the record's list.
12. In the tree, expand
'LedgerJournal<Relations\LedgerJournalTrans\Account.Dimension(LedgerDimension.Dimension)'.
13. In the tree, expand
'LedgerJournal<Relations\LedgerJournalTrans\Account.Dimension(LedgerDimension.Dimension)\Main account and dimensions'.
14. In the tree, expand
'LedgerJournal<Relations\LedgerJournalTrans\Account.Dimension(LedgerDimension.Dimension)\Main account and dimensions\Value'.
15. In the tree, expand
'LedgerJournal<Relations\LedgerJournalTrans\Account.Dimension(LedgerDimension.Dimension)\Main account and dimensions\Definition'.
16. In the tree, select
'LedgerJournal<Relations\LedgerJournalTrans\Account.Dimension(LedgerDimension.Dimension)\Main account and dimensions\Definition\Name'.
17. In the tree, select 'Journal\Transaction\Dimensions data\Name'.
18. Click Bind.
19. In the tree, select
'LedgerJournal<Relations\LedgerJournalTrans\Account.Dimension(LedgerDimension.Dimension)\Main account and dimensions\Value\Description'.
20. In the tree, select 'Journal\Transaction\Dimensions data\Description'.
21. Click Bind.
22. In the tree, select
'LedgerJournal<Relations\LedgerJournalTrans\Account.Dimension(LedgerDimension.Dimension)\Main account and dimensions\Value\Code'.
23. In the tree, select 'Journal\Transaction\Dimensions data\Code'.
24. Click Bind.
25. In the tree, select
'LedgerJournal<Relations\LedgerJournalTrans\Account.Dimension(LedgerDimension.Dimension)\Main account and dimensions'.
26. In the tree, select 'Journal\Transaction\Dimensions data'.
27. Click Bind.



28. In the tree, select 'LedgerJournal<Relations>LedgerJournalTrans\Debit(AmountCurDebit)'.
29. In the tree, select 'Journal\Transaction\Debit'.
30. Click Bind.
31. In the tree, select 'LedgerJournal<Relations>LedgerJournalTrans\Date(TransDate)'.
32. In the tree, select 'Journal\Transaction\Date'.
33. Click Bind.
34. In the tree, select 'LedgerJournal<Relations>LedgerJournalTrans\Currency(CurrencyCode)'.
35. In the tree, select 'Journal\Transaction\Currency'.
36. Click Bind.
37. In the tree, select 'LedgerJournal<Relations>LedgerJournalTrans\Credit(AmountCurCredit)'.
38. In the tree, select 'Journal\Transaction\Credit'.
39. Click Bind.
40. In the tree, select 'LedgerJournal<Relations>LedgerJournalTrans'.
41. In the tree, select 'Journal\Transaction'.
42. Click Bind.
43. In the tree, select 'LedgerJournal\Journal batch number(JournalNum)'.
44. In the tree, select 'Journal\Batch'.
45. Click Bind.
46. In the tree, select 'LedgerJournal'.
47. In the tree, select 'Journal'.
48. Click Bind.
49. In the tree, expand 'Dimensions'.
50. In the tree, expand 'Dimensions\Main account and dimensions'.
51. In the tree, expand 'Dimensions\Main account and dimensions\Definition'.
52. In the tree, select 'Dimensions\Main account and dimensions\Definition\Name'.
53. In the tree, select 'Dimensions setting\Code'.
54. Click Bind.
55. In the tree, select 'Dimensions\Main account and dimensions\Definition\Report column name'.
56. In the tree, select 'Dimensions setting\Name'.
57. Click Bind.
58. In the tree, select 'Dimensions\Main account and dimensions'.
59. In the tree, select 'Dimensions setting'.
60. Click Bind.
61. In the tree, select 'Company'.

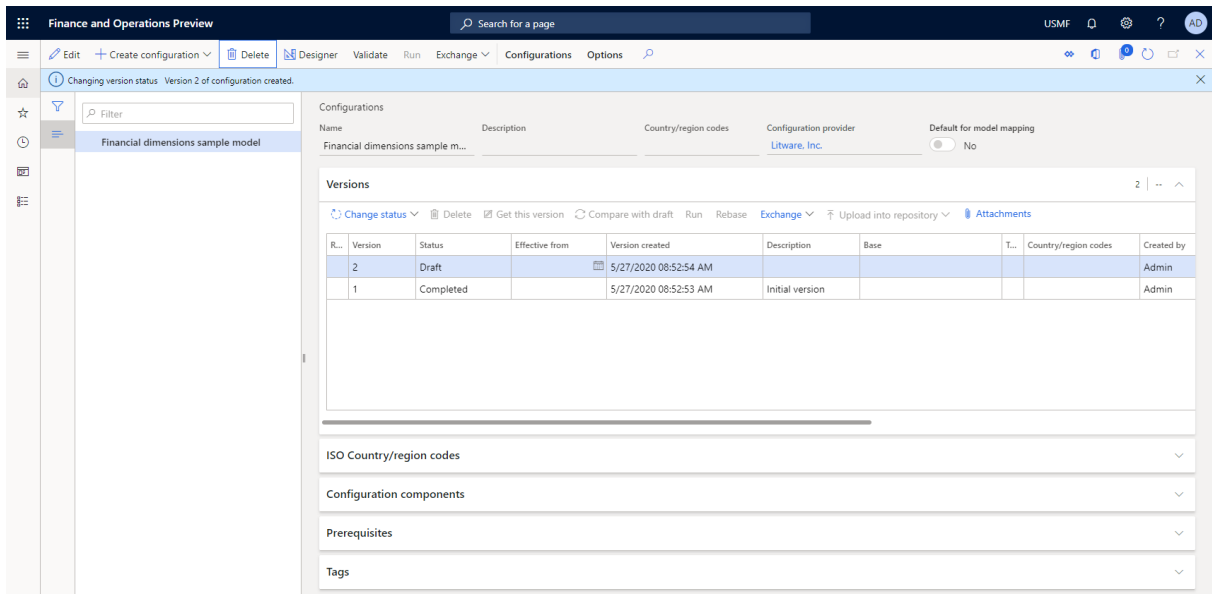
62. Click Edit.
63. In the expressionAsStringText field, enter 'Company.find().name()'.
 - Company.find().name()
64. Click Save.



65. Close the page.
66. Click Save.
67. Close the page.

Complete this draft model's version

1. Close the page.
2. Close the page.
3. Click Change status.
4. Click Complete.
5. Click OK.



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ER Use financial dimensions as a data source (Part 3 - Design the report)

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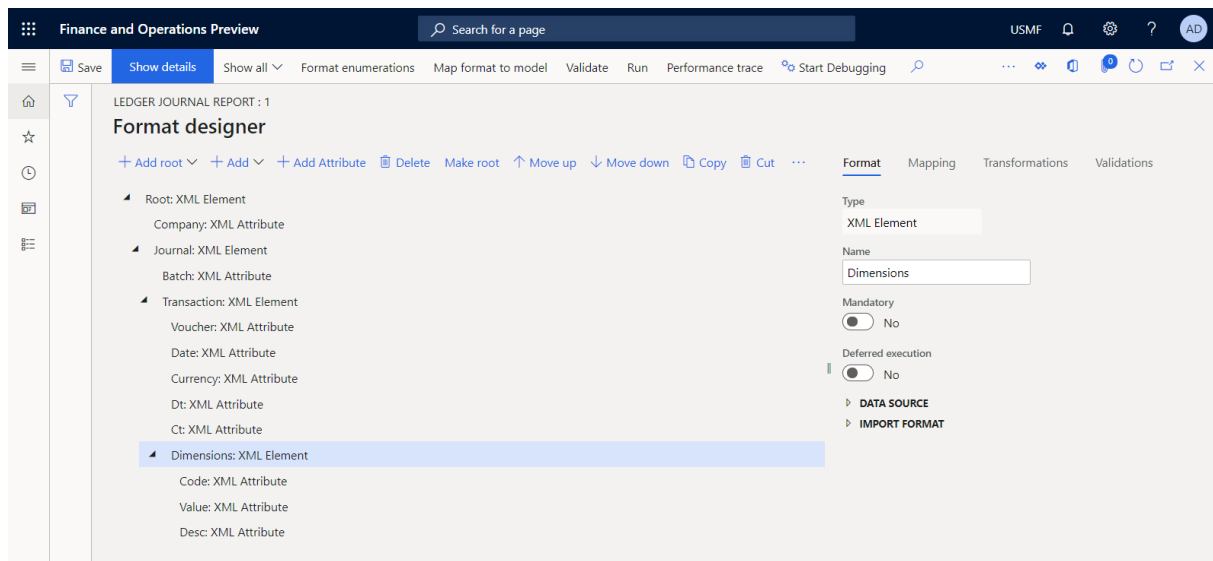
The following steps explain how a user assigned to the system administrator or electronic reporting developer role can configure an Electronic reporting (ER) model to use financial dimensions as a data source for ER reports. These steps can be performed in any company.

To complete these steps, you must first complete the steps in the "ER Use financial dimensions as a data source (Part 2: Model mapping)" procedure.

Design a report to present financial dimensions

1. Go to Organization administration > Electronic reporting > Configurations.
2. In the tree, select 'Financial dimensions sample model'.
3. Click Create configuration to open the drop dialog.
4. In the New field, enter 'Format based on data model Financial dimensions sample model'.
 - Use the model that was created in advance as the data source for your new report.
5. In the Name field, type 'Ledger journal report'.
6. In the Data model definition field, select Entry.
7. Click Create configuration.
8. Click Designer.
9. Click Add root to open the drop dialog.
10. In the tree, select 'XML\Element'.
11. In the Name field, type 'Root'.
12. Click OK.
13. Click Add to open the drop dialog.
14. In the tree, select 'XML\Attribute'.
15. In the Name field, type 'Company'.
16. Click OK.
17. Click Add to open the drop dialog.
18. In the tree, select 'XML\Element'.
19. In the Name field, type 'Journal'.
20. Click OK.
21. In the tree, select 'Root: XML Element\Journal: XML Element'.
22. Click Add to open the drop dialog.
23. In the tree, select 'XML\Attribute'.
24. In the Name field, type 'Batch'.
25. Click OK.
26. Click Add to open the drop dialog.
27. In the tree, select 'XML\Element'.
28. In the Name field, type 'Transaction'.
29. Click OK.
30. In the tree, select 'Root: XML Element\Journal: XML Element\Transaction: XML Element'.
31. Click Add to open the drop dialog.

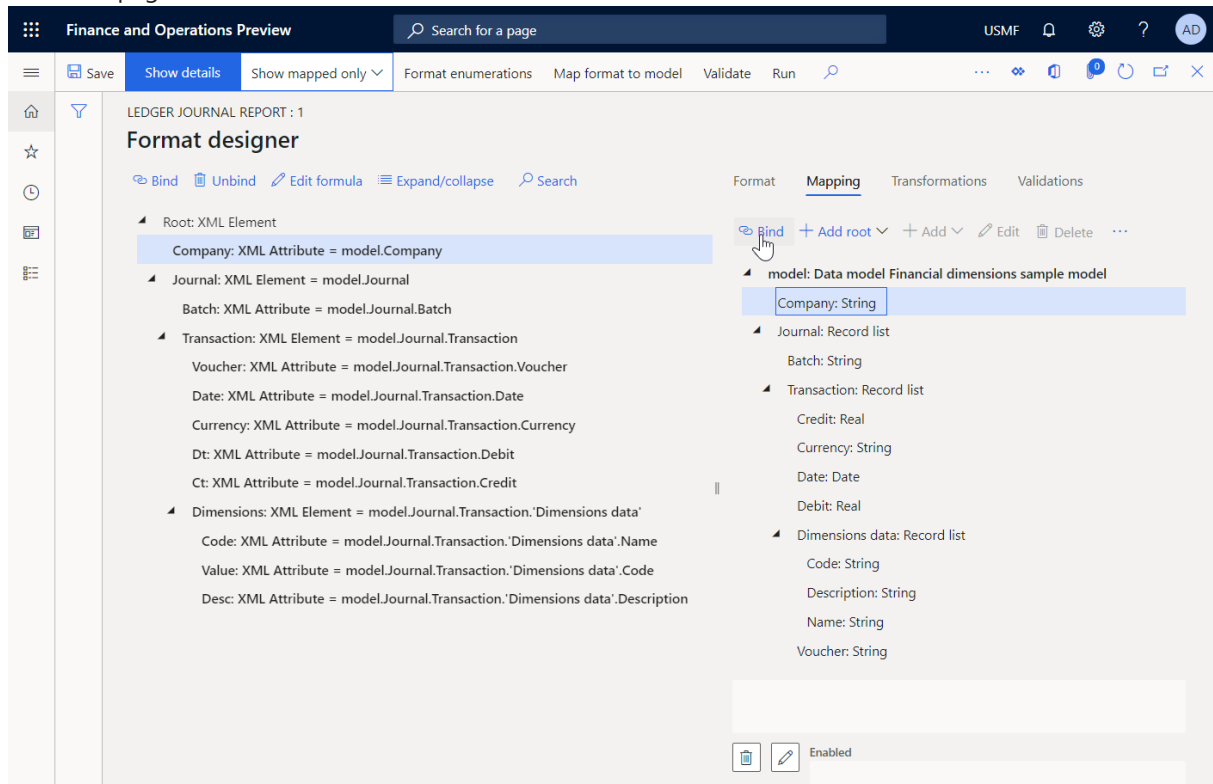
32. In the tree, select 'XML\Attribute'.
33. In the Name field, type 'Voucher'.
34. Click OK.
35. Click Add Attribute.
36. In the Name field, type 'Date'.
37. Click OK.
38. Click Add Attribute.
39. In the Name field, type 'Currency'.
40. Click OK.
41. Click Add Attribute.
42. In the Name field, type 'Dt'.
43. Click OK.
44. Click Add Attribute.
45. In the Name field, type 'Ct'.
46. Click OK.
47. Click Add to open the drop dialog.
48. In the tree, select 'XML\Element'.
49. In the Name field, type 'Dimensions'.
50. Click OK.
51. In the tree, select 'Root: XML Element\Journal: XML Element\Transaction: XML Element\Dimensions: XML Element'.
52. Click Add to open the drop dialog.
53. In the tree, select 'XML\Attribute'.
54. In the Name field, type 'Code'.
55. Click OK.
56. Click Add Attribute.
57. In the Name field, type 'Value'.
58. Click OK.
59. Click Add Attribute.
60. In the Name field, type 'Desc'.
61. Click OK.



Map report elements to data sources

1. Click the Mapping tab.
2. In the tree, expand 'model: Data model Financial dimensions sample model'.
3. In the tree, expand 'model: Data model Financial dimensions sample model\Journal: Record list'.
4. In the tree, expand 'model: Data model Financial dimensions sample model\Journal: Record list\Transaction: Record list'.
5. In the tree, expand 'model: Data model Financial dimensions sample model\Journal: Record list\Transaction: Record list\Dimensions data: Record list'.
6. In the tree, select 'Root: XML Element\Journal: XML Element\Transaction: XML Element\Dimensions: XML Element\Desc: XML Attribute'.
7. In the tree, select 'model: Data model Financial dimensions sample model\Journal: Record list\Transaction: Record list\Dimensions data: Record list\Description: String'.
8. Click Bind.
9. In the tree, select 'Root: XML Element\Journal: XML Element\Transaction: XML Element\Dimensions: XML Element\Value: XML Attribute'.
10. In the tree, select 'model: Data model Financial dimensions sample model\Journal: Record list\Transaction: Record list\Dimensions data: Record list\Code: String'.
11. Click Bind.
12. In the tree, select 'Root: XML Element\Journal: XML Element\Transaction: XML Element\Dimensions: XML Element\Code: XML Attribute'.
13. In the tree, select 'model: Data model Financial dimensions sample model\Journal: Record list\Transaction: Record list\Dimensions data: Record list\Name: String'.
14. Click Bind.
15. In the tree, select 'model: Data model Financial dimensions sample model\Journal: Record list\Transaction: Record list\Dimensions data: Record list'.
16. In the tree, select 'Root: XML Element\Journal: XML Element\Transaction: XML Element\Dimensions: XML Element'.
17. Click Bind.
18. In the tree, select 'Root: XML Element\Journal: XML Element\Transaction: XML Element\Ct: XML Attribute'.
19. In the tree, select 'model: Data model Financial dimensions sample model\Journal: Record list\Transaction: Record list\Credit: Real'.
20. Click Bind.
21. In the tree, select 'Root: XML Element\Journal: XML Element\Transaction: XML Element\Dt: XML Attribute'.
22. In the tree, select 'model: Data model Financial dimensions sample model\Journal: Record list\Transaction: Record list\Debit: Real'.
23. Click Bind.
24. In the tree, select 'Root: XML Element\Journal: XML Element\Transaction: XML Element\Currency: XML Attribute'.
25. In the tree, select 'model: Data model Financial dimensions sample model\Journal: Record list\Transaction: Record list\Currency: String'.
26. Click Bind.
27. In the tree, select 'Root: XML Element\Journal: XML Element\Transaction: XML Element\Date: XML Attribute'.
28. In the tree, select 'model: Data model Financial dimensions sample model\Journal: Record list\Transaction: Record list\Date: Date'.
29. Click Bind.
30. In the tree, select 'Root: XML Element\Journal: XML Element\Transaction: XML Element\Voucher: XML Attribute'.
31. In the tree, select 'model: Data model Financial dimensions sample model\Journal: Record list\Transaction: Record list\Voucher: String'.

32. Click Bind.
33. In the tree, select 'Root: XML Element\Journal: XML Element\Transaction: XML Element'.
34. In the tree, select 'model: Data model Financial dimensions sample model\Journal: Record list\Transaction: Record list'.
35. Click Bind.
36. In the tree, select 'Root: XML Element\Journal: XML Element\Batch: XML Attribute'.
37. In the tree, select 'model: Data model Financial dimensions sample model\Journal: Record list\Batch: String'.
38. Click Bind.
39. In the tree, select 'Root: XML Element\Journal: XML Element'.
40. In the tree, select 'model: Data model Financial dimensions sample model\Journal: Record list'.
41. Click Bind.
42. In the tree, select 'Root: XML Element\Company: XML Attribute'.
43. In the tree, select 'model: Data model Financial dimensions sample model\Company: String'.
44. Click Bind.
45. Click Save.
46. Close the page.



NOTE

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ER Use financial dimensions as a data source (Part 4 - Run the report)

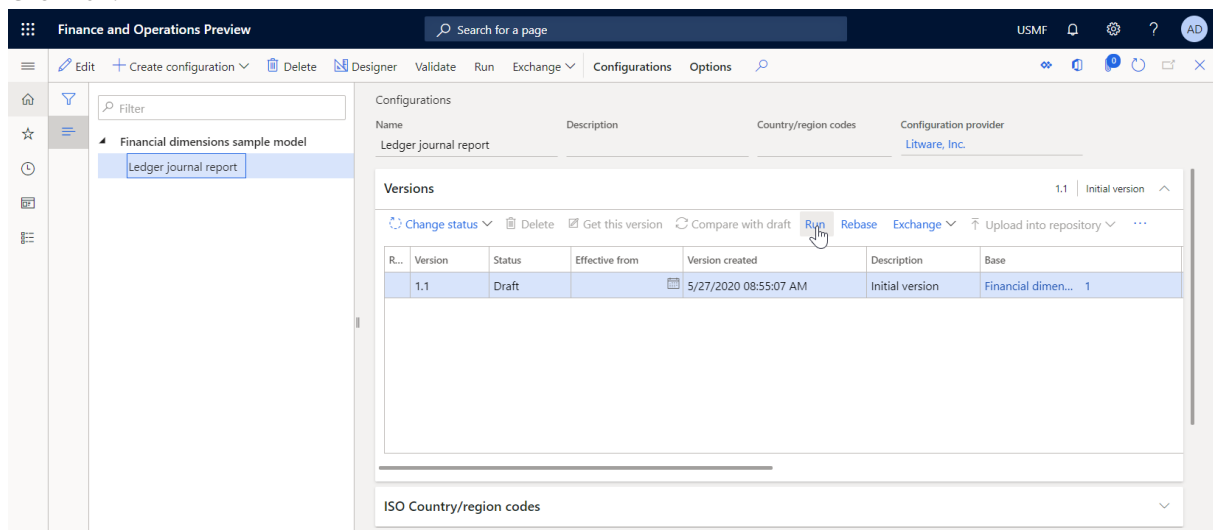
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The following steps explain how a user assigned to the system administrator or electronic reporting developer role can configure an Electronic reporting (ER) model to use financial dimensions as a data source for ER reports. These steps can be performed in the DEMF company.

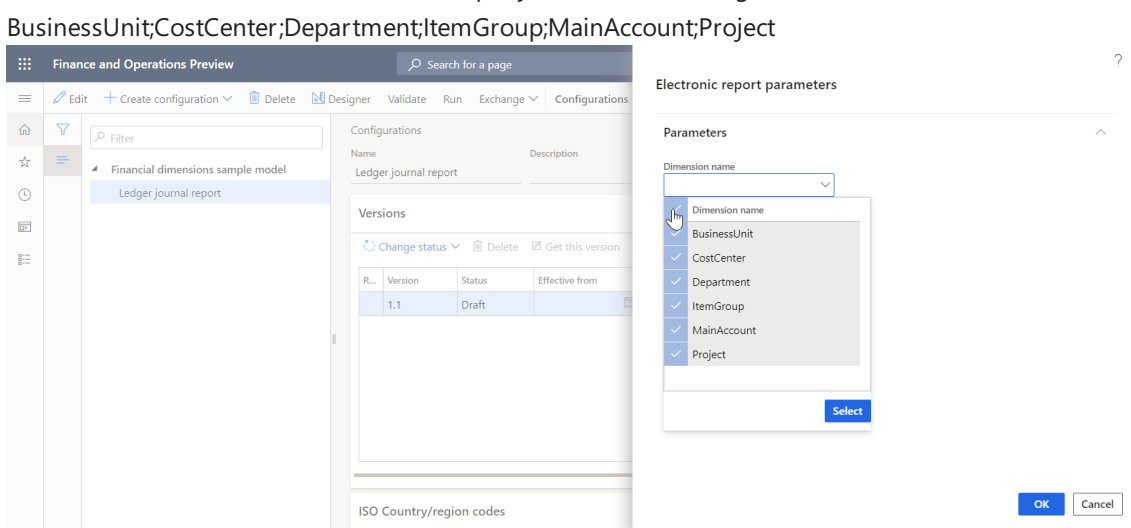
To complete these steps, you must first complete the steps in the "ER Use financial dimensions as a data source (Part 3: Design the report)" procedure. You must also configure default document types on the Electronic reporting parameters page. Default document types are also set when you download and import any ER configuration.

Run report

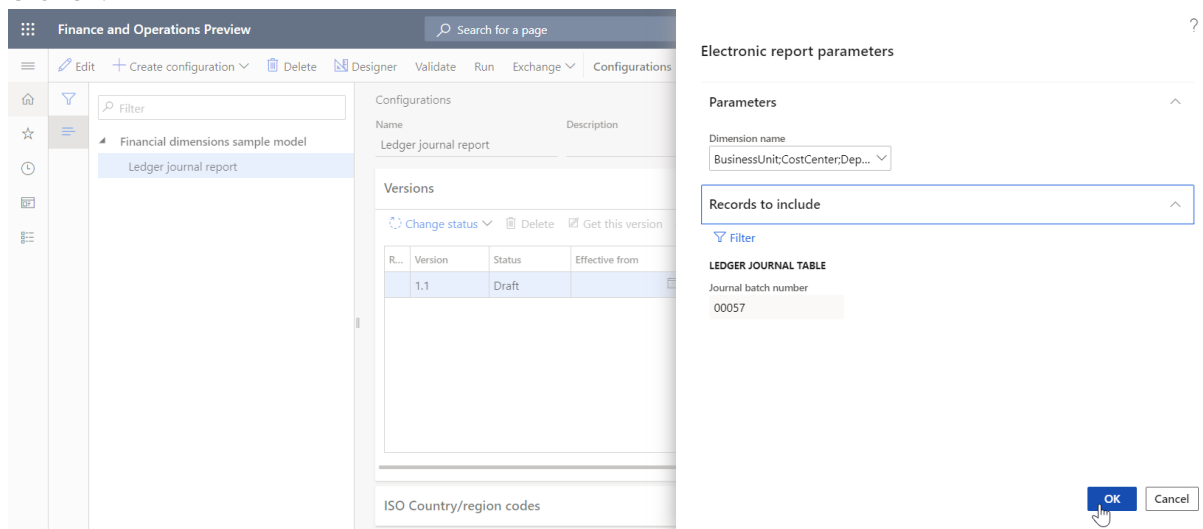
1. Go to Organization administration > Electronic reporting > Configurations.
2. In the tree, expand 'Financial dimensions sample model'.
3. In the tree, select 'Financial dimensions sample model\Ledger journal report'.
4. Click Run.



5. In the Dimension name field, enter or select a value.
- To select all dimensions in the current company, enter the following information:
BusinessUnit;CostCenter;Department;ItemGroup;MainAccount;Project



6. Expand the Records to include section.
7. Click Filter.
8. Select the row for the Ledger journal table and the Journal batch number field.
9. In the Criteria field, type '00057'.
10. Click OK.
11. Click OK.



- Review the generated output. For each transaction of the selected batch, the financial dimensions from the corresponding dimensions set are presented. Run this report and select different dimensions to see that the report is not dependent on the number of selected dimensions or the number of dimensions configured for this instance.

```

<?xml version="1.0" encoding="UTF-8"?>
<Root Company="Contoso Entertainment System Germany">
  <Journal Batch="00057">
    <Transaction Ct="0" Dt="1800" Currency="EUR" Date="2015-01-20" Voucher="GNJL000005">
      <Dimensions Desc="Pension/Profit-Sharing Plan Expense" Value="602180" Code="MainAccount"/>
      <Dimensions Desc="Auto" Value="002" Code="BusinessUnit"/>
      <Dimensions Desc="" Value="" Code="CostCenter"/>
      <Dimensions Desc="Human Resources" Value="026" Code="Department"/>
      <Dimensions Desc="" Value="" Code="ItemGroup"/>
      <Dimensions Desc="" Value="" Code="Project"/>
    </Transaction>
    <Transaction Ct="0" Dt="900" Currency="EUR" Date="2015-01-20" Voucher="GNJL000005">
      <Dimensions Desc="Pension/Profit-Sharing Plan Expense" Value="602180" Code="MainAccount"/>
      <Dimensions Desc="Auto" Value="002" Code="BusinessUnit"/>
      <Dimensions Desc="" Value="" Code="CostCenter"/>
      <Dimensions Desc="IT Department" Value="025" Code="Department"/>
      <Dimensions Desc="" Value="" Code="ItemGroup"/>
      <Dimensions Desc="" Value="" Code="Project"/>
    </Transaction>
    <Transaction Ct="0" Dt="1800" Currency="EUR" Date="2015-01-20" Voucher="GNJL000005">
      <Dimensions Desc="Pension/Profit-Sharing Plan Expense" Value="602180" Code="MainAccount"/>
      <Dimensions Desc="Auto" Value="002" Code="BusinessUnit"/>
      <Dimensions Desc="" Value="" Code="CostCenter"/>
      <Dimensions Desc="Finance" Value="024" Code="Department"/>
      <Dimensions Desc="" Value="" Code="ItemGroup"/>
      <Dimensions Desc="" Value="" Code="Project"/>
    </Transaction>
    <Transaction Ct="0" Dt="4200" Currency="EUR" Date="2015-01-20" Voucher="GNJL000005">
      <Dimensions Desc="Pension/Profit-Sharing Plan Expense" Value="602180" Code="MainAccount"/>
      <Dimensions Desc="Auto" Value="002" Code="BusinessUnit"/>
      <Dimensions Desc="" Value="" Code="CostCenter"/>
      <Dimensions Desc="Operations" Value="023" Code="Department"/>
      <Dimensions Desc="" Value="" Code="ItemGroup"/>
      <Dimensions Desc="" Value="" Code="Project"/>
    </Transaction>
    <Transaction Ct="0" Dt="21300" Currency="EUR" Date="2015-01-20" Voucher="GNJL000005">
      <Dimensions Desc="Pension/Profit-Sharing Plan Expense" Value="602180" Code="MainAccount"/>
      <Dimensions Desc="Auto" Value="002" Code="BusinessUnit"/>
      <Dimensions Desc="" Value="" Code="CostCenter"/>
      <Dimensions Desc="Sales & Marketing" Value="022" Code="Department"/>
      <Dimensions Desc="" Value="" Code="ItemGroup"/>
      <Dimensions Desc="" Value="" Code="Project"/>
    </Transaction>
  </Journal Batch>
</Root>

```

NOTE

Can you tell us about your documentation language preferences? [Take a short survey.](#)

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

ER Configure format to do counting and summing (Part 1 - Create format)

2/18/2021 • 2 minutes to read • [Edit Online](#)

The following steps explain how a user assigned to the system administrator or electronic reporting developer role can configure an Electronic reporting (ER) format to do counting and summing based on data of the already generated text output. These steps can be performed in any company.

To complete these steps, you must first complete the steps in the "Create a configuration provider and mark it as active" procedure.

This procedure is for a feature that was added in Dynamics 365 for Operations version 1611.

Get access to the list of configurations provided by Microsoft

1. Go to Organization administration > Workspaces > Electronic reporting.
 - Make sure that the "Litware, Inc." provider is available and marked as active.
2. Select the "Litware, Inc." provider.
3. Click Repositories.
 - If a repository of the "Operations resources" type already exists, skip the remaining steps of the current sub-task.
4. Click Add to open the drop dialog.
5. In the Configuration repository type field, enter 'Operations resources'.
6. Click Create repository.
7. Click OK.

Get the Intrastat configurations provided by Microsoft

1. Click Open.
2. In the tree, select 'Intrastat model\Intrastat (DE)'.
3. Click Import.
 - Click Import for version 1.1 of the selected configuration.
4. Click Yes.
5. Close the page.
6. Close the page.
7. Click Reporting configurations.
8. In the tree, expand 'Intrastat model'.
9. In the tree, select 'Intrastat model\Intrastat (DE)'.

NOTE

Can you tell us about your documentation language preferences? [Take a short survey](#).

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

ER Configure format to do counting and summing (Part 2 - Configure computations)

2/18/2021 • 4 minutes to read • [Edit Online](#)

The following steps explain how a user assigned to the system administrator or electronic reporting developer role can configure an Electronic reporting (ER) format to do counting and summing based on data of the already generated text output. These steps can be performed in any company.

To complete these steps, you must first complete the steps in the "ER Configure format to do counting and summing (Part 1: Create format)" procedure.

This procedure is for a feature that was added in Dynamics 365 for Operations version 1611.

Create a format configuration to add counting and summing details

1. Go to Organization administration > Workspaces > Electronic reporting.
2. Click Reporting configurations.
3. In the tree, expand 'Intrastat model'.
4. In the tree, select 'Intrastat model\Intrastat (DE)'.
 - Assume that you need to customize the format provided by Microsoft by adding lines with summary details at the end of the Intrastat report. You need to do that by deriving our own instance of the Intrastat configuration from the Microsoft instance to make modifications.
5. Click Create configuration to open the drop dialog.
6. In the New field, enter 'Derive from Name: Intrastat (DE), Microsoft'.
7. In the Name field, type 'Intrastat (DE) with counting & summing'.
8. Click Create configuration.

Configure this report to do counting and summation based on output details

1. Click Designer.
2. Select Yes in the Collect output details field.
 - This flag will activate at run-time the process of collecting output details for generating the Intrastat file.
 - You need to do counting for different Intrastat directions, so add a dedicated model enumeration to the data sources' list of this format configuration.
3. Click the Mapping tab.
4. Click Add root to open the drop dialog.
5. In the tree, select 'Data model\Enumeration '.
6. In the Name field, type 'Direction'.
7. In the Model enumeration field, enter or select a value.
 - Select the value Direction.
8. Click OK.
9. Click Add root to open the drop dialog.
10. In the tree, select 'Functions\Calculated field'.
11. In the Name field, type '\$BlockName'.

12. Click Edit formula.
13. In the Formula field, enter ""block"".
14. Click Save.
15. Close the page.
16. Click OK.
17. Click Add root to open the drop dialog.
18. In the tree, select 'Functions\Calculated field'.
19. In the Name field, type '\$RecName'.
20. Click Edit formula.
21. In the Formula field, enter ""record"".
22. Click Save.
23. Close the page.
24. Click OK.
25. Click Add root to open the drop dialog.
26. In the tree, select 'Functions\Calculated field'.
27. In the Name field, type '\$InvName'.
28. Click Edit formula.
29. In the Formula field, enter ""InvoicedAmountEUR"".
30. Click Save.
31. Close the page.
32. Click OK.
33. In the tree, select 'Intrastat\Data'.
34. Click Edit button for the 'Collected data key name' field
35. Click Add data source.
 - \$BlockName
36. Click Save.
37. Close the page.
38. Click the Edit button for the Collected data key value field.
39. In the Formula field, enter 'IF(Intrastat.CommodityRecord.Direction=Direction.Import, "Import", "Export")'.
 - IF(Intrastat.CommodityRecord.Direction=Direction.Import, "Import", "Export")
40. Click Save.
41. Close the page.
 - Count the lines of this sequence. The results will be used with the name "block" separately for different directions. Value "Import" will be used for any arrivals Intrastat transactions. The value "Export" will be used for any Intrastat dispatches transactions. Consider this to be a virtual Excel spreadsheet. For each transaction a row where the first column "block" is filled with the values "Import" and "Export" accordingly.
42. In the tree, expand 'Intrastat\Data: Sequence'.
43. In the tree, select 'Intrastat\Data: Sequence\Arrivals?'.
44. Click Edit button for the 'Collected data key name' field.
 - Count the lines of this sequence. The results will be memorized using the name "record".
45. In the tree, select '\$RecName'.
46. Click Add data source.
47. Click Save.
48. Close the page.
49. Click Edit button for the 'Collected data key value' field
50. In the Formula field, enter 'Intrastat.CommodityRecord.CommodityCode'.

51. Click Save.
52. Close the page.
 - Count the lines of this sequence. The results will be used with the name "record" separately for different commodity codes. Consider this to be a virtual Excel spreadsheet. For each transaction a row where the first column "block" is filled with the values "Import" and "Export" accordingly and the second block "record" is filled with the commodity code value.
53. In the tree, select 'Intrastat\Data: Sequence\Dispatches?'
54. Click Edit button for the 'Collected data key name' field
55. In the tree, select '\$RecName'.
56. Click Add data source.
57. Click Save.
58. Close the page.
59. Click the Edit button for the 'Collected data key value' field.
60. In the Formula field, enter 'Intrastat.CommodityRecord.CommodityCode'.
61. Click Save.
62. Close the page.
63. In the tree, expand 'Intrastat\Data: Sequence\Dispatches: Sequence?'
64. In the tree, expand 'Intrastat\Data: Sequence\Dispatches: Sequence?\Record = Intrastat.CommodityRecord'
65. Click the Format tab.
66. In the tree, select 'Intrastat\Data\Dispatches\Record\Invoice amount EUR'
67. Click the Mapping tab.
68. Click the Edit button for the 'Collected data key name' field.
69. In the tree, select '\$InvName'.
70. Click Add data source.
71. Click Save.
72. Close the page.
 - Summarize the invoiced amount values for lines of this sequence. The results will be used with the name "InvoicedAmountEUR" separately for different Intrastat directions and commodity codes. Consider this to be a virtual creation in Excel spreadsheet. For each transaction a row where the first column "block" is filled with the values "Import" and "Export" accordingly. The second block "record" is filled with the commodity code value, and the third column "InvoicedAmountEUR" is filled with the invoice amount value.
73. In the tree, expand 'Intrastat\Data\Arrivals?'
74. In the tree, expand 'Intrastat\Data\Arrivals?\Record = Intrastat.CommodityRecord'
75. Click the Format tab.
76. In the tree, select 'Intrastat\Data\Arrivals\Record\Invoice amount EUR'
77. Click the Mapping tab.
78. Click the Edit button for the 'Collected data key name' field.
79. In the tree, select '\$InvName'.
80. Click Add data source.
81. Click Save.
82. Close the page.
83. Click Save.
84. Close the page.

NOTE

Can you tell us about your documentation language preferences? [Take a short survey](#).

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

ER Configure format to do counting and summing (Part 3 - Use computations to make the output)

2/18/2021 • 3 minutes to read • [Edit Online](#)

The following steps explain how a user assigned to the system administrator or electronic reporting developer role can configure an Electronic reporting (ER) format to do counting and summing based on data of the already generated text output. These steps can be performed in any company.

To complete these steps, you must first complete the steps in the "ER Configure format to do counting and summing (Part 2: Configure computations)" procedure.

This procedure is for a feature that was added in Dynamics 365 for Operations version 1611.

Configure this report to use counting and summing info

1. Go to Organization administration > Workspaces > Electronic reporting.
2. Click Reporting configurations.
3. In the tree, expand 'Intrastat model'.
4. In the tree, expand 'Intrastat model\Intrastat (DE)'.
5. In the tree, select 'Intrastat model\Intrastat (DE)\Intrastat (DE) with counting & summing'.
6. Click Designer.
7. Click the Mapping tab.
8. Click Add root to open the drop dialog.
 - Add a new data source to get the list of memorized blocks.
9. In the tree, select 'Functions\Calculated field'.
10. In the Name field, type '\$BlocksList'.
 - \$BlocksList
11. Click Edit formula.
12. In the tree, select 'Data collection functions\COLLECTEDLIST'.
13. Click Add function.
14. Click Add data source.
15. In the Formula field, enter 'COLLECTEDLIST('\$BlockName', '
 - COLLECTEDLIST('\$BlockName',
16. In the Formula field, enter 'COLLECTEDLIST('\$BlockName', "*"')'.
 - COLLECTEDLIST('\$BlockName', "*"')
17. Click Save.
 - The pattern "*" means that all blocks will be included to the list for this record.
18. Close the page.
19. Click OK.
20. Click the Format tab.
21. In the tree, select 'Intrastat\Data'.
22. Click Add to open the drop dialog.
23. In the tree, select 'Text\Sequence'.
24. In the Name field, type 'Totals by blocks'.
 - Totals by blocks

25. In the Special characters field, select 'New line - Windows (CR LF)'.
26. Click OK.
27. In the tree, select 'Intrastat\Data\Totals by blocks'.
28. Click Add to open the drop dialog.
29. In the tree, select 'Text\String'.
30. In the Name field, type 'Block code'.
 - Block code
31. Click OK.
32. Click Add String.
33. In the Name field, type 'Lines counting'.
 - Lines counting
34. Click OK.
35. Click Add String.
36. In the Name field, type 'Total amount'.
 - Total amount
37. Click OK.
38. Click the Mapping tab.
39. In the tree, select '\$BlocksList'.
40. Click Bind.
 - Create a summary line for each memorized block.
41. Click the Format tab.
42. In the tree, select 'Intrastat\Data\Totals by blocks\Block code'.
43. Click the Mapping tab.
44. Click Edit formula.
45. In the Formula field, enter '"Block id: " & '.
 - "Block id: " &
46. In the tree, expand '\$BlocksList'.
47. In the tree, select '\$BlocksList\Value'.
48. Click Add data source.
49. Click Save.
50. Close the page.
51. Click the Format tab.
52. In the tree, select 'Intrastat\Data\Totals by blocks\Lines counting'.
53. Click the Mapping tab.
54. Click Edit formula.
 - Create output for the number of lines for each block presented in this report.
55. In the Formula field, enter '"Number of lines in this block: " & '.
 - "Number of lines in this block: " &
56. In the Formula field, enter '"Number of lines in this block: " & TEXT('.
 - "Number of lines in this block: " & TEXT(
57. In the tree, select 'Data collection functions\COUNTIFS'.
58. Click Add function.
59. Click Add data source.
60. In the Formula field, enter '"Number of lines in this block: " & TEXT(COUNTIFS('\$BlockName', '.
 - "Number of lines in this block: " & TEXT(COUNTIFS('\$BlockName',
61. In the tree, expand '\$BlocksList'.

62. In the tree, select '\$BlocksList\Value'.
63. Click Add data source.
64. In the Formula field, enter "'Number of lines in this block: " & TEXT(COUNTIFS('\$BlockName', '\$BlocksList'.Value, '
• "Number of lines in this block: " & TEXT(COUNTIFS('\$BlockName', '\$BlocksList'.Value,
65. In the tree, select '\$RecName'.
66. Click Add data source.
67. In the Formula field, enter "'Number of lines in this block: " & TEXT(COUNTIFS('\$BlockName', '\$BlocksList'.Value, '\$RecName', "*"'))'.
• "Number of lines in this block: " & TEXT(COUNTIFS('\$BlockName', '\$BlocksList'.Value, '\$RecName', "*"'))
68. Click Save.
69. Close the page.
70. Click the Format tab.
71. In the tree, select 'Intrastat\Data\Totals by blocks\Total amount'.
72. Click the Mapping tab.
73. Click Edit formula.
• Create output that will be the total of the invoiced amount for each block presented in this report.
74. In the Formula field, enter "'Sum of invoiced amount: " & TEXT(SUMIFS('\$InvName', '\$BlockName', '\$BlocksList'.Value, '\$RecName', "*"'))'.
• "Sum of invoiced amount: " & TEXT(SUMIFS('\$InvName', '\$BlockName', '\$BlocksList'.Value, '\$RecName', "*"'))
75. Click Save.
76. Close the page.
77. Click Save.
78. Close the page.

NOTE

Can you tell us about your documentation language preferences? [Take a short survey](#).

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

ER Configure format to do counting and summing (Part 4 - Run format)

2/18/2021 • 2 minutes to read • [Edit Online](#)

The following steps explain how a user assigned to the system administrator or electronic reporting developer role can configure an Electronic reporting (ER) format to do counting and summing based on data of the already generated text output. These steps can be performed in the DEMF company.

To complete these steps, you must first complete the steps in the "ER Configure format to do counting and summing (Part 3: Use computations to make the output)" procedure.

This procedure is for a feature that was added in Dynamics 365 for Operations version 1611.

Test this configuration for generation of the Intrastat reports

1. Go to Organization administration > Workspaces > Electronic reporting.
2. Click Reporting configurations.
3. In the tree, expand 'Intrastat model'.
4. In the tree, expand 'Intrastat model\Intrastat (DE)'.
5. In the tree, select 'Intrastat model\Intrastat (DE)\Intrastat (DE) with counting & summing'.
6. On the Action Pane, click Configurations.
7. Click User parameters.
8. Select Yes in the Run settings field.
9. Click OK.
10. Click Edit.
11. Select Yes in the Run Draft field.
12. Click Save.
13. Go to Tax > Setup > Foreign trade > Foreign trade parameters.
14. Expand the Electronic reporting section.
15. Select the "Intrastat (DE) with counting & summing" configuration.
16. Select the "Intrastat (DE) with counting & summing" configuration.
17. Click Save.
18. Close the page.
19. Go to Tax > Declarations > Foreign trade > Intrastat.
20. Click Output.
21. Click Report.
 - Run the Intrastat report generation process.
22. In the From date field, set the date to '2000-01-01'.
 - Define start and end dates for the reporting period that include the existing on the form transactions.
23. In the To date field, set the date to '2022-12-31'.
 - Define start and end dates for the reporting period that include the existing on the form transactions.
24. In the Direction field, select 'Arrivals'.
25. Select Yes in the Generate file field.
26. Click OK.
 - Review the created output with the summary lines in the end.

27. Click New.
28. In the list, mark the selected row.
29. In the Direction field, select 'Dispatches'.
30. In the Item number field, enter or select a value.
31. In the Commodity field, enter or select a value.
32. Set Weight to '10'.
33. Set Invoice amount to '10000'.
34. Set Statistical amount to '10000'.
35. Click Output.
36. Click Report.
37. In the Direction field, select 'Dispatches'.
38. Click OK.
 - Review the created output with the summary lines in the end. Note that it has been changed in comparison to the first run.

Run this configuration in debug mode to review the collected counting & summing data

1. Go to Organization administration > Electronic reporting > Configurations.
2. In the tree, expand 'Intrastat model'.
3. In the tree, expand 'Intrastat model\Intrastat (DE)'.
4. In the tree, select 'Intrastat model\Intrastat (DE)\Intrastat (DE) with counting & summing'.
5. On the Action Pane, click Configurations.
6. Click User parameters.
7. Select Yes in the Run in debug mode field.
8. Click OK.
9. Close the page.
10. Go to Tax > Declarations > Foreign trade > Intrastat.
11. Click Output.
12. Click Report.
13. Click OK.
14. Close the page.
15. Go to Organization administration > Electronic reporting > Configurations.
16. In the tree, expand 'Intrastat model'.
17. In the tree, expand 'Intrastat model\Intrastat (DE)'.
18. In the tree, select 'Intrastat model\Intrastat (DE)\Intrastat (DE) with counting & summing'.
19. Click Debug logs.
 - Note that a debug log record has been created for the execution process of the selected configuration.
20. Click Attach.
21. Click Open.
 - Review the created XML file that contains counting and summing details that were collected during the execution of the selected configuration.

NOTE

Can you tell us about your documentation language preferences? [Take a short survey.](#)

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

ER Use horizontally expandable ranges to dynamically add columns in Excel reports (Part 1 - Design format)

2/18/2021 • 5 minutes to read • [Edit Online](#)

The following steps explain how a user assigned to the system administrator or electronic reporting developer role can configure an Electronic reporting (ER) format to generate reports as OPENXML worksheets (Excel) files in which the required columns can be created dynamically as horizontally expandable ranges. These steps can be performed in any company.

To complete these steps, you must first complete these three task guides:

"ER Create a configuration provider and mark it as active"

"ER Use financial dimensions as a data source (Part 1: Design data model)"

"ER Use financial dimensions as a data source (Part 2: Model mapping)"

You must also download and save a local copy of the template with a sample report found here, [Sample Financial Dimensions Web Service Report](#).

This procedure is for a feature that was added in Dynamics 365 for Operations version 1611.

Create a new report configuration

1. Go to Organization administration > Electronic reporting > Configurations.
2. In the tree, select 'Financial dimensions sample model'.
3. Click Create configuration to open the drop dialog.
4. In the New field, enter 'Format based on data model Financial dimensions sample model'.
 - Use the model created in advance as the data source for your new report.
5. In the Name field, type 'Sample report with horizontally expandable ranges'.
 - Sample report with horizontally expandable ranges
6. In the Description field, type 'To make Excel output with dynamically adding columns'.
 - To make Excel output with dynamically adding columns
7. In the Data model definition field, select Entry.
8. Click Create configuration.

Design the report format

1. Click Designer.
2. Turn on the 'Show details' toggle button.
3. On the Action Pane, click Import.
4. Click Import from Excel.
5. Click Attachments.
 - Import the report's template. Use Excel file that you downloaded for that.
6. Click New.
7. Click File.
8. Close the page.

9. In the Template field, enter or select a value.
 - Select the downloaded template.
10. Click OK.
 - Add a new range to dynamically create Excel output with as many columns as you selected (in the user dialog form) for financial dimensions. Each cell for every column will represent a single financial dimension's name.
11. Click Add to open the drop dialog.
12. In the tree, select 'Excel\Range'.
13. In the Excel range field, type 'DimNames'.
 - DimNames
14. In the Replication direction field, select 'Horizontal'.
15. Click OK.
16. In the tree, select 'Excel = "SampleFinDimWsReport"\Range: Horizontal'.
17. Click Move up.
18. In the tree, select 'Excel = "SampleFinDimWsReport"\Cell'.
19. Click Cut.
20. In the tree, select 'Excel = "SampleFinDimWsReport"\Range: Horizontal'.
21. Click Paste.
22. In the tree, expand 'Excel = "SampleFinDimWsReport"\Range: Horizontal'.
23. In the tree, expand 'Excel = "SampleFinDimWsReport"\Range: Vertical'.
24. In the tree, expand 'Excel = "SampleFinDimWsReport"\Range: Vertical\Range: Vertical'.
25. In the tree, select 'Excel = "SampleFinDimWsReport"\Range: Vertical\Range: Vertical'.
 - Add a new range to dynamically create Excel output with as many columns as you selected (in the user dialog form) for financial dimensions. Each cell for every column will represent a single financial dimension's value for each reporting transaction.
26. Click Add Range.
27. In the Excel range field, type 'DimValues'.
 - DimValues
28. In the Replication direction field, select 'Horizontal'.
29. Click OK.
30. In the tree, select 'Excel = "SampleFinDimWsReport"\Range: Vertical\Range: Vertical\Cell'.
31. Click Cut.
32. In the tree, select 'Excel = "SampleFinDimWsReport"\Range: Vertical\Range: Vertical\Range: Horizontal'.
33. Click Paste.
34. In the tree, expand 'Excel = "SampleFinDimWsReport"\Range: Vertical\Range: Vertical\Range: Horizontal'.

Map format elements to data sources

1. Click the Mapping tab.
2. In the tree, expand 'model: Data model Financial dimensions sample model'.
3. In the tree, expand 'model: Data model Financial dimensions sample model\Journal: Record list'.
4. In the tree, expand 'model: Data model Financial dimensions sample model\Journal: Record list\Transaction: Record list'.
5. In the tree, expand 'model: Data model Financial dimensions sample model\Journal: Record list\Transaction: Record list\Dimensions data: Record list'.
6. In the tree, select 'Excel = "SampleFinDimWsReport"\Range: Vertical\Range: Vertical\Range: Horizontal\Cell'.
7. In the tree, select 'model: Data model Financial dimensions sample model\Journal: Record list\Transaction: Record list\Dimensions data: Record list'.

Record list\Dimensions data: Record list\Code: String'.

8. Click Bind.
9. In the tree, select 'Excel = "SampleFinDimWsReport"\Range: Vertical\Range: Vertical\Range: Horizontal'.
10. In the tree, select 'model: Data model Financial dimensions sample model\Journal: Record list\Transaction: Record list\Dimensions data: Record list'.
11. Click Bind.
12. In the tree, select 'Excel = "SampleFinDimWsReport"\Range: Vertical\Range: Vertical\Cell'.
13. In the tree, select 'model: Data model Financial dimensions sample model\Journal: Record list\Transaction: Record list\Credit: Real'.
14. Click Bind.
15. In the tree, select 'Excel = "SampleFinDimWsReport"\Range: Vertical\Range: Vertical\Cell'.
16. In the tree, select 'model: Data model Financial dimensions sample model\Journal: Record list\Transaction: Record list\Debit: Real'.
17. Click Bind.
18. In the tree, select 'Excel = "SampleFinDimWsReport"\Range: Vertical\Range: Vertical\Cell'.
19. In the tree, select 'model: Data model Financial dimensions sample model\Journal: Record list\Transaction: Record list\Currency: String'.
20. Click Bind.
21. In the tree, select 'Excel = "SampleFinDimWsReport"\Range: Vertical\Range: Vertical\Cell'.
22. In the tree, select 'model: Data model Financial dimensions sample model\Journal: Record list\Transaction: Record list\Date: Date'.
23. Click Bind.
24. In the tree, select 'Excel = "SampleFinDimWsReport"\Range: Vertical\Range: Vertical\Cell'.
25. In the tree, select 'model: Data model Financial dimensions sample model\Journal: Record list\Transaction: Record list\Voucher: String'.
26. Click Bind.
27. In the tree, select 'Excel = "SampleFinDimWsReport"\Range: Vertical\Range: Vertical\Cell'.
28. In the tree, select 'model: Data model Financial dimensions sample model\Journal: Record list\Batch: String'.
29. Click Bind.
30. In the tree, select 'Excel = "SampleFinDimWsReport"\Range: Vertical\Range: Vertical'.
31. In the tree, select 'model: Data model Financial dimensions sample model\Journal: Record list\Transaction: Record list'.
32. Click Bind.
33. In the tree, select 'Excel = "SampleFinDimWsReport"\Range: Vertical\Cell'.
34. In the tree, select 'model: Data model Financial dimensions sample model\Journal: Record list\Batch: String'.
35. Click Bind.
36. In the tree, select 'Excel = "SampleFinDimWsReport"\Range: Vertical'.
37. In the tree, select 'model: Data model Financial dimensions sample model\Journal: Record list'.
38. Click Bind.
39. In the tree, expand 'model: Data model Financial dimensions sample model\Dimensions setting: Record list'.
40. In the tree, select 'model: Data model Financial dimensions sample model\Dimensions setting: Record list\Code: String'.
41. In the tree, select 'Excel = "SampleFinDimWsReport"\Range: Horizontal\Cell'.
42. Click Bind.
43. In the tree, select 'model: Data model Financial dimensions sample model\Dimensions setting: Record list'.
44. In the tree, select 'Excel = "SampleFinDimWsReport"\Range: Horizontal'.
45. Click Bind.

46. In the tree, select 'Excel = "SampleFinDimWsReport"\Cell'.
47. In the tree, select 'model: Data model Financial dimensions sample model\Company: String'.
48. Click Bind.
49. Click Save.
50. Close the page.

NOTE

Can you tell us about your documentation language preferences? [Take a short survey](#).

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

ER Use horizontally expandable ranges to dynamically add columns in Excel reports (Part 2 - Run format)

2/18/2021 • 2 minutes to read • [Edit Online](#)

The following steps explain how a user assigned to the system administrator or electronic reporting developer role can configure an Electronic reporting (ER) format to generate reports as OPENXML worksheets (Excel) files in which the required columns can be created dynamically as horizontally expandable ranges. These steps can be performed in the DEMF company.

To complete these steps, you must first complete the steps in the "ER Use horizontally expandable ranges to dynamically add columns in Excel reports (Part 1: Design format)" procedure.

This procedure is for a feature that was added in Dynamics 365 for Operations version 1611.

Find created format

1. Go to Organization administration > Electronic reporting > Configurations.
2. In the tree, expand 'Financial dimensions sample model'.
3. In the tree, select 'Financial dimensions sample model\Sample report with horizontally expandable ranges'.

Execute format to create Excel output

1. Click Run.
2. In the Dimension name field, type 'BusinessUnit;CostCenter;Department'.
 - In the Dimension name field, enter or select a value. To select all dimensions for the current company, enter the following: BusinessUnit;CostCenter;Department;ItemGroup;MainAccount;Project
3. Expand the Records to include section.
4. Click Filter.
5. Select the row for the Ledger journal table and the Journal batch number field.
6. In the Criteria field, type '00057..00058'.
 - 00057..00058
7. Click OK.
8. Click OK.
 - Review the generated output. Note that the newly created Excel file contains the same number of columns that were selected for financial dimensions. The report header in those columns represents financial dimensions' names. The transactions' lines in those columns represent financial dimensions. Run this report and select different dimensions to see that the report is not dependent on the number of selected dimensions or the number of dimensions configured for this instance.

NOTE

Can you tell us about your documentation language preferences? [Take a short survey.](#)

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

ER Use Document Management files in format outputs (Part 1 - Prepare data model)

2/18/2021 • 2 minutes to read • [Edit Online](#)

The following steps explain how a user assigned to the system administrator or electronic reporting developer role can configure an Electronic reporting (ER) format to use Document Management files (attachments) in ER output. These steps can be performed in any company.

To complete these steps, you must first complete the steps in the "Create a configuration provider and mark it as active" procedure.

This procedure is for a feature that was added in Dynamics 365 for Operations version 1611.

Get access to the list of configurations provided by Microsoft

1. Go to Organization administration > Workspaces > Electronic reporting.

Make sure that the 'Litware, Inc.' provider is available and marked as active.

2. Select the 'Litware, Inc.' provider.
3. Click Repositories.

If a repository of the 'Operations resources' type already exists, skip the remaining steps of the current sub-task.

4. Click Add to open the drop dialog.
5. In the Configuration repository type field, enter 'Operations resources'.
6. Click Create repository.
7. Click OK.

Get the Customer invoice model configurations provided by Microsoft

1. Click Show filters.
2. Apply the following filters: Enter a filter value of "Operations resources" on the "Name" field using the "begins with" filter operator; Enter a filter value of "" on the "Description" field using the "begins with" filter operator

3. Click Show filters.
4. Click Open.
5. In the tree, select 'Customer invoice model'.

Select the model configuration 'Customer invoice model' to import it.

6. Click Import.
Click Import for version 1 of the selected configuration.
7. Click Yes.

8. Close the page.
9. Close the page.
10. Click Reporting configurations.
11. In the tree, select 'Customer invoice model'.

Create the derived model to support access to the Document Management files.

You will create our own configuration of the Customer invoice model deriving it from the configuration provided by Microsoft. You will use this configuration to implement access to the Document Management files and make them available for electronic documents that you will create based on this model.

1. Click Create configuration to open the drop dialog.
2. In the New field, enter 'Derive from Name: Customer invoice model, Microsoft'.
3. In the Name field, type 'Customer invoice model (custom)'.
4. Click Create configuration.

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

ER Use Document Management files in format outputs (Part 2 - Extend data model)

2/18/2021 • 2 minutes to read • [Edit Online](#)

The following steps explain how a user assigned to the System Administrator or Electronic Reporting Developer role can configure an Electronic reporting (ER) format to use Document Management files (attachments) in ER output. These steps can be performed in any company.

To complete these steps, you must first complete the steps in the "ER Use Document Management files in format outputs (Part 1: Prepare data model)" task guide.

This procedure is for a feature that was added in Dynamics 365 for Operations version 1611.

Extend data model to present the Document Management files in it

1. Go to Organization administration > Workspaces > Electronic reporting.
2. Click Reporting configurations.
3. In the tree, expand 'Customer invoice model'.
4. In the tree, select 'Customer invoice model\Customer invoice model (custom)'.
5. Click Designer.
6. In the tree, select 'Customer invoice(InvoiceCustomer)'.
 - We will extend this data model to expose in it any files that have been attached to a sales order that is related to an electronically processing invoice.
7. Click New to open the drop dialog.
8. In the Name field, type 'Invoice attachments'.
 - Invoice attachments
9. In the Item type field, select 'Record list'.
10. Click Add.
11. Click New to open the drop dialog.
12. In the Name field, type 'File content'.
 - File content
13. In the Item type field, select 'Container'.
14. Click Add.
15. Click New to open the drop dialog.
16. In the Name field, type 'File name'.
 - File name
17. In the Item type field, select 'String'.
18. Click Add.

Map new data model elements to data sources

1. Click Map model to datasource.
2. Use the Quick Filter to filter on the Definition field with a value of 'InvoiceCustomer'.
 - InvoiceCustomer
 - We will map new model elements to appropriate data sources.
3. Click Designer.

4. In the tree, select 'Invoice attachments'.
5. In the tree, expand 'Invoice attachments'.
6. In the tree, select 'Invoice attachments\File name'.
7. Click Edit.
8. In the Formula field, enter
'CustInvoiceJour.'>Relations'.SalesTable.'<Relations'.'<Documents'.'originalFileName()'.
 - CustInvoiceJour.'>Relations'.SalesTable.'<Relations'.'<Documents'.'originalFileName()'
9. Click Save.
10. Close the page.
11. In the tree, select 'Invoice attachments\File content'.
12. Click Edit.
13. In the Formula field, enter
'CustInvoiceJour.'>Relations'.SalesTable.'<Relations'.'<Documents'.'getFileContentAsContainer()'.
 - CustInvoiceJour.'>Relations'.SalesTable.'<Relations'.'<Documents'.'getFileContentAsContainer()'
14. Click Save.
15. Close the page.
16. In the tree, select 'Invoice attachments'.
17. Click Edit.
18. In the Formula field, enter 'CustInvoiceJour.'>Relations'.SalesTable.'<Relations'.'<Documents''.
 - CustInvoiceJour.'>Relations'.SalesTable.'<Relations'.'<Documents'
19. Click Save.
20. Close the page.
21. Click Save.
22. Close the page.
23. Close the page.
24. Close the page.
25. Click Change status.
26. Click Complete.
27. Click OK.

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

ER Use Document Management files in format outputs (Part 3 - Create format)

2/18/2021 • 2 minutes to read • [Edit Online](#)

The following steps explain how a user assigned to the system administrator or electronic reporting developer role can configure an Electronic reporting (ER) format to use Document Management files (attachments) in ER output. These steps can be performed in any company.

To complete these steps, you must first complete the steps in the "ER Use Document Management files in format outputs (Part 2: Extend data model)" procedure.

This procedure is for a feature that was added in Dynamics 365 for Operations version 1611.

Create a format to process invoices

1. Go to Organization administration > Workspaces > Electronic reporting.
2. Click Reporting configurations.
3. In the tree, expand 'Customer invoice model'.
4. In the tree, select 'Customer invoice model\Customer invoice model (custom)'.
 - You will create a format to generate electronic messages with information about any files that have been attached to a sales order that is related to an electronically processing invoice.
5. Click Create configuration to open the drop dialog.
6. In the New field, enter 'Format based on data model Customer invoice model (custom)'.
7. In the Name field, type 'Electronic invoice sample message'.
 - Electronic invoice sample message
8. In the Data model definition field, enter or select a value.
 - InvoiceCustomer
9. Click Create configuration.

Design a format to populate attachments into generating a message in MIME format

1. Click Designer.
2. Click Add root to open the drop dialog.
3. In the tree, select 'XML\Element'.
4. In the Name field, type 'Invoice'.
 - Invoice
5. Click OK.
6. Click Add to open the drop dialog.
7. In the tree, select 'XML\Attribute'.
8. In the Name field, type 'SalesOrder'.
 - SalesOrder
9. Click OK.
10. Click Add Attribute.
11. In the Name field, type 'InvoiceNumber'.
 - InvoiceNumber

12. Click OK.
13. Click Add Attribute.
14. In the Name field, type 'InvoiceAmount'.
 - InvoiceAmount
15. Click OK.
16. Click Add to open the drop dialog.
17. In the tree, select 'XML\Element'.
18. In the Name field, type 'EnclosedDocs'.
 - EnclosedDocs
19. Click OK.
20. In the tree, select 'Invoice\EnclosedDocs'.
21. Click Add Element.
22. In the Name field, type 'Document'.
 - Document
23. Click OK.
24. In the tree, select 'Invoice\EnclosedDocs\Document'.
25. Click Add to open the drop dialog.
26. In the tree, select 'XML\Attribute'.
27. In the Name field, type 'FileName'.
 - FileName
28. Click OK.
29. Click Add to open the drop dialog.
30. In the tree, select 'XML\Element'.
31. In the Name field, type 'FileContent'.
 - FileContent
32. Click OK.
33. In the tree, select 'Invoice\EnclosedDocs\Document\FileContent'.
34. Click Add to open the drop dialog.
35. In the tree, select 'Text\Base64'.
36. Click OK.

Map format elements to data model as data source

1. In the tree, select 'Invoice\SalesOrder'.
2. Click the Mapping tab.
3. In the tree, expand 'model'.
4. In the tree, select 'model\Sales order number(SalesId)'.
5. Click Bind.
6. In the tree, select 'Invoice\InvoiceNumber'.
7. In the tree, expand 'model\Base invoice(InvoiceBase)'.
8. In the tree, select 'model\Base invoice(InvoiceBase)\Invoice number(Id)'.
9. Click Bind.
10. In the tree, select 'Invoice\InvoiceAmount'.
11. In the tree, select 'model\Base invoice(InvoiceBase)\Invoice amount(Amount)'.
12. Click Bind.
13. In the tree, expand 'model\Invoice attachments'.
14. In the tree, select 'model\Invoice attachments\File content'.

15. In the tree, select 'Invoice\EnclosedDocs\Document\FileContent\Base64'.
16. Click Bind.
17. In the tree, select 'model\Invoice attachments\File name'.
18. In the tree, select 'Invoice\EnclosedDocs\Document\FileName'.
19. Click Bind.
20. In the tree, select 'model\Invoice attachments'.
21. In the tree, select 'Invoice\EnclosedDocs\Document'.
22. Click Bind.
23. Click Save.
24. Close the page.

NOTE

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ER Use Document Management files in format outputs (Part 4 - Run format)

2/18/2021 • 2 minutes to read • [Edit Online](#)

The following steps explain how a user assigned to the system administrator or electronic reporting developer role can configure an Electronic reporting (ER) format to use Document Management files (attachments) in ER output. These steps can be performed in the DEMF company.

To complete these steps, you must first complete the steps in the "ER Use Document Management files in format outputs (Part 3: Create format)" procedure.

This procedure is for a feature that was added in Dynamics 365 for Operations version 1611.

Add necessary attachments for sales order of a single invoice

1. Go to Accounts receivable > Invoices > Open customer invoices.
2. Use the Quick Filter to find records. For example, filter on the Invoice field with a value of 'CIV-000148'.
 - CIV-000148
3. Click to follow the selected invoice's link.
 - CIV-000148
4. Click to follow the link in the Sales order field.
 - 000148
5. In the Lines or header field, select the option of Header.
 - Select Header to indicate that this will be the target for adding attachments.
6. Click Attach.
 - Add a few files as attachments for this sales order. Use the files of the document types that are supported by the Document Management (with file extensions DOCX, DPF, XML, JPG, etc.). Browse and select files to be attached and further processed with the related invoice in the ER electronic message.
7. Click New.
8. Click File.
9. Click New.
10. Click File.
11. Close the page.
12. Close the page.
13. Close the page.
14. Close the page.

Run the designed report for the selected invoice

1. Go to Organization administration > Electronic reporting > Configurations.
2. In the tree, expand 'Customer invoice model'.
3. In the tree, expand 'Customer invoice model\Customer invoice model (custom)'.
4. In the tree, select 'Customer invoice model\Customer invoice model (custom)\Electronic invoice sample message'.
5. Click Run.
6. Expand the Records to include () section.

7. Click Filter.
8. Select the row of the Customer invoice journal and the Sales order field.
9. In the Criteria field, type '000148'.
 - In the criteria "Sales order" field, type the order number 000148.
10. Click OK.
11. Click OK.
 - Review the generated output. Note that for each attachment a single XML node has been created. The attachment's content is populated to the XML output in MIME (base64) text format.

NOTE

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ER Use Document Management files in format outputs (Part 5 - Modify and run format)

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The following steps explain how a user assigned to the system administrator or electronic reporting developer role can configure an Electronic reporting (ER) format to use Document Management files (attachments) in ER output. These steps can be performed in the DEMF company.

To complete these steps, you must first complete the steps in the "ER Use Document Management files in format outputs (Part 4: Run format)" procedure.

This procedure is for a feature that was added in Dynamics 365 for Operations version 1611.

Modify the format to populate attachments into generating messages in binary format

1. Go to Organization administration > Electronic reporting > Configurations.
2. In the tree, expand 'Customer invoice model'.
3. In the tree, expand 'Customer invoice model\Customer invoice model (custom)'.
4. In the tree, select 'Customer invoice model\Customer invoice model (custom)\Electronic invoice sample message'.
5. Click Designer.
 - You will populate the invoice message in the generating output as an XML file using UNICODE encoding.
6. Click Add root to open the drop dialog.
7. In the tree, select 'Common\File'.
8. In the Name field, type 'Xml message'.
 - Xml message
9. In the Encoding field, type 'UTF-8'.
 - UTF-8
10. Click OK.
 - Configure the generating output as a zipped file.
11. Click Add root to open the drop dialog.
12. In the tree, select 'Common\Folder'.
13. In the Name field, type 'Zip output'.
 - Zip output
14. Click OK.
15. In the tree, select 'Zip output'.
 - Add attachments to the generating zipped file as files with original names and extensions.
16. Click Add to open the drop dialog.
17. In the tree, select 'Common\File'.
18. In the Name field, type 'Attached file'.
 - Attached file
19. Click OK.
20. In the tree, select 'Zip output\Attached file'.

21. Click Add to open the drop dialog.
22. In the tree, select 'Text\Base64'.
23. Click OK.

Map new format elements to data model

1. Click the Mapping tab.
2. In the tree, expand 'model'.
3. In the tree, expand 'model\Invoice attachments'.
4. In the tree, select 'Zip output\Attached file\Base64'.
5. In the tree, select 'model\Invoice attachments\File content'.
6. Click Bind.
7. In the tree, select 'Zip output\Attached file'.
8. Click Edit filename.
9. In the tree, expand 'model'.
10. In the tree, expand 'model\Invoice attachments'.
11. In the tree, select 'model\Invoice attachments\File name'.
12. Click Add data source.
13. Click Save.
14. Close the page.
15. In the tree, select 'model\Invoice attachments'.
16. Click Bind.
17. Click Save.
18. Close the page.

Run the designed report for the selected invoice

1. Click Run.
2. Expand the Records to include () section.
3. Click Filter.
4. Select the row of the Customer invoice journal and the Sales order field.
5. In the Criteria field, In the criteria "Sales order" field, type the order number 000148.
 - 000148
6. Click OK.
7. Click OK.
 - Review the generated output. Note,that in addition to the invoice message in XML format, a single file has been created for each attachment. The attachment files are populated with the zipped output in binary format.

NOTE

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Generate electronic documents and update application data by using ER

2/18/2021 • 2 minutes to read • [Edit Online](#)

You can design Electronic reporting (ER) formats that can be used in the application to generate outgoing electronic documents. You can also design ER formats that parse incoming electronic documents and use the content in those documents to update application data.

With this functionality, a single ER format can be used to generate outgoing electronic documents and then update the application data. This feature can be used in the following scenarios:

- To prevent repeated usage of application data in subsequent processes you can mark an application's data immediately after it is used to generate electronic documents. For example, you can mark payment transactions as already processed immediately after they have been included in a generated payment message.
- To store the processing details of electronic documents that have been generated using ER logic. For example, a unique payment message identification that is generated using the ER expression. The expression is based on information entered in the ER dialog box when the ER format is run to generate documents.

To learn more about this feature, play the set of ER Generate documents with application data update Task guides (part of the 7.5.4.3 Acquire/Develop IT service/solution components (10677) business process), which walk you through the details of Intrastat reporting and archiving. The following files are required to complete certain steps in these Task guides. Download and save these files to your local machine.

- [ER data model configuration: Intrastat \(model\)](#)
- [ER model mapping configuration: Intrastat \(mapping\)](#)
- [ER format configuration: Intrastat \(format\)](#)

NOTE

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Import configurations to generate documents that have application data

2/18/2021 • 4 minutes to read • [Edit Online](#)

To complete the steps in this procedure, you must first complete the procedure, "ER Create a configuration provider and mark it as active".

The steps in this procedure explain how to design Electronic reporting (ER) configurations to generate an electronic document. In this procedure, you will import the required ER configurations that have been created for the sample company, Litware, Inc. and use them to generate electronic documents. This procedure is created for users with the assigned role of system administrator or electronic reporting developer. These steps can be completed using the DEMF dataset. Before you begin, download and save the files listed in the Help topic, "Generate electronic documents and update application data with ER tool" (generate-electronic-documents-update-application-data/). The files are Intrastat (model).xml, Intrastat (mapping).xml, and Intrastat (format).xml.

1. Go to Organization administration > Workspaces > Electronic reporting.
 - Make sure that the configuration provider for the sample company, Litware, Inc., is available and marked as Active. If you don't see this configuration provider, complete the steps in the procedure, Create a configuration provider and mark it as active.
 - The steps in this procedure show how to use ER capabilities to complete an application data update and how to generate an Intrastat report. The details of the reporting process are archived in the application tables. Currently, when the Intrastat reporting process is activated from the Intrastat form, archiving is done based on the logic programmed in the existing source code. In this procedure, you will configure a similar yet simplified logic of application data using only the ER framework. No changes will be made to the source code.

Import ER configurations

1. Click Reporting configurations.
2. Click Exchange.
3. Click Load from XML file.
 - Import the ER model configuration that contains the data model that is designed to be used as the data source for generating the Intrastat report. Later, you will extend this data model definition to use it for an application data update to archive details of the Intrastat reporting process.
 - Click Browse and select the Intrastat (model).xml file.
4. Click OK.
5. In the tree, select 'Intrastat (model)'.
6. Click Designer.
7. In the tree, expand 'For outgoing document'.
8. In the tree, expand 'For outgoing document\Transactions'.
 - Review the structure of the imported data model. Note that the root item 'For outgoing document' is defined to specify the data flow for getting data from the application and using it as data source to generate the Intrastat report. The 'Transactions (Record list)' is used to represent the list of Intrastat transactions that must be reported. Because you will archive reported commodity codes, the unique identifier of a single commodity code 'Commodity rec id (Int64)' is needed in this data flow.
9. Close the page.
10. Click Exchange.

11. Click Load from XML file.
 - Import the ER mapping configuration that specifies the data flow for getting data from the application and then using it to generate the Intrastat report. Later, you will extend this model mapping definition to get data from the Intrastat report and use it for the application data update to archive details of Intrastat reporting process.
 - Click Browse and select the Intrastat (mapping).xml file.
12. Click OK.
13. In the tree, expand 'Intrastat (model)'.
14. In the tree, select 'Intrastat (model)\Intrastat (mapping)'.
15. Click Designer.
 - Note that the current model mapping contains the value 'To model' in the Direction field. This means that this model mapping has been designed for getting data from the application and storing it in the data model.
16. Click Designer.
17. In the tree, expand 'List'.
18. In the tree, expand 'Transactions= List'.
 - Review the structure of the model mapping that uses the data model that is filtered based on the root item, 'For outgoing document.' Note that the added data source, 'List' provides access to the required application data, which is the list of records from the Intrastat table.
19. Close the page.
20. Close the page.
21. Click Exchange.
22. Click Load from XML file.
 - Import the ER format configuration that specifies the layout of the Intrastat report and the process of populating data to the report. Later, you will extend this format definition to put data from the Intrastat report in to the data model and then use it to update application data to archive the details of Intrastat reporting process.
 - Click Browse and select the Intrastat (format).xml file.
23. Click OK.
24. In the tree, select 'Intrastat (model)\Intrastat (format)'.
25. Click Designer.
26. Click Expand/collapse.
27. In the tree, select 'File\Declaration'.
28. Click the Mapping tab.
29. In the tree, select 'File'.
 - Review the structure of the format used to generate the Intrastat report. Note that it is designed to generate an XML file by populating data from the data model, which is based on the root item 'For outgoing document'. Verify that the name for generated file is defined on the user dialog form ('fn' data source is used for that).
30. Close the page.

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Design configurations to generate documents that have application data

2/18/2021 • 2 minutes to read • [Edit Online](#)

To complete the steps in this procedure, you must first complete the procedure, ER Generate documents with application data update (Part 1: Import configurations).

The steps in this procedure explain how to design Electronic reporting (ER) configurations to generate an electronic document. In this procedure, you run the ER imported format configuration that has been created for the sample company, Litware, Inc. to generate electronic documents.

This procedure is created for users with the assigned role of system administrator or electronic reporting developer. These steps can be completed using the DEMF dataset.

Before you begin, change the country context for the DEMF company from DEU (Germany) to BEL (Belgium). Click Organization administration > Organizations > Legal entities to update the country code in the primary address of the legal entity DEMF. Restart your application.

Run imported ER format

1. Go to Organization administration > Electronic reporting > Configurations.
2. In the tree, expand 'Intrastat (model)'.
3. In the tree, select 'Intrastat (model)\Intrastat (format)'.
4. Click Run.
 - Run the draft version of the ER format configuration to generate the Intrastat report.
5. In the Enter file name field, type 'intrastat.xml'.
 - Specify the name of the file.
6. Click OK.
 - Review the generated XML file.
7. Close the page.
8. Go to Tax > Declarations > Foreign trade > Intrastat.
 - Open this form to view the Intrastat transactions that are included in the generated electronic document.
9. Click Intrastat archive.
 - Because the executed ER format does not contain any settings for application data update, the details of the completed Intrastat report have not been archived.
10. Close the page.
11. Close the page.

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Modify models and mappings to generate documents that have application data

2/18/2021 • 5 minutes to read • [Edit Online](#)

To complete the steps in this procedure, you must first complete the procedure, "ER Generate documents with application data update (Part 2: Generate documents)".

The steps in this procedure explain how to design Electronic reporting (ER) configurations to generate an electronic document and update application data. In this procedure, you will modify the ER configurations to start using them to generate electronic documents and update application data. This procedure is created for users with the assigned role of system administrator or electronic reporting developer. These steps can be completed using the DEMF dataset.

Modify data model

1. Go to Organization administration > Electronic reporting > Configurations.
2. In the tree, select 'Intrastat (model)'.
 - You will extend how you use the data model. Besides using it as data source to generate the Intrastat report, the data model will be used to collect details about the Intrastat reporting process. The details will then be used to update application data.
3. Click Designer.
4. Click New to open the drop dialog.
5. In the New node as a field, enter 'Model root'.
6. In the Name field, type 'For application data update'.
 - For application data update
7. Click Add.
8. In the tree, select 'For application data update'.
 - This new root item is added to specify the data flow for moving data from the Intrastat report (used as a data source) to the application tables (the update destination). Note that different root items must be used for getting data that is posted to the outgoing document and for getting data from the document that is used to update application data.
9. Click New to open the drop dialog.
10. In the Name field, type 'Archive header'.
 - Archive header
11. In the Item type field, select 'Record list'.
12. Click Add.
 - Because you will create a record for each Intrastat report that is generated, you must create a new item for that.
13. Click New to open the drop dialog.
14. In the Name field, type 'File name'.
 - File name
15. In the Item type field, select 'String'.
16. Click Add.
17. Click New to open the drop dialog.
18. In the Name field, type 'Number of lines'.

- Number of lines
19. In the Item type field, select 'Integer'.
 20. Click Add.
 - Add this item to represent the number of Intrastat transactions that are reported during the current reporting process.
 21. Click New to open the drop dialog.
 22. In the Name field, type 'Archive lines'.
 - Archive lines
 23. In the Item type field, select 'Record list'.
 24. Click Add.
 - Add this item to represent the list of Intrastat transactions that are reported during the current reporting process.
 25. Click New to open the drop dialog.
 26. In the Name field, type 'Amount'.
 - Amount
 27. In the Item type field, select 'Real'.
 28. Click Add.
 29. Click New to open the drop dialog.
 30. In the Name field, type 'Commodity rec id'.
 - Commodity rec id
 31. In the Item type field, select 'Int64'.
 32. Click Add.
 33. Click New to open the drop dialog.
 34. In the Name field, type 'Item number'.
 - Item number
 35. In the Item type field, select 'String'.
 36. Click Add.
 37. Click Save.
 38. Close the page.

Modify model mapping

1. In the tree, expand 'Intrastat (model)'.
2. In the tree, select 'Intrastat (model)\Intrastat (mapping)'.
 - Modify the existing model mapping to start using it for the application data update and to archive Intrastat reporting details.
3. Click Designer.
4. Click New.
5. In the Name field, type 'Update archive'.
 - Update archive
6. In the Direction field, select 'To destination'.
7. Click Save.
 - This new mapping specifies the data flow for moving data (Intrastat reporting details) from the data model to the application tables (the update destination). Note that different model's root items must be used to get data from the application for the reporting process and then use the data from data model for the application data update.
8. Click Designer.
9. In the tree, select 'Data model\Data model'.

- Add the required data source. This is the data model that contains details of the reported Intrastat transactions that must be archived.
10. Click Add root.
 11. In the Name field, type 'model'.
 - model
 12. In the Definition field, enter or select the value 'For application data update'.
 - For application data update
 13. Click OK.
 14. In the tree, expand 'model'.
 15. In the tree, select 'Functions\Calculated field'.
 16. In the tree, select 'model\Archive header'.
 17. Click Add.
 - Because you want to enumerate reported Intrastat transactions for archiving, the appropriate data source must be added.
 18. In the Name field, type 'Enumerated lines'.
 - Enumerated lines
 19. Click Edit formula.
 20. In the tree, select 'List\ENUMERATE'.
 21. Click Add function.
 22. In the tree, expand 'model'.
 23. In the tree, expand 'model\Archive header'.
 24. In the tree, select 'model\Archive header\Archive lines'.
 25. Click Add data source.
 26. In the Formula field, enter 'ENUMERATE(model.'Archive header'.'Archive lines')'.
 - ENUMERATE(model.'Archive header'.'Archive lines')
 27. Click Save.
 28. Close the page.
 29. Click OK.
 30. Click Add destination.
 - Add application tables as required destinations that require updates to archive details of reported Intrastat transactions.
 31. In the Name field, type 'Archive'.
 - Archive
 32. In the Table name field, type 'IntrastatArchiveGeneral'.
 - IntrastatArchiveGeneral
 - Keep the record action 'Insert' so you can add records during the detail archiving of each Intrastat reporting process.
 33. Select Yes in the Record infolog field.
 - Select Yes to get information about issues with the application data update.
 34. Select Yes in the Skip record action validation field.
 - Select Yes to suppress validation errors about the empty 'Intrastat archive ID' field. This will be done after records are added, based on the sequence number settings that are configured for this table in the Foreign trade parameters form.
 35. Click OK.
 - Bind elements of the added data source (the filtered model based on the selected root item) with elements from the added destination.
 36. In the tree, expand 'Archive'.

37. In the tree, expand 'Archive<Relations'.
38. In the tree, expand 'Archive<Relations\IntrastatArchiveDetail'.
39. In the tree, select 'Archive<Relations\IntrastatArchiveDetail\Amount(AmountMST)'.
40. In the tree, expand 'model\Archive header\Enumerated lines'.
41. In the tree, expand 'model\Archive header\Enumerated lines\Value'.
42. In the tree, select 'model\Archive header\Enumerated lines\Value\Amount'.
43. Click Bind.
44. In the tree, select 'Archive<Relations\IntrastatArchiveDetail\Commodity(IntrastatCommodity)'.
45. In the tree, select 'model\Archive header\Enumerated lines\Value\Commodity rec id'.
46. Click Bind.
47. In the tree, select 'Archive<Relations\IntrastatArchiveDetail\Item number(ItemId)'.
48. In the tree, select 'model\Archive header\Enumerated lines\Value\Item number'.
49. Click Bind.
50. In the tree, select 'Archive<Relations\IntrastatArchiveDetail\Line number(LineNumber)'.
51. In the tree, select 'model\Archive header\Enumerated lines\Number'.
52. Click Bind.
53. In the tree, select 'Archive<Relations\IntrastatArchiveDetail'.
54. In the tree, select 'model\Archive header\Enumerated lines'.
55. Click Bind.
56. In the tree, select 'Archive\File name(FileName)'.
57. In the tree, select 'model\Archive header\File name'.
58. Click Bind.
59. In the tree, select 'Archive\Number of lines(NumberOfLines)'.
60. In the tree, select 'model\Archive header\Number of lines'.
61. Click Bind.
62. In the tree, select 'Archive'.
63. In the tree, select 'model\Archive header'.
64. Click Bind.
65. Click Save.
66. Close the page.
67. Close the page.

NOTE

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Modify formats to generate documents that have application data

2/18/2021 • 5 minutes to read • [Edit Online](#)

To complete the steps in this procedure, you must first complete the procedure, "ER Generate documents with application data update (Part 3: Modify model and mapping)".

The steps in this procedure explain how to design Electronic reporting (ER) configurations to generate an electronic document and update application data. In this procedure, you will modify the ER configurations to not just use them to generate electronic documents, but also to update application data. This procedure is created for users with the assigned role of system administrator or electronic reporting developer. These steps can be completed using the DEMF dataset.

Modify format to collect details of reporting

1. Go to Organization administration > Electronic reporting > Configurations.
2. In the tree, expand 'Intrastat (model)'.
3. In the tree, select 'Intrastat (model)\Intrastat (format)'.
4. Click Designer.
5. In the tree, expand 'File'.
6. In the tree, expand 'File\Declaration'.
7. In the tree, select 'File\Declaration\Data'.
8. In the Multiplicity field, select 'One many'.
 - Configure this format element to archive details of the Intrastat reporting process. This item represents the archive's header record.
9. In the tree, expand 'File\Declaration\Data'.
10. In the tree, select 'File\Declaration\Data\Item'.
11. In the Multiplicity field, select 'Zero many'.
 - Configure this format element to archive details of the Intrastat reporting process. This item will represent the list of archived lines.
12. In the tree, expand 'File\Declaration\Data\Item'.
13. In the tree, select 'File\Declaration\Data\Item\Dim1'.
14. Select Yes in the Excluded field.
 - You will not archive this data, so you can exclude this format element from the data source of Intrastat reporting details.
15. In the tree, expand 'File\Declaration\Data\Item\Dim1'.
16. In the tree, select 'File\Declaration\Data\Item\Dim1\property'.
17. Select Yes in the Excluded field.
18. In the tree, select 'File\Declaration\Data\Item\Dim1\date'.
19. Select Yes in the Excluded field.
20. In the tree, select 'File\Declaration\Data\Item\Dim2'.
21. Select Yes in the Excluded field.
22. In the tree, expand 'File\Declaration\Data\Item\Dim2'.
23. In the tree, select 'File\Declaration\Data\Item\Dim2\property'.
24. Select Yes in the Excluded field.

25. In the tree, select 'File\Declaration\Data\Item\Dim2\code'.
26. Select Yes in the Excluded field.
27. In the tree, select 'File\Declaration\Data\Item\Dim3'.
 - Several format elements can have the same name. For example, Dim. You cannot explicitly recognize them when you use this format as a data source for archiving Intrastat reporting details, so you need to define the alternative names for these format elements.
28. In the Name field, type 'Amount'.
 - Amount
29. In the Multiplicity field, select 'Exactly one'.
30. In the tree, select 'File\Declaration\Data\Item\Dim4'.
31. In the Name field, type 'Item'.
 - Item
32. In the Multiplicity field, select 'Exactly one'.
 - In addition to the design format elements, the following Intrastat reporting details must be archived: unique record identification of each reported commodity item and name of the generated file. Because this data will not be populated in the Intrastat report, you need to add the format that is related to these detail elements as data source items.
33. In the tree, select 'File\Declaration\Data'.
34. Click Add to open the drop dialog.
35. In the tree, select 'Data source\Item'.
36. In the Name field, type 'File name'.
 - File name
37. In the Data type field, select 'String'.
38. Click OK.
39. In the tree, select 'File\Declaration\Data\Item'.
40. Click Add Item.
41. In the Name field, type 'Commodity rec ID'.
 - Commodity rec ID
42. In the Data type field, select 'Int64'.
43. Click OK.
44. Click the Mapping tab.
45. In the tree, select 'File\Declaration\Data\File name'.
46. Click Bind.
47. In the tree, expand 'model'.
48. In the tree, expand 'model\Transactions'.
49. In the tree, select 'File\Declaration\Data\Item = model.Transactions\Commodity rec ID'.
50. In the tree, select 'model\Transactions\Commodity rec ID'.
51. Click Bind.
52. Click Save.

Modify format to memorize details of reporting

1. Click Map format to model.
2. Click New.
3. In the Definition field, enter or select the 'For application data update' root item.
 - For application data update.
4. In the Name field, type 'Mapping to update data'.
 - Mapping to update data

5. Click Save.

- This mapping defines how the details of the Intrastat report are collected in the data model, the structure of which is specified by the selected root item 'For application data update'. These details, the model mapping with same root item 'For application data update', and the direction 'To destination' will be used for the application data update. The application data update starts immediately after the outgoing Intrastat report is generated. The application data update can be skipped at run-time, but the data model must be empty (containing empty record list).

6. Click Designer.

- The outgoing Intrastat report format is added by default as a data source for this model mapping.
- Bind elements of the designed report (presented as data source) to elements of the data model, which is filtered based on the selected model's root item.

7. In the tree, expand 'Archive header'.

8. In the tree, expand 'Archive header\Archive lines'.

9. In the tree, expand 'format'.

10. In the tree, expand 'format\Declaration: XML Element(Declaration)'.

11. In the tree, expand 'format\Declaration: XML Element(Declaration)\Data: XML Element 1..* (Data)'.

12. In the tree, expand 'format\Declaration: XML Element(Declaration)\Data: XML Element 1..* (Data)\Item: XML Element 0..* (Item)'.

13. In the tree, expand 'format\Declaration: XML Element(Declaration)\Data: XML Element 1..* (Data)\Item: XML Element 0..* (Item)\Dim3: XML Element 1..1 (Amount)'.

14. In the tree, expand 'format\Declaration: XML Element(Declaration)\Data: XML Element 1..* (Data)\Item: XML Element 0..* (Item)\Dim4: XML Element 1..1 (Item)'.

15. In the tree, select 'Archive header\Number of lines'.

16. Click Edit.

17. In the tree, select 'List\COUNT'.

18. Click Add function.

19. In the tree, expand 'format'.

20. In the tree, expand 'format\Declaration: XML Element(Declaration)'.

21. In the tree, expand `format\Declaration: XML Element(Declaration)\Data: XML Element 1..* (Data)`.

22. In the tree, select

`format\Declaration: XML Element(Declaration)\Data: XML Element 1..* (Data)\Item: XML Element 0..* (Item)`.

23. Click Add data source.

24. In the Formula field, enter 'COUNT(format.Declaration.Data.Item)'.

- COUNT(format.Declaration.Data.Item)

25. Click Save.

26. Close the page.

27. In the tree, select 'Archive header\File name'.

28. In the tree, select 'format\Declaration: XML Element(Declaration)\Data: XML Element 1..* (Data)\File name: Item String(File name)'.

29. Click Bind.

30. In the tree, select

`format\Declaration: XML Element(Declaration)\Data: XML Element 1..* (Data)\Item: XML Element 0..* (Item)\Dim4: XML Element 1..1 (Item)\number: String(number)`

31. In the tree, select 'Archive header\Archive lines\Item number'.

32. Click Bind.

33. In the tree, select

`format\Declaration: XML Element(Declaration)\Data: XML Element 1..* (Data)\Item: XML Element 0..* (Item)\Dim3: XML Element 1..1 (Amount)\value: Numeric Real(value)`

34. In the tree, select 'Archive header\Archive lines\Amount'.

35. Click Bind.

36. In the tree, select

```
format\Declaration: XML Element(Declaration)\Data: XML Element 1..* (Data)\Item: XML Element 0..* (Item)\Commodity rec ID: Item Int64(Commodity rec ID)
```

37. In the tree, select 'Archive header\Archive lines\Commodity rec ID'.

38. Click Bind.

39. In the tree, select 'Archive header\Archive lines'.

40. In the tree, select

```
format\Declaration: XML Element(Declaration)\Data: XML Element 1..* (Data)\Item: XML Element 0..* (Item)
```

41. Click Bind.

42. In the tree, select 'Archive header'.

43. In the tree, select `format\Declaration: XML Element(Declaration)\Data: XML Element 1..* (Data)`.

44. Click Bind.

45. Click Save.

46. Close the page.

47. Close the page.

48. Close the page.

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Generate documents that have application data

2/18/2021 • 2 minutes to read • [Edit Online](#)

To complete the steps in this procedure, you must first complete the procedure, "ER Generate documents with application data update (Part 4: Modify format)".

The steps in this procedure explain how to design Electronic reporting (ER) configurations to generate an electronic document and update application data. In this procedure, you execute the ER format configuration to generate the Intrastat report and update application data for archiving details of the reporting process.

This procedure is created for users with the assigned role of system administrator or electronic reporting developer. These steps can be completed using the DEMF dataset. Before you begin, make sure that the country context for the DEMF company is BEL (Belgium).

Set up foreign trade parameters

1. Go to Tax > Setup > Foreign trade > Foreign trade parameters.
2. Click the Number sequences tab.

Archiving details of Intrastat reporting process, we need to identify records of each archive we created. A special number sequence must be configured for that.

3. Select the 'Intrastat archive ID' reference.
4. In the Number sequence code field, type a value.

In the 'Number sequence code' field, enter or select the value 'Fore_2'.

5. ResolveChanges the Number sequence code.
6. Click Save.
7. Close the page.

Run modified ER format

1. Go to Organization administration > Electronic reporting > Configurations.
2. In the tree, expand 'Intrastat (model)'.
3. In the tree, select 'Intrastat (model)\Intrastat (format)'.
4. Click Run.
5. In the Enter file name field, type 'intrastat2.xml'.
6. Click OK.

Review ER format execution's results

Review the generated XML file.

1. Close the page.
2. Go to Tax > Declarations > Foreign trade > Intrastat.

Open this form containing Intrastat transactions that have been included to the generated electronic document.

3. Click Intrastat archive.

Since the executed ER format contains now settings for application data update, the details of the completed Intrastat reporting have been archived. In this form, you can see the header record of the created archive.

4. Click Details.

In this form, you can see the details for the created archive.

5. Close the page.

6. Close the page.

7. Close the page.

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Parse incoming documents

2/18/2021 • 6 minutes to read • [Edit Online](#)

This topic covers the following three tasks:

- [Parse incoming documents to update application data](#)
- [Parse incoming documents in Excel format](#)
- [Parse incoming documents in CSV format](#)

Parse incoming documents to update application data

You can design Electronic reporting (ER) formats and run them in the application to parse incoming electronic documents and then use their content to update application data.

The following new ER functionality that has been introduced improves the parsing of incoming electronic documents in XML format:

- The **CASE** format element can be used as a root element of the ER format that is configured to parse incoming electronic documents in XML format. The **FILE** format element is supported as a nested element of the **CASE** element. Therefore, you can configure a single ER format to parse incoming electronic documents that might contain different root XML elements.
- A **Parsing order of nested elements** attribute has been introduced for XML format elements in ER formats. You can use this attribute to define a single XML element that is expected in the incoming file. There are two valid sequences of the nested elements:
 - **As in format** – The incoming file is valid when the sequence of nested elements in the file is the same as the order that is described in the ER format.
 - **Any** – The incoming file is valid when all nested elements in the ER format are present in the parsing file, regardless of their sequence in that file.

To become more familiar with the details of this feature, play the task guide, ER - Parse incoming documents to update application data (part of the 7.5.4.3 Acquire/Develop IT service/solution components (10677) business process). This task guide shows how the responses from a web service can be parsed by using an ER format.

To complete some steps of the task guide, you must download the following files:

CONTENT DESCRIPTION	FILE
ER data model configuration	EFSTAmodel.xml
ER format configuration	EFSTAformat.xml
Web service response sample 1	Response1.xml
Web service response sample 2	Response2.xml
Web service response sample 3	Response3.xml
Web service response sample 4	Response4.xml

Parse incoming documents in Excel format

You can design Electronic reporting (ER) formats to parse incoming Microsoft Excel files that represent data in Microsoft Excel workbooks (files in XLSX format). You can then use the content from these files to update application data. This is useful if you:

- Design a new model and format and want to test them at run-time. In this case, Excel will simulate the actual application data.
- Manage data beyond your application in Excel and want to import this data to submit a specific report.

To learn more about this feature, play the task guides **ER Import data from a Microsoft Excel file (Part 1: Design format)** and **ER Import data from a Microsoft Excel file (Part 2: Import data)** (parts of the 7.5.4.3 Acquire/Develop IT service/solution components (10677) business process). These task guides walk through how the incoming Excel file can be parsed by using the ER format to import information from incoming documents and update application data. You can download the task guide files from the [Microsoft Download Center](#).

Download the following files to complete the task guides mentioned above.

CONTENT DESCRIPTION	FILE
Incoming file in .XLSX format - template	1099import-template.xlsx
Incoming file in .XLSX format - sample data	1099import-data.xlsx

If you have not yet played the following task guide, [ER Create required configurations to import data from an external file](#) in the current Finance and Operations application, download the following file.

CONTENT DESCRIPTION	FILE
ER model configuration	1099model.xml

Parse incoming documents in CSV format

You can design Electronic reporting (ER) formats to parse incoming electronic documents that represent tabular data in plain text (files in CSV format) and then use the content from these documents to update application data. The following approach can be used:

- Begin your format's design by adding a new root sequence element to specify that each line in the parsing file is considered a separate record.
 - In the added sequence element, select the appropriate value, for example **New line - Windows (CR LF)**, in the **Special characters** field in the **Sequence element delimiter** field group.
- Continue your format's design by adding a nested sequence element of the added root sequence element to specify that each line in the parsing file is considered as a set of fields.
 - You can specify the character in the **Custom delimiter** field that will be recognized in the parsing line as a fields separator.

NOTE

- You can define different field separators for different sequence elements to parse specific file lines in which fields are separated by different characters.
- The **Custom delimiter** field can be left blank for certain sequence elements. An empty field means that any file line that is parsed by using this sequence will be parsed like a .txt (fixed length text) file line.

- In the **Quotation application** field, select the value when you expect that some fields of any line that is parsed by this sequence element will be enclosed by certain characters. The following options are available:
 - **All** – Include quotation characters in the parsing line for any field of any data type. If you select this, define the desired characters in the **Quotation mark** field that will be used for fields quotation. For example, the double quotes character.
 - **Text only** – Include quotation characters in the parsing line for any field of the **String** data type. If you select this, define the desired characters in the **Quotation mark** field that will be used for fields quotation.
 - **Derive from parent only** – Use the same **Quotation application** field settings that are defined for the parent sequence element. Note that the **Quotation mark** field setting will be taken from the settings of the parent sequence element as well.
 - **None** – Exclude quotation characters in the parsing line for any field of any data type.
- Complete your format's design by adding nested elements for the added sequence element that represents the set of fields of the parsing line. Add the required elements of the **Text** group, such as **String**, **DateTime**, and **Numeric**, to describe the structure of the parsing line as a set of individual fields of different data types.
 - For each format element that represents an individual field of the parsing line, by default, nothing is selected in the **Multiplicity** field. This means that the value of the field in the parsing line is considered required. In the **Multiplicity** field, select **Zero one** to consider the value of this field in the parsing line as optional.

NOTE

The data source item **isMatch** is available when you map this format to ER data model for each **String**, **DateTime**, or **Numeric** format element with the option **Zero one** selected in the **Multiplicity** field. When this field contains a value, **isMatch** will return **True**. If there is no value in the field, it will return **False**.

To learn more about this feature, play the task guide, **ER Create a format configuration to import data from an external CSV file** (part of the 7.5.4.3 Acquire/Develop IT service/solution components (10677) business process), which walks through how the incoming CSV file can be parsed by using the ER format to update application data.

Download the following files to complete the task guide mentioned above.

TITLE	FILE NAME
ER format configuration	1099formatcsv.xml
Sample of incoming file in .csv format	1099entriescsv.csv

Download the following file that is required to complete the task guide mentioned above if you have not played the task guide, **ER Create required configurations to import data from an external file for electronic**

reporting in the current Finance and Operations application.

TITLE	FILE NAME
ER model configuration	1099model.xml

NOTE

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ER Create required configurations to import data from an external file

2/18/2021 • 12 minutes to read • [Edit Online](#)

The following steps explain how a user in the System administrator or Electronic reporting developer role can design Electronic reporting (ER) configurations to import data in to the application from an external file. In this example, you will create the required ER configurations for the sample company, Litware, Inc. To complete these steps, you must first complete the steps in the Task guide, "ER Create a configuration provider and mark it as active." These steps can be completed using the USMF data set. You must also download and save the following files locally using links from the Electronic reporting overview topic (<https://go.microsoft.com/fwlink/?linkid=852550>): 1099model.xml, 1099format.xml, 1099entries.xml, 1099entries.xlsx.

ER offers business users the ability to configure the process of importing external data files to tables in either .XML or .TXT format. First, an abstract data model and an ER data model configuration must be designed to represent the data that you are importing. Next, you need to define the structure of the file that you are importing and the method that you will use to port the data from the file to the abstract data model. The ER format configuration that maps to the designed data model must be created for that abstract data model. Then, the data model configuration must be extended with a mapping that describes how the imported data is persisted as abstract data model data and how it is used to update tables. The ER data model configuration must be appended with a new model mapping that describes the binding of the data model to the application's destinations.

The following scenario shows the ER data import capabilities. This includes vendor transactions that are tracked externally and then imported to be reported later in Vendor's settlement for 1099's.

Add a new ER model configuration

1. Go to Organization administration > Workspaces > Electronic reporting.

Verify that the configuration provider for sample company 'Litware, Inc.' is available and marked as active. If you don't see this configuration provider, you must first complete the steps in the procedure, "Create a configuration provider and mark it as active."

2. Click Reporting configurations.

Instead of creating of a new model to support data import, load the file, 1099model.xml, that you previously downloaded. This file contains the custom data model of vendors' transactions. This data model is mapped to the data components that are in the AOT data entity.

3. Click Exchange.

4. Click Load from XML file.

Click Browse and navigate to the 1099model.xml file that you previously downloaded.

5. Click OK.

6. In the tree, select '1099 Payments model'.

Review data model settings

1. Click Designer.

This model is designed to represent vendors' transactions from the business standpoint and are separate from the implementation.

2. In the tree, expand '1099-MISC'.
3. In the tree, select '1099-MISC\Transactions'.
4. In the tree, expand '1099-MISC\Transactions'.

The Transactions element of this model represents individual transactions. The child elements are used to specify required details, such as vendor account and transaction date, for each transaction.

5. Close the page.

Add a new ER format configuration that supports data import

The steps in this subtask show you how a new format configuration can be created to manage data import from external files.

1. Click Create configuration to open the drop dialog.
2. In the New field, enter 'Format based on data model 1099 Payments model'.
3. Select Yes in the Supports data import field.
4. Press ESC key to close this page.

Instead of creating a new format to support data import, load the 1099format.xml file that you previously downloaded. This file contains the defined structure of the file you are importing and the mapping of the structure to the custom data model of vendors' transactions.

5. Click Exchange.
6. Click Load from XML file. Click Browse and navigate to the 1099format.xml file that you previously downloaded.
7. Click OK.
8. In the tree, expand '1099 Payments model'.
9. In the tree, select '1099 Payments model\Format for importing vendors' transactions'.

Review format settings

1. Click Designer.
2. Toggle 'Show details' on.
3. Click Expand/collapse.
4. Click Expand/collapse.

The designed format represents the expected structure of the external file. This file must be in XML format and have the settlement root element. Each vendor's transaction is represented by the transaction element that is defined as having zero-to-many multiplicity. This means that the incoming file may contain anywhere from zero to multiple transactions. Nested elements of the 'transaction' element represent a single transaction's attributes. Note that all attributes, except country, are marked as mandatory, meaning that it is required to have them in the importing file.

Review the settings of the format mapping to the data model

1. Click Map format to model.

The mapping 'For importing vendors' transactions' contains the data transfer rules from the incoming XML file to the selected part of the custom data model, which is defined by selecting the1099-MISC definition.

2. Click Designer.
3. Toggle 'Show details' on.
4. In the tree, expand 'format: Record'.
5. In the tree, select 'format: Record'.

Note that the designed format is presented here as a data source component.

6. In the tree, expand `format: Record*settlement: XML Element 1..1 (settlement): Record`.

7. In the tree, expand

```
format: Record\*settlement: XML Element 1..1 (settlement): Record\transaction: XML Element 0..*
(transaction): Record list
```

8. In the tree, expand

```
format: Record\*settlement: XML Element 1..1 (settlement): Record\transaction: XML Element 0..*
(transaction): Record list\*vendor: XML Element 1..1 (vendor): Record
```

9. In the tree, expand

```
format: Record\*settlement: XML Element 1..1 (settlement): Record\transaction: XML Element 0..*
(transaction): Record list\country: XML Element 0..1 (country): Record
```

10. In the tree, select

```
format: Record\*settlement: XML Element 1..1 (settlement): Record\transaction: XML Element 0..*
(transaction): Record list\*vendor: XML Element 1..1 (vendor): Record
```

Note that the presentation of mandatory and optional format elements is different in the predefined 'format' data source component.

11. In the tree, expand 'Transactions: Record list= format.settlement.'\$enumerated''.

Note that the elements of the format that defines the structure of the imported file are bound to the elements of the custom data model. Based on these bindings, the content of the imported XML file will be stored at run-time in the existing data model. Pay attention to the binding of the country element. For any transaction element in the incoming file that has no such element, the default country code 'USA' will be populated in the data model.

12. Click the Validations tab.

This format mapping may contain user-defined logic to validate the accuracy of the imported data from a business standpoint. For example, based on the setting, for any transaction in the importing file without a defined country code, a warning message will be generated in the Infolog informing the user about the case and indicating the transaction's sequence number.

13. Close the page.

Run the format mapping to the data model

Execute this format mapping for testing purposes. Use the file 1099entries.xml that you previously downloaded.

You can export this file from the 1099entries.xlsx workbook that is used to manage vendor transactions. The generated output will be imported from the selected XML file and populate the custom data model at real import.

1. Click Run.

Click Browse and navigate to the 1099entries.xml file that you previously downloaded.

2. Click OK.

Note the warning message about a missing country code for a transaction in the imported file.

Review the output in XML format, which represents the data that has been imported from the selected file and ported to the data model.

3. Close the page.
4. Close the page.

Review the settings for the model mapping to the destinations

1. In the tree, select '1099 Payments model'.
2. Click Designer.
3. Click Map model to datasource.

The mapping For 1099 manual transactions import has been defined with the To destination direction type. This means that it has been entered to support data import and contains the setting of rules defining how the imported external file and persisted as abstract data model data is used to update tables in the application.

4. Click Designer.
5. In the tree, expand 'model: Data model 1099 Payments model'.
6. In the tree, expand 'model: Data model 1099 Payments model\Transactions: Record list'.

Note that the designed model is presented here as a data source element. At runtime, it will contain the data that is imported from the external file. Several tables were added as data source elements to ensure that the imported data is compliant with the data of the current application, including whether the importing transaction vendor account is available in the system, whether the combination of the importing country and state codes exists, etc.

7. In the tree, select 'model: Data model 1099 Payments model\Transactions: Record list\$failed: Calculated field = IF(OR(ISEMPTY(model.Transactions.'\$refs'.vendor), ISEMPTY(model.Transactions.'\$refs'.vendor1099), ISEMPTY(model.Transactions.'\$refs'.box1099), ISEMPTY(model.Transactions.'\$refs'.country), ISEMPTY(model.Transactions.'\$refs'.state), ISEMPTY(model.Transactions.'\$refs'.location)), true, false): Boolean'.
8. Click Edit.
9. Click Edit formula.

When at least one validation fails for a single imported transaction, this transaction will be marked as failed by the data source attribute '\$failed'.

10. Close the page.
11. Click Cancel.

12. In the tree, select 'tax1099trans: Table 'VendSettlementTax1099' records= model.Validated'.

13. Click Edit destination.

This ER destination was added to specify how the imported data will update the application tables. In this case, the data table VendSettlementTax1099 has been selected. Because the record action Insert has been selected, the imported transactions will be inserted in the table VendSettlementTax1099. Note that a single model mapping may contain several destinations. This means that the imported data can be used to update multiple application's tables at once. Tables, views, and data entities can be used as ER destinations.

If the mapping will be called from a point in the application (such as button or menu item) that was specifically designed for this action, the ER destination should be marked as the integration point. In this example this is the ERTableDestination#VendSettlementTax1099 point.

14. Click Cancel.

15. Click Show all.

16. Click Show mapped only.

17. In the tree, expand 'tax1099trans: Table 'VendSettlementTax1099' records= model.Validated'.

Note that the data source element that contains the only validated transactions is bound to the created destination. You can filter the imported transactions to skip the ones that are incompatible with the applications' data.

18. In the tree, select 'failed: Table 'VendSettlementTax1099Entity' records= model.Failed'.

19. Click the Validations tab.

This model mapping may contain user-defined logic to validate the correctness of the imported data from the existing application data. For example, based on the present setting, for any transaction in the imported file with a vendor account that is not in the system, a warning message will be generated informing the user and indicating the incorrect vendor account code.

Note that the Post validation action option can be used for each validation, to specify whether the import process must be continued or stopped, as well as if the already performed inserts/updates can be kept or rolled back.

20. Click Show mapped only.

21. Click Show all.

22. Close the page.

Execute this model mapping to test the designed format and model mappings. Use the file 1099entries.xml. The data from the selected file will be imported in to the system.

23. Click Run.

Note that the dialog box contains no additional questions about the format mapping that must be used to parse the imported file and then port the data to the data model. This is because there is currently only one format that uses this model, which is marked as designed to support data import.

Define the voucher ID to differentiate the imported transactions from other transactions that may already have been entered manually or imported.

24. In the Enter voucher id field, type 'IMPORT-001'.

Browse to get the '1099entries.xml' file.

25. Click OK.

The list of generated warnings provides information about incorrect vendor accounts, an incorrect tax 1099 box code, missing country codes, etc. Compare this list of warnings to the content that is included in the execution XML file.

26. Close the page.

27. Close the page.

28. Close the page.

29. Close the page.

30. Go to Accounts payable > Periodic tasks > Tax 1099 > Vendor settlement for 1099s.

This form shows the cumulative transactions in the Tax1099Summary table that have been created based on imported transactions.

31. In the From date field, set the date to '2000-01-01'.

32. Click Manual 1099 transactions.

This form contains the list of transactions that were added manually and those that we just imported.

33. Open Voucher column filter.

34. Enter a filter value of "IMPORT-001" on the "Voucher" field using the "begins with" filter operator.

Review the relationship between model and format mappings

1. Close the page.

2. Close the page.

3. Go to Organization administration > Workspaces > Electronic reporting.

4. Click Reporting configurations.

5. In the tree, select '1099 Payments model'.

Assume that you want to support importing the same data but from a .TXT file format.

6. Click Create configuration to open the dialog box.

7. In the New field, enter 'Format based on data model 1099 Payments model'.

8. In the Name field, type 'Import data from TXT file'.

9. Select Yes in the Supports data import field.

10. Click Create configuration.

11. Click Designer.

12. Click Map format to model.

13. Click New.

14. In the Definition field, enter or select a value.

Select '1099-MISC' option.

15. In the Name field, type 'Import data from TXT file'.

16. In the Description field, type 'Import data from TXT file'.

17. Click Save.

18. Close the page.

19. Close the page.

20. Click Edit.

If you installed the hotfix "KB 4012871 Support of GER model mappings in separated configurations with an ability to specify different kinds of prerequisites for deploying them on different versions of Dynamics 365 Finance" ([KB 4012871](#)), execute the next step "Turn the flag 'Default for model mapping' on" for the entered format configuration. Skip the next step otherwise.

21. Select Yes in the Default for model-mapping field.

22. In the tree, select '1099 Payments model'.

23. Click Designer.

24. Click Map model to datasource.

25. Click Run.

If you installed the hotfix, KB 4012871 Support of GER model mappings in separated configurations with an ability to specify different kinds of prerequisites for deploying them on different versions ([KB 4012871](#)), select the preferred model mapping in the lookup field. If you haven't installed the hotfix yet, skip to the next step as the mapping has already been selected by the definition of the default format configuration.

If you have not installed the hotfix, KB 4012871, notice that the dialog box contains an additional model-mapping question that is used to parse the file that you are importing. The data is then ported from the dialog box to the data model. Currently, you can choose which format mapping must be used depending on the type of file that you plan to import.

If you plan to call this model mapping from a point in the application that is specifically designed for the action, the ER destination and the format mapping must be marked as part of the integration.

26. Click Cancel.

27. Close the page.

28. Close the page.

NOTE

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Configure data import from SharePoint

2/18/2021 • 9 minutes to read • [Edit Online](#)

To import data from an incoming file by using the Electronic reporting (ER) framework, you must configure an ER format that supports the import and then run a model mapping of the **To destination** type that uses that format as a data source. To import data, you must navigate to the file that you want to import. The incoming file can be manually selected by user. With the new ER capability to support importing data from Microsoft SharePoint, this process can be configured as unattended. You can use ER configurations to perform data import from files that are stored in Microsoft SharePoint folders. This topic explains how to complete the import from SharePoint. The examples use vendor transactions as business data.

Prerequisites

To complete the examples in this topic, you must have the following access:

- Access one of the following roles:
 - Electronic reporting developer
 - Electronic reporting functional consultant
 - System administrator
- Access to the instance of Microsoft SharePoint Server that is configured for use with the application.
- ER format and model configurations for 1099 payments.

Create required ER configurations

Play the **ER Import data from a Microsoft Excel file** task guides, which are part of the **7.5.4.3 Acquire/Develop IT service/solution components (10677)** business process. These task guides walk you through the process of designing and using ER configurations to interactively import vendor transactions from Microsoft Excel files. For more information, see [Parse incoming documents in Excel format](#). After you have completed the task guides, you will have the following setup.

ER configurations

- ER model configuration, **1099 Payments model**
- ER format configuration, **Format for importing vendors' transactions from Excel**

The screenshot displays the Dynamics 365 Finance and Operations interface. The main window shows the configuration details for an ER format configuration named "Format for importing vendors' t...". The configuration is set to "Country/region codes" and "Run Draft" is enabled. The configuration provider is "Litware, Inc." and "Default for model mapping" is also enabled. Below the configuration details, a table shows the versions of the configuration:

R...	Version	Status	Effective from	Version created	Description	Base
	6.2	Draft		4/2/2018 08:25:58 AM		1099 Payment... 6
	6.1	Completed		4/2/2018 08:21:29 AM	Initial version	1099 Payment... 6

Sample of the incoming file for data import

- Excel file **1099import-data.xlsx**, with vendor transactions that should be imported.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	US-101	3/25/2018	MISC-01	3,000.00	USA	WA								
2	US-103	4/12/2018	MISC-02	4,000.00	USA	IL								
3	US-105	5/1/2018	MISC-03	450.00	USA	CO								
4														
5														
6														
7														

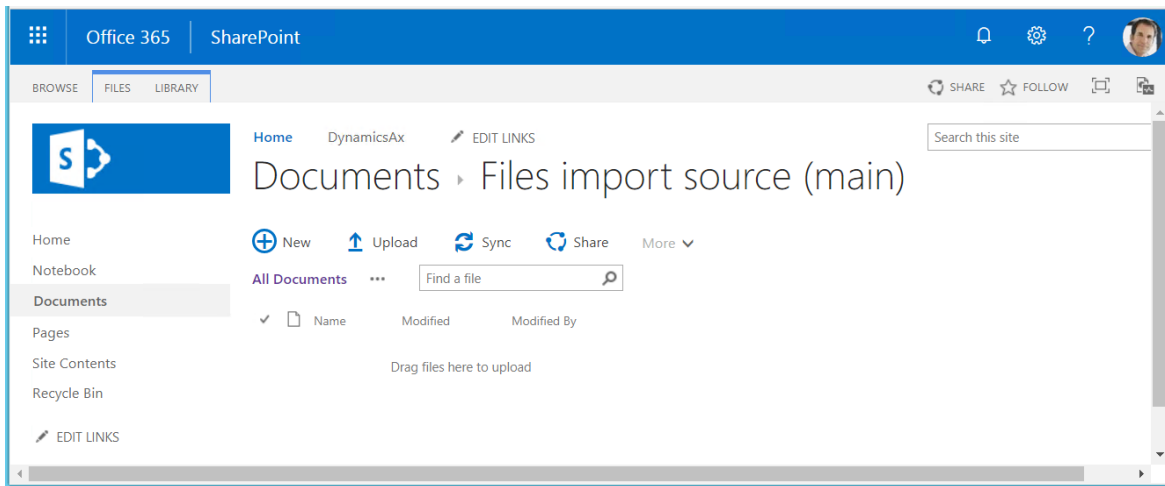
NOTE

The format for importing vendor transactions is selected as the default model mapping. Therefore, if you run a model mapping of the **1099 Payments model**, and that model mapping is of the **To destination** type, the model mapping runs this format to import data from external files. It then uses that data to update application tables.

Configure access to SharePoint for file storage

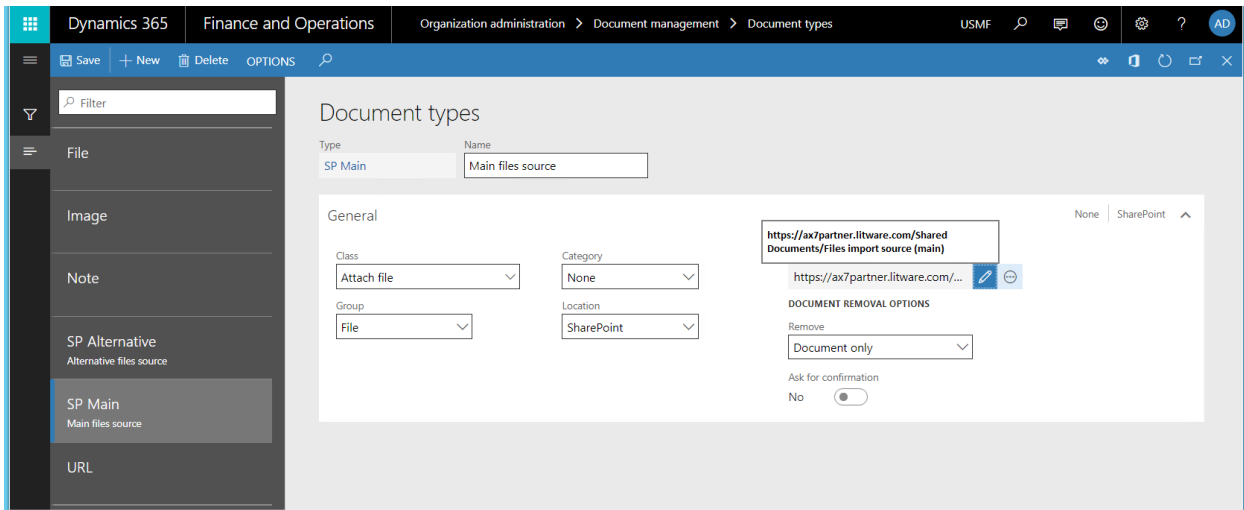
To store electronic report files in a SharePoint location, you must configure access to the SharePoint Server instance that will be used by the current company. In this example, the company is USMF. For instructions, see [Configure SharePoint storage](#).

1. Complete the steps in [Configure SharePoint storage](#).
2. Open the configured SharePoint site.
3. Create the following folders where incoming electronic reporting files can be stored:
 - Files import source (main) (Example shown in screenshot below)
 - Files import source (alternative)



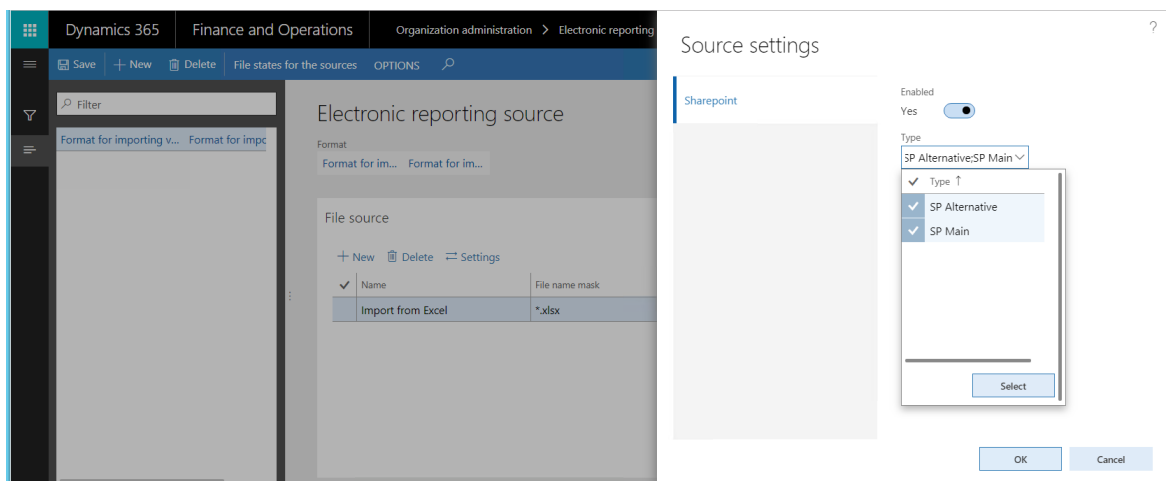
4. (Optional) Create the following folders where the files can be stored after import.
 - Files archive folder - This folder would be for successfully imported files.
 - Files warning folder - This folder would be for files that were imported with a warning.
 - Files error folder - This folder would be for files that failed to import.
5. Go to **Organization administration > Document management > Document types**.
6. Create the following document types that will be used to access the SharePoint folders that you created. For instructions, see [Configure document types](#).

DOCUMENT TYPE	GROUP	LOCATION	SHAREPOINT FOLDER
SP Main	File	SharePoint	Files import source (main)
SP Alternative	File	SharePoint	Files import source (alternative)
SP Archive	File	SharePoint	Files archive folder
SP Warning	File	SharePoint	Files warning folder
SP Error	File	SharePoint	Files error folder



Configure ER sources for the ER format

1. Click **Organization administration > Electronic reporting > Electronic reporting source**.
2. On the **Electronic reporting source** page, configure the source files for data import by using the configured ER format.
3. Define a file name mask, so that only files with the .xlsx extension are imported. The file name mask is optional and is used only when it has been defined. You can define only one mask for each ER format.
4. Change **Sort files before import** to **Do not sort**, if there are several files for import and the import order is not important
5. Select all SharePoint folders that you created earlier.



NOTE

- The ER *source* is defined for each application company individually. By contrast, ER *configurations* are shared across companies.
- When you delete an ER source setting for an ER format, all connected file states (see below) are also deleted by confirmation.

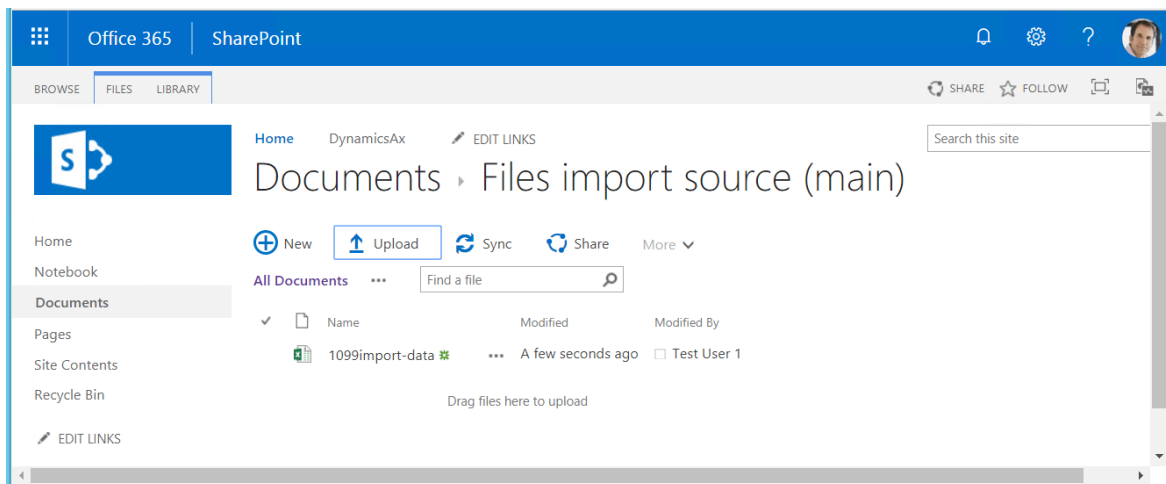
Review the files states for the ER format

1. On the **Electronic reporting source** page, select **File states for the sources** to review the content of the configured file sources for the current ER format.
2. In the **Files** section, review the list of files. This list presents the following:
 - Source files that are applicable, based on the file name mask (if a file name mask is defined), and that are ready for data import. For these files, the **Sources log for the import format** section is blank.
 - Previously imported files. For each of these files, in the **Sources log for the import format** section, you can review the history of import of this file.

You can also open the **File states for the sources** page by selecting **Organization administration** > **Electronic reporting** > **File states for the sources**. In this case, the page provides information about file sources for all ER formats that file sources have been configured for in the company that you're currently signed in to.

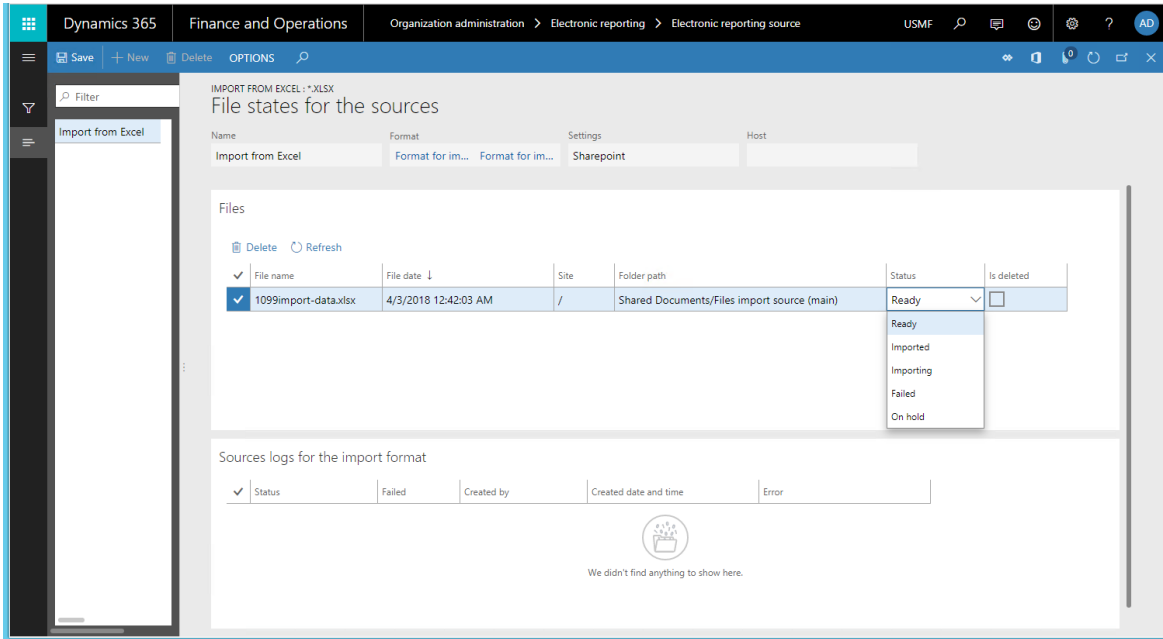
Import data from Excel files that are in a SharePoint folder

1. In SharePoint, upload the Microsoft Excel file **1099import-data.xlsx** that contains vendor transactions to the **Files import source (main)** SharePoint folder that you created earlier.



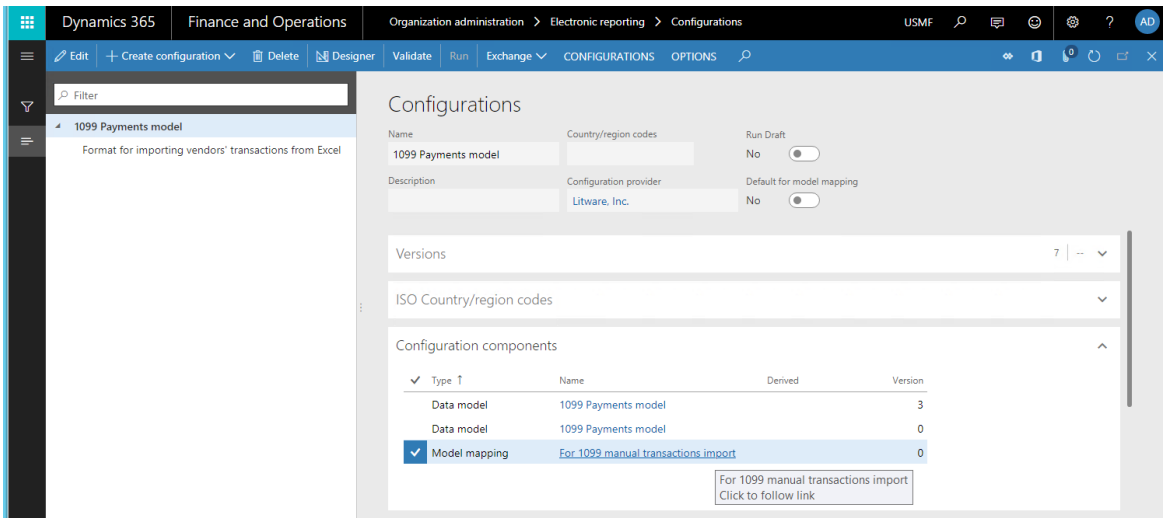
2. On the **File states for the sources** page, select **Refresh** to refresh the page. The Excel file that was uploaded to SharePoint appeared on this page with the status **Ready**. The following statuses are currently supported:
 - **Ready** – Assigned automatically for each new file in a SharePoint folder. This status means that the file is ready for import.
 - **Importing** – Assigned automatically by an ER report when the file will be locked by the import process to prevent its usage by other processes (if many of them are running simultaneously).
 - **Imported** – Assigned automatically by an ER report when the file import is successfully completed. This status means that the imported file has been deleted from the configured files source (SharePoint folder).

- **Failed** – Assigned automatically by an ER report when the file import completed with errors or exceptions.
- **On hold** – Assigned manually by user on this page. This status means that the file will not be imported for now. This status can be used to postpone the import of some files.



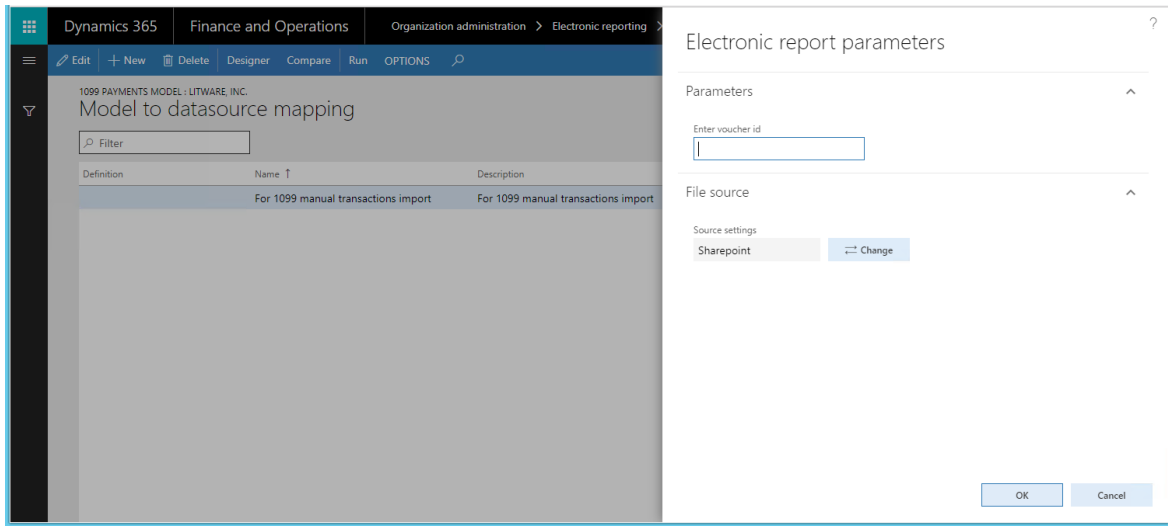
Import data from SharePoint files

1. Open the ER configurations tree, select the **1099 Payment model**, and expand the list of ER model components.
2. Select the name of the model mapping to open the list of model mappings of the selected ER model configuration.



3. Select **Run** to run the selected model mapping. Because you configured file sources for the ER format, you can change the setting of the **File source** option, if needed. If you keep the setting of this option, the .xlsx files are imported from the configured sources (the SharePoint folders, in this example).

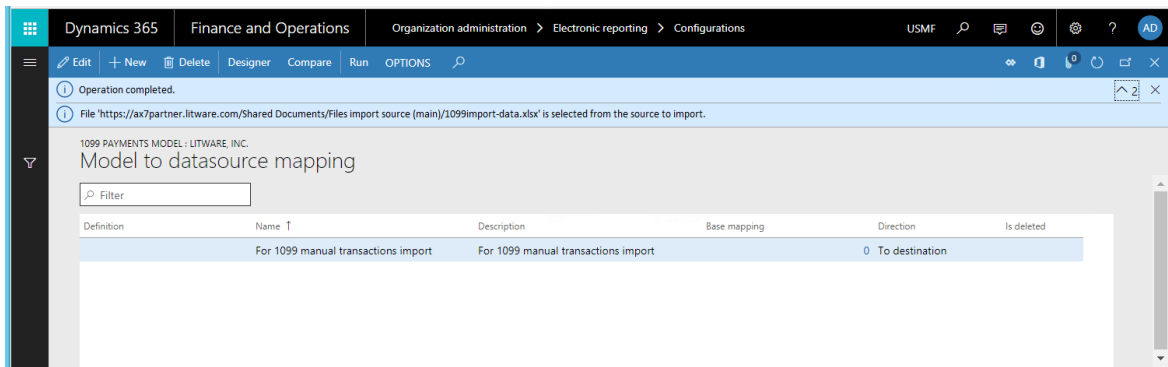
In this example, you're importing only one file. However, if there are multiple files, they are selected for importing in the order in which they were added to the SharePoint folder. Every run of an ER format imports a single selected file.



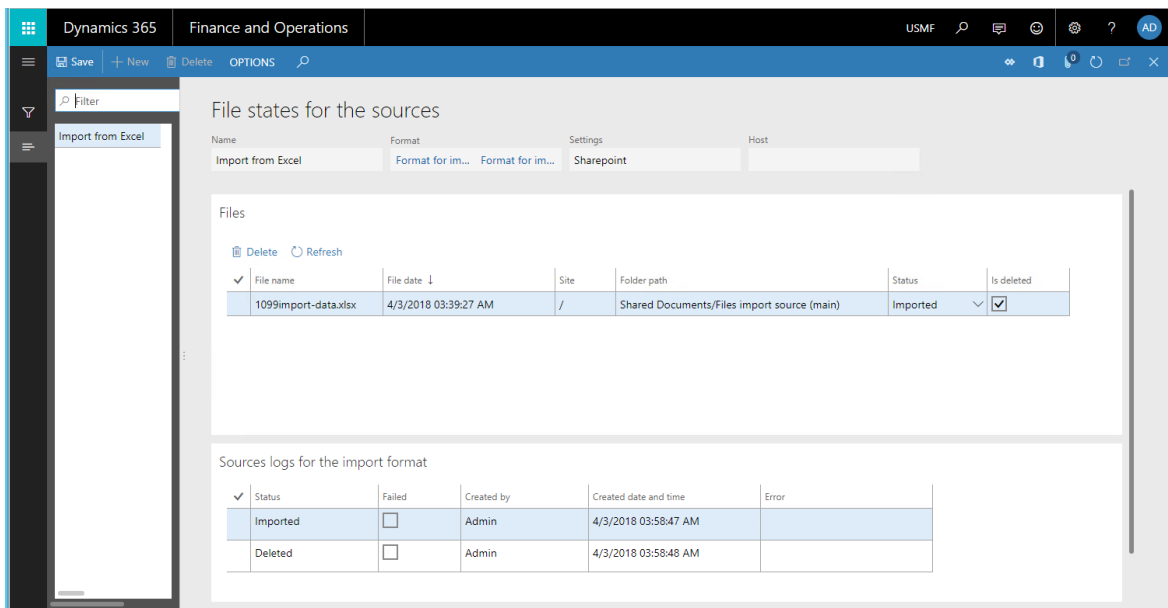
4. The model mapping can run **unattended** in batch mode. In this case, every time that a batch runs this ER format, a single file is imported from the configured file sources.

When a file is successfully imported from the SharePoint folder, it's deleted from that folder and moved to folder for successful imported files or to the folder to imported files with warnings. Otherwise it's moved to folder for failed files or stays in this folder if the folder for failed files isn't set up.

5. Enter the voucher ID, such as **V-00001**, and then select **OK**.



6. On the **File states for the sources** page, select **Refresh** to refresh the page.



7. In the **Files** section, review the list of files. The **Sources log for the import format** section provides the history of the Excel file import. Because this file was successfully imported, it's marked as **Deleted** in the SharePoint folder.

8. Review the **Files import source (main)** SharePoint folder. The Excel files that were successfully imported have been deleted from this folder.
9. Select **Accounts payable > Periodic tasks > Tax 1099 > Vendor settlement for 1099s**.
10. In the **From date** and **To date** fields, enter appropriate values. Then select **Manual 1099 transactions**.

The vendor transactions that were imported from the Excel files on SharePoint for voucher **V-00001**, are presented on the page.

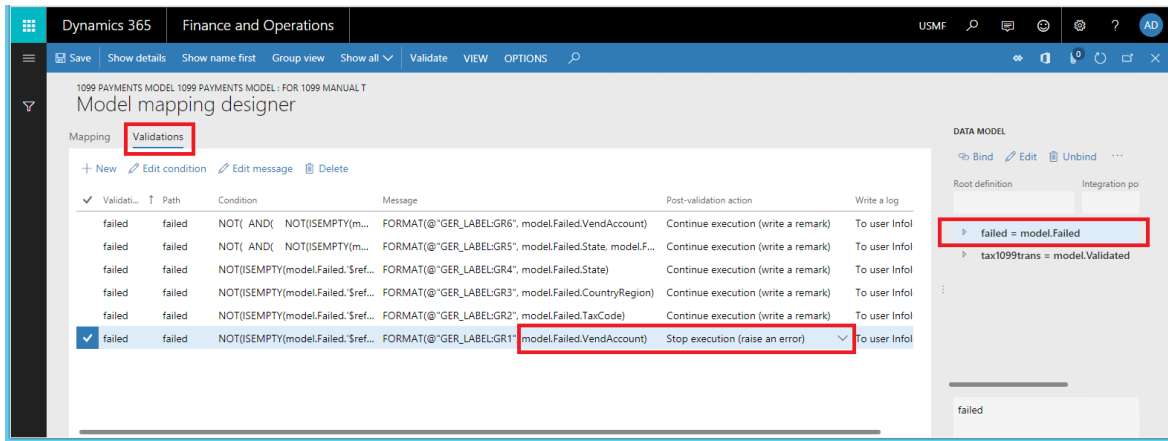
Vendor account	Date	Voucher	Invoice	Lot ID	Internal invoice	1099 box	Settled federal ...	State
US-101	3/25/2018	V-00001				MISC-01	3,000.00	WA
US-103	4/12/2018	V-00001				MISC-02	4,000.00	IL
US-105	5/1/2018	V-00001				MISC-03	450.00	CO

Prepare an Excel file for import

1. Open the Excel file that you previously used. In row 3 column 1, add a vendor code that doesn't exist in the application. Add additional false vendor information to the row.

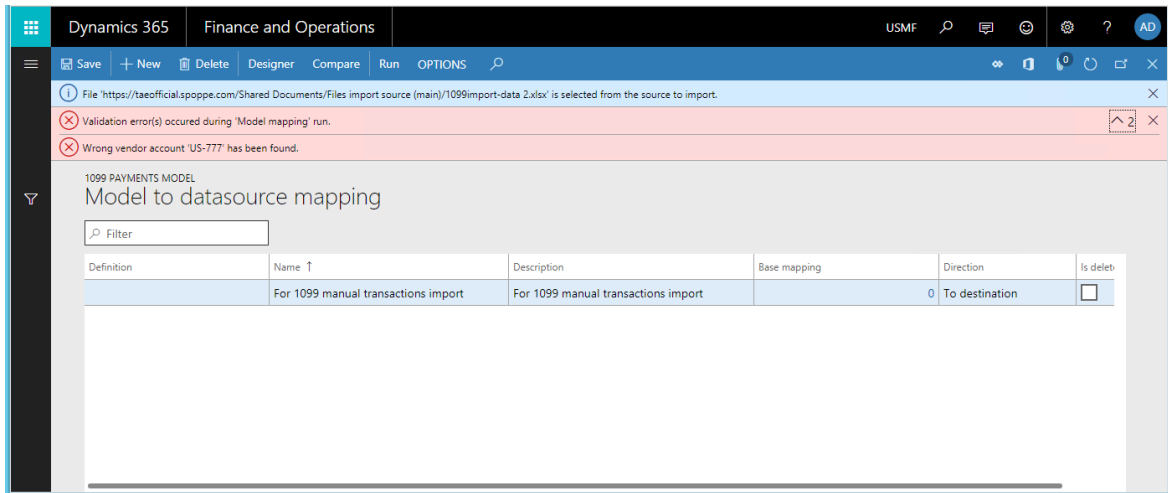
	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	US-101	3/25/2018	MISC-01	3,000.00	USA	WA								
2	US-103	4/12/2018	MISC-02	4,000.00	USA	IL								
3	US-777	5/1/2018	MISC-03	450.00	USA	CO								

2. Upload the updated Excel file that contains vendors transactions to the **Files import source (main)** SharePoint folder.
3. Open the ER configurations tree, select the **1099 Payment model**, and expand the list of ER model components.
4. Select the name of the model mapping to update the model mapping so that the incorrect vendor code is considered an error during the data import process.
5. Select **Designer**.
6. On the **Validations** tab, you must change the post-validation action for the validation rule that was configured to evaluate whether the vendor account that is imported exists in the application. Update the value of the **Post-validation action** field to **Stop execution**, save your changes, and close the page.

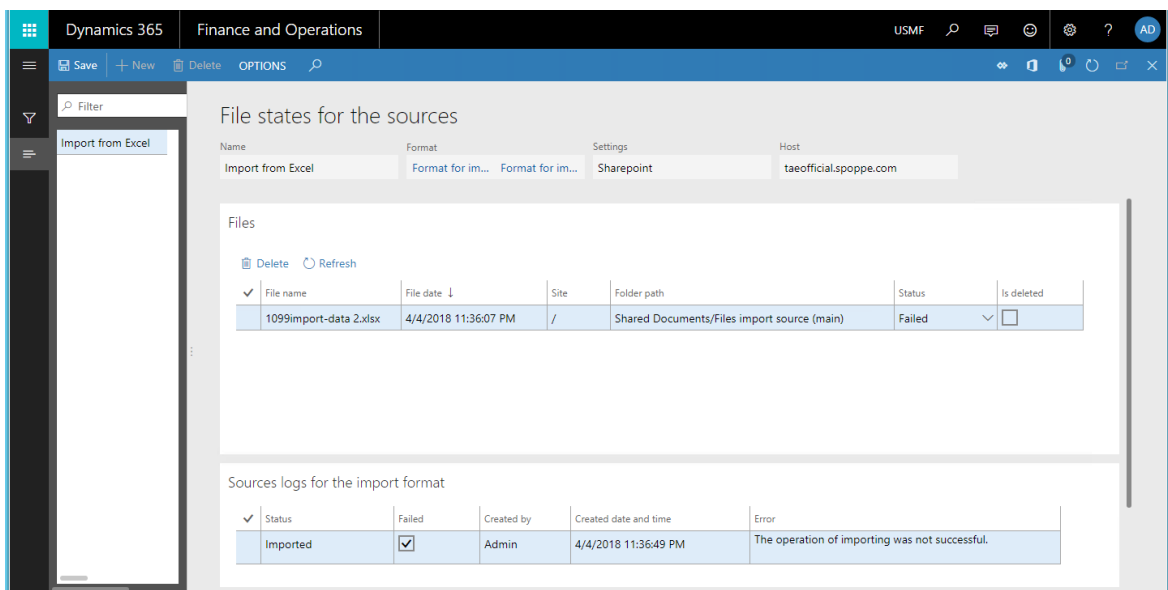


7. Save your changes, and close the ER model mapping designer.
8. Select **Run** to run the modified ER model mapping.
9. Enter the voucher ID, such as **V-00002**, and then select **OK**.

The Infolog contains a notification that there's a file in the SharePoint folder that contains incorrect vendor account and can't be imported.



10. On the **File states for the sources** page, select **Refresh**, and then, in the **Files** section, review the list of files.



The **Sources log** for the **import format** section indicates that the import process failed and that the file is in the Files error SharePoint folder (the **Is deleted** check box is not selected). If you fix this file on SharePoint by

adding the proper vendor code and then move it to the Files import source (main) SharePoint folder, you can import the file again.

11. Select **Accounts payable > Periodic tasks > Tax 1099 > Vendor settlement for 1099s**, enter appropriate values in the **From date** and **To date** fields, and then select **Manual 1099 transactions**.

Only transactions for voucher V-00001 are available. No transactions for voucher V-00002 are available even though the error for the last imported transaction has been found in the Excel file.

Limitations

The ER framework doesn't offer the capability to initiate a new batch job that will execute a model mapping in unattended mode for data import. To do this, you must develop new logic so that the configured ER model mapping can be called from the application user interface (UI) to import data from inbound files. Therefore, some engineering work is required.

To learn more about the relevant ER API, see the [Code to run a format mapping for data import](#) section in the [ER framework API changes for Application update 7.3](#) topic.

Review the code in the `BankImport_RU` class of the `Application Suite` model to see how your custom logic can be implemented. This class extends the `RunBaseBatch` class. In particular, review the `runER()` method where the `ERIModelMappingDestinationRun` object is created as the runner of an ER model mapping.

Additional resources

[Electronic Reporting overview](#)

[ER framework API changes for Application update 7.3](#)

NOTE

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Import files in XML format with optional attributes

2/18/2021 • 3 minutes to read • [Edit Online](#)

You can design Electronic reporting (ER) formats to parse incoming electronic documents in XML format. Certain attributes of XML elements can be specified in designed ER format as optional. It will allow you to handle incoming files with and without such XML attributes properly. You can then use the content from these files to update application data.

To learn more about this feature, complete the steps in the topic, [\(RCS\) Import files in XML format with optional attributes](#), which is part of the 7.5.4.3 Acquire/Develop IT service/solution components (10677) business process. You can download this task guide and associated sample files from the [Microsoft Download Center](#).

CONTENT DESCRIPTION	FILE
Sample file in XML format	IncomingDocumentToLearnHowToHandleOptionalAttributes.xml
Task guide	RCS Import files in XML format with optional attributes.axtr

The following steps explain how a user in the System Administrator or Electronic Reporting Developer role can design ER format configuration to import files in XML format containing optional attributes. To complete these steps, you must first complete the steps in the procedure, [Create configuration providers and mark them as active](#). Before you begin, download and save locally the IncomingDocumentToLearnHowToHandleOptionalAttributes.xml file from Microsoft Download Center (<https://go.microsoft.com/fwlink/?linkid=874684>).

1. Go to **Organization administration > Workspaces > Electronic reporting**.
2. Make sure that the configuration provider for the sample company, Litware, Inc., is available and marked as **Active**. If you don't see this configuration provider, complete the steps in the topic, [Create configuration providers and mark them as active](#).
3. Click **Reporting configurations**.

Create a new data model configuration

1. Click **Create configuration** to open the drop dialog.
2. In the **Name** field, type 'Model to import xml file'.
3. Click **Create configuration**.
4. Click **Designer**.
5. Click **New** to open the drop dialog.
6. In the **Name** field, type 'Root'.
7. Click **Add**.
8. Click **New** to open the drop dialog.
9. In the **Name** field, type 'List'.
10. In the **Item type** field, select **Record list**.
11. Click **Add**.
12. Click **New** to open the drop dialog.
13. In the **Name** field, type 'Code'.
14. In the **Item type** field, select **String**.

15. Click **Add**.
16. Click **Save**.
17. Close the page.
18. Click **Change status**.
19. Click **Complete**.
20. Click **OK**.

Create a format for data import

1. Click **Create configuration** to open the drop dialog.
2. In the **New** field, enter 'Format based on data model Model to import xml file'.
3. In the **Name** field, type 'Format to import xml file'.
4. Select **Yes** in the **Supports data import** field.
5. Click **Create configuration**.

Design a format to parse incoming file in xml format

1. Click **Designer**.
2. Click **Add root** to open the drop dialog.
3. In the tree, select **XML\Element**.
4. In the **Name** field, type 'root'.
5. Click **OK**.
6. Click **Add** to open the drop dialog.
7. In the tree, select **XML\Element**.
8. In the **Name** field, type 'document'.
9. In the **Multiplicity** field, select **One many**.
10. Click **OK**.
11. In the tree, select **root\document**.
12. Click **Add** to open the drop dialog.
13. In the tree, select **XML\Attribute**.
14. In the **Name** field, type 'id'.
15. Click **OK**.
16. Click **Save**.

Design a format mapping to save parsed information to data model

1. Click **Map format to model**.
2. Click **New**.
3. In the **Definition** field, enter or select a value.
4. In the **Name** field, type 'Mapping'.
5. Click **Save**.
6. Click **Designer**.
7. In the tree, expand **format**.
8. In the tree, expand **format\root: XML Element(root)**.
9. In the tree, select **format\root: XML Element(root)\document: XML Element 1.. (document)***.
10. Click **Bind**.
11. In the tree, expand **format\root: XML Element(root)\document: XML Element 1.. (document)***.
12. In the tree, select *format\root: XML Element(root)\document: XML Element 1.. (document)\id**.

13. In the tree, expand **List = format.root.document**.
14. In the tree, select **List = format.root.document\Code**.
15. Click **Bind**.
16. Click **Save**.
17. Close the page.

Run format mapping

1. Click **Run**.
2. Click **Browse** and select the file, **IncomingDocumentToLearnHowToHandleOptionalAttributes.xml**.
3. Click **OK**.

NOTE

The selected file has not been imported as the format design assumes the existence of 'id' attribute for the 'document' element, but the imported file contains no such attribute.

Modify format structure to handle xml attribute as optional

1. Close the page.
2. In the tree, expand **root\document**.
3. In the tree, select **root\document\id**.
4. In the **Empty string for missing attribute** field, select **Yes**.
5. Click **Save**.

Run format mapping to test changes

1. Click **Map format to model**.
2. Click **Run**.
3. Click **Browse** and select the file, **IncomingDocumentToLearnHowToHandleOptionalAttributes.xml**.
4. Click **OK**.
5. Review the generated file. Note that same file has been imported as the format design now consider the 'id' attribute for the 'document' element as optional.

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

(RCS) Import files in XML format with optional attributes

2/18/2021 • 3 minutes to read • [Edit Online](#)

The following steps explain how a user in the System Administrator or Electronic Reporting Developer role can design ER format configuration to import files in XML format containing optional attributes. To complete these steps, you must first complete the steps in the "Create a configuration provider and mark it as active" procedure. Before you begin, download and save locally the IncomingDocumentToLearnHowToHandleOptionalAttributes.xml file from [Microsoft Download Center](#).

1. Go to **All workspaces** > **Electronic reporting**.
2. Make sure that the configuration provider for the sample company, Litware, Inc., is available and marked as **Active**. If you don't see this configuration provider, complete the steps in the procedure [Create configuration providers and mark them as active](#).
3. Click **Reporting configurations**.

Create a new data model configuration

1. Click **Create configuration** to open the drop dialog.
2. In the **Name** field, type 'Model to import xml file'.
3. Click **Create configuration**.
4. Click **Designer**.
5. Click **New** to open the drop dialog.
6. In the **Name** field, type 'Root'.
7. Click **Add**.
8. Click **New** to open the drop dialog.
9. In the **Name** field, type 'List'.
10. In the **Item type** field, select **Record list**.
11. Click **Add**.
12. Click **New** to open the drop dialog.
13. In the **Name** field, type 'Code'.
14. In the **Item type** field, select **String**.
15. Click **Add**.
16. Click **Save**.
17. Close the page.
18. Click **Change status**.
19. Click **Complete**.
20. Click **OK**.

Create a format for data import

1. Click **Create configuration** to open the drop dialog.
2. In the **New** field, enter 'Format based on data model Model to import xml file'.
3. In the **Name** field, type 'Format to import xml file'.
4. Select **Yes** in the **Supports data import** field.

5. Click **Create configuration**.

Design a format to parse incoming file in xml format

1. Click **Designer**.
2. Click **Add root** to open the drop dialog.
3. In the tree, select **XML\Element**.
4. In the **Name** field, type 'root'.
5. Click **OK**.
6. Click **Add** to open the drop dialog.
7. In the tree, select **XML\Element**.
8. In the **Name** field, type 'document'.
9. In the **Multiplicity** field, select **One many**.
10. Click **OK**.
11. In the tree, select **root\document**.
12. Click **Add** to open the drop dialog.
13. In the tree, select **XML\Attribute**.
14. In the **Name** field, type 'ID'.
15. Click **OK**.
16. Click **Save**.

Design a format mapping to save parsed information to data model

1. Click **Map format to model**.
2. Click **New**.
3. In the **Definition** field, enter or select a value.
4. In the list, click the link in the selected row.
5. In the **Name** field, type 'Mapping'.
6. Click **Save**.
7. Click **Designer**.
8. In the tree, expand **format**.
9. In the tree, expand **format\root: XML Element(root)**.
10. In the tree, select **format\root: XML Element(root)\document: XML Element 1.. (document)***.
11. Click **Bind**.
12. In the tree, expand **format\root: XML Element(root)\document: XML Element 1.. (document)***.
13. In the tree, select *format\root: XML Element(root)\document: XML Element 1.. (document)\id**.
14. In the tree, expand **List = format.root.document**.
15. In the tree, select **List = format.root.document\Code**.
16. Click **Bind**.
17. Click **Save**.
18. Close the page.

Run format mapping

1. Click **Run**.
2. Click **Browse** and select **IncomingDocumentToLearnHowToHandleOptionalAttributes.xml**.
3. Click **OK**.

NOTE

The selected file has not been imported as the format design assumes the existence of 'id' attribute for the 'document' element, but the imported file contains no such attribute.

Modify format structure to handle xml attribute as optional

1. Close the page.
2. In the tree, expand **root\document**.
3. In the tree, select **root\document\id**.
4. Select **Yes** in the **Empty string for missing attribute** field.
5. Click **Save**.

Run format mapping to test changes

1. Click **Map format to model**.
2. Click **Run**.
3. Click **Browse** and select the **IncomingDocumentToLearnHowToHandleOptionalAttributes.xml** file.
4. Click **OK**.
5. Review the generated file.

NOTE

The same file has been imported as the format design now consider the 'id' attribute for the 'document' element as optional.

NOTE

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Split generated XML files based on file size and content quantity

2/18/2021 • 2 minutes to read • [Edit Online](#)

You can design Electronic reporting (ER) formats to generate outgoing documents in XML format. Sometimes, those documents can be accepted only when they meet specific criteria, such a maximum file size or a maximum number of some XML nodes. You can design ER formats to generate electronic documents that satisfy the requirements that the recipients of those documents specify.

- For the FILE format element, you can define a limit on the file size as an ER expression. If the defined limit is exceeded when an ER report is generated, ER finishes creating the current file and then moves on to create the next file.
- For any XML ELEMENT format, you can define a limit on the number of elements as an ER expression. If the number of XML nodes in the file that is generated exceeds the defined limit when an ER report is run, ER finishes creating the current file and then moves on to create the next file.
- For any XML SEQUENCE format element, you can define a limit on the number of child elements as an ER expression. If the number of nested XML nodes of the format element in the generated file exceeds the defined limit when an ER report is run, ER finishes creating the current file and then moves on to create the next file.
- You can mark any XML ELEMENT format element as non-breakable. In this way, you can keep the nested items of XML nodes that are generated under the format element in a single generated file.

In addition to using the XML ELEMENT and XML SEQUENCE format elements to add XML nodes to the generated file, you can use the RAW XML format element. However, nodes that you add by using the RAW XML format element aren't considered when the number of nodes is calculated to evaluate the limits on the number of elements.

If you configured file destinations for a FILE format element that has been configured to split the generated output whenever specific limits are exceeded, each piece of generated output is sent to the configured file destination as an individual file. To uniquely name the files that are created by splitting the output, you must configure an ER expression for the FILE format element. If you include an ER data source of the NUMBER SEQUENCE type, the number sequence will be incremented for each piece of the split output.

To learn more about this feature, play the **ER Split XML files based on the file size or content item quantity** task guide, which is part of the **7.5.4.3 Acquire/Develop IT service/solution components (10677)** business process and can be downloaded from the [Microsoft Download Center](#). This task guide walks you through the process of configuring an ER format to split generated files based on limits on the file size and content item quantity. To complete the task guide, you must download the following files:

- [ER model configuration - XmlFilesSplittingModel.xml](#)
- [ER format configuration - XmlFilesSplittingFormat.xml](#)

Additional resources

[Electronic reporting \(ER\) destinations](#)

[Formula designer in Electronic reporting \(ER\)](#)

NOTE

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Support parameterized calls of ER data sources of the Calculated field type

2/18/2021 • 10 minutes to read • [Edit Online](#)

This topic explains how you can design an Electronic reporting (ER) data source by using the **Calculated field** type. This data source may contain an ER expression that, when executed, can be controlled by the values of the parameter arguments that are configured in a binding that calls this data source. By configuring parameterized calls of such a data source, you can reuse a single data source in many bindings, which reduces the total number of data sources that must be configured in ER model mappings or ER formats. It also simplifies the configured ER component, which reduces the maintenance costs and the cost of use by other consumers.

Prerequisites

To complete the examples in this topic, you must have the following access:

- Access to one of these roles:
 - Electronic reporting developer
 - Electronic reporting functional consultant
 - System administrator
- Access to Regulatory Configuration Services (RCS) that have been provisioned for the same tenant as Finance and Operations for one of the following roles:
 - Electronic reporting developer
 - Electronic reporting functional consultant
 - System administrator

You must also download and locally store the following files.

CONTENT	FILE NAME
Sample ER data model configuration	Model to learn parameterized calls.version.1.xml
Sample ER metadata configuration	Metadata to learn parameterized calls.version.1.xml
Sample ER model mapping configuration	Mapping to learn parameterized calls.version.1.1.xml
Sample ER format configuration	Format to learn parameterized calls.version.1.1.xml

Sign in to your RCS instance

In this example, you will create a configuration for the sample company, Litware, Inc. First, in RCS, you must complete the steps in the [Create configuration providers and mark them as active](#) procedure:

1. On the default dashboard, select **Electronic reporting**.
2. Select **Reporting configurations**.
3. Import the downloaded configurations to RCS in the following sequence: data model, metadata, model mapping, format. Complete the following steps for each ER configuration:

- a. Select **Exchange**.
- b. Select **Load from XML file**.
- c. Select **Browse**, and then select the required ER configuration in XML format.
- d. Select **OK**.

Review the provided ER solution

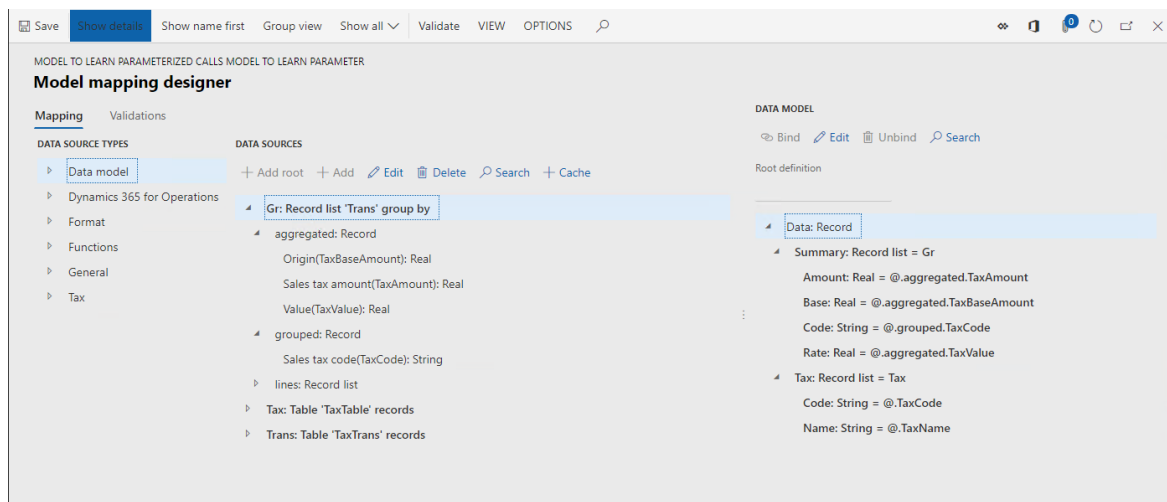
Review model mapping

1. In the configuration tree, expand the content of the **Model to learn parameterized calls** item.
2. Select **Mapping to learn parameterized calls**.
3. Select **Designer**.
4. Select **Designer**.

This ER model mapping is designed to do the following:

- Fetch the list of tax codes (**Tax** data source) residing in the **TaxTable** table.
- Fetch the list of tax transactions (**Trans** data source) residing in the **TaxTrans** table:
 - Group the list of fetched transactions (**Gr** data source) by tax code.
 - Calculate for grouped transactions following aggregated values per tax code:
 - Sum of tax base values.
 - Sum of tax values.
 - Minimum value of applied tax rate.

The model mapping in this configuration implements the base data model for any of the ER formats created for this model and executed in Finance and Operations. As a result, the content of the **Tax** and **Gr** data sources is exposed for ER formats such as abstract data sources.

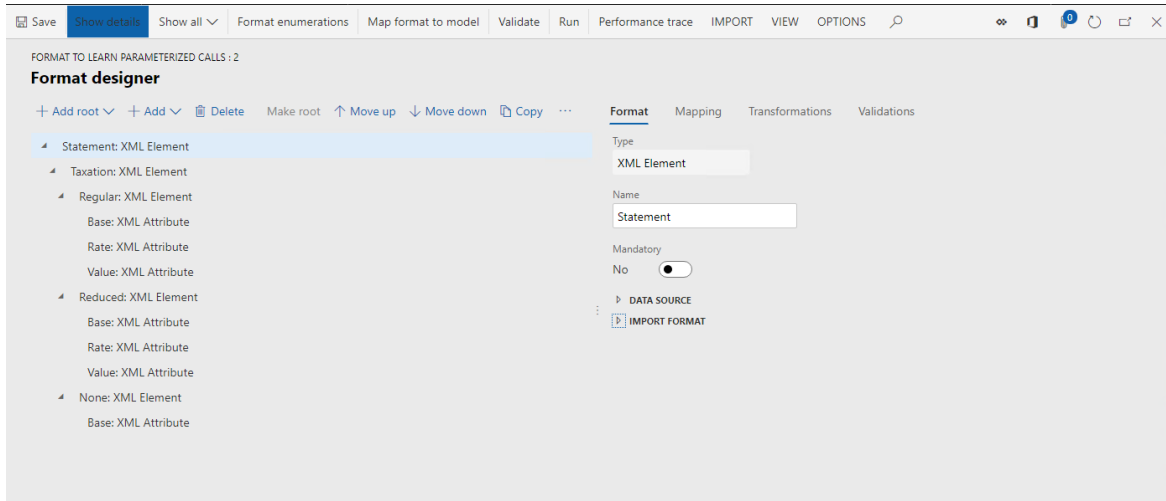


5. Close the **Model mapping designer** page.
6. Close the **Model mapping** page.

Review format

1. In the configuration tree, expand the content of the **Model to learn parameterized calls** item.
2. Select **Format to learn parameterized calls**.
3. Select **Designer**. This ER format is designed to do the following:

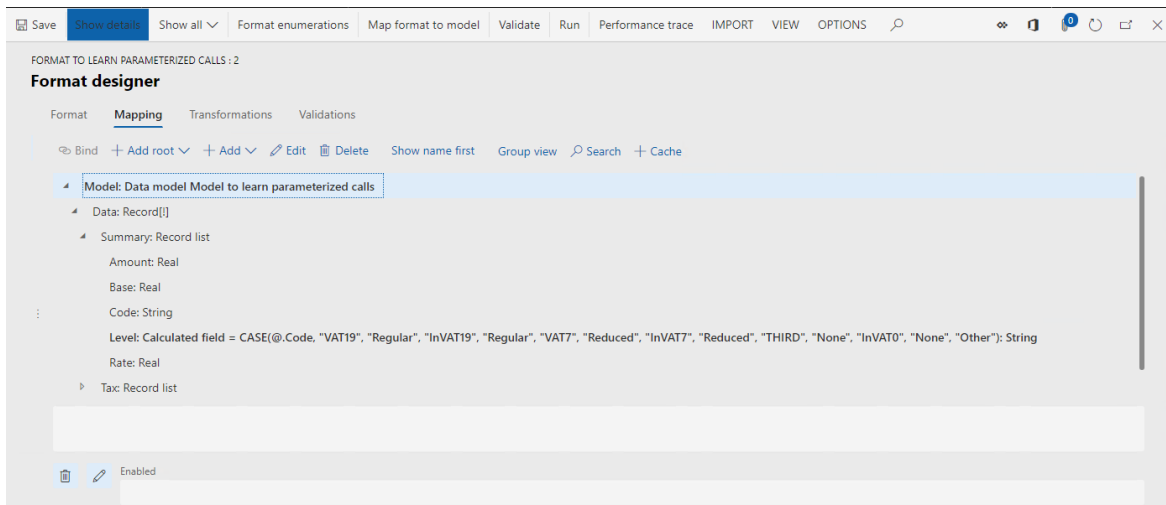
- Generate a tax statement in XML format.
- Present the following levels of taxation in the tax statement: regular, reduced, and none.
- Present multiple details at each taxation level, having a different number of details in each level.



4. Select **Mapping**.

5. Expand the **Model**, **Data**, and **Summary** items.

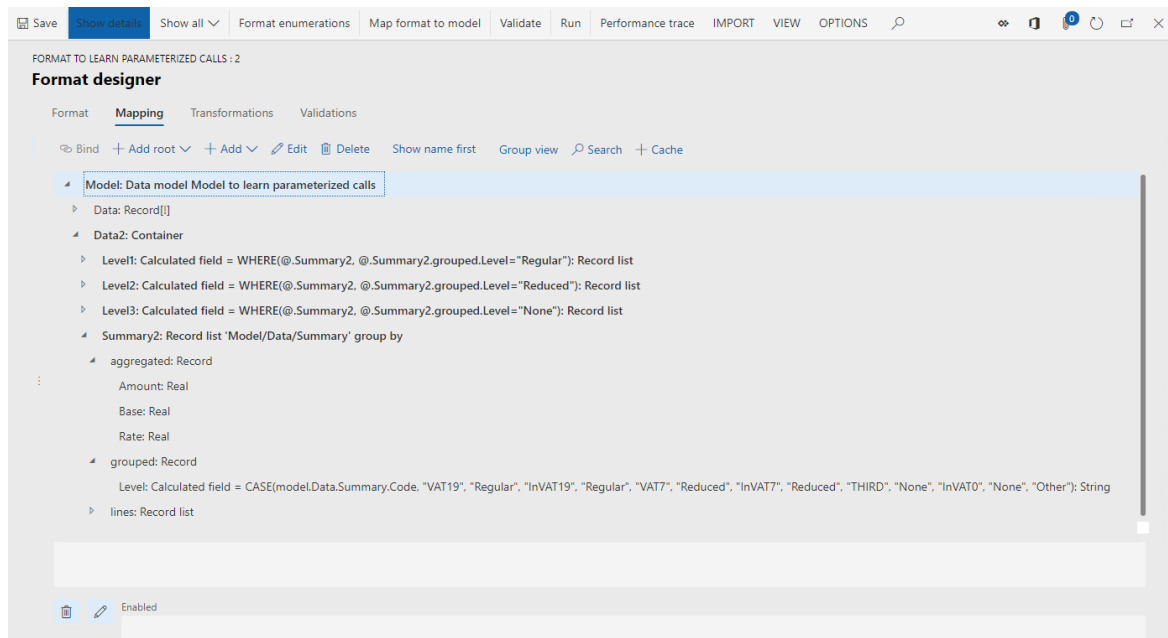
The calculated field **Model.Data.Summary.Level** contains the expression that returns the code of the taxation level (**Regular**, **Reduced**, **None**, or **Other**) as a text value for any tax code that can be retrieved from the **Model.Data.Summary** data source at run time.



6. Expand the **Model.Data2** item.

7. Expand the **Model.Data2.Summary2** item.

The **Model.Data2.Summary2** data source is configured to group the **Model.Data.Summary** data source transaction details by taxation level (returned by the **Model.Data.Summary.Level** calculated field) and compute the aggregations.



8. Review the calculated fields **Model.Data2.Level1**, **Model.Data2.Level2**, and **Model.Data2.Level3**. These calculated fields are used to filter the **Model.Data2.Summary2** records list and return only records that represent a particular taxation level.
9. Close the **Format designer** page.

Create a derived format

You can improve the provided format by adding one calculated field to filter the required taxation level instead of using the existing three fields: **Model.Data2.Level1**, **Model.Data2.Level2**, and **Model.Data2.Level3**. The required taxation level can be specified in the location where this new calculated field will be called.

1. In the configuration tree, expand the content of the **Model to learn parameterized calls** item.
2. Select **Format to learn parameterized calls**.
3. Select **Create configuration**.
4. Select **Derive from Name: Format to learn parameterized calls, Microsoft**.
5. In the **Name** field, enter **Format to learn parameterized calls (custom)**.
6. Select **Create configuration**.

Configure a parameterized calculated field that returns a list of records

Start adding a new calculated field

1. Select **Designer**.
2. Select **Expand/collapse** to expand all format items.
3. Select **Mapping**.
4. Expand the **Model** item.
5. Select the **Model.Data2** item.
6. Select **Add**.
7. Select **Functions\Calculated field**.
8. In the **Name** field, enter **Levels**.
9. Select **Edit formula**.

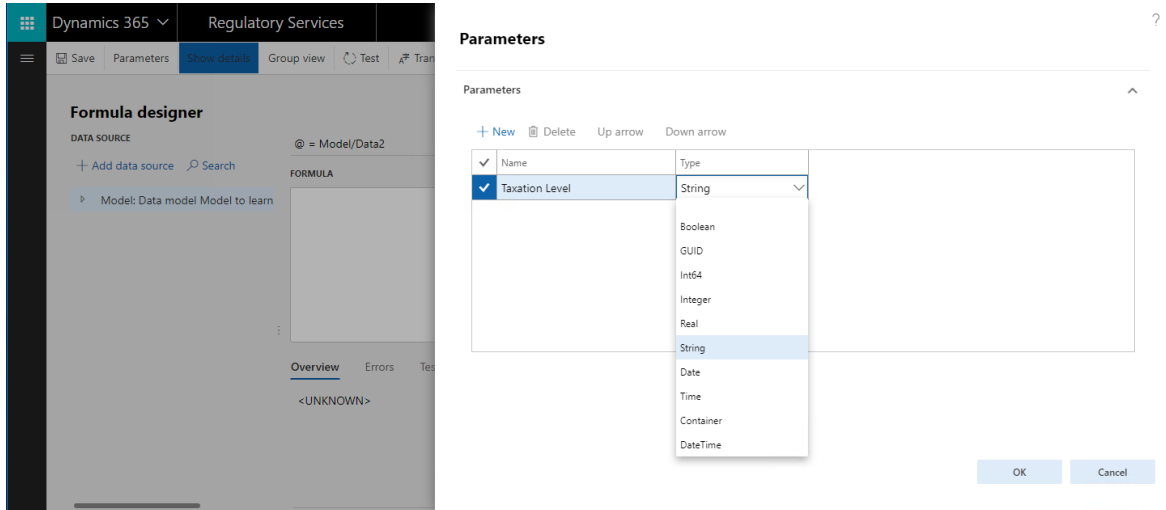
Define a parameter for adding a calculated field

1. Select **Parameters**.

2. Select **New**.
3. In the **Name** field, enter **Taxation Level**.
4. In the **Type** field, select **String**.

Only primitive data types can be used to specify the type of the parameter's argument. Therefore, **Record list**, **Record**, and **Enum** types cannot be used for this purpose.

The maximum number of parameters that can be specified for a single calculated field is 8.

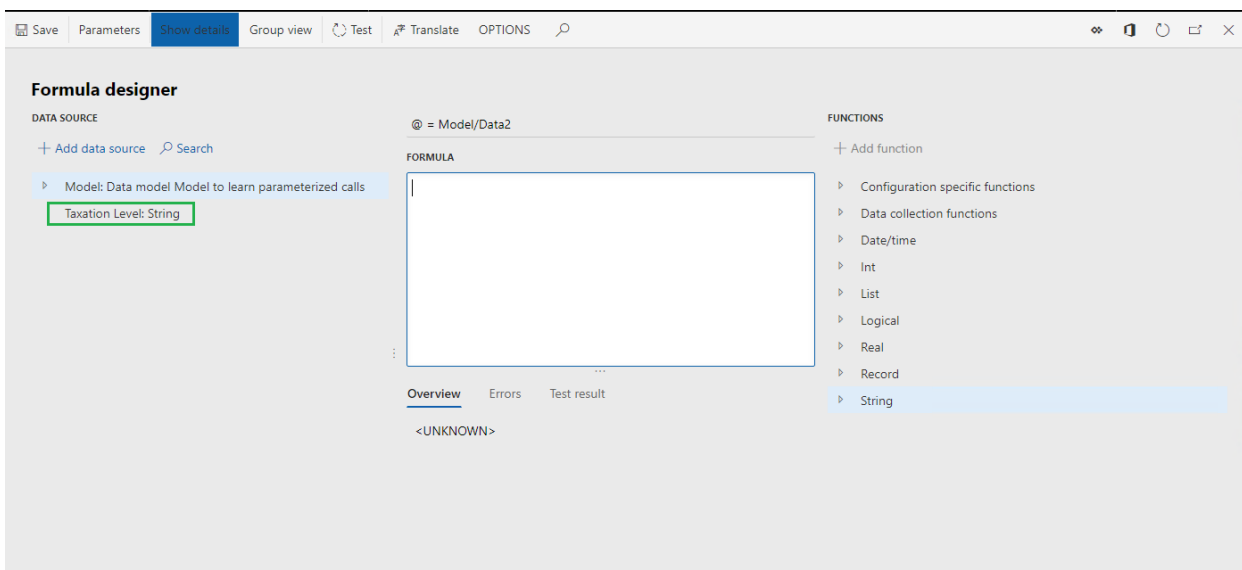


5. Select **OK**.

By adding this parameter, you specify the condition that must be in place to call this calculated field. When you call this calculated field, you need to specify the argument of the **Taxation Level** parameter as a value with **String** format.

Make sure that you define parameters only for those calculated fields that reside in a container (either **Record list**, **Record**, or **Container**).

The configured parameter is available in the list of data sources for this calculated field. You can add the parameter to the configured expression by selecting **Add data source**.



Define an expression for adding a calculated field

1. In the **Formula** field, enter:

WHERE(@.Summary2, @.Summary2.grouped.Level =

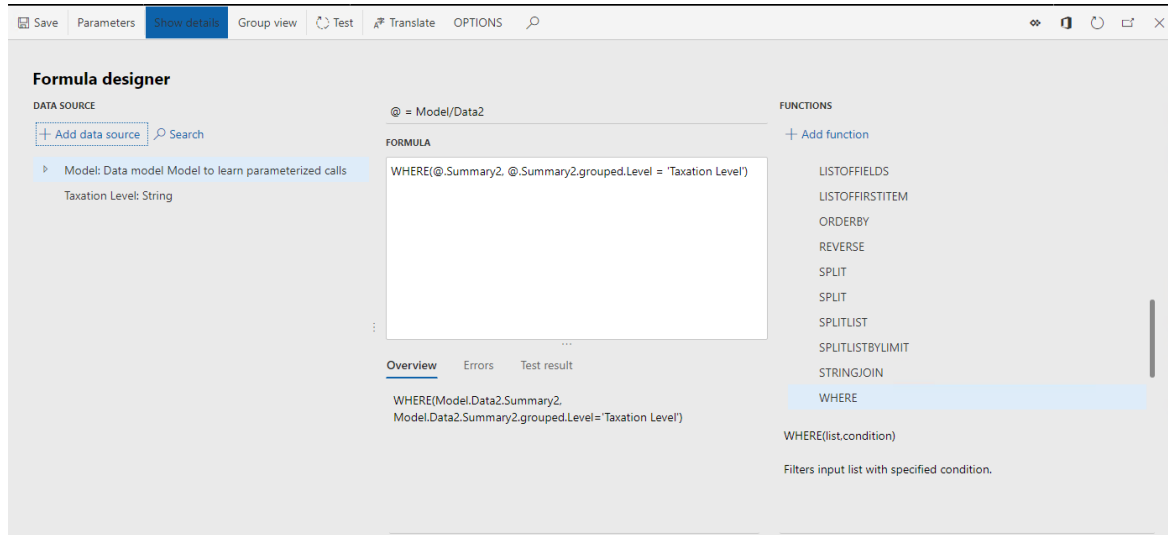
2. Select the **Taxation Level** parameter in the list of data sources.

3. Select **Add data source**.

4. In the **Formula** field, finalize the expression as:

WHERE(@.Summary2, @.Summary2.grouped.Level = 'Taxation Level')

5. Select **Save**.

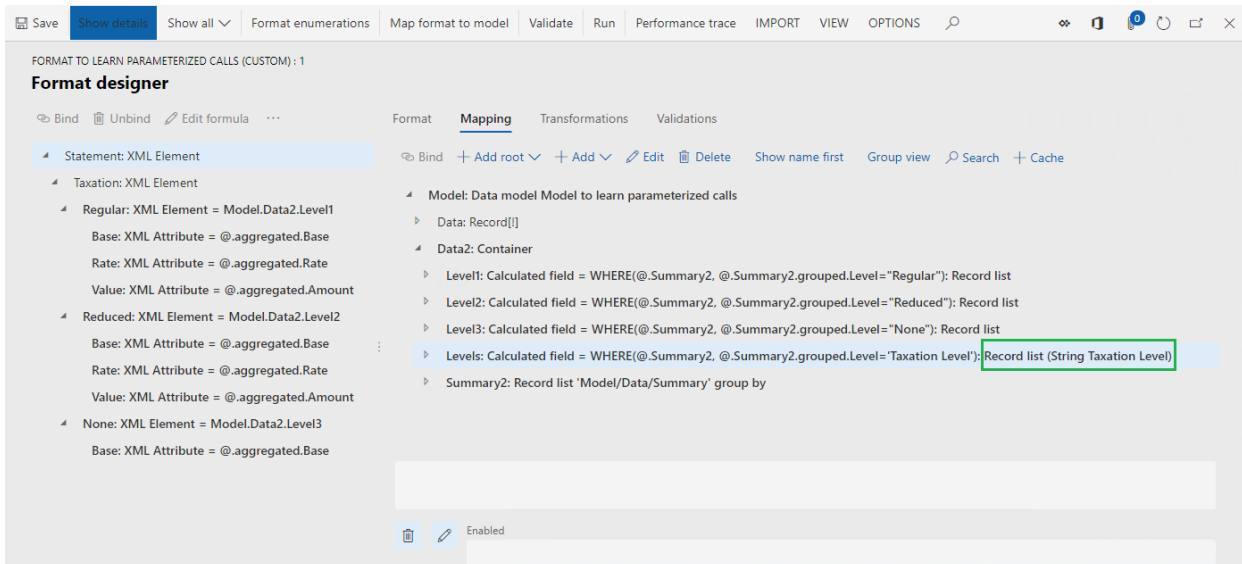


6. Close the **Formula designer** page.

Finish adding a new calculated field

- Select **OK**.

On the **Format designer** page, the configured parameterized calculated field **Levels** requires a **String** argument.



Use the configured calculated field for binding format elements

1. Select **Model.Data2.Levels** to select the configured calculated field.

2. Select the **Statement.Taxation.Regular** format element.

3. Select **Bind**.

4. Select **Yes** to confirm the replacement of the currently used data source, **Level1**, by the new data source, **Levels**, in all nested format elements of the selected format element.

Applied binding has been built as a call of the parameterized calculated field. By default, the name of the bound format element is used as an argument for parameterized calculated field under the following conditions:

- The calculated field is configured to use a single parameter.
- The data type of this parameter is defined as **String**.

When the name of the bound format element is blank, the data source name of this element is used in applied binding.

5. Select the **Statement.Taxation.Reduced** format element.
6. Select **Bind**.
7. Select **Yes** to confirm the replacement of the currently used data source, **Level2**, by the new data source, **Levels**, in all nested format elements under the selected format element.
8. Select the **Statement.Taxation.None** format element.
9. Select **Bind**.
10. Select **Yes** to confirm the replacement of the currently used data source, **Level3**, by the new data source, **Levels**, in all nested format elements under the selected format element.

When you specify the argument of the parameterized calculated field for the XML element representing taxation level (for example, **Model.Data2.Levels("Reduced")** as a text value), you don't need to do the same for nested XML attributes—their bindings will automatically inherit the value of the argument defined on the parent level (**Model.Data2.Levels.aggregated.Base**, not **Model.Data2.Levels("Reduced").aggregated.Base**).

Recurrent calls of any parameterized calculated field are not supported.

You can select **Edit formula**, and change the applied-by-default argument of the parameterized calculated field in the selected binding. If this argument is missing, it can cause errors at run time — users are informed about such a situation when the current format is validated.

The screenshot shows the 'Format designer' interface. At the top, a yellow banner displays the message 'Validation warnings exist'. The main workspace is divided into a tree view on the left and a mapping table on the right. The tree view shows a hierarchy: 'Statement: XML Element' > 'Taxation: XML Element' > 'None: XML Element = Model.Data2.Levels'. The mapping table shows two entries: 'Level3: Calculated field = WHERE(@.Summary2, @.Summary2.grouped.Level="None"): Record list' and 'Levels: Calculated field = WHERE(@.Summary2, @.Summary2.grouped.Level="Taxation Level"): Record list (String Taxation Level)'. Below the mapping table, a 'DETAILS' section shows 'Warnings (1)'. A table below this section lists the warning:

Description	Path	Resolutions
Value of mandatory parameter 1 is not provided in 'Model.Data2.Levels'	Binding: Statement: XML Element/Taxation: XML Element/None: XML Element	None

Configure a parameterized calculated field to return a record

When a parameterized calculated field returns a record, you need to support binding of individual fields of this record to format elements. In such cases there will be no parent binding that contains the value of an argument

to call a parameterized calculated field — this value must be defined in the binding of a single record's field.

Start adding a new calculated field

1. Select the **Model.Data2** item.
2. Select **Add**.
3. Select **Functions\Calculated field**.
4. In the **Name** field, enter **LevelRecord**.
5. Select **Edit formula**.

Define a parameter for adding a calculated field

1. Select **Parameters**.
2. Select **New**.
3. In the **Name** field, enter **Taxation Level**.
4. In the **Type** field, select **String**.
5. Select **OK**.

Define an expression for adding a calculated field

1. In the **Formula** field, enter the following:

```
FIRSTORNULL(@.Levels(
```

2. Select the **Taxation Level** parameter.

3. Select **Add data source**.

4. In the **Formula** field, append **'Taxation Level')**) to what you entered in Step 1 to finalize the expression to:

```
FIRSTORNULL(@.Levels('Taxation Level'))
```

5. Select **Save**.

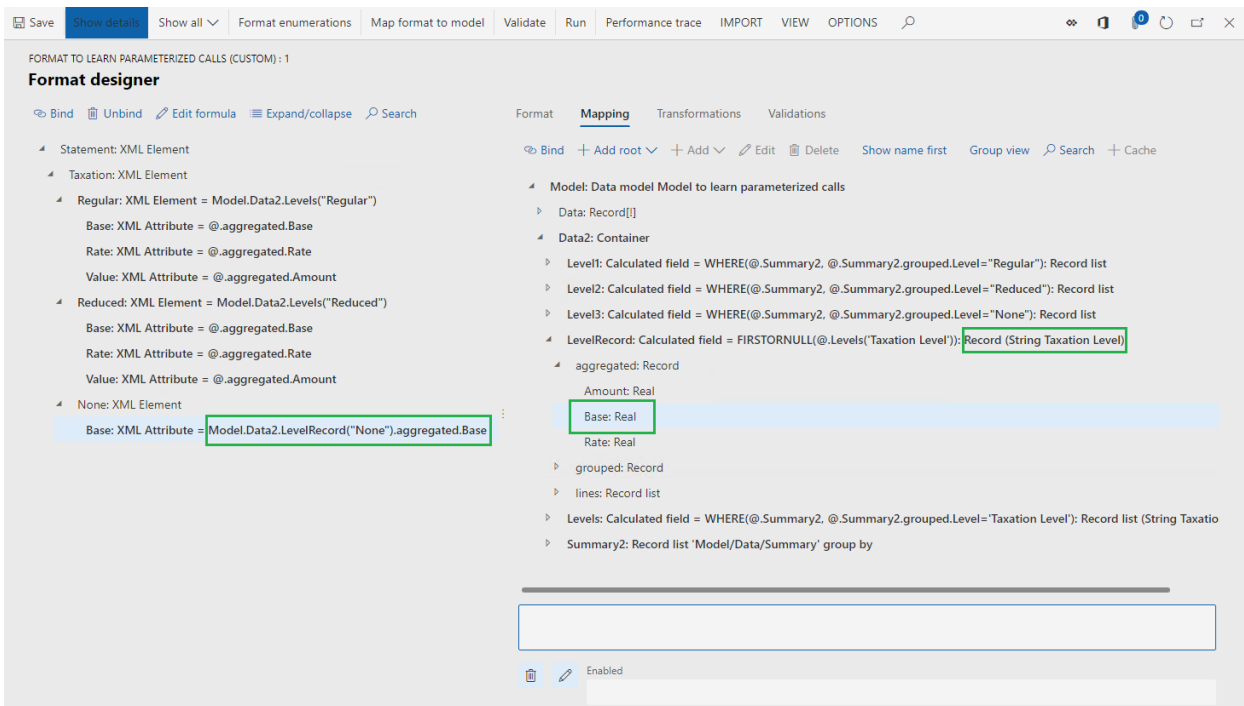
6. Close the **Formula designer** page.

Finish adding a new calculated field

- Select **OK**.

Use the configured calculated field to bind format elements

1. Expand **Model.Data2.LevelRecord** to select the configured calculated field.
2. Expand the **Model.Data2.LevelRecord.aggreated** container of the configured calculated field.
3. Select the **Model.Data2.LevelRecord.aggreated.Base** field.
4. Select the **Statement.Taxation.None** format element.
5. Select **Unbind**.
6. Select the **Statement.Taxation.None.Base** format element.
7. Select **Bind**.
8. Select **Edit formula**.
9. Change the expression to **Model.Data2.LevelRecord("None").aggreated.Base**.



Remove calculated fields that are not used

1. Select **Model.Data2.Level1**.
2. Select **Delete**.
3. Select **Model.Data2.Level2**.
4. Select **Delete**.
5. Select **Model.Data2.Level3**.
6. Select **Delete**.
7. Select **Save**.

NOTE

You reused the same calculated field **Model.Data2.Levels** several times in format bindings. It is much easier to use and maintain a single calculated field instead of doing this for multiple similar fields.

8. Close the **Format designer** page.

Complete adjusted version of a derived format

1. In the **Versions** FastTab, select **Change status**.
2. Select **Complete**.

Export completed version of a derived format

1. Select **Format to learn parameterized calls (custom)** format in the configurations tree.
2. In the **Versions** FastTab, select the completed version 1.1.1.
3. Select **Exchange**.
4. Select **Export as XML file**.
5. Store the downloaded configuration locally, in XML format.

Test ER formats

You can run the initial and improved ER formats to make sure that configured parameterized calculated fields work properly.

Import ER configurations

You can import reviewed configurations from RCS by using the ER repository of the RCS type. If you already went through the steps in the topic, [Import Electronic reporting \(ER\) configurations from Regulatory Configuration Services \(RCS\)](#), use the configured ER repository to import configurations discussed earlier in this topic to your environment. Otherwise, follow these steps:

1. Select the **DEMF** company and on the default dashboard, select **Electronic reporting**.
2. Select **Reporting configurations**.
3. Import the configurations from Microsoft Download Center in the following sequence: data model, model mapping, format. Complete the following steps for each ER configuration:
 - a. Select **Exchange**.
 - b. Select **Load from XML file**.
 - c. Select **Browse** to select the required ER configuration in XML format.
 - d. Select **OK**.
4. Import the exported from RCS completed version 1.1.1 of the **Format to learn parameterized calls (custom)** format:
 - a. Select **Exchange**.
 - b. Select **Load from XML file**.
 - c. Select **Browse** to select the locally stored **Format to learn parameterized calls (custom)** file in XML format.
 - d. Select **OK**.

Run ER formats

1. In the configuration tree, expand the content of the **Model to learn parameterized calls** item.
2. Select **Format to learn parameterized calls**.
3. Select **Run** on the top-most ribbon.
4. Save the locally generated output.
5. Select the **Format to learn parameterized calls (custom)** item.
6. Select **Run** on the top-most ribbon.
7. Save the generated output locally.
8. Compare the contents of the generated outputs.

Additional resources

- [Formula designer in Electronic reporting \(ER\)](#)
- [Improve performance of ER solutions by adding parameterized CALCULATED FIELD data sources](#)

NOTE

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Manage the Electronic reporting (ER) configuration lifecycle

2/18/2021 • 3 minutes to read • [Edit Online](#)

This topic describes how to manage the lifecycle of Electronic reporting (ER) configurations for Microsoft Dynamics 365 Finance.

Overview

Electronic reporting (ER) is an engine that supports statutory required and country-specific electronic documents. In general, ER assumes an ability to perform the following tasks for a single electronic document. For more details, see [Electronic reporting \(ER\) overview](#).

- Design a template for an electronic document:
 - Identify the required sources of data that can be presented in the document:
 - Underlying data, such as data tables, data entities, and classes.
 - Process-specific properties, such as execution date and time, and time zone.
 - User input parameters, specified by the end user at run time.
 - Define the required document elements and their topology to specify a final document format.
 - Configure the desired flow of data from selected data sources to defined document elements (via data source bindings to document format components), and specify process control logic.
- Make a template available so that it can be used in other instances:
 - Transform a document template that was created into an ER configuration, and export the configuration from the current application instance as an XML package that can be stored either locally or in LCS.
 - Transform an ER configuration into an application document template.
 - Import an XML package that is stored either locally or in LCS into the current instance.
- Customize the template of an electronic document:
 - Bring a template from LCS into the current instance as an ER configuration.
 - Design a custom version of an ER configuration, and keep a reference to the base version.
- Integrate a template with a particular business process, so that it's available in the application:
 - Configure settings so that the application starts to use an ER configuration, by referring to that configuration in a process-related parameter. For example, refer to the ER configuration in a specific Accounts payable payment method to generate an electronic payment message for processing invoices.
- Use a template in a specific business process:
 - Run an ER configuration in a specific business process. For example, to generate an electronic payment message for processing invoices when a payment method that references the ER configuration is selected.

Concepts

The following roles and related activities are associated with the ER configuration lifecycle.

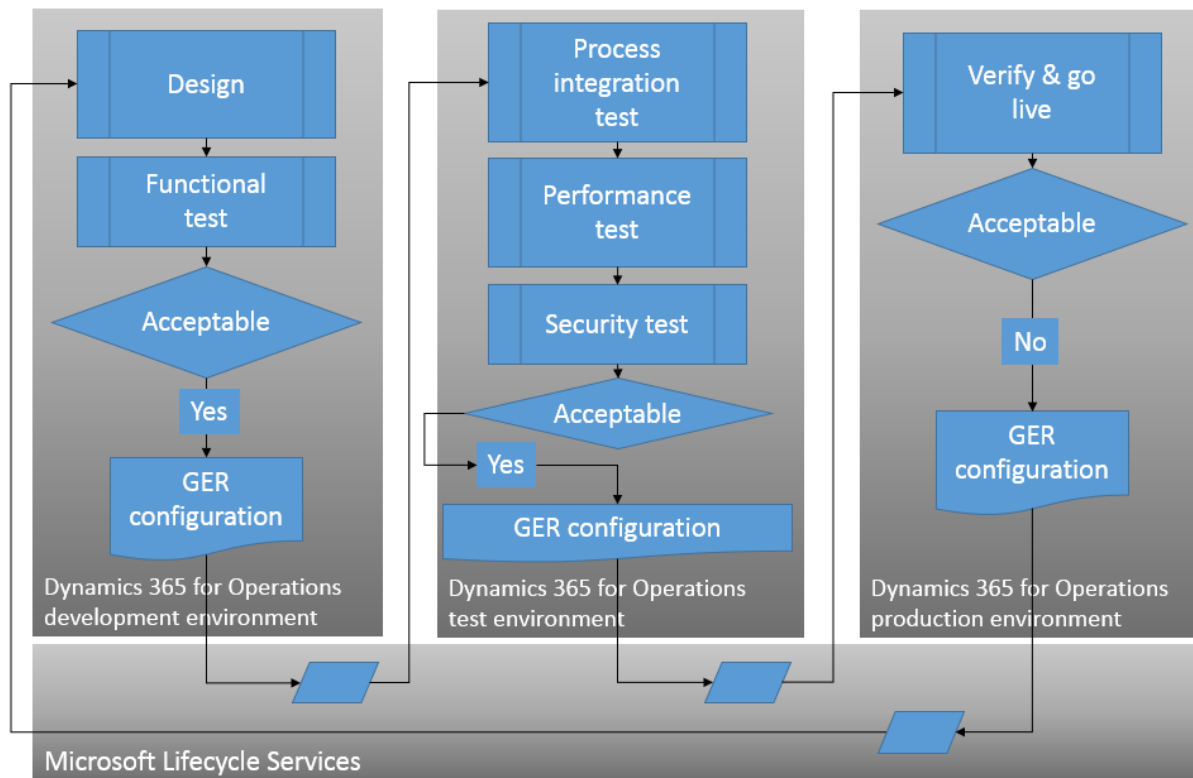
ROLE	ACTIVITIES	DESCRIPTION
Electronic reporting functional consultant	Create and manage ER components (models and formats).	A business person who designs ER domain-specific data models, designs the required templates for electronic documents, and binds them accordingly.
Electronic reporting developer	Create and manage data model mappings.	A specialist who selects the required Finance data sources and binds them to ER domain-specific data models.
Accounting supervisor	Configure process-related settings that reference ER artifacts.	For example, an Accounting supervisor role that allows the settings of an ER configuration to be used in a particular Accounts payable payment method to generate an electronic payment message for processing invoices.
Accounts payable payments clerk	Use ER artifacts in a specific business process.	For example, an Accounts payable payments clerk role that allows electronic payment messages to be generated for processing invoices, based on the ER format that is configured for a specific payment method.

ER configuration development lifecycle

For the following ER-related reasons, we recommend that you design ER configurations in the development environment, as a separate instance of Finance and Operations:

- Users in either the **Electronic reporting developer** role or the **Electronic reporting functional consultant** role can edit configurations and run them for testing purposes. This scenario can cause calls of methods of classes and tables that might harm business data and the performance of the instance.
- Calls of methods of classes and tables as ER data sources of ER configurations aren't restricted by entry points and logged company content. Therefore, users in either the **Electronic reporting developer** role or the **Electronic reporting functional consultant** role can access business-sensitive data.

ER configurations that are designed in the development environment can be uploaded to the test environment for the configuration evaluation (proper process integration, correctness of results, and performance) and quality assurance, such as correctness of role-driven access rights and segregation of duties. The features that enable ER configuration interchange can be used for this purpose. Finally, proven ER configurations can be uploaded either to LCS, where they can be shared with service subscribers, or to the production environment for internal use, such as shown in the following illustration.



Additional resources

[Electronic reporting \(ER\) overview](#)

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Upload a configuration into Lifecycle Services

2/18/2021 • 4 minutes to read • [Edit Online](#)

This topic explains how a user in the System administrator or Electronic reporting developer role can create a new [Electronic reporting \(ER\) configuration](#) and upload it into the [project-level Asset library](#) in Microsoft Dynamics Lifecycle Services (LCS).

In this example, you will create a configuration and upload it into LCS for a sample company that is named Litware, Inc. These steps can be completed in any company, because ER configurations are shared among companies. To complete these steps, you must first complete the steps in [Create configuration providers and mark them as active](#). Access to LCS is also required.

1. Sign in to the application by using one of the following roles:
 - Electronic reporting developer
 - System administrator
2. Go to **Organization administration > Workspaces > Electronic reporting**.
3. Select **Litware, Inc.**, and mark it as **Active**.
4. Select **Configurations**.

NOTE

Make sure that the current Dynamics 365 Finance user is a member of the LCS project that contains the [Asset library](#) that is used to import ER configurations.

You can't access an LCS project from an ER repository that represents a different domain than the domain that is used in Finance. If you try, an empty list of LCS projects will be shown, and you won't be able to import ER configurations from the project-level Asset library in LCS. To access project-level Asset libraries from an ER repository that is used to import ER configurations, sign in to Finance by using the credentials of a user who belongs to the tenant (domain) that the current Finance instance has been provisioned for.

Create a new data model configuration

1. Go to **Organization administration > Electronic reporting > Configurations**.
2. On the **Configurations** page, select **Create configuration** to open the drop-down dialog box.

In this example, you will create a configuration that contains a sample data model for electronic documents. This data model configuration will be uploaded into LCS later.
3. In the **Name** field, enter **Sample model configuration**.
4. In the **Description** field, enter **Sample model configuration**.
5. Select **Create configuration**.
6. Select **Model designer**.
7. Select **New**.
8. In the **Name** field, enter **Entry point**.
9. Select **Add**.

10. Select **Save**.
11. Close the page.
12. Select **Change status**.
13. Select **Complete**.
14. Select **OK**.
15. Close the page.

Register a new repository

1. Go to **Organization administration > Workspaces > Electronic reporting**.
2. In the **Configuration providers** section, select the **Litware, Inc.** tile.
3. On the **Litware, Inc.** tile, select **Repositories**.

You can now open the list of repositories for the Litware, Inc. configuration provider.

4. Select **Add** to open the drop-down dialog box.

You can now add a new repository.

5. In the **Configuration repository enter** field, select **LCS**.
6. Select **Create repository**.
7. In the **Project** field, enter or select a value.

For this example, select the desired LCS project. You must have [access](#) to the project.

8. Select **OK**.

Complete a new repository entry.

9. In the list, mark the selected row.

For this example, select the **LCS** repository record.

Note that a registered repository is marked by the current provider. In other words, only configurations that are owned by that provider can be put in this repository and therefore uploaded into the selected LCS project.

10. Select **Open**.

You open the repository to view the list of ER configurations. If the selected project hasn't yet been used for ER configurations sharing, the list will be empty.

11. Close the page.
12. Close the page.

Upload a configuration into LCS

1. Go to **Organization administration > Electronic reporting > Configurations**.
2. On the **Configurations** page, in the configurations tree, select **Sample model configuration**.

You must select a created configuration that has been already completed.

3. In the list, find and select the desired record.

For this example, select the version of the selected configuration that has a status of **Completed**.

4. Select **Change status**.

5. Select **Share**.

The status of the configuration is changed from **Completed** to **Shared** when the configuration is published in LCS.

6. Select **OK**.

7. In the list, find and select the desired record.

For this example, select the configuration version that has a status of **Shared**.

Note that the status of the selected version was changed from **Completed** to **Shared**.

8. Close the page.

9. Select **Repositories**.

You can now open the list of repositories for the Litware, Inc. configuration provider.

10. Select **Open**.

For this example, select the **LCS** repository, and open it.

Notice that the selected configuration is shown as an asset of the selected LCS project.

11. Open LCS by going to <https://lcs.dynamics.com>.

12. Open a project that was used earlier for repository registration.

13. Open the Asset library of the project.

14. Select the **GER configuration** asset type.

The ER configuration that you uploaded should be listed.

Note that the uploaded LCS configuration can be imported into another instance if providers have access to this LCS project.

NOTE

Can you tell us about your documentation language preferences? [Take a short survey](#).

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Import a configuration from Lifecycle Services

2/18/2021 • 3 minutes to read • [Edit Online](#)

This topic explains how a user in the System administrator or Electronic reporting developer role can import a new version of an [Electronic reporting \(ER\) configuration](#) from the [project-level Asset library](#) in Microsoft Dynamics Lifecycle Services (LCS).

In this example, you will select the desired version of the ER configuration and import it for a sample company that is named Litware, Inc. These steps can be completed in any company, because ER configurations are shared among companies. To complete these steps, you must first complete the steps in [Upload a configuration into Lifecycle Services](#). Access to LCS is also required.

1. Sign in to the application by using one of the following roles:
 - Electronic reporting developer
 - System administrator
2. Go to **Organization administration > Workspaces > Electronic reporting**.
3. Select **Configurations**.

NOTE

Make sure that the current Dynamics 365 Finance user is a member of the LCS project that contains the Asset library that the user wants to [access](#) to import ER configurations.

You can't access an LCS project from an ER repository that represents a different domain than the domain that is used in Finance. If you try, an empty list of LCS projects will be shown, and you won't be able to import ER configurations from the project-level Asset library in LCS. To access project-level Asset libraries from an ER repository that is used to import ER configurations, sign in to Finance by using the credentials of a user who belongs to the tenant (domain) that the current Finance instance has been provisioned for.

Delete a shared version of a data model configuration

1. On the **Configurations** page, in the configurations tree, select **Sample model configuration**.

You created the first version of a sample data model configuration and published it to LCS when you completed the steps in [Upload a configuration into Lifecycle Services](#). In this procedure, you will delete that version of the ER configuration. You will then import that version from LCS later in this topic.

2. In the list, find and select the desired record.

For this example, select the version of the configuration that has a status of **Shared**. This status indicates that the configuration has been published to LCS.

3. Select **Change status**.
4. Select **Discontinue**.

By changing the status of the selected version from **Shared** to **Discontinued**, you make the version available for deletion.

5. Select **OK**.
6. In the list, find and select the desired record.

For this example, select the version of the configuration that has a status of **Discontinued**.

7. Select **Delete**.

8. Select **Yes**.

Notice that the only draft version 2 of the selected data model configuration is now available.

9. Close the page.

Import a shared version of a data model configuration from LCS

1. Go to **Organization administration > Workspaces > Electronic reporting**.

2. In the **Configuration providers** section, select the **Litware, Inc.** tile.

3. On the **Litware, Inc.** tile, select **Repositories**.

You can now open the list of repositories for the Litware, Inc. configuration provider.

4. Select **Open**.

For this example, select the **LCS** repository, and open it. You must have **access** to the LCS project and to the Asset library that is accessed by the selected ER repository.

5. In the list, mark the selected row.

For this example, select the first version of **Sample model configuration** in the version list.

6. Select **Import**.

7. Select **Yes** to confirm the import of the selected version from LCS.

An informational message confirms that the selected version was successfully imported.

8. Close the page.

9. Close the page.

10. Select **Configurations**.

11. In the tree, select **Sample model configuration**.

12. In the list, find and select the desired record.

For this example, select the version of the configuration that has a status of **Shared**.

Notice that shared version 1 of the selected data model configuration is also available now.

NOTE

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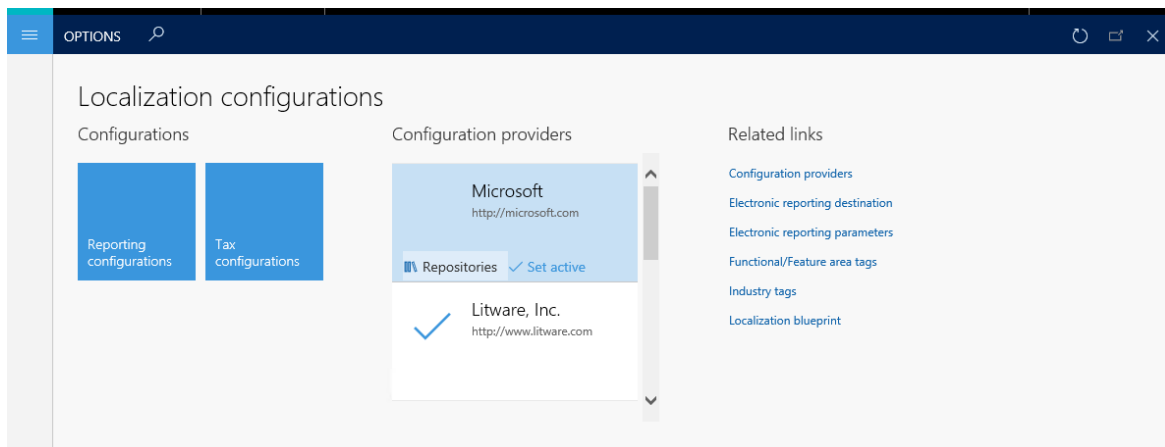
The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Download Electronic reporting configurations from Lifecycle Services

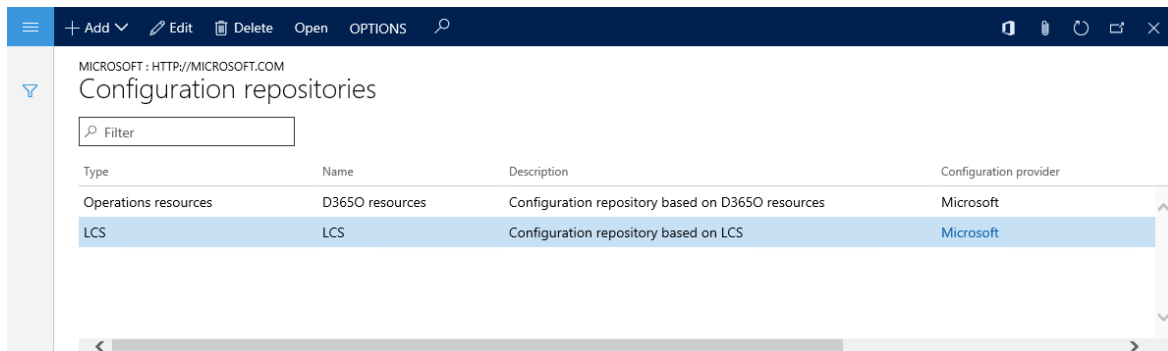
2/18/2021 • 2 minutes to read • [Edit Online](#)

This topic explains how to download the newest version of [Electronic reporting \(ER\) configurations](#) from the [Shared asset library](#) in Microsoft Dynamics Lifecycle Services (LCS).

1. Sign in to the application by using one of the following roles:
 - Electronic reporting developer
 - Electronic reporting functional consultant
 - System administrator
2. Go to **Organization administration > Workspaces > Electronic reporting**.
3. In the **Configuration providers** section, select the **Microsoft** tile.
4. On the **Microsoft** tile, select **Repositories**.



5. On the **Configuration repositories** page, in the grid, select the existing repository of the LCS type. If this repository doesn't appear in the grid, follow these steps:
 - a. Select **Add** to add a repository.
 - b. Select **LCS** as the repository type.
 - c. Select **Create repository**.
 - d. If you're prompted about authorization, follow the on-screen instructions.
 - e. Enter a name and description for the repository.
 - f. Select **OK** to confirm the new repository entry.
 - g. In the grid, select the new repository of the **LCS** type.
6. Select **Open** to view the list of ER configurations for the selected repository.



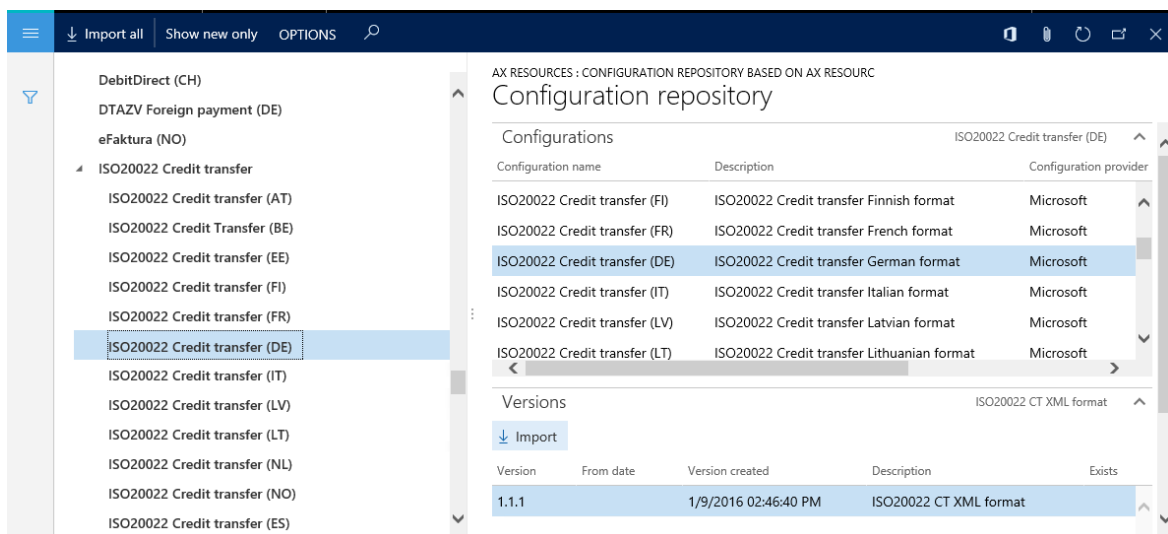
TIP

If you have trouble accessing the LCS repository to download configurations from the Shared asset library in LCS, you can download configurations from the [Global repository](#) instead.

7. In the configurations tree in the left pane, select the required ER configuration.
8. On the **Versions** FastTab, select the required version of the selected ER configuration.
9. Select **Import** to download the selected version from LCS to the current instance.

NOTE

The **Import** button is unavailable for ER configuration versions that are already present in the current instance.



NOTE

Depending on the ER settings, configurations are validated after they are imported. You might be notified about any inconsistency issues that are discovered. You must resolve those issues before you can use the imported configuration version. For more information, see the list of related topics for this topic.

Additional resources

[Electronic reporting \(ER\) overview](#)

[Download ER configurations from the Global repository of Configuration service](#)

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Import Electronic reporting (ER) configurations

2/18/2021 • 2 minutes to read • [Edit Online](#)

This topic explains how to download Electronic reporting (ER) configurations from Microsoft Dynamics Lifecycle Services (LCS) to a local business data application. It also explains how to upload the ER configurations from an ER repository to the local business data (LBD) application.

1. Sign in to your local business data application by using one of the following roles:
 - Electronic reporting developer
 - Electronic reporting functional consultant
 - System administrator
2. Go to **Organization administration > Electronic reporting**.
3. In the **Configuration providers** section, select the card for the ER provider that is associated with your company.

NOTE

To learn how to register a new ER solution provider, play the **Create a configuration provider and mark it as active** task guide.

4. On the selected tile, click **Repositories**.
5. On the **Configuration repositories** page, in the grid, select the existing repository of the **File system** type. If the repository doesn't appear in the grid, follow these steps:
 - a. Click **Add** to add a new repository.
 - b. Select **FILE SYSTEM** as the repository type.
 - c. Click **Create repository**.
 - d. Enter a name and description for the repository.
 - e. Enter the path of the working directory for this repository. This path should point to a folder of the local file system where the ER configurations that belong to the repository will be stored.
 - f. Click **OK** to confirm and save the new repository.
 - g. In the grid, select the new repository of the **File system** type.
6. In your browser, open another tab, and sign in to LCS.
7. In the Shared asset library, select the **GER Configuration** asset type, and then click **Download all**.

NOTE

All the ER configurations will be put into a zip file for download.

8. Open the file, select all the ER configurations, and then copy them to the working directory for the repository of the **File system** type.
9. On the **ER repositories** page, on the **Dynamics 365 for Finance and Operations** tab, click **Open** to view the list of ER configurations for the selected repository.
10. In the **Configurations** tree in the left pane, select an ER configuration.

11. On the **Versions** FastTab, select the required version of the ER configuration.
12. Click **Import** to download the selected version from this repository to the current instance.

NOTE

The **Import** button is unavailable for existing ER configuration versions.

NOTE

Depending on the ER settings, configurations are validated after they are imported. You might be notified about inconsistencies or issues that are discovered. You must resolve these inconsistencies or issues before you can use the imported configuration version.

Frequently asked questions

Question: When I click **Download all** in the Shared asset library, I receive the following warning: "Zip generation is in progress, please try again in a few minutes." Why do I receive this warning?

Answer: You receive this warning because a new configuration is added to the Shared asset library, and the ER configuration is being archived.

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Import Electronic reporting (ER) configurations from Regulatory Configuration Services (RCS)

2/18/2021 • 2 minutes to read • [Edit Online](#)

You can use Regulatory Configuration Services (RCS) to design Electronic reporting (ER) configurations. The ER tool provides access to the list of configurations that have been configured in each instance of RCS that has been provisioned for your company. You can use this feature to import configurations that you configured in an RCS instance into the current instance. After configurations are imported, they can be used to handle incoming documents or generate outgoing electronic documents.

To learn more about this feature, complete the example in this topic. Alternatively, play the **ER Import configurations from RCS** task guide, which is part of the 7.5.4.3 Acquire/Develop IT service/solution components (10677) business process. This task guide can be downloaded from the [Microsoft Download Center](#). It walks you through the process of importing ER configurations from an RCS instance into the current instance.

Example: Import an ER configuration from RCS

This example shows how a user in the System Administrator or Electronic Reporting Developer role can import a new version of an ER configuration from RCS. In this example, you select the desired version of the ER configuration that has been configured in an RCS instance, and you import that version into the current instance for a sample company that is named Litware, Inc. These steps can be completed in any company, because ER configurations are shared among companies.

To complete the steps in this example, you must first complete the steps in [Create configuration providers and mark them as active](#). You must also have access to an RCS instance that contains at least one ER configuration that has a status of either **Completed** or **Shared**.

1. Go to **Organization administration > Workspaces > Electronic reporting**.
2. On the **Localization configurations** page, in the **Configuration providers** section, make sure that the configuration provider for the Litware, Inc. sample company is listed, and that it's marked as **Active**. If you don't see this configuration provider, follow the steps in [Create configuration providers and mark them as active](#).
3. If no RCS environment has been provisioned for your company, in the **External Links** section, select **Regulatory services – Configuration**. Then follow the instructions to provision an RCS environment.
4. In the **Related links** section, select **Electronic reporting parameters**.
5. On the **Electronic reporting parameters** page, select the **RCS** tab.
6. Use the URLs on this tab to access the RCS environment has been provisioned for your company.
7. Close the **Electronic reporting parameters** page.

Register a new ER repository

1. On the **Localization configurations** page, select the **Litware, Inc.** configuration provider in the list.
2. Select **Repositories**.
3. Select **Add** to open the drop-down dialog box.
4. Select **RCS** as the configuration repository type, and then select **Create repository**.
5. In the **RCS environment display name** field, select the desired RCS instance. Note that you can have several instances.
6. Select **OK**.

Import ER configurations from an RCS-based repository

1. On the **Configuration repositories** page, select the **Show filters** button on the left side of the window.
2. For the **Name** filter, select **begins with** as the filter operator, and then enter **RCS** as the filter value.
3. Select the repository, and open it.
4. On the **Connect to Regulatory Configuration Services** page, select the **Click here to connect to Regulatory Configuration Services** link.
5. Select **Open**.
6. Select **Close**.
7. Select the desired version of the ER configuration, and then select **Import** to import that version.

Additional resource

- [Electronic reporting \(ER\) overview](#)

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

(ER) Import configurations from RCS

2/18/2021 • 2 minutes to read • [Edit Online](#)

The following steps explain how a user in the System Administrator or Electronic Reporting Developer role can import a new version of an Electronic reporting (ER) configuration from Microsoft Regulatory Configuration Services (RCS). In this example, you will select the version of the ER configuration that has been configured in an RCS instance and import it into the current instance for sample company, Litware, Inc. These steps can be performed in any company because ER configurations are shared among companies. To complete these steps, you must first complete the steps in the topic, [Create configuration providers and mark them as active](#). To complete these steps, you must also have access to an RCS instance containing at least one ER configuration in either **Completed** or **Shared** status.

1. Go to **Organization administration > Workspaces > Electronic reporting**.
2. Make sure that the configuration provider for the sample company, Litware, Inc., is available and marked as **Active**. If you don't see this configuration provider, complete the steps in the topic, [Create configuration providers and mark them as active](#).
3. If you have no RCS environment provisioned to your company, select **Regulatory services – Configuration** external link and follow the instructions to provision an RCS environment.
4. Select **Electronic reporting parameters**.
5. Select the **RCS** tab.
6. If RCS environment has been already provisioned to your company, use presented on the page URLs to access it.
7. Close the page.

Register a new ER repository.

1. In the list, mark the selected row.
2. Select Litware, Inc. provider.
3. Select Repositories.
4. Select Add to open the drop dialog.
5. In the Configuration repository type field, enter 'RCS'.
6. Select Create repository.
7. In the RCS environment display name field, enter or select a value.
8. Select the desired RCS instance. You can have several of them.
9. Select OK.

Import ER configurations from RCS-based repository

1. Select **Show filters**.
2. Enter a filter value of "RCS" on the **Name** field using the **begins with** filter operator.
3. When you open the selected repository, on the **Connect to Regulatory Configuration Services** page, select **Select here to connect to Regulatory Configuration Services** link.
4. Select **Open**.
5. Select **Close**.
6. Select the desired version of ER configuration and select **Import** to bring it in the current instance.

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Use JOIN data sources to get data from multiple application tables in Electronic reporting (ER) model mappings

2/18/2021 • 13 minutes to read • [Edit Online](#)

While configuring Electronic reporting (ER) model mappings or formats, you can [add](#) required data sources of the **Join** type. At design time, a **Join** data source is configured as a set of several data sources each of which returns a list of records. For every data source except the first one, you need to define necessary conditions to join records of the current and previous data sources. At runtime, a configured data source of **Join** type [returns](#) a single joined list of records containing fields from the records of nested data sources.

The following types of joins are currently supported:

- Outer (left) join:
 - Join all records of the first (left-most) data source and then any matching in accordance to configured conditions records of the second (right-most) data source.
- Inner (right) join:
 - Join only records of the first (left-most) data source and only records of the second (right-most) data source matching to each other in accordance to configured conditions.

In the configured **Join** data source, when all data sources are the **Table records** type, execution of the **Join** data source can be [performed at the database level](#) using a single SQL statement. This statement reduces the number of database calls, which improves model-mapping performance. Otherwise, execution of **Join data** source is performed in memory.

NOTE

Using the **VALUEIN** function in ER expressions that specify conditions for joining records in data sources of **Join** type is not supported yet. Visit the [Formula designer in Electronic reporting](#) page for more details about this function.

To learn more about this feature, complete the example in this topic.

Example: Use JOIN data sources in ER model mappings

The following steps explain how the System administrator or Electronic reporting developer can configure an Electronic reporting (ER) model mapping to get data from multiple application tables at once by using data sources of the **Join** type to improve data access performance. These steps can be performed for any company of Dynamics 365 Finance or Regulatory Configuration Services (RCS).

Prerequisites

To complete the examples in this topic, you must have access to one of the following depending on what service is used to complete these steps:

Access to Finance for one of the following roles:

- Electronic reporting developer
- Electronic reporting functional consultant
- System administrator

Access to RCS for one of the following roles:

- Electronic reporting developer
- Electronic reporting functional consultant
- System administrator

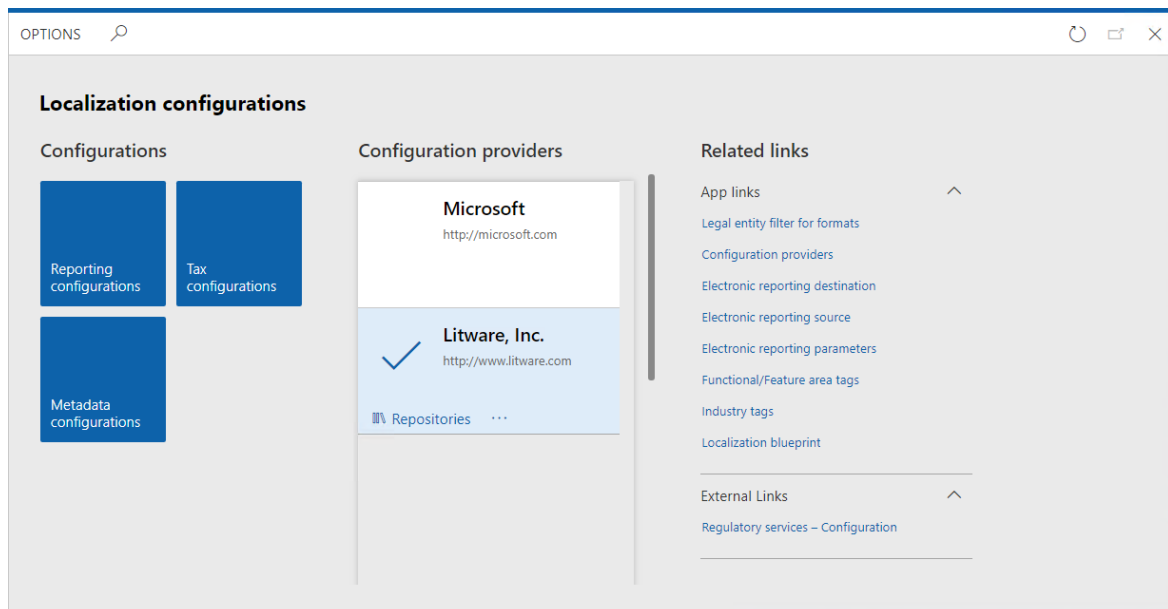
You also must first complete the steps in the [Create a configuration provider and mark it as active](#) procedure.

In advance, you must also download from [Microsoft Download Center](#) and save locally the following sample ER configuration files:

CONTENT DESCRIPTION	FILE NAME
Sample ER data model configuration file, which is used as the data source for the examples.	Model to learn JOIN data sources.version.1.1.xml
Sample ER model mapping configuration file, which implements the ER data model for the examples.	Mapping to learn JOIN data sources.version.1.1.xml
Sample ER format configuration file. This file describes the data to populate the ER format component for the examples.	Format to learn JOIN data sources.version.1.1.xml

Activate a configurations provider

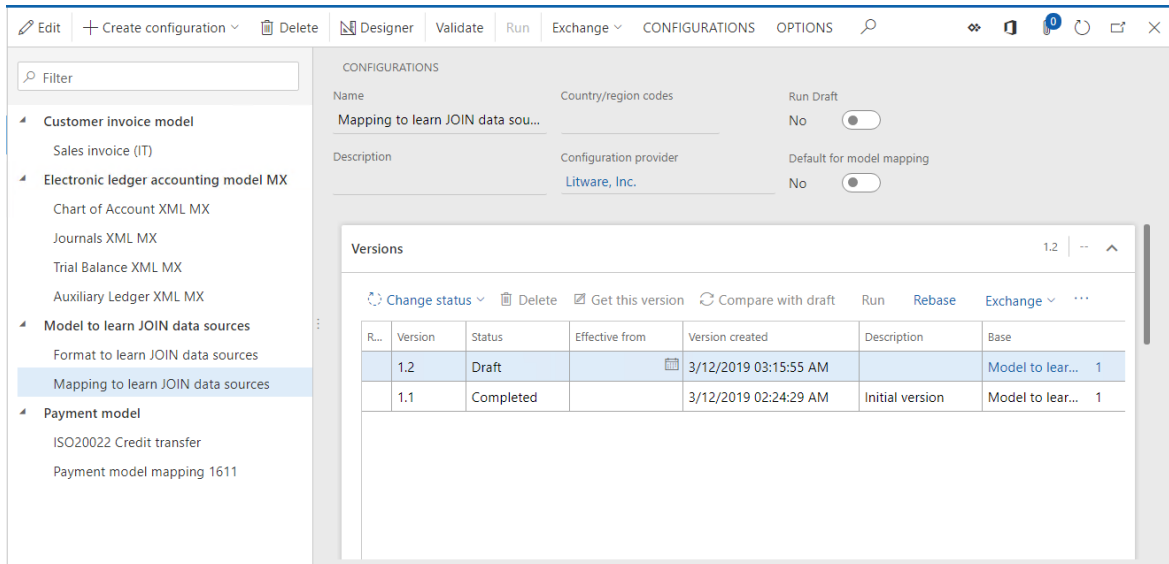
1. Access either Finance or RCS in the first session of your web browser.
2. Go to **Organization administration > Workspaces > Electronic reporting**.
3. On the **Localization configurations** page, in the **Configuration providers** section, make sure that the configuration provider for the [Litware, Inc.](#) sample company is listed, and that it's marked as **Active**. If you don't see this configuration provider, follow the steps in [Create a configuration provider and mark it as active](#) procedure.



Import sample ER configuration files

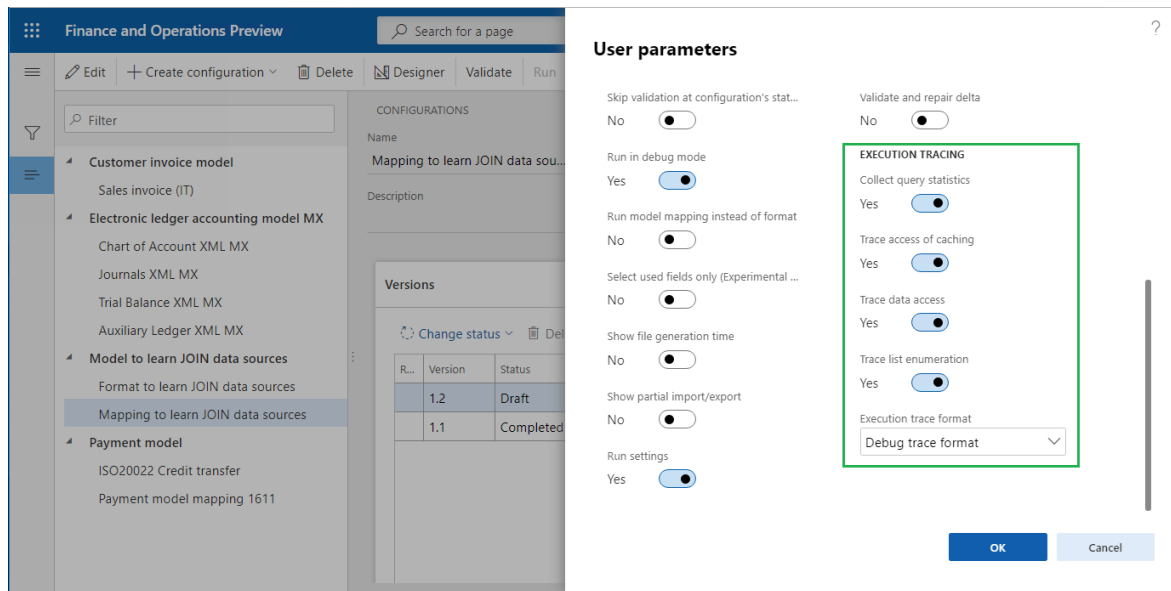
1. Select **Reporting configurations**.
2. Import the ER data model configuration file.
 - a. Select **Exchange**.
 - b. Select **Load from XML file**.

- c. Select **Browse** to find the **Model to learn JOIN data sources.version.1.1.xml** file.
 - d. Select **OK**.
3. Import the ER model-mapping configuration file.
 - a. Select **Exchange**.
 - b. Select **Load from XML file**.
 - c. Select **Browse** to find the **Mapping to learn JOIN data sources.version.1.1.xml** file.
 - d. Select **OK**.
 4. Import the ER format configuration file.
 - a. Select **Exchange**.
 - b. Select **Load from XML file**.
 - c. Select **Browse** to find the **Format to learn JOIN data sources.version.1.1.xml** file.
 - d. Select **OK**.
 5. In the configurations tree, expand the **Model to learn JOIN data sources** item as well as other model items (when available).
 6. Observe the list of ER configurations in the tree as well as version details on the **Versions** fast tab – they will be used as the source of data for your sample report.



Turn on execution trace options

1. Select **CONFIGURATIONS**.
2. Select **User parameters**.
3. Set execution trace parameters as shown on the screenshot below.

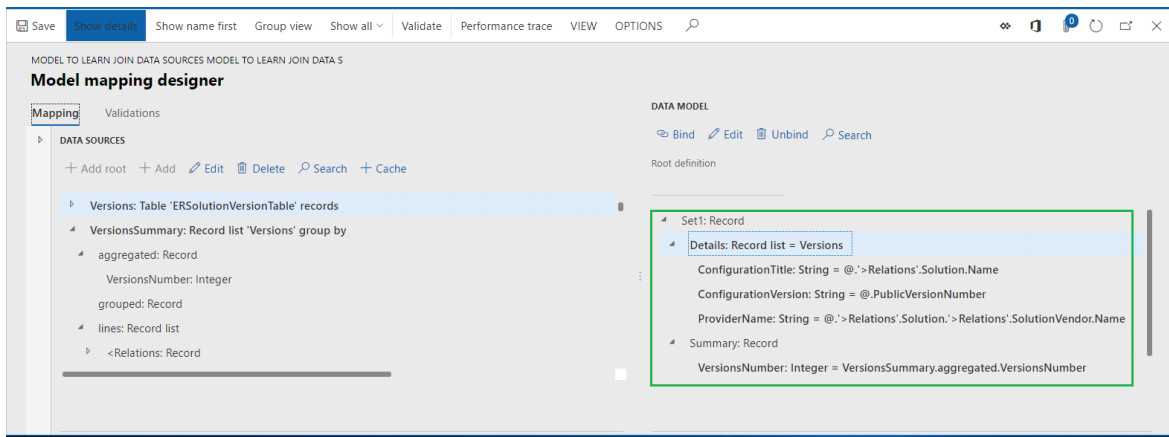


With these parameters turned on, for every execution of the imported ER format file, the execution trace will be generated. Using details of generated execution trace, you can analyze the execution of ER format and ER model-mapping components. Visit the [Trace execution of ER format to troubleshoot performance issues](#) page for more details about ER execution trace feature.

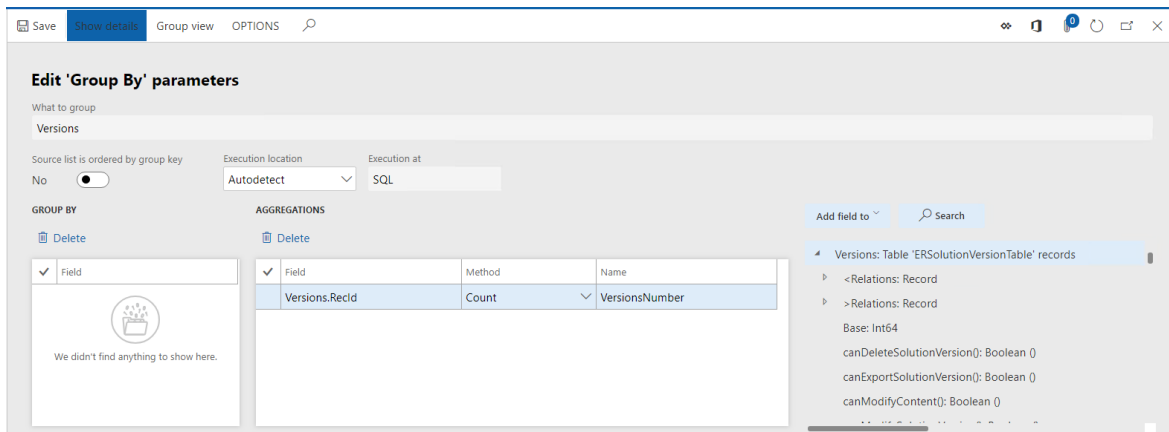
Review ER model mapping (part 1)

Review settings of the ER model-mapping component. The component is configured to access information about versions of ER configurations, details of configurations and configuration providers without using data sources of the **Join** type.

1. Select **Mapping to learn JOIN data sources** configuration.
2. Select **Designer** to open the list of mappings.
3. Select **Designer** to review the mapping details.
4. Select **Show details**.
5. In the configurations tree, expand the **Set1** and **Set1.Details** data model items:
 - a. Binding **Details: Record list = Versions** indicates that the **Set1.Details** item is bound to the **Versions** data source returning records of the **ERSolutionVersionTable** table. Each record of this table represents a single version of an ER configuration. The content of this table is presented in the **Versions** fast tab on the **Configurations** page.
 - b. Binding **ConfigurationVersion: String = @.PublicVersionNumber** means that the value of the public version of each ER configuration's version is taken from the **PublicVersionNumber** field of the **ERSolutionVersionTable** table and placed to the **ConfigurationVersion** item.
 - c. Binding **ConfigurationTitle: String = @.'>Relations'.Solution.Name** indicates that the name of an ER configuration is taken from the **Name** field of the **ERSolutionTable** table assessing by using the many-to-one relation ('>Relations') between the **ERSolutionVersionTable** and **ERSolutionTable** tables. Names of ER configurations of the current application instance are presented in the configurations tree on the **Configurations** page.
 - d. Binding **@.'>Relations'.Solution.'>Relations'.SolutionVendor.Name** means that the name of the configuration provider that owns the current configuration is taken from the **Name** field of the **ERVendorTable** table assessing by using the many-to-one relation between **ERSolutionTable** and **ERVendorTable** tables. Names of ER configuration providers are presented in the configurations tree on the **Configurations** page on the page header for each configuration. The entire list of ER configuration providers can be found on the **Organization administration > Electronic reporting > Configuration provider** table page.



6. In the configurations tree, expand the Set1.Summary data model item:
 - a. Binding **VersionsNumber: Integer = VersionsSummary.aggregated.VersionsNumber** indicates that the Set1.Summary.VersionsNumber item is bound to the VersionsNumber aggregation field of the VersionsSummary data source of the GroupBy type that was configured to return the number of records of the ERSolutionVersionTable table via the Versions data source.

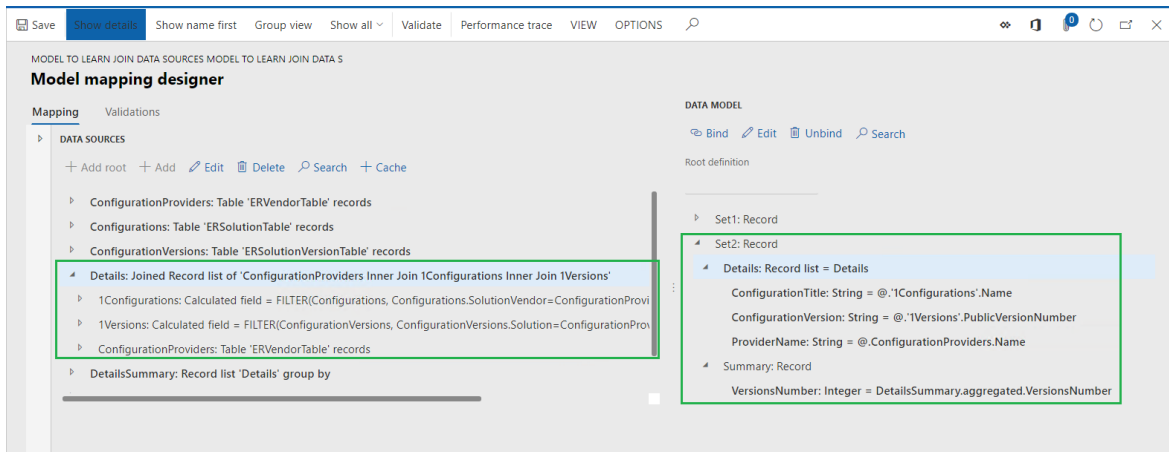


7. Close the page.

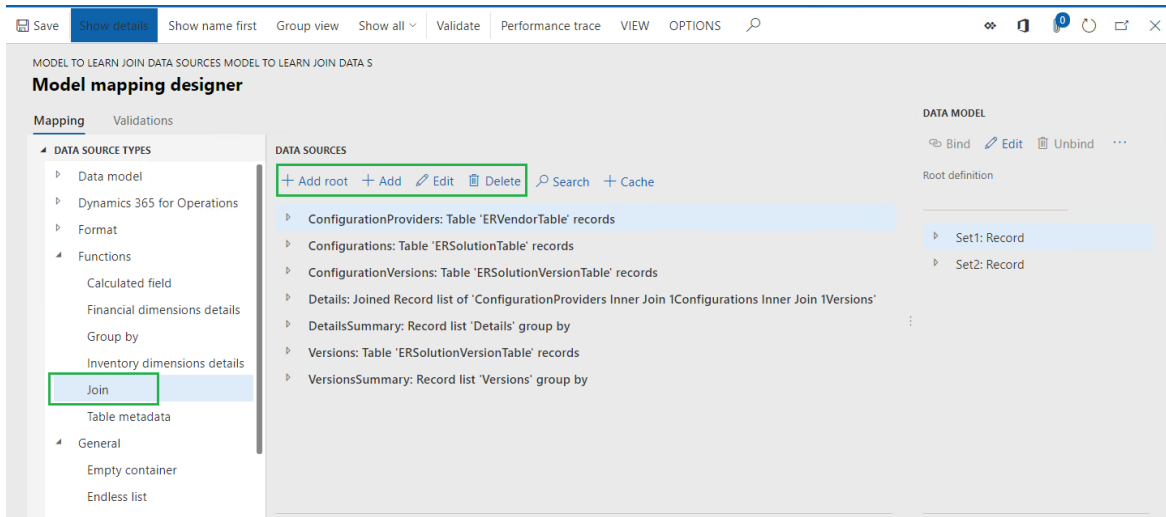
Review ER model mapping (part 2)

Review settings of the ER model-mapping component. The component is configured to access information about versions of ER configurations, details of configurations and configuration providers with using a data source of the Join type.

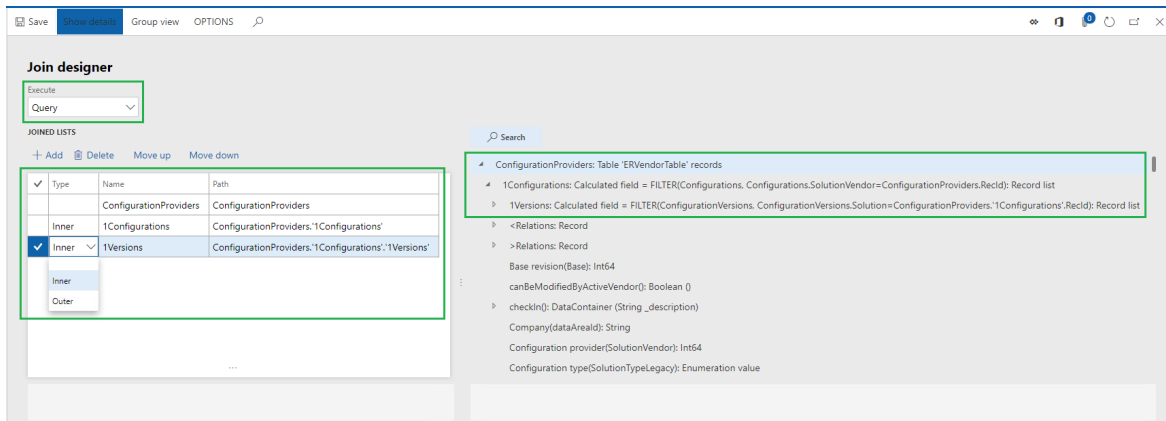
1. In the configurations tree, expand the Set2 and Set2.Details data model items. The binding **Details: Record list = Details** indicates that the Set2.Details item is bound to the Details data source configured as the data source of the Join type.



The Join data source can be added by selecting the Functions\Join data source:



2. Select **Details** data source.
3. Select **Edit** in the **Data sources** pane.
4. Select **Edit join**.
5. Select **Show details**.



This page is used to design the required data source of the **Join type**. At runtime, this data source will create a single joined list of records from the data sources in the **Joined list** grid. Join of records will start from the **ConfigurationProviders** data source that is in the grid as a first one (the **Type** column is blank for it). Records of every other data source will be joined consequently to records of the parent data source based on its order in this grid. Every joining data source must be configured as a data source nested under a target data source (**1Versions** data source is nested under **1Configurations** one; **1Configurations** data source is nested under **ConfigurationProviders** one). Each configured data source must contain the conditions for the join. In the data source for this particular **Join**, the following joins are defined:

- Each record of the **ConfigurationProviders** data source (referred to the **ERVendorTable** table) is joined with only records of the **1Configurations** one (referred to in the **ERSolutionTable** table) having the same value in the **SolutionVendor** and **ReclId** fields. The **Inner join** type is used for this join as well as the following conditions for matching records:

FILTER (Configurations, Configurations.SolutionVendor = ConfigurationProviders.ReclId)

- Each record of the **1Configurations** data source (referred to the **ERSolutionTable** table) is joined with the only records of the **1Versions** one (referred to the **ERSolutionVersionTable** table) having the same value in the **Solution** and **ReclId** fields. **Inner join** type is used for this join as well as the following conditions for matching records:

FILTER (ConfigurationVersions, ConfigurationVersions.Solution =

ConfigurationProviders.'1Configurations'.ReclId)

- **Execute** option is configured as **Query** meaning that this join data source will be executed at runtime on database level as a direct SQL call.

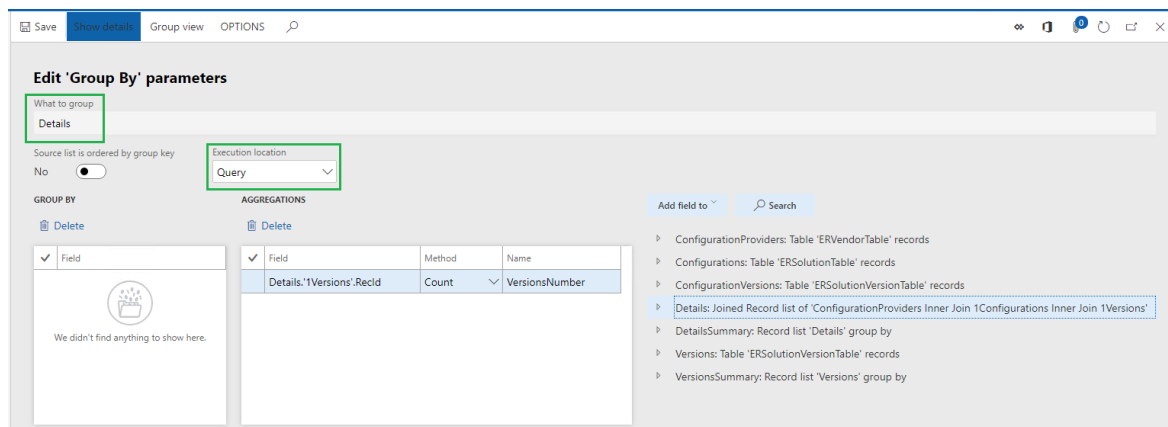
For joining records of data sources representing application tables, you can specify join conditions by using pairs of fields other than ones that describe existing in AOT relations between these tables. This type of join can be configured to execute at the database level as well.

6. Close the page.

7. Select **Cancel**.

8. In the configurations tree, expand the **Set2.Summary** data model item:

- Binding **VersionsNumber: Integer = DetailsSummary.aggregated.VersionsNumber** indicates that the **Set2.Summary.VersionsNumber** item is bound to the **VersionsNumber** aggregation field of the **DetailsSummary** data source of the **GroupBy** type that was configured to return the number of joined records of the **Details** data source of the **Join** type.
- The **Execution** location option is configured as **Query** meaning that this **GroupBy** data source will be run at runtime as a direct SQL call at the database level. This behavior is possible because the base data source **Details** of the **Join** type is configured as executed at the database level.



9. Close the page.

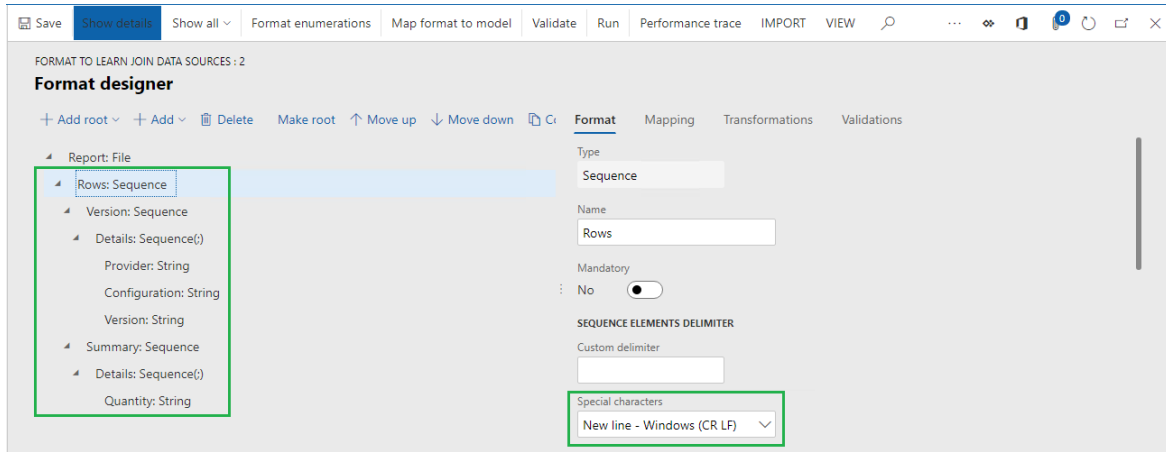
10. Select **Cancel**.

Execute ER format

1. Access Finance or RCS in the second session of your web browser using same credentials and company as in the first session.
2. Go to **Organization administration > Electronic reporting > Configurations**.
3. Expand **Model** to learn **JOIN data sources** configuration.
4. Select **Format** to learn **JOIN data sources** configuration.
5. Select **Designer**.
6. Select **Show details**.
7. Select **Mapping**.
8. Select **Expand/Collapse**.

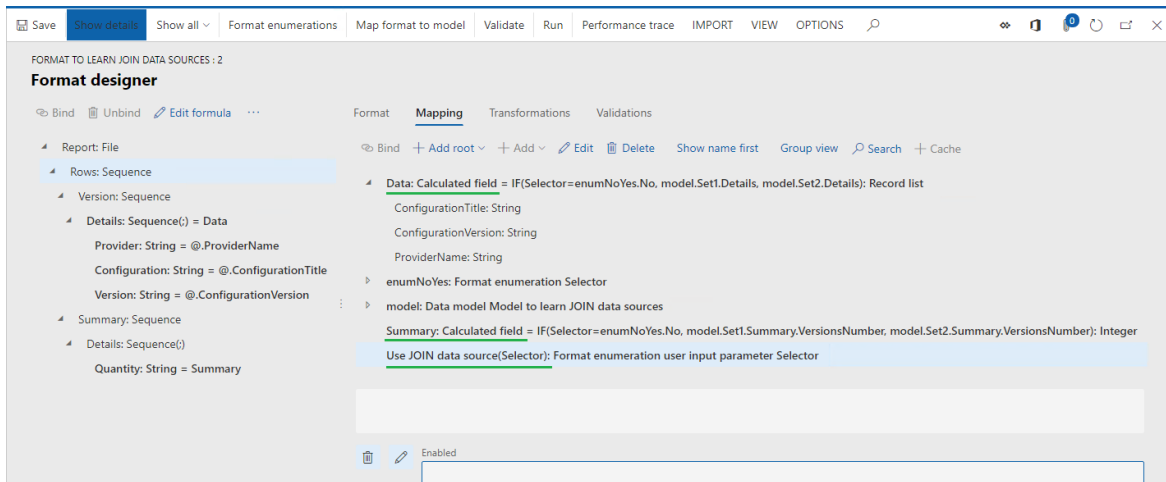
This format is designed to populate a generated text file with a new line for every version of an ER configuration (**Version** sequence). Each generated line will contain the name of a configuration provider owning the current configuration, the configuration name, and the configuration version separated by semicolon mark. The final line of generated file will contain the number of discovered versions of ER

configurations (Summary sequence).



The **Data** and **Summary** data sources are used to populate configuration version details to the generated file:

- Information from the **Set1** data model is used when you choose **No** for the **Selector** data source at runtime on the user dialog page when running ER format.
- Information from the **Set2** data model is used when you choose **Yes** for the **Selector** data source at runtime on the user dialog page.

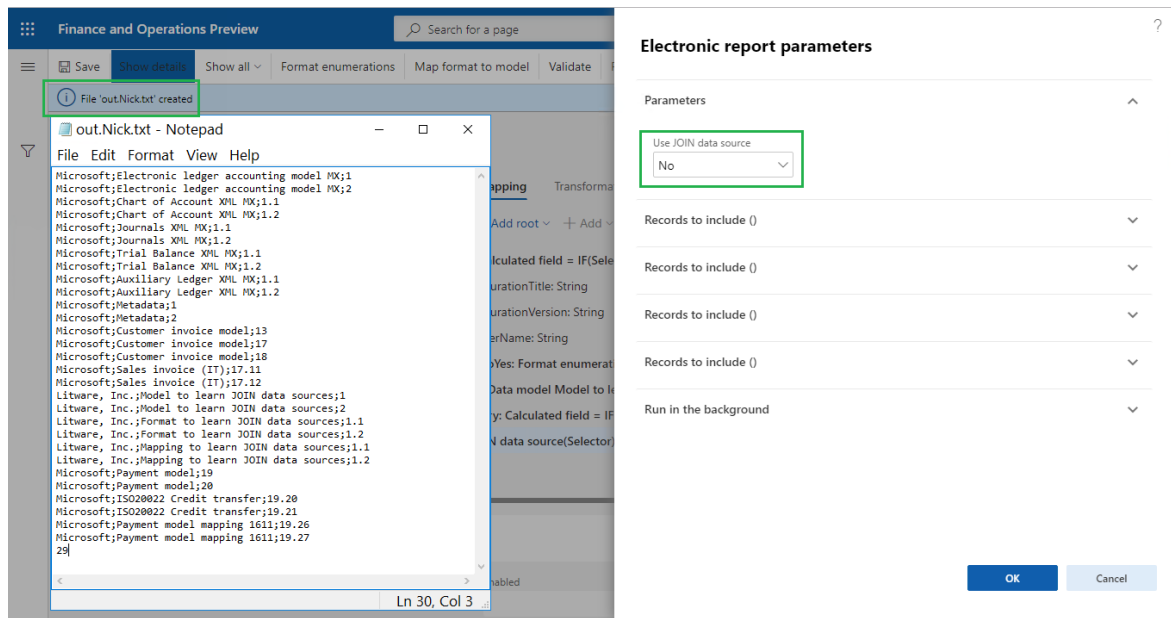


9. Select **Run**.

10. On the dialog page, select **No** in the **Use JOIN data source** field.

11. Select **OK**.

12. Review generated file.

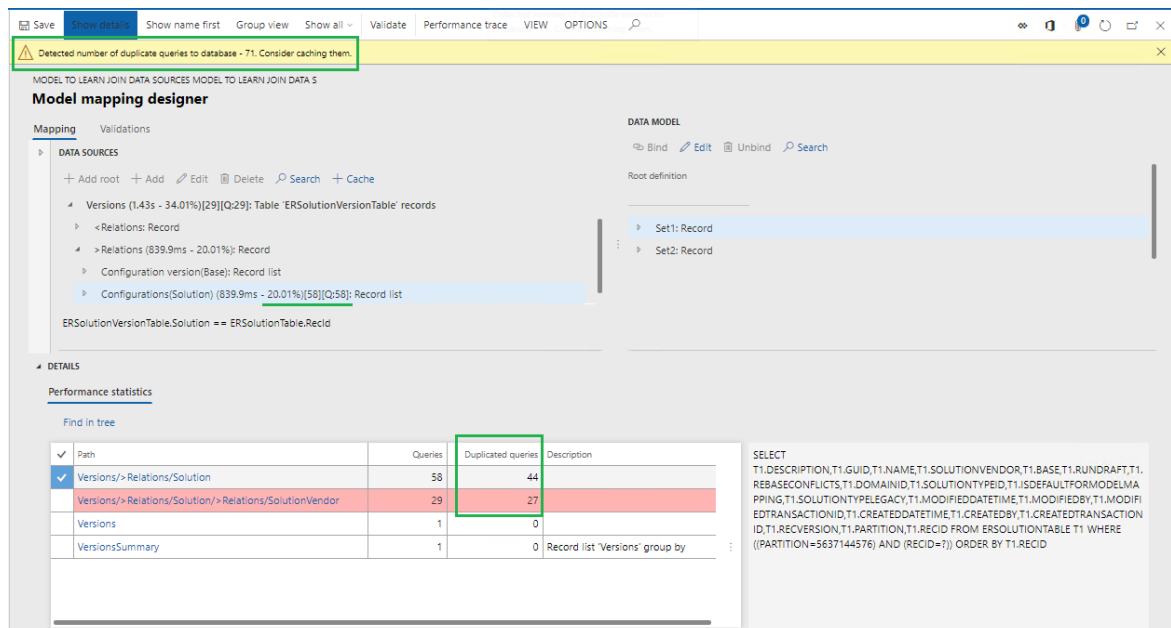


Analyze ER format execution trace

1. In the first session of Finance or RCS, select **Designer**.
2. Select **Performance trace**.
3. In the **Performance trace** grid, select the top-most record of the latest execution trace of an ER format that used the current model mapping component.
4. Select **OK**.

Execution statistics informs you about duplicated calls to application tables:

- **ERSolutionTable** has been called as many times as you have configuration version records in the **ERSolutionVersionTable** table, while the number of such calls could be reduced in times for performance improvement.
- **ERVendorTable** has been called twice for every configuration version record that was discovered in the **ERSolutionVersionTable** table, while the number of such calls could be reduced as well.

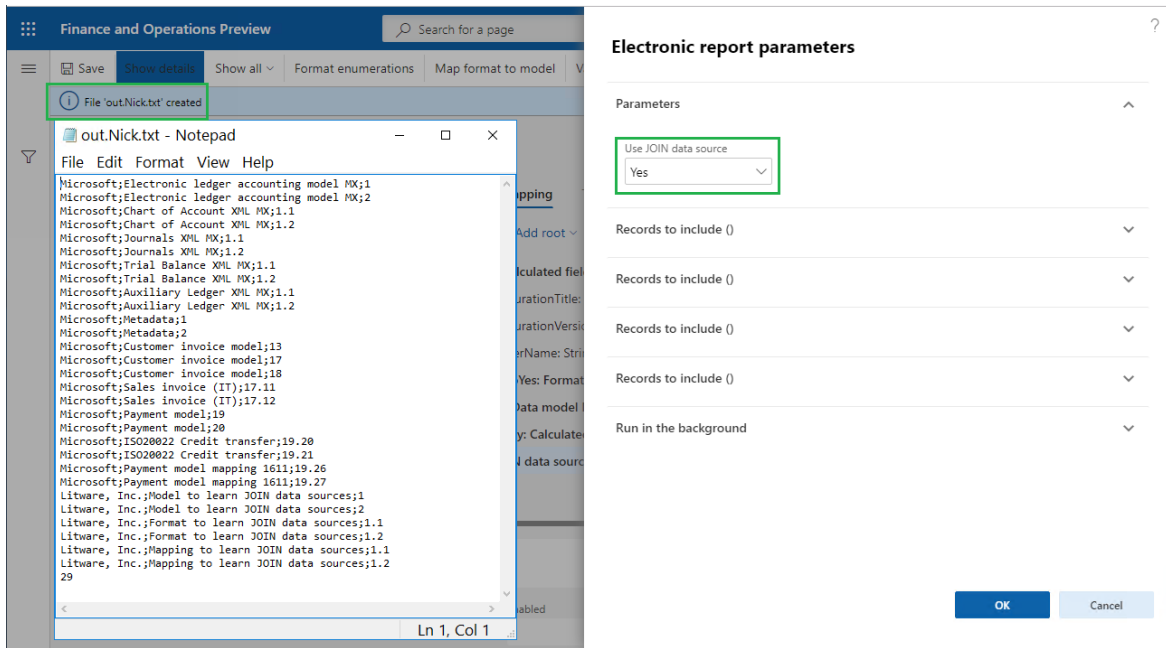


5. Close the page.

Execute ER format

1. Switch to your web browser tab with the second session of Finance or RCS.

2. Select **Run**.
3. On the dialog page, select **Yes** in the **Use JOIN data source** field.
4. Select **OK**.
5. Review generated file.

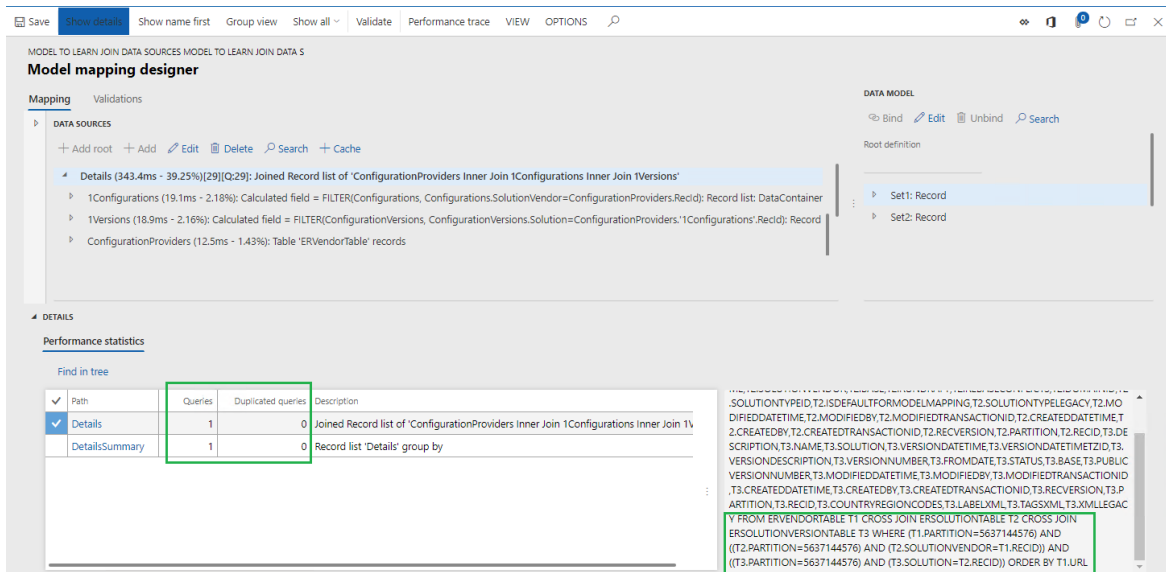


Analyze ER format execution trace

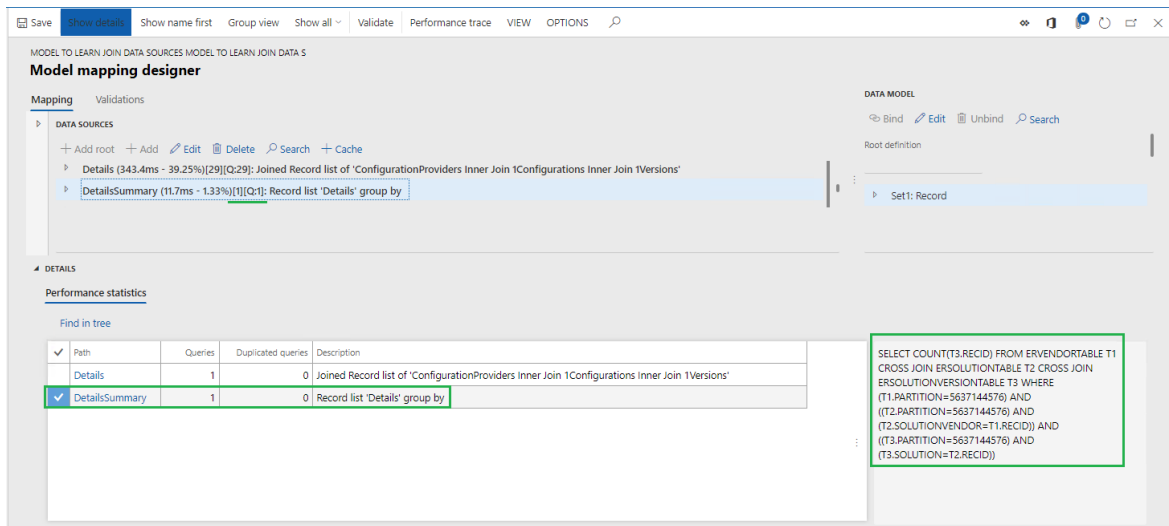
1. In the first session of Finance or RCS, select **Designer**.
2. Select **Performance trace**.
3. In the **Performance trace** grid, select top-most record representing the latest execution trace of an ER format that used the current model mapping component.
4. Select **OK**.

Statistics informs you about the following:

- Application database has been called once to get records from **ERVendorTable**, **ERSolutionTable**, and **ERSolutionVersionTable** tables to access required fields.



- Application database has been called once to calculate the number of configuration versions by using joins that were configured in the **Details** data source.



Limitations

As you can see from the example in this topic, the **JOIN** data source can be built from several data sources that describe the individual datasets of the records that must eventually be joined. You can configure those data sources by using the built-in ER **FILTER** function. When you configure the data source so that it's called beyond the **JOIN** data source, you can use company ranges as part of the condition for data selection. The initial implementation of the **JOIN** data source doesn't support data sources of this type. For example, when you call a **FILTER**-based data source within the scope of execution of a **JOIN** data source, if the called data source contains company ranges as part of the condition for data selection, an exception occurs.

In Microsoft Dynamics 365 Finance version 10.0.12 (August 2020), you can use company ranges as part of the condition for data selection in **FILTER**-based data sources that are called within the scope of execution of a **JOIN** data source. Because of the limitations of the application **query** builder, the company ranges are supported only for the first data source of a **JOIN** data source.

Example

For example, you must make a single call to the application database to get the list of foreign trade transactions of multiple companies and the details of the inventory item that is referred to in those transactions.

In this case, you configure the following artifacts in your ER model mapping:

- **Intrastat** root data source that represents the **Intrastat** table.
- **Items** root data source that represents the **InventTable** table.
- **Companies** root data source that returns the list of companies (**DEMF** and **GBSI** in this example) where transactions must be accessed. The company code is available from the **Companies.Code** field.
- **X1** root data source that has the expression `FILTER (Intrastat, VALUEIN(Intrastat.dataAreaId, Companies, Companies.Code))`. As part of the condition for data selection, this expression contains the definition of company ranges `VALUEIN(Intrastat.dataAreaId, Companies, Companies.Code)`.
- **X2** data source as a nested item of the **X1** data source. It includes the expression `FILTER (Items, Items.ItemId = X1.ItemId)`.

Finally, you can configure a **JOIN** data source where **X1** is the first data source and **X2** is the second data source. You can specify **Query** as the **Execute** option to force ER to run this data source on the database level as a direct SQL call.

When the configured data source is run while the ER execution is **traced**, the following statement is shown in the ER model mapping designer as part of the ER performance trace.

```
SELECT ... FROM INTRASTAT T1 CROSS JOIN INVENTTABLE T2 WHERE ((T1.PARTITION=?) AND (T1.DATAAREAID IN (N'DEMF',N'GBSI' ) ) ) AND ((T2.PARTITION=?) AND (T2.ITEMID=T1.ITEMID AND (T2.DATAAREAID = T1.DATAAREAID) AND (T2.PARTITION = T1.PARTITION))) ORDER BY T1.DISPATCHID,T1.SEQNUM
```

NOTE

An error occurs if you run a **JOIN** data source that has been configured so that it contains data selection conditions that have company ranges for additional data sources of the executed **JOIN** data source.

Additional resources

[Formula designer in Electronic reporting](#)

[Trace execution of ER format to troubleshoot performance issues](#)

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Configure country context dependent ER model mappings

2/18/2021 • 19 minutes to read • [Edit Online](#)

You can configure Electronic reporting (ER) model mappings so that they implement a generic ER data model but are specific to Dynamics 365 Finance. This topic explains how to design multiple ER model mappings for an ER data model to control how they are used by corresponding ER formats that are run from companies that have different country/region contexts.

Prerequisites

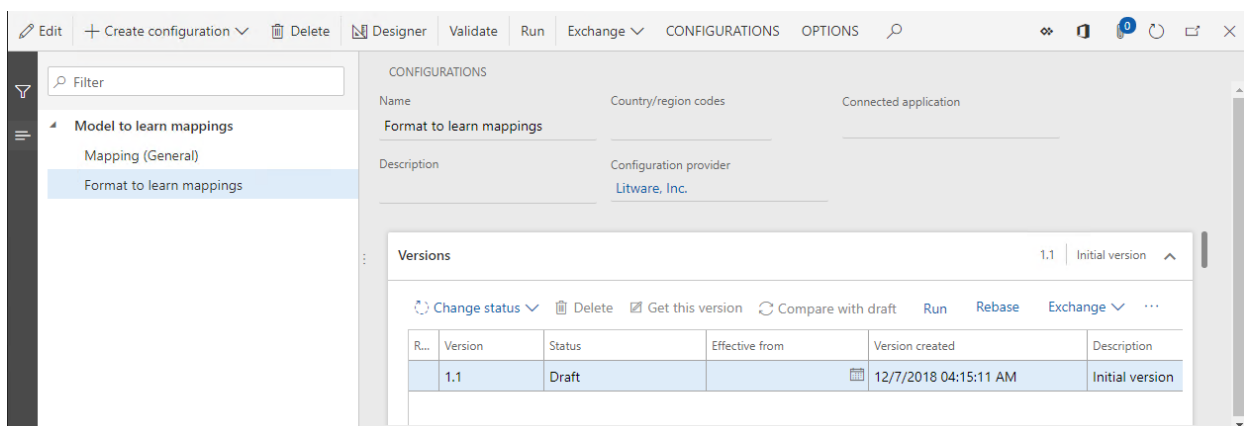
To complete the examples in this topic, you must have the following access:

- Access to Finance for one of the following roles:
 - Electronic reporting developer
 - Electronic reporting functional consultant
 - System administrator
- Access to the instance of Regulatory Configuration Services (RCS) that has been provisioned for the same tenant as Finance for one of the following roles:
 - Electronic reporting developer
 - Electronic reporting functional consultant
 - System administrator

Some steps in this topic require execution of an ER format. In some cases, execution of an ER format is affected by the country/region context of the company that you're currently signed in to. You can run an ER format in the current RCS instance if the company that has the required country/region context is available in RCS. Otherwise, you must upload a completed version of the ER model mapping and ER format configurations that use the ER data model to your Finance instance, and then run the ER format in that Finance instance. For information about how to import configurations that reside in RCS into a Finance instance, see [Import configurations from RCS](#).

Single model mapping case

Follow the steps in [Appendix 1](#) of this topic to design the required ER components. You now have the **Mapping (General)** model mapping configuration that contains the model mapping for the **Entry point 1** definition.



The screenshot shows the Dynamics 365 configuration interface. The left sidebar contains a filter and a tree view with 'Model to learn mappings' expanded, showing 'Mapping (General)' and 'Format to learn mappings'. The main area displays the configuration for 'Format to learn mappings' with fields for Name, Country/region codes, Connected application, Description, and Configuration provider (Litware, Inc.). Below this is a 'Versions' section with a table showing a single draft version (1.1) created on 12/7/2018.

R...	Version	Status	Effective from	Version created	Description
	1.1	Draft		12/7/2018 04:15:11 AM	Initial version

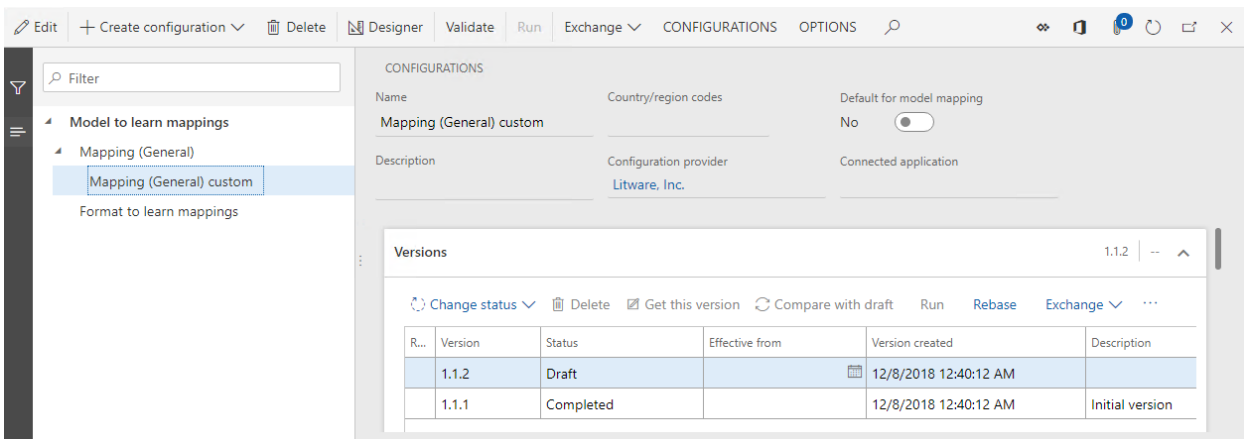
Run the configured format

1. On the **Configurations** page, on the **Versions** FastTab, select **Run**.
2. Select **OK**.

Notice that the web browser offers to download the text file that was generated by executed ER format. Because this format was configured to use the **Entry point 1** definition, and only a single model mapping is currently available for the base model that contains a mapping for this definition, the executed ER format used the **Mapping (General)** model mapping of the **Mapping (General)** configuration as a data source. Therefore, the downloaded file contains the **Generic functionality 1** text.

Multiple shared model mappings case

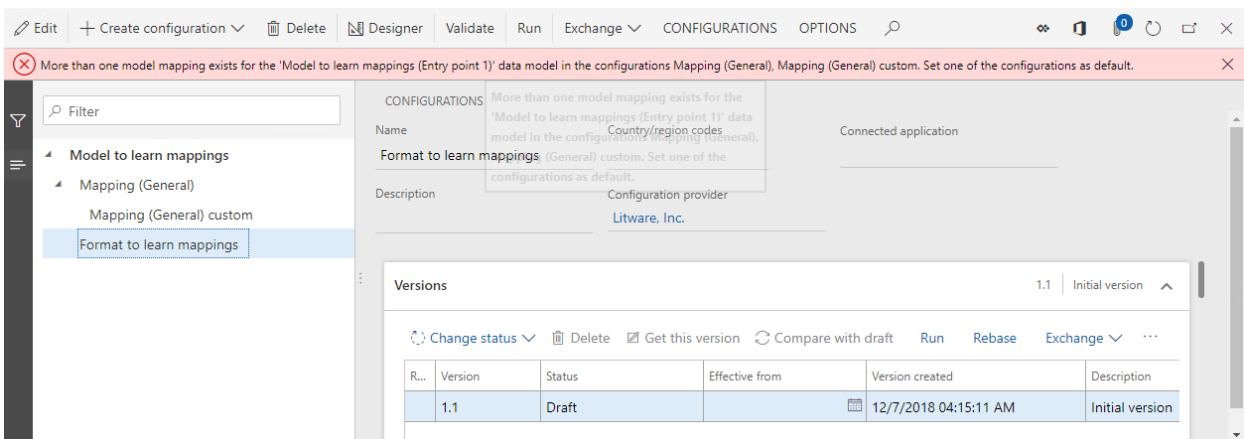
Follow the steps in [Appendix 2](#) of this topic to design the required ER components. You now have **Mapping (General)** and **Mapping (General) custom** model mapping configurations, each of which contains the model mapping for the **Entry point 1** definition.



Run the configured format

1. On the **Configurations** page, in the configurations tree, select **Format to learn mappings**.
2. On the **Versions** FastTab, select **Run**.
3. Select **OK**.

Notice that execution of the selected ER format is unsuccessful. An error message informs you that more than one model mapping exists for the **Model to learn mappings** model and the **Entry point 1** definition in the **Mapping (General)** and **Mapping (General) custom** model mapping configurations. The message also recommends that you select one of those configurations as the default configuration.

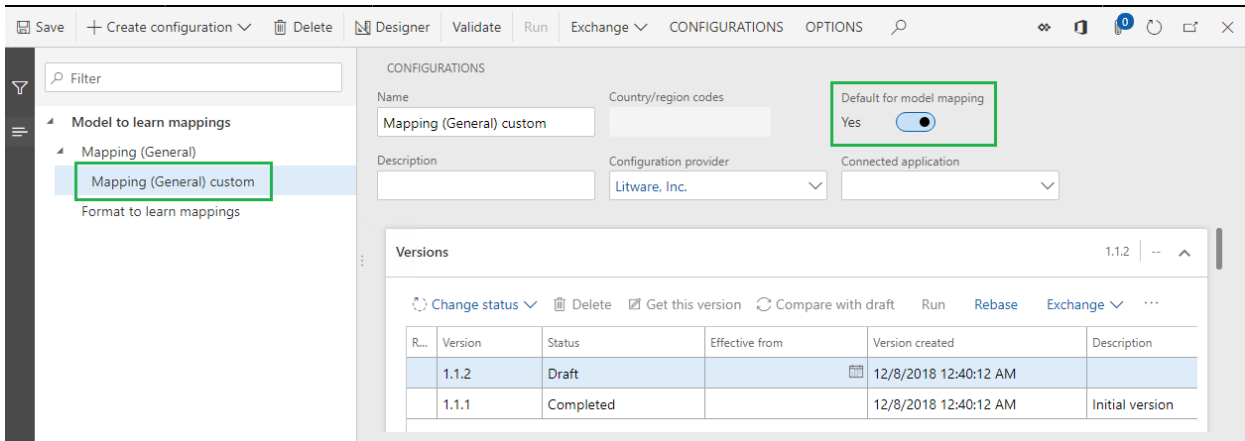


Define a default mapping configuration

Follow these steps to define the **Mapping (General) custom** model mapping configuration as the default configuration, so that its mappings can be used as data sources for the **Format to learn mappings** ER format.

1. On the **Configurations** page, in the configurations tree, select **Mapping (General) custom**.

2. As required, select **Edit** to make the current page ready for editing.
3. Set the **Default for model mapping** option to **Yes**.
4. Select **Save**.



Run the configured format

1. On the **Configurations** page, in the configurations tree, select **Format to learn mappings**.
2. On the **Versions** FastTab, select **Run**.
3. Select **OK**.

Notice that execution of the selected ER format succeeds. The web browser offers to download the text file that was generated by executed ER format. Because this format was configured to use the **Entry point 1** definition, and the **Mapping (General) custom** model mapping configuration was selected as the default configuration, the executed ER format used the **Mapping (General) copy** model mapping of the **Mapping (General) custom** configuration as a data source. Therefore, the downloaded file contains the **Generic functionality 1 custom** text.

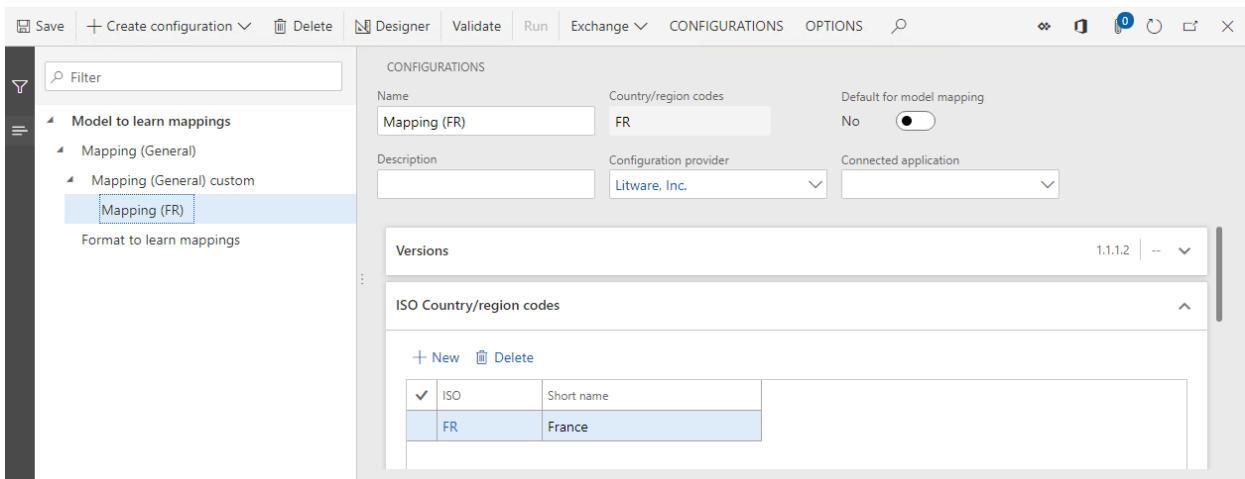
NOTE

If you change the company that you're currently signed in to and run this ER format again, you get the same content in the generated file, because the default ER model mapping configuration doesn't contain any company-dependent restrictions.

Multiple mixed model mappings case

Follow the steps in [Appendix 3](#) of this topic to design the required ER components. You now have **Mapping (General)**, **Mapping (General) custom**, and **Mapping (FR) model mapping** configurations that contain the model mapping for the **Entry point 1** definition.

Notice that version 1 of the **Mapping (FR) model mapping** configuration is configured so that it applies only to ER formats of the **Model to learn mappings** model that are run in Finance companies that have French country/region context.



Run the configured format

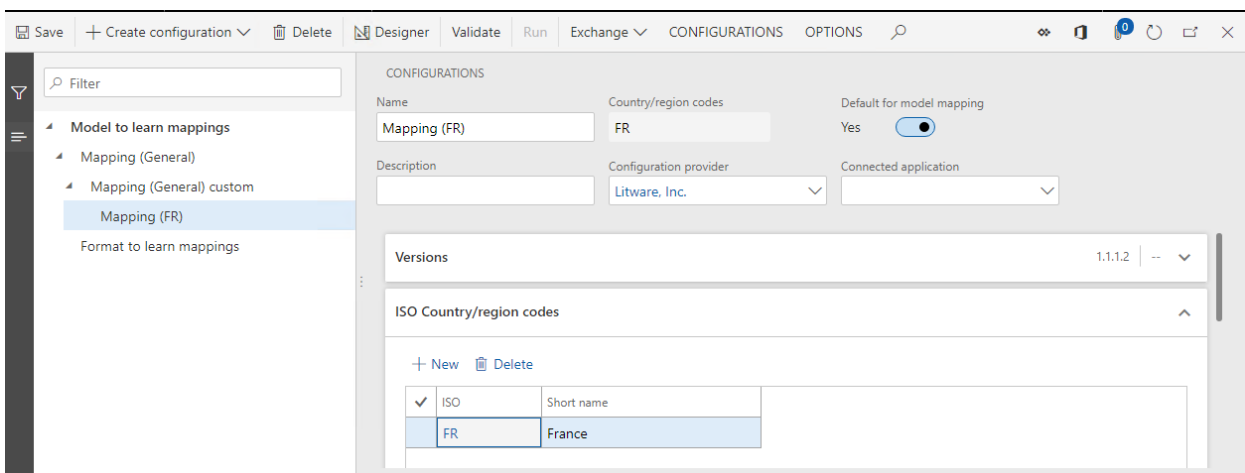
1. Change the company to FRSI.
2. On the **Configurations** page, in the configurations tree, select **Format to learn mappings**.
3. On the **Versions** FastTab, select **Run**.
4. Select **OK**.

Notice that execution of the selected ER format succeeds. The web browser offers to download the text file that was generated by the executed ER format. Because this format was configured to use the **Entry point 1** definition, and the **Mapping (General) custom** model mapping configuration was selected as the default configuration, the executed ER format used the **Mapping (General) copy** model mapping of the **Mapping (General) custom** configuration as a data source. Therefore, the downloaded file contains the **Generic functionality 1** custom text.

Define the France-specific mapping configuration as the default configuration

Follow these steps to define the custom **Mapping (FR)** model mapping configuration as the default configuration. Note that, because this mapping is specific to France, it will be considered the default mapping between all model mapping configurations that have the **FR** country code specified in the **ISO country/region codes** field.

1. On the **Configurations** page, in the configurations tree, select **Mapping (FR)**.
2. As required, select **Edit** to make the current page ready for editing.
3. Set the **Default for model mapping** option to **Yes**.
4. Select **Save**.



Run the configured format

1. On the **Configurations** page, in the configurations tree, select **Format to learn mappings**.
2. On the **Versions** FastTab, select **Run**.

3. Select **OK**.

Notice that execution of the selected ER format succeeds. The web browser offers to download the text file that was generated by the executed ER format. Because this format was configured to use the **Entry point 1** definition, and the **Mapping (FR)** model mapping configuration was selected as the default configuration, the executed ER format used the **Mapping (FR)** model mapping of the **Mapping (FR)** configuration as a data source. Therefore, the downloaded file contains the **FR functionality 1** text.

NOTE

If you change the company that you're currently signed in to and run this ER format again, the output will depend on the country/region context of the selected company.

Other model mapping cases

As you've seen, the selection of a model mapping for the execution of an ER format works in the following way:

- The model mapping definition that an ER format uses is specified (**Entry point 1** in the examples in this topic).
- All mapping configurations that contain a mapping that has the specified definition, and that satisfy any country/region context restrictions that are configured, can potentially be used to run the ER format (**Mapping (General)**, **Mapping (General) custom**, and **Mapping (FR)** in the examples in this topic).
- Any default model mapping that has country/region context restrictions has the highest priority for selection (**Mapping (FR)** in the examples in this topic).
- Any default model mapping that doesn't have country/region context restrictions has the next higher priority for selection (**Mapping (General) custom** in the examples in this topic).
- Any model mapping that has country/region context restrictions has higher priority for selection than a model mapping that doesn't have country/region context restrictions.

The following table provides information about the results of model mapping selection for all possible cases for model mapping settings:

- Column 1 indicates whether the first model mapping that doesn't have country/region context restrictions (for example, the shared **Mapping (General)** mapping) is presented and, if it is, whether the **Default for model mapping** option is set to **Yes** for it.
- Column 2 indicates whether the second model mapping that doesn't have country/region context restrictions (for example, the shared **Mapping (General) custom** mapping) is presented and, if it is, whether the **Default for model mapping** option is set to **Yes** for it.
- Column 3 indicates whether the first model mapping that has country/region A context restrictions (for example, the France-specific **Mapping (FR)** mapping) is presented and, if it is, whether the **Default for model mapping** option is set to **Yes** for it.
- Column 4 indicates whether the second model mapping that has country/region A context restrictions is presented and, if it is, whether the **Default for model mapping** option is set to **Yes** for it.
- Column 5 presents the result of a model mapping selection for execution of an ER format under the control of a company that has country/region A context.
- Column 6 presents the result of a model mapping selection for execution of an ER format under the control of a company that has country/region B context.

In the table, a plus sign (+) indicates the presence of a model mapping configuration in the current instance of the Microsoft Azure service that is used to run an ER format (either Finance or RCS).

CASE	MODEL MAPPING 1 WITHOUT COUNTRY/REGION CONTEXT (MM1)	MODEL MAPPING 2 WITHOUT COUNTRY/REGION CONTEXT (MM2)	MODEL MAPPING 1 WITH COUNTRY/REGION A CONTEXT (MM1A)	MODEL MAPPING 2 WITH COUNTRY/REGION A CONTEXT (MM2A)	RUN UNDER CONTROL OF A COMPANY THAT HAS COUNTRY/REGION A CONTEXT	RUN UNDER THE CONTROL OF A COMPANY THAT HAS COUNTRY/REGION B CONTEXT
	1	2	3	4	5	6
1					Error (missing mapping)	Error (missing mapping)
2	+				MM1	MM1
3	+	+			Error (multiple mappings)	Error (multiple mappings)
4	+		+		MM1A	MM1
5	+		+	+	Error (multiple mappings)	MM1
6	+	default	+	+	MM2	MM2
7	+		default		MM1A	MM1
8	+		default	+	MM1A	MM1
9	+		default	default	Error (multiple mappings)	MM1
10	default				MM1	MM1
11	default	+			MM1	MM1
12	default		+		MM1	MM1
13	default	default			Error (multiple mappings)	Error (multiple mappings)
14	default		default		MM1A	MM1
15	default		default	default	MM1A	MM2A
16			+	+	MM1A	MM2A
17			default	default	MM1A	MM2A

Learn what mapping was used in the execution of an ER format

Configure ER user parameters

1. On the **Configurations** page, on the Action Pane, on the **CONFIGURATIONS** tab, select **User parameters**.
2. Set the **Run in debug mode** option to **Yes**.

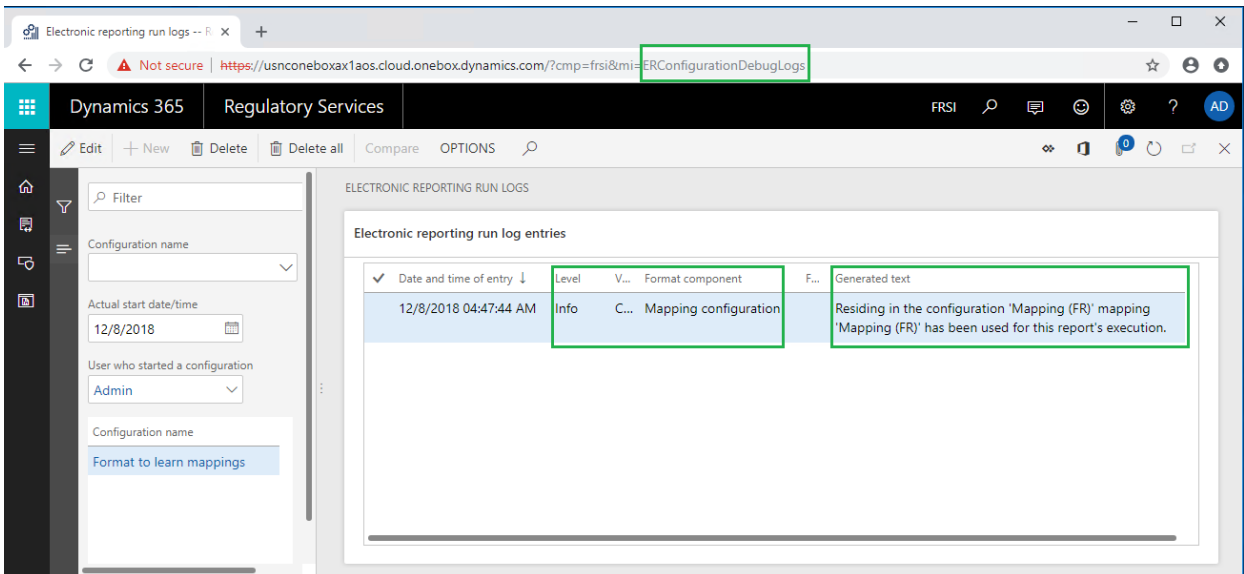
3. Select **Ok**.

Run the configured format

1. On the **Configurations** page, in the configurations tree, select **Format to learn mappings**.
2. On the **Versions** FastTab, select **Run**.
3. Select **Ok**.

Review the ER debug log

1. In the navigation pane, go to **Modules > Organization administration > Electronic reporting > Configuration debug log**.
2. Select the **Reload this page** button.



Notice that a new record has been added to the ER debug log for the executed ER format. Because the **Level** field of this record is set to **Info**, the record is informational. Because the **Format component** field is set to **Mapping configuration**, the record informs you about a model mapping that was used during execution of the **Format to learn mappings** ER format (selected in the **Configuration name** field). The content of the **Generated text** field informs you that the **Mapping (FR)** mapping component that resides in the **Mapping (FR)** configuration has been used to run this report.

Appendix 1

Configure a sample data model

Sign in to your RCS instance.

In this example, you will create a configuration for sample company, Litware, Inc. To complete these steps, you must first complete, in RCS, the steps in the [Create a configuration provider and mark it as active](#) procedure.

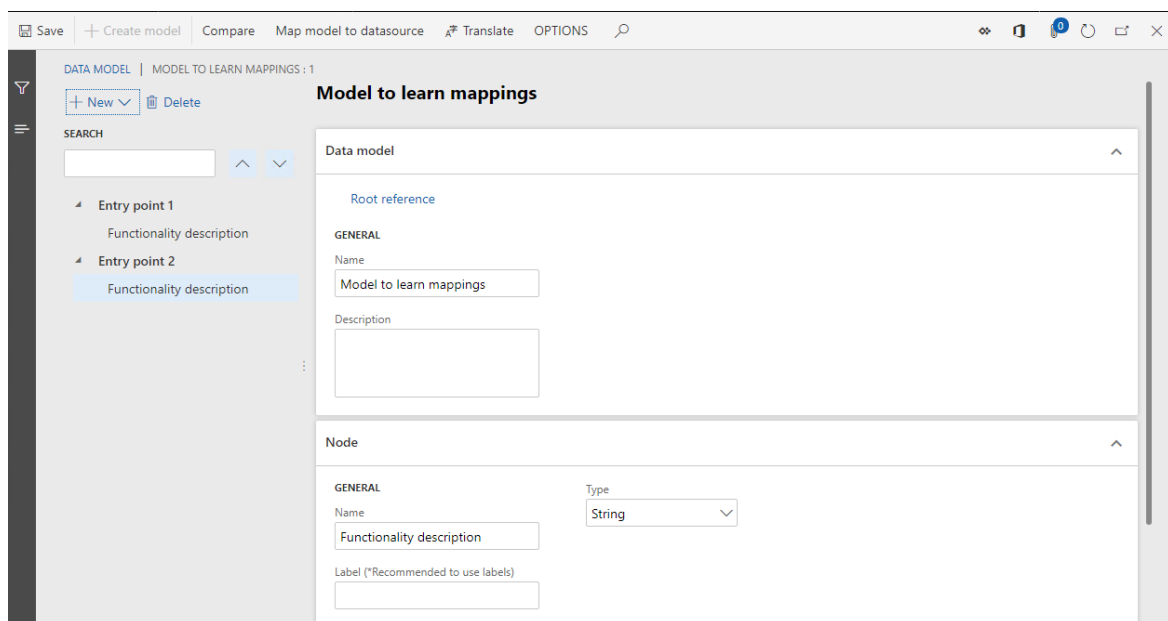
Create an ER data model configuration

1. On the default dashboard, select **Electronic reporting**.
2. Select the **Reporting configurations** tile.
3. On the **Configurations** page, select **Create configuration**.
4. In the drop-down dialog box, in the **Name** field, enter **Model to learn mappings**.
5. Select **Create configuration**.
6. Select the **Configuration components** FastTab.

Notice that draft version 1 of this ER configuration is ready for editing. This version contains the data model component.

Design a sample data model

1. On the **Configurations** page, select **Designer**.
2. Select **New**.
3. In the drop-down dialog box, in the **Name** field, enter **Entry point 1**.
4. Select **Add**.
5. Select **New**.
6. In the drop-down dialog box, in the **Name** field, enter **Functionality description**.
7. Select **Add**.
8. Select **New**.
9. In the drop-down dialog box, in the **New node** field group, select **Model root**.
10. In the **Name** field, enter **Entry point 2**.
11. Select **Entry point 2**.
12. Select **Add**.
13. Select **New**.
14. In the drop-down dialog box, in the **Name** field, enter **Functionality description**.
15. Select **Add**.



16. Select **Save**.
17. Close the page.

Complete the modified version of the model configuration

1. On the **Configurations** page, on the **Versions** FastTab, select **Change status**.

Change the status of designed model configuration from **Draft** to **Completed**, so that it can be used to design the required model mappings and formats.

2. Select **Complete**.
3. Select **OK**.

Notice that the configuration that you created is saved as completed version 1.

Configure a sample model mapping

Create an ER model mapping configuration

1. On the **Configurations** page, select **Create configuration**.
2. In the drop-down dialog box, in the **New** field group, select **Model mapping based on data model Model to learn mappings**.
3. In the **Name** field, enter **Mapping (General)**.
4. In the **Data model definition** field, select **Entry point 1**.
5. Select **Create configuration**.

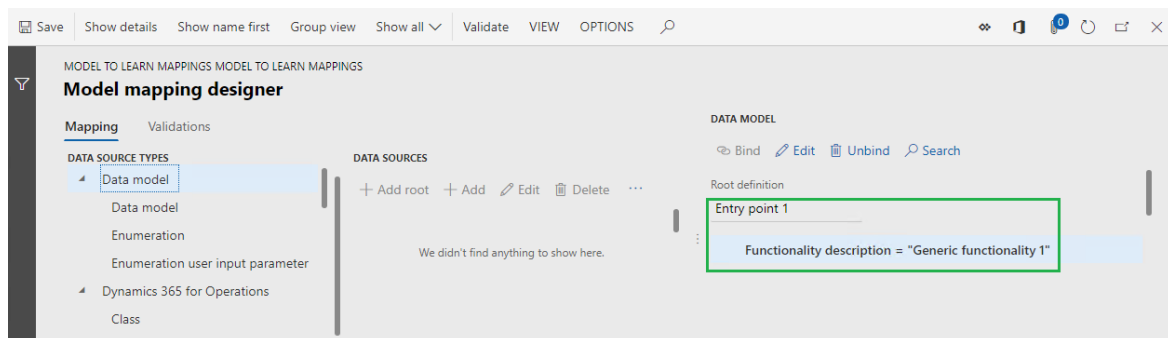
Notice that draft version 1 of this ER configuration is ready for editing. This version contains the model mapping component.

Design a sample model mapping

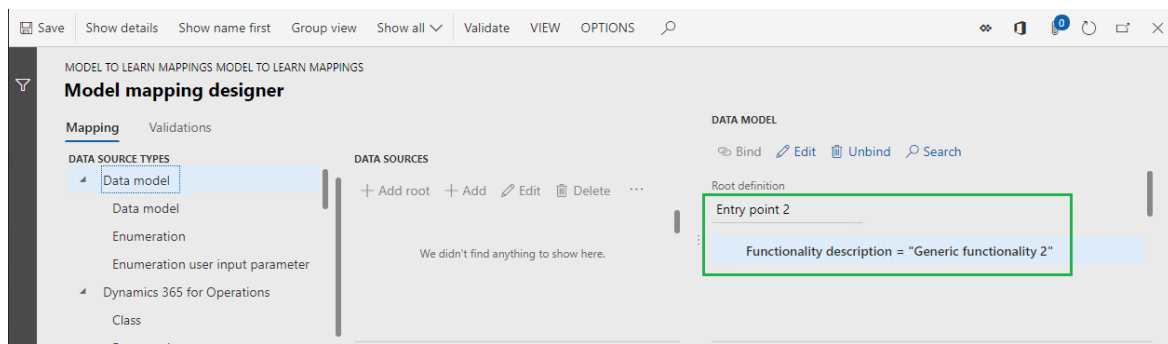
1. On the **Configurations** page, select **Designer**.

Notice that the model mapping of the **To model** direction type has been automatically added to this component for the **Entry point 1** definition.

2. Select **Designer** to start editing the added model mapping.
3. In the **Data model** section, select **Edit**.
4. In the **Formula** field, enter "**Generic functionality 1**".
5. Select **Save**.
6. Close the **Formula designer** page.

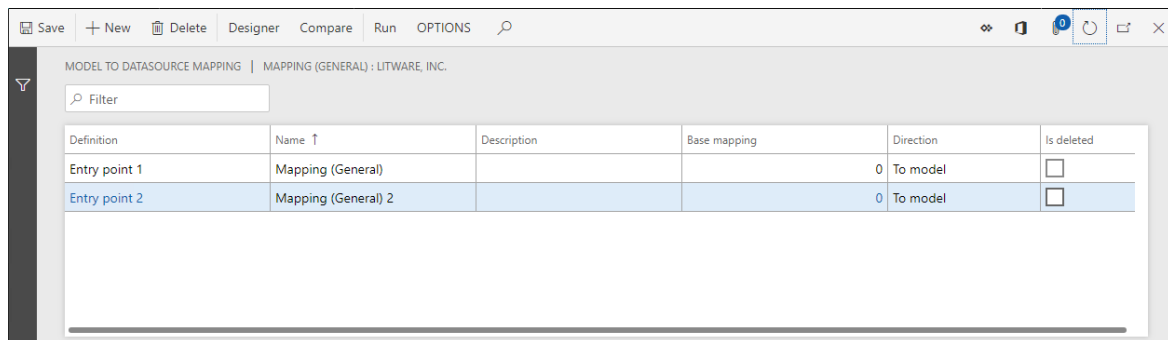


7. Select **Save**.
8. Close the **Model mapping designer** page.
9. Select **New**.
10. In the **Definition** field, select **Entry point 2**.
11. In the **Name** field, enter **Mapping (General) 2**.
12. Select **Designer**.
13. In the **Data model** section, select **Edit**.
14. In the **Formula** field, enter "**Generic functionality 2**".
15. Select **Save**.
16. Close the **Formula designer** page.



17. Select **Save**.

18. Close the **Model mapping designer** page.



19. Close the **Model mappings** page.

Complete the modified version of the model mapping configuration

1. On the **Configurations** page, on the **Versions** FastTab, select **Change status**.

Change the status of designed model mapping configuration from **Draft** to **Completed**, so that it can be used by ER formats.

2. Select **Complete**.

3. Select **OK**.

Notice that the configuration that is created is saved as completed version 1.

Configure a sample format

Create an ER format configuration

1. On the **Configurations** page, in the configurations tree, select **Model to learn mappings**.

2. Select **Create configuration**.

3. In the drop-down dialog box, in the **New** field group, select **Format based on data model Model to learn mappings**.

4. In the **Name** field, enter **Format to learn mappings**.

5. In the **Data model definition** field, select **Entry point 1**.

6. Select **Create configuration**.

Notice that draft version 1 of this ER configuration is ready for editing. This version contains the format component.

Design a sample format

1. On the **Configurations** page, select **Designer**.

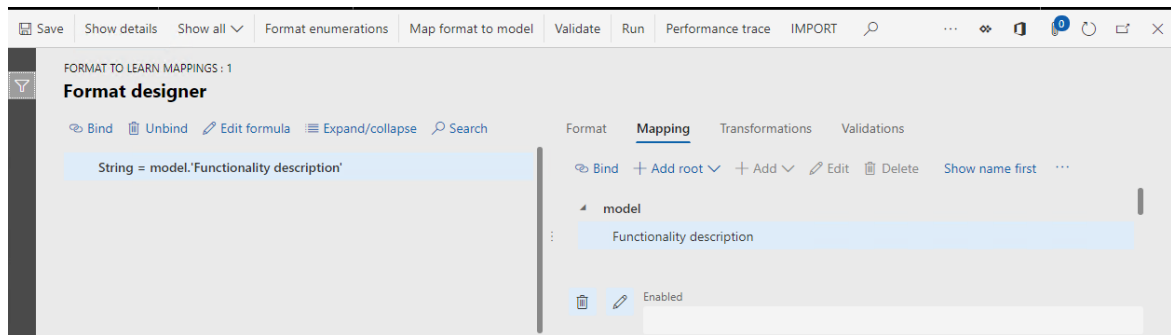
2. Select **Add root**.

3. In the **Text** group, select the **String** item.

4. Select **OK**.

Bind format elements to a data source

1. On the **Format designer** page, on the **Mapping** tab, expand the model data source.
2. Select the **Functionality description** field.
3. Select **Bind**.



4. Select **Save**.
5. Close the page.

Appendix 2

Configure a sample model mapping for general customization

You might want to customize a model mapping that a configuration provider (partner) provided to you, and then use the customized version as a data source for your ER formats. In this case, you must create a custom ER model mapping configuration to make the required changes in existing model mappings. The procedures in this appendix use the **Mapping (General)** model mapping as an example.

Create an ER model mapping configuration

1. On the **Configurations** page, in the configurations tree, select **Mapping (General)**.
2. Select **Create configuration**.
3. In the drop-down dialog box, in the **New** field group, select **Derive from Name: Mapping (General), Litware, Inc..**
4. In the **Name** field, enter **Mapping (General) custom**.
5. Select **Create configuration**.

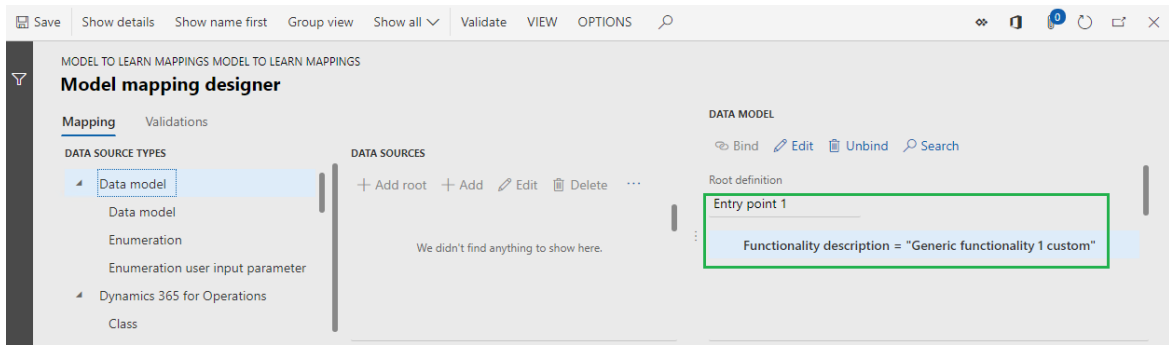
Notice that draft version 1 of this ER configuration is ready for editing.

Design a sample model mapping

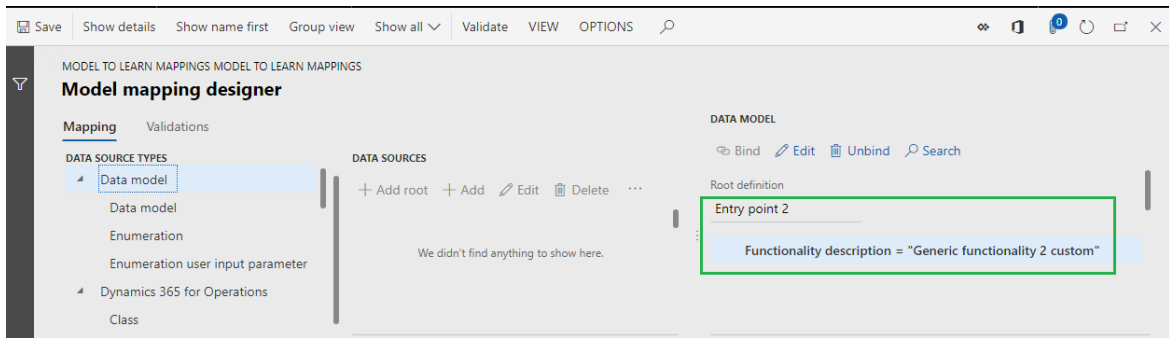
1. On the **Configurations** page, select **Designer**.

Notice that the model mappings of the base configuration have been automatically copied to this configuration.

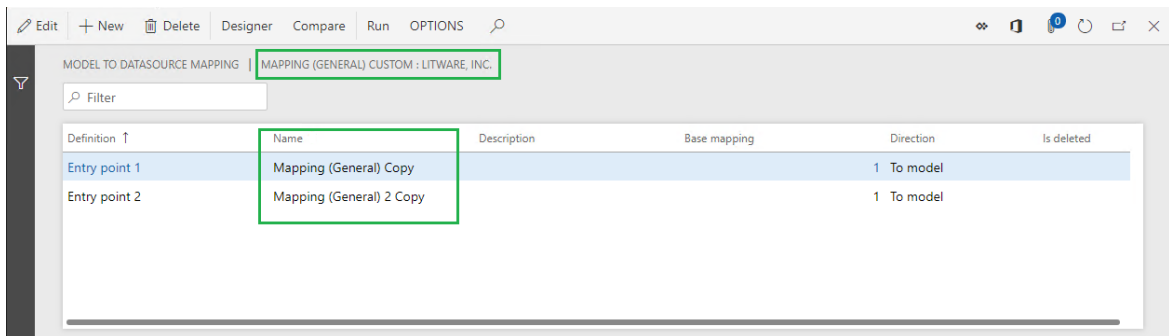
2. Select the **Mapping (General) Copy** mapping.
3. Select **Designer**.
4. In the **Data model** section, select **Edit**.
5. In the **Formula** field, enter **"Generic functionality 1 custom"**.
6. Select **Save**.
7. Close the page.



8. Select **Save**.
9. Close the page.
10. Select the **Mapping (General) 2 Copy** mapping.
11. Select **Designer**.
12. In the **Data model** section, select **Edit**.
13. In the **Formula** field, enter "**Generic functionality 2 custom**".
14. Select **Save**.
15. Close the page.



16. Select **Save**.
17. Close the page.



18. Close the page.

Complete the modified version of the model mapping configuration

1. On the **Configurations** page, on the **Versions** FastTab, select **Change status**.

Change the status of designed model mapping configuration from **Draft** to **Completed**, so that it can be used by ER formats.

2. Select **Complete**.

3. Select **OK**.

Notice that the configuration that is created is saved as completed version 1.

Appendix 3

Configure a sample model mapping for country/region-specific customization

For some ER formats, there might be country/region-specific requirements for data preparation. In this case, you can manage a separate ER model mapping configuration and isolate the implementation of these country/region-specific requirements from the general implementation. The procedures in this appendix use the **Format to learn mappings** ER format and French-specific requirements as an example.

Create an ER model mapping configuration

First, create a new ER model mapping configuration to implement the country/region-specific requirements. Use your custom ER model mapping configuration as a base.

1. On the **Configurations** page, in the configurations tree, select **Mapping (General) custom**.
2. Select **Create configuration**.
3. In the drop-down dialog box, in the **New** field group, select **Derive from Name: Mapping (General) custom, Litware, Inc.**
4. In the **Name** field, enter **Mapping (FR)**.
5. Select **Create configuration**.

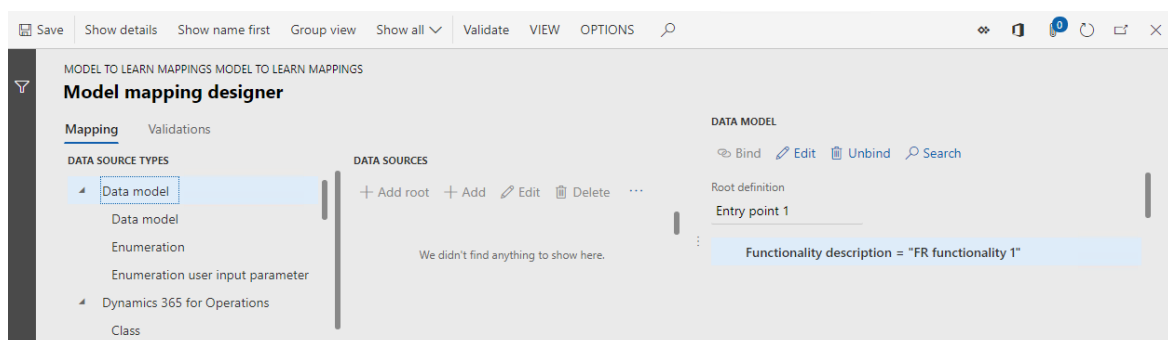
Notice that draft version 1 of this ER configuration is ready for editing.

Design a sample model mapping

1. On the **Configurations** page, select **Designer**.

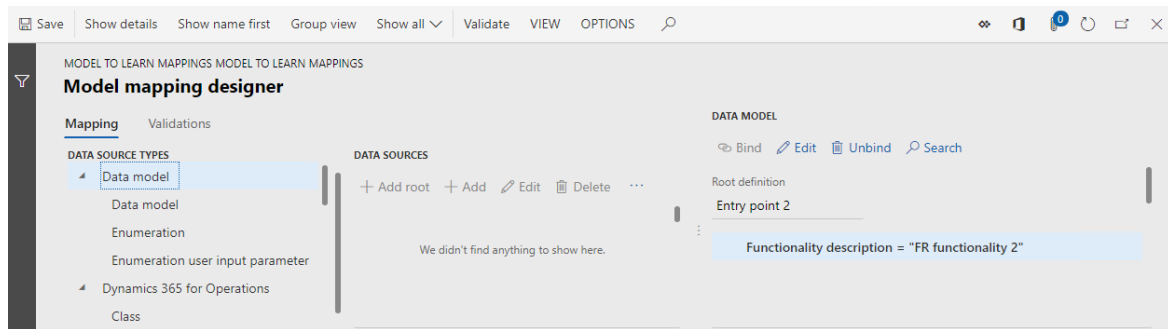
Notice that model mappings of the base configuration have been automatically copied to this configuration.

2. Select the **Mapping (General) Copy Copy** mapping.
3. Rename it **Mapping (FR)**.
4. Select **Designer**.
5. In the **Data model** section, select **Edit**.
6. In the **Formula** field, enter **"FR functionality 1"**.
7. Select **Save**.
8. Close the page.

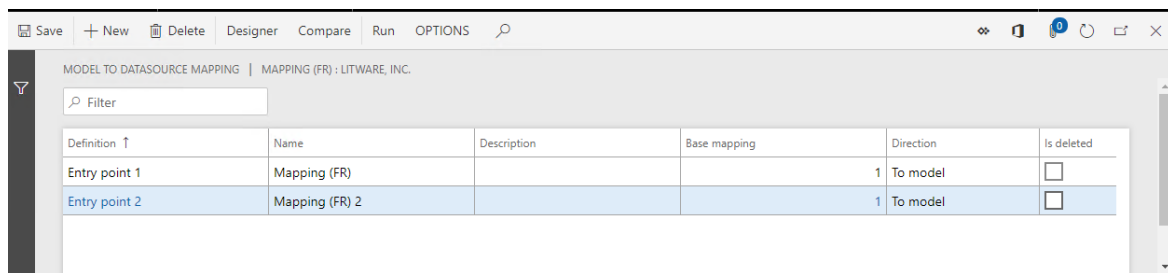


9. Select **Save**.
10. Close the page.

11. Select the **Mapping (General) 2 Copy Copy** mapping.
12. Rename it **Mapping (FR) 2**.
13. Select **Designer**.
14. In the **Data model** section, select **Edit**.
15. In the **Formula** field, enter "**FR functionality 2**".
16. Select **Save**.
17. Close the page.



18. Select **Save**.
19. Close the page.



20. Close the page.

Specify country/region context restrictions for use

1. On the **Configurations** page, on the **ISO Country/region codes** FastTab, select **New**.
2. In the **ISO** field, select **FR**.
3. Select **Save**.

Note that you must sign in to a specific company in Finance to run an ER format. Therefore, this company can be considered a party that controls both ER format execution and selection of the correct ER model mapping of the base ER data model. By adding the **FR** country code, you specify that this model mapping is available for selection by an ER format of the base data model only when that format is run under the control of a company that has French country/region context.

You can add multiple country/region codes for a single version of an ER model mapping configuration. In this way, model mappings that reside in that model mapping configuration can be used for an ER format that is run under the control of companies that have a different country/region context.

Note that the list of country/region codes is specified for each version of an ER model mapping configuration and can vary from version to version.

Complete the modified version of the model mapping configuration

1. On the **Configurations** page, on the **Versions** FastTab, select **Change status**.

Change the status of designed model mapping configuration from **Draft** to **Completed**, so that it

can be used by ER formats.

2. Select **Complete**.
3. Select **OK**.

Notice that the configuration that is created is saved as completed version 1.

Additional resources

[Electronic reporting \(ER\) overview](#)

[Manage ER model mapping in separate ER configurations](#)

[Apply country/region context](#)

Frequently asked questions

I configured two shared ER model mapping configurations in RCS and marked one of them as the default model mapping configuration. I successfully ran an ER format that was created for the same base ER data model configuration, to test model mappings. I then imported the whole ER solution (ER data model, two ER model mapping configurations, and ER format configuration) into Finance. Why do I receive an error message when I try to run the same ER format in Finance?

The default model mapping setting is environment-specific. It's configured in RCS but isn't exported to Finance. To successfully run this ER format, you must mark one of ER model mapping configurations as the default model mapping configuration in Finance too.

I configured one model mapping as a shared model mapping and completed the draft version of it. I then added a new model mapping configuration for same data model and configured it as French-specific. Why is the shared model mapping selected when I run an ER format, even though this ER format uses the correct root definition and execution is done under the control of the company that has French country/region context?

Make sure that the shared model mapping configuration isn't marked as the default model mapping configuration. Otherwise, it will have higher priority during mapping selection. Also make sure that the French-specific model mapping configuration is considered when a mapping is selected during ER format execution. An ER model mapping configuration is available for selection only if at least one of the following conditions is met:

- At least one version of the ER model mapping configuration has either **Completed** or **Shared** status. In this case, the version that has the highest version number will be used for ER format execution.
- The **Run draft** option for the ER model mapping configuration is turned on. In this case, the version that has **Draft** status will be used for ER format execution.

The **Run draft** option becomes available on the **Configurations** page for each ER model mapping configuration when the **Run setting** ER user parameter is turned on.

NOTE

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Configure ER formats to use parameters that are specified per legal entity

2/18/2021 • 13 minutes to read • [Edit Online](#)

Overview

In many of the Electronic reporting (ER) formats that you will design, you must filter data by using a set of values that are specific to each legal entity of your instance (for example, a set of tax codes to filter tax transactions). Currently, when filtering of this type is configured in an ER format, values that are dependent on the legal entity (for example, tax codes) are used in expressions of the ER format to specify data filtering rules. Therefore, the ER format is made legal entity-specific, and to generate the required reports, you must create derived copies of the original ER format for each legal entity where you have to run the ER format. Each derived ER format must be edited to bring legal entity-specific values into it, rebased whenever the original (base) version has been updated, exported from a test environment and imported into a production environment when it must be deployed for production use, and so on. Therefore, maintenance of this type of configured ER solution is quite complex and time-consuming for several reasons:

- The more legal entities there are, the more ER format configurations must be maintained.
- Maintenance of ER configurations requires that business users have ER knowledge.

The ER application-specific parameters feature lets power users configure data filtering in an ER format so that it's based on a set of abstract rules. This set of rules can be configured to use the data sources that are available in an ER format. Business users can then specify real rules beyond the ER framework by using the user interface (UI) that is automatically generated based on the settings of the corresponding ER format and the current legal entity data that will be accessed by the ER format's data sources. The set of rules that is specified for an ER format can be exported from the current legal entity of the Dynamics 365 Finance (Finance) instance. It can then be imported into another legal entity of either the same Finance instance or a different instance as a set of rules for the same ER format.

Prerequisites

To complete the examples in this topic, you must have access to the instance of Regulatory Configuration Services (RCS) that has been provisioned for the same tenant as Finance for one of the following roles:

- Electronic reporting developer
- Electronic reporting functional consultant
- System administrator

We recommend that you complete the steps in the [Support parameterized calls of ER data sources of CALCULATED FIELD type](#) topic. If you've already completed those steps, you can skip the steps in the **Import ER configurations into RCS** section that follows.

Import ER configurations into RCS

From [Microsoft Download Center](#), download the **Support parameterized calls of ER data sources of CALCULATED FIELD type** zip file. This zip file contains the following ER configurations that must be extracted and stored locally.

CONTENT DESCRIPTION	FILE NAME
Sample ER data model configuration file	Model to learn parameterized calls.version.1.xml
Sample ER metadata configuration file	Metadata to learn parameterized calls.version.1.xml
Sample ER model mapping configuration file	Mapping to learn parameterized calls.version.1.1.xml
Sample ER format configuration	Format to learn parameterized calls.version.1.1.xml

Next, sign in to your RCS instance.

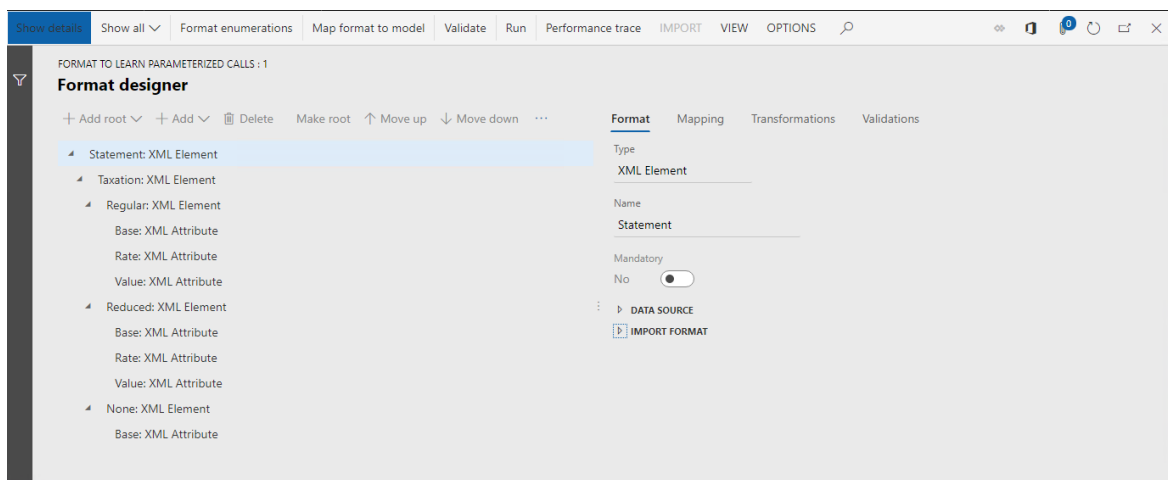
In this example, you will create a configuration for the Litware, Inc sample company. Before you can complete this procedure, you must complete the steps in the [Create a configuration provider and mark it as active](#) topic in RCS.

1. On the default dashboard, select **Electronic reporting**.
2. Select **Reporting configurations**.
3. Import the ER configurations that you downloaded earlier into RCS, in the following order: data model, metadata, model mapping, and format. For each ER configuration, follow these steps:
 - a. Select **Exchange**.
 - b. Select **Load from XML file**.
 - c. Select **Browse** to select the file for the required ER configuration in XML format.
 - d. Select **OK**.

Review the ER solution that is provided

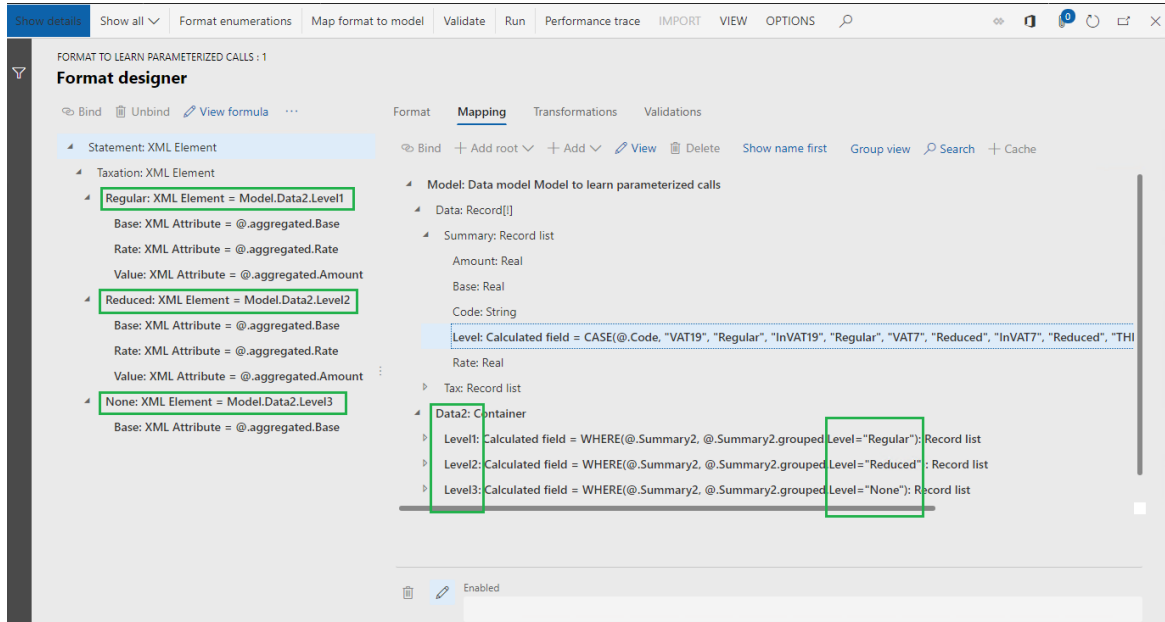
1. In the configuration tree, expand the contents of the **Model to learn parameterized calls** item.
2. Select the **Format to learn parameterized calls** item.
3. Select **Designer**.
4. Select **Expand/Collapse**.

The **Format to learn parameterized calls** ER format is designed to generate a tax statement in XML format that presents several levels of taxation (regular, reduced, and none). Each level has a different number of details.

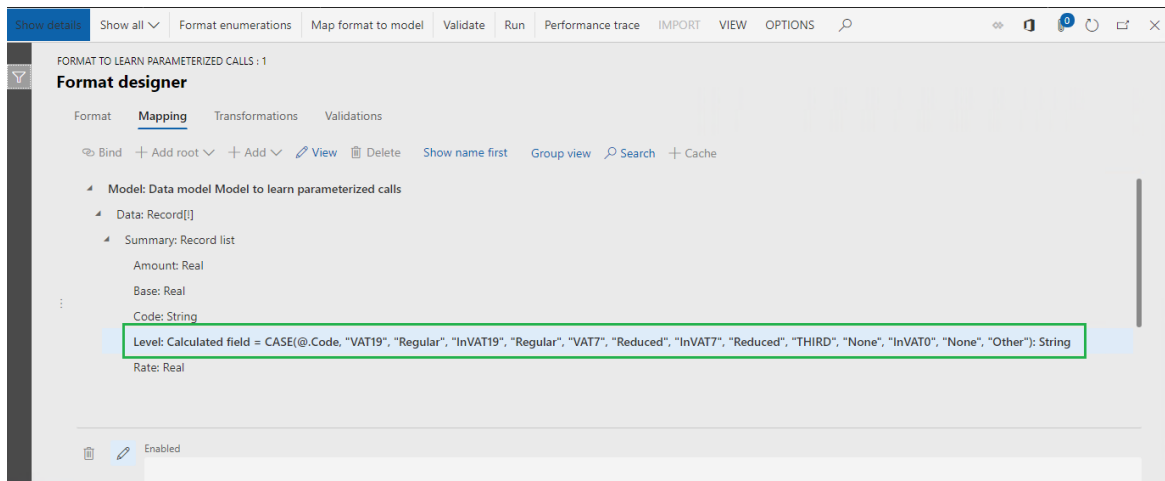


5. On the **Mapping** tab, expand the **Model**, **Data**, and **Summary** items.

The **Model.Data.Summary** data source returns the list of tax transactions. These transactions are summarized by tax code. For this data source, the **Model.Data.Summary.Level** calculated field has been configured to return the code for the taxation level of each summarized record. For any tax code that can be retrieved from the **Model.Data.Summary** data source at runtime, the calculated field returns the taxation level code (**Regular**, **Reduced**, **None**, or **Other**) as a text value. The **Model.Data.Summary.Level** calculated field is used to filter records of the **Model.Data.Summary** data source and enter the filtered data in each XML element that represents a taxation level by using the **Model.Data2.Level1**, **Model.Data2.Level2**, and **Model.Data2.Level3** fields.



The **Model.Data.Summary.Level** calculated field has been configured so that it contains an ER expression. Note that tax codes (**VAT19**, **InVAT19**, **VAT7**, **InVAT7**, **THIRD**, and **InVAT0**) are hardcoded into this configuration. Therefore, this ER format is dependent on the legal entity where these tax codes were configured.



To support a different set of tax codes for each legal entity, you must follow these steps:

- Create a derived version of the ER format for each legal entity.
- Update the tax codes in the **Model.Data.Summary.Level** calculated field, based on the legal entity setting.

6. Close the **Format designer** page.

Create a derived format

Next, you will use the ER application-specific parameters feature to support a different set of tax codes for each

legal entity in a single ER format.

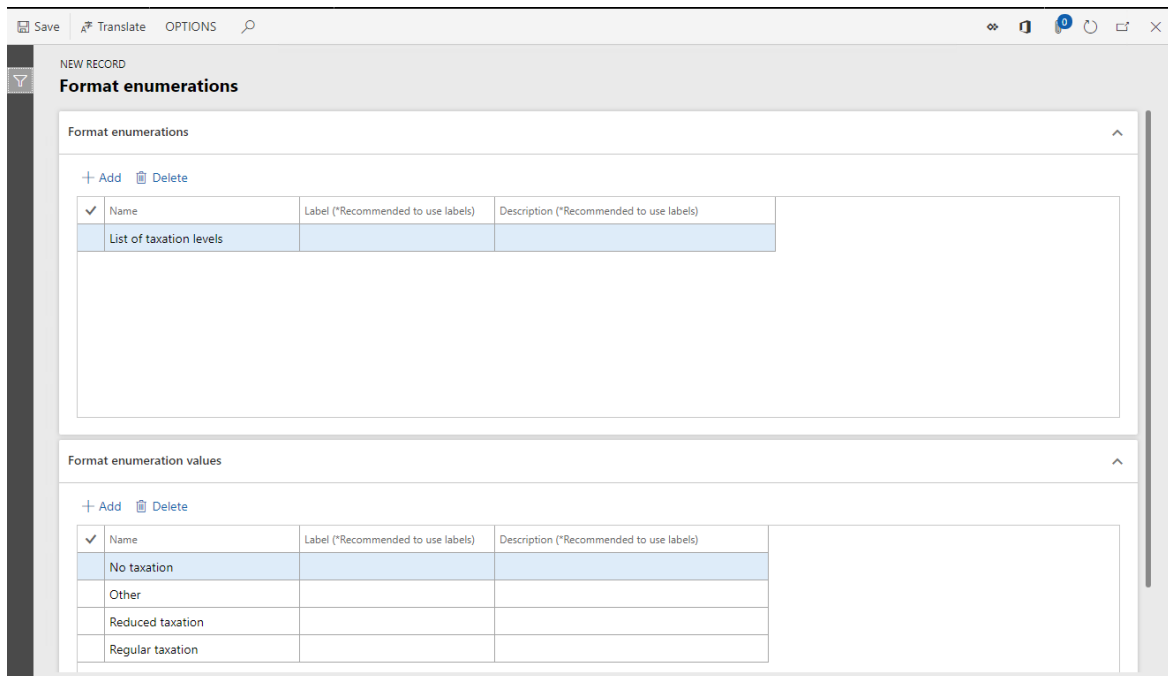
1. In the configuration tree, expand the contents of the **Model to learn parameterized calls** item.
2. Select the **Format to learn parameterized calls** item.
3. Select **Create configuration**.
4. Select the **Derive from Name: Format to learn parameterized calls, Microsoft** option.
5. In the **Name** field, enter **Format to learn how to lookup LE data**.
6. Select **Create configuration**.

Configure a derived format

Add a format enumeration

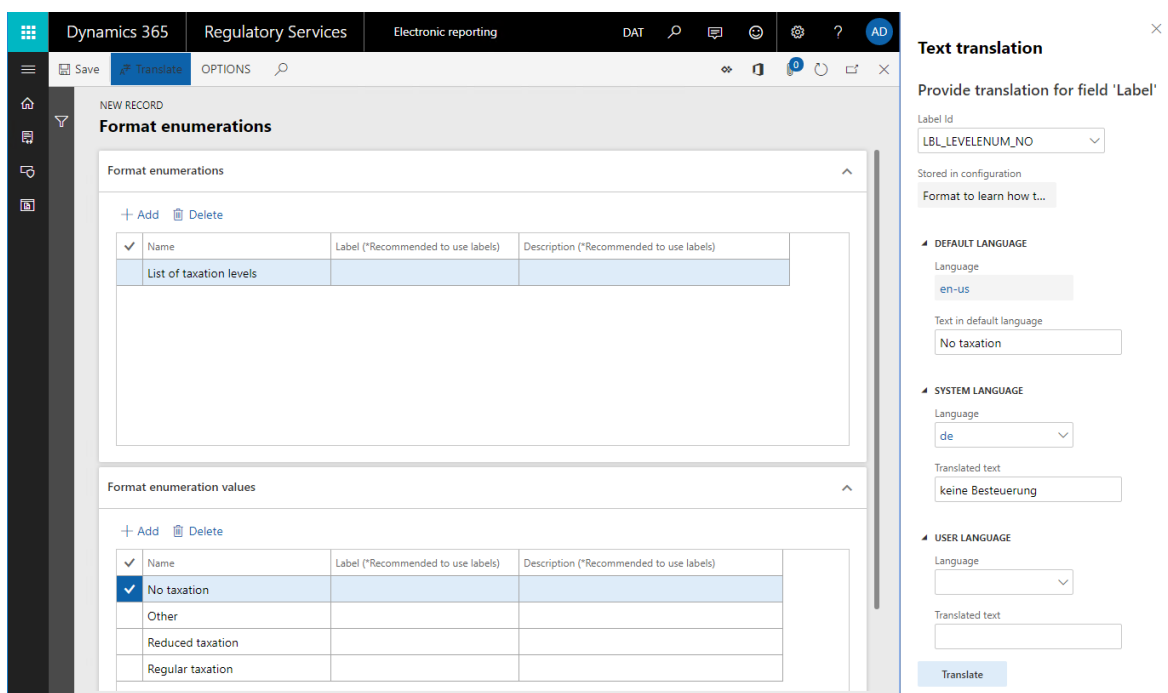
Next, you will add a new ER format enumeration. The values of this format enumeration will be presented to business users, who will specify legal entity–dependent sets of tax codes for the various taxation levels that are used in the ER format.

1. Select **Designer**.
2. Select **Format enumerations**.
3. Select **Add**.
4. In the **Name** field, enter **List of taxation levels**.
5. Select **Save**.
6. On the **Format enumeration values** tab, select **Add**.
7. In the **Name** field, enter **Regular taxation**.
8. Select **Add** again.
9. In the **Name** field, enter **Reduced taxation**.
10. Select **Add** again.
11. In the **Name** field, enter **No taxation**.
12. Select **Add** again.
13. In the **Name** field, enter **Other**.



Because the business users might use different languages to specify legal entity–dependent sets of tax codes, we recommend that you translate the values of this enumeration into the languages that are configured as the preferred languages for those users in Finance.

14. Select the **No taxation** record.
15. Click in the **Label** field.
16. Select **Translate**.
17. In the **Text translation** pane, in the **Label Id** field, enter **LBL_LEVELENUM_NO**.
18. In the **Text in default language** field, enter **No taxation**.
19. In the **Language** field, select **DE**.
20. In the **Translated text** field, enter **keine Besteuerung**.
21. Select **Translate**.



22. Select **Save**.

23. Close the **Format enumerations** page.

Add a new lookup data source

Next, you will add a new data source to specify how business users will specify legal entity–dependent rules to recognize the correct taxation level for each summarized transaction record.

1. On the **Mapping** tab, select **Add**.

2. Select **Format enumeration\Lookup**.

You just identified that each rule that business users specify for taxation level recognition will return a value of an ER format enumeration. Notice that the **Lookup** data source type can be accessed under the **Data model** and **Dynamics 365 for Operations** blocks in addition to the **Format enumeration** block. Therefore, ER data model enumerations and application enumerations can be used to specify the type of values that are returned for data sources of that type.

3. In the **Name** field, enter **Selector**.

4. In the **Format enumeration** field, select **List of taxation levels**.

You just specified that, for each rule that is specified in this data source, a business user must select one of the values of the **List of taxation levels** format enumeration as a returned value.

5. Select **Edit lookup**.

6. Select **Columns**.

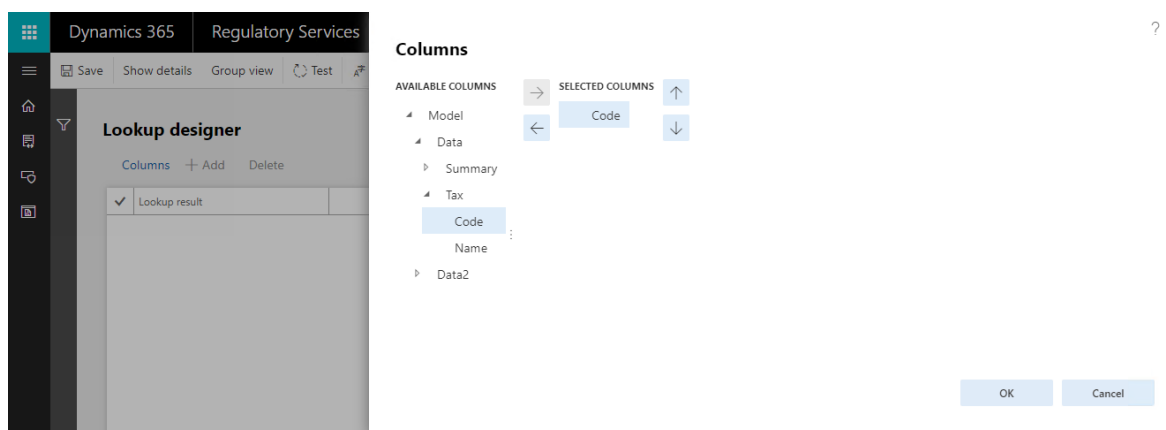
7. Expand the **Model** item.

8. Expand the **Data** item.

9. Expand the **Tax** item.

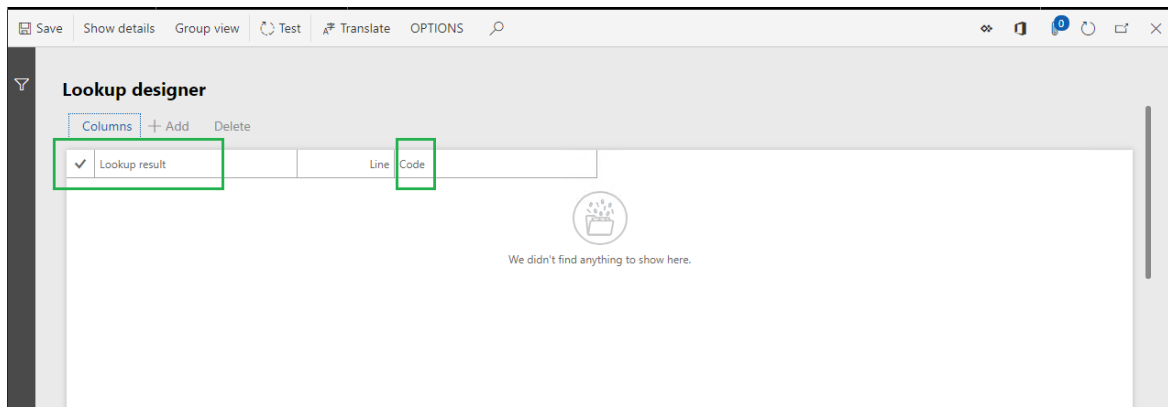
10. Select the **Model.Data.Tax.Code** item.

11. Select the **Add** button (the right arrow).



You just specified that, for each rule that is specified in this data source for taxation level recognition, a business user must select one of the tax codes as a condition. The list of tax codes that the business user can select will be returned by the **Model.Data.Tax** data source. Because this data source contains the **Name** field, the name of the tax code will be shown for each tax code value in the lookup that is presented to the business user.

12. Select **OK**.



Business users can add multiple rules as records of this data source. Each record will be numbered by a line code. Rules will be evaluated in order of increasing line number.

Because you selected the **Tax code** field as a condition for rules in this lookup data source, and because **Tax code** is set up as a field of the **String** data type, each rule will be evaluated at runtime by comparing the tax code that is passed to the data source with the tax code that is defined in this record of the data source.

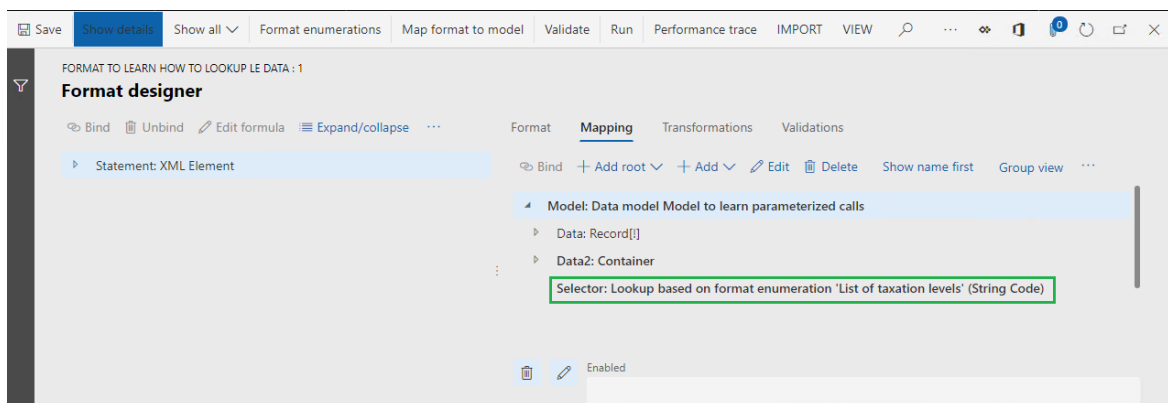
When a rule that satisfies the configured condition is found, this data source returns the lookup value of the rule that is defined in the **Lookup result** field. If no rule is found, an exception is thrown to notify the user that the current data source can't return a correct value.

13. Select **Save**.

14. Close the **Lookup designer** page.

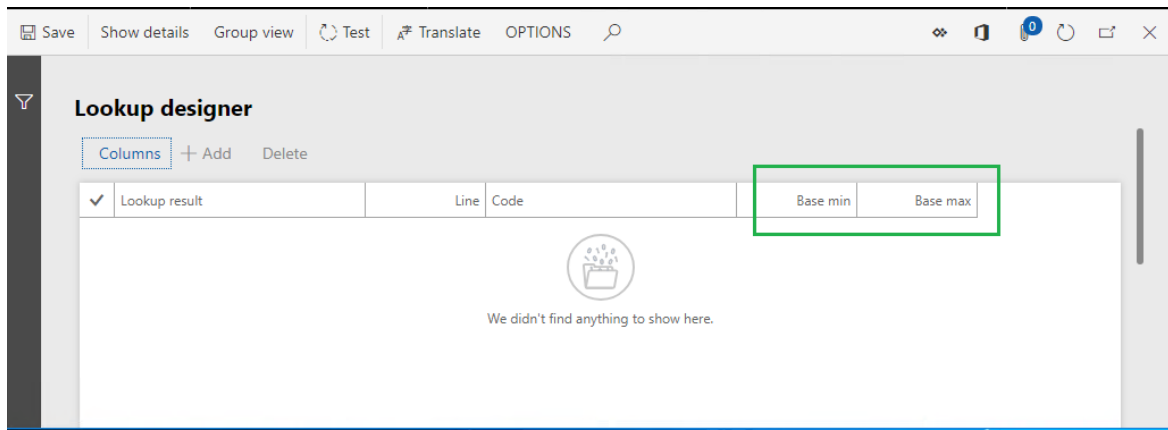
15. Select **OK**.

Notice that you added a new data source that will return the taxation level as the value of the **List of taxation levels** format enumeration for any tax code that is passed to the data source as the argument of the **Code** parameter of the **String** data type.



Note that the evaluation of configured rules depends on the data type of the fields that have been selected to define conditions of those rules. When you select a field that is configured as a field of either the **Numeric** or **Date** data type, the criteria will differ from the criteria that were described earlier for the **String** data type. For **Numeric** and **Date** fields, the rule must be specified as a range of values. The condition of the rule will then be considered satisfied when a value that is passed to the data source is in the configured range.

The following illustration shows an example of this type of setup. In addition to the **Model.Data.Tax.Code** field of the **String** data type, the **Model.Tax.Summary.Base** field of the **Real** data type is used to specify conditions for a lookup data source.



Because the **Model.Data.Tax.Code** and **Model.Tax.Summary.Base** fields are selected for this lookup data source, each rule of this data source will be configured in the following way:

- In the list that is presented, the value of the **List of taxation levels** format enumeration must be selected as a returned value.
- The tax code must be entered as a condition of this rule. Only tax codes that are provided by the **Model.Data.Tax** data source are applicable.
- Minimum and maximum values of the tax base amount must be entered as conditions of this rule.

Here is how each rule of this data source will be evaluated at runtime:

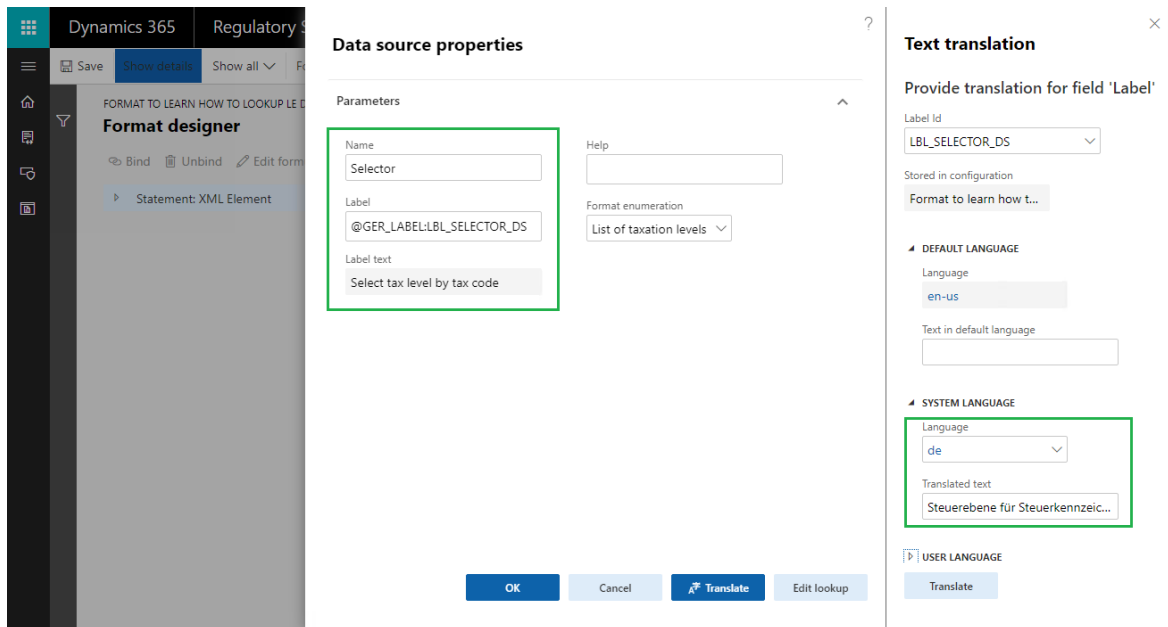
- Does the code of the **String** data type that was passed to this data source equal the tax code of a rule?
- Does the value of the **Real** data type that was passed to this data source fall between specific minimum and maximum values?

A rule will be considered applicable when both conditions are satisfied.

Translate the label of the lookup data source that was added

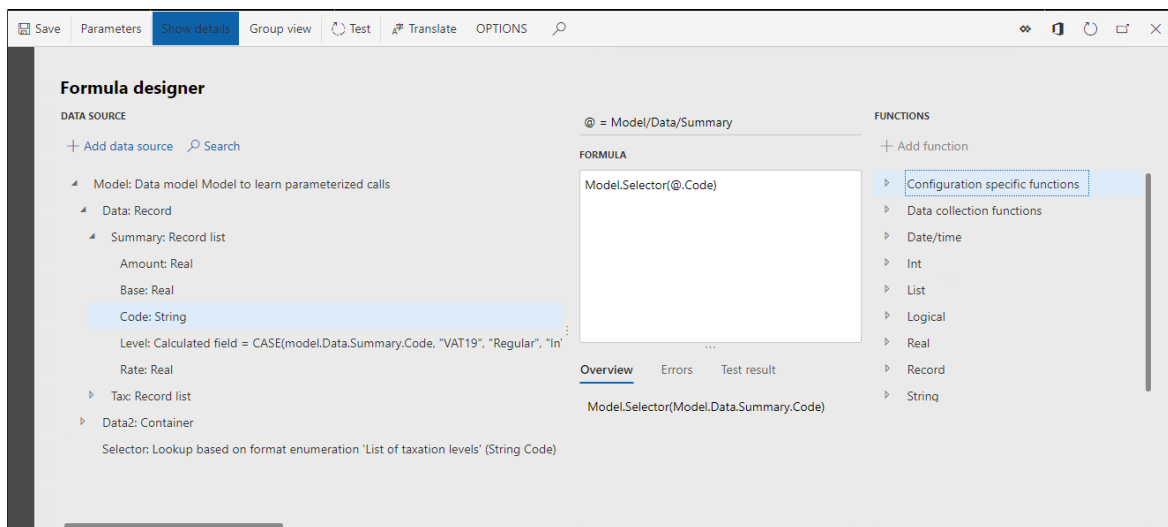
Because business users might use different languages to specify legal entity–dependent sets of tax codes, we recommend that you translate the label of any lookup data source that you add, so that it's presented in each user's preferred language on the corresponding page.

1. Select the **Model.Data.Selector** data source.
2. Select **Edit**.
3. Click in the **Label** field.
4. Select **Translate**.
5. In the **Text translation** pane, in the **Label Id** field, enter **LBL_SELECTOR_DS**.
6. In the **Text in default language** field, enter **Select tax level by tax code**.
7. In the **Language** field, select **DE**.
8. In the **Translated text** field, enter **Steuerebene für Steuerkennzeichen auswählen**.
9. Select **Translate**.
10. Select **OK**.

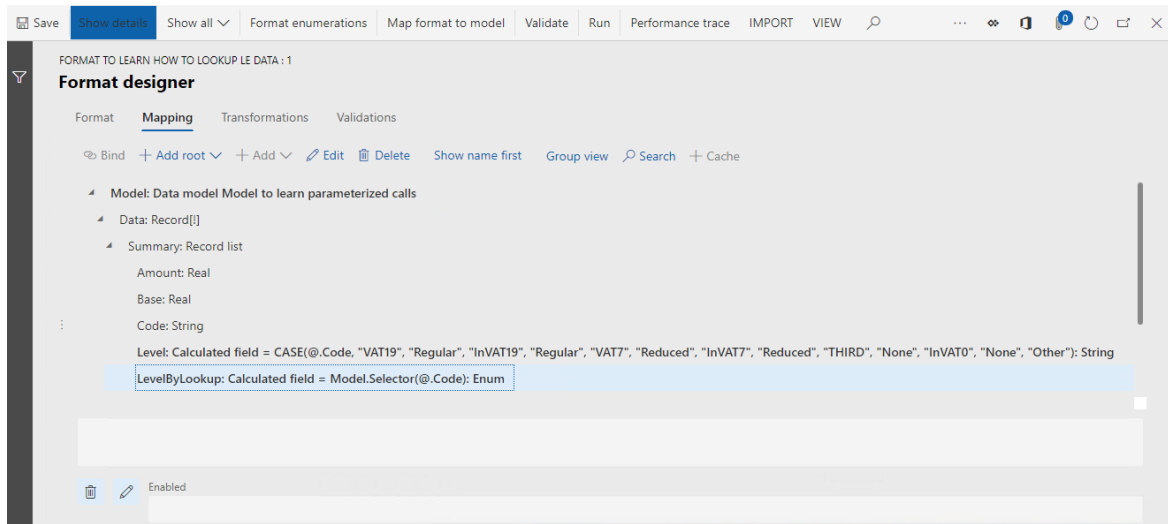


Add a new field to consume the configured lookup

1. Expand the **Model.Data** item.
2. Select the **Model.Data.Summary** item.
3. Select **Add**.
4. Select **Functions/Calculated field**.
5. In the **Name** field, enter **LevelByLookup**.
6. Select **Edit formula**.
7. In the **Formula** field, enter **Model.Selector(Model.Data.Summary.Code)**.
8. Select **Save**.



9. Close the **Formula editor** page.
10. Select **OK**.



Notice that the **LevelByLookup** calculated field that you added will return the taxation level as the value of the **List of taxation levels** format enumeration for each summarized tax transactions record. The tax code of the record will be passed to the **Model.Selector** lookup data source, and the set of rules for this data source will be used to select the correct taxation level.

Add a new format enumeration-based data source

Next, you will add a new data source that refers to the format enumeration that you added earlier. Values of this data source will be used in an ER format expression later.

1. Select **Add root**.
2. Select **Format enumerations\Enumeration**.
3. In the **Name** field, enter **TaxationLevel**.
4. In the **Format enumeration** field, select **List of taxation levels**.
5. Select **Save**.

Modify an existing field to start to use the lookup

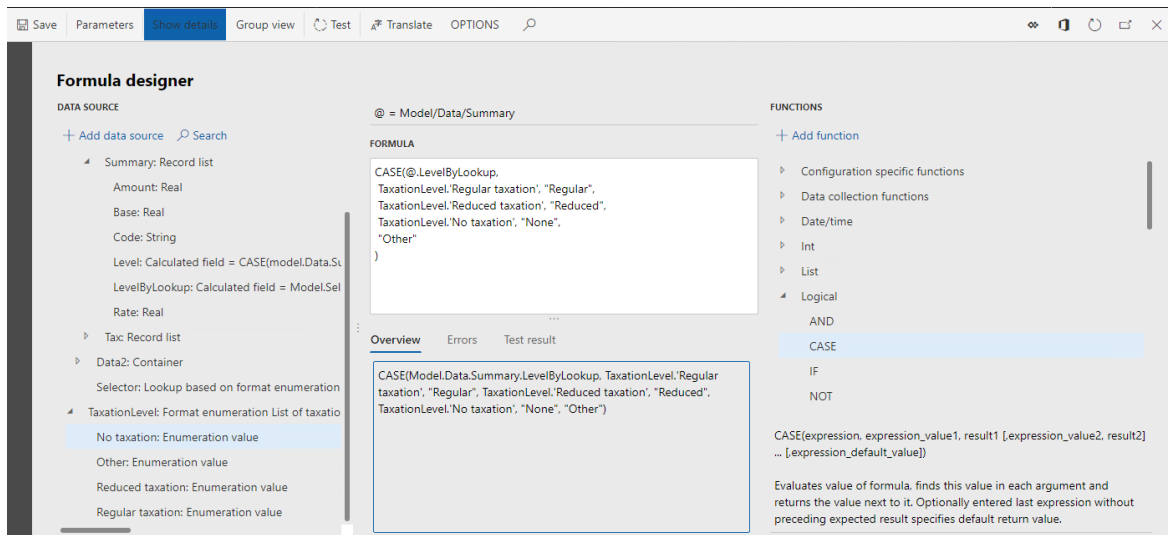
Next, you will modify the existing calculated field so that it uses the configured lookup data source to return the correct taxation level value, depending on the tax code.

1. Select the **Model.Data.Summary.Level** item.
2. Select **Edit**.
3. Select **Edit formula**.

Notice that the current expression of the **Model.Data.Summary.Level** field includes the following hard-coded tax codes:

```
CASE (@.Code, "VAT19", "Regular", "InVAT19", "Regular", "VAT7", "Reduced", "InVAT7", "Reduced", "THIRD", "None", "InVAT0", "None", "Other")
```

4. In the **Formula** field, enter **CASE(@.LevelByLookup, TaxationLevel.'Regular taxation', "Regular", TaxationLevel.'Reduced taxation', "Reduced", TaxationLevel.'No taxation', "None", "Other")**.



Notice that the expression of the **Model.Data.Summary.Level** field will now return the taxation level, based on the tax code of the current record and the set of rules that a business user configures in the **Model.Data.Selector** lookup data source.

5. Select **Save**.
6. Close **Formula designer** page.
7. Select **OK**.
8. Select **Save**.
9. Close **Format designer** page.

Complete the draft version of a derived format

1. On the **Versions** fast tab, select **Change status**.
2. Select **Complete**.
3. Select **OK**.

Export completed version of modified format

1. In the configuration tree, select the **Format to learn how to lookup LE data** item.
2. On the **Versions** fast tab, select the record that has a status of **Completed**.
3. Select **Exchange**.
4. Select **Export as XML file**.
5. Select **OK**.
6. The web browser downloads a **Format to learn how to lookup LE data.xml** file. Store this file locally.

Repeat steps in this section for parent items of the **Format to learn how to lookup LE data** format, and store the following files locally:

- **Format to learn parameterized calls.xml**
- **Mapping to learn parameterized calls.xml**
- **Model to learn parameterized calls.xml**

To learn how to use the configured **Format to learn how to lookup LE data** ER format to set up legal entity-dependent sets of tax codes to filter tax transactions by different taxation levels, complete the steps in the [Set up the parameters of an ER format per legal entity](#) topic.

Additional resources

[Formula designer in Electronic reporting](#)

[Set up the parameters of an ER format per legal entity](#)

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Set up the parameters of an ER format per legal entity

2/18/2021 • 9 minutes to read • [Edit Online](#)

Prerequisites

To complete these steps, you must first complete the steps in the [Configure ER formats to use parameters that are specified per legal entity](#) topic.

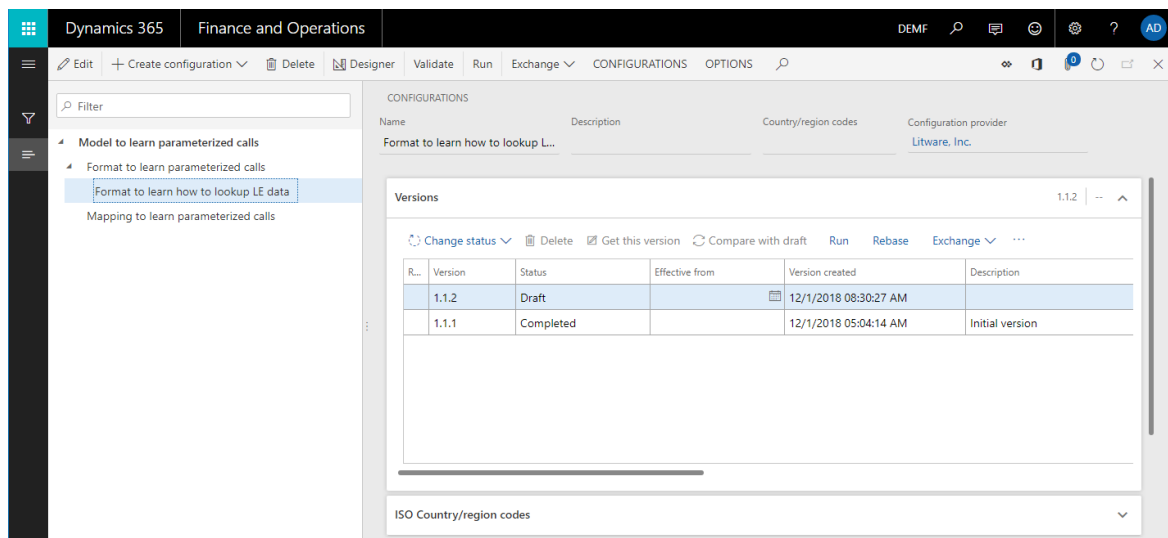
To complete the examples in this topic, you must have access to Microsoft Dynamics 365 Finance (Finance) for one of the following roles:

- Electronic reporting developer
- Electronic reporting functional consultant
- System administrator

Import ER configurations

1. Sign in to your environment.
2. On the default dashboard, select **Electronic reporting**.
3. Select **Reporting configurations**.
4. Import, into the current instance of Finance, the configurations that you exported from Regulatory Configuration Services (RCS) while you were completing the steps in the [Configure ER formats to use parameters that are specified per legal entity](#) topic. Follow these steps for each Electronic reporting (ER) configuration, in the following order: data model, model mapping, and formats.
 - a. Select **Exchange > Load from XML file**.
 - b. Select **Browse** to select the file for the required ER configuration in XML format.
 - c. Select **OK**.

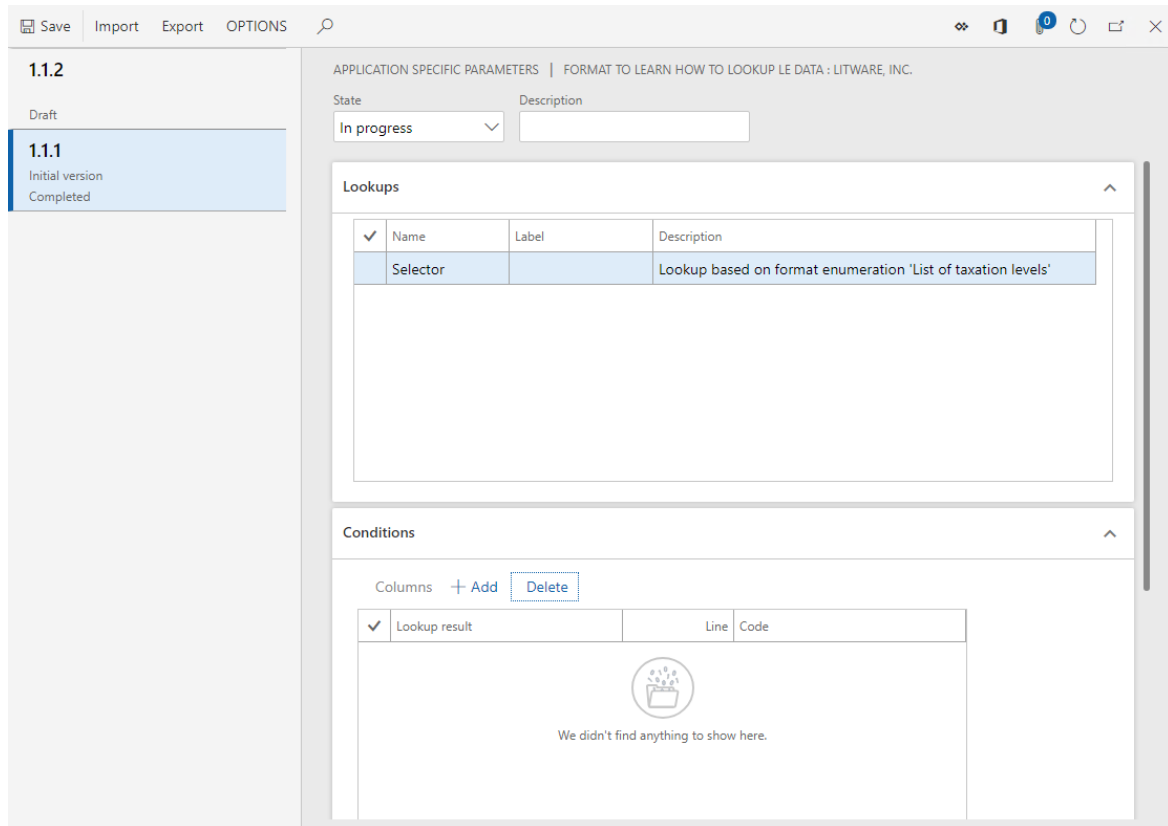
The following illustration shows the configurations that you must have when you've finished.



Set up parameters for the DEMF company

You can use the ER framework to set up application-specific parameters for an ER format.

1. Select the **DEMF** legal entity.
2. In the configurations tree, select the **Format to learn how to lookup LE data** format.
3. On the Action Pane, on the **Configurations** tab, in the **Application specific parameters** group, select **Setup**.



On the **Application specific parameters** page, you can configure the rules for the **Selector** data source of the **Format to learn how to lookup LE data** format.

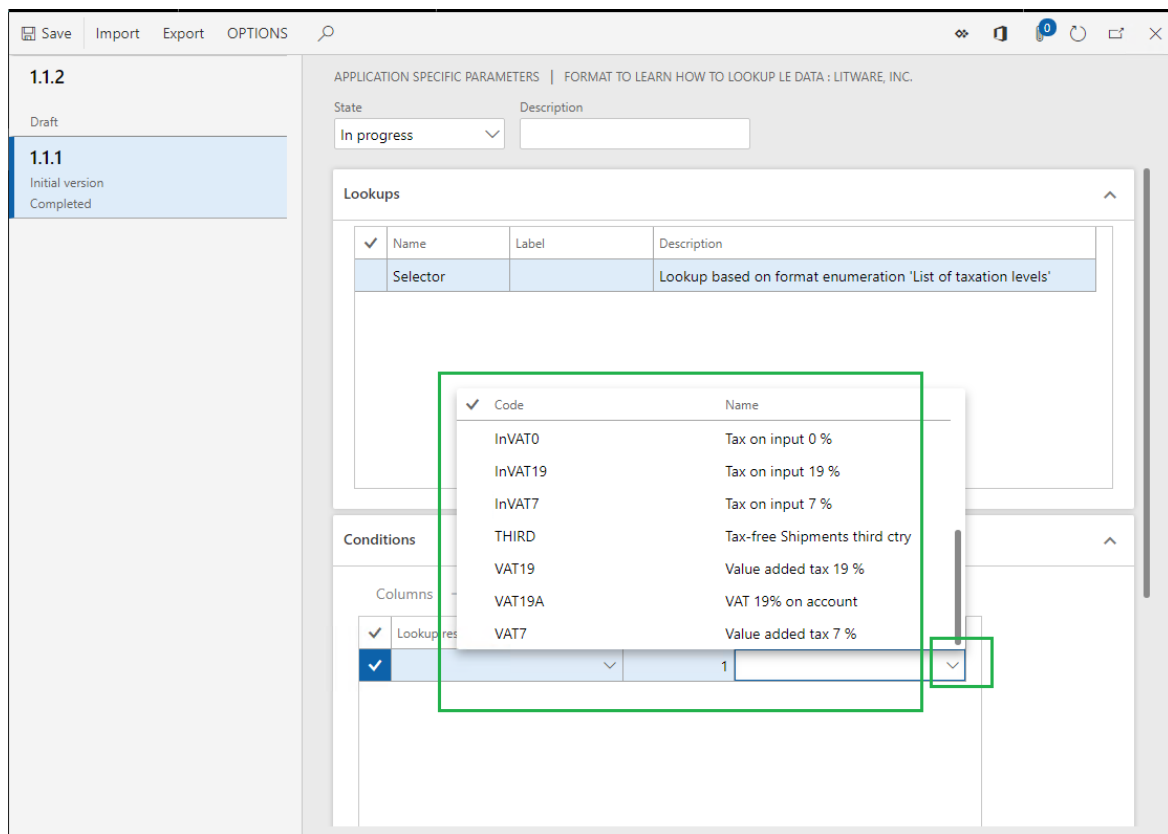
If the base ER format will contain several data sources of the **Lookup** type, you must select the desired data source on the **Lookups** FastTab before you can start to configure the set of rules for the data source.

For each data source, you can configure separate rules for each version of the selected ER format.

The whole set of rules for all lookup data sources that are available in the selected version of the base ER format makes up the application-specific parameters for the ER format.

4. Select version **1.1.1** of the ER format.
5. On the **Conditions** FastTab, select **Add**.
6. In the **Code** field of the new record, select the drop-down arrow to open the lookup.

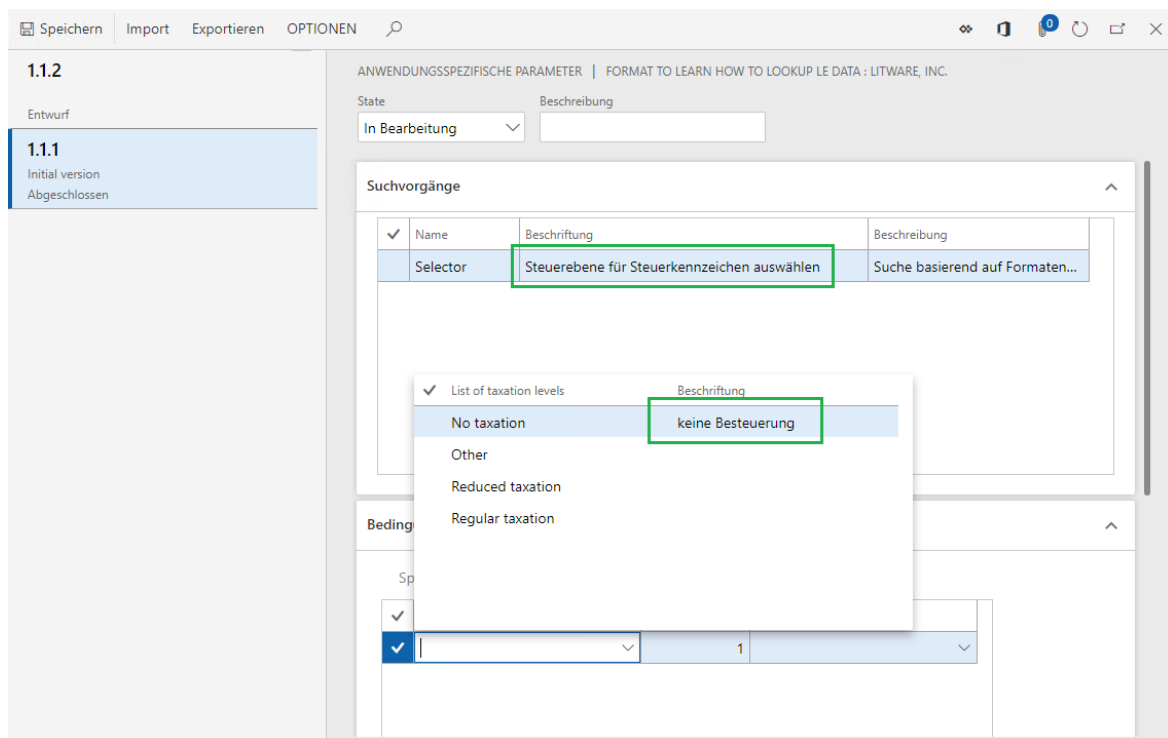
The lookup presents the list of tax codes for selection. This list is returned by the **Model.Data.Tax** data source that has been configured in the base ER format. Because this data source contains the **Name** field, the name of each tax code appears in the lookup.



7. Select the **VAT19** tax code.

8. In the **Lookup result** field of the new record, select the drop-down arrow to open the lookup. The lookup presents the list of values for the TaxationLevel format enumeration for selection.

Note that, if German is selected as the preferred language of the user that you're signed in as, the labels of the values in the lookup will be in German, provided that they have been translated in the base ER format. Additionally, if the label of a lookup data source has been translated, that label will appear in the user's preferred language on the **Lookups** tab.



9. Select the **Regular taxation** value.

By adding this record, you define the following rule: Whenever the **Selector** lookup data source is

requested, and the **VAT19** tax code is passed as an argument, **Regular taxation** will be returned as the requested taxation level.

10. Select **Add**, and then follow these steps:
 - a. In the **Code** field, select the **InVAT19** tax code.
 - b. In the **Lookup result** field, select the **Regular taxation** value.
11. Select **Add** again, and then follow these steps:
 - a. In the **Code** field, select the **VAT7** tax code.
 - b. In the **Lookup result** field, select the **Reduced taxation** value.
12. Select **Add** again, and then follow these steps:
 - a. In the **Code** field, select the **InVAT7** tax code.
 - b. In the **Lookup result** field, select the **Reduced taxation** value.
13. Select **Add** again, and then follow these steps:
 - a. In the **Code** field, select the **THIRD** tax code.
 - b. In the **Lookup result** field, select the **No taxation** value.
14. Select **Add** again, and then follow these steps:
 - a. In the **Code** field, select the **InVAT0** tax code.
 - b. In the **Lookup result** field, select the **No taxation** value.
15. Select **Add** again, and then follow these steps:
 - a. In the **Code** field, select the ***Not blank*** option.
 - b. In the **Lookup result** field, select the **Other** value.

By adding this last record, you define the following rule: Whenever the tax code that is passed as an argument doesn't satisfy any of the previous rules, the lookup data source will return **Other** as the requested taxation level.

1.1.2

Draft

1.1.1

Initial version

Completed

APPLICATION SPECIFIC PARAMETERS | FORMAT TO LEARN HOW TO LOOKUP LE DATA : LITWARE, INC.

State: In progress

Description:

Conditions

Lookup result	Line	Code
Regular taxation	1	VAT19
Regular taxation	2	InVAT19
Reduced taxation	3	VAT7
Reduced taxation	4	InVAT7
No taxation	5	THIRD
No taxation	6	InVAT0
Other	7	*Not blank*

16. In the **State** field, select **Completed**.

When you run an ER format version that has a status of either **Completed** or **Shared**, this set of rules must be in the **Completed** state. Otherwise, execution of the base ER format will be interrupted when the format tries to load data from this set of rules while the **Selector** lookup data source is being run.

When you run an ER format version that has a status of **Draft**, the base ER format can access this set of rules, regardless of its state.

17. Select **Save**.
18. Close the **Application specific parameters** page.

Run the ER format in the DEMF company

1. In the configurations tree, select the **Format to learn how to lookup LE data** format.
2. On the Action Pane, select **Run**.
3. In the dialog box that appears, select **OK**.
4. Download the statement that is generated and store it locally.

In the generated statement, notice that the summary of the **InVAT7** tax code has been put on the **Reduced** level, and the summaries of the **VAT19** and **InVA19** tax codes have been put on the **Regular** level. This behavior is determined by the configuration in the legal entity–dependent set of rules.

5. Go to **Tax > Indirect taxes > Sales tax > Sales tax codes**.
6. Select the **InVAT7** tax code.
7. On the Action Pane, on the **Sales tax code** tab, in the **Inquiries** group, select **Posted sales tax** to view information about the tax value and applied tax rate per tax code.

✓ Voucher ↑	Date	Source	Sales tax code	Sales tax direction	Transaction
PIV-110000004	1/4/2015	Purchase order	InVAT7	Sales tax receivable	EUR
PIV-110000018	3/1/2016	Purchase order	InVAT7	Sales tax receivable	EUR
PIV-110000027	12/3/2016	Purchase order	InVAT7	Sales tax receivable	EUR

```
<?xml version="1.0" encoding="UTF-8"?>
- <Statement>
- <Taxation>
  <Regular Value="-5073163.93" Rate="19" Base="-26700862.86"/>
  <Reduced Value="3623.2" Rate="7" Base="51760.0"/>
  <None Base="0"/>
</Taxation>
</Statement>
```

Total actual sales tax amount
3,623.20

8. Close the **Posted sales tax** page.

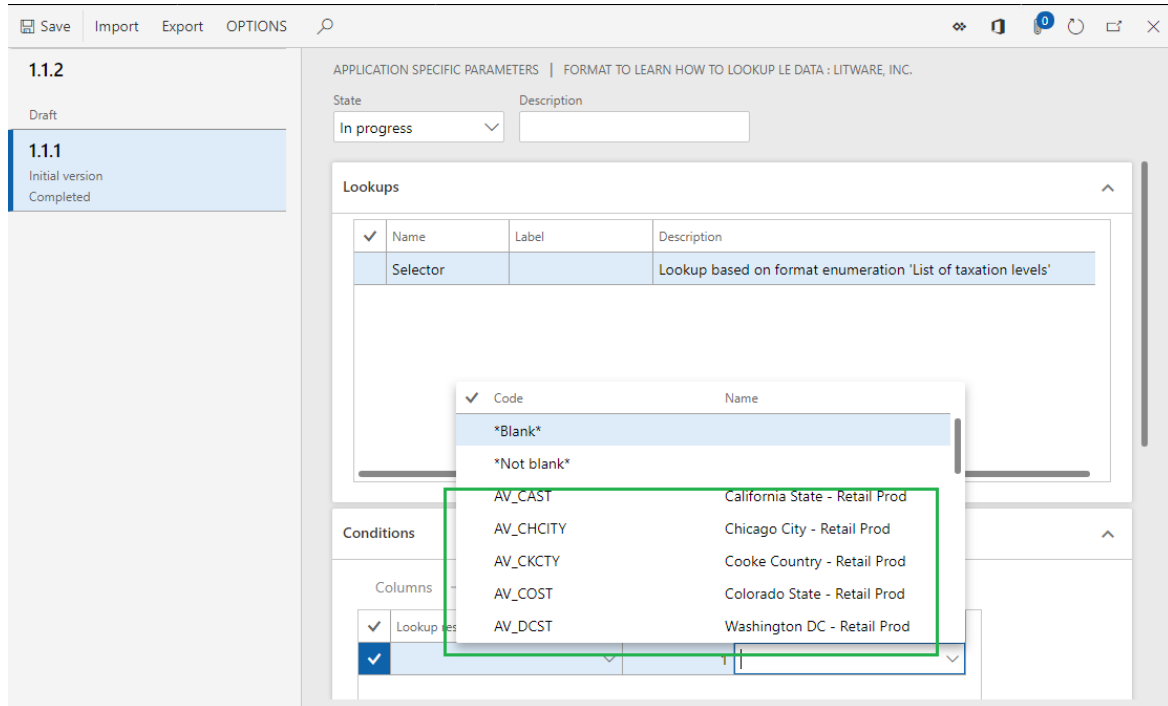
Set up parameters for the USMF company

1. Select the **USMF** legal entity.
2. Go to **Organization administration > Electronic reporting > Configurations**.
3. In the configurations tree, expand the **Model to learn parameterized calls** item, expand the **Format to learn parameterized calls** item, and select the **Format to learn how to lookup LE data** format.
4. On the Action Pane, on the **Configurations** tab, in the **Application specific parameters** group, select

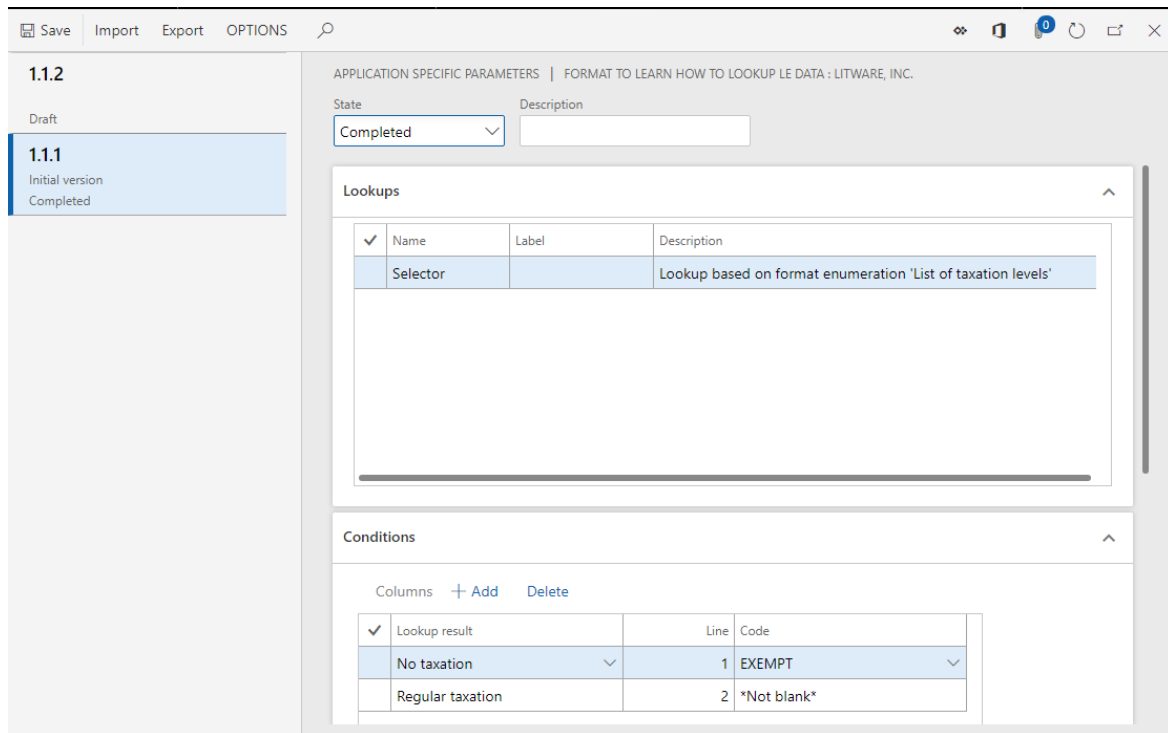
Setup.

5. Select version **1.1.1** of the selected ER format.
6. On the **Conditions** FastTab, select **Add**.
7. In the **Code** field of the new record, select the drop-down arrow to open the lookup.

The lookup now presents the list of tax codes for the **USMF** company tax for selection.



8. Select the **EXEMPT** tax code.
9. In the **Lookup result** field of the new record, select the **No taxation** value.
10. Select **Add** again.
11. In the **Code** field of the new record, select the ***Not blank*** option.
12. In the **Lookup result** field of the new record, select the **Regular taxation** value.
13. In the **State** field, select **Completed**.
14. Select **Save**.



15. Close the **Application specific parameters** page.

Run the ER format in the USMF company

1. In the configurations tree, select the **Format to learn how to lookup LE data** format.
2. On the Action Pane, select **Run**.
3. In the dialog box that appears, select **OK**.
4. Download the statement that is generated and store it locally.

In the generated statement, notice that you've now reused the same ER format for a different legal entity, but without making any adjustments to the ER format.

Reuse legal entity–dependent parameters

Export parameters

1. Go to **Organization administration > Workspaces > Electronic reporting**.
2. Select **Reporting configurations**.
3. In the configurations tree, select the **Format to learn how to lookup LE data** format.
4. On the Action Pane, on the **Configurations** tab, in the **Application specific parameters** group, select **Setup**.
5. Select version **1.1.1** of the ER format.
6. On the Action Pane, select **Export**.
7. Download the file that is generated and store it locally.

The configured set of application-specific parameters has now been exported as an XML file.

Import parameters

1. Select version **1.1.2** of the ER format.
2. On the Action Pane, select **Import**.

3. Select **Yes** to confirm that you want to override the existing application-specific parameters for this format version.
4. Select **Browse** to find the file that contains the exported application-specific parameters for version 1.1.1.
5. Select **OK**.

Version 1.1.2 of the ER format now has the same application-specific parameters that you originally configured for version 1.1.1.

Note that the application-specific parameters of an ER format are legal entity–dependent. To reuse the application-specific parameters that were configured for one legal entity in a different legal entity, you must export them while you're signed in to the first legal entity and then import them after you sign in to the other legal entity.

You can also use this approach to transfer an ER format related application-specific parameters that were originally configured in one instance of Finance to another instance of Finance.

Be aware that if you configure application-specific parameters for one version of an ER format and import a higher version of the same format into the current Finance instance, the existing application-specific parameters won't be applied for the imported version.

Also be aware that, when you select a file for import, the structure of the application-specific parameters in that file is compared with the structure of the corresponding data source of the **Lookup** type in the ER format that is selected for import. The import is done when the structure of each application-specific parameter matches the structure of the corresponding data source in the ER format that is selected for import. If the structures don't match, you receive a warning message that states that the import can't be done. If you force the import to be done, the existing application-specific parameters for the selected ER format will be cleaned up, and you must set them up from the beginning.

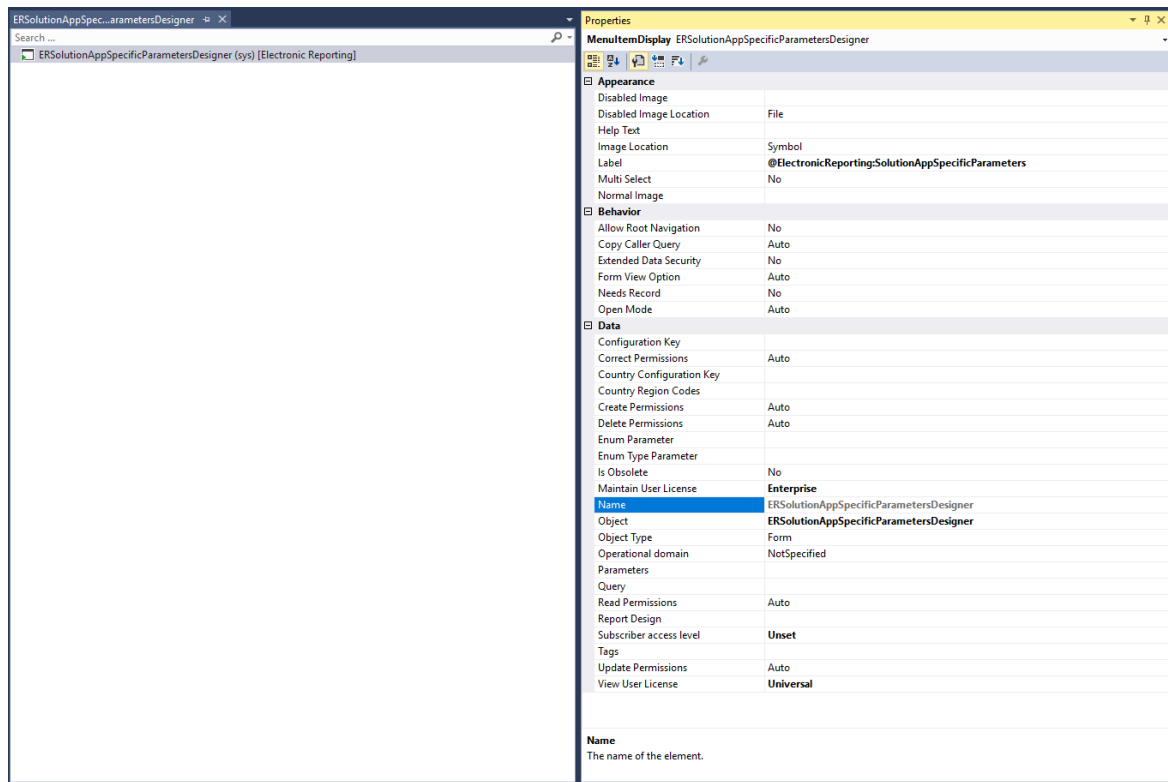
Relationship between application-specific parameters and an ER format

The relationship between an ER format and its application-specific parameters is established by the ER format's instance-independent unique identification code. Therefore, when you remove an ER format from Finance, the application-specific parameters that are configured for the ER format are kept in the current instance of Finance. They can be accessed whenever the base ER format is reimported into this instance of Finance.

Access application-specific parameters by using the ER framework

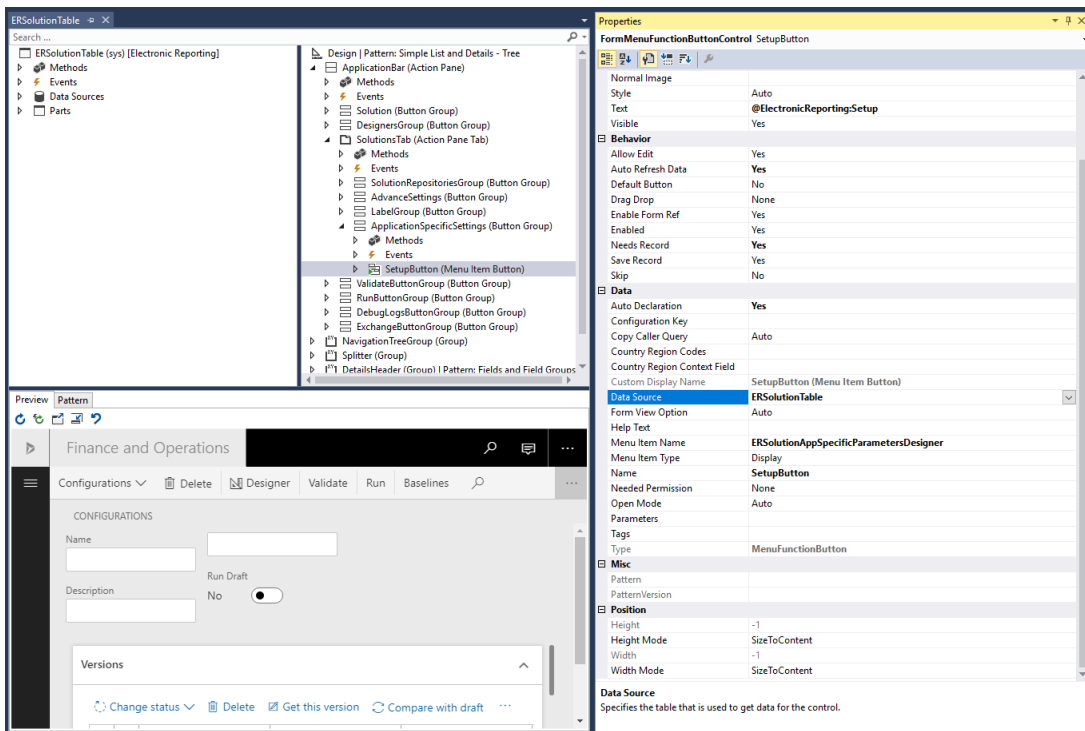
In the preceding example, you have accessed application-specific parameters of an ER format by using the ER framework. This approach doesn't let you restrict access to the application-specific parameters of a specific ER format. If you must apply such restrictions, follow these steps.

1. Either reuse an existing **ERSolutionAppSpecificParametersDesigner** menu item, or implement your own **ERSolutionAppSpecificParametersDesigner** menu item.



2. Follow one of these steps:

- a. Create a new menu item button, and link it to the corresponding record from the ERSolutionTable table by setting its Data Source property to ERSolutionTable.



- b. Create a simple button, and override the Clicked method as shown in the following example.

By using this approach, you can specify a unique solution ID (defined via the GUID value) to allow access to the application-specific parameters of only a specific ER format and descendant copies that have been derived from it.

```
public void clicked()
{
    super();

    ERSolutionTable solutionTableRecord = ERSolutionTable::findByGUID(str2Guid('ADACCB2F-
EFD1-4C90-877D-7E1E5D1AEE92'));

    Args args = new Args();
    args.record(solutionTableRecord);
    args.caller(this);

    new MenuFunction(menuItemDisplayStr(ERSolutionAppSpecificParametersDesigner),
MenuItemType::Display)
        .run(args);
}
```

Additional resources

[Formula designer in Electronic reporting](#)

[Configure ER formats to use parameters that are specified per legal entity](#)

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Defer the execution of sequence elements in ER formats

2/18/2021 • 11 minutes to read • [Edit Online](#)

Overview

You can use the Operations designer of the [Electronic reporting \(ER\)](#) framework to [configure](#) the [format component](#) of an ER solution that is used to generate outbound documents in a text format. The hierarchical structure of the configured format component consists of format elements of various types. These format elements are used to fill generated documents with the required information at runtime. By default, when you run an ER format, the format elements are run in the same order as they are presented in the format hierarchy: one by one, from top to bottom. However, at design time, you can change the execution order for any sequence elements of the configured format component.

By turning on the **Deferred execution** option for a sequence format element in the configured format, you can defer (postpone) the execution of that element. In this case, the element isn't run until all other elements of its parent have been run.

To learn more about this feature, complete the example in this topic.

Limitations

The **Deferred execution** option is supported only for sequence elements that are configured for an ER format that is used to generate **outbound** documents in text format.

The **Deferred execution** option isn't applicable to sequences that have been configured as trimmed sequences where the maximum length is limited.

Example: Defer the execution of a sequence element in an ER format

The following steps explain how a user in the System administrator or Electronic reporting functional consultant [role](#) can configure an ER format that contains a sequence element where order of execution differs from the order in the format hierarchy.

These steps can be performed in the **USMF** company in Microsoft Dynamics 365 Finance.

Prerequisites

To complete this example, you must have access to the **USMF** company in Finance for one of the following roles:

- Electronic reporting functional consultant
- System administrator

If you haven't yet completed the example in the [Defer the execution of XML elements in ER formats](#) topic, download the following [configurations](#) of the sample ER solution.

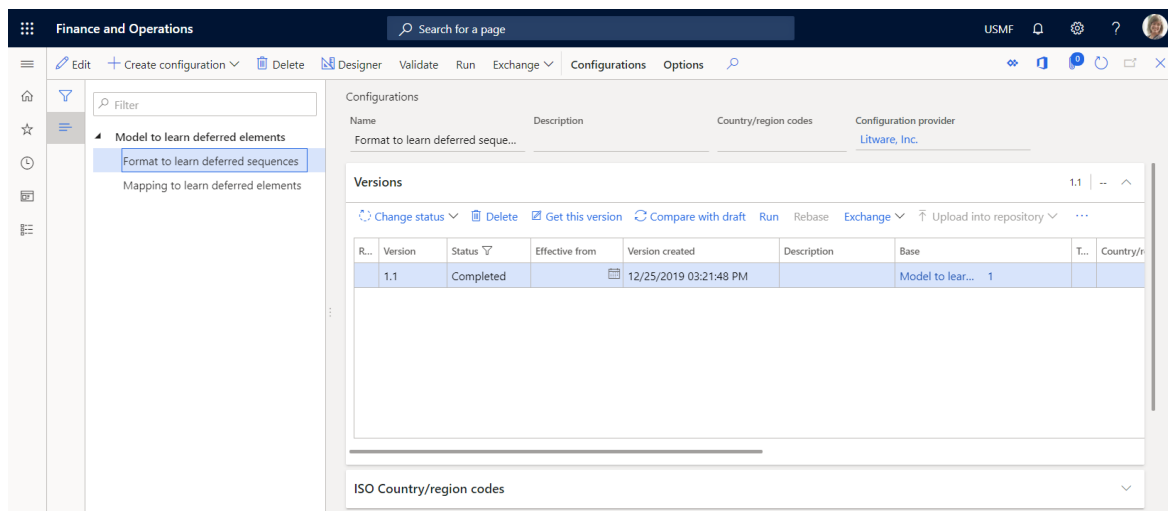
CONTENT DESCRIPTION	FILE NAME
ER data model configuration	Model to learn deferred elements.version.1.xml
ER model mapping configuration	Mapping to learn deferred elements.version.1.1.xml

Before you begin, you must also download and save the following configuration of the sample ER solution.

CONTENT DESCRIPTION	FILE NAME
ER format configuration	Format to learn deferred sequences.version.1.1.xml

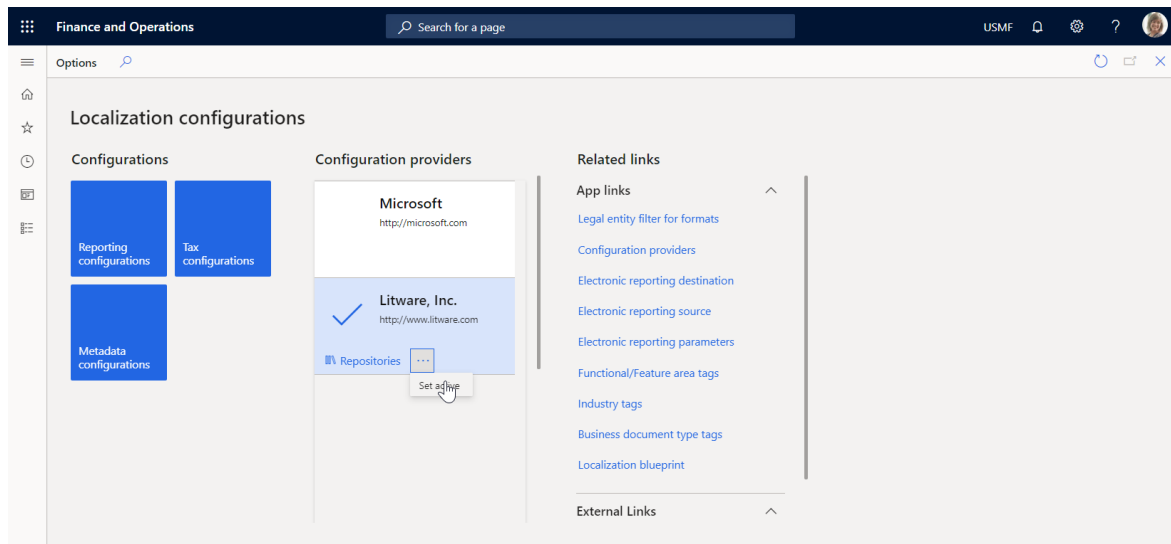
Import the sample ER configurations

1. Go to **Organization administration > Workspaces > Electronic reporting**.
2. Select **Reporting configurations**.
3. On the **Configurations** page, if the **Model to learn deferred elements** configuration isn't available in the configuration tree, import the ER data model configuration:
 - a. Select **Exchange**, and then select **Load from XML file**.
 - b. Select **Browse**, find and select the **Model to learn deferred elements.1.xml** file, and then select **OK**.
4. If the **Mapping to learn deferred elements** configuration isn't available in the configuration tree, import the ER model mapping configuration:
 - a. Select **Exchange**, and then select **Load from XML file**.
 - b. Select **Browse**, find and select the **Mapping to learn deferred elements.1.1.xml** file, and then select **OK**.
5. Import the ER format configuration:
 - a. Select **Exchange**, and then select **Load from XML file**.
 - b. Select **Browse**, find and select the **Format to learn deferred sequences.1.1.xml** file, and then select **OK**.
6. In the configuration tree, expand **Model to learn deferred elements**.
7. Review the list of imported ER configurations in the configuration tree.



Activate a configurations provider

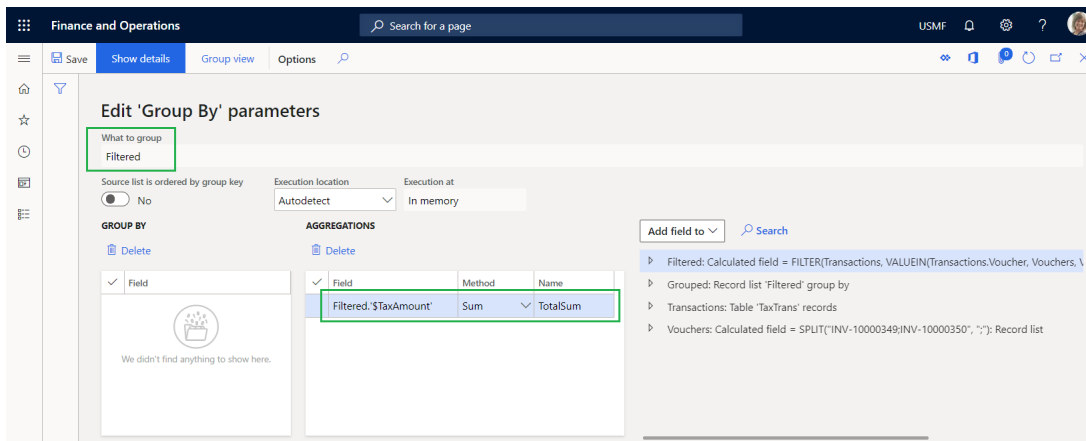
1. Go to **Organization administration > Workspaces > Electronic reporting**.
2. On the **Localization configurations** page, in the **Configuration providers** section, make sure that the **configuration provider** for the Litware, Inc. (<http://www.litware.com>) sample company is listed, and that it's marked as active. If this configuration provider isn't listed, or if it isn't marked as active, follow the steps in the [Create a configuration provider and mark it as active](#) topic.



Review the imported model mapping

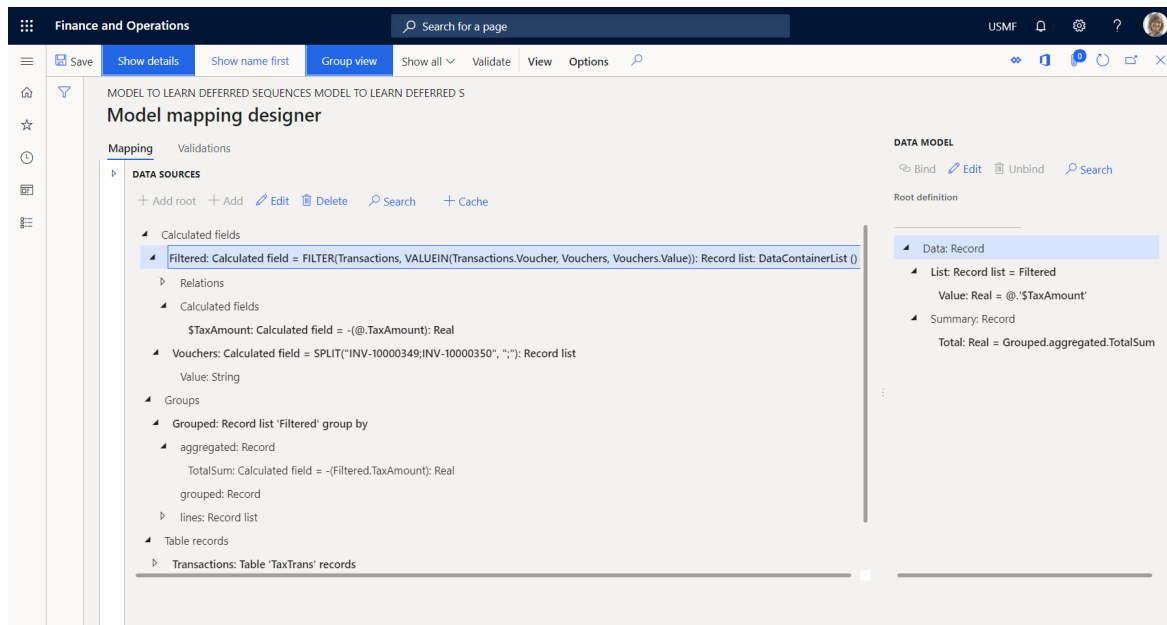
Review the settings of the ER model mapping component that is configured to access tax transactions and expose accessed data on request.

1. Go to **Organization administration > Workspaces > Electronic reporting**.
2. Select **Reporting configurations**.
3. On the **Configurations** page, in the configuration tree, expand **Model to learn deferred elements**.
4. Select the **Mapping to learn deferred elements** configuration.
5. Select **Designer** to open the list of mappings.
6. Select **Designer** to review the mapping details.
7. Select **Show details**.
8. Review the data sources that are configured to access tax transactions:
 - The **Transactions** data source of the *Table record* type is configured to access records of the **TaxTrans** application table.
 - The **Vouchers** data source of the *Calculated field* type is configured to return the required voucher codes (**INV-10000349** and **INV-10000350**) as a list of records.
 - The **Filtered** data source of the *Calculated field* type is configured to select, from the **Transactions** data source, only tax transactions of the required vouchers.
 - The **\$TaxAmount** field of the *Calculated field* type is added for the **Filtered** data source to expose the tax value that has the opposite sign.
 - The **Grouped** data source of the *Group By* type is configured to group filtered tax transactions of the **Filtered** data source.
 - The **TotalSum** aggregation field of the **Grouped** data source is configured to summarize values of the **\$TaxAmount** field of the **Filtered** data source for all filtered tax transactions of that data source.



9. Review how the configured data sources are bound to the data model, and how they expose accessed data to make it available in an ER format:

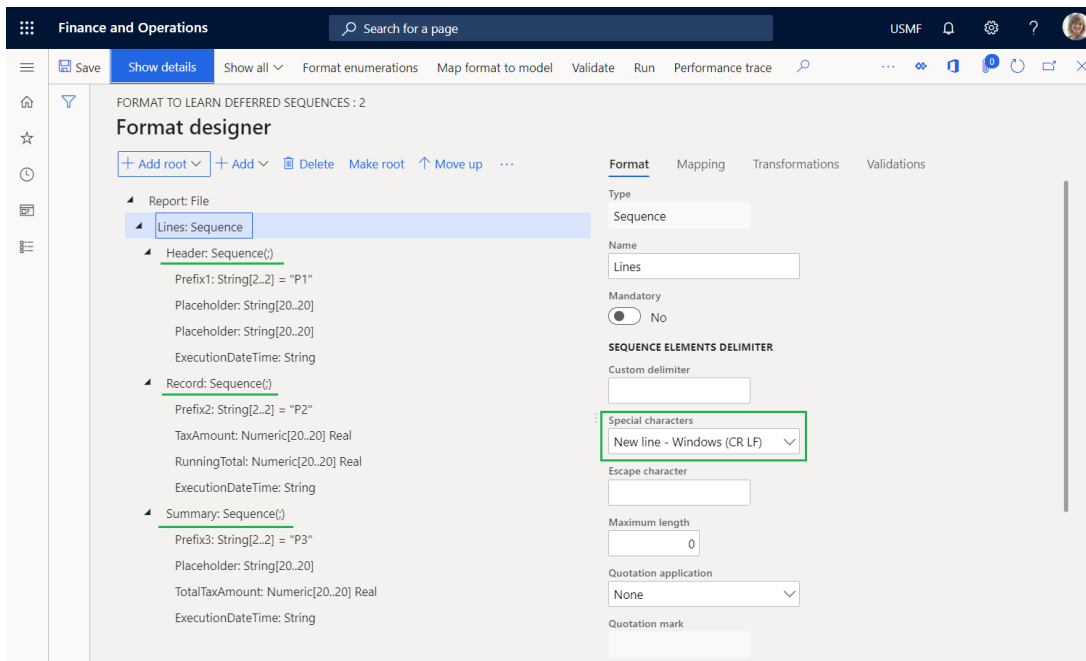
- The **Filtered** data source is bound to the **Data.List** field of the data model.
- The **\$TaxAmount** field of the **Filtered** data source is bound to the **Data.List.Value** field of the data model.
- The **TotalSum** field of the **Grouped** data source is bound to the **Data.Summary.Total** field of the data model.



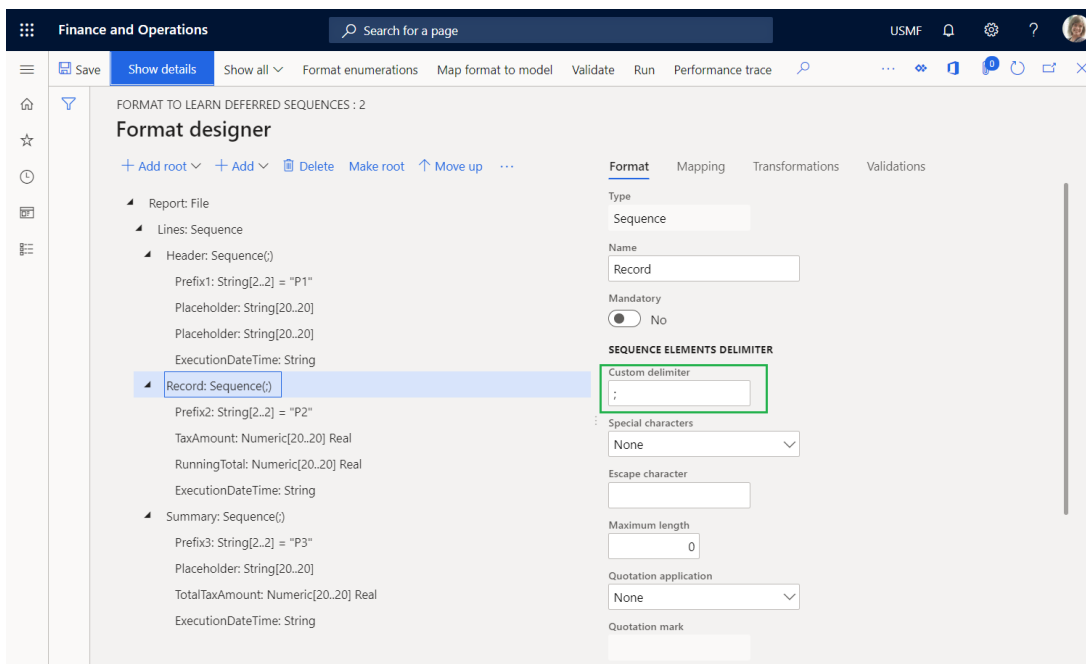
10. Close the **Model mapping designer** and **Model mappings** pages.

Review the imported format

1. On the **Configurations** page, in the configuration tree, select the **Format to learn deferred sequences** configuration.
2. Select **Designer** to review the format details.
3. Select **Show details**.
4. Review the settings of the ER format components that are configured to generate an outbound document in text format that includes details of the tax transactions:
 - The **Report\Lines** sequence format element is configured to fill the outbound document with a single line that is generated from the nested sequence elements (**Header**, **Record**, and **Summary**).



- The **Report\Lines\Header** sequence format element is configured to fill the outbound document with a single header line that shows the date and time when the processing starts.
- The **Report \Lines\Record** sequence format element is configured to fill the outbound document with a single line that shows the details of individual tax transactions. These tax transactions are separated by a semicolon.

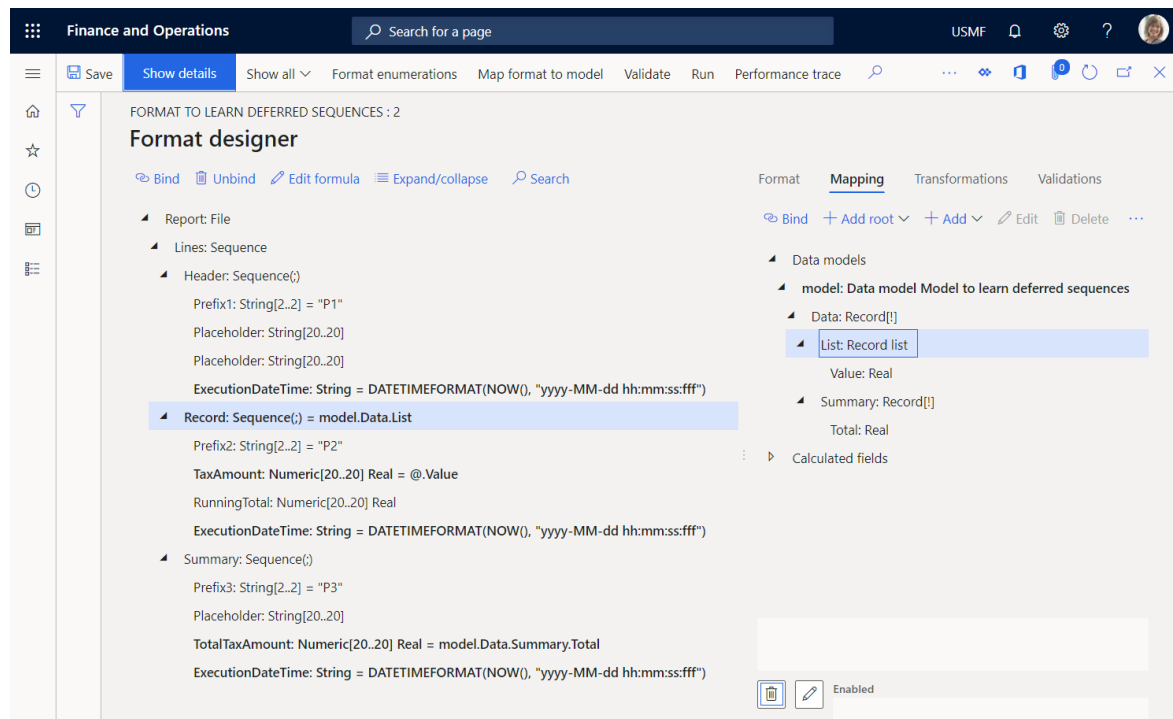


- The **Report\Lines\Summary** sequence format element is configured to fill the outbound document with a single summary line that includes the sum of the tax values from the processed tax transactions.

5. On the **Mapping** tab, review the following details:

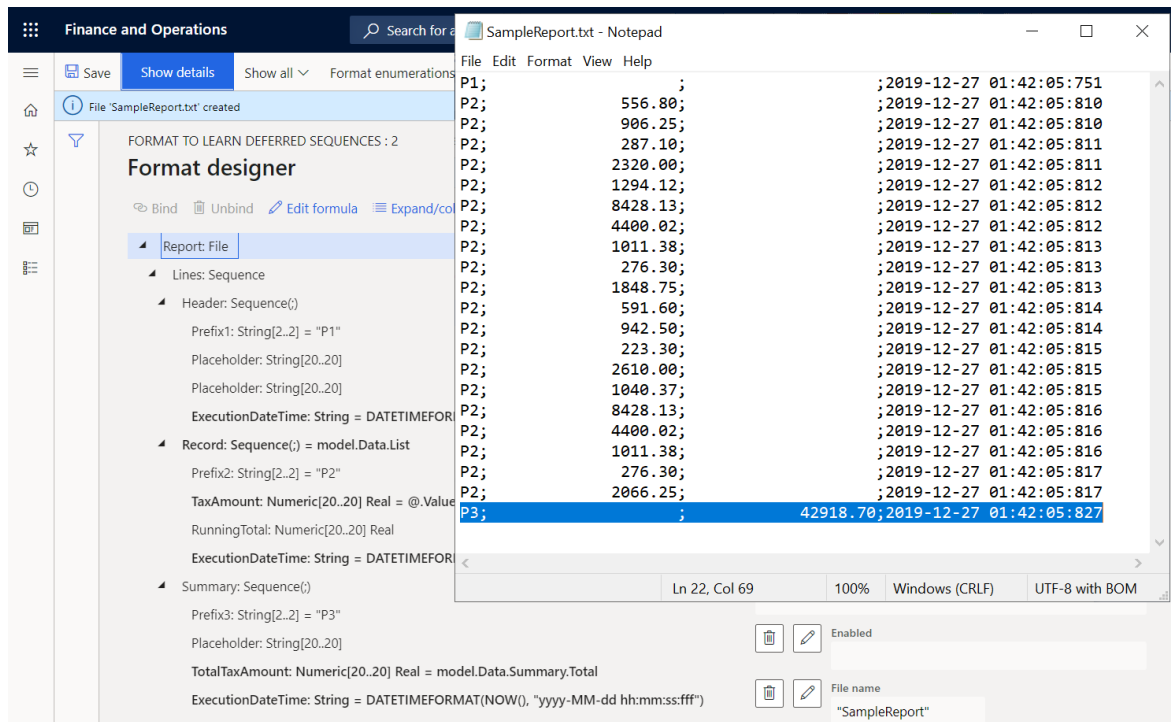
- The **Report\Lines\Header** element doesn't have to be bound to a data source to generate a single line in an outbound document.
- The **Prefix1** element generates **P1** symbols to indicate that the line that is added is the report header line.
- The **ExecutionDateTime** element generates the date and time (including milliseconds) when the header line is added.

- The **Report\Lines\Record** element is bound to the **model.Data.List** list to generate a single line for every record from the bound list.
- The **Prefix2** element generates **P2** symbols to indicate that the line that is added is for the tax transaction details.
- The **TaxAmount** element is bound to **model.Data.List.Value** (which is shown as **@.Value** in the relative path view) to generate the tax value of the current tax transaction.
- The **RunningTotal** element is a placeholder for the running total of the tax values. Currently, this element has no output, because neither a binding nor a default value is configured for it.
- The **ExecutionDateTime** element generates the date and time (including milliseconds) when the current transaction is processed in this report.
- The **Report\Lines\Summary** element doesn't have to be bound to a data source to generate a single line in an outbound document.
- The **Prefix3** element generates **P3** symbols to indicate that the line that is added contains the total tax value.
- The **TotalTaxAmount** element is bound to **model.Data.Summary.Total** to generate the sum of the tax values of the processed tax transactions.
- The **ExecutionDateTime** element generates the date and time (including milliseconds) when the summary line is added.



Run the imported format

1. On the **Format designer** page, select **Run**.
2. Download the file that the web browser offers, and open it for review.

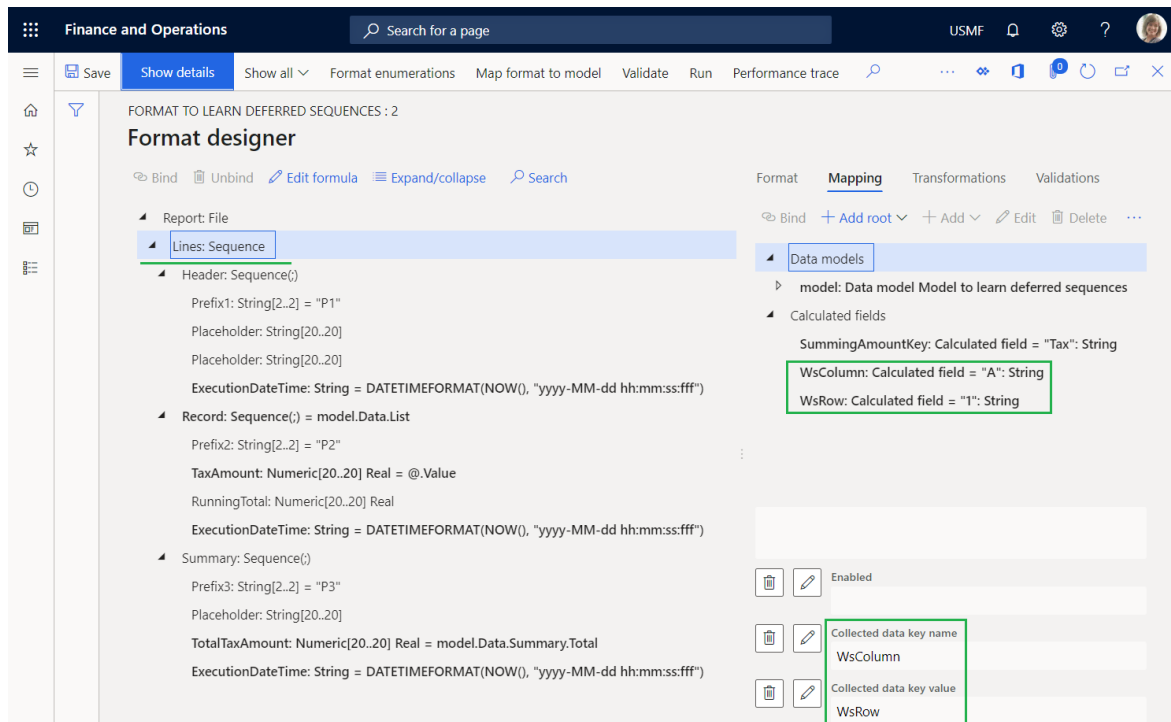


Notice that summary line 22 presents the sum of the tax values for the processed transactions. Because the format is configured to use the `model.Data.Summary.Total` binding to return this sum, the sum is calculated by calling the `TotalSum` aggregation of the `Grouped` data source of the `GroupBy` type that uses the model mapping. To calculate this aggregation, model mapping iterates over all transactions that have been selected in the `Filtered` data source. By comparing the execution times of lines 21 and 22, you can determine that calculation of the sum took 10 milliseconds (ms). By comparing the execution times of lines 2 and 21, you can determine that generation of all transactional lines took 7 ms. Therefore, a total of 17 ms was required.

Modify the format so that the summing is based on generated output

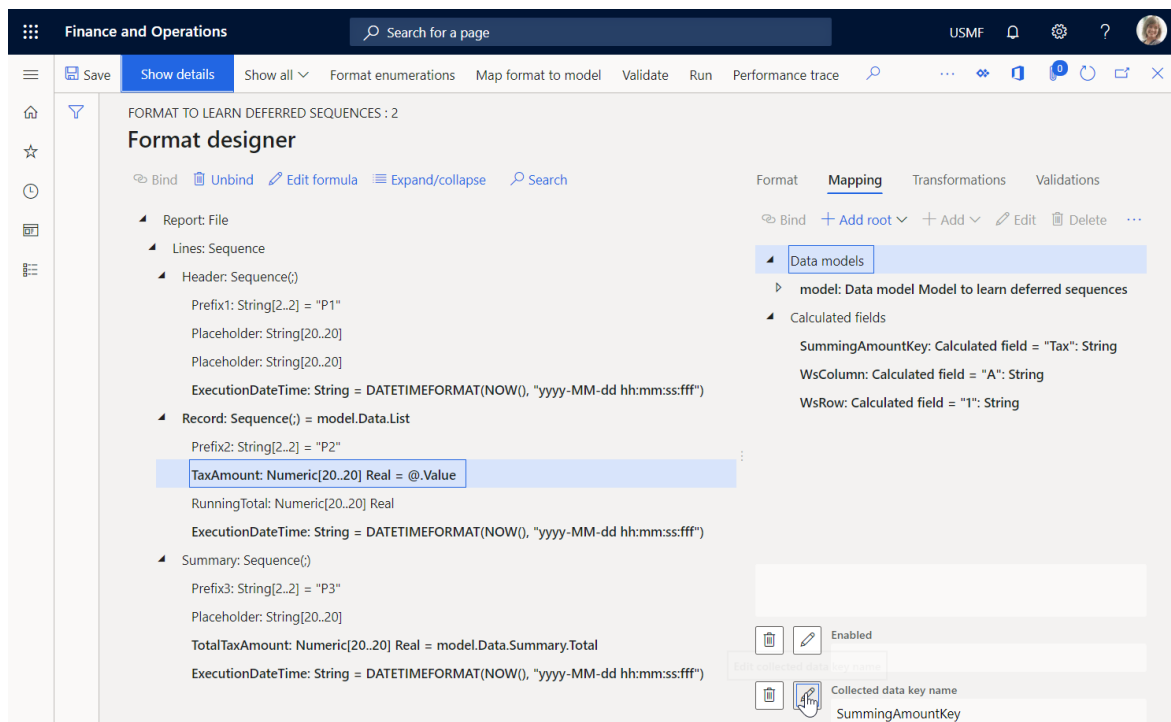
If the volume of transactions is much larger than the volume in the current example, the summing time might increase and cause performance issues. By changing the setting of the format, you can help prevent these performance issues. Because you access tax values to include them in the generated report, you can reuse this information to sum tax values. For more information, see [Configure format to do counting and summing](#).

1. On the **Format designer** page, on the **Format** tab, select the **Report** file element in the format tree.
2. Set the **Collect output details** option to **Yes**. You can now configure this format by using the content of an existing report as a data source that can be accessed by using the built-in ER functions in the **Data collection** category.
3. On the **Mapping** tab, select the **Report\Lines** sequence element.
4. Configure the **Collected data key name** expression as `WsColumn`.
5. Configure the **Collected data key value** expression as `WsRow`.



6. Select the **Report\Lines\Record\TaxAmount** numeric element.

7. Configure the **Collected data key name** expression as `SummingAmountKey`.

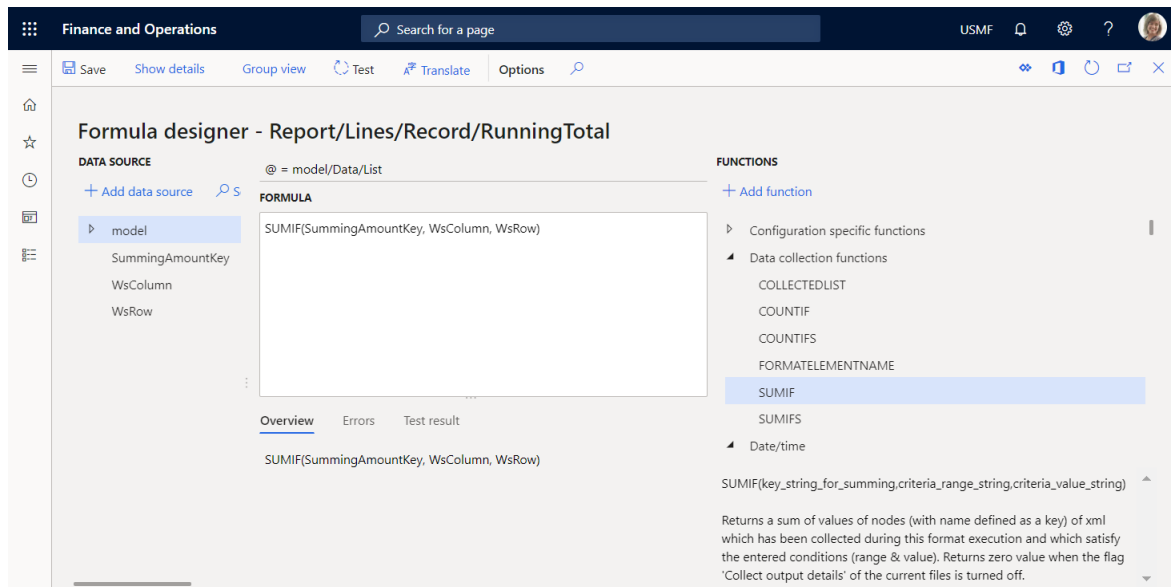


You can consider this setting the fulfillment of a virtual worksheet, where the value of cell A1 is appended with the value of the tax amount from every processed tax transaction.

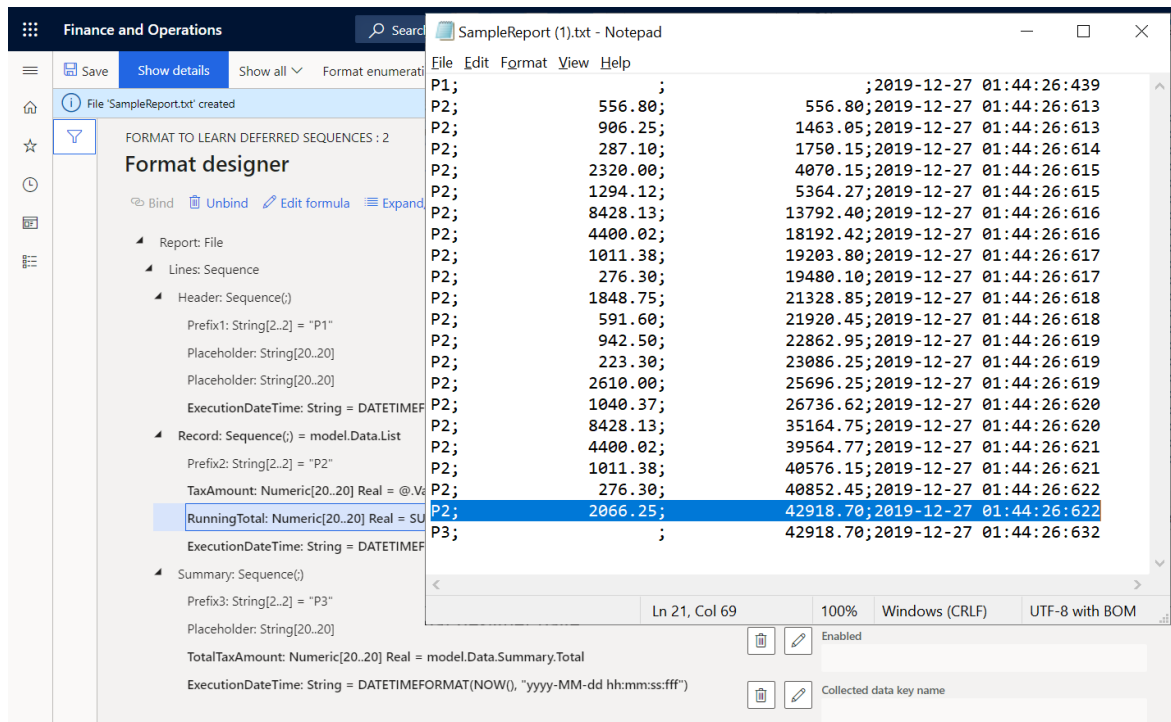
8. Select the **Report\Lines\Record\RunningTotal** numeric element, and then select **Edit formula**.

9. Configure the `SUMIF(SummingAmountKey, WsColumn, WsRow)` expression by using the built-in **SUMIF** ER function.

10. Select **Save**.



11. Close the Formula designer page.
12. Select **Save**, and then select **Run**.
13. Download and review the file that the web browser offers.

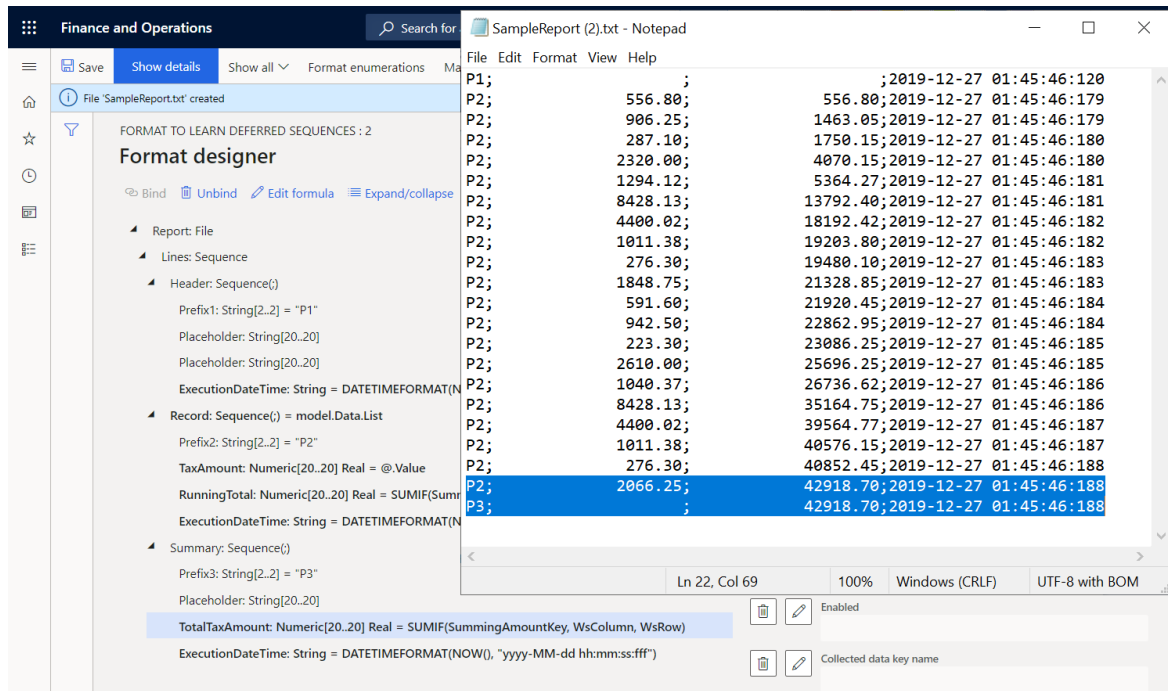


Line 21 contains the running total of tax values that is calculated for all processed transactions by using the generated output as a data source. This data source starts from the beginning of the report and continues through the last tax transaction. Line 22 contains the sum of the tax values for all processed transactions that are calculated in the model mapping by using the data source of the *GroupBy* type. Notice that these values are equal. Therefore, the output-based summing can be used instead of **GroupBy**. By comparing the execution times of lines 2 and 21, you can determine that generation of all the transactional lines and summing took 9 ms. Therefore, as far as the generation of detailed lines and the summing of tax values are concerned, the modified format is approximately two times faster than the original format.

14. Select the **Report\Lines\Summary>TotalTaxAmount** numeric element, and then select **Edit formula**.
15. Enter the `SUMIF(SummingAmountKey, WsColumn, WsRow)` expression instead of the existing expression.

16. Select **Save**, and then select **Run**.

17. Download and review the file that the web browser offers.

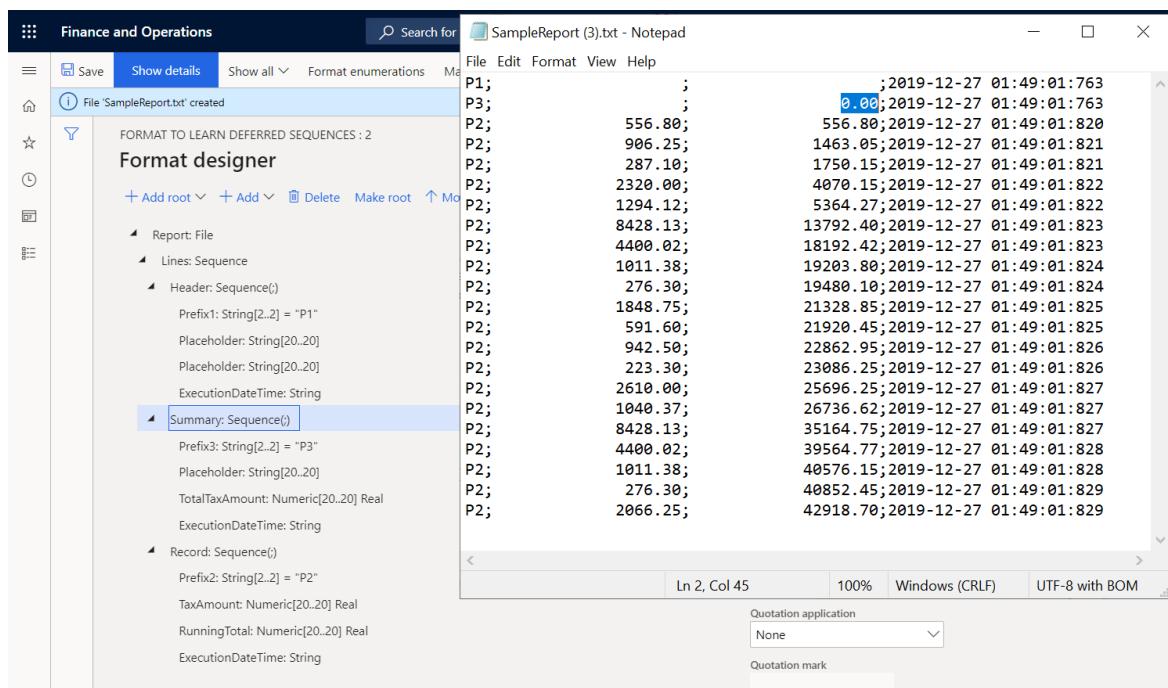


Notice that the running total of tax values on the last transaction details line now equals the sum on the summary line.

Put values of output-based summing in the report header

If, for example, you must present the sum of tax values in the header of your report, you can modify your format.

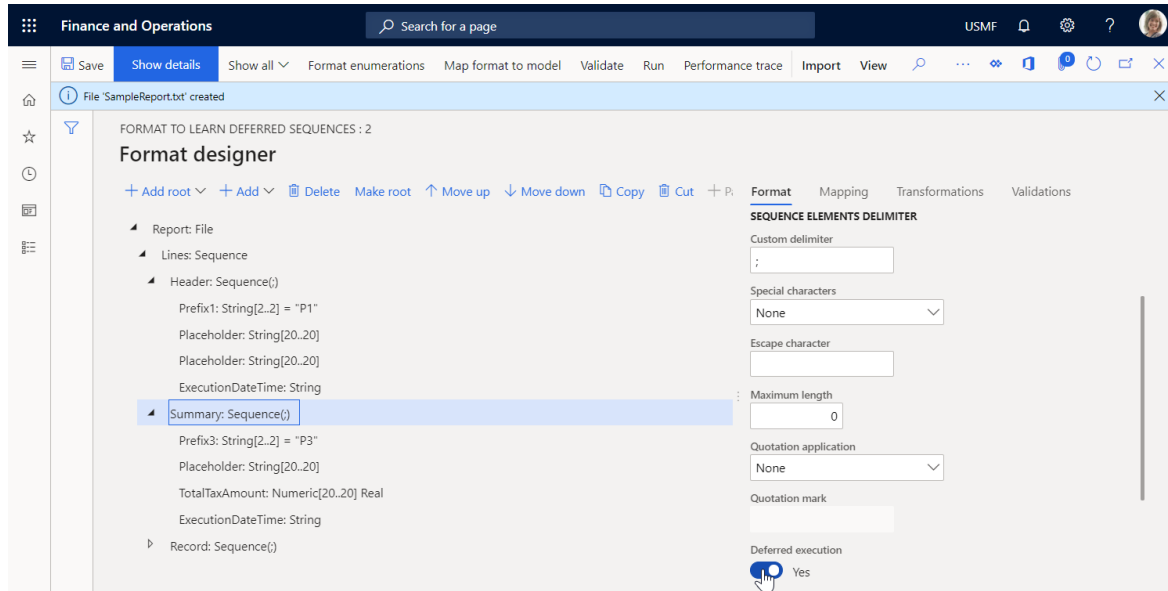
1. On the **Format designer** page, on the **Format** tab, select the **Report\Lines\Summary** sequence element.
2. Select **Move up**.
3. Select **Save**, and then select **Run**.
4. Download and review the file that the web browser offers.



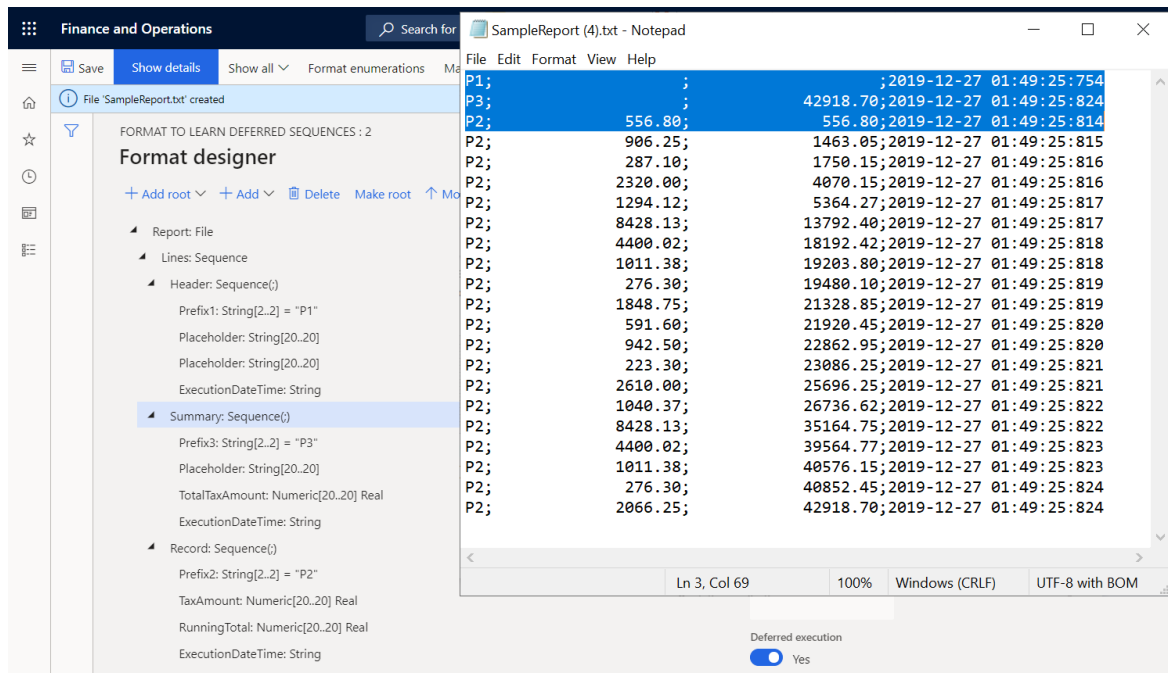
Notice that the sum of tax values on summary line 2 now equals 0 (zero), because this sum is now calculated based on the generated output. When line 2 is generated, the generated output doesn't yet contain lines that have transaction details. You can configure this format to defer the execution of the **Report\Lines\Summary** sequence element until the **Report\Lines\Record** sequence element has been run for all tax transactions.

Defer the execution of the summary sequence so that the calculated total is used

1. On the **Format designer** page, on the **Format** tab, select the **Report\Lines\Summary** sequence element.
2. Set the **Deferred execution** option to **Yes**.



3. Select **Save**, and then select **Run**.
4. Download and review the file that the web browser offers.



The **Report\Lines\Summary** sequence element is now run only after all other items that are nested under its parent element, **Report\Lines**, have been run. Therefore, it's run after the **Report\Lines\Record** sequence element has been run for all tax transactions of the model.Data.List data source. The execution times of lines 1, 2, and 3, and of the last line, 22, reveal this fact.

Additional resources

- [Configure format to do counting and summing](#)
- [Trace execution of ER format to troubleshoot performance issues](#)
- [Defer the execution of XML elements in ER formats](#)

NOTE

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Defer the execution of XML elements in ER formats

2/18/2021 • 11 minutes to read • [Edit Online](#)

Overview

You can use the Operations designer of the [Electronic reporting \(ER\)](#) framework to [configure](#) the [format component](#) of an ER solution that is used to generate outbound documents in XML format. The hierarchical structure of the configured format component consists of format elements of various types. These format elements are used to fill generated documents with the required information at runtime. By default, when you run an ER format, the format elements are run in the same order as they are presented in the format hierarchy: one by one, from top to bottom. However, at design time, you can change the execution order for any XML elements of the configured format component.

By turning on the **Deferred execution** option for an XML element in the configured format, you can defer (postpone) the execution of that element. In this case, the element isn't run until all other elements of its parent have been run.

To learn more about this feature, complete the example in this topic.

Limitations

The **Deferred execution** option is supported only for XML elements that are configured for an ER format that is used to generate **outbound** documents in XML format.

The **Deferred execution** option is supported only for XML elements that reside in only one other XML element. Therefore, it isn't applicable to XML elements that reside in other types of format elements (for example, in an **XML sequence** element).

The **Deferred execution** option isn't supported for XML elements that reside in the **Common\File** format element when the **Split file** option is set to **Yes**. For more information about how to split XML files, see [Split generated XML files based on file size and content quantity](#).

Example: Defer the execution of an XML element in an ER format

The following steps explain how a user in the System administrator or Electronic reporting functional consultant [role](#) can configure an ER format that contains an XML element where the order of execution differs from the order in the format hierarchy.

These steps can be performed in the **USMF** company in Microsoft Dynamics 365 Finance.

Prerequisites

To complete this example, you must have access to the **USMF** company in Finance for one of the following roles:

- Electronic reporting functional consultant
- System administrator

If you haven't yet completed the example in the [Defer the execution of sequence elements in ER formats](#) topic, download the following [configurations](#) of the sample ER solution.

CONTENT DESCRIPTION	FILE NAME
ER data model configuration	Model to learn deferred elements.version.1.xml

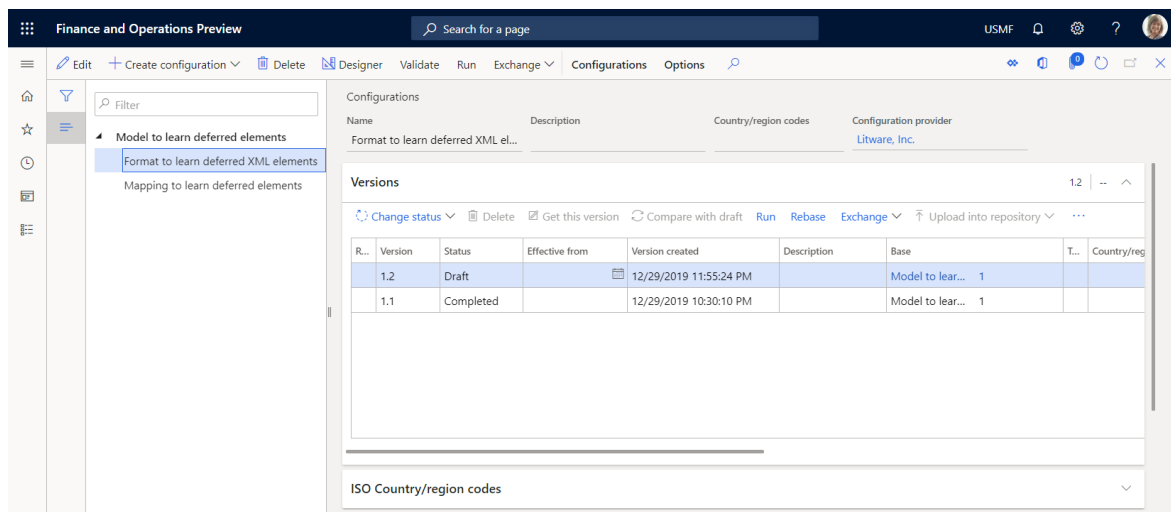
CONTENT DESCRIPTION	FILE NAME
ER model mapping configuration	Mapping to learn deferred elements.version.1.1.xml

Before you begin, you must also download and save the following configuration of the sample ER solution to your local computer.

CONTENT DESCRIPTION	FILE NAME
ER format configuration	Format to learn deferred XML elements.version.1.1.xml

Import the sample ER configurations

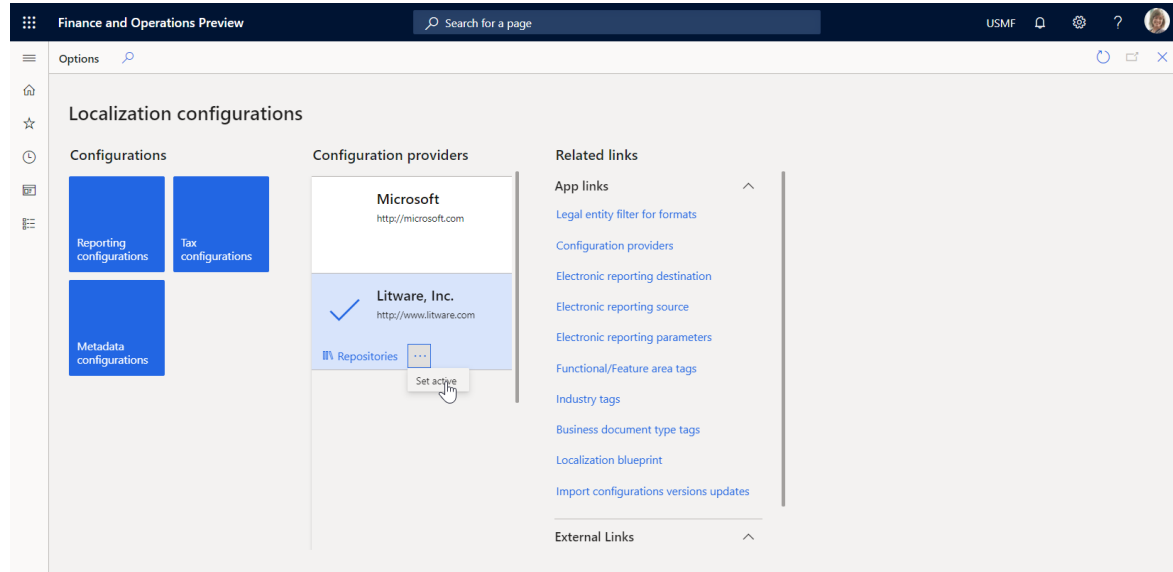
1. Go to **Organization administration > Workspaces > Electronic reporting**.
2. Select **Reporting configurations**.
3. On the **Configurations** page, if the **Model to learn deferred elements** configuration isn't available in the configuration tree, import the ER data model configuration:
 - a. Select **Exchange**, and then select **Load from XML file**.
 - b. Select **Browse**, find and select the **Model to learn deferred elements.1.xml** file, and then select **OK**.
4. If the **Mapping to learn deferred elements** configuration isn't available in the configuration tree, import the ER model mapping configuration:
 - a. Select **Exchange**, and then select **Load from XML file**.
 - b. Select **Browse**, find and select the **Mapping to learn deferred elements.1.1.xml** file, and then select **OK**.
5. Import the ER format configuration:
 - a. Select **Exchange**, and then select **Load from XML file**.
 - b. Select **Browse**, find and select the **Format to learn deferred XML elements.1.1.xml** file, and then select **OK**.
6. In the configuration tree, expand **Model to learn deferred elements**.
7. Review the list of imported ER configurations in the configuration tree.



Activate a configuration provider

1. Go to **Organization administration > Workspaces > Electronic reporting**.
2. On the **Localization configurations** page, in the **Configuration providers** section, make sure that

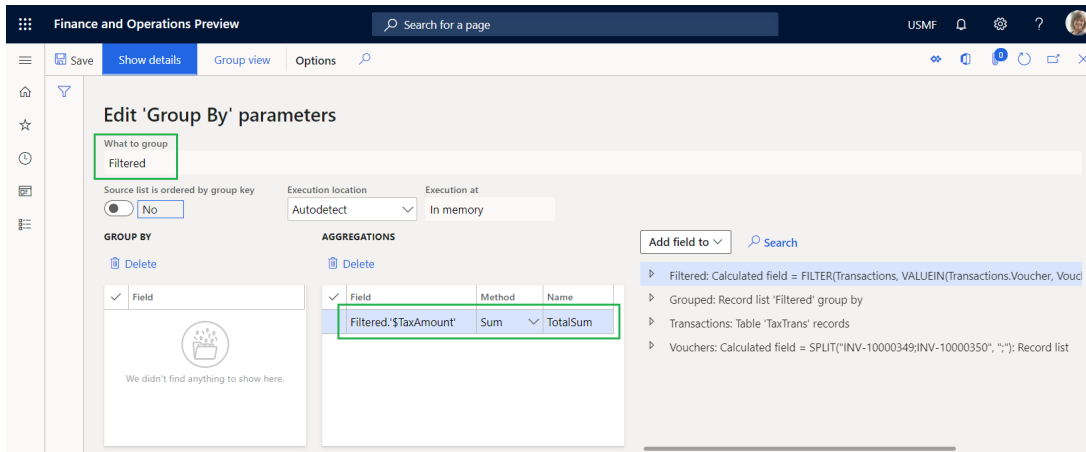
the [configuration provider](#) for the Litware, Inc. (<http://www.litware.com>) sample company is listed, and that it's marked as active. If this configuration provider isn't listed, or if it isn't marked as active, follow the steps in the [Create a configuration provider and mark it as active](#) topic.



Review the imported model mapping

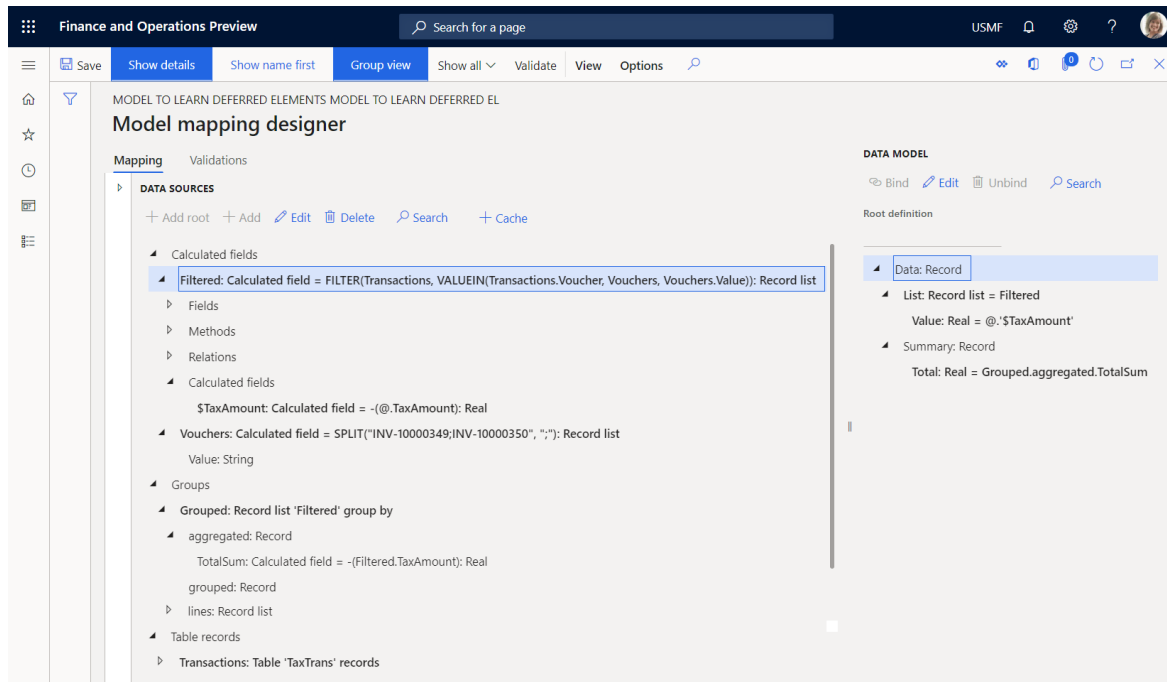
Review the settings of the ER model mapping component that is configured to access tax transactions and expose accessed data on request.

1. Go to **Organization administration > Workspaces > Electronic reporting**.
2. Select **Reporting configurations**.
3. On the **Configurations** page, in the configuration tree, expand **Model to learn deferred elements**.
4. Select the **Mapping to learn deferred elements** configuration.
5. Select **Designer** to open the list of mappings.
6. Select **Designer** to review the mapping details.
7. Select **Show details**.
8. Review the data sources that are configured to access tax transactions:
 - The **Transactions** data source of the *Table record* type is configured to access records of the **TaxTrans** application table.
 - The **Vouchers** data source of the *Calculated field* type is configured to return the required voucher codes (**INV-10000349** and **INV-10000350**) as a list of records.
 - The **Filtered** data source of the *Calculated field* type is configured to select, from the **Transactions** data source, only tax transactions of the required vouchers.
 - The **\$TaxAmount** field of the *Calculated field* type is added for the **Filtered** data source to expose the tax value that has the opposite sign.
 - The **Grouped** data source of the *Group By* type is configured to group filtered tax transactions of the **Filtered** data source.
 - The **TotalSum** aggregation field of the **Grouped** data source is configured to summarize values of the **\$TaxAmount** field of the **Filtered** data source for all filtered tax transactions of that data source.



9. Review how the configured data sources are bound to the data model, and how they expose accessed data to make it available in an ER format:

- The **Filtered** data source is bound to the **Data.List** field of the data model.
- The **\$TaxAmount** field of the **Filtered** data source is bound to the **Data.List.Value** field of the data model.
- The **TotalSum** field of the **Grouped** data source is bound to the **Data.Summary.Total** field of the data model.



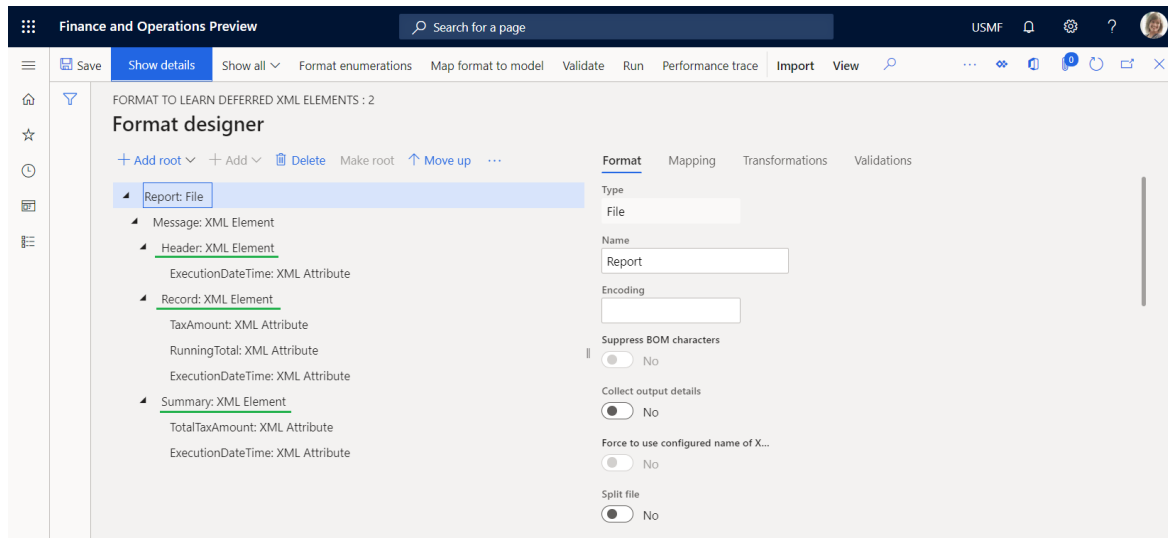
10. Close the **Model mapping designer** and **Model mappings** pages.

Review the imported format

1. On the **Configurations** page, in the configuration tree, select the **Format to learn deferred XML elements** configuration.
2. Select **Designer** to review the format details.
3. Select **Show details**.
4. Review the settings of the ER format components that are configured to generate an outbound document in XML format that includes details of the tax transactions:
 - The **Report\Message** XML element is configured to fill the outbound document with a single node that includes the nested XML elements (**Header**, **Record**, and **Summary**).
 - The **Report\Message\Header** XML element is configured to fill the outbound document with a

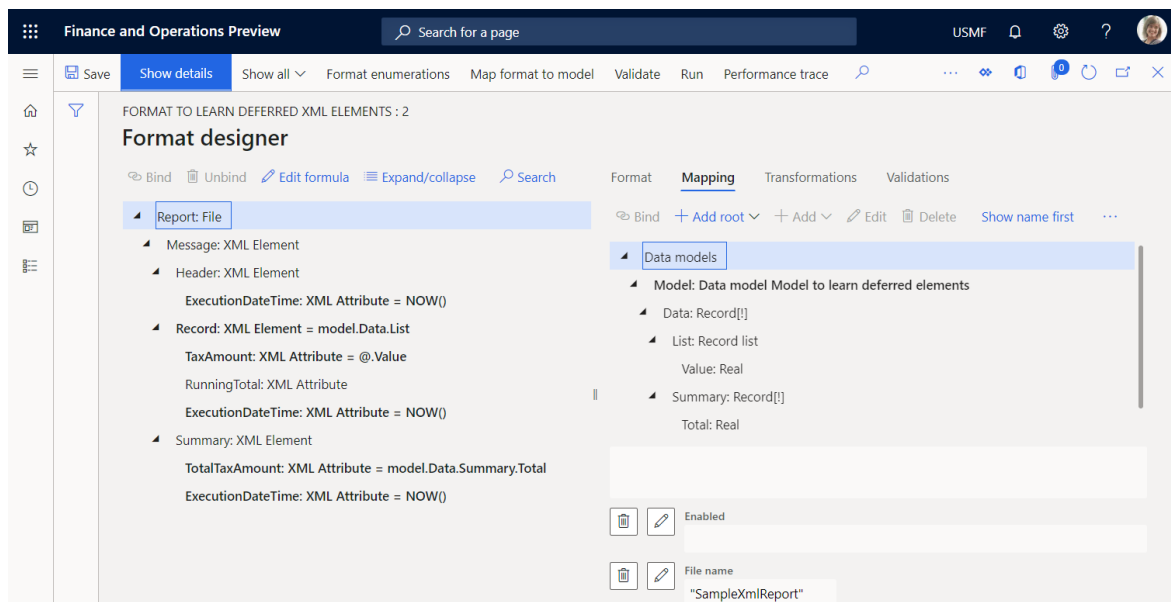
single header node that shows the date and time when the processing starts.

- The **Report \Message \Record** XML element is configured to fill the outbound document with a single record node that shows the details of a single tax transaction.
- The **Report \Message \Summary** XML element is configured to fill the outbound document with a single summary node that includes the sum of the tax values from the processed tax transactions.



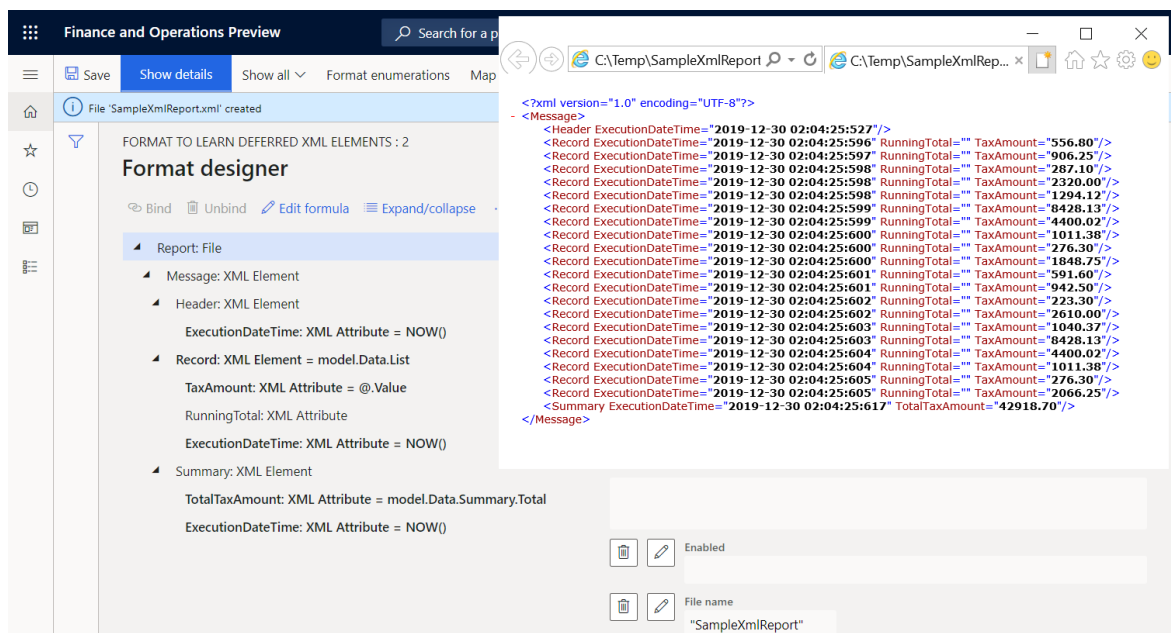
5. On the **Mapping** tab, review the following details:

- The **Report \Message \Header** element doesn't have to be bound to a source to generate a single node in an outbound document.
- The **ExecutionDate** attribute generates the date and time (including milliseconds) when the header node is added.
- The **Report \Message \Record** element is bound to the **model.Data.List** list to generate a single record node for every record from the bound list.
- The **TaxAmount** attribute is bound to **model.Data.List.Value** (which is shown as **@.Value** in the relative path view) to generate the tax value of the current tax transaction.
- The **RunningTotal** attribute is a placeholder for the running total of the tax values. Currently, this attribute has no output, because neither a binding nor a default value is configured for it.
- The **ExecutionDate** attribute generates the date and time (including milliseconds) when the current transaction is processed in this report.
- The **Report \Message \Summary** element doesn't have to be bound to a data source to generate a single node in an outbound document.
- The **TotalTaxAmount** attribute is bound to **model.Data.Summary.Total** to generate the sum of the tax values of the processed tax transactions.
- The **ExecutionDate** attribute generates the date and time (including milliseconds) when the summary node is added.



Run the imported format

1. On the Format designer page, select Run.
2. Download the file that the web browser offers, and open it for review.



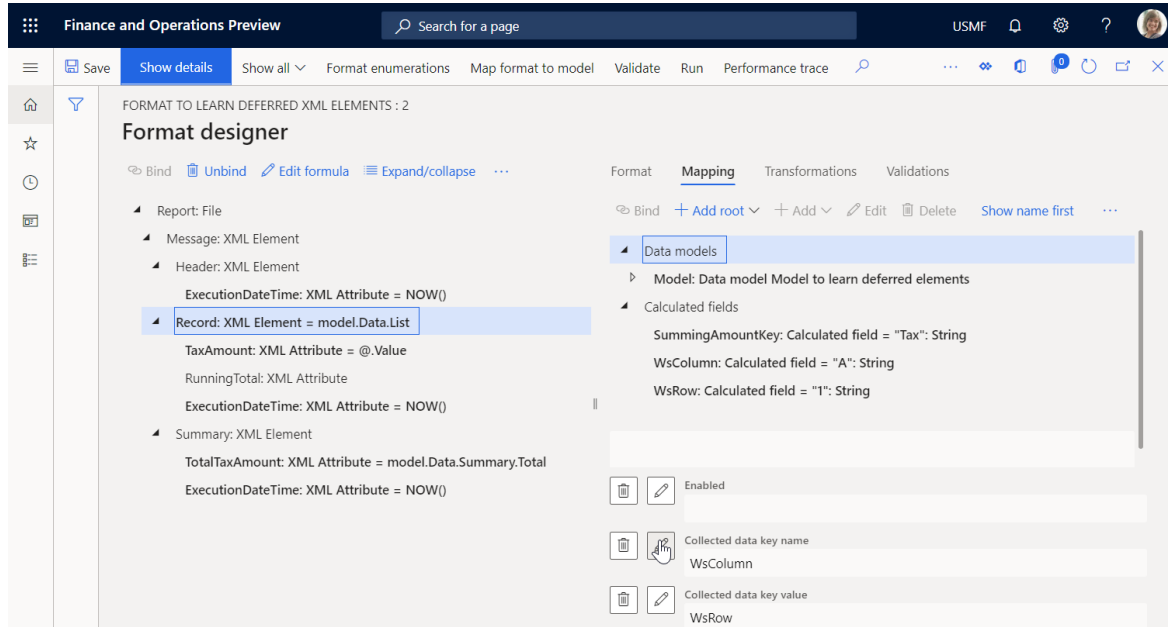
Notice that the summary node presents the sum of the tax values for the processed transactions. Because the format is configured to use the `model.Data.Summary.Total` binding to return this sum, the sum is calculated by calling the `TotalSum` aggregation of the `Grouped` data source of the `GroupBy` type in the model mapping. To calculate this aggregation, the model mapping iterates over all transactions that have been selected in the `Filtered` data source. By comparing the execution times of the summary node and the last record node, you can determine that calculation of the sum took 12 milliseconds (ms). By comparing the execution times of the first and last record nodes, you can determine that generation of all record nodes took 9 ms. Therefore, a total of 21 ms was required.

Modify the format so that the calculation is based on generated output

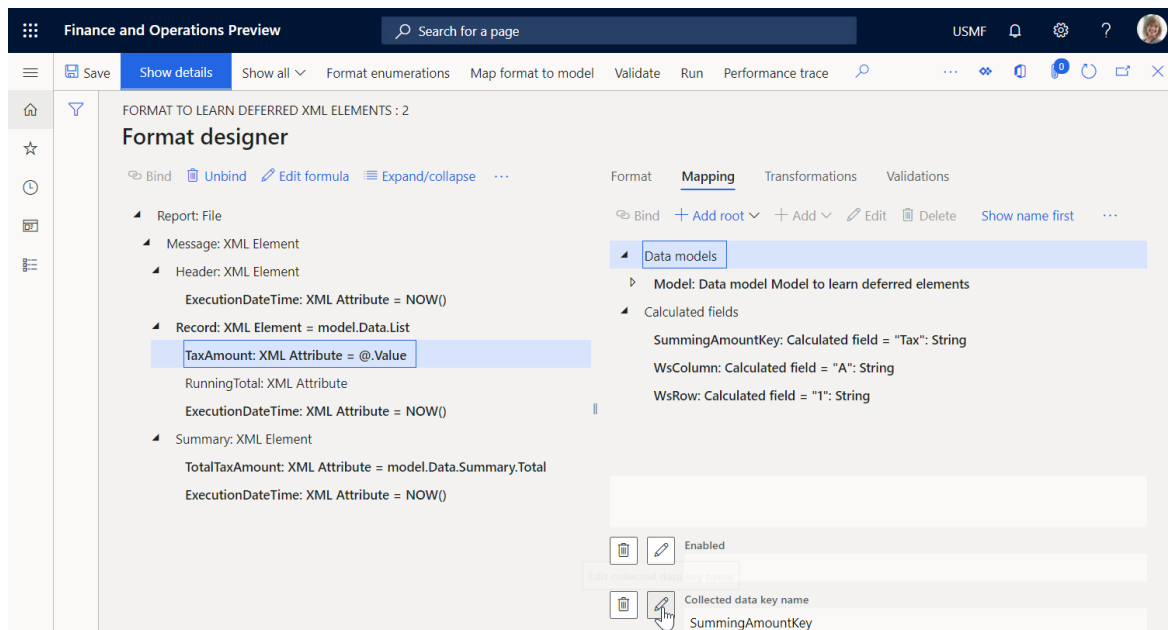
If the volume of transaction is much larger than the volume in the current example, the calculation time might increase and cause performance issues. By changing the setting of the format, you can help prevent these performance issues. Because you access tax values to include them in the generated report, you can reuse this information to calculate tax values. For more information, see [Configure format to do counting and summing](#).

1. On the Format designer page, on the Format tab, select the Report file element in the format tree.

- Set the **Collect output details** option to **Yes**. You can now configure this format by using the content of a generated report as a data source that can be accessed by using the built-in ER functions in the **Data collection** category.
- On the **Mapping** tab, select the **Report\Message\Record** XML element.
- Configure the **Collected data key name** expression as `WsColumn`.
- Configure the **Collected data key value** expression as `WsRow`.

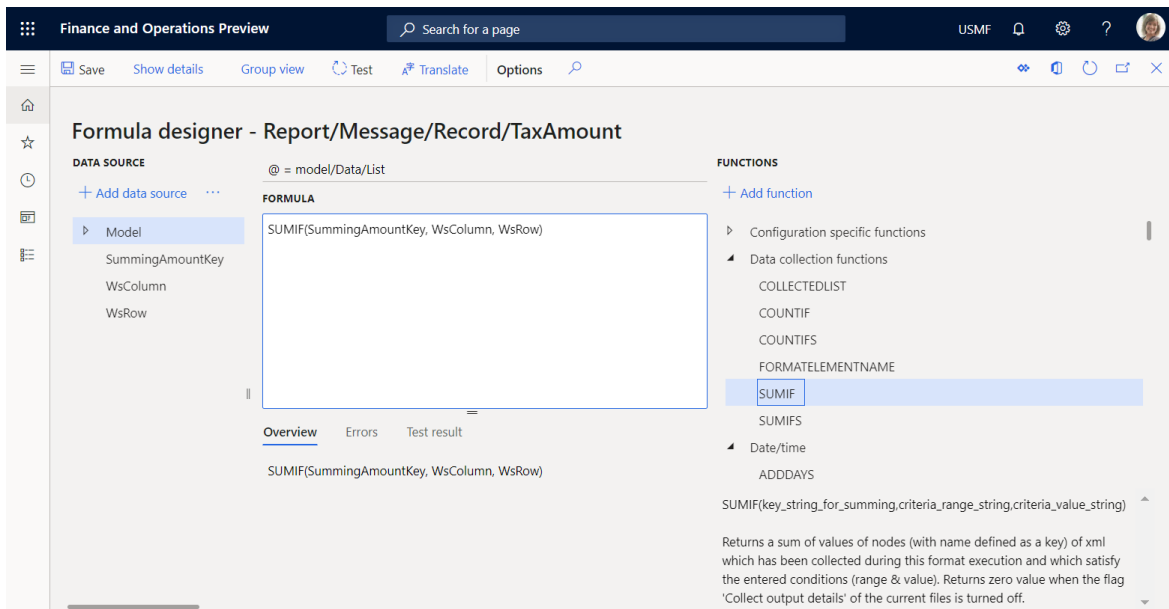


- Select the **Report\Message\Record\TaxAmount** attribute.
- Configure the **Collected data key name** expression as `SummingAmountKey`.

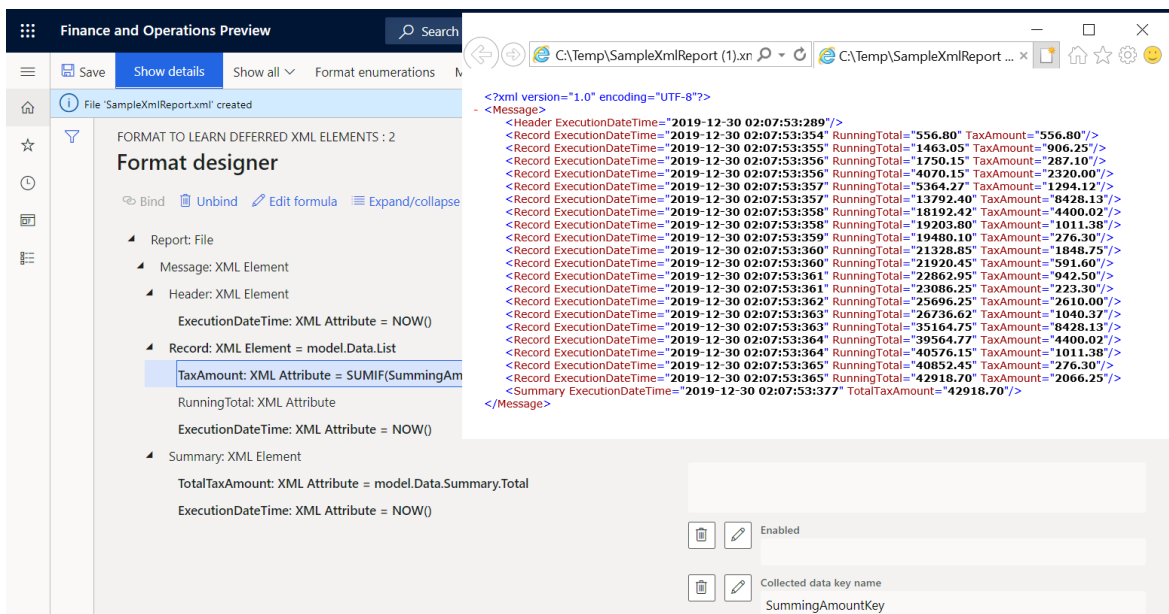


You can consider this setting the fulfillment of a virtual worksheet, where the value of cell A1 is appended with the value of the tax amount from every processed tax transaction.

- Select the **Report\Message\Record\RunningTotal** attribute, and then select **Edit formula**.
- Configure the `SUMIF(SummingAmountKey, WsColumn, WsRow)` expression by using the built-in **SUMIF** ER function, and then select **Save**.

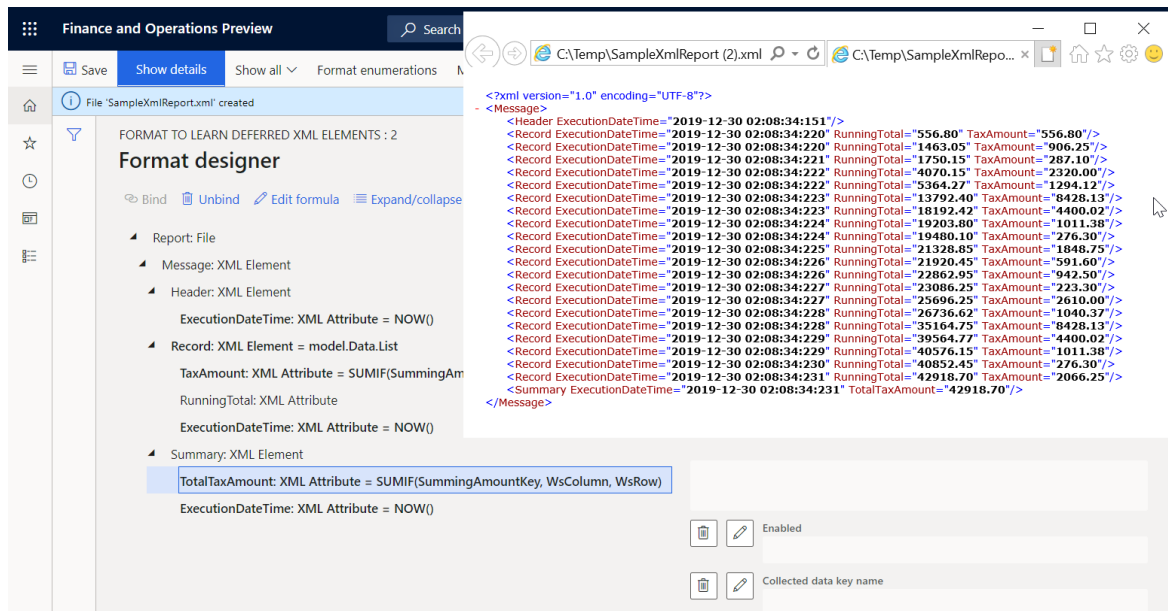


10. Close the Formula designer page.
11. Select **Save**, and then select **Run**.
12. Download and review the file that the web browser offers.



The last record node contains the running total of tax values that is calculated for all processed transactions by using the generated output as a data source. This data source starts from the beginning of the report and continues through the last tax transaction. The summary node contains the sum of the tax values for all processed transactions that are calculated in the model mapping by using the data source of the *GroupBy* type. Notice that these values are equal. Therefore, the output-based summing can be used instead of **GroupBy**. By comparing the execution times of the first record node and the summary node, you can determine that generation of all the record nodes and summing took 11 ms. Therefore, as far as the generation of record nodes and the summing of tax values are concerned, the modified format is approximately two times faster than the original format.

13. Select the **Report\Message\Summary\TotalTaxAmount** attribute, and then select **Edit formula**.
14. Enter the `SUMIF(SummingAmountKey, WsColumn, WsRow)` expression instead of the existing expression.
15. Select **Save**, and then select **Run**.
16. Download and review the file that the web browser offers.

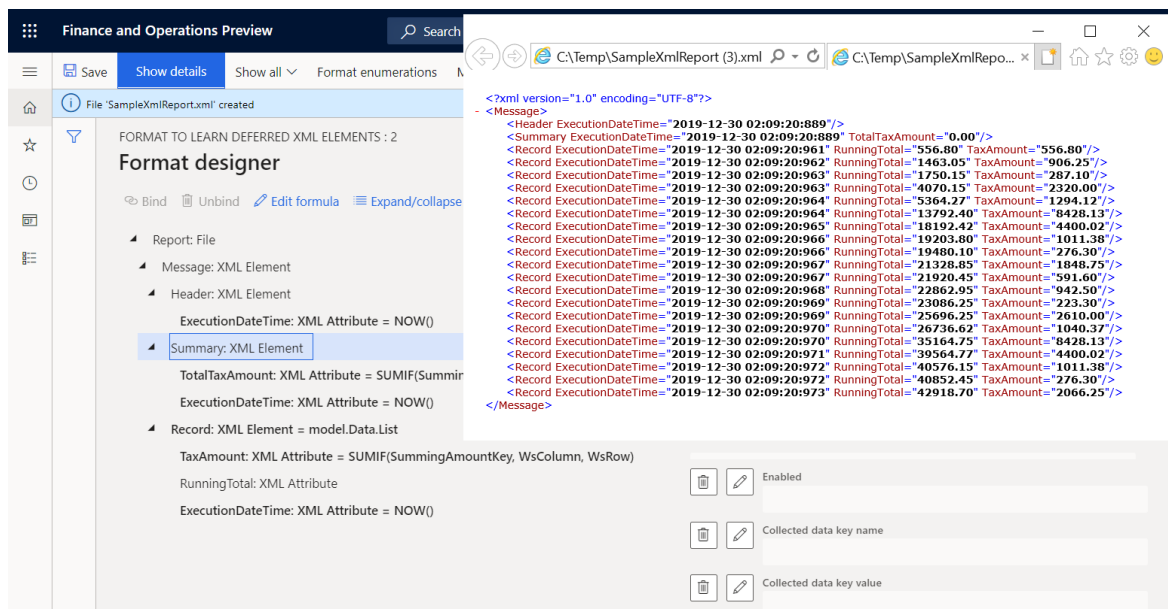


Notice that the running total of tax values in the last record node now equals the sum in the summary node.

Put values of output-based summing in the report header

If, for example, you must present the sum of tax values in the header of your report, you can modify your format.

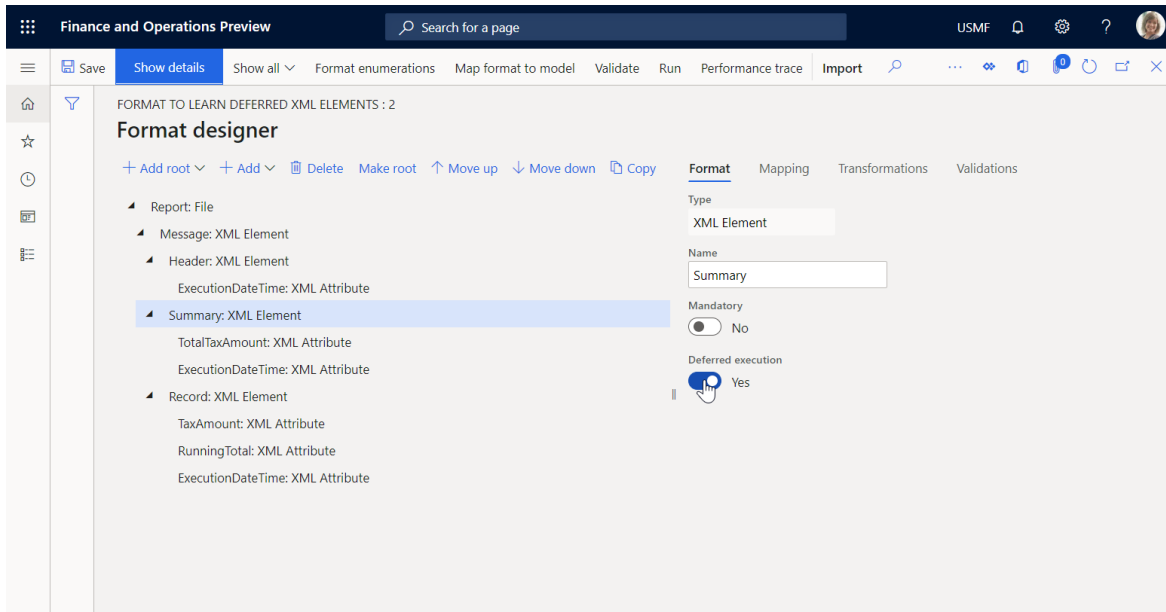
1. On the Format designer page, on the Format tab, select the Report\Message\Summary XML element.
2. Select **Move up**.
3. Select **Save**, and then select **Run**.
4. Download and review the file that the web browser offers.



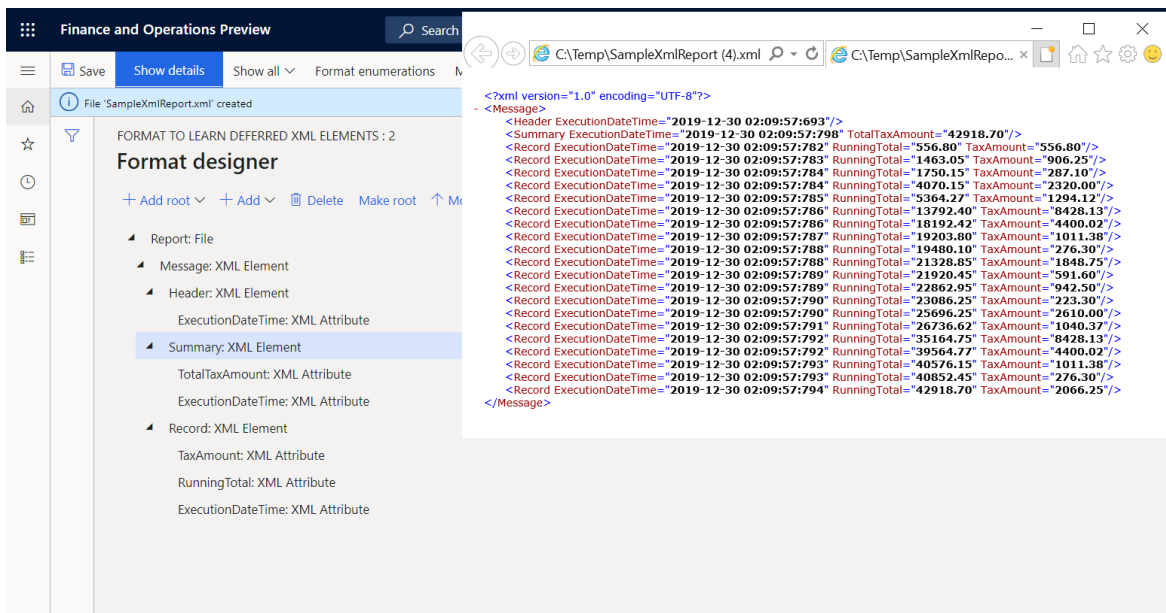
Notice that the sum of tax values in the summary node now equals 0 (zero), because this sum is now calculated based on the generated output. When the first record node is generated, the generated output doesn't yet contain record nodes that have transaction details. You can configure this format to defer the execution of the Report\Message\Summary element until the Report\Message\Record element has been run for all tax transactions.

Defer the execution of the summary XML element so that the calculated total is used

1. On the **Format designer** page, on the **Format** tab, select the **Report\Message\Summary** XML element.
2. Set the **Deferred execution** option to **Yes**.



3. Select **Save**, and then select **Run**.
4. Download and review the file that the web browser offers.



The **Report\Message\Summary** element is now run only after all other items that are nested under its parent element, **Report\Message**, have been run. Therefore, it's run after the **Report\Message\Record** element has been run for all tax transactions of the **model.Data.List** data source. The execution times of the first and last record nodes, and of the header and summary nodes, reveal this fact.

Additional resources

- [Configure format to do counting and summing](#)
- [Trace execution of ER format to troubleshoot performance issues](#)
- [Defer the execution of sequence elements in ER formats](#)

NOTE

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Configure the Electronic reporting (ER) framework

2/18/2021 • 7 minutes to read • [Edit Online](#)

This topic explains how to set up the basic functionality for Electronic reporting (ER). It also describes the steps that you must complete before you can set up ER.

Prerequisites for ER setup

Before you can set up ER, you must set up the required [document types](#) in Document management:

- A document type for Microsoft Office documents that are used as templates for ER reports.
- A document type that is used to store the output of ER reports in the jobs archive.
- A document type that is used to store the output of ER reports so that they can be viewed in other programs.
- A document type that is used to keep baselines of outputs of ER configurations.
- A document type that is used to handle files in the ER framework for all other purposes.

For each document type, the following attribute values can be selected.

ATTRIBUTE NAME	ATTRIBUTE VALUE
Class	Attach file
Group	File
Location	Azure storage or SharePoint

Set up ER

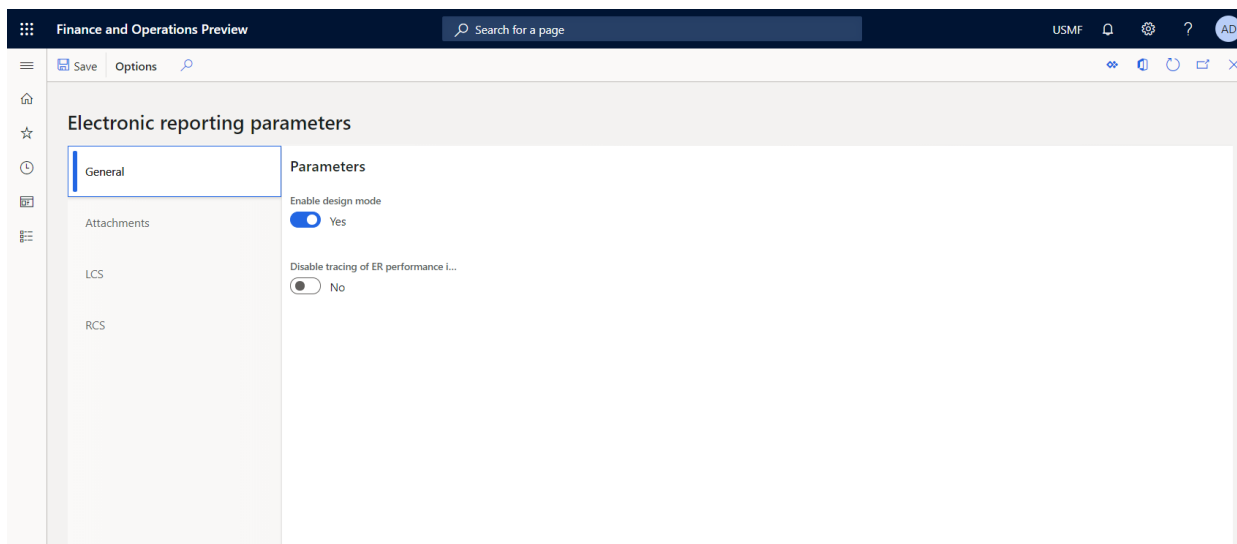
Use the following procedure to set up the basic functionality of ER for all legal entities.

1. Open the **Electronic reporting** workspace page.
2. Click **Electronic reporting parameters**.

Main parameters

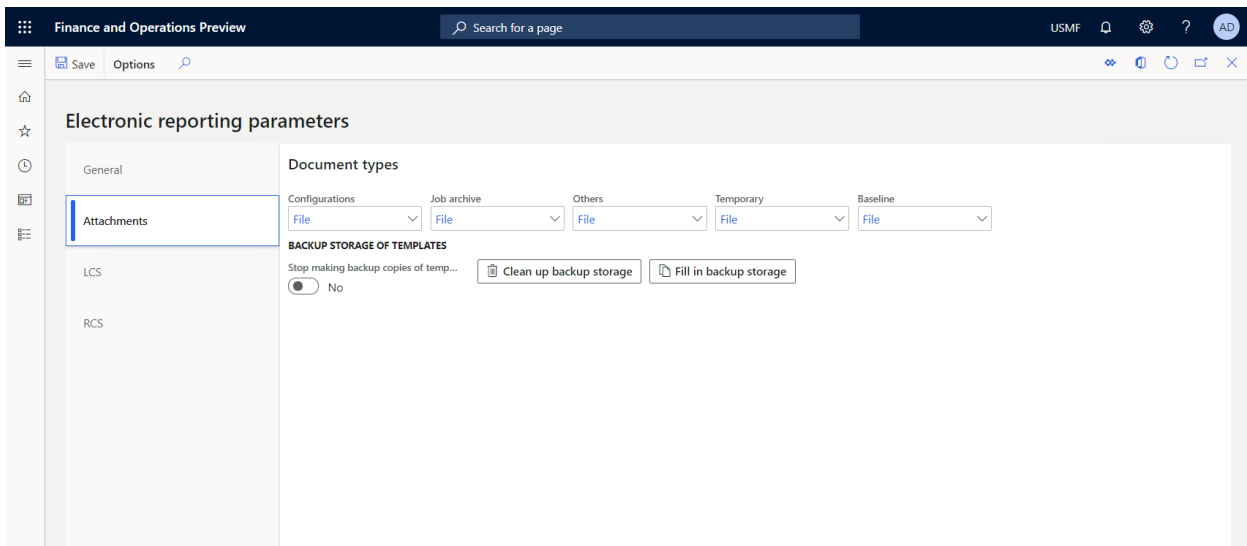
On the **General** tab of the **Electronic reporting parameters** page, set the following ER parameters:

- **Enable design mode**
 - Set this option to **Yes** to enable embedded ER designers, so that users can create their own ER configurations.
 - Set this option to **No** to require that users access the functionality of ER designers by signing up for [Configuration service](#).
- **Disable tracing of ER performance in data handling**
 - Set this option to **No** to allow Microsoft Telemetry to collect information about the average time that is required to process a single incoming or outgoing record as an ER configuration. This information is tracked as a specific health metric of the environment, and it will help Microsoft quickly identify and address issues that affect customers who use the ER framework.
 - Set this option to **Yes** to stop collecting telemetry information.



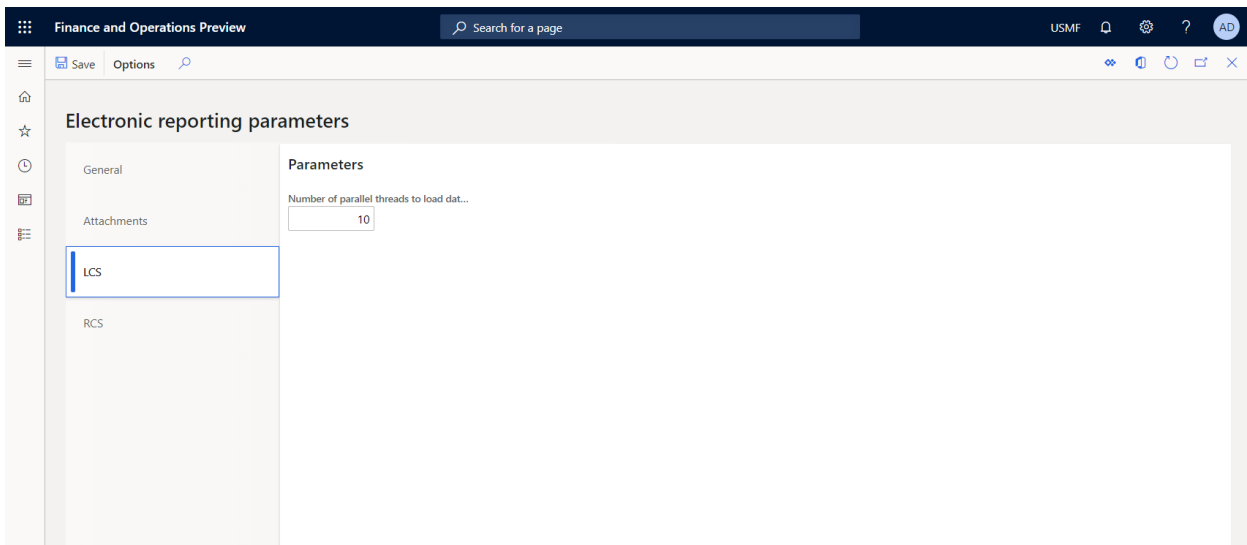
On the **Attachments** tab of the **Electronic reporting parameters** page, set the following ER parameters:

- **Configurations** – Select a document type to specify the storage of templates of ER formats. This document type is selected within the scope of a specific company. This document type will be used, regardless of the company that a user is signed in to while an ER format is being used.
 - **Job archive** – Select a document type to specify the storage of generated documents that are attached to the records of the ER jobs [archive](#). This document type is selected as a company-specific document type. You must make sure that the selected document type is configured for every company that you plan to run ER formats for, and then store the results in the ER jobs archive.
 - **Temporary** – Select a document type to specify the storage of generated documents that are used for other purposes. For example, documents might be generated for [preview](#) by other services. This document type is selected as a company-specific document type. You must make sure that the selected document type is configured for every company that you plan to run ER formats for, and then store the results in the ER jobs archive.
 - **Baseline** – Select a document type to specify the storage of documents that are used as [baselines](#) during the automated testing of ER configurations. This document type is selected as a company-specific document type. You must make sure that the selected document type is configured for every company that you plan to run ER formats for, and then store the results in the ER jobs archive.
 - **Others** – Select a document type to specify the storage of generated documents that are used for all other purposes. This document type is selected as a company-specific document type. You must make sure that the selected document type is configured for every company that you plan to run ER formats for, and then store the results in the ER jobs archive.
 - **Stop making backup copies of templates**
 - Set this option to **No** to automatically create a backup copy of any ER format configuration template and store the copy in the database storage.
 - Set this option to **Yes** to stop making backup copies of ER formation configuration templates.
- For more information, see [Backup storage of ER templates](#).



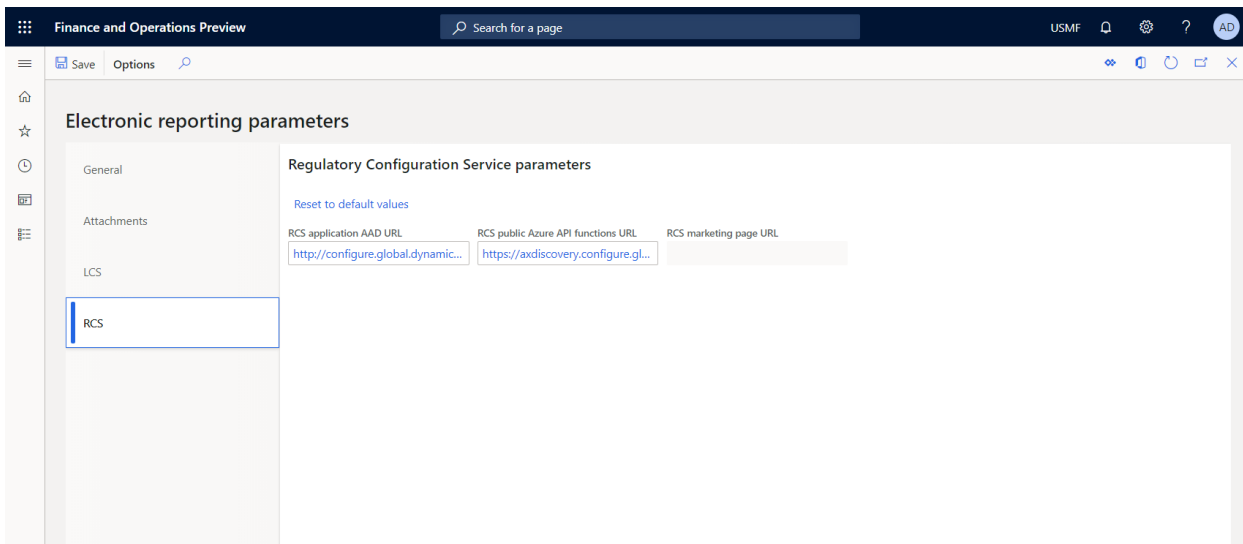
LCS parameters

On the LCS tab of the **Electronic reporting parameters** page, define the number of parallel threads that should be used to load an ER configuration from repositories in Microsoft Dynamics Lifecycle Services (LCS), so that the configurations are loaded in the most efficient manner. The value can vary from 1 through 15, depending on the available resources of the current program. Based on this setting and the number of other tasks and their priorities, the real number of threads will be defined automatically.



RCS parameters

On the RCS tab of the **Electronic reporting parameters** page, sign up for [Configuration service](#).



Active ER configurations provider

On the **Configuration provider** table page, create ER provider records. Each provider can be **marked** as **Active**. The active provider's name and internet address are stored in an ER configuration, as attributes of the configuration owner.

Optional setup for ER

In addition to the basic functionality, ER has other functionality that you can set up.

- On the **Electronic reporting destination** page, define the ER output destinations for each file output of each ER format configuration. Use the **document types** of the Document management framework that you set up earlier. You can also use this page to set up the optional ER functionality for each legal entity. For more information, see **Electronic reporting (ER) destinations**.
- When you add new Application Object Tree (AOT) artifacts or update existing AOT artifacts that are used as data sources (tables, views, or data entities) in ER, use the **Rebuild table references** menu item (**Organization administration** > **Electronic reporting** > **Rebuild table references**) to bring your AOT changes into the ER metadata.

Frequently asked questions

Question: What is the optimal number of parallel threads to use to load an ER configuration from LCS?

Answer: To calculate the optimal number of parallel threads, use the following empirical formula: $\text{Cores} \div 2 + 1(2)$. For example, if the program runs on a virtual machine (VM) that has two CPUs, and each CPU contains four cores, the optimal number is five or six parallel threads.

Question: I have added a custom table to the AOT. I created a new ER model mapping configuration for my ER data model. During the design of the model mapping, I tried to add a new data source type, **Table records**, that refers to my table. I could manually add my table name to the **Table** lookup, and the ER model mapping accepted it without errors or warnings. However, my table's name isn't included in the list of available choices that the **Table** lookup of this data source offers. How do I include the name of my table?

Answer: To include the name of your custom table in the **Table** lookup, use the **Rebuild table references** menu item as described in the "Optional setup for ER" section earlier in this topic.

Question: Why can't I mark the Microsoft provider as **Active** in the **Electronic reporting** workspace in my production environment?

Answer: The Microsoft provider is used to mark ER configurations that have been designed and maintained by

Microsoft. We expect that Microsoft will release new versions of the configurations in the future. We recommend that you not mark the Microsoft provider as **Active**. Otherwise, you can update the configurations. (For example, you can change the content and register new versions.) These updates will cause issues in the future, when Microsoft provides new versions of the configurations, and those new versions must be imported and adopted. Instead, register a new ER provider for your company, and use it for your ER configurations maintenance. To reuse a Microsoft configuration, select it as the base for your derived copy. To incorporate changes that are provided by Microsoft, rebase your configuration to a new version of the Microsoft configuration when it becomes available.

Question: I successfully ran an ER format in one company. However, when I ran the same ER format in another company and used the same settings, I received the following error message: "The provided document type is not a File type." Why?

Answer: Most likely, the second company doesn't contain document types that have been selected in the **Job archive, Temporary, Baseline, and Others ER parameters**. To fix this issue, configure these document types in the second company.

- [Electronic reporting \(ER\) overview](#)
- [Electronic reporting \(ER\) destinations](#)
- [Configuration service of Regulatory Services](#)

NOTE

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Backup storage of ER templates

2/18/2021 • 5 minutes to read • [Edit Online](#)

The [Electronic reporting \(ER\) overview](#) lets business users configure formats for outbound documents according to the legal requirements of various countries and regions. Configured ER formats can use predefined templates to generate outbound documents in various formats, such as Microsoft Excel workbooks, Microsoft Word documents, or PDF documents. The templates are filled with data that the configured dataflow for generated documents requires.

Each configured format can be published as part of an ER solution. Each ER solution can be exported from one instance of Finance and Operations and imported into another instance.

The ER framework uses the [Configure document management](#) to keep the required templates for the current Finance and Operations instance. Depending on the settings of the ER framework, Microsoft Azure Blob storage or a Microsoft SharePoint folder can be selected as the physical primary storage location for templates. (For more information, see [Configure the Electronic reporting \(ER\) framework](#).) The DocuValue table holds an individual record for each template. In each record, the **AccessInformation** field stores the path of a template file that is located in the configured storage location.

When you manage your Finance and Operations instances, you might decide to migrate the current instance to another location. For example, you might migrate your production instance to a new sandbox environment. If you configured the ER framework to store templates in Blob storage, the DocuValue table in the new sandbox environment refers to the instance of Blob storage in the production environment. However, this instance can't be accessed from the sandbox environment, because the migration process doesn't support the migration of artifacts in Blob storage. Therefore, if you try to run an ER format that uses a template to generate business documents, an exception occurs, and you're notified about the missing template. You're also guided to use the ER cleanup tool to delete and then re-import the ER format configuration that contains the template. Because you might have several ER format configurations, this process can be time consuming.

The Backup storage of ER templates feature can help you make your templates so that they are always available to generate business documents.

NOTE

This feature can be used only when Blob storage has been selected as the physical storage location for ER templates.

Automated recovery and notification

For this feature, every template of a new ER format configuration in the current environment is automatically saved to the backup storage location for templates (the ERDocuDatabaseStorage database table) when the following events occur:

- You import a new ER format configuration that contains a template.
- You complete the draft version of an ER format configuration that contains a template.

Backup copies of templates are migrated to a new instance of Finance and Operations as part of the application database.

If a template of an ER format is required for generation of outbound documents, to process vendor payments including generation of payment advice and control reports, for example, but the required template isn't found in the primary storage location, the following events occur:

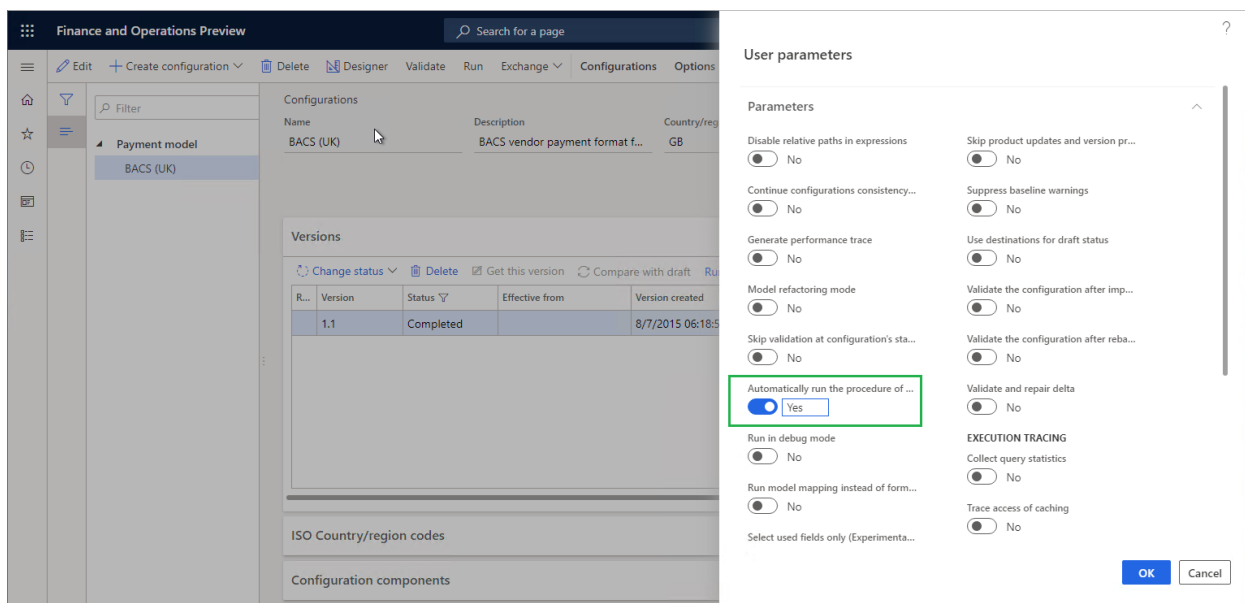
- If the template is available in the backup storage location, it is automatically taken from the backup storage location, restored to the primary storage location, and used for the current execution.
- Every user who is assigned to the **Electronic reporting developer** or **System administrator** role is notified about the missing template issue through the Action center. The message that appears depends on the value of the **Automatically run the procedure of restoring the broken templates in batch** parameter:
 - If this parameter is set to **Off**, the message recommends that you start the batch process to automatically fix similar issues for other ER format configuration templates. The message includes a link that you can use to start the batch process.
 - If this parameter is set to **On**, the message notifies you that a missing templates issue has been discovered, and that a new batch process, **Restore broken templates from internal database backup**, has been automatically scheduled. This batch process will automatically fix similar issues for other templates.

To set up the **Automatically run the procedure of restoring the broken templates in batch** parameter, complete the following steps:

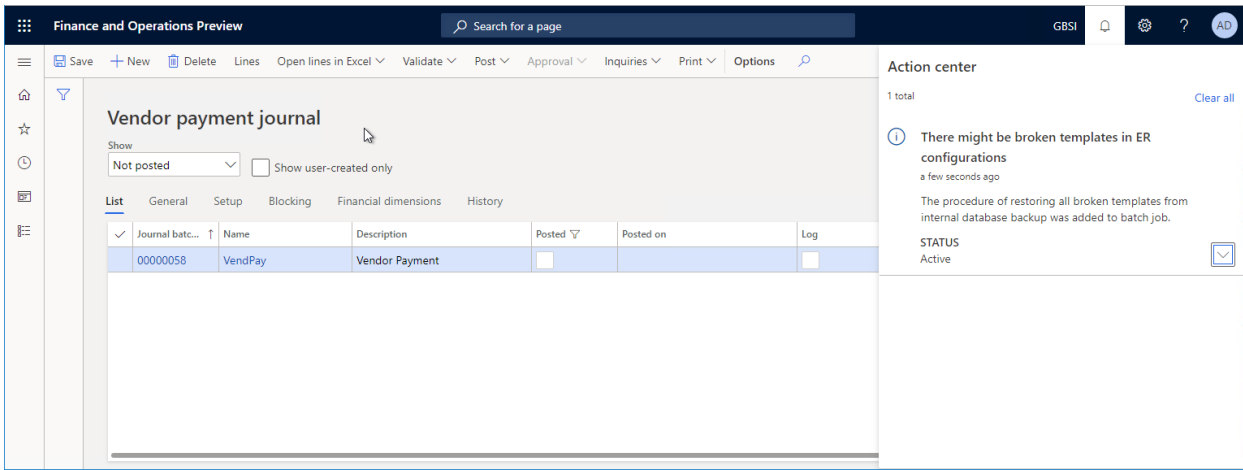
1. In Finance and Operations, open the **Organization administration > Electronic reporting > Configurations** page.
2. On the **Configurations** page, on the Action Pane, on the **Configurations** tab, in the **Advanced settings** group, select **User parameters**.
3. In the **User parameters** dialog box, set the required value for the **Automatically run the procedure of restoring the broken templates in batch** parameter.

NOTE

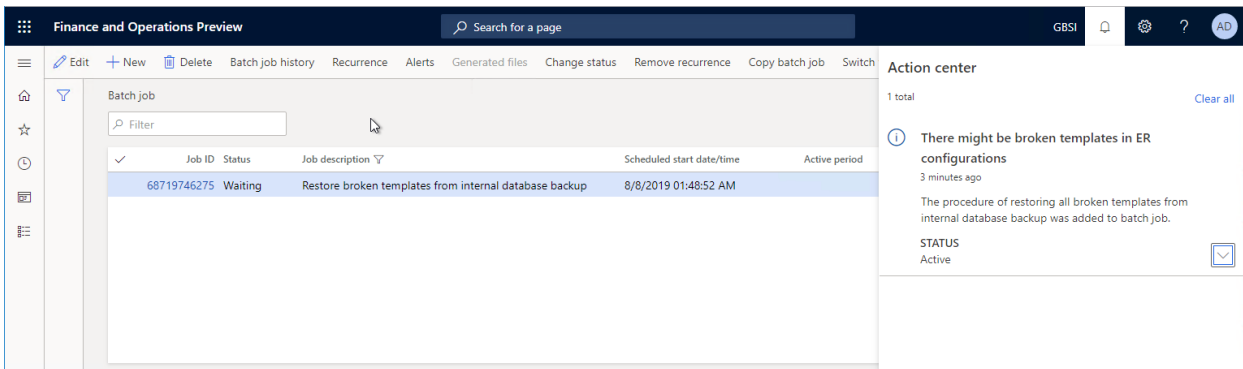
This parameter is defined as application user and logged company specific.



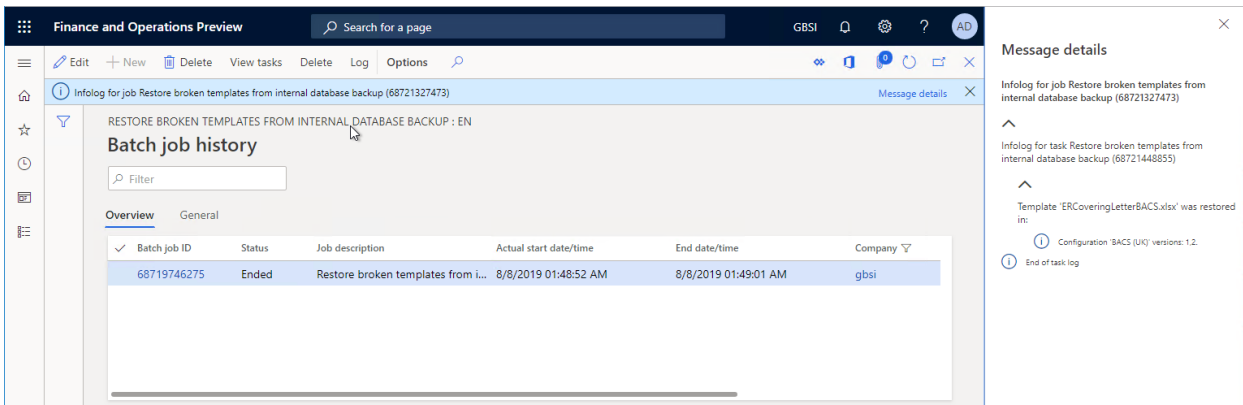
The following illustration shows an example of the message that appears when the **Automatically run the procedure of restoring the broken templates in batch** parameter is set to **On**.



The following illustration shows the **Restore broken templates from internal database backup** batch process on the **Batch job** page.



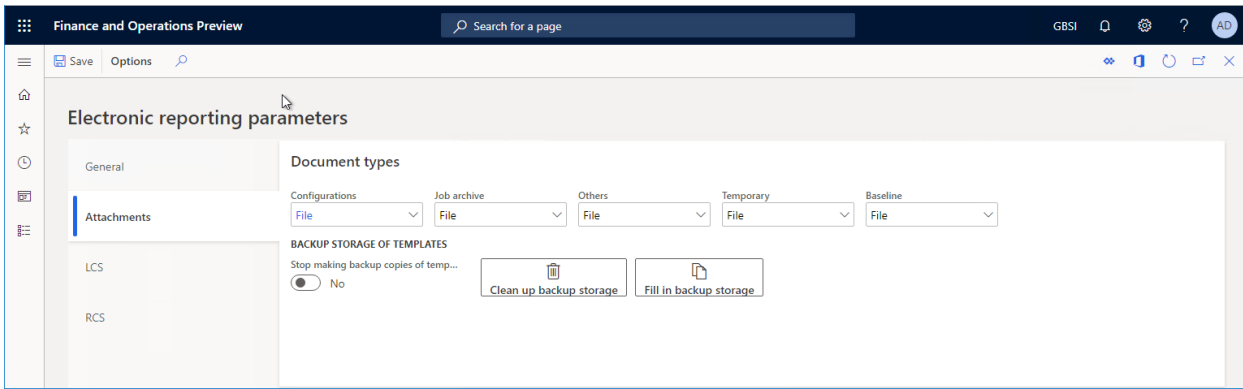
The execution log of the completed **Restore broken templates from internal database backup** batch process includes information about the templates that have been restored from the backup storage location to the primary storage location.



By default, the process of automatically creating backup copies of templates that reside in ER format configurations is turned on. To stop making backup copies of templates, set the **Stop making backup copies of template** option to **Yes** on the **Attachments** tab of the **Electronic reporting parameters** page. You can open this page from the **Electronic reporting** workspace.

If you set the **Stop making backup copies of templates** option to **Yes** and don't want to keep the backup copies that were previously made of templates, select **Clean up backup storage** on the **Electronic reporting parameters** page.

If you upgraded your environment to Finance and Operations version 10.0.5 (October 2019) and want to migrate to a new environment that includes ER format configurations that can be run, select **Fill in backup storage** on the **Electronic reporting parameters** page before the migration occurs. This button starts the process of making backup copies of all available templates, so that they can be stored in the ER backup storage location for templates.



Manual recovery

Go to **Organization administration > Electronic reporting > Restore broken templates** to manually initiate the process of restoring ER templates from the backup storage location to the primary storage location. Before you start this process, on the **Restore broken templates** page you can specify whether it will be performed interactively, or the batch process will be scheduled for this.

Supported deployments

In Finance and Operations version 10.0.5, the Backup storage of ER templates feature is available only in cloud deployments.

Additional resources

[Electronic reporting \(ER\) overview](#)

[Configure the Electronic reporting \(ER\) framework](#)

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Create configuration providers and mark them as active

2/18/2021 • 2 minutes to read • [Edit Online](#)

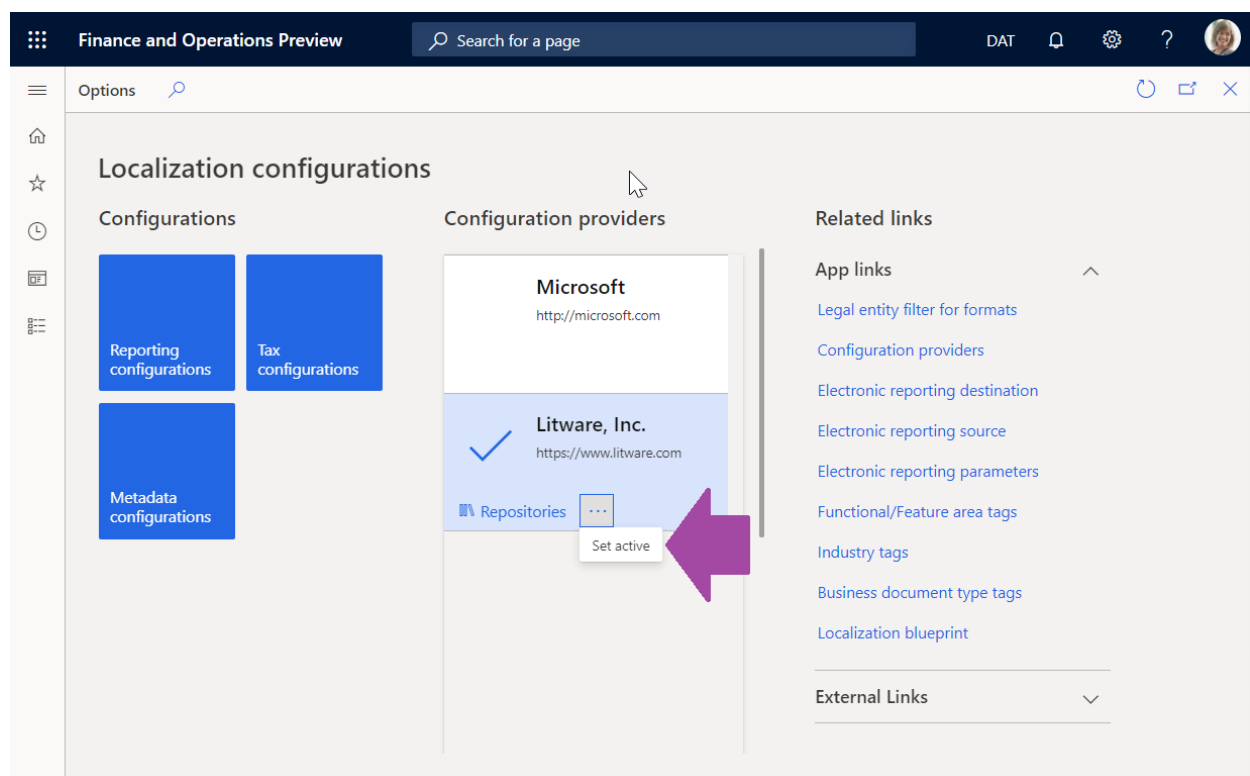
This topic explains how a user assigned to the System Administrator or Electronic Reporting Developer role can create a configuration provider for Electronic reporting (ER). Each ER configuration will refer to the provider as the author of the configuration. In this example, you will create a configuration provider for sample company, Litware, Inc. These steps can be performed in any company as ER configuration providers are shared among all companies.

Create a provider

1. Go to the **navigation pane** in the upper left corner and select **Organization administration**.
2. Go to **Workspaces > Electronic reporting**.
3. Go to **Related links > Configuration providers**.
4. Select **New**.
 - A provider record has a unique name and URL. Review the content of this page and skip this procedure if a record for Litware, Inc. (<https://www.litware.com>) already exists.
5. In the Name field, type `Litware, Inc.`.
6. In the Internet address field, type `https://www.litware.com`.
7. Select **Save**.
8. Close the page.

Select as an active provider

1. Select the Litware, Inc. provider.
2. Select **Set active**.



The screenshot shows the Dynamics 365 interface for 'Localization configurations'. The 'Configuration providers' section is active, displaying two providers: 'Microsoft' (http://microsoft.com) and 'Litware, Inc.' (https://www.litware.com). The 'Litware, Inc.' provider is selected, indicated by a blue checkmark and a blue background. A purple arrow points to the 'Set active' button located below the 'Litware, Inc.' provider. The interface also shows 'Reporting configurations', 'Tax configurations', and 'Metadata configurations' on the left, and 'Related links' on the right.

NOTE

Can you tell us about your documentation language preferences? [Take a short survey.](#)

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Electronic reporting (ER) destinations

2/18/2021 • 12 minutes to read • [Edit Online](#)

You can configure a destination for each Electronic reporting (ER) format configuration and its output component (a folder or a file). Users who have appropriate access rights can also modify destination settings at runtime. This topic explains ER destination management, the types of destinations that are supported, and security considerations.

ER format configurations usually contain at least one output component: a file. Typically, configurations contain multiple file output components of different types (for example, XML, TXT, XLSX, DOCX, or PDF) that are grouped into either a single folder or multiple folders. ER destination management lets you preconfigure what occurs when each component is run. By default, when a configuration is run, a dialog box appears that lets you save or open the file. The same behavior also occurs when you import an ER configuration and don't configure any specific destinations for it. After a destination is created for a main output component, that destination overrides the default behavior, and the folder or file is sent according to the destination's settings.

Availability and general prerequisites

The functionality for ER destinations isn't available in Microsoft Dynamics AX 7.0 (February 2016). Therefore, you must install Microsoft Dynamics 365 for Operations version 1611 (November 2016) or later to use the following destination types:

- [Email](#)
- [Archive](#)
- [File](#)
- [Screen](#)
- [Power BI](#)

Alternatively, you can install one of the following prerequisites. However, be aware that these alternatives provide a more limited ER destination experience.

- Microsoft Dynamics AX application version 7.0.1 (May 2016)
- [Electronic reporting destination management application hotfix](#)

There is also a [Print](#) destination type. To use it, you must install Microsoft Dynamics 365 Finance version 10.0.9 (April 2020).

Overview

You can set up destinations only for ER configurations that have been [imported](#) into the current Finance instance, and for the formats that are available on the [Electronic reporting configurations](#) page. The functionality for ER destination management is available at **Organization administration > Electronic reporting > Electronic reporting destination**.

Default behavior

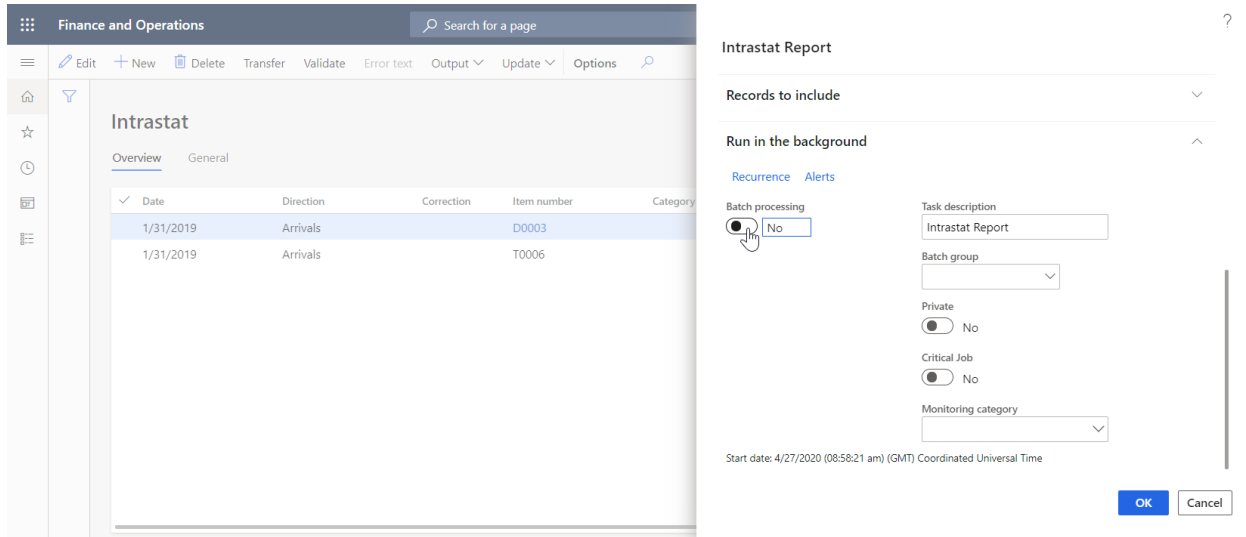
The default behavior for an ER format configuration depends on the execution type that you specify when an ER format starts.

In the **Intrastat Report** dialog box, on the **Run in the background** FastTab, if you set the **Batch processing** option to **No**, an ER format is run immediately in interactive mode. When this execution is successfully completed, a generated outbound document is made available for download.

If you set the **Batch processing** option to **Yes**, an ER format is run in **batch** mode. The appropriate batch job is created, based on the parameters that you specify on the **Run in the background** tab of the ER parameters dialog box.

NOTE

The job description informs you about the run of an ER format mapping. It also contains the name of the ER component that is run.



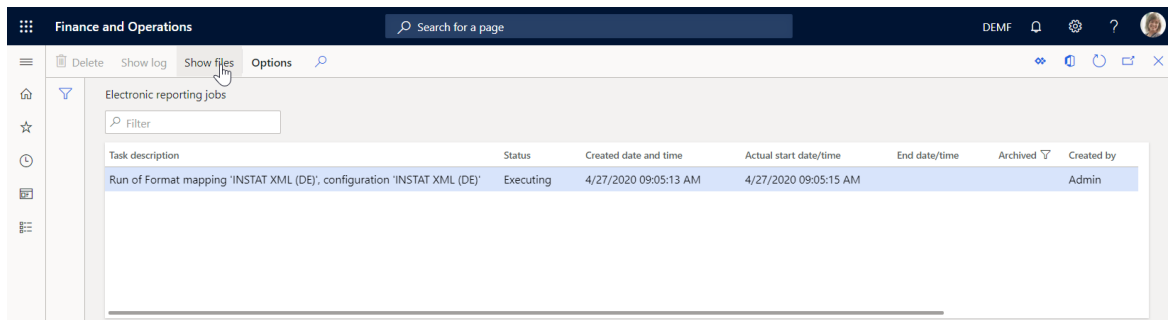
You can find information about this job in several places:

- Go to **Common > Inquiries > Batch jobs > My batch jobs** to check the status of the scheduled job.
- Go to **Organization administration > Electronic reporting > Electronic reporting jobs** to check the status of the scheduled job and the execution results of the completed job. When job execution is successfully completed, select **Show files** on the **Electronic reporting jobs** page to get a generated outbound document.

NOTE

This document is stored as an attachment of the current job record and is controlled by the **Document management** framework. The **document type** that is used to store ER artifacts of this type is configured in the **ER parameters**.

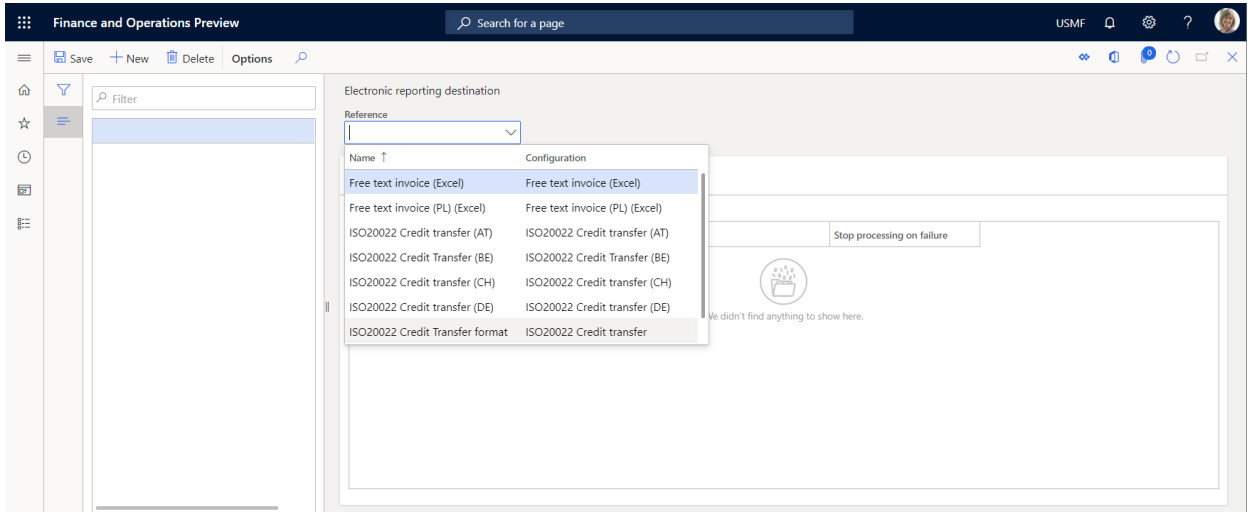
- On the **Electronic reporting jobs** page, select **Show files** to view the list of any errors and warnings that were generated during job execution.



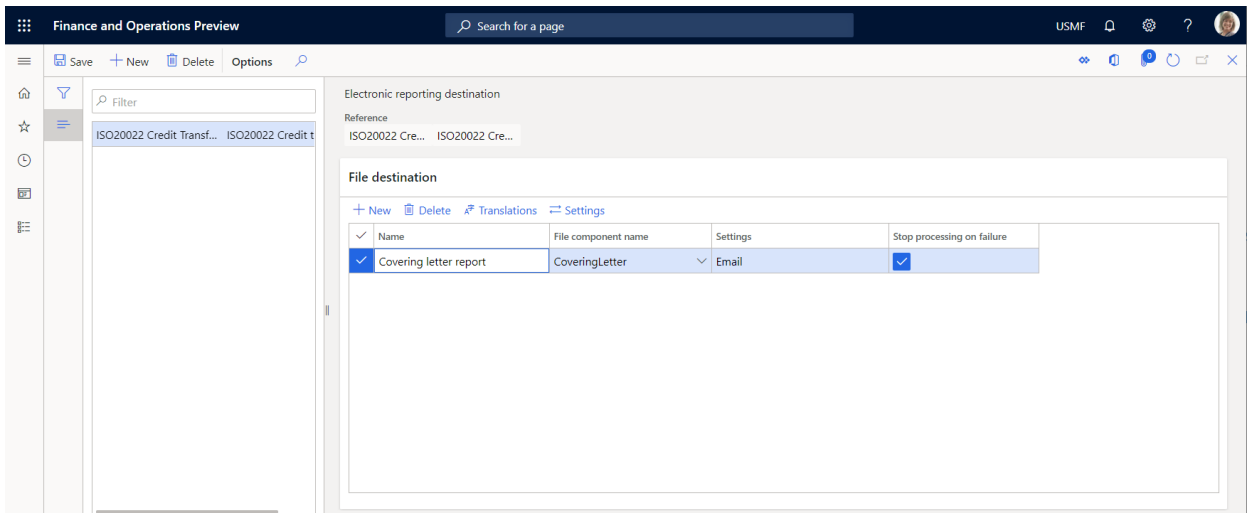
User-configured behavior

On the **Electronic reporting destination** page, you can override the default behavior for a configuration. Imported configurations aren't shown on this page until you select **New** and then, in the **Reference** field, select

a configuration to create destination settings for.



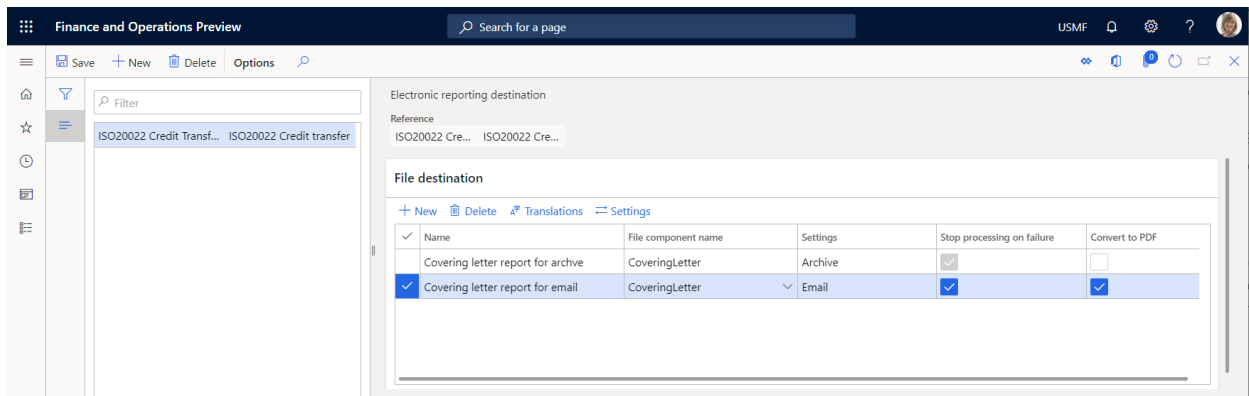
After you create a reference, you can create a file destination for each **Folder** or **File** output component of the referenced ER format.



Next, in the **Destination settings** dialog box, you can enable and disable individual destinations for the file destination. The **Settings** button is used to control all the destinations for a selected file destination. In the **Destination settings** dialog box, you can control each destination separately by setting the **Enabled** option for it.

In versions of Finance **before version 10.0.9**, you can create **one file destination** for each output component of the same format, such as a folder or a file that is selected in the **File Name** field. However, in **version 10.0.9 and later**, you can create **multiple file destinations** for each output component of the same format.

For example, you can use this capability to configure file destinations for a file component that is used to generate an outbound document in Excel format. One destination (**Archive**) can be configured to store the original Excel file in the ER jobs archive, and another destination (**Email**) can be configured to simultaneously **convert** the Excel file to PDF format and send the PDF file by email.



When you run an ER format, all destinations that were configured for components of the format are always run. In addition, in Finance **version 10.0.17 and later**, the ER destinations functionality has been improved and now lets you configure different sets of destinations for a single ER format. This configuration marks each set as configured for a particular user action. The ER API has been [extended](#) so that an action can be provided that the user performs by running an ER format. The action code that is provided is passed to ER destinations. You can run different destinations of an ER format, depending on the action code that is provided. For more information, see [Configure action-dependent ER destinations](#).

Destination types

The following destinations are currently supported for ER formats. You can disable or enable all types at the same time. In this way, you can either do nothing or send the component to all configured destinations.

- [Email](#)
- [Archive](#)
- [File](#)
- [Screen](#)
- [Power BI](#)
- [Print](#)

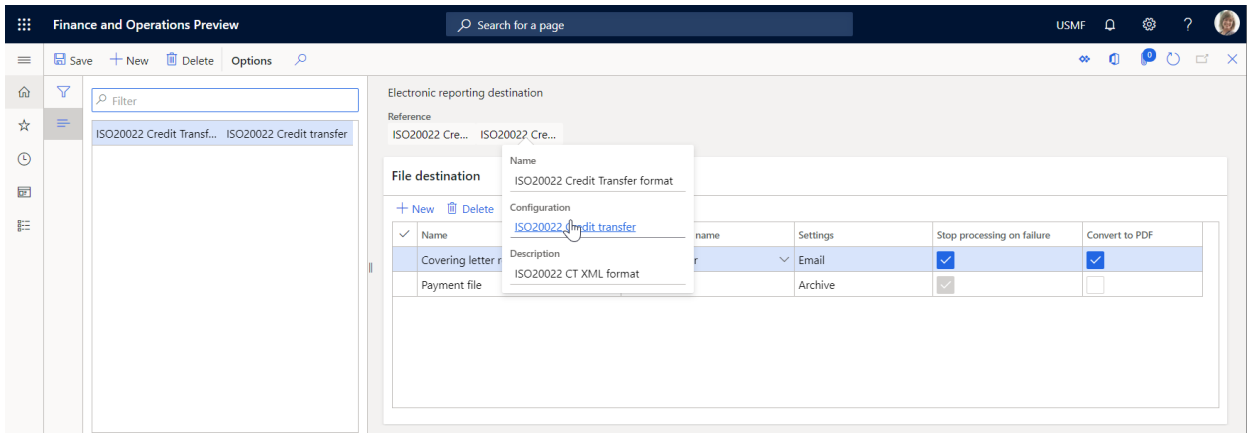
Applicability

You can set up destinations only for ER configurations that have been imported, and for the formats that are available on the [Electronic reporting configurations](#) page.

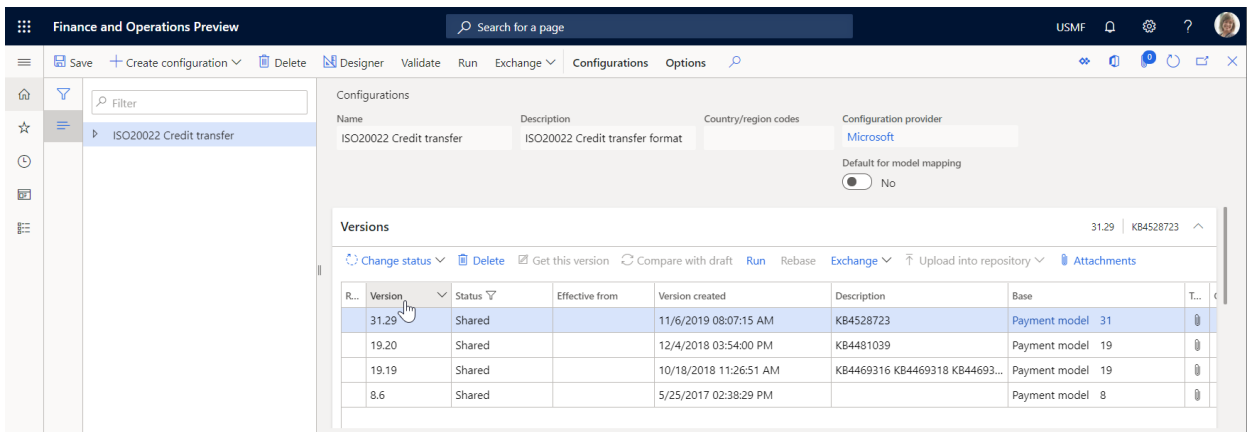
NOTE

Configured destinations are company-specific. If you plan to use an ER format in different companies of the current Finance instance, you must configure destinations for that ER format for each of those companies.

When you configure file destinations for a selected format, you configure them for the whole format.

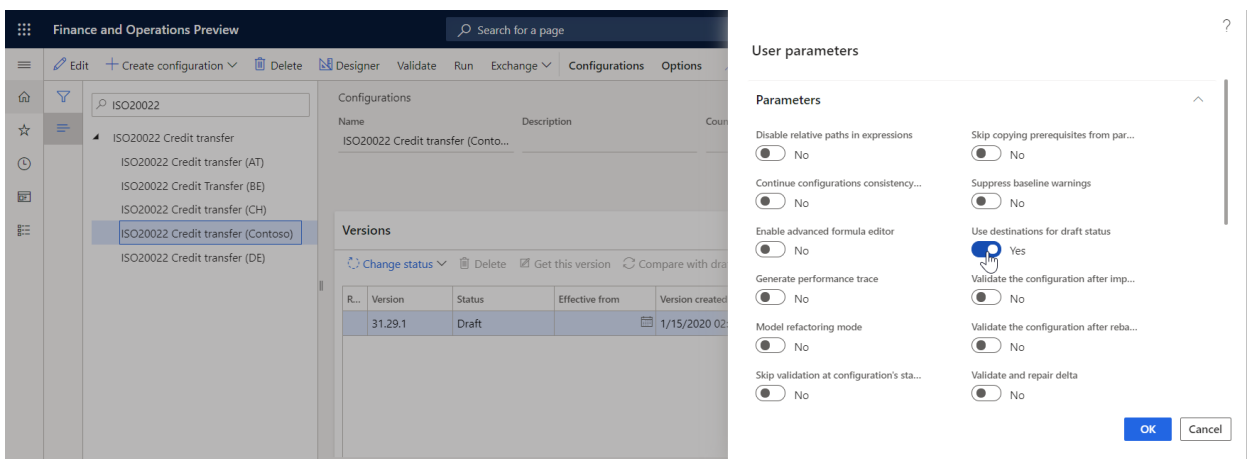


At the same time, you might have multiple **versions** of the format that have been imported into the current Finance instance. You can view them if you select the **Configuration** link that is offered when you select the **Reference** field.



By default, configured destinations are applied only when you run an ER format version that has a status of either **Completed** or **Shared**. However, you must sometimes use configured destinations when the draft version of an ER format is run. For example, you modify a draft version of your format, and you want to use configured destinations to test how generated output will be delivered. Follow these steps to apply destinations for an ER format when the draft version is run.

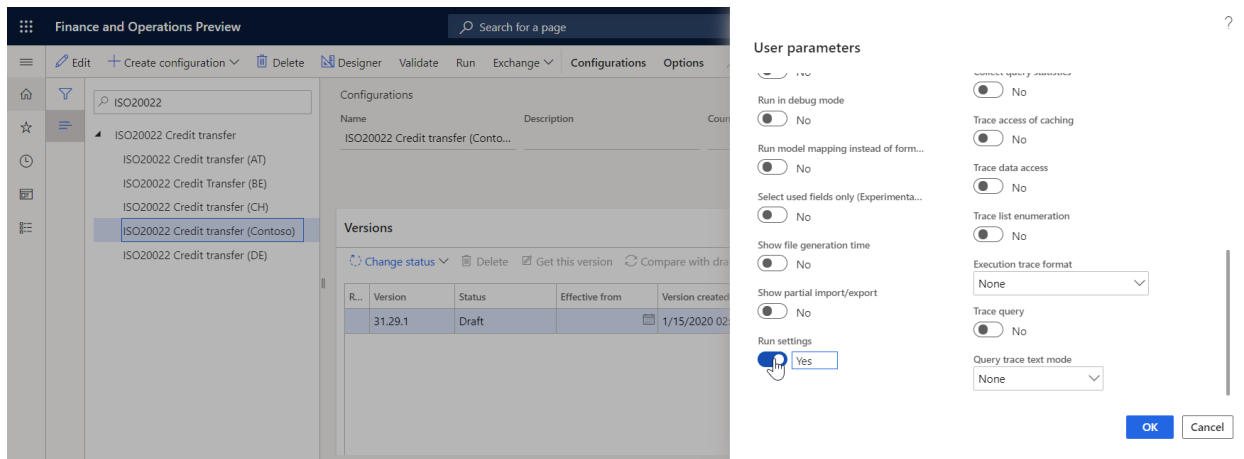
1. Go to **Organization administration > Electronic reporting > Configurations**.
2. On the **Configurations** page, on the Action Pane, on the **Configurations** tab, in the **Advanced settings** group, select **User parameters**.
3. Set the **Use destinations for draft status** option to **Yes**.



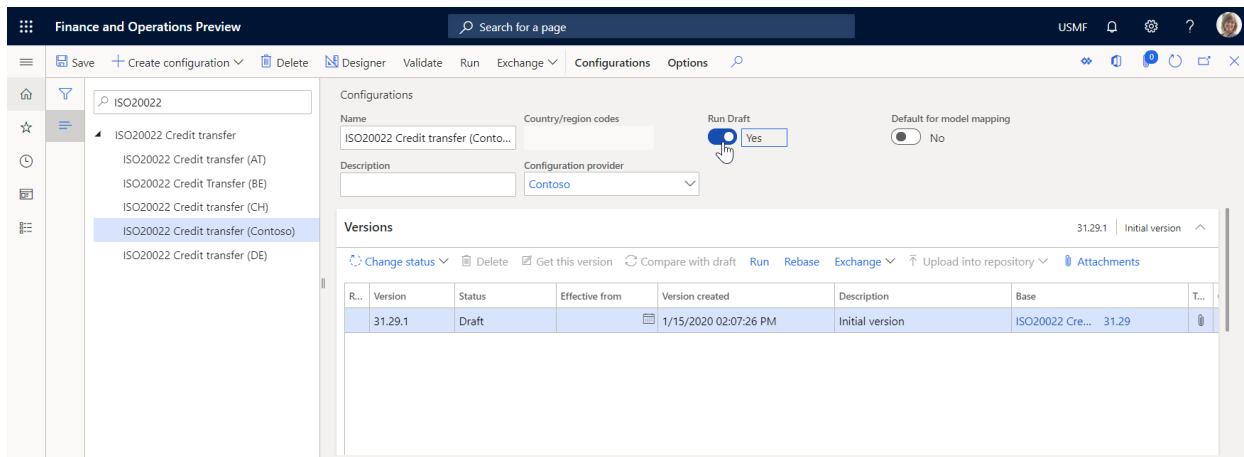
To use the draft version of an ER format, you must mark the ER format accordingly.

1. Go to **Organization administration > Electronic reporting > Configurations**.

- On the **Configurations** page, on the Action Pane, on the **Configurations** tab, in the **Advanced settings** group, select **User parameters**.
- Set the **Run setting** option to **Yes**.



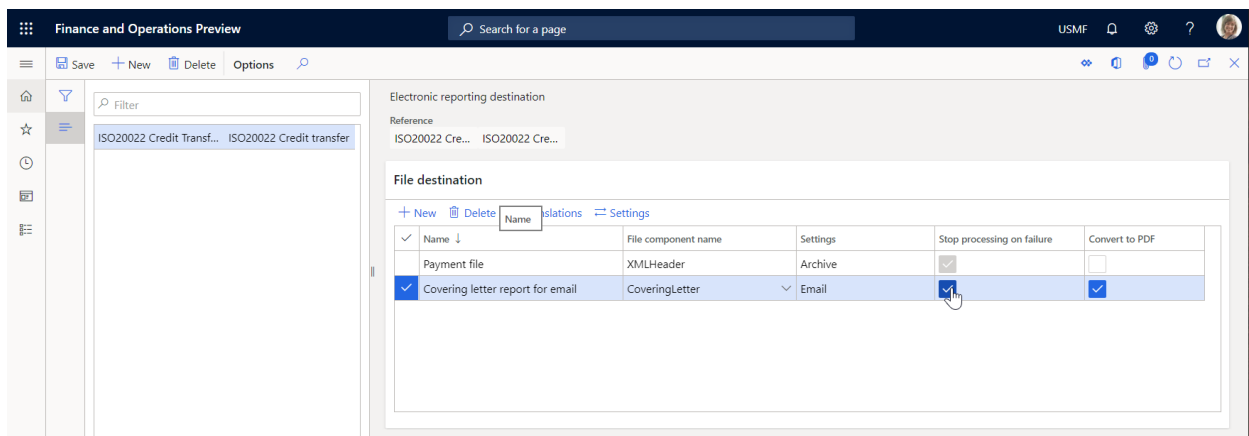
After you complete this setup, the **Run draft** option becomes available for ER formats that you modify. Set this option to **Yes** to start to use the draft version of the format when the format is run.



Destination failure handling

Usually, an ER format is run within the scope of a specific business process. However, the delivery of an outbound document that is generated during execution of an ER format must sometimes be considered part of that business process. In this case, if delivery of a generated outbound document to a configured destination is unsuccessful, execution of the business process must be canceled. To configure the appropriate ER destination, select the **Stop processing on failure** option.

For example, you configure vendor payment processing so that the **ISO20022 Credit Transfer** ER format is run to generate the payment file and supplementary documents (for example, the covering letter and control report). If a payment should be considered successfully processed only if the covering letter is successfully delivered by email, you must select the **Stop processing on failure** check box for the **CoveringLetter** component in the appropriate file destination, as shown in the following illustration. In this case, the status of the payment that is selected for processing will be changed from **None** to **Sent** only when the covering letter that is generated is successfully accepted for delivery by an email provider that is configured in the Finance instance.



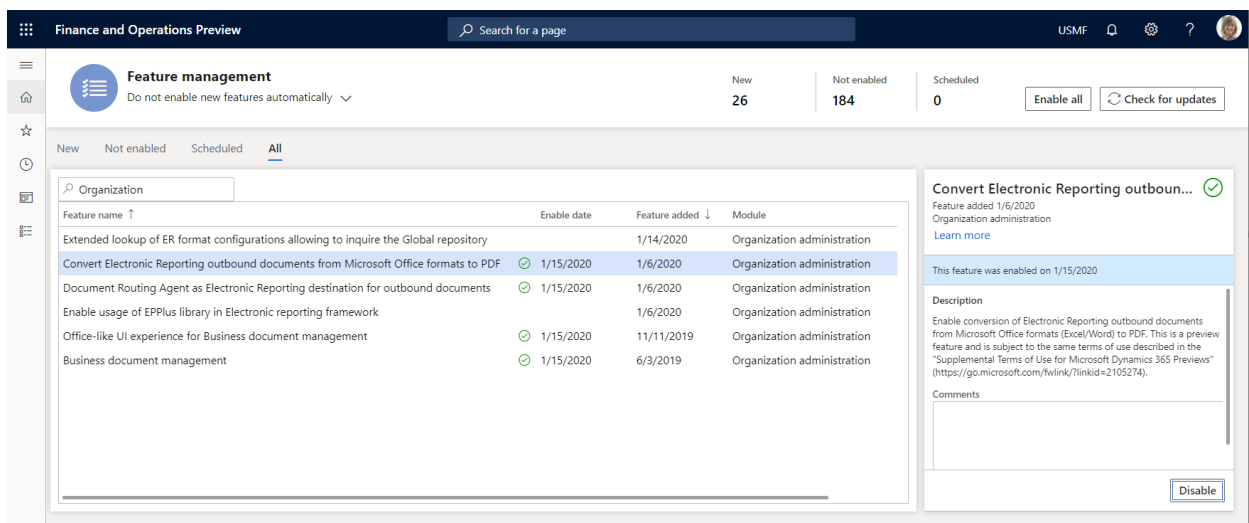
If you clear the **Stop processing on failure** check box for the **CoveringLetter** component in the destination, a payment will be considered successfully processed even if the covering letter isn't successfully delivered by email. The status of the payment will be changed from **None** to **Sent** even if the covering letter can't be sent because, for example, the email address of the recipient or sender is missing or incorrect.

Output conversion to PDF

You can use the PDF conversion option to convert output in Microsoft Office (Excel or Word) format to PDF format.

Make PDF conversion available

To make the PDF conversion option available in the current Finance instance, open the **Feature management** workspace, and turn on the **Convert Electronic Reporting outbound documents from Microsoft Office formats to PDF** feature.



Applicability

The PDF conversion option can be turned on only for file components that are used to generate output in Office (Excel or Word) format (**Excel file**). When this option is turned on, output that is generated in Office format is automatically converted to PDF format.

Limitations

The PDF conversion option is available only for cloud deployments.

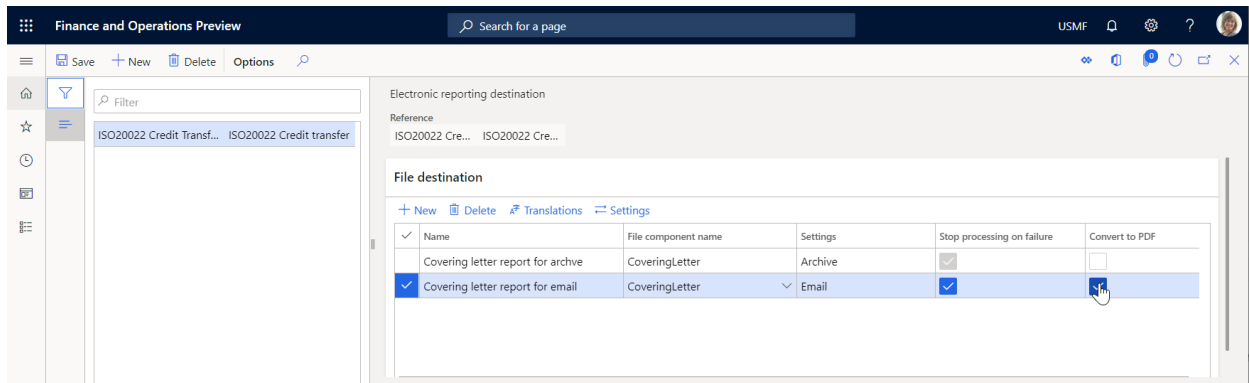
The PDF document that is produced is limited to a maximum length of 300 pages.

In Finance **version 10.0.9**, only landscape page orientation is supported in the PDF document that is produced from Excel output. In Finance **version 10.0.10 (May 2020) and later**, you can [specify the page orientation](#) of the PDF document that is produced from Excel output while you configure an ER destination.

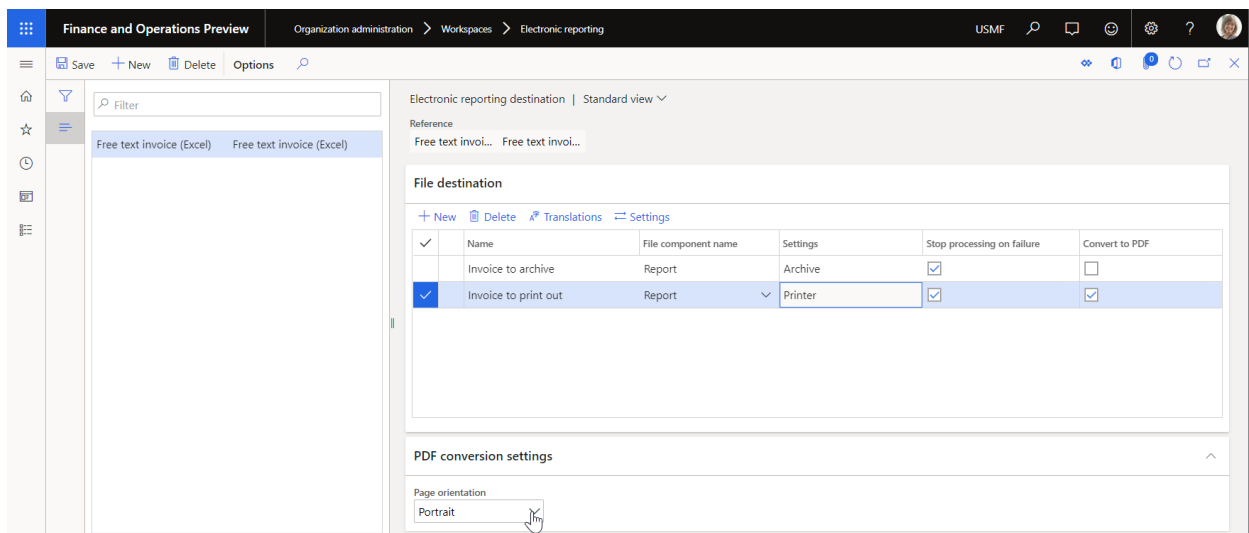
Only the common system fonts of the Windows operating system are used to convert output that contains no embedded fonts.

Use the PDF conversion option

To turn on PDF conversion for a file destination, select the **Convert to PDF** check box.



If you generate an ER configuration in Excel format and want to convert it to PDF format, you can specify the page orientation of the PDF document. When you select the **Convert to PDF** check box to turn on PDF conversion for a file destination that produces an output file in Excel format, the **Page orientation** field becomes available on the **PDF conversion settings** FastTab. In the **Page orientation** field, select the preferred orientation.



NOTE

To have the option to select the PDF page orientation, you must install Finance version 10.0.10 or later.

The selected page orientation is applied to all ER configurations that are generated in Excel format and then converted to PDF format.

If an ER configuration in Word format is converted to PDF format, the page orientation of the PDF document is taken from the Word document.

Security considerations

Two types of privileges and duties are used for ER destinations. One type controls a user's overall ability to maintain the destinations that are configured for a legal entity (that is, it controls access to the **Electronic reporting destinations** page). The other type controls an application user's ability to override, at runtime, the destination settings that an ER developer or ER functional consultant has configured.

ROLE (AOT NAME)	ROLE NAME	DUTY (AOT NAME)	DUTY NAME
ERDeveloper	Electronic reporting developer	ERFormatDestinationConfigure	Configure electronic reporting format destination
ERFunctionalConsultant	Electronic reporting functional consultant	ERFormatDestinationConfigure	Configure electronic reporting format destination
PaymAccountsPayablePaymentsClerk	Accounts payable payments clerk	ERFormatDestinationRuntimeConfigure	Configure electronic reporting format destination during runtime
PaymAccountsReceivablePaymentsClerk	Accounts receivable payments clerk	ERFormatDestinationRuntimeConfigure	Configure electronic reporting format destination during runtime

NOTE

Two privileges are used in the preceding duties. These privileges have the same names as the corresponding duties: `ERFormatDestinationConfigure` and `ERFormatDestinationRuntimeConfigure`.

Frequently asked questions

I have imported electronic configurations, and I see them on the Electronic reporting configurations page. But why don't I see them on the Electronic reporting destinations page?

Make sure that you select **New** and then select a configuration in the **Reference** field. The **Electronic reporting destinations** page shows only configurations that destinations have been configured for.

Is there any way to define which Microsoft Azure Storage account and Azure Blob storage are used?

No. The default Microsoft Azure Blob storage that is defined and used for the document management system is used.

What is the purpose of the File destination in the destination settings? What does that setting do?

The **File** destination is used to control a dialog box of your web browser when you run an ER format in interactive mode. If you enable this destination, or if no destination is defined for a configuration, an open or save dialog box appears in your web browser after an output file is created.

Can you give an example of the formula that refers to a vendor account that I can send email to?

The formula is specific to the ER configuration. For example, if you use the ISO 20022 Credit Transfer configuration, you can use `'$PaymentsForCoveringLetter'.Creditor.Identification.SourceID` or `model.Payments.Creditor.Identification.SourceID` to get an associated vendor account.

One of my format configurations contains multiple files that are grouped into one folder (for example, Folder1 contains File1, File2, and File3). How do I set up destinations so that Folder1.zip isn't created at all, File1 is sent by email, File2 is sent to SharePoint, and I can open File3 immediately after the configuration is run?

Your format must first be available in the ER configurations. If this prerequisite is met, open the **Electronic reporting destination** page, and create a new reference to the configuration. You must then have four file destinations, one for each output component. Create the first file destination, give it a name such as **Folder**, and select a file name that represents a folder in your configuration. Then select **Settings**, and make sure that all the destinations are disabled. For this file destination, the folder won't be created. By default, because of hierarchical dependencies between files and parent folders, the files will behave in the same way. In other words, they won't

be sent anywhere. To override that default behavior, you must create three more file destinations, one for each file. In the destination settings for each, you must enable the destination that the file should be sent to.

Additional resources

[Electronic reporting \(ER\) overview](#)

[Configure action-dependent ER destinations](#)

NOTE

Can you tell us about your documentation language preferences? [Take a short survey](#).

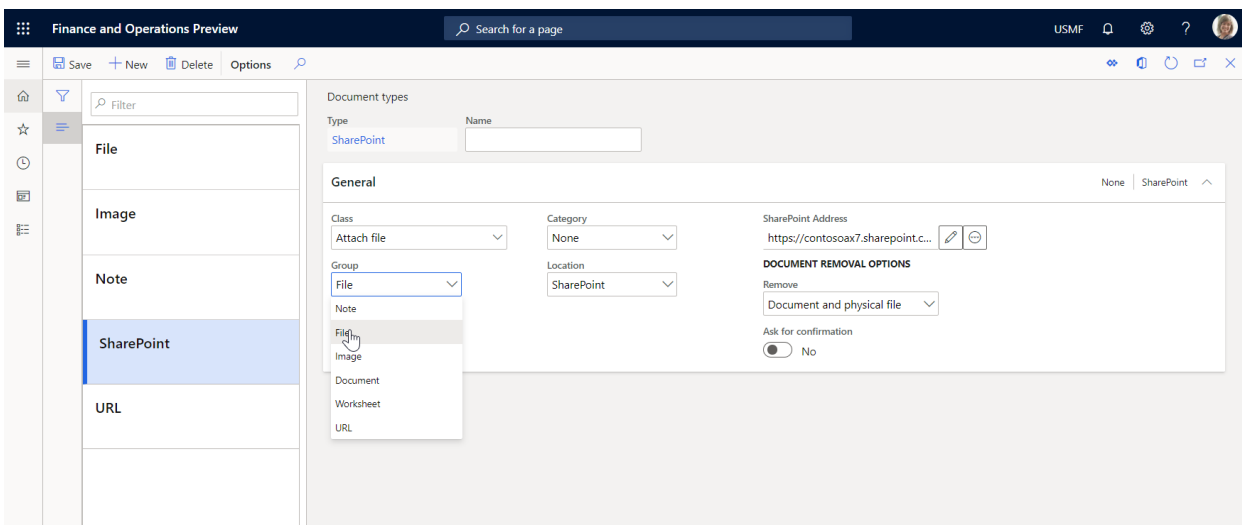
The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Archive ER destination type

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You can configure an archive destination for each **Folder** or **File** component of an Electronic reporting (ER) format that is configured to generate outbound documents. Based on the destination setting, a generated document is stored as an attachment of a record of the ER jobs list. To view the results, go to **Organization administration > Electronic reporting > Electronic reporting jobs**.

You can use this option to send the generated document to a Microsoft SharePoint folder or Microsoft Azure Storage. Set **Enabled** to **Yes** to send output to a destination that is defined by the selected document type. Only document types where the group is set to **File** are available for selection. You define document **types** at **Organization administration > Document management > Document types**. The configuration for ER destinations is the same as the configuration for the document management system.



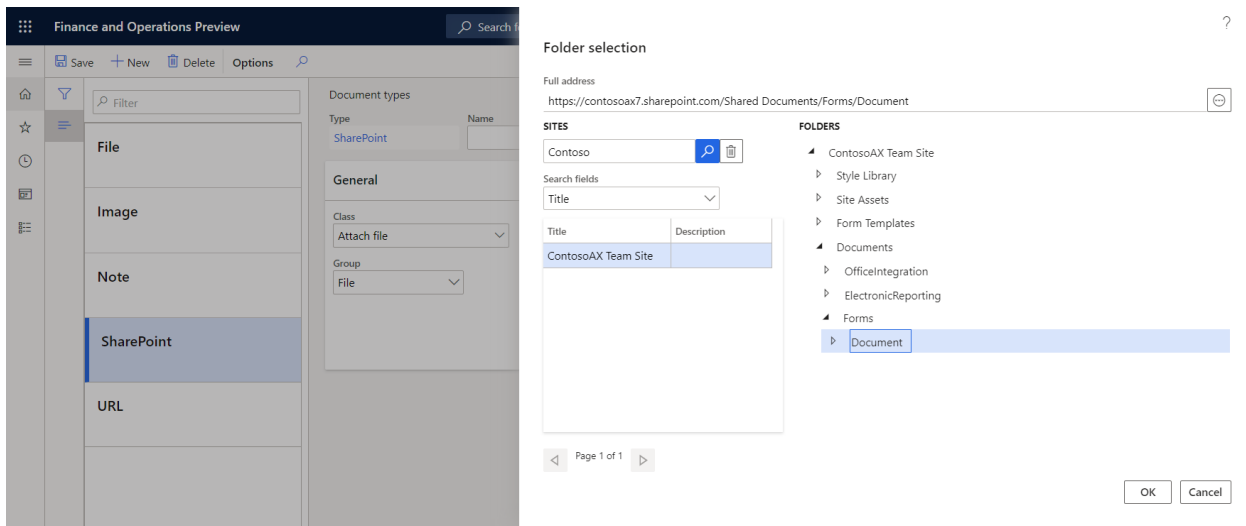
The location determines where the file is saved. After the **Archive** destination is enabled, the results can be saved in the Job archive. You can view the results at **Organization administration > Electronic reporting > Electronic reporting archived jobs**.

NOTE

Select a document type for the Job archive by navigating to **Organization administration > Workspaces > Electronic reporting > Electronic reporting parameters**. For more information, see [Configure the Electronic reporting \(ER\) framework](#).

SharePoint

You can save a file in a designated SharePoint folder. To define the default SharePoint server, go to **Organization administration > Document management > Document management parameters**. On the **SharePoint** tab, configure the SharePoint folder. Then, you can select it as the folder where the ER output will be saved. The **SharePoint** location must be selected in this document type.



Azure Storage

When the document type location is set to **Azure storage**, you can save a file to Azure Storage.

NOTE

The ER framework permanently stores files in Azure Blob storage unlike the Data management framework that applies the seven-day retention policy for documents that must be processed. For more information, see [API for getting message status](#) and [Status check API](#). The ER-related files will be stored in Azure Blob storage as attachments of application table records as long as necessary. A single file will be deleted from Azure Blob storage along with the application table record that this file was attached to.

Additional resources

- [Electronic reporting \(ER\) overview](#)
- [Electronic reporting \(ER\) destinations](#)
- [Configure document management](#)

NOTE

Can you tell us about your documentation language preferences? [Take a short survey](#).

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Email ER destination type

2/18/2021 • 7 minutes to read • [Edit Online](#)

When an Electronic reporting (ER) format is run, one or more outbound documents can be generated. **Folder** or **File** format components are used in ER formats to specify the structure of outbound documents. You can configure an email destination for these types of components to send outbound documents as email attachments.

You can configure an email destination for each **Folder** or **File** component of an ER format. In this case, **each outbound document is emailed individually**. Based on this destination setting, a generated document is delivered as an attachment of an email.

NOTE

If no document is generated, because the **Enabled** expression for the relevant **File** component has been configured to return a **False** Boolean value, no email is sent, even if an email destination is configured and enabled for the component.

You can also **group** several **Folder** or **File** components together, and then configure an email destination for all the components in the group. In this case, all outbound documents that are generated by components that belong to the group **are sent as multiple attachments of a single email**. Based on this destination setting, each generated document is delivered as an attachment of a single email.

NOTE

If at least one document is generated by a **File** component in a group of components, an email is sent. If no document is generated by grouped components, because the **Enabled** expression for each **File** component has been configured to return a **False** Boolean value, no email is sent, even if an email destination is configured and enabled for that group of components.

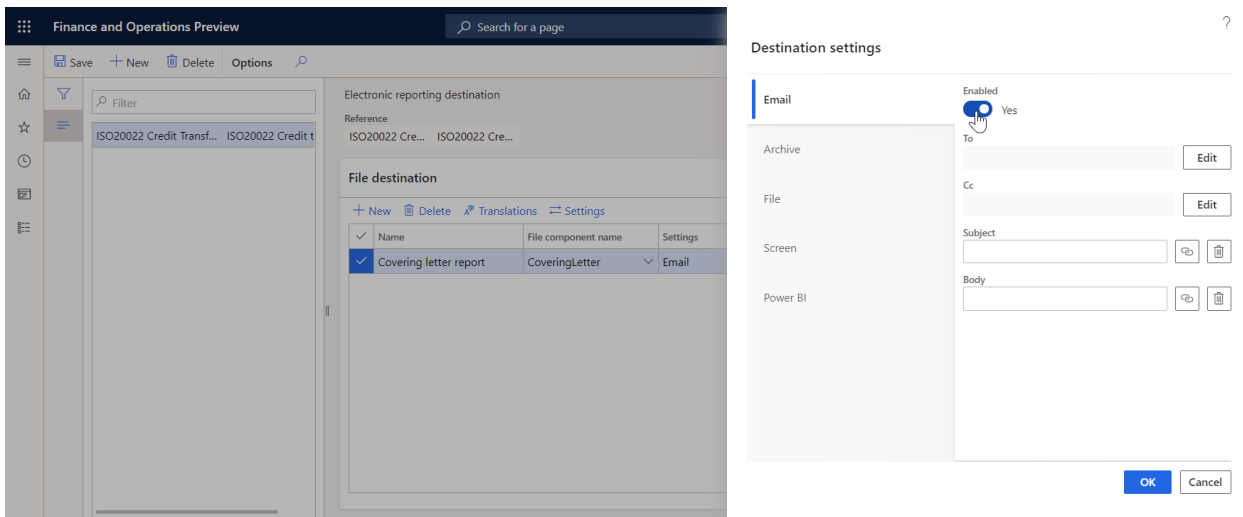
Email is the only destination that can be configured for a group of components. To deliver a document that is emailed based on the email destination setting for a group, add one more destination record, select the component that you want, and then configure another destination for this record.

Multiple groups of components can be configured for a single ER format configuration. In this way, you can configure an email destination for every group of components and an email destination for every component.

Configure an email destination

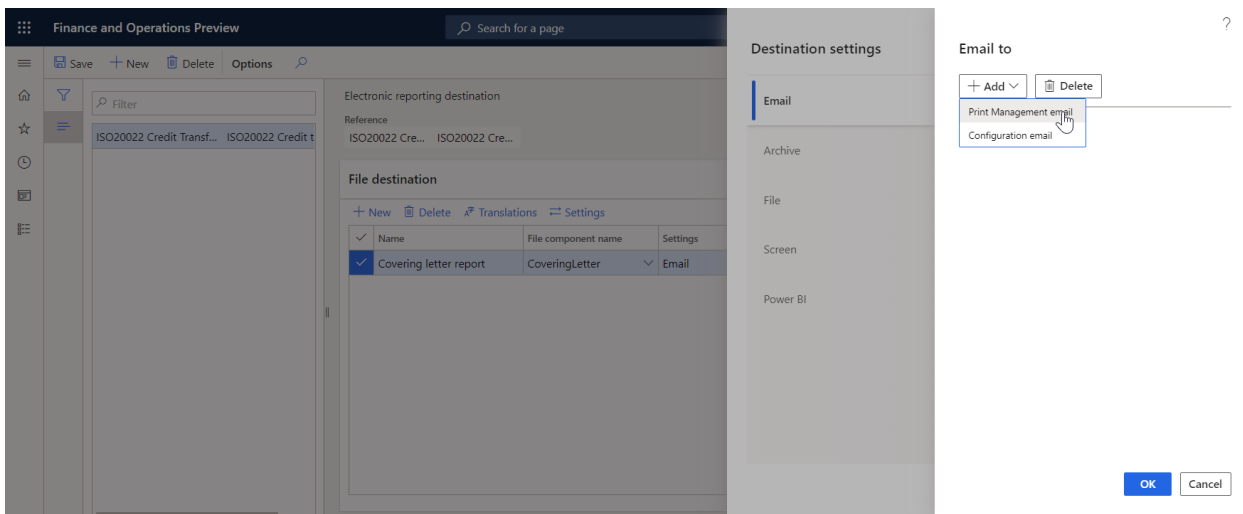
To send an output file or several output files by email, on the **Electronic reporting destination** page, on the **File destination** FastTab, select a component or group of components in the grid, and then select **Settings**. In the **Destination settings** dialog box that appears, on the **Email** tab, set the **Enabled** option to **Yes**. You can then specify email recipients, and edit the subject and body of the email message. You can either set up constant text for the email subject and body, or use ER [formulas](#) to dynamically create email texts.

You can configure email addresses for ER in two ways. The configuration can be completed in the same way that the Print Management feature completes it, or you can resolve an email address by using a direct reference to the ER configuration through a formula.



Email address types

If you select **Edit** next to the **To** or **Cc** field in the **Destination settings** dialog box, the **Email to** dialog box appears. Select **Add**, and then select the type of email address to use. Two types are currently supported: **Print Management email** and **Configuration email**.



Print Management email

If you select **Print Management email** as the email address type, you can enter fixed email addresses in the **Email to** dialog box by setting the following fields:

- In the **Email source** field, select **None**.
- In the **Additional email addresses, separated by ";"** field, enter the fixed email addresses.

Alternatively, you can obtain email addresses from the contact details of the party that you generate an outbound document for. To use email addresses that aren't fixed, in the **Email source** field, select the **role** of the party for a file destination. The following roles are supported:

- Customer
- Vendor
- Prospect
- Contact
- Competitor
- Worker
- Applicant
- Prospective vendor

- Disallowed vendor

For example, to configure an email destination for an ER format that is used to process vendor payments, select the **Vendor** role.

After you select the desired role, select the **Bind** button (chain symbol) next to the **Email source account** field to open the [Formula designer](#) page. You can then use this page to configure a formula that returns, at runtime, the account number of the party that is assigned to the configured role from the processed document to the email destination.

NOTE

Formulas are specific to the ER configuration.

On the **Formula designer** page, in the **Formula** field, enter a document-specific reference to a supported role. Instead of typing the reference, in the **Data source** pane, find and select the data source node that represents an account of the configured role, and then select **Add data source** to update the formula. For example, if you configure the email destination for the **ISO 20022 Credit Transfer** configuration that is used to process vendor payments, the node that represents a vendor account is

```
'$PaymentsForCoveringLetter'.Creditor.Identification.SourceID
```

The screenshot shows the 'Destination settings' dialog box in Microsoft Dynamics 365 Finance and Operations. The 'Email to' section is selected, and the 'Vendor' role is chosen from the 'Email source' dropdown. The 'Email source account' and 'Company of email source' fields are empty. The 'To' field is empty with an 'Edit' button next to it. The 'OK' and 'Cancel' buttons are at the bottom right.

If the account numbers of the configured role are unique for the whole instance of Microsoft Dynamics 365 Finance, the **Company of email source** field in the **Email to** dialog box can remain blank.

Alternatively, you might have a situation where different parties in the [Global address book](#) have been registered in different companies ([legal entities](#)) in such a way that they all use the same account number to fill the configured role. In this case, account numbers for the configured role aren't unique for the whole Finance instance. Therefore, to explicitly select a party, you can't specify only an account number. You must also specify the company that the party has been registered in the scope of to fill the configured role. Select the **Bind** button (chain symbol) next to the **Company of email source** field in the **Email to** dialog box to open the [Formula designer](#) page. You can then use this page to configure a formula that returns, at runtime, the code of the company that the desired source must be found in the scope of.

TIP

If you must use the company code to run an ER format, but the ER format doesn't provide any data source that the company code can be obtained from, configure the `GetCurrentCompany()` formula by using the built-in `GETCURRENTCOMPANY` ER function.

NOTE

Formulas are specific to the ER configuration.

To specify the type of email addresses that must be used at runtime, in the **Email to** dialog box, select **Edit** next to the **To** field to open the **Assign email address** drop-down dialog box. Then set the following fields:

- In the **Purpose** field, select the desired purposes. Only email addresses of the selected purposes from contacts of the discovered party will be used.
- Set the **Primary contact** option to **Yes** to use an email address that is configured for the discovered party as the primary email address.

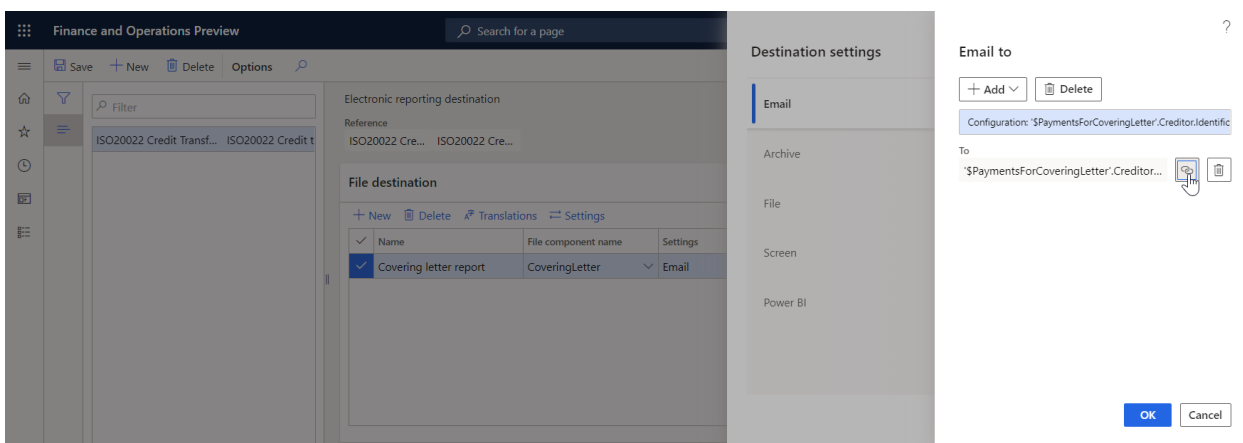
NOTE

If purposes are selected in the **Purpose** field and the **Primary contact** option is set to **Yes** at the same time, every email that satisfies at least one configured criterion will be used at runtime.

Configuration email

Select **Configuration email** as the email address type if the configuration that you use has a node in the data sources that returns either a single email address or multiple email addresses that are separated by semicolons (;). You can use [data sources](#) and [functions](#) in the formula designer to get a correctly formatted email address or correctly formatted email addresses that are separated by semicolons. For example, if you use the **ISO 20022 Credit Transfer** configuration, the node that represents the primary email address of a vendor from the vendor contact details that the covering letter should be sent to is

```
'$PaymentsForCoveringLetter'.Creditor.ContactDetails.Email
```



Group format components

To group format components, on the **Electronic reporting destination** page, on the **File destination** FastTab, select the components in the grid, and then select **Group**.

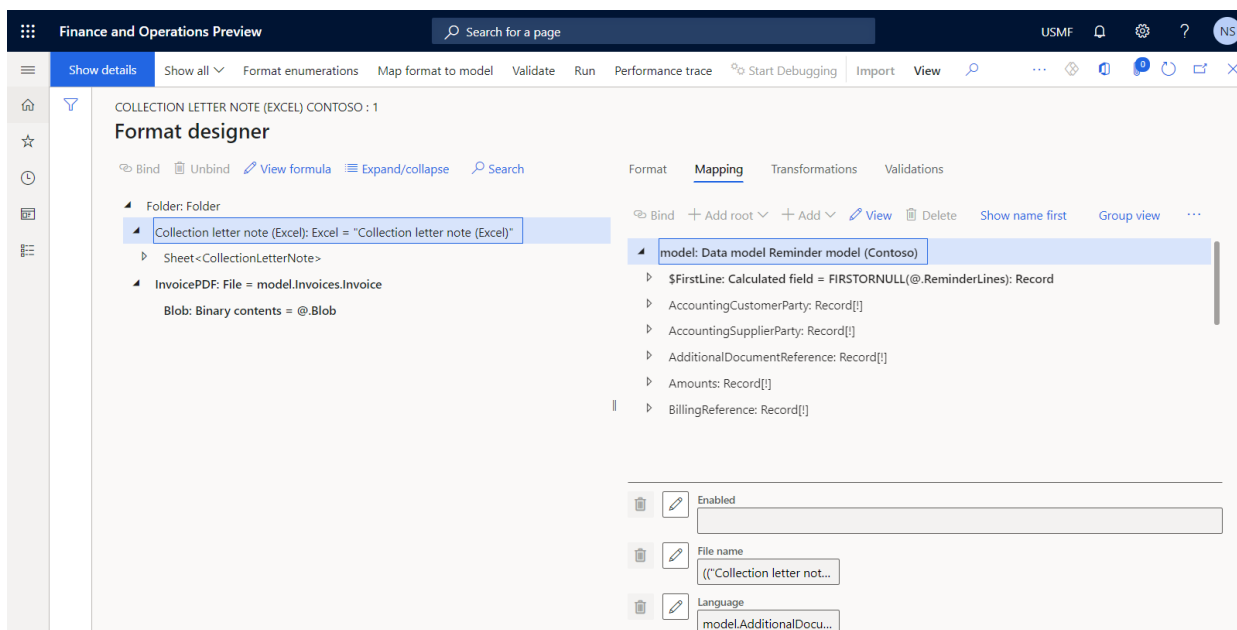
Email is the only previously configured destination that is still available for the selected components. No other previously configured destinations are available, because they are considered unsupported for a group of components. You will be notified about these changes as appropriate.

The record that you previously added is considered the header of the group that is created. This header record holds the email destination settings for the group. Other records are group members that will use the email destination settings of the group's header record.

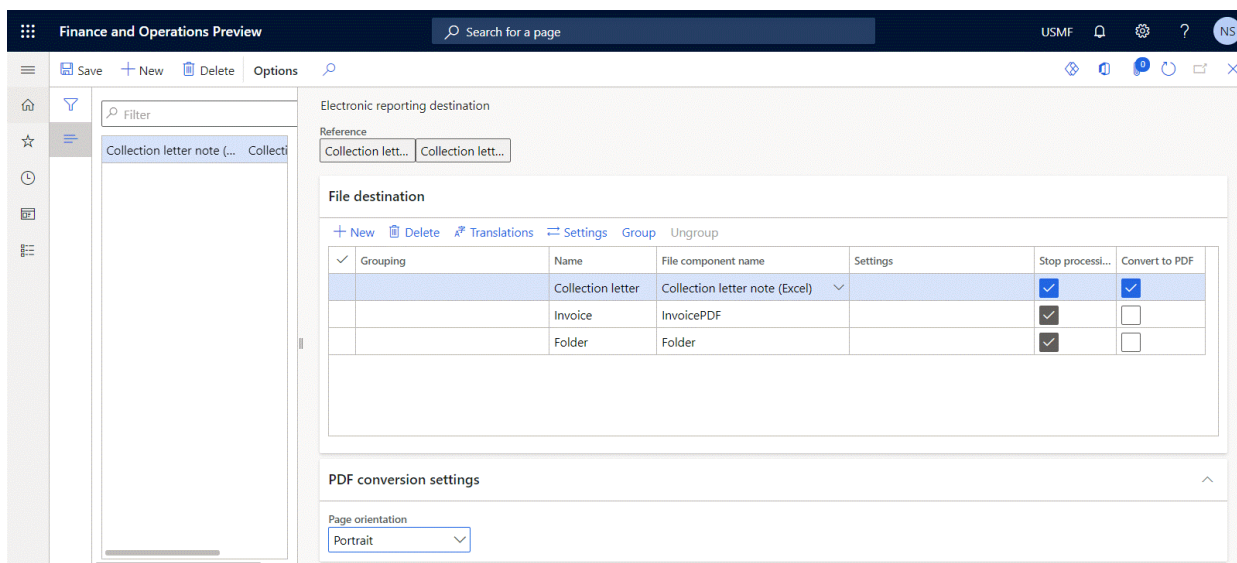
To ungroup format components, on the **File destination** FastTab, select a record that belongs to the group, and then select **Ungroup**.

- If you select a header record, the whole group will be ungrouped.
- If you select a member record, and it's the last member record in a group, the whole group will be ungrouped.
- If you select a member record that isn't the last member record in a group, that record will be excluded from the current group.

The following illustration shows the structure of an ER format that was configured to produce a zipped outbound file that contains a collection letter note and appropriate customer invoices in PDF format.



The following illustration shows the process, as described in this topic, of grouping individual components and enabling the **Email** destination for the new group, so that a collection letter note is sent together with appropriate customer invoices as email attachments.



Additional resources

- [Electronic reporting \(ER\) overview](#)
- [Electronic reporting \(ER\) destinations](#)
- [Formula designer in Electronic reporting \(ER\)](#)

NOTE

Can you tell us about your documentation language preferences? [Take a short survey.](#)

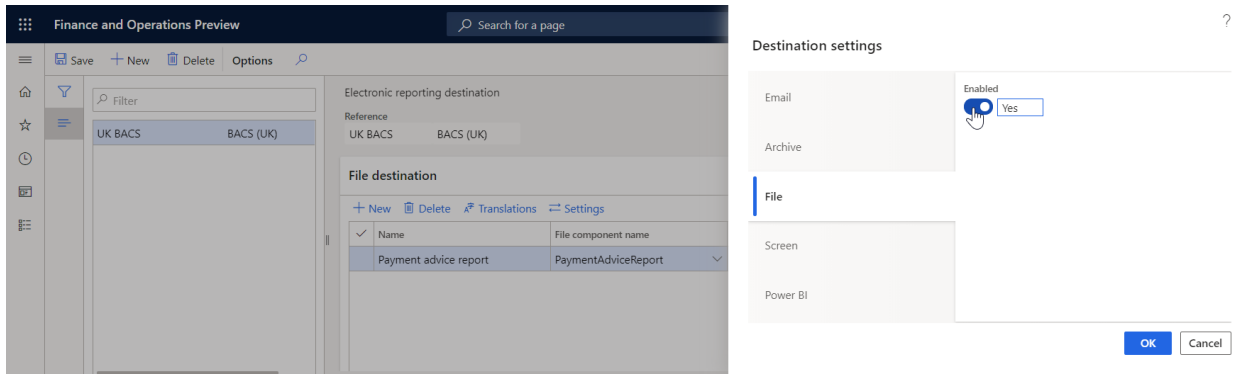
The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

File destination

2/18/2021 • 2 minutes to read • [Edit Online](#)

You can configure a file destination for each FOLDER or FILE component of an Electronic reporting (ER) format that is configured to generate outbound documents. Based on the setting of the destination, a generated document is available for download from the web browser.

On the **Destination settings** page, if you set **Enabled** to **Yes**, an open or save dialog box opens when the configuration has finished running.



Additional resources

- [Electronic reporting \(ER\) overview](#)
- [Electronic reporting \(ER\) destinations](#)

NOTE

Can you tell us about your documentation language preferences? [Take a short survey.](#)

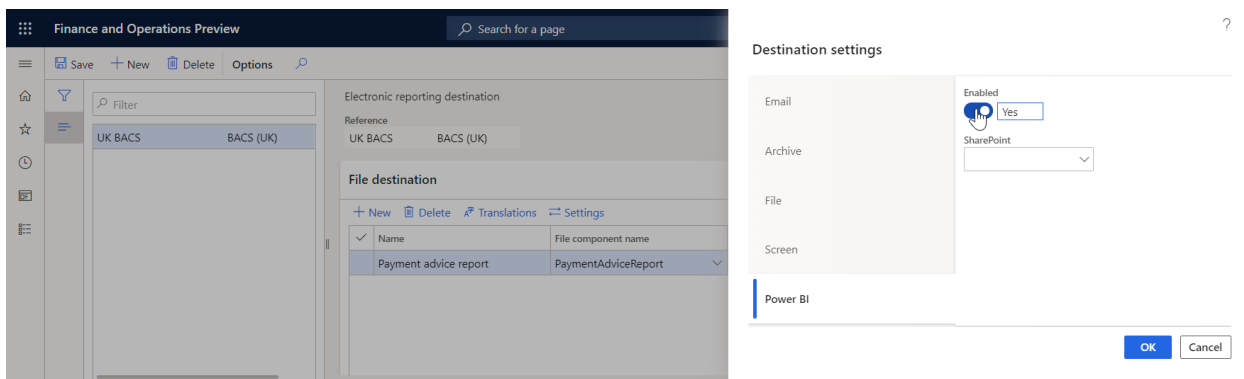
The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Power BI destination

2/18/2021 • 2 minutes to read • [Edit Online](#)

You can configure a Microsoft Power BI destination for each folder or file component of an Electronic reporting (ER) format that is configured to generate outbound documents. Based on the setting of the destination, a generated document is stored in a previously configured SharePoint folder.

Set **Enabled** to **Yes** to use your ER configuration to arrange the transfer of data from your Dynamics 365 Finance instance to Microsoft Power BI services. The transferred files are stored on a Microsoft SharePoint Server instance that must be configured for that purpose. For more information, see [Configure Electronic reporting \(ER\) to pull data into Power BI](#).



Additional resources

- [Electronic reporting \(ER\) overview](#)
- [Electronic reporting \(ER\) destinations](#)

NOTE

Can you tell us about your documentation language preferences? [Take a short survey](#).

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Printer destination

2/18/2021 • 2 minutes to read • [Edit Online](#)

You can send a generated document directly to a network printer for direct printing.

Prerequisites

Before you begin, you must install and configure the Document Routing Agent, and then register the network printers. For more information, see [Install the Document Routing Agent to enable network printing](#).

Make the Printer destination available

To make the **Printer** destination available in the current instance of Microsoft Dynamics 365 Finance, go to the **Feature management** workspace, and turn on the following features, in this order:

1. Convert Electronic Reporting outbound documents from Microsoft Office formats to PDF
2. Document Routing Agent as Electronic Reporting destination for outbound documents

Feature name ↑	Enable date	Feature added ↓	Module
Extended lookup of ER format configurations allowing to inquire the Global repository		1/14/2020	Organization administration
Convert Electronic Reporting outbound documents from Microsoft Office formats to PDF		1/6/2020	Organization administration
Document Routing Agent as Electronic Reporting destination for outbound documents		1/6/2020	Organization administration
Enable usage of EPPlus library in Electronic reporting framework		1/6/2020	Organization administration
Office-like UI experience for Business document management	1/15/2020	11/11/2019	Organization administration
Business document management	1/15/2020	6/3/2019	Organization administration

Document Routing Agent as Electronic...

Feature added 1/6/2020
Organization administration
[Learn more](#)

You cannot enable this feature. Please first enable the "Convert Electronic Reporting outbound documents from Microsoft Office formats to PDF" feature.

Description
Enable Document Routing Agent in Electronic Reporting framework to support network printing scenarios for outbound documents. This is a preview feature and is subject to the same terms of use described in the "Supplemental Terms of Use for Microsoft Dynamics 365 Previews" (<https://go.microsoft.com/fwlink/?linkid=2105274>).

Comments

[Schedule](#) [Enable now](#)

Applicability

The **Printer** destination can be configured only for file components that are used to generate output in either printable PDF format (PDF Merger or PDF file format elements) or Microsoft Office Excel/Word format (Excel file). When output is generated in PDF format, it's sent to a printer. When output is generated in Microsoft Office format, it's automatically converted to PDF format and then sent to a printer.

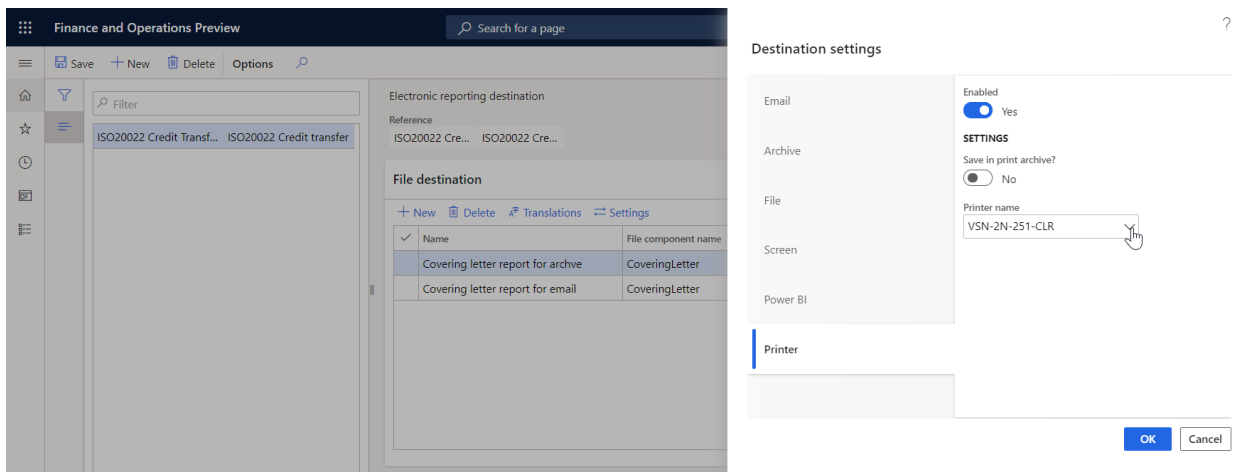
Limitations

This feature is a preview feature and is subject to the terms of use that are described in [Supplemental Terms of Use for Microsoft Dynamics 365 Previews](#).

The **Printer** destination is implemented only for cloud deployments.

Use the Printer destination

1. Set the **Enabled** option to **Yes** to send a generated document to a printer.
2. In the **Printer** name field, select the required network printer.
3. Set the **Save in print archive?** option to **Yes** to store the generated output in the print archive, so that it's available for further printing. To access archived output later, go to **Organization administration** > **Inquiries and reports** > **Report archive**.



NOTE

The **Convert to PDF** option doesn't have to be turned on when you configure the **Printer** destination. The PDF conversion for printing purposes will occur even if the option is turned off.

To use a specific [page orientation](#) when you print an outbound document in Excel format, you must turn on the **Convert to PDF** option. When you set the **Convert to PDF** option to **Yes**, the **Page orientation** field becomes available. In the **Page orientation** field, you can select a page orientation.

Additional resources

- [Electronic reporting \(ER\) overview](#)
- [Electronic reporting \(ER\) destinations](#)

NOTE

Can you tell us about your documentation language preferences? [Take a short survey.](#)

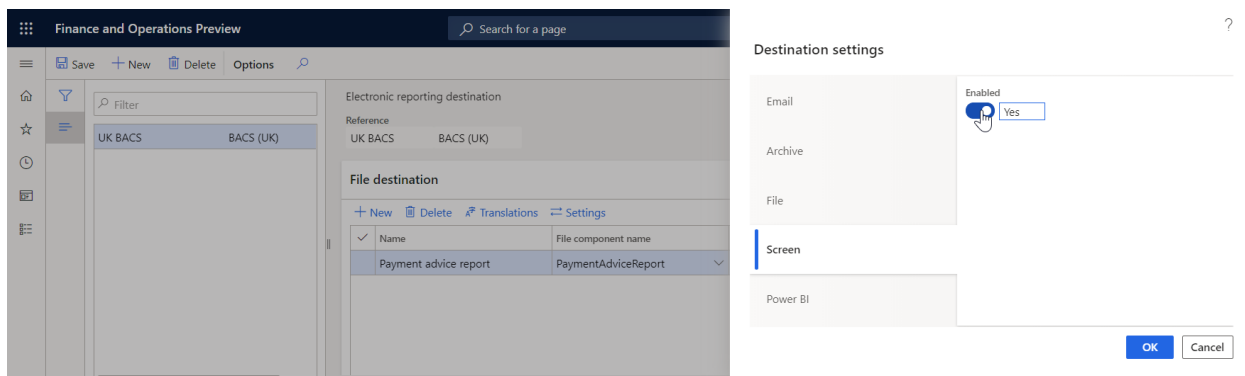
The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Screen destination

2/18/2021 • 2 minutes to read • [Edit Online](#)

You can configure a screen destination for each folder or file component of an Electronic reporting (ER) format that is configured to generate outbound documents. Based on the setting of the destination, a generated document is opened for preview in a separate browser tab.

If you set **Enabled** to **Yes**, a preview of the output is created. You can view some file types, such as XML, TXT, or PDF, directly in a browser window. For other file types, such as Microsoft Excel or Word, the Microsoft Office Online service is used.



Additional resources

- [Electronic reporting \(ER\) overview](#)
- [Electronic reporting \(ER\) destinations](#)

NOTE

Can you tell us about your documentation language preferences? [Take a short survey.](#)

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

ER Configure destinations

2/18/2021 • 2 minutes to read • [Edit Online](#)

This procedure demonstrates how to set up and use different destinations for Electronic reporting (ER) output components, such as a folder or a file. The demo data company used to create this procedure is DEMF. Germany is the country\region of the legal entity's primary address, however you can use any legal entity for this procedure.

The format used in this example is ISO20022 Credit transfer, but you can use any format that you have already imported. Note, this procedure is an example of a single file and a single destination setup. More information about Electronic reporting destination management can be found in the Dynamics 365 Finance Help.

1. Go to Organization administration > Electronic reporting > Electronic reporting destination.
2. Click New to create a new set of destinations for a format.
3. In the Reference field, select a format for which you want to configure destinations.
 - If you don't have a value to select, it means that you have not imported any Electronic reporting format configurations. You must import a format configuration before setting up destinations.
4. Click New to create a new file destination.
 - Note, you can create one file destination for each output component of the same format, such as a folder or a file. You will be able to enable and disable destinations separately in the settings.
5. In the Name field, enter the user-friendly name of output component.
 - We recommend that you use meaningful names, such as "Payment file" or "Control report". These names will be presented to users at configuration runtime along with the destination settings.
6. In the File name, select a file or folder that is specific to the format.
7. Click Settings.
8. Select Yes in the Enabled field.
 - The Enabled check box on each tab enables and disables each destination separately. In this example, you'll enable sending an output file to a mail recipient when the file is generated.
9. Click Edit, to set up email recipients.
10. Click Add.
11. Click Print Management email.
12. In the Email source field, select an option.
 - You can select different email source types, such as a customer or a vendor type. This defines the type of argument that will be returned by the Email source account formula. The Email source account formula, described in a following step, is the place where you bind an email source. Select Vendor if your formula will return a vendor account. Use Vendor if you are using the ISO 20022 Credit Transfer configuration example.
13. Click Email source bind button.
14. In the Formula, enter a document-specific reference to a party type that you selected earlier.
 - Instead of typing, you can find a data source node that represents the party account, and click the Add data source button to update the formula. For example, if you use the ISO 20022 Credit Transfer configuration, the node representing a vendor account is '\$PaymentsForCoveringLetter'.Creditor.Identification.SourceID. Otherwise, enter any string value, such as "DE-001", to save a formula.
15. Click Save.
16. Close the page.
17. Click Edit to configure contact details for the party.

18. Select Yes in the Primary contact field.

- You may use different options to indicate what contact type of the party should be used as an email address for this destination. We use primary contact in this example.

19. Click OK.

20. Click OK.

21. In the Subject field, type a value.

22. Click OK.

NOTE

Can you tell us about your documentation language preferences? [Take a short survey.](#)

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Allow users to set up an ER format reference inquiring a format from the Global repository

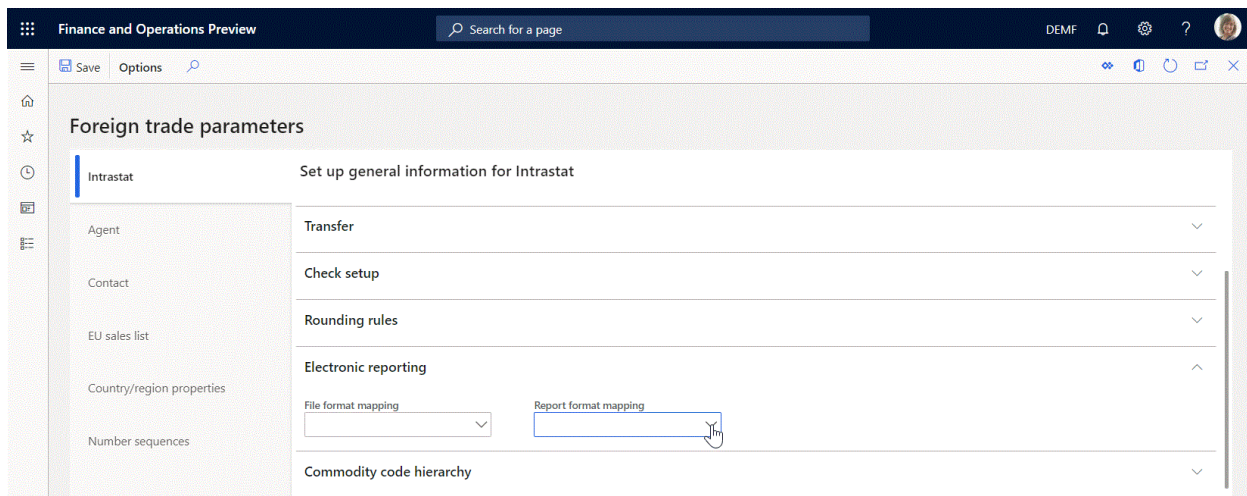
2/18/2021 • 4 minutes to read • [Edit Online](#)

You can use the [Electronic reporting](#) (ER) framework to configure [formats](#) for outbound documents in accordance to the legal requirements of various countries/regions. You can also use the ER framework to configure [formats](#) for parsing inbound documents and use the information from those documents to append or update application data. Each of these formats can be used in your Dynamics 365 Finance instance for handling inbound or outbound business documents as part of a certain business process.

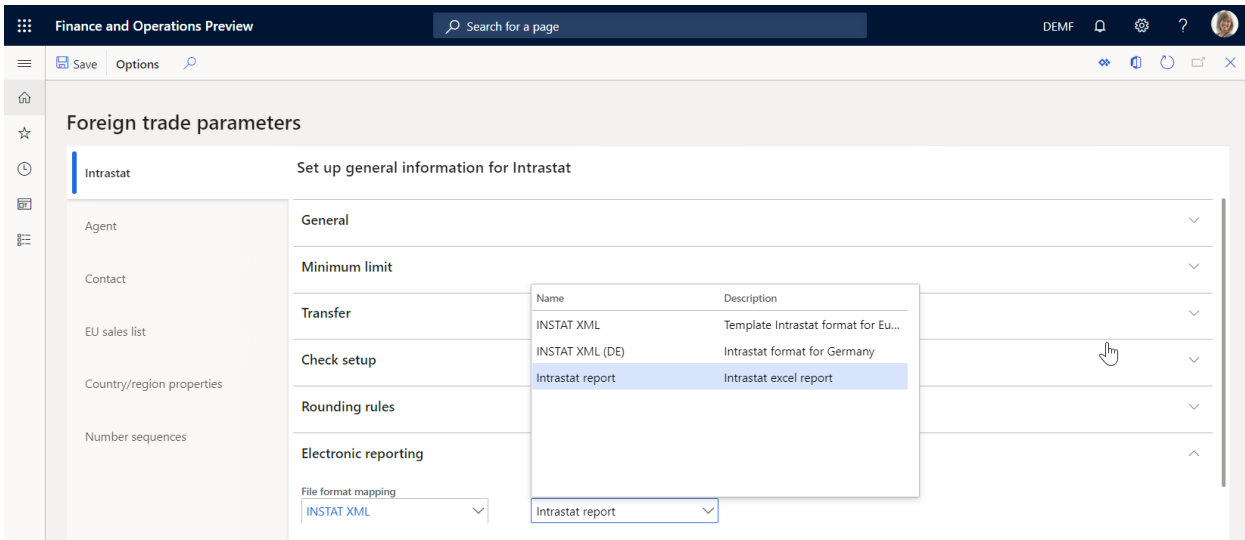
Usually, you must specify what ER format must be used in a certain business process. To do that, select a single ER format in a lookup field that is configured as part of business process-specific parameters. These lookup fields are usually implemented by using the appropriate API of the ER framework. For more information, see [ER framework API - code to display a format mapping lookup](#).

For example, when you configure [foreign trade parameters](#), you need to set up the references to individual ER formats that will be used to generate the Intrastat declaration and the Intrastat declaration control report. The screenshots below show how the ER formats lookup field looks like in the **Foreign trade parameters** page.

If the current Finance instance contains no Intrastat business process-related ER formats, this lookup field will be empty.

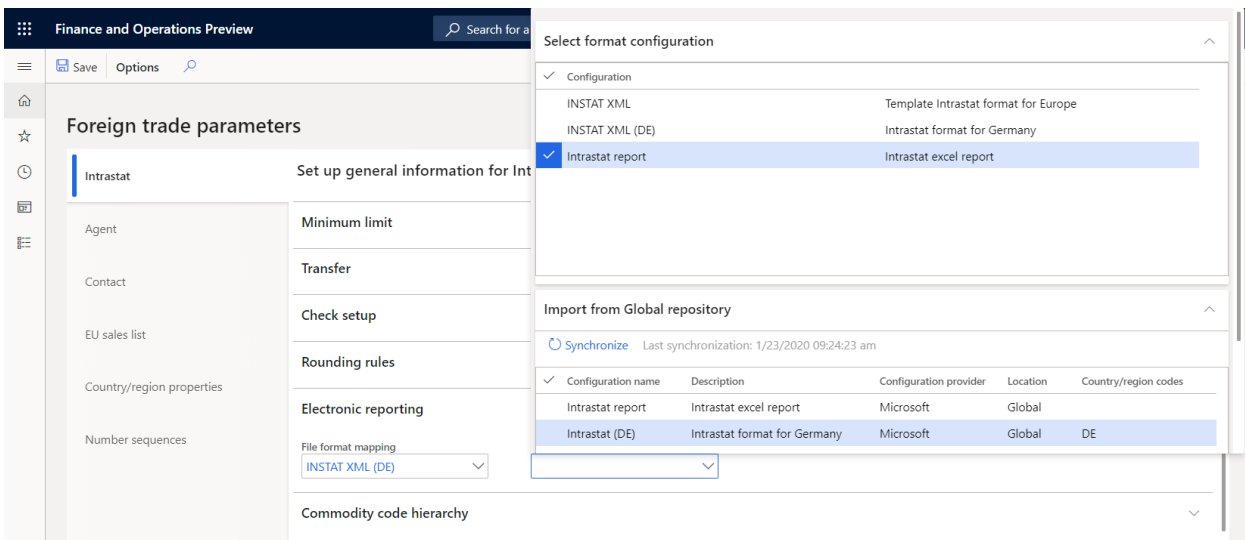


If the current Finance instance contains Intrastat business process related ER formats, this lookup field offers the ER formats.



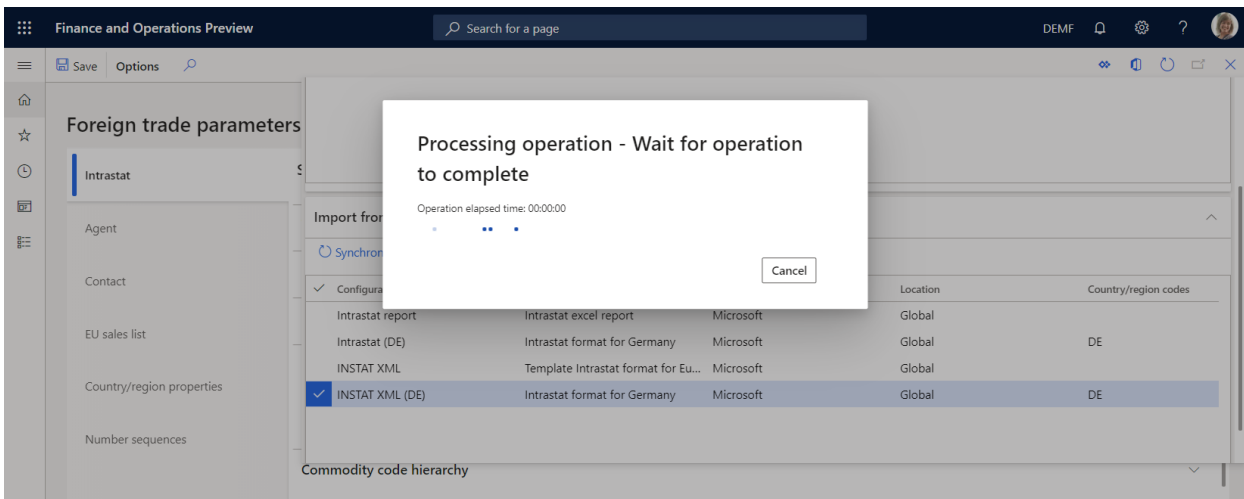
This lookup offers only the ER formats that have already been imported to the current Finance instance. To [import](#) ER solutions to the current Finance instance, you need to have permissions to run the appropriate function of the ER framework that supports the [lifecycle](#) of ER solutions that contain ER formats.

Starting in the Finance version 10.0.9 (April 2020 release), the user interface of the ER format lookup that is implemented by using the ER framework API, has been extended. You can still select the existing ER formats, which on the **Select format configuration** FastTab. In addition, the extended lookup offers the new option to search the Global repository (GR) to locate specific ER formats. All ER formats of the GR are offered on the **Import from Global repository** FastTab.

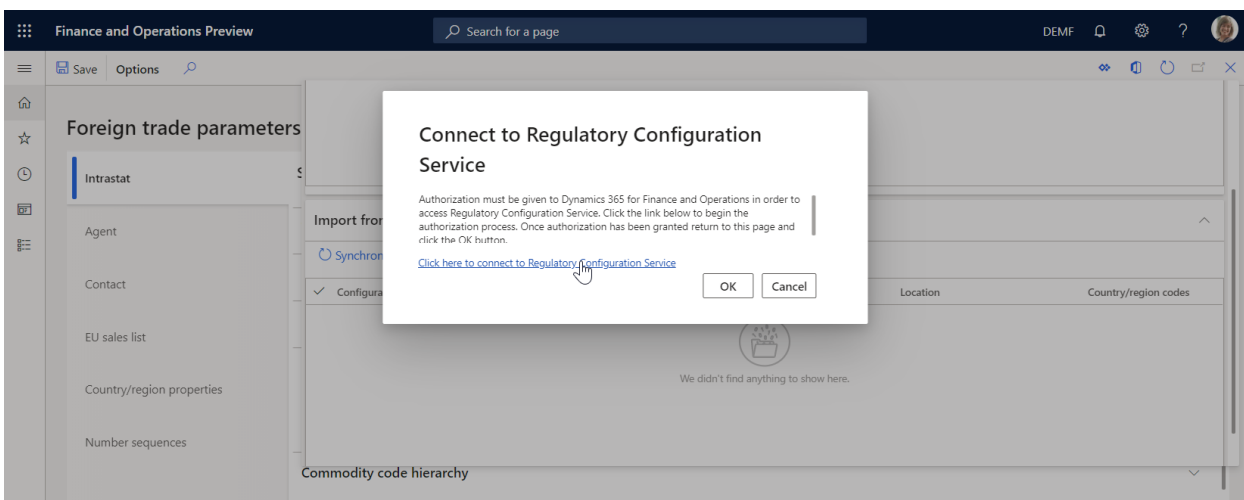


Similar to the **Select format configuration** FastTab, the **Import from Global repository** FastTab shows only the ER formats that are applicable to the business process for which an ER format is selected in this lookup field. In this example, the generation of Intrastat declaration. The ER format is applicable for the company to which the user is currently signed in, depending on the company country context.

When you select an ER format on the **Import from Global repository** FastTab, the selected ER format [configuration](#) is imported from the GR to the current Finance instance.



Then, if the import completes successfully, the reference to the imported ER format is stored in this lookup field. When you access the GR for the first time, you need to follow the link provided to sign up for the [Regulatory Configuration Service \(RCS\)](#) that is used to manage access to the GR storage.

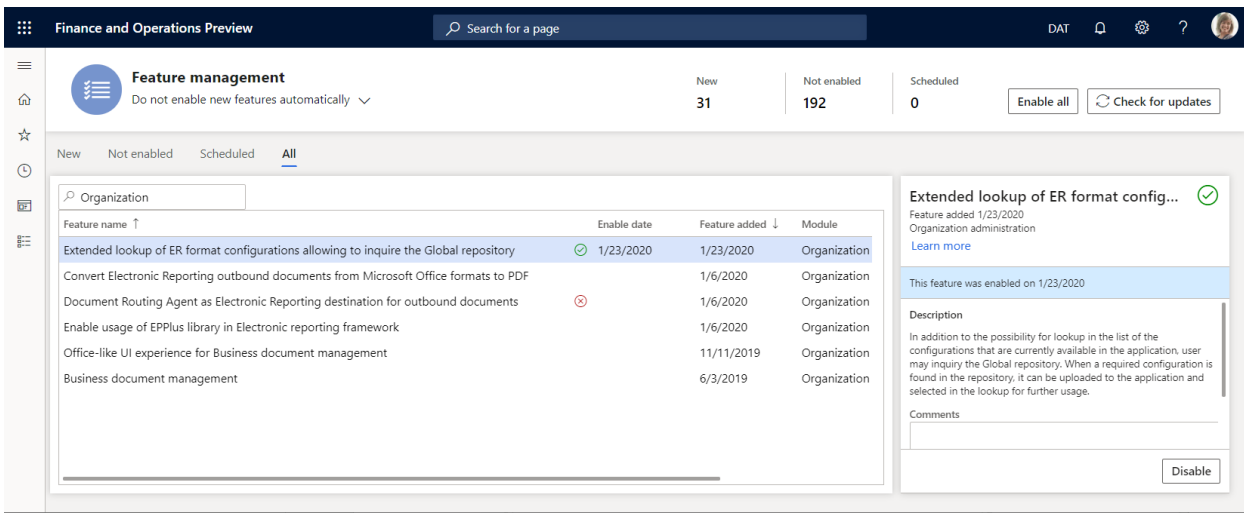


By default, the **Import from Global repository** FastTab presents the list of ER formats from the temporary storage that is automatically created based on the GR content for performance improvements. This happens when the **Import from Global repository** FastTab is opened the first time, which may take several seconds.

If you do not see the required ER format in the **Import from Global repository** FastTab, but you are sure that this ER format is stored in the GR, select the **Synchronize** option. This option will update the temporary storage and synchronize it with the current content of the GR.

Feature activation

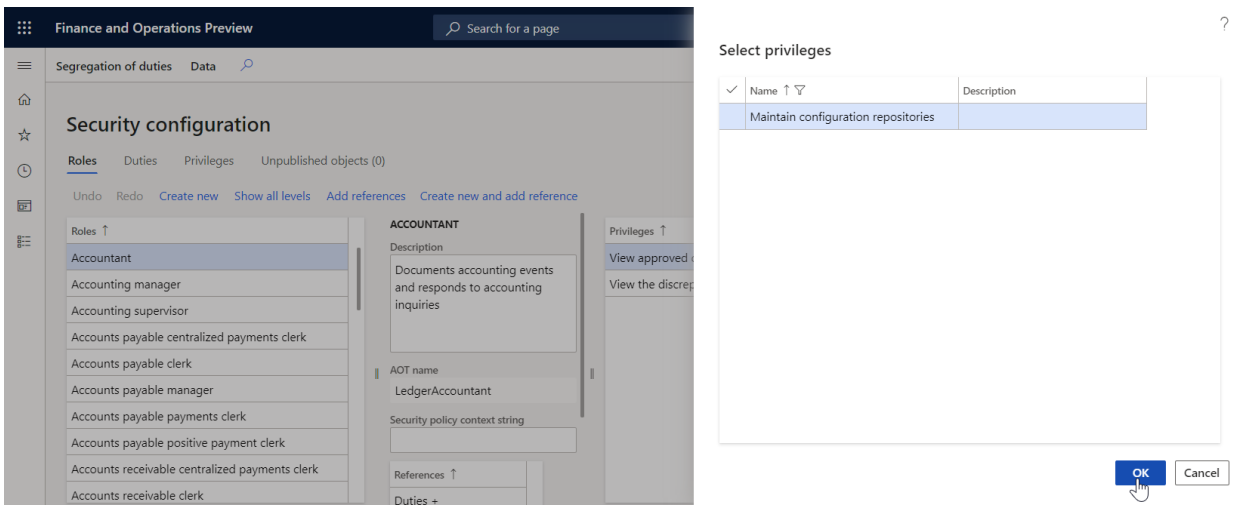
The availability of this functionality is controlled by the feature **Extended lookup of ER format configurations allowing to inquire the Global repository** in the **Feature management**. This feature is enabled by default.



Security considerations

The **Maintain configuration repositories (ERMaintainSolutionRepositories)** privilege controls access to the GR for a user opening the ER format lookup with the enabled **Import from Global repository** FastTab. To allow users to access the GR content from the ER format lookups, you need to change the security settings by granting the **ERMaintainSolutionRepositories** privilege to users either directly or by using already assigned roles and duties.

The following screenshot shows how this privilege can be granted to users who are assigned to the **Accountant** role. This role allows users to configure foreign trade parameters and set up references to the ER formats in the **File format mapping** and **Report format mapping** fields on the **Foreign trade parameters** page.



Limitations

Access to the GR in the ER format lookup is currently only supported for the selection of ER formats that are used to generate outbound documents.

Frequently asked questions

Why can't I access the Global repository from the ER format lookup?

If you have enabled the **Extended lookup of ER format configurations allowing to inquire the Global repository** feature on the **Feature management** page, but users can't see ER formats on the **Import from Global repository** FastTab and the **Synchronize** option is visible but disabled, make sure that the **Maintain configuration repositories (ERMaintainSolutionRepositories)** privilege has been granted to the user. Contact your system administrator to receive this privilege.

Additional resources

- [Electronic reporting \(ER\) overview](#)
- [Electronic reporting \(ER\) framework API](#)
- [Manage Electronic reporting \(ER\) configurations lifecycle](#)

NOTE

Can you tell us about your documentation language preferences? [Take a short survey](#).

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Trace generated report results and compare them with baseline values

2/18/2021 • 8 minutes to read • [Edit Online](#)

You can trace the results of Electronic reporting (ER) formats that generate outgoing electronic documents. When trace generation is turned on (by using the **Run in debug mode** ER user parameter), a new trace record is generated in the ER format execution log every time that an ER report is run. The following details are stored in each trace that is generated:

- All warnings that were generated by validation rules
- All errors that were generated by validation rules
- All generated files that are stored as attachments of the trace record

You can store individual baseline application files for any ER format. Files are considered baseline files when they describe the expected results of reports that are run. If a baseline file is available for an ER format that is run while trace generation is turned on, the trace stores, in addition to the details that were mentioned earlier, the result of the comparison of the generated electronic document with the baseline file. In one click, you can also get the generated electronic document and its baseline file in a single zip file. You can then do detailed comparison by using an external tool such as WinDiff.

You can evaluate the trace to analyze whether the electronic documents that are generated include the expected content. You can do this evaluation in a user acceptance testing (UAT) environment when the code base has been changed (for example, when you migrated to a new instance of the application, installed hotfix packages, or deployed code modifications). In this way, you can make sure that the evaluation doesn't affect the execution of ER reports that are used. For many ER reports, the evaluation can be done in unattended mode.

To learn more about this feature, play the **ER Generate reports and compare results (Part 1)** and **ER Generate reports and compare results (Part 2)** task guides, which are part of the **7.5.4.3 Test IT services/solutions (10679)** business process and can be downloaded from the [Microsoft Download Center](#). These task guides walk you through the process of configuring the ER framework to use baseline files to evaluate generated electronic documents.

Example: Trace generated report results and compare them with baseline values

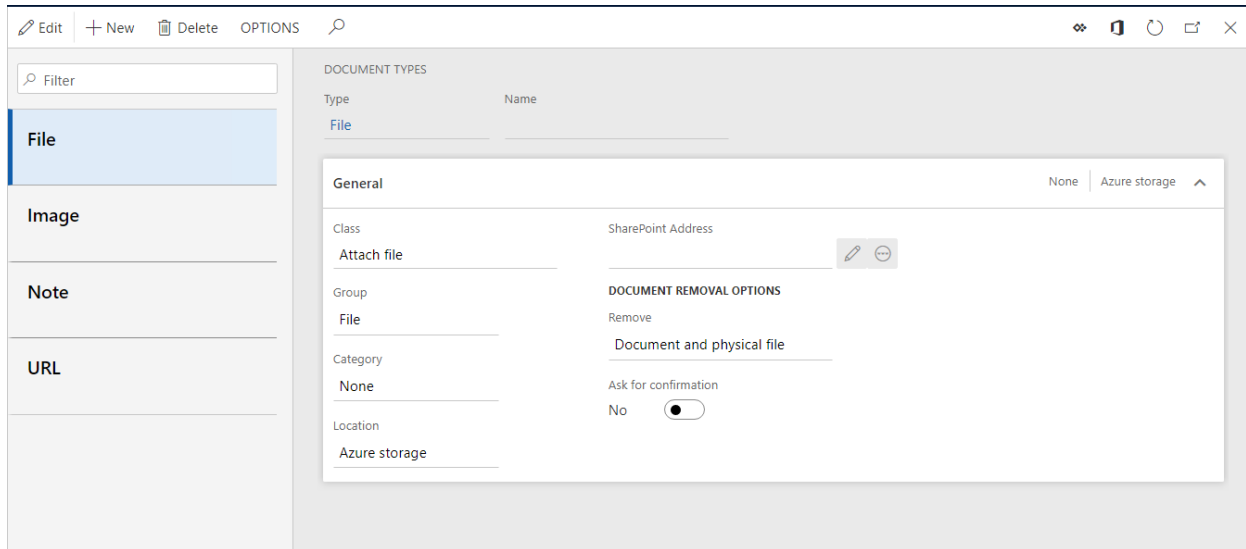
This procedure explains how to configure the ER framework to collect information about ER format executions and then evaluate the results of those executions. As part of that evaluation, generated documents are compared with their baseline files. In this example, you will create the required ER configurations for the Litware, Inc. sample company. This procedure is intended for users who have the System administrator or Electronic reporting developer role assigned to them. These steps can be completed by using any data set.

To complete the steps in this example, you must first complete the steps in [Create configuration providers and mark them as active](#).

1. Go to **Organization administration > Workspaces > Electronic reporting**.
2. On the **Localization configurations** page, in the **Configuration providers** section, verify that the configuration provider for the Litware, Inc. sample company is listed, and that it's marked as **Active**. If you don't see this configuration provider, follow the steps in [Create configuration providers and mark them as active](#).

Configure document management parameters

1. Go to **Organization administration > Document management > Document types**, and create a new document type to store baseline files.
2. In the **Class** field, enter **Attach file**.
3. In the **Group** field, enter **File**.

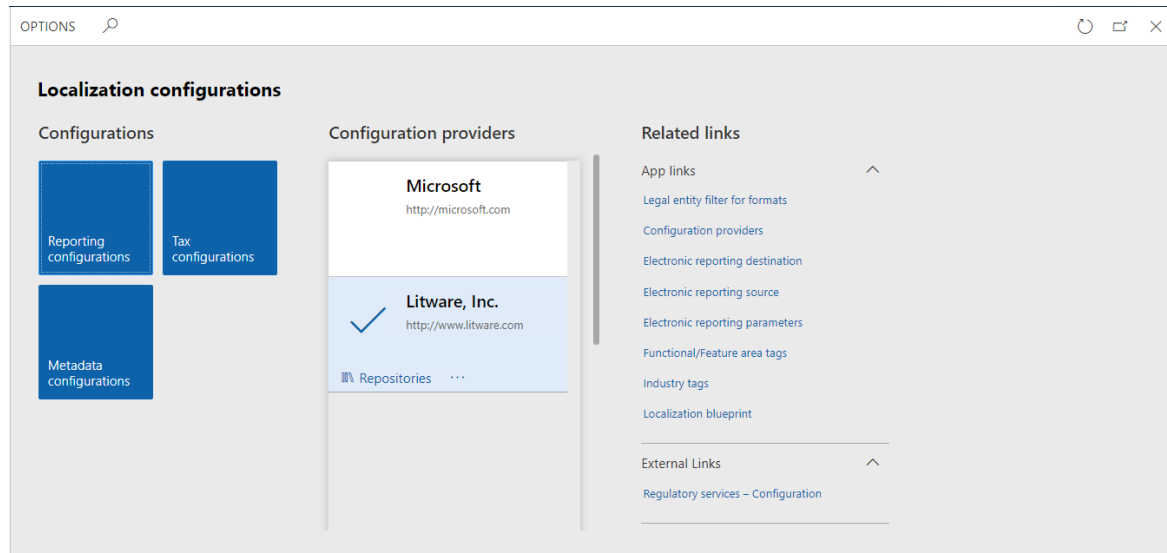


NOTE

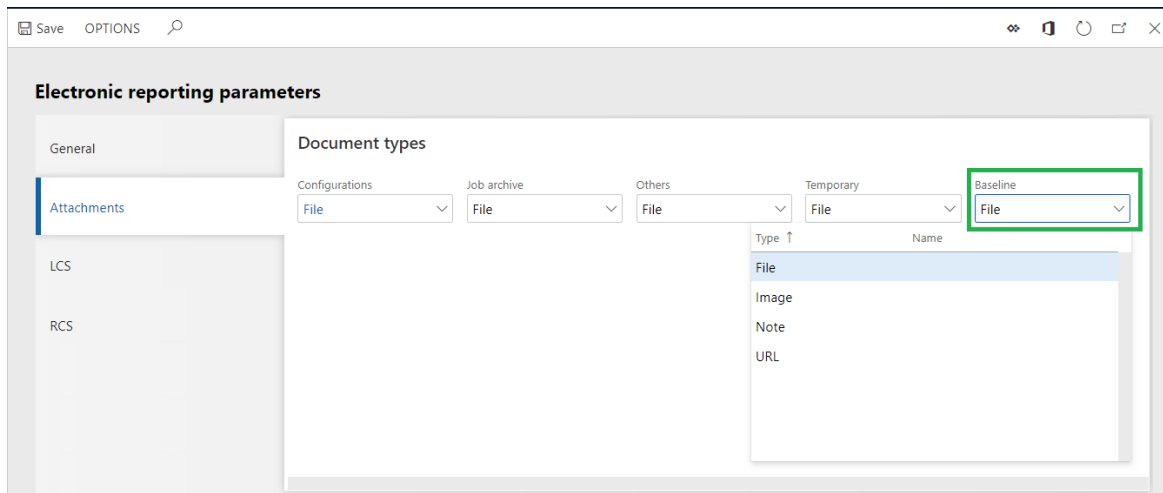
A new document type that has the same name must be configured for each data set where you plan to use the ER baseline feature.

Configure ER parameters to start to use the baseline feature

1. In the **Electronic reporting workspace**, in the **Related links** section, select **Electronic reporting parameters**.



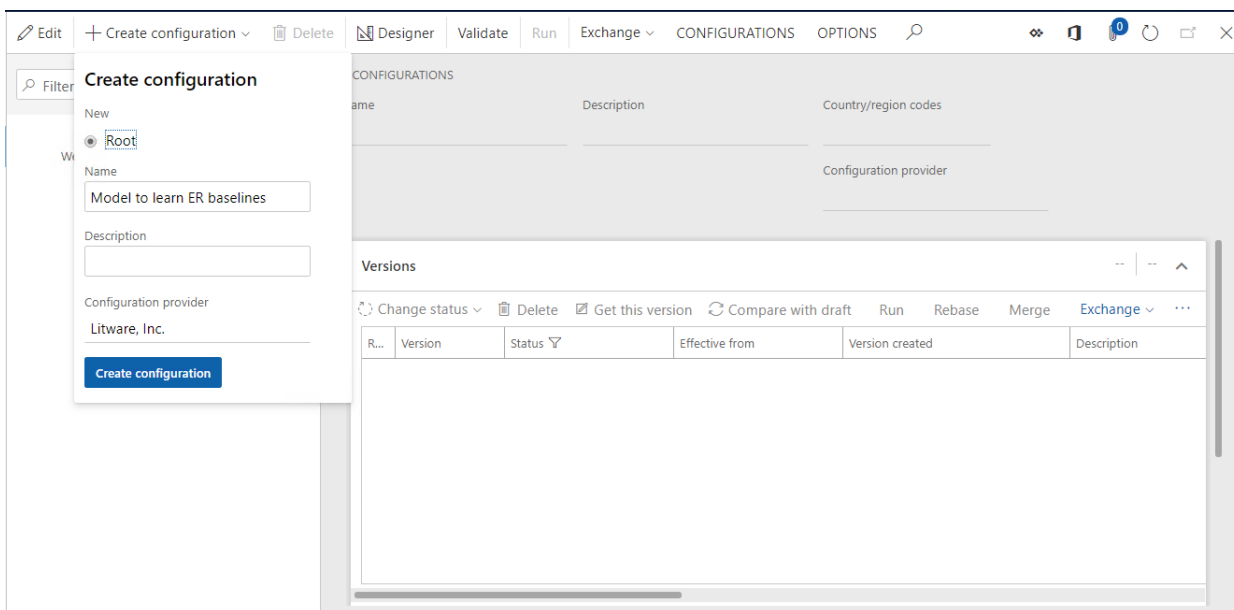
2. On the **Attachments** tab, in the **Baseline** field, enter or select the document type that you just created.



3. Select **Save**, and then close the **Electronic reporting parameters** page.

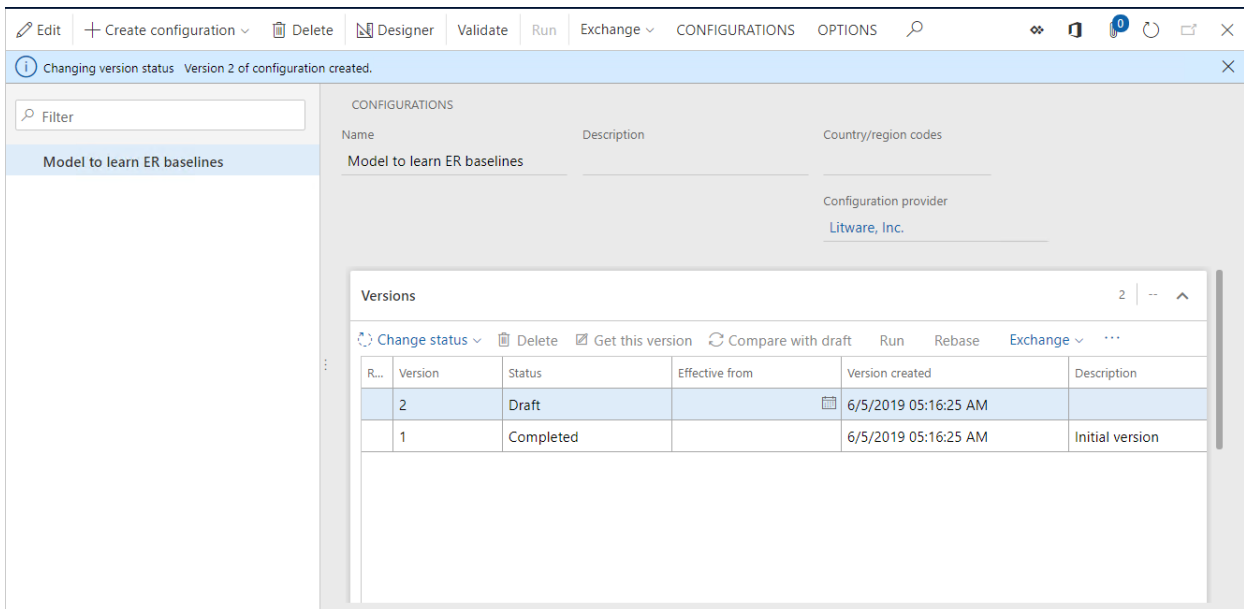
Add a new ER model configuration

1. In the **Electronic reporting workspace**, in the **Configurations** section, select the **Reporting configurations** tile.
2. On the **Action Pane**, select **Create configuration**.
3. In the drop-down dialog box, in the **Name** field, enter **Model to learn ER baselines**.
4. Select **Create configuration** to confirm the creation of a new ER data model entry.



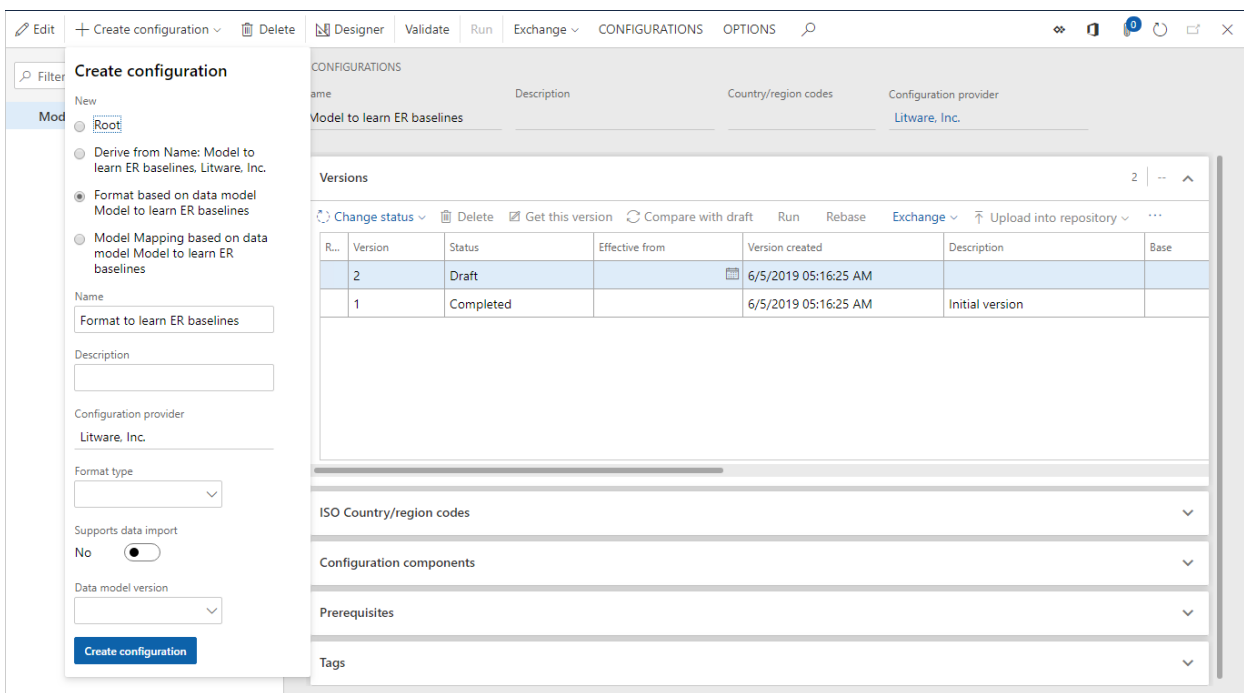
Design a data model

1. On the **Configurations** page, on the **Action Pane**, select **Designer**.
2. Select **New**.
3. In the drop-down dialog box, in the **Name** field, enter **Root**.
4. Select **Add**.
5. Select **Root reference**.
6. Select **OK**, and then select **Save**.
7. Close the **Model designer** page.
8. Select **Change status**.
9. Select **Complete**, and then select **OK**.



Add a new ER format configuration

1. On the **Configurations** page, on the Action Pane, select **Create configuration**.
2. In the drop-down dialog box, in the **New** field group, select **Format based on data model Model to learn ER baselines**.
3. In the **Name** field, enter **Format to learn ER baselines**.
4. Select **Create configuration** to confirm the creation of a new ER format entry.

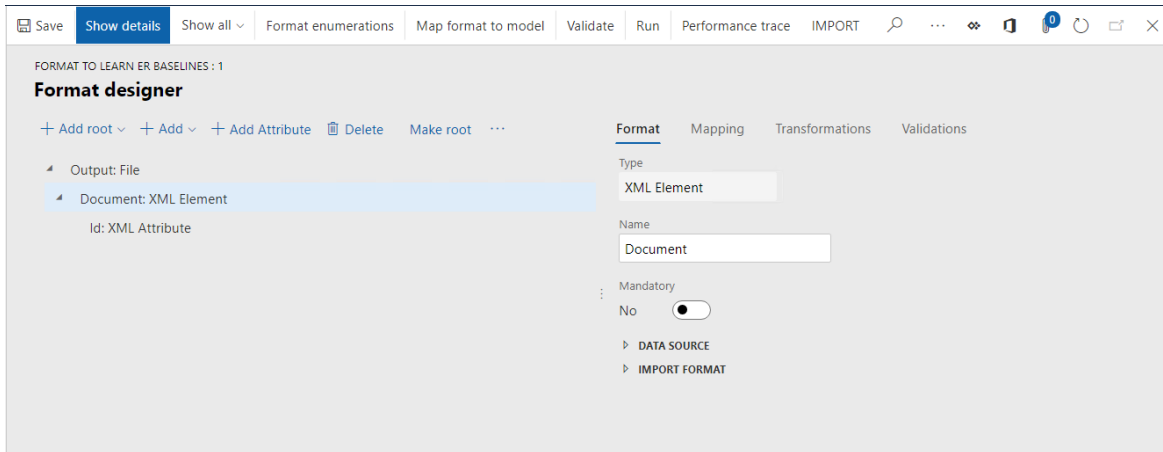


Design a format

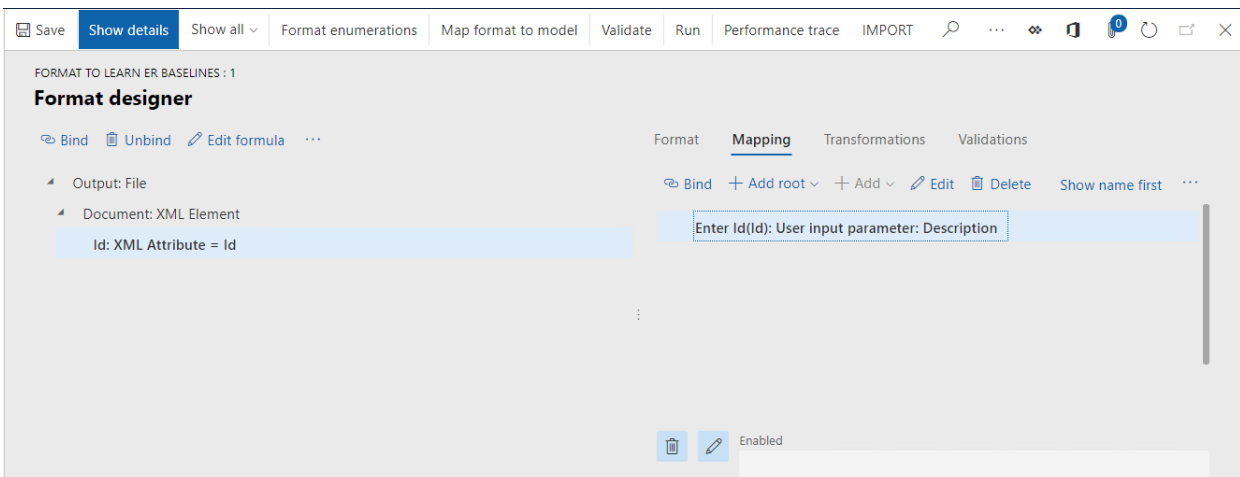
For this example, you will create a simple ER format to generate XML documents.

1. On the **Configurations** page, on the Action Pane, select **Designer**.
2. Select **Add root**.
3. In the drop-down dialog box, follow these steps:
 - a. In the tree, select **Common\File**.
 - b. In the **Name** field, enter **Output**.
 - c. Select **OK**.

4. Select **Add**.
5. In the drop-down dialog box, follow these steps:
 - a. In the tree, select **XML\Element**.
 - b. In the **Name** field, enter **Document**.
 - c. Select **OK**.
6. In the tree, select **Output\Document**.
7. Select **Add**.
8. In the drop-down dialog box, follow these steps:
 - a. In the tree, select **XML\Attribute**.
 - b. In the **Name** field, enter **ID**.
 - c. Select **OK**.



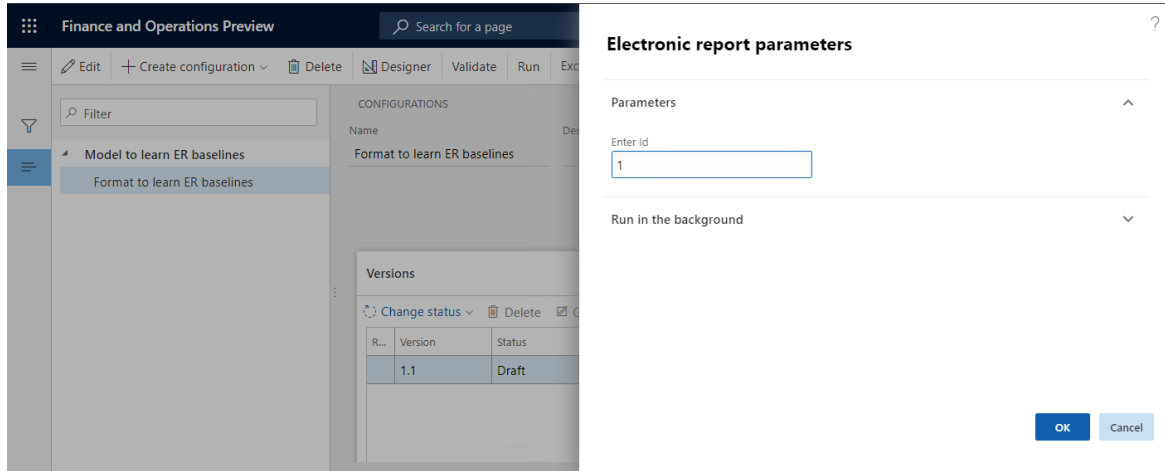
9. On the **Mapping** tab, select **Delete**.
10. Select **Add root**.
11. In the drop-down dialog box, in the tree, select **General\User input parameter**, and then follow these steps:
 - a. In the **Name** field, enter **ID**.
 - b. In the **Label** field, enter **Enter ID**.
 - c. Select **OK**.
12. In the tree, select **Output\Document\Id**.
13. Select **Bind**, and then select **Save**.



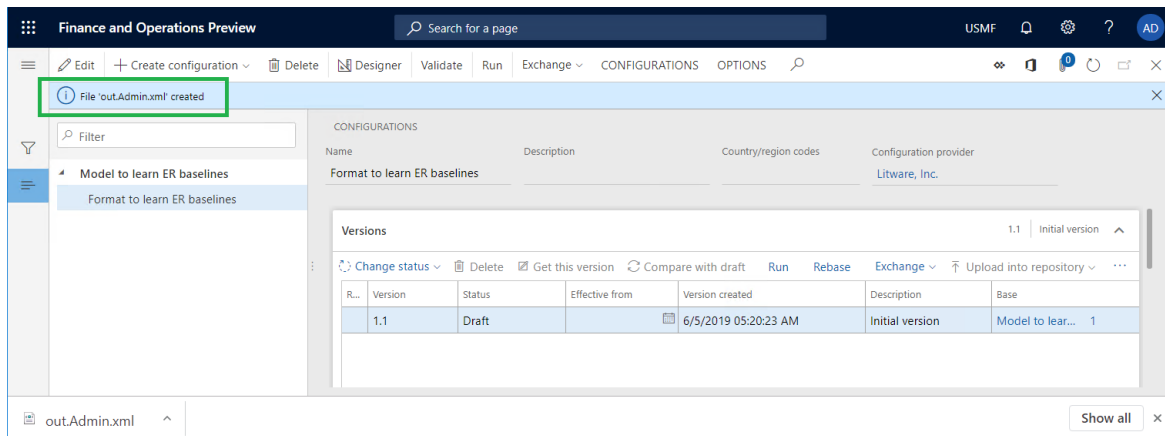
Based on the designed structure, the configured format will generate an XML file. This XML contains the Root element that has the ID attribute that is set to the value that the user enters in the ER runtime dialog box.

Generate a new baseline file for a designed ER format

1. On the Configurations page, on the Versions FastTab, select Run.
2. In the Enter ID field, enter 1.
3. Select OK.

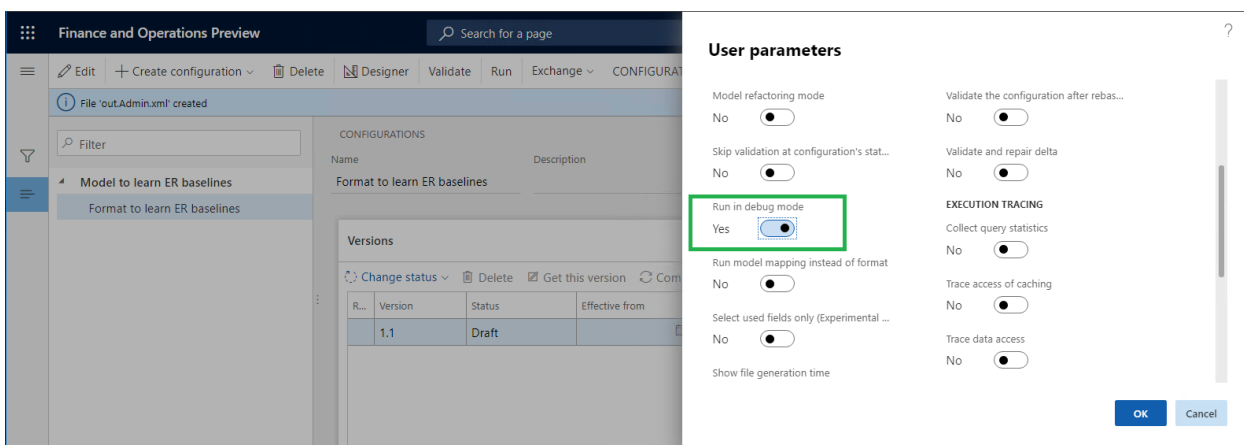


4. Save a local copy of the out.Admin.xml file that is generated, so that you can use it later as a baseline for this ER format.



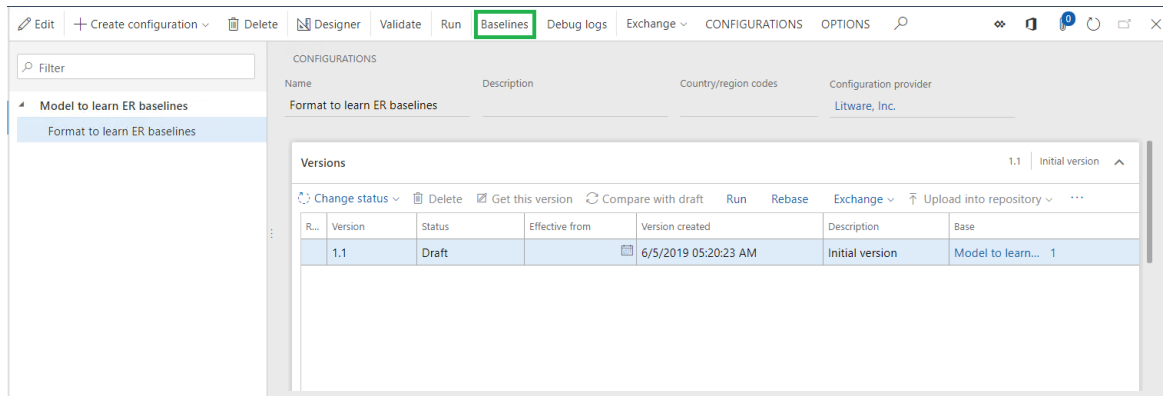
Configure ER parameters to use the baseline feature

1. On the Configurations page, on the Action Pane, on the Configurations tab, select User parameters.
2. Set the Run in debug mode option to Yes.
3. Select OK.

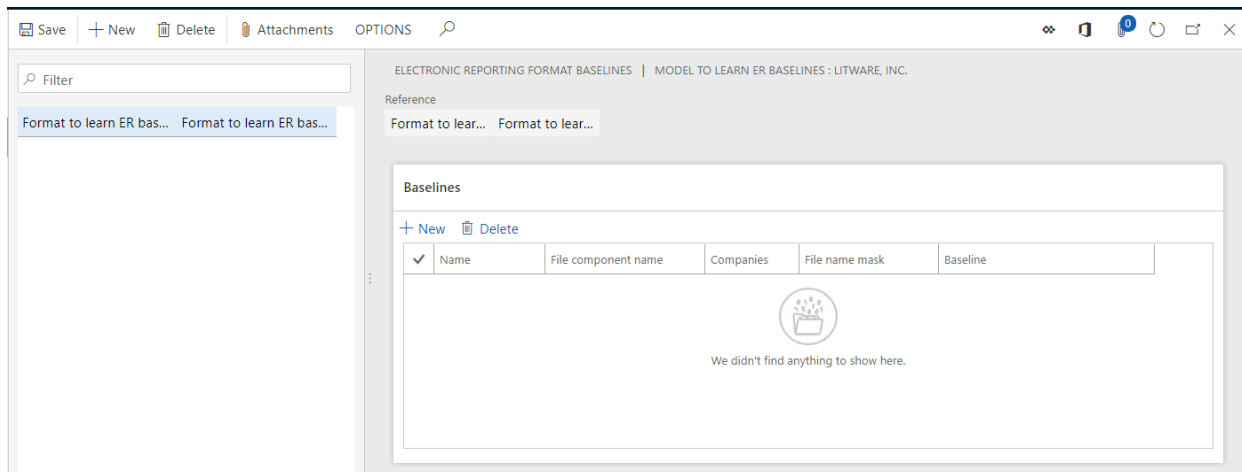


Add a new baseline for designed ER format

1. Go to **Organization administration > Electronic reporting > Configurations**.
2. On the Action Pane, select **Baselines**.



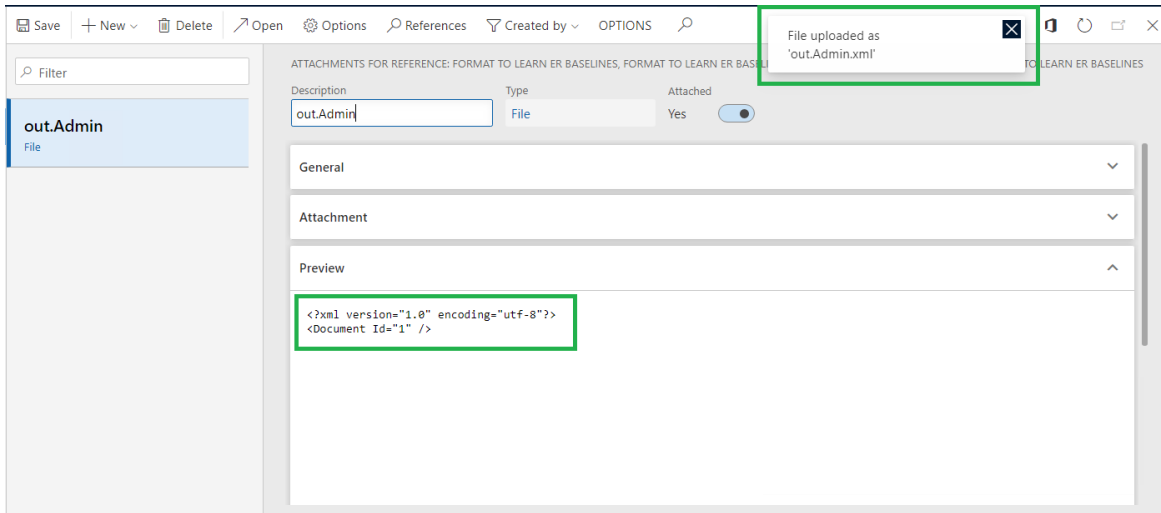
3. On the Action Pane, select **New**.
4. Select the **Format to learn ER baselines** ER format that you designed earlier.
5. Select **Save**.



The baseline is added for the **Format to learn ER baselines** format.

Configure a baseline rule for the added baseline

1. On the **Electronic reporting format baselines** page, on the Action Pane, select the **Attachments** button (the paper clip symbol).
2. On the Action Pane, select **New > File**. In the ER parameters, the **File** document type should have been previously selected as the document type that is used to store baseline files.
3. Select **Browse**, and select the **out.Admin.xml** file that was generated when you ran the configured ER format earlier.

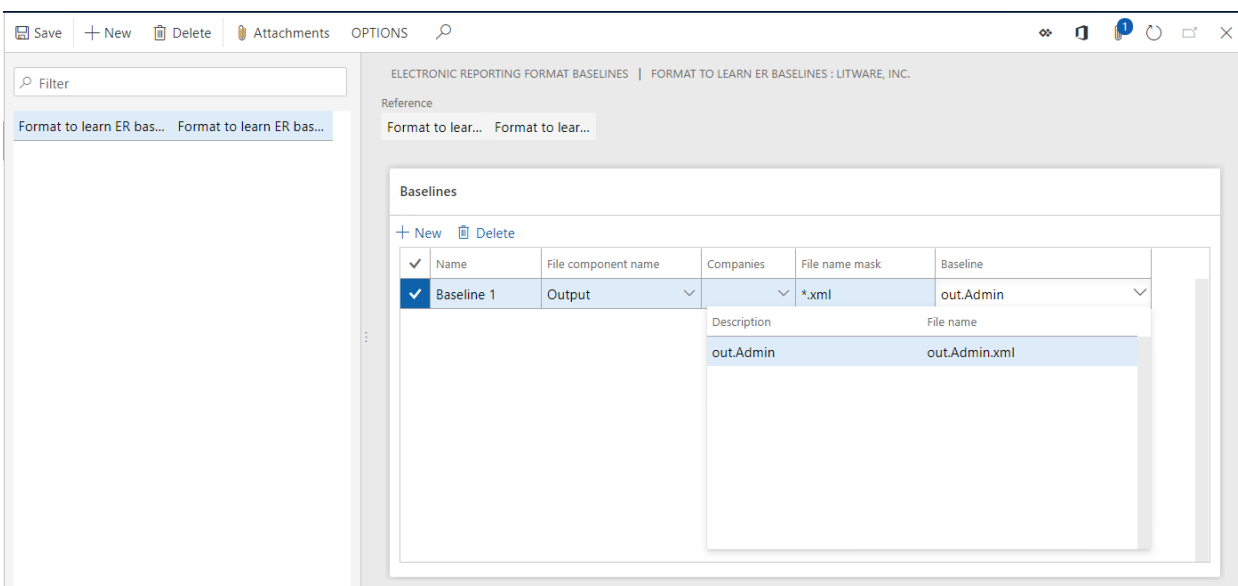


4. Close the **Attachments** page.
5. On the **Baselines** FastTab, select **New**.
6. In the **Name** field, enter **Baseline 1**.
7. In the **File component name** field, enter or select **Output**. This value indicates that the configured baseline will be compared with a file that is generated by using the **Output** format element.
8. In the **File name mask** field, enter ***.xml**.

NOTE

You can define the file name mask. When the file name mask is defined, the baseline record will be used to evaluate the generated output only when the name of the output file that is generated satisfies that mask.

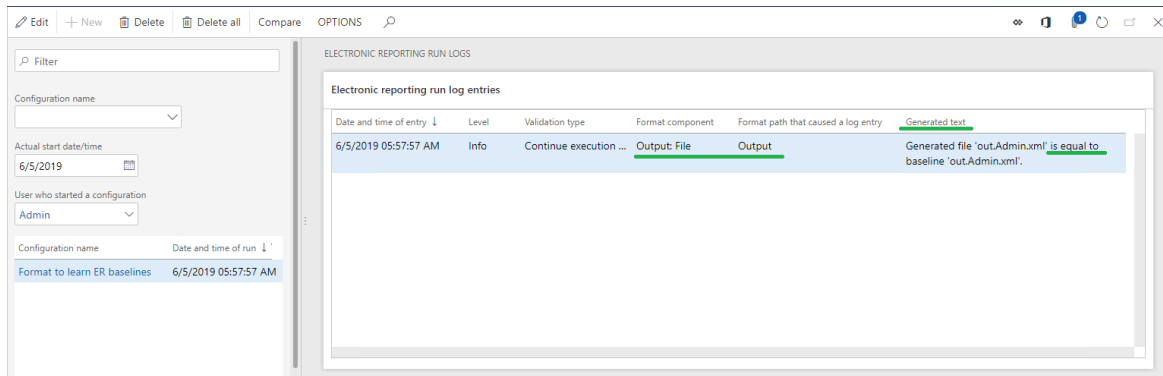
9. If the configured baseline should be used only when the **Format to learn ER baselines** ER format is run by users who are signed in to specific companies, select those companies in the **Companies** field.
10. In the **Baseline** field, enter or select the **out.Admin** attachment.
11. Select **Save**.



Run the designed ER format and review the log to analyze the results

1. Go to **Organization administration > Electronic reporting > Configurations**.

- In the tree, expand **Model to learn ER baselines**, and then select **Model to learn ER baselines\Format to learn ER baselines**.
- On the **Versions** FastTab, select **Run**.
- In the **Enter ID** field, enter **1**.
- Select **OK**.
- Go to **Organization administration > Electronic reporting > Configuration debug logs**.



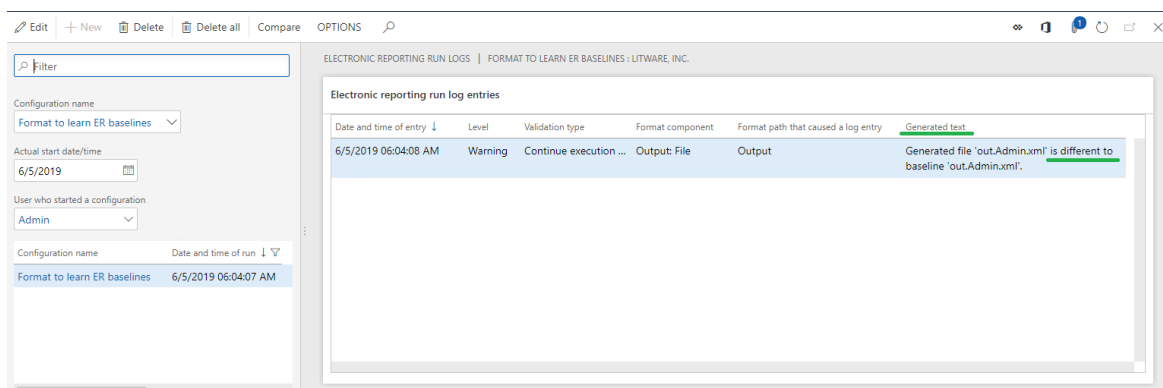
NOTE

The execution log contains information about the results of the comparison of the generated file with the configured baseline. In this example, the log indicates that the generated file and the baseline are equal.

- Select **Delete all**.

Run the designed ER format and review the log to analyze the results

- Go to **Organization administration > Electronic reporting > Configurations**.
- In the tree, expand **Model to learn ER baselines**, and then select **Model to learn ER baselines\Format to learn ER baselines**.
- On the **Versions** FastTab, select **Run**.
- In the **Enter ID** field, enter **2**.
- Select **OK**.
- Go to **Organization administration > Electronic reporting > Configuration debug logs**.



NOTE

The execution log contains information about the results of the comparison of the generated file with the configured baseline. In this example, the log indicates that the generated file and the baseline differ.

7. Select **Compare**.

NOTE

The generated file and the baseline file are offered as a zip file. You can use external comparison tools such as WinDiff to compare the files and review the differences.

Additional resources

- [Configure the Electronic reporting \(ER\) framework](#)

NOTE

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Improvements in tracing the results of generated ER reports and comparing them with baseline values

2/18/2021 • 7 minutes to read • [Edit Online](#)

This topic describes the first set of improvements that have been made to the baseline feature of the Electronic reporting (ER) framework. These improvements are available in Microsoft Dynamics 365 for Finance and Operations version 10.0.3 (June 2019) and later.

Automate the setting of baseline rules

The [Trace generated report results and compare them with baseline values](#) topic explains how to configure the ER framework to collect information about ER format executions and evaluate the results of those executions. The example in this topic shows the steps that must be completed.

Here are some of the steps:

- Run an ER format to generate an outbound file, and store the file locally.
- Add the locally stored file as an attachment of the baseline that was added for an ER format.
- Configure the baseline rule for the added baseline. This configuration includes the following steps:
 - Specify an ER format element that is used to generate an outbound file.
 - Select the attachment that refers to the generated outbound file.

NOTE

These steps must be done manually, even though the new ER capabilities enable them to be automated. To learn more about this feature, complete the following example.

Example: Automate the setting of baseline rules

To complete the steps in this example, you must first complete the steps in the example in the [Trace generated report results and compare them with baseline values](#) topic, up through the "Add a new baseline for a designed ER format" section.

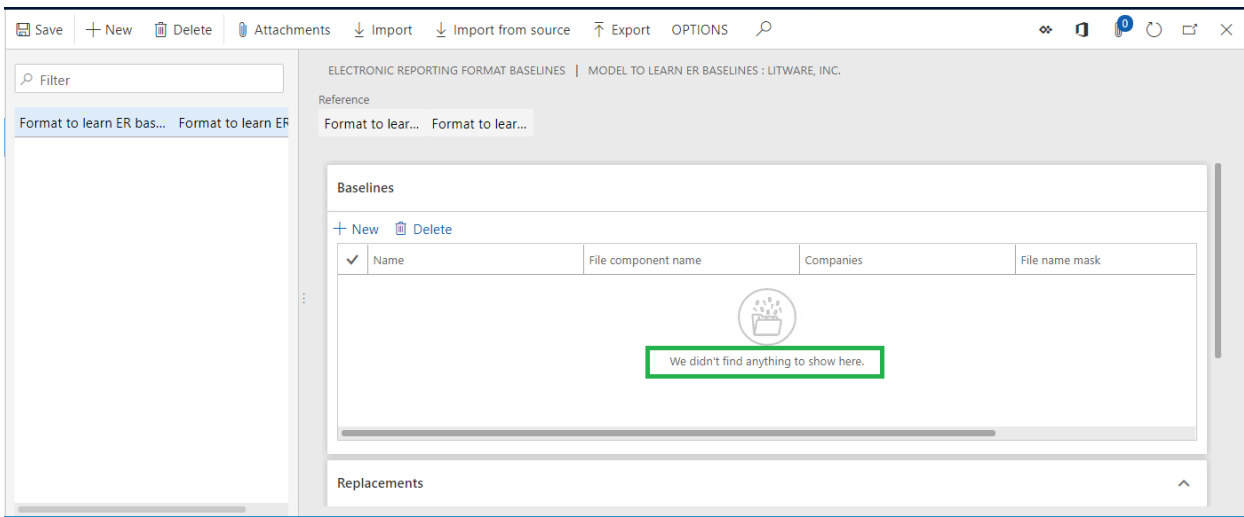
Review added baseline

1. Go to **Organization administration > Electronic reporting > Configurations**.
2. Select **Baselines**.

NOTE

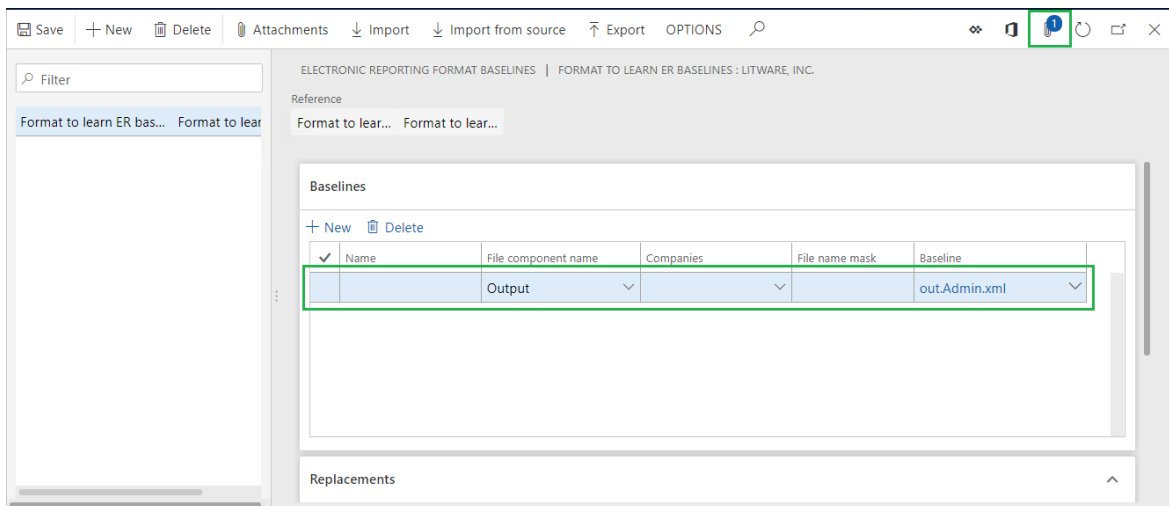
The **Baselines** button on the Action Pane is available only when the **Run in debug mode** ER user parameter is turned on for the current company.

The baseline has been added for the selected **Format to learn ER baselines** format, but the baseline rules haven't yet been added for this baseline.



Make a new baseline rule

1. Go to **Organization administration > Electronic reporting > Configurations**.
2. In the tree, expand **Model to learn ER baselines**.
3. In the tree, select **Model to learn ER baselines\Format to learn ER baselines**.
4. On the **Versions** FastTab, select **Run**.
5. In the **Enter Id** field, enter **1**.
6. Set the **Make baseline files** option to **Yes**.
7. Select **OK**.
8. Select **Baselines**.



The generated outbound file has been automatically attached to the baseline of the executed ER format. The baseline rule has been automatically added to this baseline and also contains the reference to the attached file.

9. In the **Name** field, enter **Baseline 1**.
10. In the **File name mask** field, enter **.xml**.
11. Select **Save**.

Run the format

You're now ready to complete the remaining steps in the example in the [Trace generated report results and compare them with baseline values](#) topic, starting from the "Run the designed ER format and review the log to

analyze the results" section.

NOTE

When you delete the automatically added baseline rule on the **Baselines** FastTab, the referenced attachment isn't automatically deleted.

Configure the baseline so that it ignores constantly changing parts of the ER output

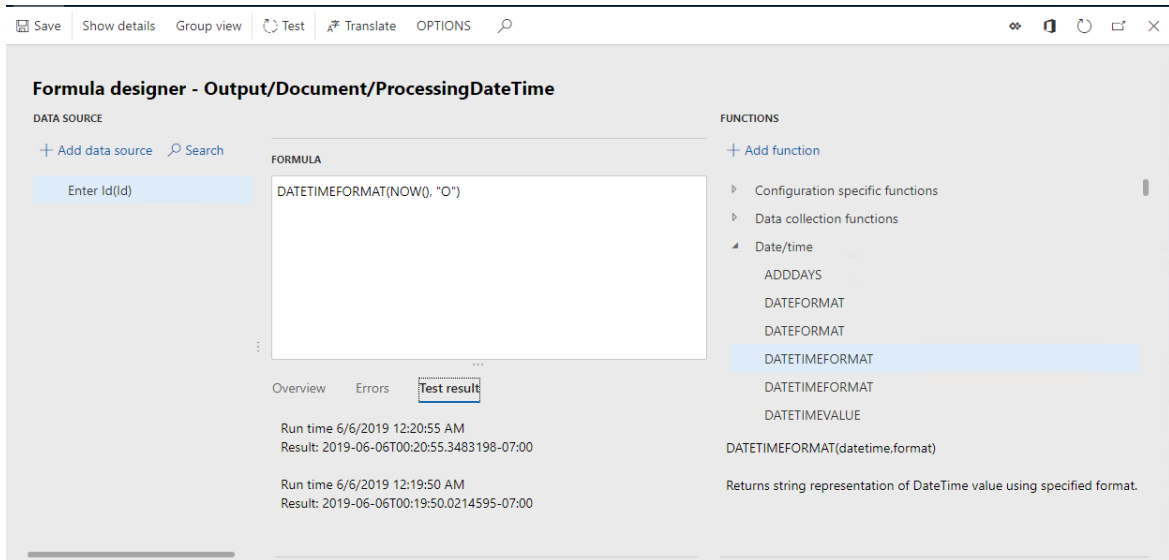
When an ER format has been designed to contain information that is changed when the format is run, the format must be required to use the ER baseline feature to compare the generated results with baseline values. For example, the information might be the processing date and time or the unique identifier of a generated document in different formats (globally unique identifier [GUID], and so on). The new ER capabilities let you configure the baseline rule so that it ignores changeable elements of an ER format when the format is run with the purpose of comparing baseline values with the results of the format's execution. To learn more about this feature, complete the following example.

Example: Configure the baseline so that it ignores constantly changing parts of the ER output

To complete the steps in this example, you must first complete the steps in the example in the [Trace generated report results and compare them with baseline values](#) topic.

Modify a configured ER format

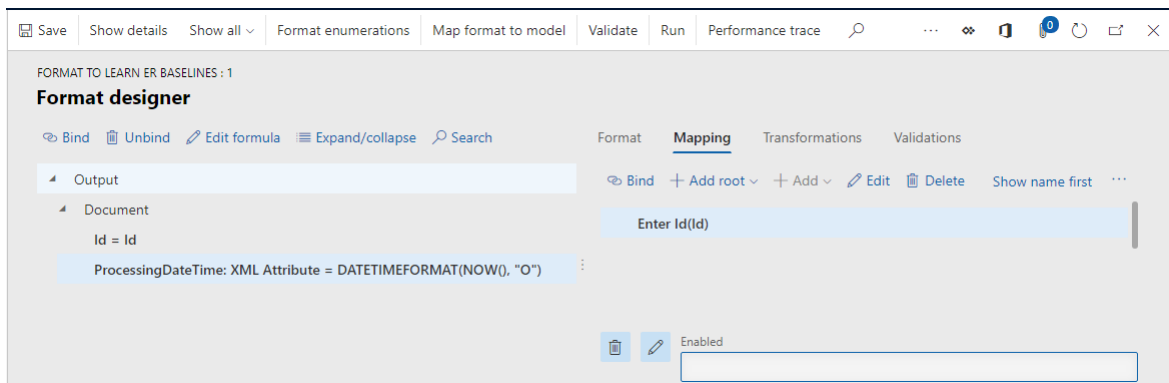
1. Go to **Organization administration > Electronic reporting > Configurations**.
2. In the tree, expand **Model to learn ER baselines**.
3. In the tree, select **Model to learn ER baselines\Format to learn ER baselines**.
4. Select **Designer**.
5. In the tree, select **Output\Document**.
6. Select **Add**.
7. In the drop-down dialog box, in the tree, select **XML\Attribute**.
8. In the **Name** field, enter **ProcessingDateTime**.
9. Select **OK**.
10. On the **Mapping** tab, in the tree, select **Output\Document\ProcessingDateTime**.
11. Select **Edit formula**.
12. In the **Formula** field, enter the following expression: `DATETIMEFORMAT(NOW(), "O")`
13. Select **Save**, and then select **Test**.
14. Select **Test** again to retest the configured expression.



NOTE

The **Test result** tab shows that the configured expression returns a different date and time value whenever it's called.

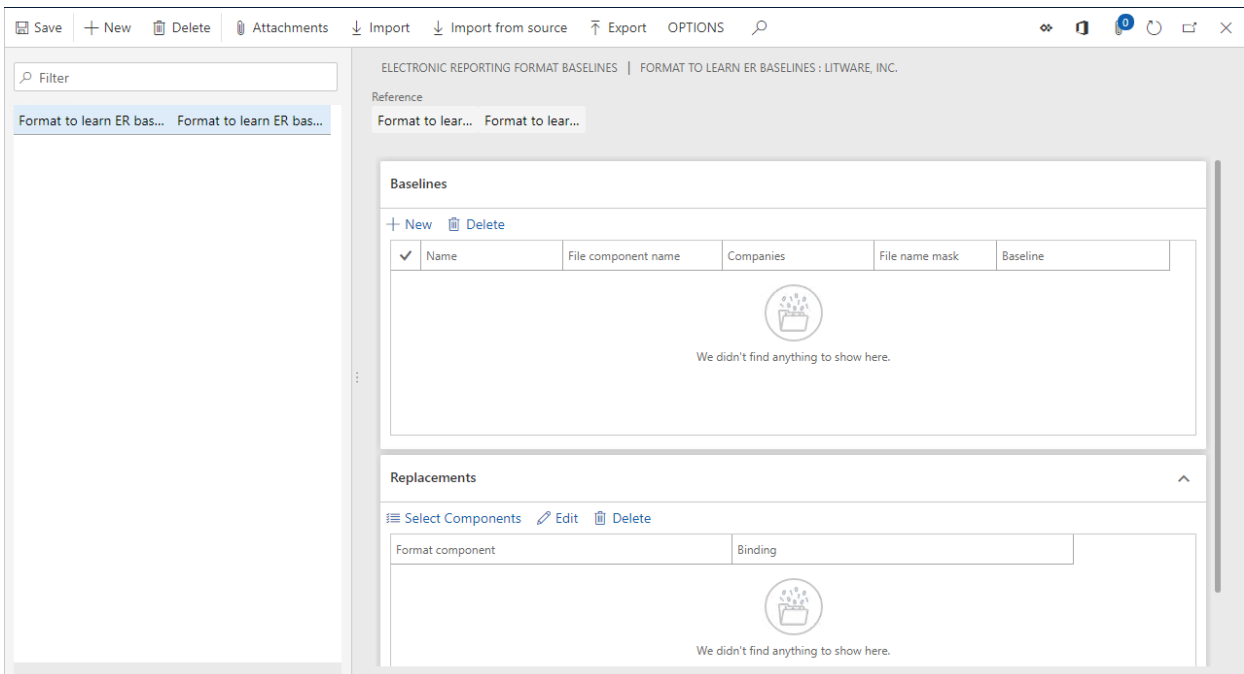
15. Close the Formula designer page, and then select **Save**.



16. Close the Format designer page.

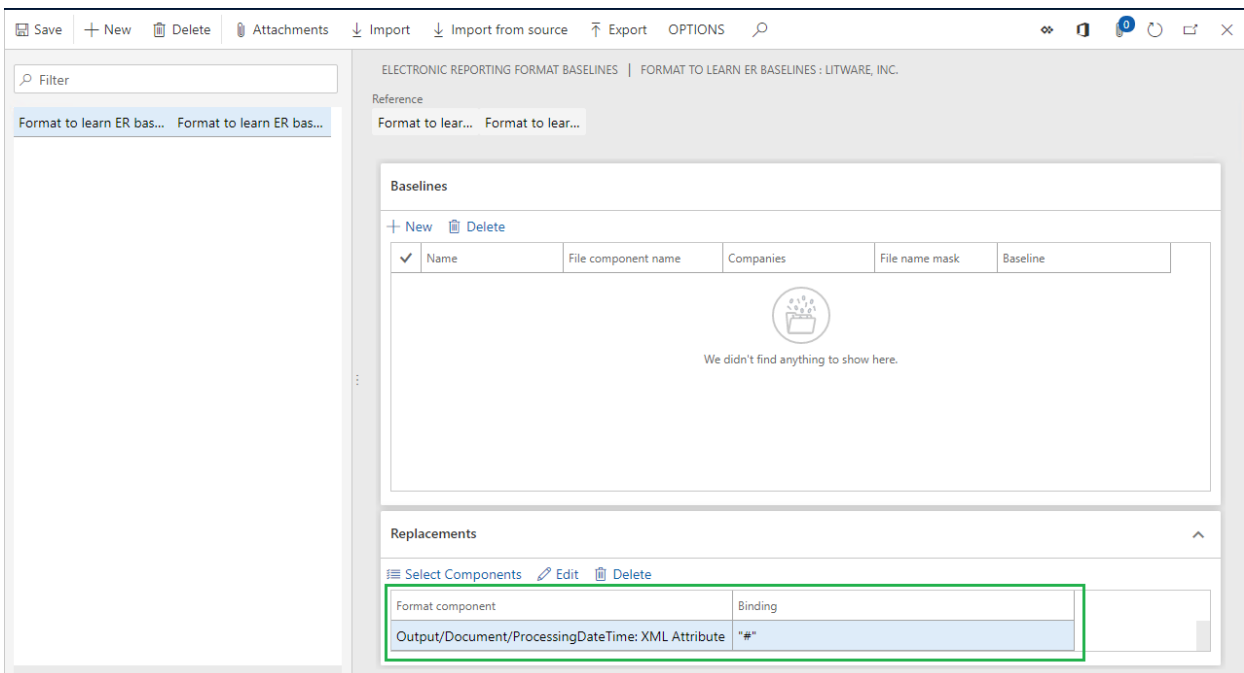
Remove an existing baseline rule

1. Go to **Organization administration > Electronic reporting > Configurations**.
2. Select **Baselines**.
3. In the list of baselines, select the baseline that is configured for the **Format to learn ER baselines** format.
4. On the **Baselines** FastTab, select **Delete** to remove the baseline rule that you configured earlier.



Define replacements for bindings of designed ER format

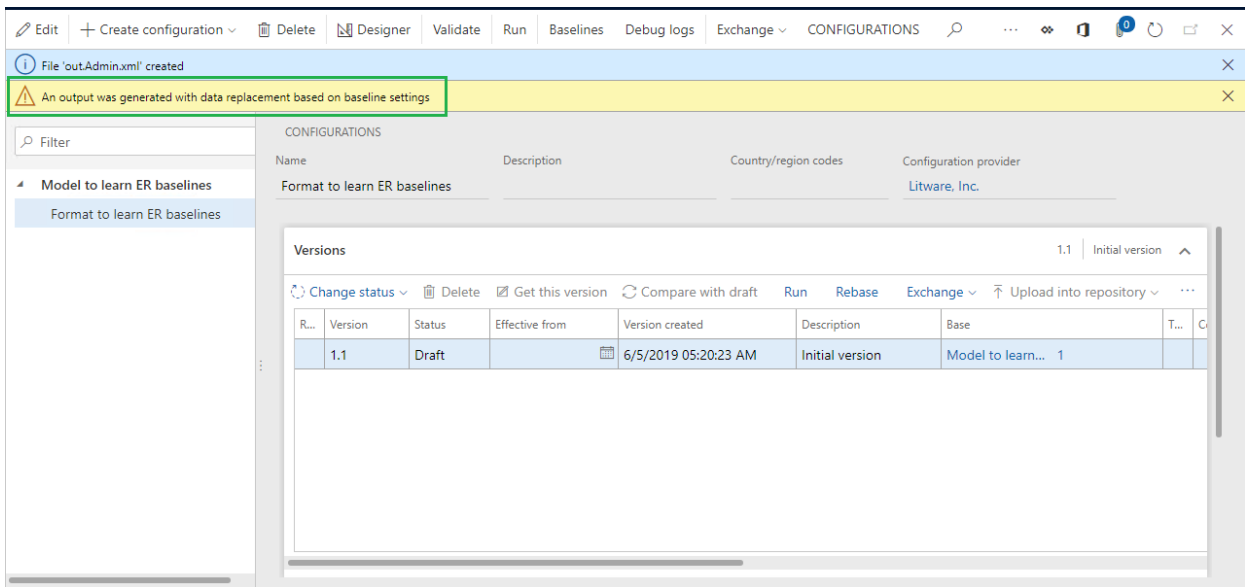
1. On the **Configurations** page, on the **Replacements** FastTab, select **Select components**.
2. In the format components tree, expand **Output**, expand **Output\Document**, and then select the check box for **Output\Document\ProcessingDateTime**.
3. Select **OK**.



The selected ER format component has been added to the list of components on the **Replacements** FastTab. When the base ER format is run in debug mode, the format's binding for each component will be replaced by the binding that is shown in the **Binding** column. To change the default binding for a component that is listed on the **Replacements** FastTab, select **Edit**.

Make a new baseline rule

Follow the steps in the "Example: Automate the setting of baseline rules" section earlier in this topic. A notification warns you that the outbound file has been generated by using baseline settings, and that a forced replacement of the format bindings has occurred.



Suppress warnings about the replacement of format bindings

By setting specific ER parameters, you can suppress notifications that warn about the replacement of format bindings. This suppression can be useful when format bindings are replaced in an unattended mode by using the Regression Suite Automation Tool. In this case, the warning can be considered a failure of the test case that is running.

1. On the **Configurations** page, on the Action Pane, on the **Configurations** tab, select **User parameters**.
2. Set the **Suppress baseline warnings** option to **Yes**, and then select **OK**.

Review the generated baseline file

1. Go to **Organization administration > Electronic reporting > Configurations**.
2. Select **Baselines**.
3. Select **Attachments**.

NOTE

The generated file contains the processing date and time text ("##") from the binding that was configured in the added baseline rule, not from the format's binding.

4. Close the **Attachments** page.

Run the designed ER format and review the log to analyze the results

1. Go to **Organization administration > Electronic reporting > Configurations**.
2. In the tree, expand **Model to learn ER baselines**.
3. In the tree, select **Model to learn ER baselines\Format to learn ER baselines**.
4. On the **Versions** FastTab select **Run**.
5. In the **Enter Id** field, type **1**.
6. Select **OK**.
7. Go to **Organization administration > Electronic reporting > Configuration debug logs**.

The execution log contains information about the results of the comparison of the generated file with the configured baseline. The log indicates that the generated file and the baseline are equal, even though the executed format contains the binding to enter a constantly changing date and time value in the outbound file.

NOTE

Although the outbound file has been generated by using baseline settings that force the replacement of the format's bindings, you don't receive any warnings about the replacement.

Exchange baseline settings between environments

Export baseline settings

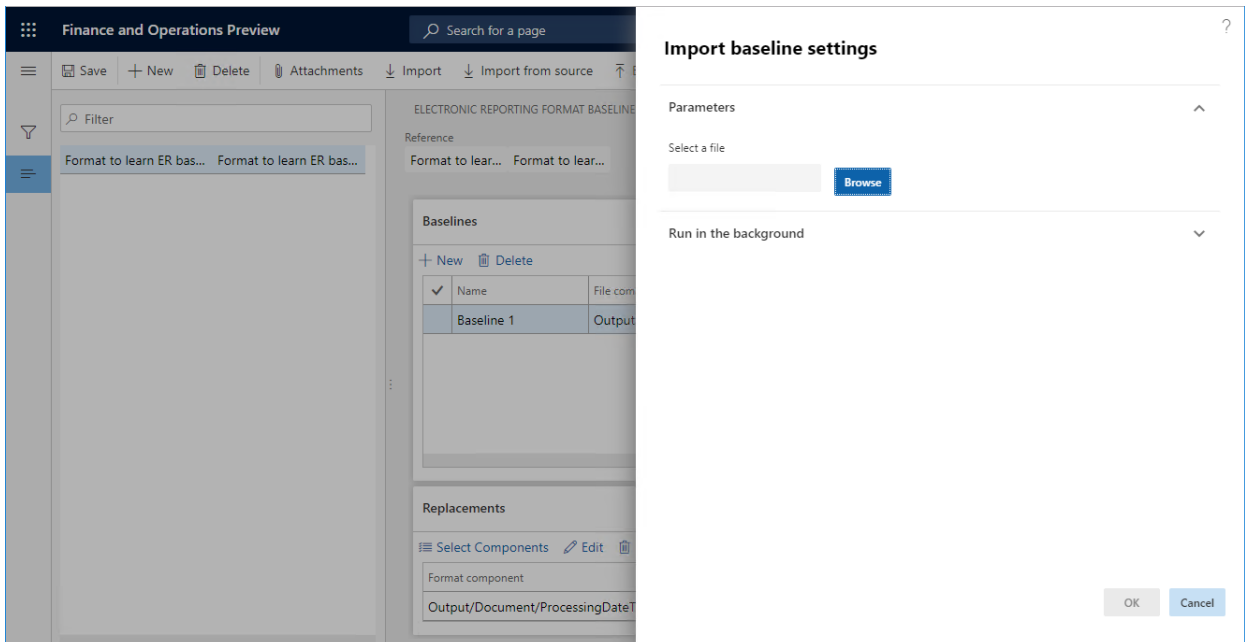
The new ER capabilities let you export baseline settings for the selected ER format from the current environment and store them as XML files.

To export baseline settings, on the **Electronic reporting format baselines** page, select **Export**.

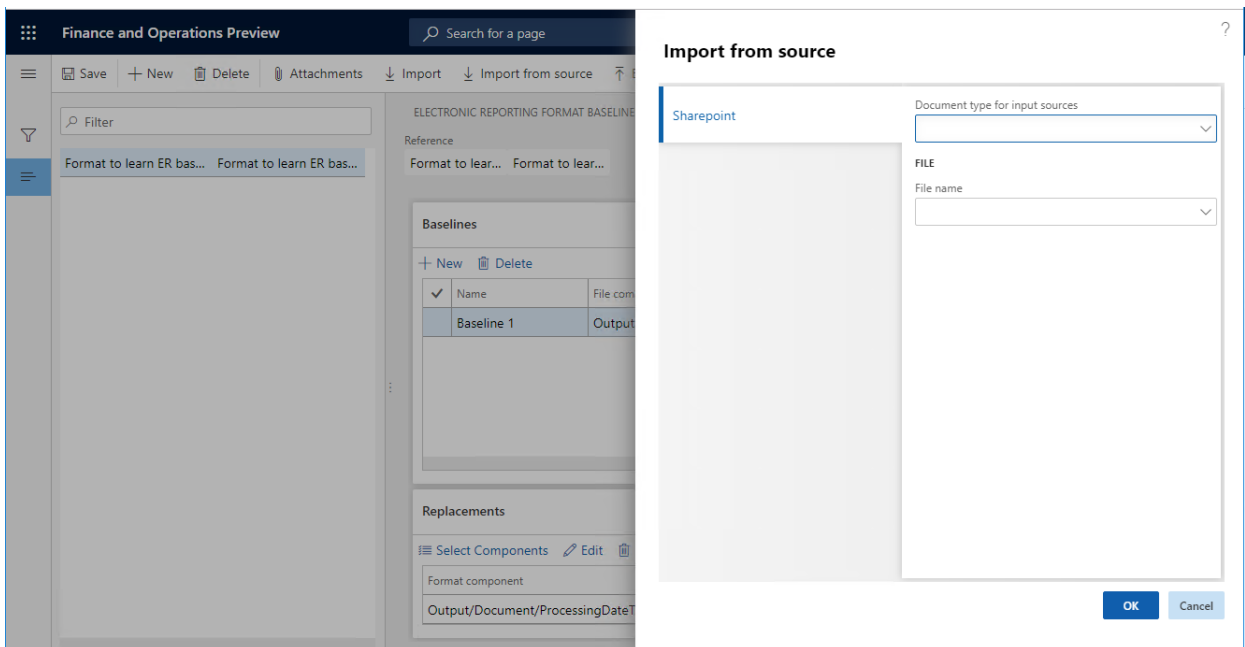
Import baseline settings

Exported baseline settings can be imported into a different environment. The environment must first be imported as an ER format. You can then import the baseline settings.

To import baseline settings from a locally stored XML file, on the **Electronic reporting format baselines** page, select **Import**, and then select **Browse** to select the XML file.



To import baseline settings from an XML file that is stored on the Microsoft SharePoint Server, based on the current Document management settings and the selected document type, on the **Electronic reporting format baselines** page, select **Import from source**. Then select the document type and the XML file. The required document type to access the SharePoint folder must be configured in advance.



NOTE

You can use Task recorder to record the steps for selecting the required document type and the file name in the **Import from source** dialog box. In this way, you can keep required baseline settings on SharePoint Server and then automatically import them by playing a task recording when you run automated tests by using the Regression Suite Automation Tool.

Additional resources

- [Trace generated report results and compare them with baseline values](#)
- [Task recorder resources](#)

NOTE

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Automate testing with Electronic reporting

2/18/2021 • 13 minutes to read • [Edit Online](#)

This topic explains how you can use the Electronic reporting (ER) framework to automate testing of some functionality. The example in this topic shows how to automate the testing of vendor payment processing.

The application uses the ER framework to generate payment files and corresponding documents during vendor payment processing. The ER framework consists of a data model, model mappings, and format components that support payment processing for different payment types and the generation of documents in different formats. These components can be downloaded from Microsoft Dynamics Lifecycle Services (LCS) and imported into the instance.

You also can customize each Microsoft component and use it as the basis of your own custom component. By creating a custom version, you can make changes that support specific requirements. For example, you can adjust the ER data model and ER model mapping to access customer-specific application data, or you can change an ER format to modify the layout of a generated document.

You can use customized ER formats to process payment files that generate vendor payments and also to process control reports. Versioning is supported in ER components. Therefore, Microsoft can provide updated versions of ER solutions for vendor payment processing, and you can automatically merge the updated version with your customized component by rebasing it. However, you must test the rebased version to make sure that it works as you expect.

ER data models and ER model mappings are common for many ER formats that are used to process payments of different types and to generate country/region-specific payment documents. Therefore, it's highly desirable to automate user acceptance and integration testing so that it's automatically done in multiple companies but considers the country/region context of each target company, uses different datasets, and so on.

For more information about how to create a custom version of a format that is based on the format that you received from a configuration provider, see [ER Upgrade your format by adopting a new, base version of that format](#).

Key concepts

Functional power users can author user acceptance and integration testing without having to write source code.

- Use the ER baseline feature to compare generated documents to master copies. For more information, see [Trace generated report results and compare them with baseline values](#).
- Use Task recorder to record test cases, and include baseline assessment. For more information, see [Task recorder resources](#).
- Group test cases for required test scenarios. For more information, see [Create and automate user acceptance tests](#).
 - Use Business process modeler (BPM) in LCS to make libraries for user acceptance tests.
 - Use BPM test libraries to create a test plan and test suites in Microsoft Azure DevOps Services (Azure DevOps).

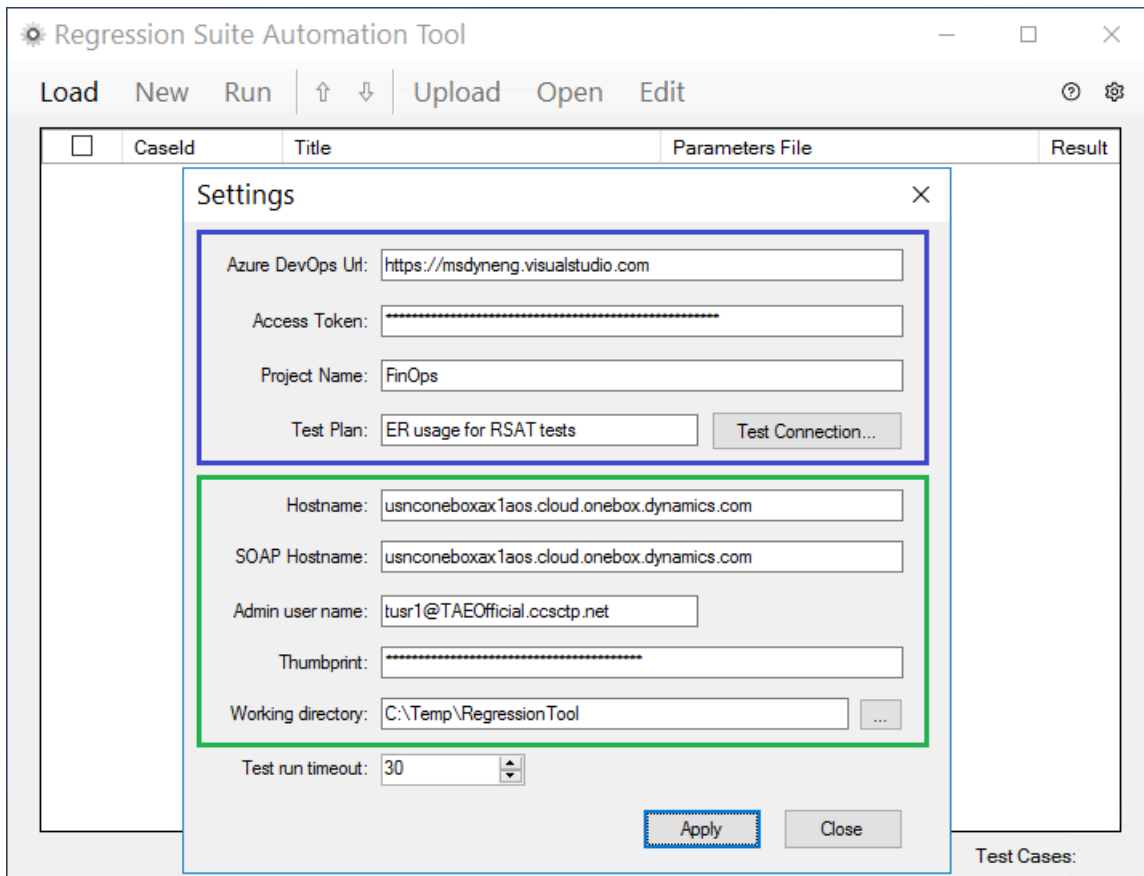
Functional power users can run user acceptance and integration tests.

- Use Regression suite automation tool (RSAT) to run test cases of the desired test suite.
- Report the results of the testing to Azure DevOps, and use this service to investigate those results.

Prerequisites

Before you can complete the tasks in this topic, you must complete the following prerequisites:

- Deploy a topology that supports test automation. You must have access to the instance of this topology for the **System administrator** role. This topology must contain the demo data that will be used in this example. For more information, see [Deploy and use an environment that supports continuous build and test automation](#).
- To run user acceptance and integration tests automatically, you must install RSAT in the topology that you're using and configure it in the appropriate manner. For information about how to install and configure RSAT and configure it to work with Finance and Operations apps and Azure DevOps, see [Regression Suite Automation Tool](#). Pay attention to the prerequisites for using the tool. The following illustration shows an example of the RSAT settings. The blue rectangle encloses the parameters that specify access to Azure DevOps. The green rectangle encloses the parameters that specify access to the instance.

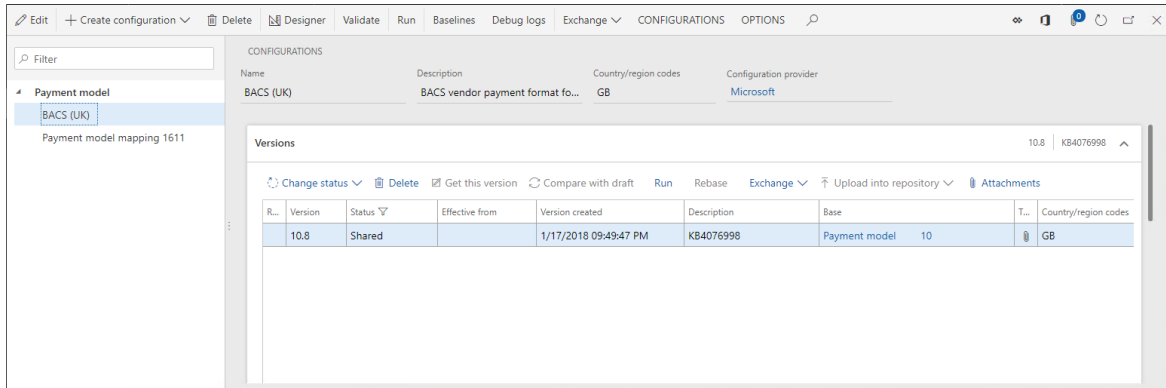


- To organize test cases in suites to help guarantee the correct execution sequence, so that you can collect logs of test executions for further reporting and investigation, you must have access to Azure DevOps from the deployed topology.
- To complete the example in this topic, we recommend that you download [ER usage for RSAT tests](#). This zip file contains the following task guides:

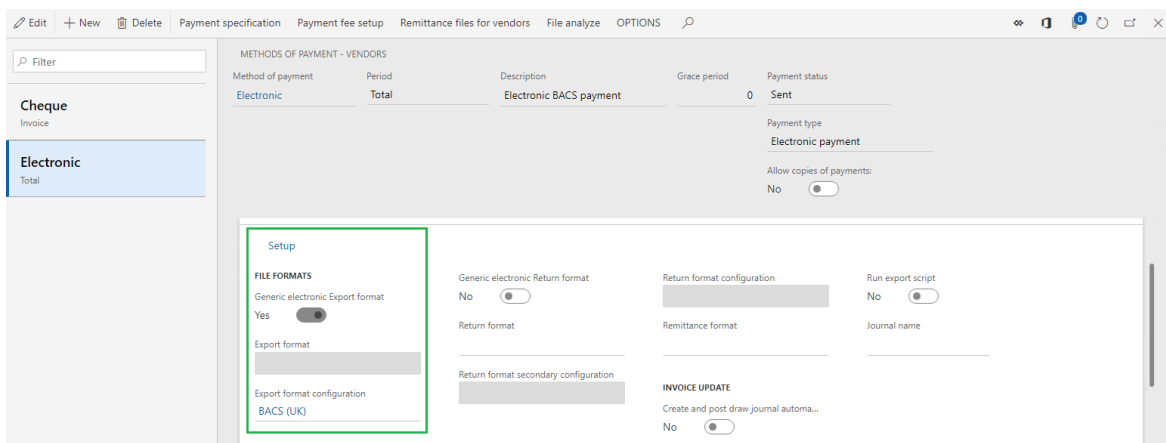
CONTENT	FILE NAME AND LOCATION
Sample task recording to prepare data for testing	Prepare\Recording.xml
Sample task recording to process vendor payment	Process\Recording.xml

Prepare the Accounts payable module to process vendor payments

1. Sign in to your instance.
2. Download the following ER configurations from LCS. For instructions, see [ER Import a configuration from Lifecycle Services](#).
 - **Payment model** ER model configuration
 - **Payment model mapping 1611** ER model mapping configuration
 - **BACS (UK)** ER format configuration



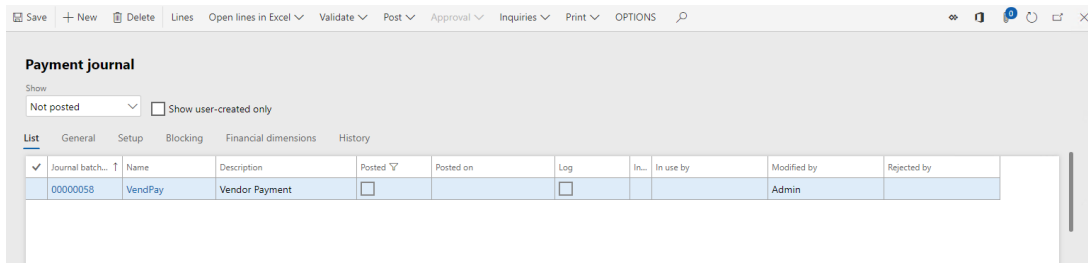
3. Select the GBSI demo data company, which has a country/region context in Great Britain.
4. Configure Accounts payable parameters:
 - a. Go to **Accounts payable > Payment setup > Methods of payment**.
 - b. Select the **Electronic** method of payment.
 - c. Configure the selected method of payment so that it uses the **BACS (UK)** ER format that you downloaded earlier for vendor payment processing:
 - a. On the **File formats** FastTab, set the **Generic electronic Export format** option to **Yes**.
 - b. In the **Export format configuration** field, select **BACS (UK)**.



NOTE

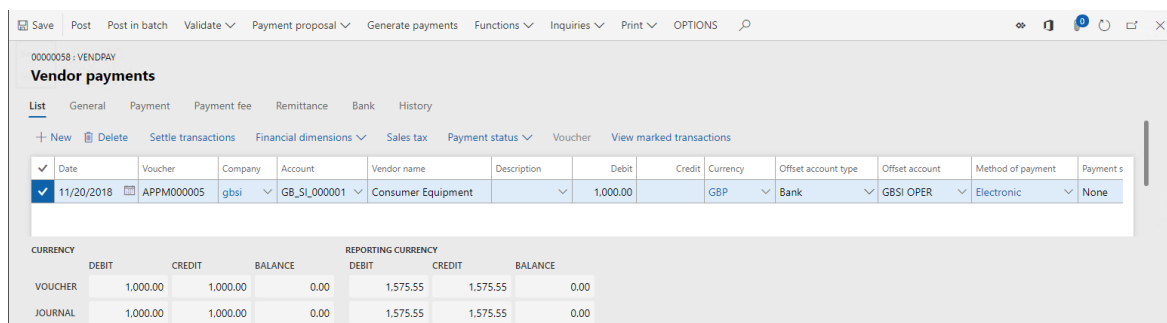
If you have the derived version of this ER format that was created to support customizations, you can select this configuration in the **Electronic** method of payment.

5. Create an example vendor payment:
 - a. Go to **Accounts payable > Payments > Payment journal**.
 - b. Make sure that you haven't posted the payment journal.



c. Select Lines, and enter a line that has the following information.

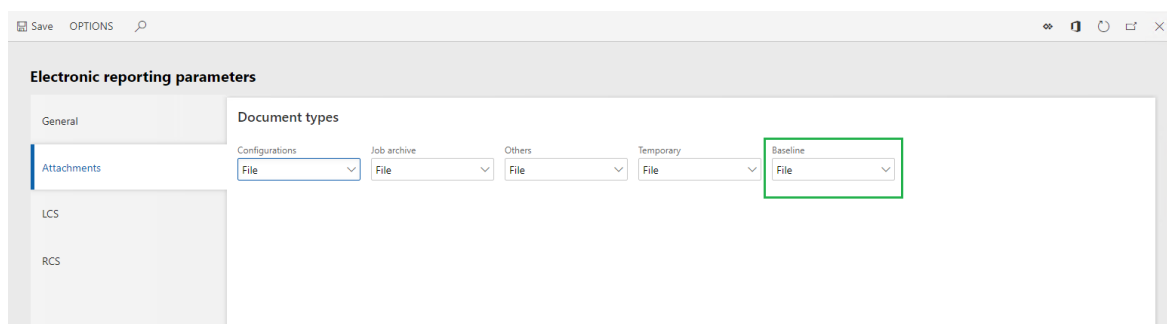
FIELD	EXAMPLE VALUE
Vendor name	GB_SI_000001
Debit	1,000.00
Currency	GBP
Offset account type	Bank
Offset account	GBSI OPER
Method of payment	Electronic



Prepare the ER framework to test vendor payment processing

Configure ER parameters

1. Go to **Organization administration > Electronic reporting > Electronic reporting parameters**.
2. On the **Attachments** tab, in the **Baseline** field, select **File** as the document type that the Document management (DM) framework uses to keep documents that are related to the baseline feature as DM attachments.

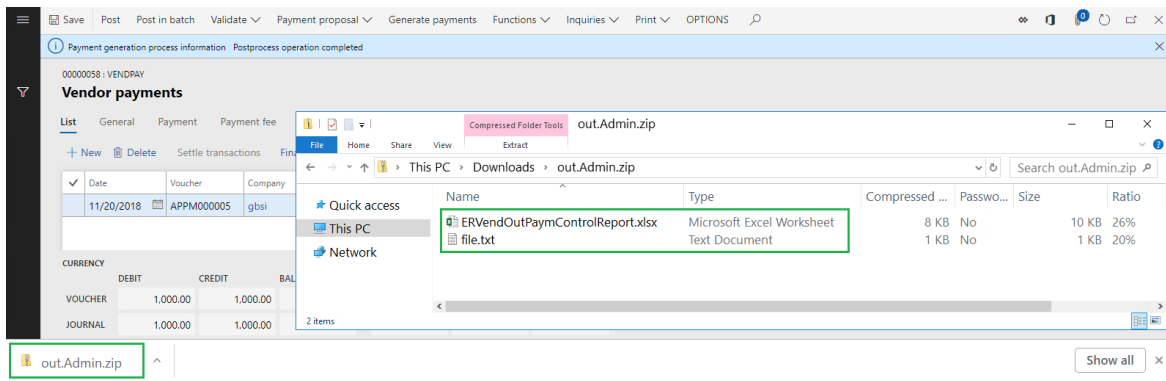


Generate baseline copies of vendor payment-related documents

1. Go to **Accounts payable > Payments > Payment journal**.

2. Select **Lines**.
3. Select **Generate payments**.
4. Select the **Electronic** method of payment.
5. Select the **GBSI OPER** bank account.
6. Set the **Print control report** option to **Yes**.
7. Download the generated output as a zip file.
8. Open the downloaded file.
9. Extract following files from the downloaded file:

- **File payment file in text format**
- **ERVendOutPaymControlReport control report file in XLSX format**



Turn on the ER baseline feature

1. Go to **Organization administration > Electronic reporting > Configurations**.
2. On the Action Pane, on the **Configurations** tab, select **User parameters**.
3. Set the **Run in debug mode** option to **Yes**.

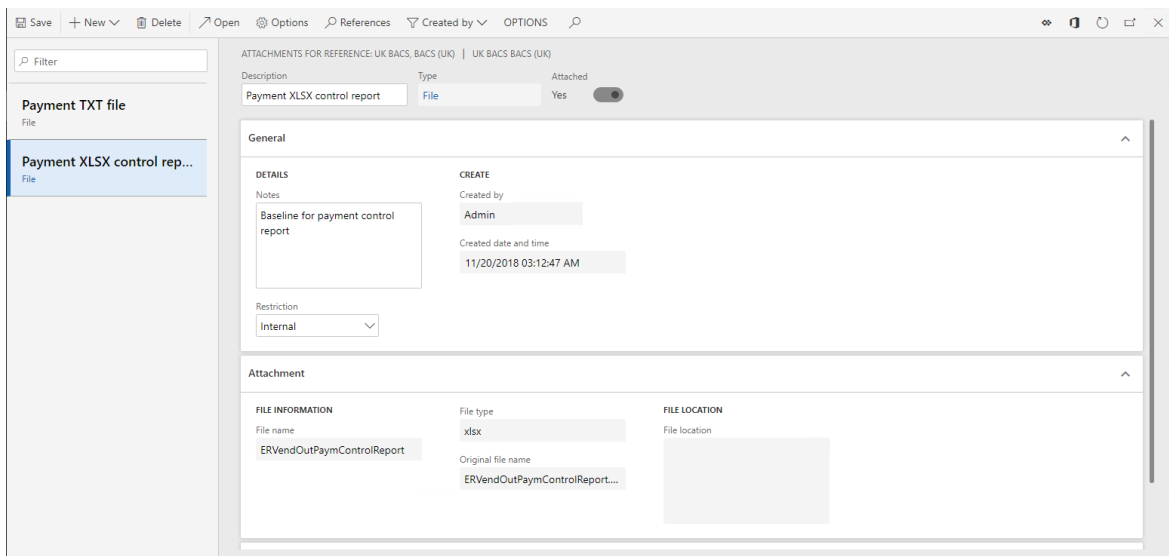
By turning on the **Run in debug mode** parameter, you force the ER framework to perform the following actions after the execution of any ER format that generates outgoing documents:

1. Determine whether a baseline was configured for any of components of the executed ER format.
2. Determine whether each configured baseline is applicable in the current conditions (company code of the signed-in company, file name and file name extension of the generated output, and so on).
3. For each applicable baseline, perform the following actions:
 - a. Compare the output that is generated during execution of the ER format with the corresponding baseline.
 - b. Store the results of the comparison in the ER configurations debug log.

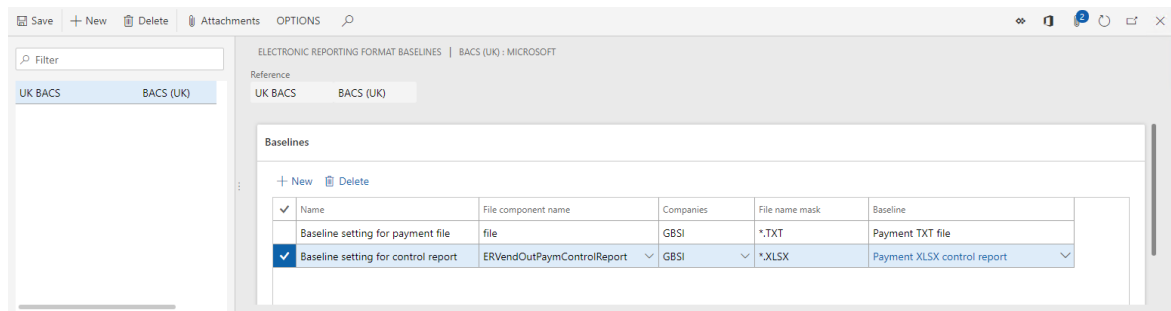
Configure ER baselines for vendor payment processing

1. Go to **Organization administration > Electronic reporting > Configurations**.
2. Select **Baselines**.
3. Select **New**.
4. In the **Reference** field, select the **BACS (UK)** format.
5. Select **Attachments**.
6. Add a new baseline for the vendor payment file:

- a. Select **New**.
 - b. In the **Type** field, select the **File DM** document type that you configured in the ER parameters to store baseline artifacts.
 - c. Browse to select the locally saved **File** payment file in text format.
 - d. In the **Description** field, enter **Payment TXT file**.
7. Add a new baseline for the control report for the vendor payment:
- a. Select **New**.
 - b. In the **Type** field, select the **File DM** document type that you configured in the ER parameters to store baseline artifacts.
 - c. Browse to select the locally saved **ERVendOutPaymControlReport** control report file in XLSX format.
 - d. In the **Description** field, enter **Payment XLSX control report**.



8. Close the page.
9. On the **Baselines** FastTab, select **New** to configure a baseline for the payment file:
 - a. Name the line **Baseline setting for payment file**.
 - b. In the **File component name** field, select **file** to apply this baseline to the ER format output that generates the payment file in BACS (UK) text format.
 - c. In the **Companies** field, select **GBSI** to apply this baseline when the **BACS (UK)** ER format is run in the GBSI company.
 - d. In **File name mask** field, enter ***.TXT** to apply this baseline only to outputs of the file format component that have the **.txt** file name extension.
 - e. In the **Baseline** field, select **Payment TXT file** so that this baseline is used for comparison with the generated output.
10. Select **New** to configure a baseline for the control report:
 - a. Name the line **Baseline setting for control report**.
 - b. In the **File component name** field, select **ERVendOutPaymControlReport** to apply this baseline to the ER format output that generates the control report.
 - c. In the **Companies** field, select **GBSI** to apply this baseline when the **BACS (UK)** ER format is run in the GBSI company.
 - d. In **File name mask** field, enter ***.XLSX** to apply this baseline only to outputs of the **ERVendOutPaymControlReport** format component that have the **.xlsx** file name extension.
 - e. In the **Baseline** field, select **Payment XLSX control report** so that this baseline is used for comparison with the generated output.



Record tests to validate vendor payment processing

As a functional power user, you can record your own steps to test vendor payment processing. We recommend that you play (and edit, as required) the **Prepare\Recording.xml** task recording that you downloaded earlier. This recording is used to set all testing data to the correct state. That step is required because the testing can be done many times, and every test must use data that is in the same state.

Reset user settings

1. Open the default dashboard.
2. Select the **Settings** button (the gear symbol).
3. Select **User options**.
4. Select **Usage data**.
5. Select **Reset**.
6. Select **Yes** to confirm that you want to reset usage data.
7. Close the page.

Record the steps to prepare data for testing

1. Select the **Settings** button (the gear symbol).
2. Select **Task recorder**.
3. Select **Playback recording**.
4. Select **Open from this PC**.
5. Select **Browse**, and select the locally save **Prepare\Recording.xml** file.
6. Select **Start**.
7. Keep selecting **Play next pending step** until all the steps in the recording have been played.

This task recording performs the following actions:

1. Set the status of the processed payment line to **None**.

Prepare data to test processing of vendor's electronic payment

Dynamics 365 Finance and Operations

Contoso Consulting GB

November 2018

Bank management, My business processes, Benefits, Optimization advisor, Budget planning, Outbound work monitoring, Business processes for human resources, Outbound work planning

Work items assigned to me

Cash advance request: Record returned
Expense reports: Record returned
Catalog: catalog approval
Expense reports: Expense report approval

Task recorder

PLAYBACK CONTROLS

- Play next pending step
- ⌵ Play to selected step
- ▶ Play all pending steps

STEPS

Start sub-task

0 steps recorded / 15 steps pending

1	Go to Accounts payable > Payments > Payment journal.
2	Click Lines.
3	Click Payment status.
4	Click None.
5	Close the page.
6	Close the page.
7	Go to Organization administration > Electronic

2. Turn on the Run in debug mode ER user parameter.

Prepare data to test processing of vendor's electronic payment

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Task recorder

PLAYBACK CONTROLS

- Play next pending step
- ⌵ Play to selected step
- ▶ Play all pending steps

STEPS

Start sub-task

0 steps recorded / 15 steps pending

7	Go to Organization administration > Electronic
8	On the Action Pane, click Configurations.
9	Click User parameters.
10	Select Yes in the Run in debug mode field.
11	Click OK.
12	Close the page.
13	Go to Organization administration > Electronic

3. Clean up the ER debug log that contains the results of the comparison of generated files to baselines.

Prepare data to test processing of vendor's electronic payment

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Work items assigned to me

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Task recorder

PLAYBACK CONTROLS

- Play next pending step
- ⌵ Play to selected step
- ▶ Play all pending steps

STEPS

Start sub-task

0 steps recorded / 15 steps pending

9	Click User parameters.
10	Select Yes in the Run in debug mode field.
11	Click OK.
12	Close the page.
13	Go to Organization administration > Electronic
14	Click Delete all.
15	Click Yes.

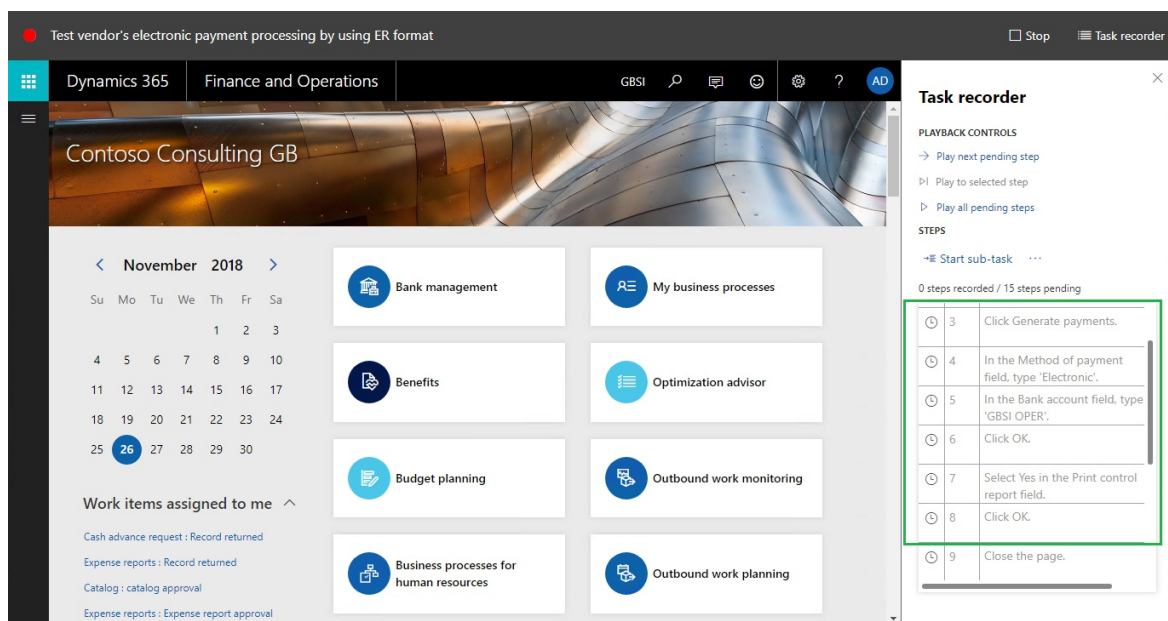
Record the steps to test vendor payment processing

We recommend that you play (and edit, as required) the **Process\Recording.xml** task recording that you downloaded earlier. This recording is used to process vendor payments and validate the results of the comparison of generated documents to corresponding baselines.

1. Select the **Settings** button (the gear symbol).
2. Select **Task recorder**.
3. Select **Playback recording**.
4. Select **Open from this PC**.
5. Select **Browse**, and select the locally saved **Process\Recording.xml** file.
6. Select **Start**.
7. Keep selecting **Play next pending step** until all the steps in the recording have been played.

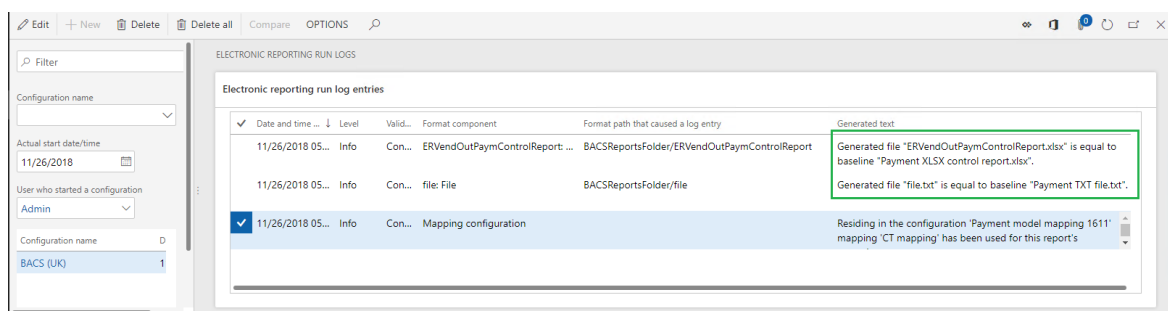
This task recording performs the following actions:

1. Start vendor payment processing.
2. Select the correct runtime parameters, and turn on generation of a control report.

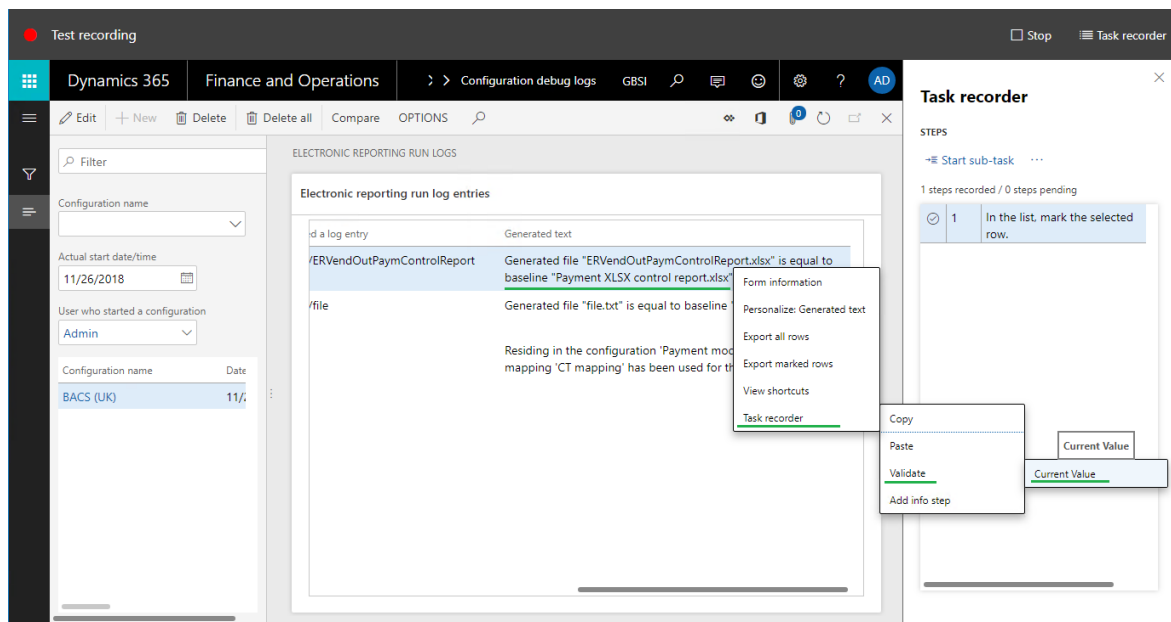


3. Access the ER debug log to record the results of the comparison of generated outputs to corresponding baselines.

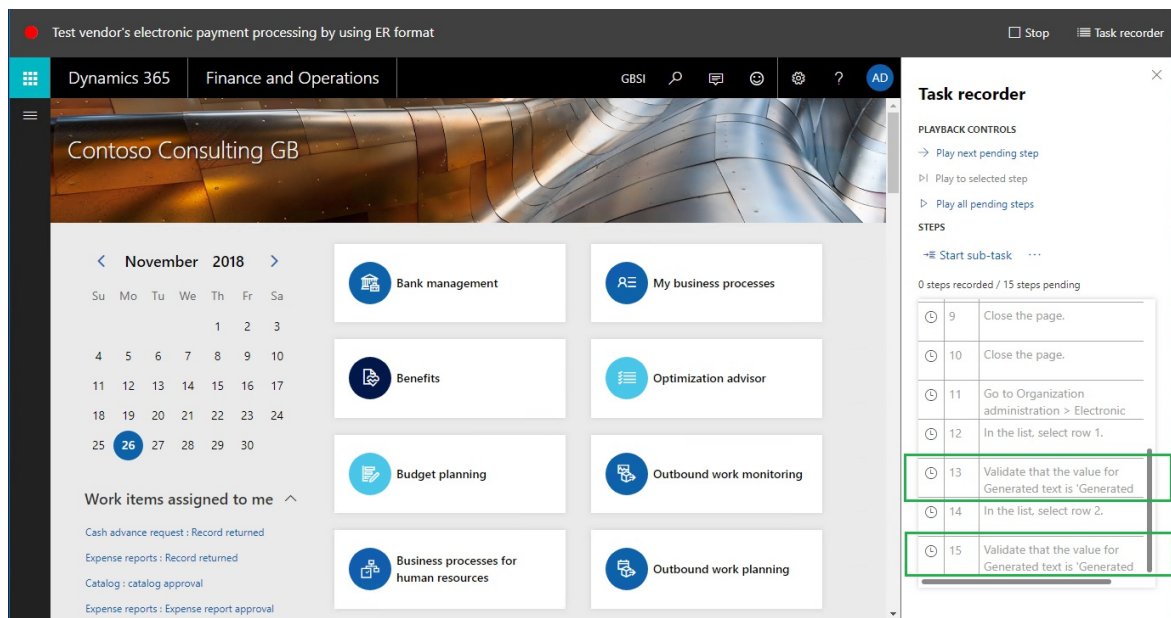
In the ER debug log, the results of the comparison appear in the **Generated text** field. The **Format component** and **Format path that caused a log entry** fields refer to the file component for which the generated output has been compared to the baseline.



4. The comparison of the current output to the baseline is recorded by using the **Validate** Task recorder option and selecting **Current Value**.

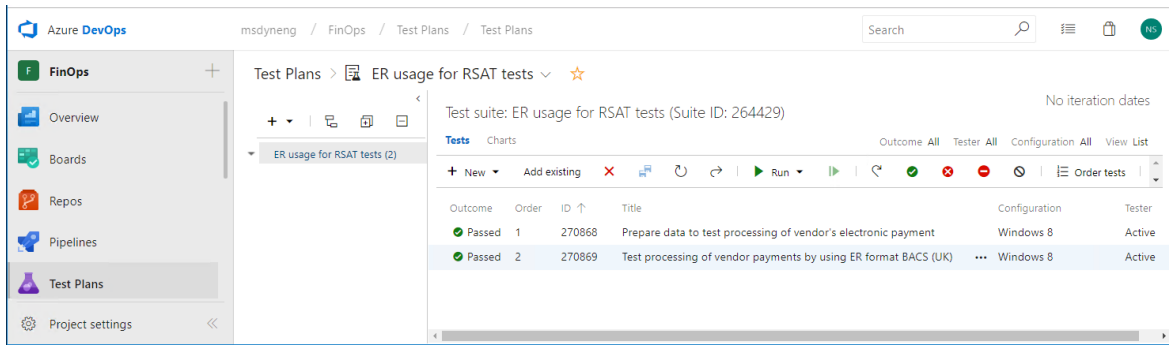


The following illustration shows what the recorded validation steps look like in the task recording.



Add the recorded tests to Azure DevOps

1. Open the Azure DevOps environment.
2. Select the project that you defined in the RSAT parameters when you [configured the tool](#).
3. Select the test plan that you defined in the RSAT parameters when you [configured the tool](#).
4. Create a new test case for the selected test plan:
 - a. Name the test case **Prepare data to test processing of vendor's electronic payment**.
 - b. Attach the **Recording.xml** file from the **Prepare** folder that you downloaded earlier.
5. Create a new test case for the selected test plan:
 - a. Name the test case **Test processing of vendor payments by using ER format BACS (UK)**.
 - b. Attach the **Recording.xml** file from the **Process** folder that you downloaded earlier.



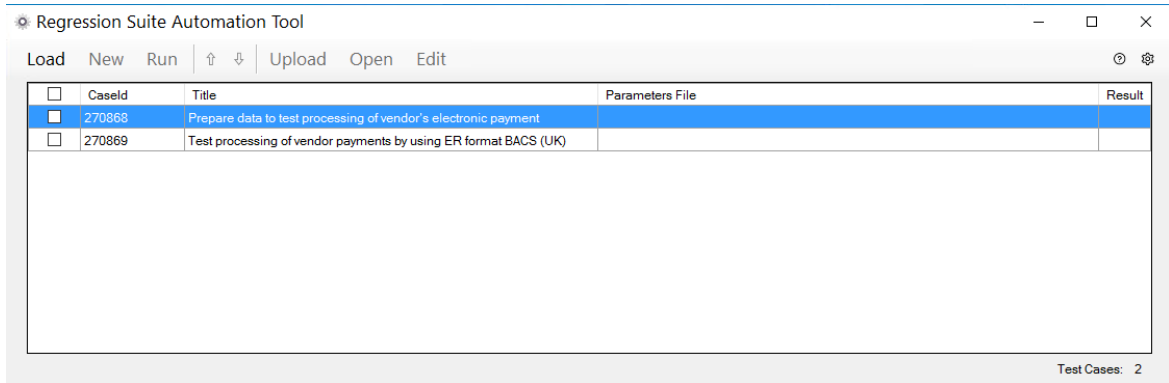
NOTE

Pay attention to the correct execution order of the tests that are added.

Prepare RSAT to run the recorded tests

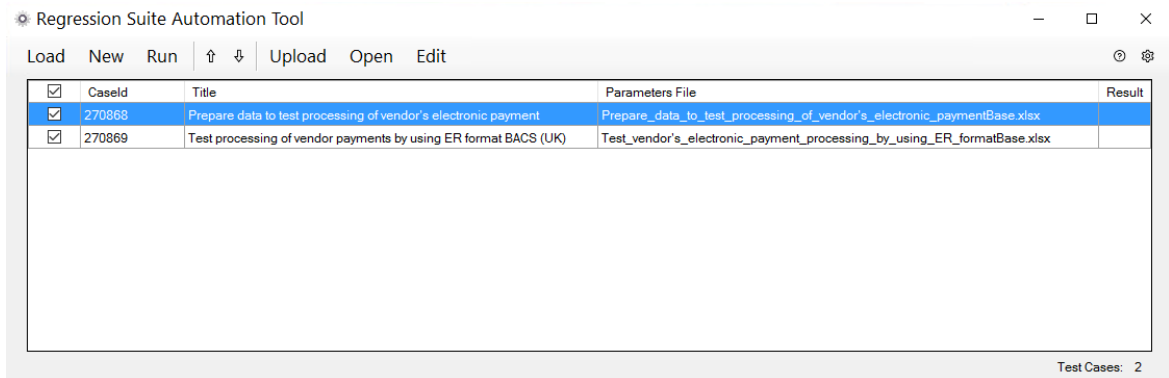
Load the tests from Azure DevOps to RSAT

1. Open the local RSAT application in the current topology.
2. Select **Load** to load the tests that currently reside in Azure DevOps into RSAT.



Create automation and parameters files

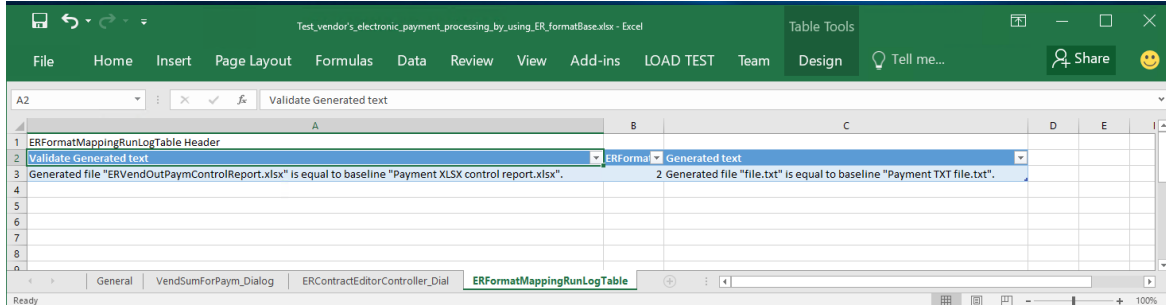
1. In RSAT, select the tests that you loaded from Azure DevOps.
2. Select **New** to create RSAT automation and parameters files.



Modify the parameters files

1. In RSAT, select the **Prepare data to test processing of vendor's electronic payment** test case.
2. Select **Edit**.
3. In the Microsoft Excel workbook that is opened, on the **General** worksheet, change the company code to **GBSI**, because this company will be used for test execution.

- In RSAT, select the **Test processing of vendor payments by using ER format BACS (UK)** test case.
- Select **Edit**.
- In the Excel workbook that is opened, on the **General** worksheet, change the company code to **GBSI**.
- On the **ERFormatMappingRunLogTable** worksheet, notice that cells A:3 and C:3 contain the text of the fields in the ER debug log table that are used to validate the results of the comparison of the output to the baseline. These texts will be used to evaluate ER debug log records that are created during test execution.



Run the tests and analyze the results

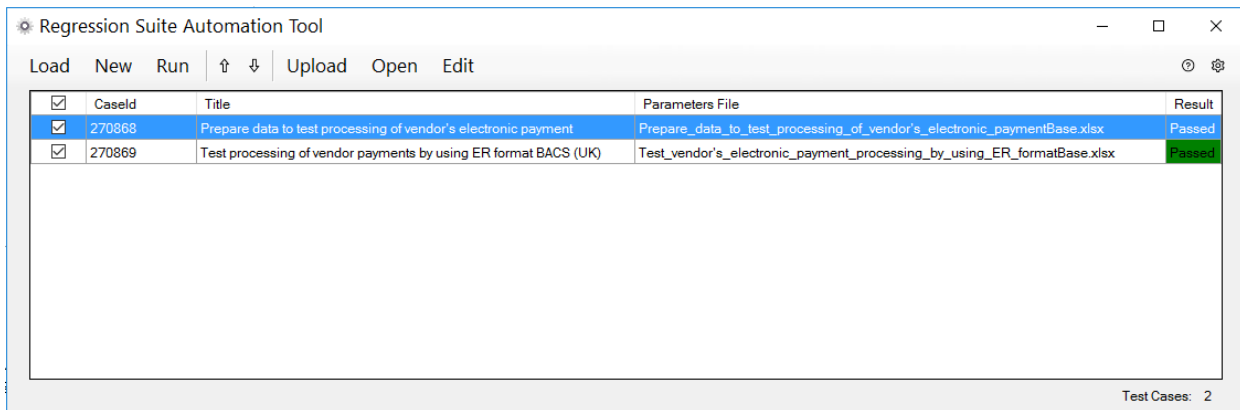
Run the tests in RSAT

- In RSAT, select the loaded tests.
- Select **Run**.

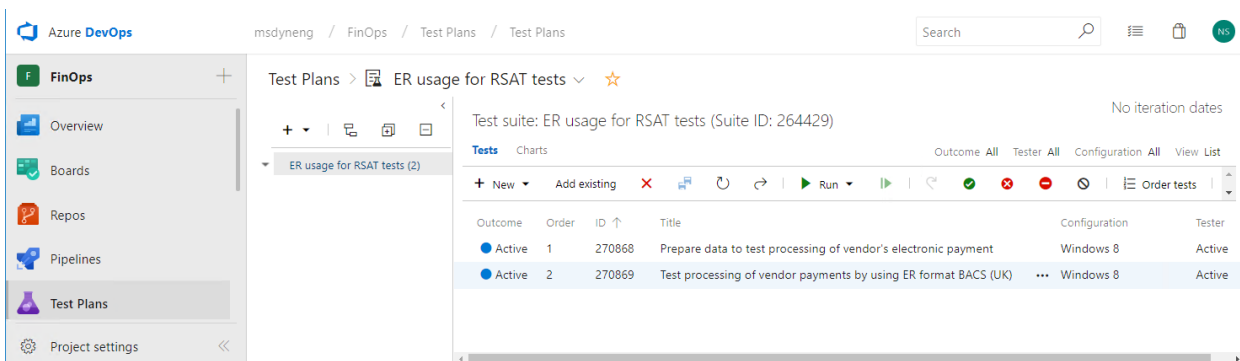
Notice that test cases are automatically run in the application by using a web browser.

Analyze the results of test execution

The results of the test execution are stored in RSAT. Notice that both tests were passed.



Notice that the results of the test execution are also sent to Azure DevOps so that you can do further analysis.



Simulate a situation where tests fail

This test suite must fail when at least one of the generated outputs doesn't match the corresponding baseline. To

achieve this situation, you can use your derived version of the **BACS (UK)** format that will generate a payment file that has different content than the corresponding baseline. To simulate this situation, you can use the same **BACS (UK)** format but change the payment amount on the processed payment line.

1. Open the application and go to **Accounts payable > Payments > Payment journal**.
2. Select **Lines**.
3. Select the payment line, and then select **Payment status > None**.
4. In the **Debit** field, change the value from **1,000.00** to **2,000.00**.
5. Select **Save** to save your changes.

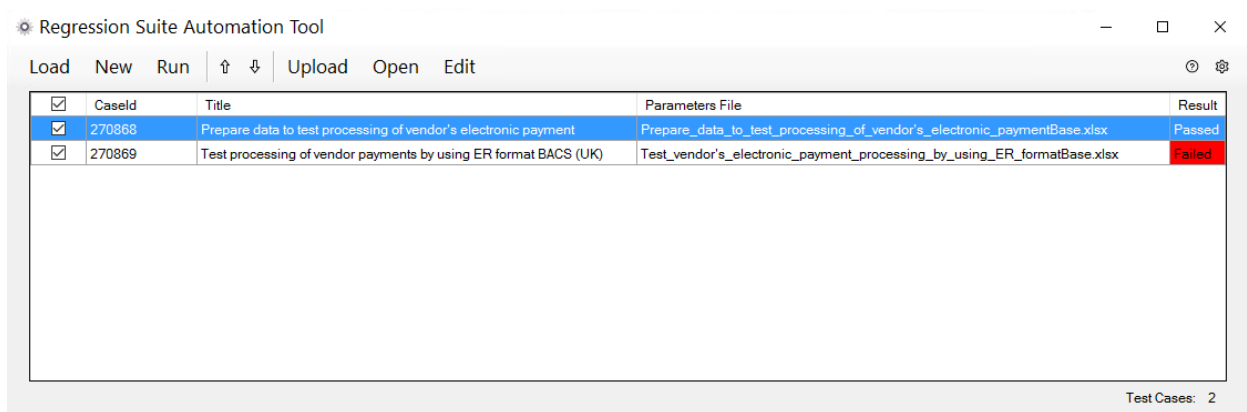
Run the tests in RSAT

1. In RSAT, select the loaded tests.
2. Select **Run**.

Notice that test cases are automatically run in the application by using a web browser.

Analyze the results of test execution

The results of the test execution are stored in RSAT. Notice that the second test failed during the second execution.

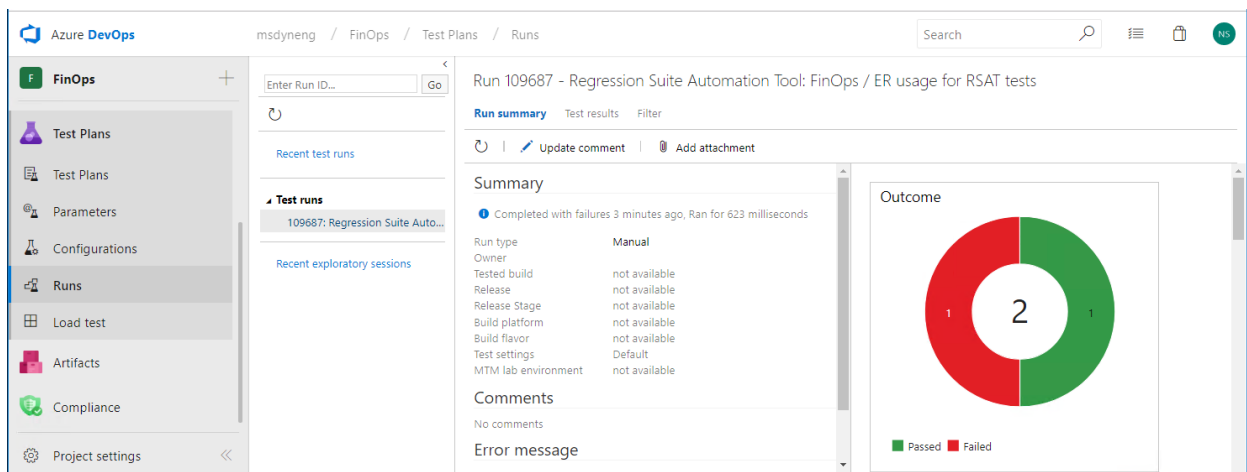


The screenshot shows the Regression Suite Automation Tool (RSAT) interface. At the top, there are menu options: Load, New, Run, Upload, Open, Edit. Below the menu is a table with the following data:

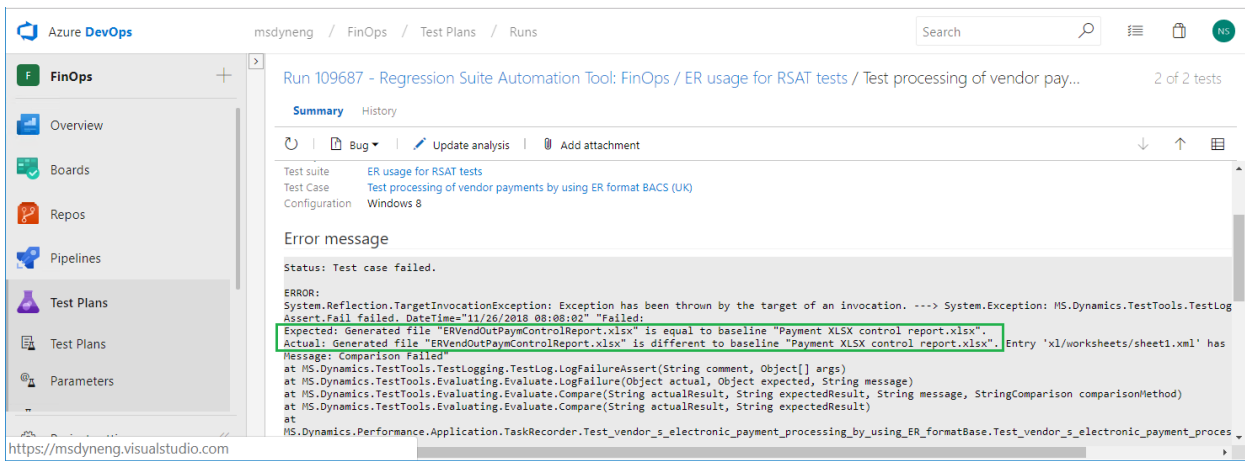
CaseId	Title	Parameters File	Result
270868	Prepare data to test processing of vendor's electronic payment	Prepare_data_to_test_processing_of_vendor's_electronic_paymentBase.xlsx	Passed
270869	Test processing of vendor payments by using ER format BACS (UK)	Test_vendor's_electronic_payment_processing_by_using_ER_formatBase.xlsx	Failed

At the bottom right of the window, it says "Test Cases: 2".

Notice that the results of the test execution are also sent to Azure DevOps so that you can do further analysis.



You can access the status of each test. You can also access the execution log so that you analyze the reasons for any failure. In the following illustration, the execution log shows that the failure occurred because of the difference in content between the generated payment file and its baseline.



Therefore, as you've seen, the functioning of any ER format can be evaluated automatically by using RSAT as the testing platform and by using Task recorder-based test cases that use the ER baseline feature.

Additional resources

- [Task recorder resources](#)
- [Regression suite automation tool](#)
- [Create and automate user acceptance tests](#)
- [Deploy and use an environment that supports continuous build and test automation](#)
- [Trace generated report results and compare them with baseline values](#)
- [ER Upgrade your format by adopting a new, base version of that format](#)
- [ER Import a configuration from Lifecycle Services](#)

NOTE

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Configure Electronic reporting (ER) to pull data into Power BI

2/18/2021 • 8 minutes to read • [Edit Online](#)

This topic explains how you can use your Electronic reporting (ER) configuration to arrange the transfer of data from your instance to Power BI services. As an example, this topic uses Intrastat transactions as business data that must be transferred. The Power BI map visualization uses this Intrastat transaction data to present a view for analysis of company import/export activities on the Power BI report.

Overview

Microsoft Power BI is a collection of software services, apps, and connectors that work together to turn external sources of data into coherent, visually immersive, and interactive insights. Electronic reporting (ER) lets users easily configure data sources and arrange the transfer of data from the application to Power BI. The data is transferred as files in the OpenXML worksheet (Microsoft Excel workbook file) format. The transferred files are stored on a Microsoft SharePoint Server that has been configured for that purpose. The stored files are used in Power BI to make reports that include visualizations (tables, charts, maps, and so on). Power BI reports are shared with Power BI users, and they are accessed in Power BI dashboards and on the application pages. This topic explains the following tasks:

- Configure Microsoft Dynamics 365 Finance.
- Prepare your ER format configuration to get data from the Finance application.
- Configure the ER environment to transfer data to Power BI.
- Use transferred data to create a Power BI report.
- Make the Power BI report accessible in Finance.

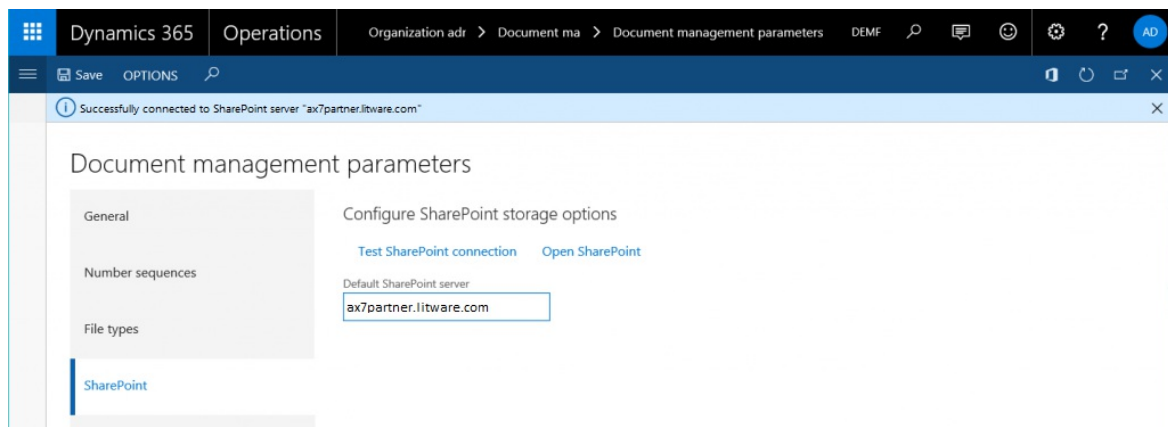
Prerequisites

To complete the example in this topic, you must have the following access:

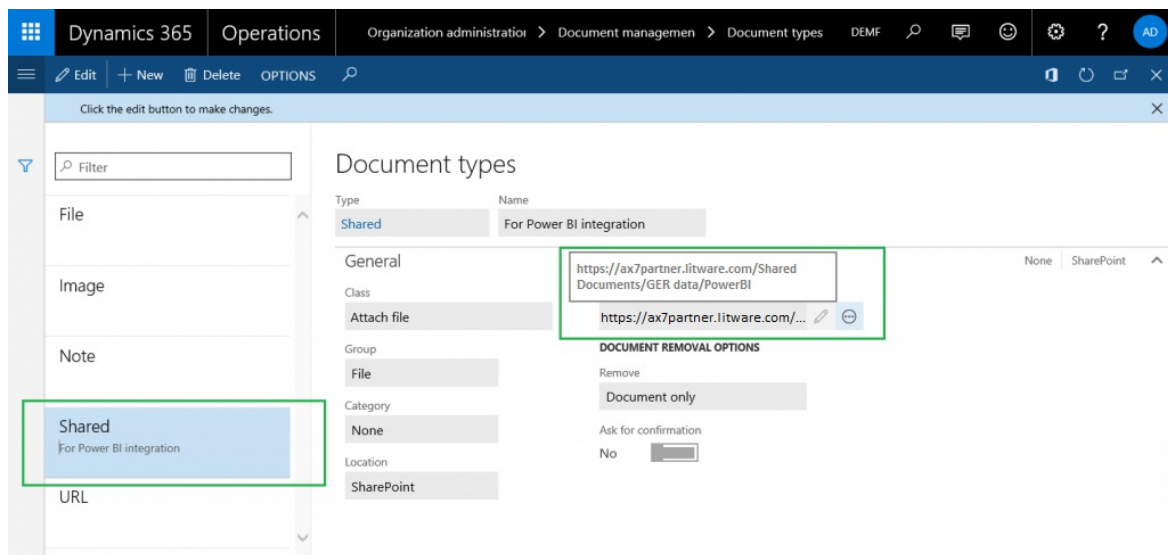
- Access for one of the following roles:
 - Electronic reporting developer
 - Electronic reporting functional consultant
 - System administrator
- Access to the SharePoint Server that is configured for use with the application
- Access to the Power BI framework

Configure document management parameters

1. On the **Document management parameters** page, configure access to the SharePoint Server that will be used in the company that you're signed in to (the DEMF company in this example).
2. Test the connection to the SharePoint Server to make sure that you've been granted access.



3. Open the configured SharePoint site. Create a new folder where ER will store Excel files that have the business data that the Power BI reports require as a source of Power BI datasets.
4. On the **Document types** page, create a new document type that will be used to access the SharePoint folder that you just created. Enter **File** in the **Group** field and **SharePoint** in the **Location** field, and then enter the address of the SharePoint folder.

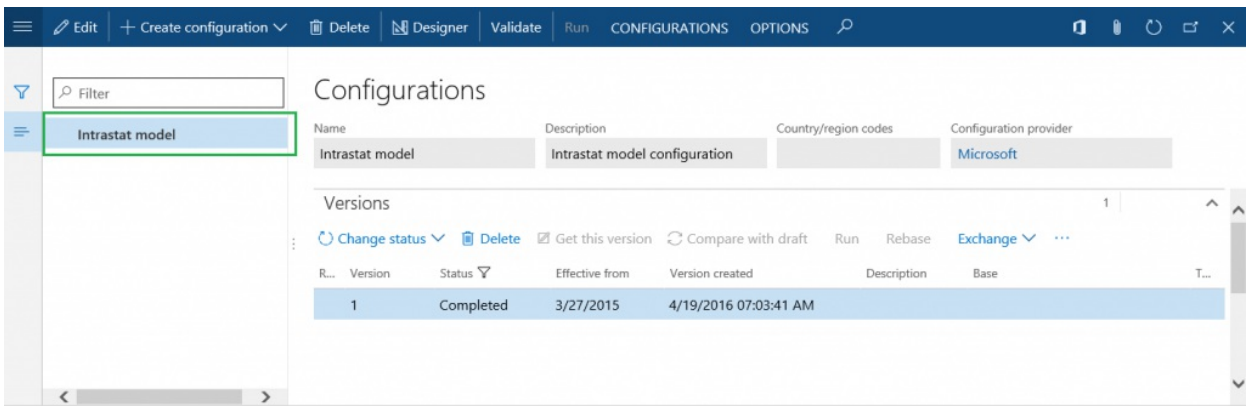


Configure ER parameters

1. In the **Electronic reporting** workspace, click the **Electronic reporting parameters** link.
2. On the **Attachments** tab, select the **File** document type for all the fields.
3. In the **Electronic reporting** workspace, make the required provider active by clicking **Set active**. For more information, play the **ER Select service provider** task guide.

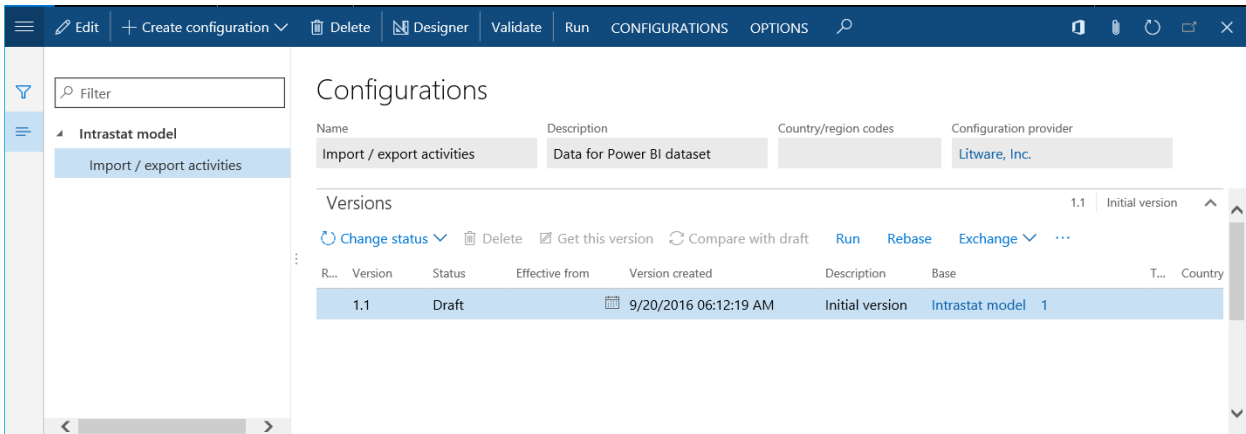
Use an ER data model as the source of data

You must have an ER data model as the source of business data that will be used on Power BI reports. This data model is uploaded from the ER configurations repository. For more information, see [Download Electronic reporting configurations from Lifecycle Services](#), or play the **ER Import a configuration from Lifecycle Services** task guide. Select **Intrastat** as the data model that will be uploaded from the selected ER configurations repository. (In this example, version 1 of the model is used.) You can then access the **Intrastat ER** model configuration on the **Configurations** page.



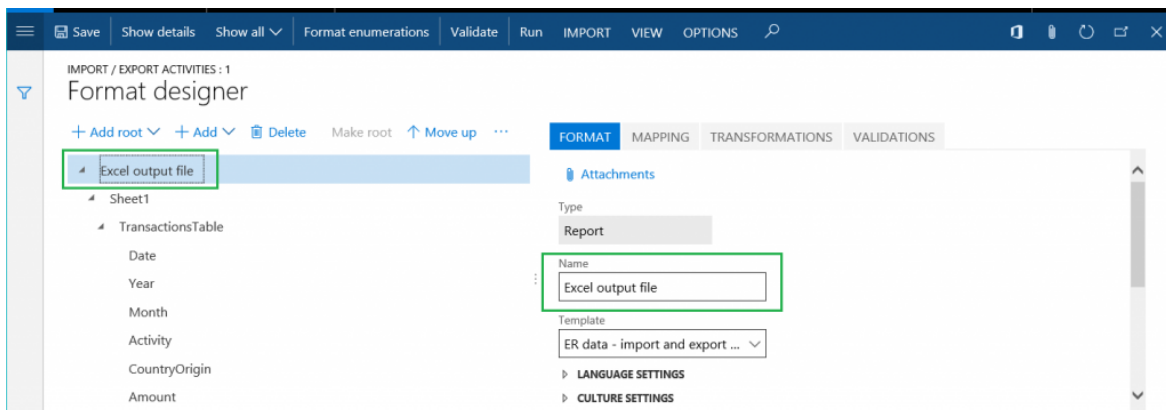
Design an ER format configuration

You must create a new ER format configuration that uses the **Intrastat** data model as the source of business data. This format configuration must generate output results as electronic documents in OpenXML (Excel file) format. For more information, play the **ER Create a configuration for reports in OPENXML format** task guide. Name the new configuration **Import / export activities**, as shown in the following illustration. Use the [ER data - import and export details](#) Excel file as a template when you design the ER format. (For information about how to import a format template, play the task guide.)

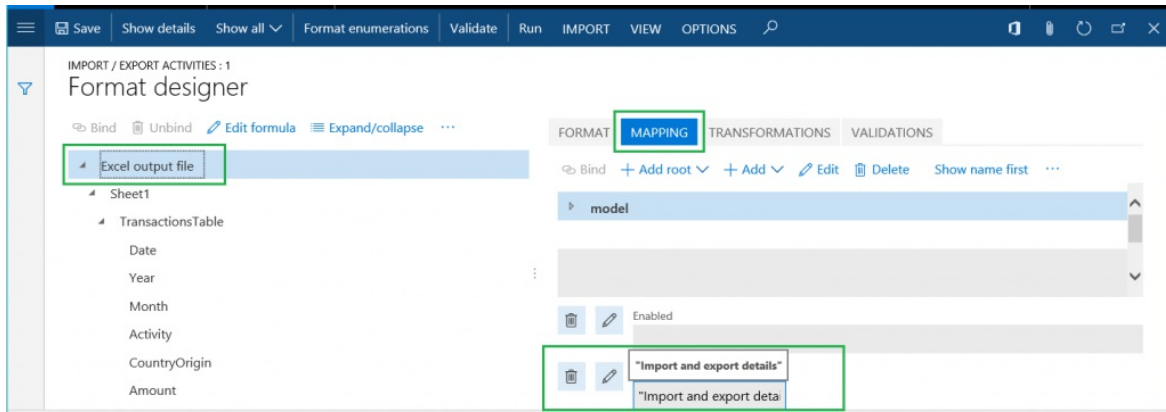


To modify the **Import / export activities** format configuration, follow these steps.

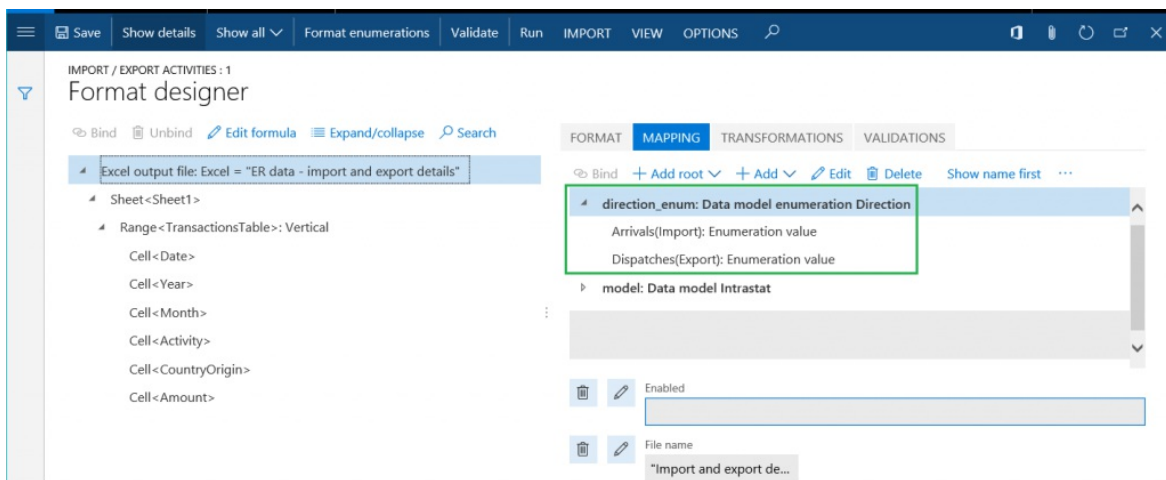
1. Click **Designer**.
2. On the **Format** tab, name the file element for this format **Excel output file**.



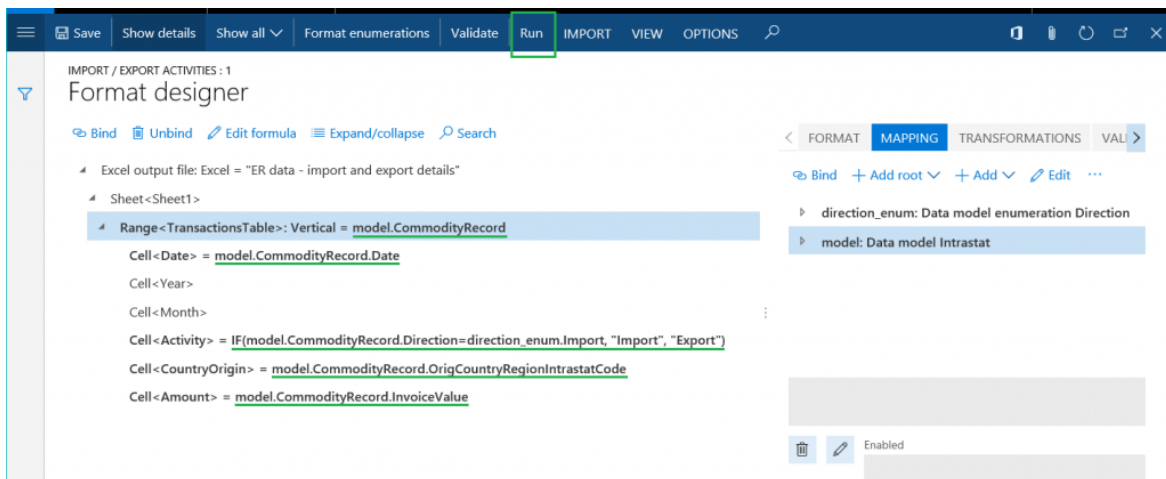
3. On the **Mapping** tab, specify the name of the Excel file that will be generated whenever this format is run. Configure the related expression to return the value **Import and export details** (the .xlsx file name extension will be added automatically).



4. Add a new data source item for this format. (This enumeration will be required for further data binding.)
 - a. Name the data source **direction_enum**.
 - b. Select **Data model enumeration** as the data source type.
 - c. Refer to the **Direction** data model enumeration.



5. Complete the binding of elements of the **Intrastat** data model and elements of the designed format, as shown in the following illustration.



After it's run, the ER format generates the output result in Excel format. It sends the details of the Intrastat transactions to the output result, and separates them as transactions that describe either import activities or export activities. Click Run to test the new ER format for the list of Intrastat transactions on the **Intrastat** page (Tax > Declarations > Foreign trade > Intrastat).

The screenshot shows the 'Intrastat' application with a table of data. The table has columns for Date, Direction, Correction, Item number, Category, Commodity, Weight, Invoice amount, Statistical amount, and Country/region of origin. Two rows are visible:

Date	Direction	Correction	Item number	Category	Commodity	Weight	Invoice amount	Statistical amount	Country/region of origin
1/31/2016	Arrivals		D0003		920 20 34	4.00	1,000.00	1,000.00	AUT
1/31/2016	Arrivals		T0006		900 22 33	5.00	700.00	700.00	CHE

The following output result is generated. The file is named **Import and export details.xlsx**, as you specified in the format settings.

The screenshot shows an Excel spreadsheet titled 'Import and export details.xlsx'. The data is organized into columns: Date, Year, Month, Activity, CountryOrigin, and Amount. The first two rows of data are:

Date	Year	Month	Activity	CountryOrigin	Amount
31.01.2016	2016	1	Import	AT	1 000,00
31.01.2016	2016	1	Import	CH	700,00

Configure the ER destination

You must configure the ER framework to send the output result of the new ER format configuration in a special way.

- The output result must be sent to the folder of the selected SharePoint Server.
- Each execution of the format configuration must create a new version of same Excel file.

On the **Electronic reporting** page (**Organization administration** > **Electronic reporting**), click the **Electronic reporting destination** item, and add a new destination. In the **Reference** field, select the **Import / export activities** format configuration that you created earlier. Follow these steps to add a new file destination record for the reference.

1. In the **Name** field, enter the title of the file destination.
2. In the **File name** field, select the name **Excel output file** for the Excel file format component.

Click the **Settings** button for the new destination record. Then, in the **Destination settings** dialog box, follow these steps.

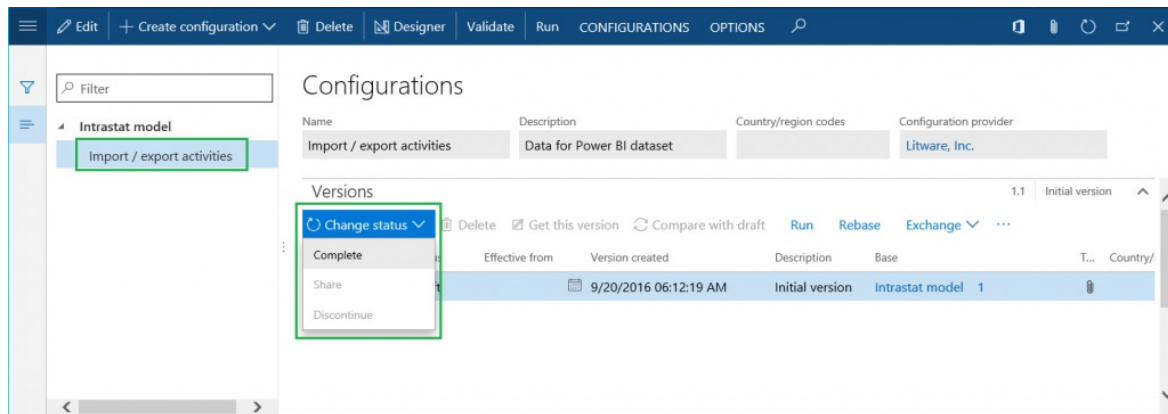
1. On the **Power BI** tab, set the **Enabled** option to **Yes**.
2. In the **SharePoint** field, select the **Shared** document type that you created earlier.

Schedule execution of the configured ER format

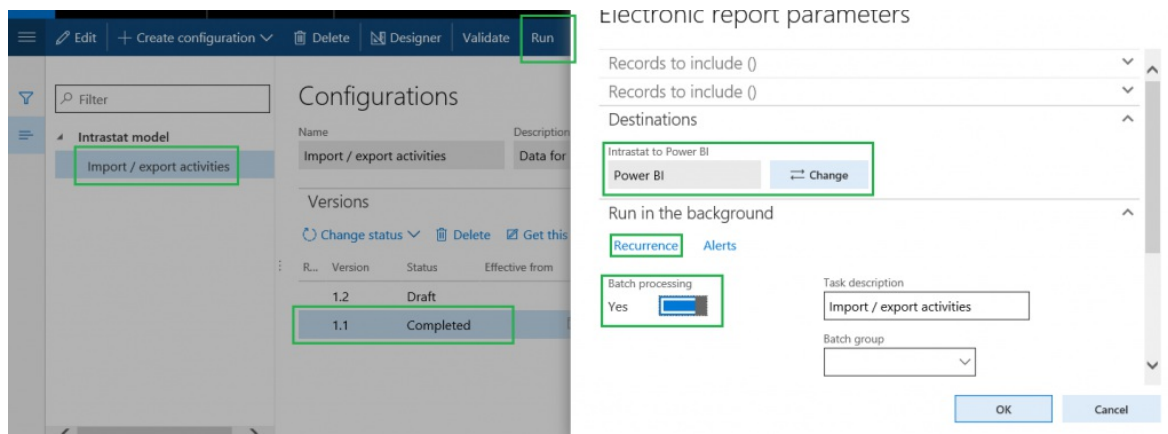
1. On the **Configurations** page (**Organization administration** > **Electronic reporting** >

Configurations), in the configurations tree, select the **Import / export activities** configuration that you created earlier.

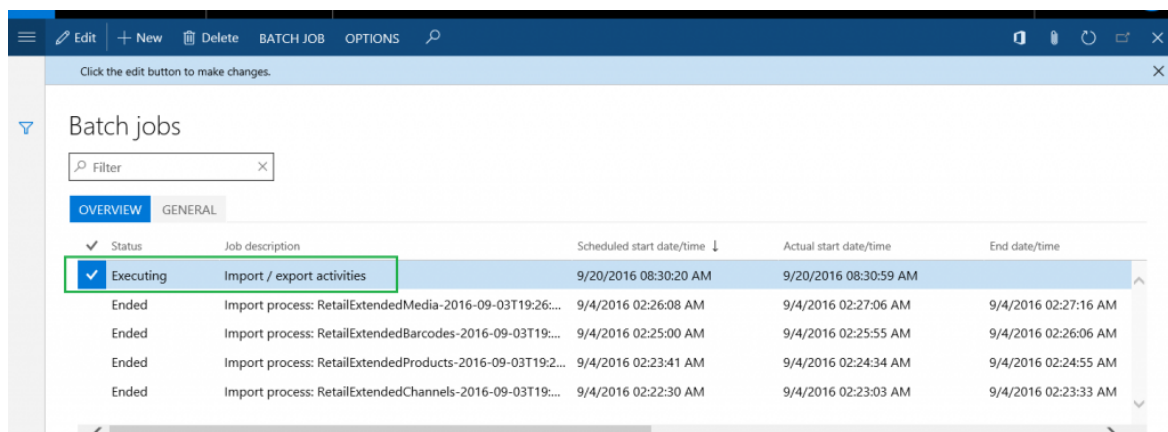
- Change the status of version 1.1 from **Draft** to **Complete** to make this format available for use.



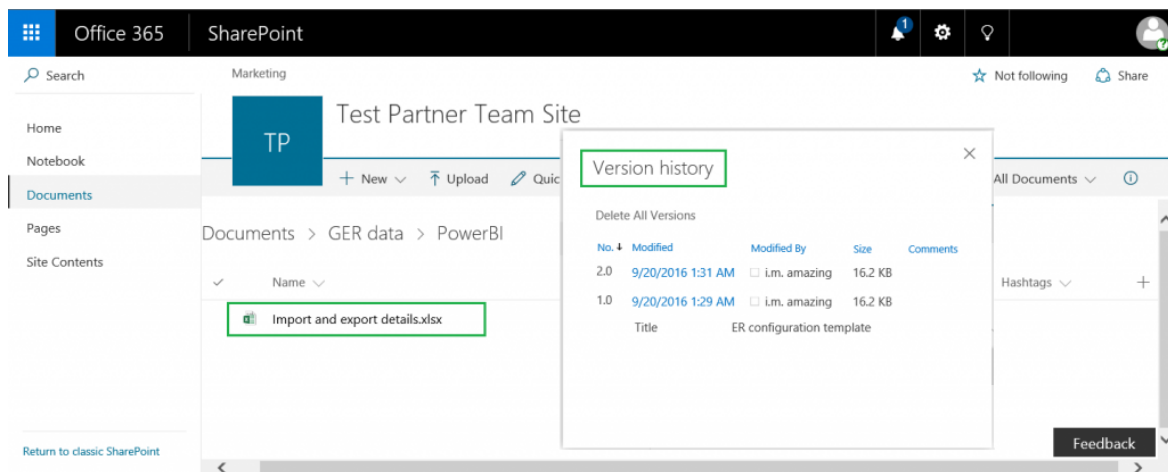
- Select the completed version of the **Import / export activities** configuration, and then click **Run**. Note that the configured destination is applied to the output result that is generated in Excel format.
- Set the **Batch processing** option to **Yes** to run this report in unattended mode.
- Click **Recurrence** to schedule the required recurrence of this batch execution. The recurrence defines how often the updated data will be transferred to Power BI.



- After it's configured, you can find the ER report execution job on the **Batch jobs** page (**System administration > Inquiries > Batch jobs**).

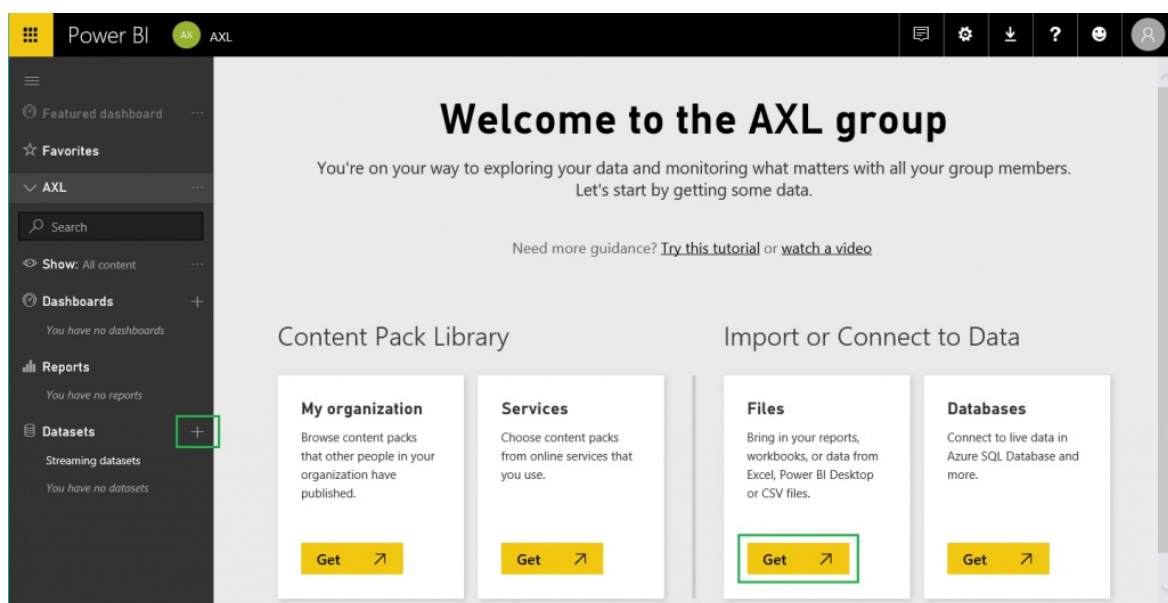


- When this job is run for the first time, the destination creates a new Excel file that has the configured name in the selected SharePoint folder. Every subsequent time that the job is run, the destination creates a new version of this Excel file.

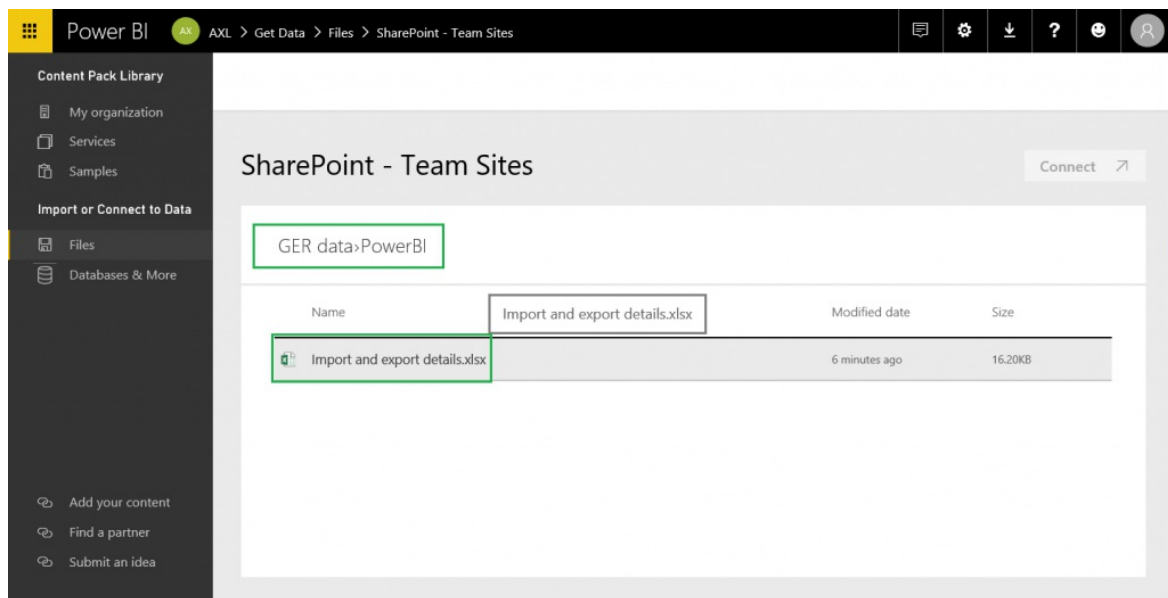


Create a Power BI dataset by using the output result of the ER format

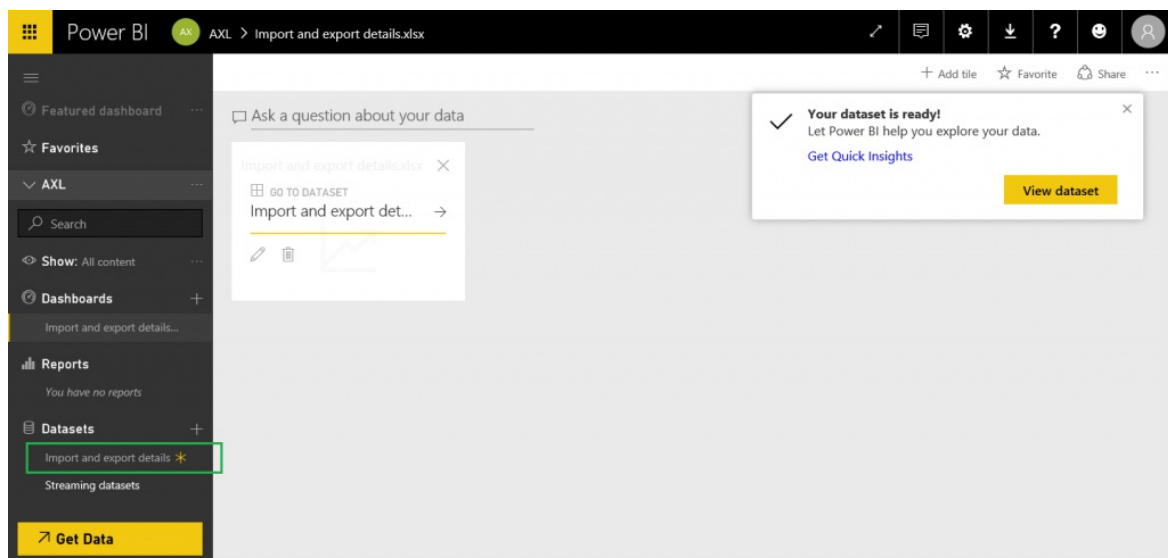
1. Sign in to Power BI, and either open an existing Power BI group (workspace) or create a new group. Either click **Add** under **Files** in the **Import or Connect to Data** section, or click the plus sign (+) next to **Datasets** in the left pane.



2. Select the **SharePoint – Team sites** option, and then enter the path of SharePoint Server that you're using (`https://ax7partner.litware.com` in our example).
3. Browse to the `/Shared Documents/GER data/PowerBI` folder, and select the Excel file that you created as the source of data for the new Power BI dataset.



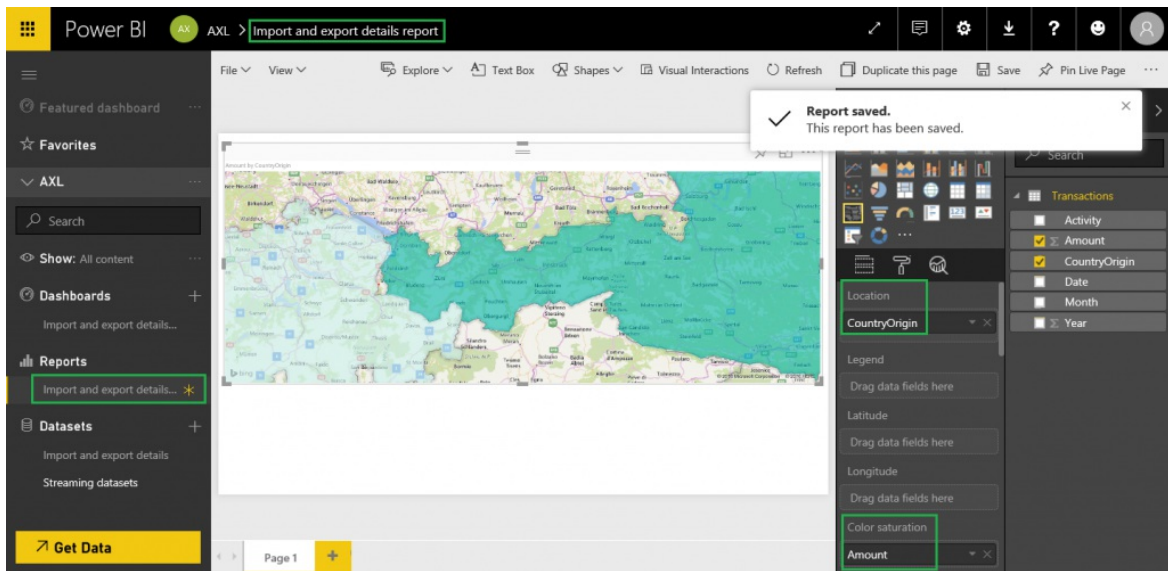
4. Click **Connect**, and then click **Import**. A new dataset is created that is based on the selected Excel file. The dataset can also be added automatically to the newly created dashboard.



5. Configure the refresh schedule for this dataset to force a periodic update. Periodic updates enable the consumption of new business data that comes via periodic execution of the ER report through new versions of the Excel file that are created on the SharePoint Server.

Create a Power BI report by using the new dataset

1. Click the **Import and export details** Power BI dataset that you created.
2. Configure the visualization. For example, select the **Filled map** visualization, and configure it as follows:
 - Assign the **CountryOrigin** dataset field to the **Location** field of the map visualization.
 - Assign the **Amount** dataset field to the **Color saturation** field of the map visualization.
 - Add the **Activity** and **Year** dataset fields to the **Filters** fields collection of the map visualization.
3. Save the Power BI report as **Import and export details report**.

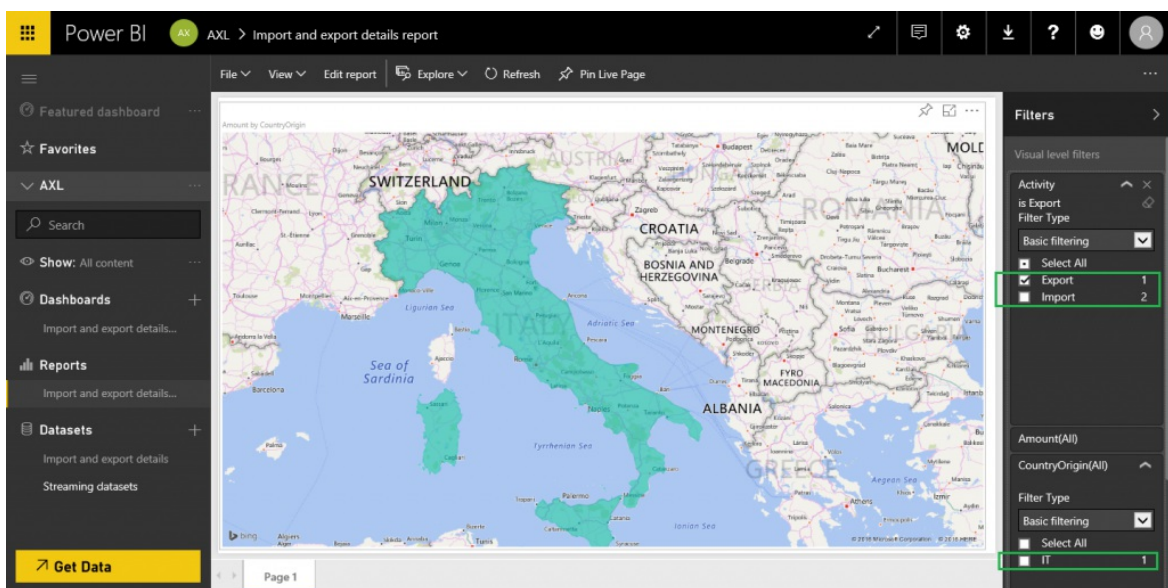


Note that the map shows the countries/regions that are mentioned in the Excel file (Austria and Switzerland in this example). These countries/regions are colored to show the proportion of invoiced amounts for each.

- Update the list of Intrastat transactions. The export transaction that originated from Italy is added.

Date	Direction	Correction	Item number	Category	Commodity	Weight	Invoice amount	Statistical amount	Is...	Country/region of origin
1/31/2016	Arrivals	<input type="checkbox"/>	D0003		920 20 34	4.00	1,000.00	1,000.00	✓	AUT
1/31/2016	Arrivals	<input type="checkbox"/>	T0006		900 22 33	5.00	700.00	700.00	✓	CHE
1/31/2016	Dispatches	<input type="checkbox"/>	D0006		900 30 10	1.00	1,500.00	500.00	✓	ITA

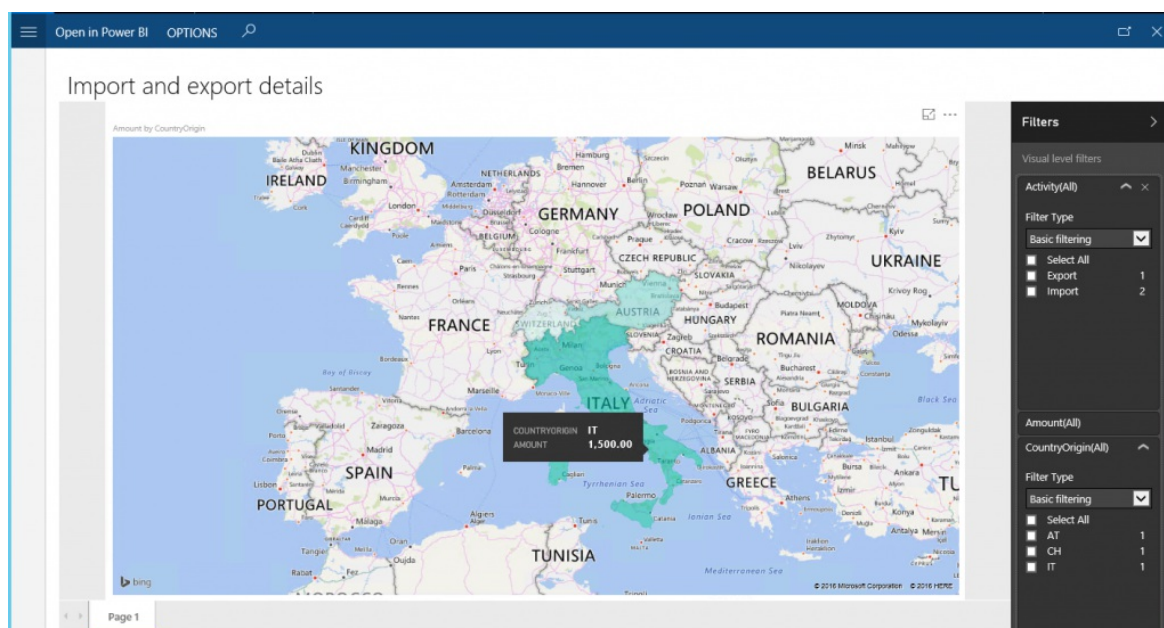
- Wait for the next scheduled execution of the ER report and the next scheduled update of the Power BI dataset. Then review the Power BI report (select to show import transactions only). The updated map now shows Italy.



Access Power BI report in Finance

Set up the integration with Power BI. For more information, see [Configure Power BI integration for workspaces](#).

1. On the **Electronic reporting** workspace page that supports Power BI integration (**Organization administration > Workspaces > Electronic reporting workspace**), click **Options > Open report catalog**.
2. Select the **Import and export details** Power BI report that you created, to show that report as an action item on the selected page.
3. Click the action item to open the page that shows the report that you designed in Power BI.



Additional resources

[Electronic reporting \(ER\) destinations](#)

[Electronic reporting \(ER\) overview](#)

NOTE

Can you tell us about your documentation language preferences? [Take a short survey](#).

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Generate printable FTI forms

2/18/2021 • 10 minutes to read • [Edit Online](#)

The Electronic reporting (ER) framework lets you generate printable free text invoice (FTI) forms as Microsoft Office documents. This topic provides information about how to build your own configurations as well as details of available configuration templates.

Overview

In addition to the existing capability of generating printable FTI forms by using Microsoft SQL Server Reporting Services (SSRS), you can now use the ER framework. You can manage printable FTI forms in Microsoft Office Excel and Word. You can also modify the layout, data flow, and formatting to meet specific requirements without making code changes.

NOTE

If you want to start with an overview of existing ER configurations for this sample of the printable FTI forms solution, you can go directly to section **Download sample ER configurations to generate printable FTI forms** later in this topic.

Create customized configurations for FTI printable forms

As part of your customized solution for printable FTI forms, you must create a set of ER configurations.

Configure the ER data model

Your application must include the ER data model configuration that contains a data model that describes the customer invoicing business domain. As a requirement, the name of the data model must be **CustomersInvoicing**. For information about how to design ER data models, see [ER Design domain specific data model](#).

Configure the ER model mapping

Your application must include the ER model mapping for the CustomersInvoicing data model. The model mapping can be in either the ER data model configuration or the ER model mapping configuration. However, the name of the root descriptor of the model mapping must be **FreeTextInvoice**.

The mapping must contain the following data sources:

- Data source type: **Table records**
 - This data source must be named **CustInvoiceJour**.
 - It must refer to the CustInvoiceJour application table.
 - It's used at runtime to pass from the application to the ER model mapping the list of invoices that have been selected for printing.
- Data source type: **Object**
 - This data source must be named **PrintMgmtPrintSettingDetail**.
 - It must refer to the **PrintMgmtPrintSettingDetail** application class.
 - It's used at runtime to pass from the application to the ER model mapping details of the print management settings for the ER format that is running.

The details of the application integration with the ER framework can be found in the

ERPrintMgmtReportFormatSubscriber class (ER Application Suite integration model) in the source code of the application.

For more information about the design of ER model mappings, see [Define ER model mappings and select data sources for them](#).

Configure the ER format

In your application instance, you must have the ER format configuration that will be used to generate FTI forms.

NOTE

This format configuration must be created for the CustomersInvoicing data model, and it must use the model mapping that has the **FreeTextInvoice** root descriptor.

For information about how to configure ER formats, see [ER Create a format configuration \(November 2016\)](#). For information about how to design ER formats to generate reports in OpenXML format, see [ER Design a configuration for generating reports in OPENXML format \(November 2016\)](#).

Configure print management

To generate FTI forms by using the ER framework, you can assign ER formats in the same way that you assign SSRS reports. To associate the ER format with all Accounts receivable FTIs, go to **Accounts receivable > Setup > Forms > Form setup > General > Print management > Free text invoice > Original**. To associate the ER format with a specific customer or invoice, follow these steps.

1. Go to **Accounts receivable > Invoices > All free text invoices**.
2. Select the FTI to associate the ER format with, and open the **Print management setup** page.
3. Select the document level to specify the scope of invoices for processing.
4. Select the ER format for the specified document level.

The screenshot shows the Dynamics 365 interface for configuring print management. The breadcrumb trail is "Accounts receivable > Invoices > All free text invoices". The page title is "Print management setup" for "US-001". The left navigation pane shows a tree view with "Free text invoice" selected, and "Copy <Default>" highlighted. The main content area is titled "ORIGINAL OR COPY IDENTIFICATION" and contains several fields: "Original / copy" (Copy), "Name" (Copy), "Sus" (All countries/regions), "No" (Report format), "Default country/region", a checked checkbox for "Customer FTI report (GER)", "FreeTextInvoice.Report", a dropdown menu showing "FreeTextInvoice.Report", "Number of copies" (1), and "Footer text".

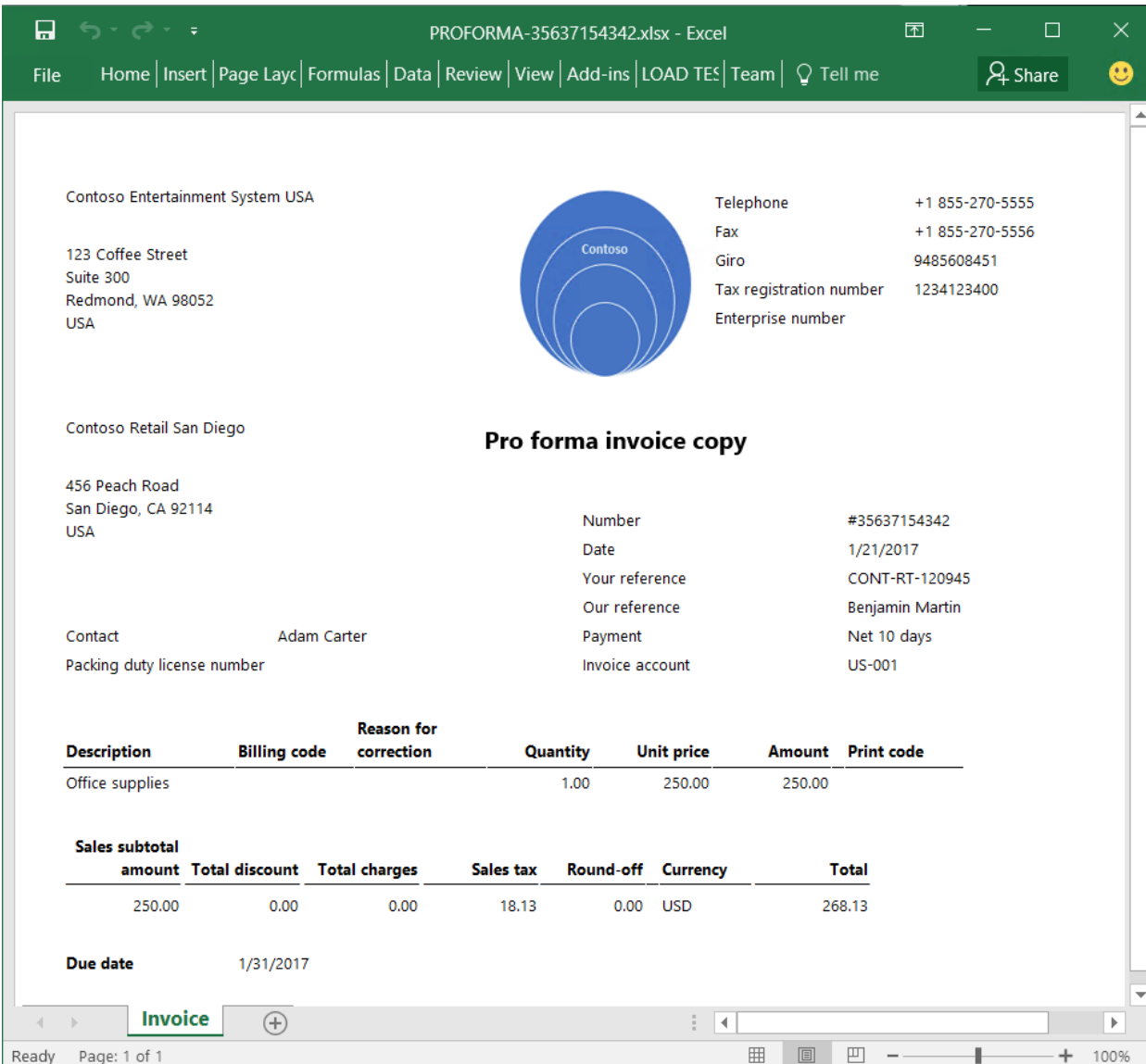
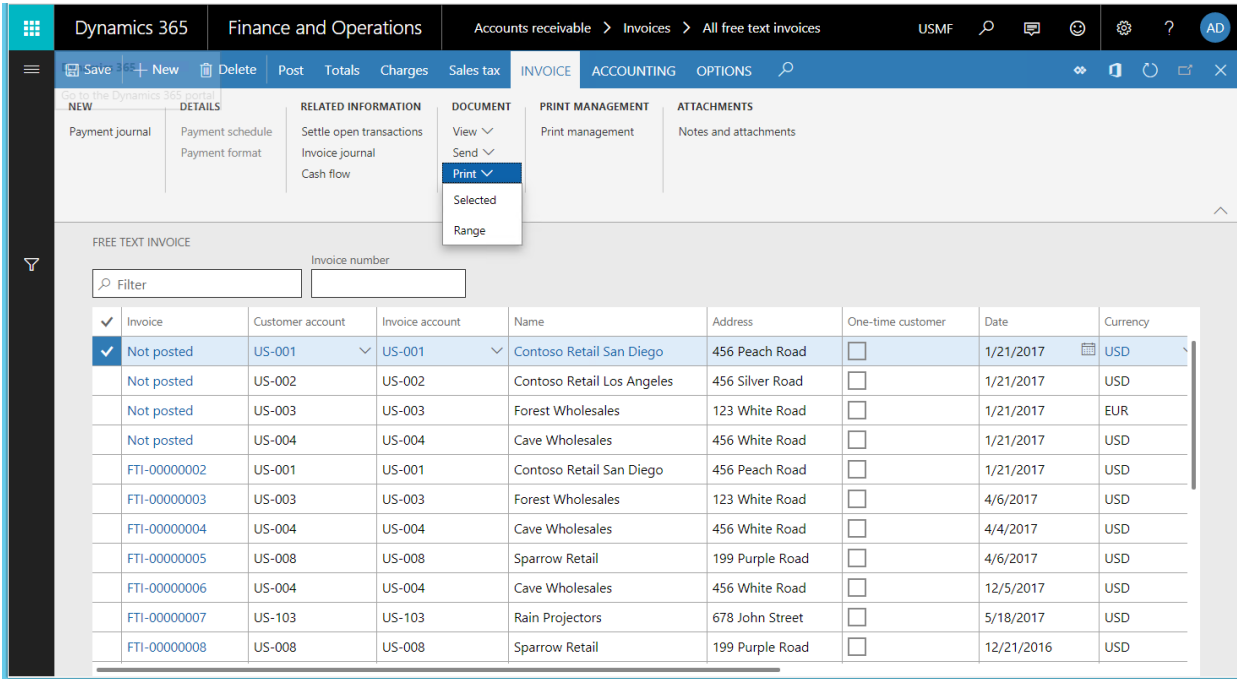
NOTE

Only ER formats that use the **FreeTextInvoice** root descriptor of the CustomersInvoicing data model appear in the **Report format lookup** field for the selected format.

Generate FTI forms

FTI forms are generated in the ER framework in the same way that SSRS reports are generated.

To generate FTI forms, you can select invoices either by range or by selection.



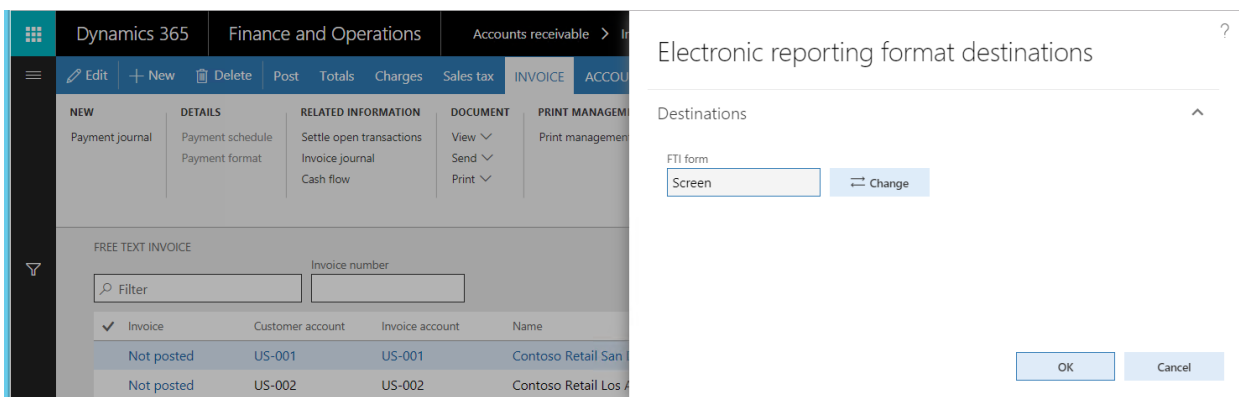
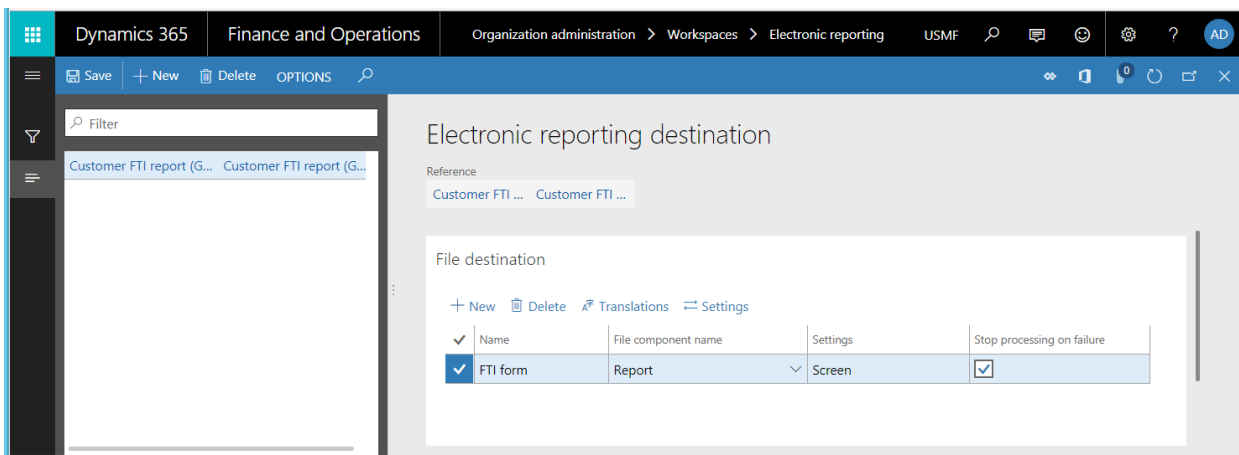
When you use ER formats to print FTI forms in this way, the default ER file destinations are used. You can't change the destination. For more information about how to configure the ER destinations for ER formats, see [Electronic reporting \(ER\) destinations](#).

You can also generate FTI forms when you post an FTI, by turning **Print invoice** on and turning **Use print management destinations** off.

NOTE

When you use ER formats to print FTI forms in this way, the default ER file destinations are used. You can change the default destination at runtime if the destination has already been configured. To change the destination, you must have the following security privilege:

- **Name:** ERFormatDestinationRuntimeMaintain
- **Label:** Maintain electronic reporting format destination during runtime



The ER framework currently supports the following destinations for generated documents:

- **Downloaded file** – Generated forms are offered as downloads that you can save by using the browser.
- **Screen** – Microsoft 365 Excel is used to preview generated FTI forms in Excel format.
- **SharePoint folder** – Generated forms are stored based on the settings of the Document management framework.
- **Application archive** – Generated forms are stored as attachments of execution log records in the Microsoft Azure Storage.
- **Email** – Generated forms are sent as email attachments.

NOTE

You can't send the FTI forms that are generated directly to the printer, because direct printing that uses the Dynamics Printer Routing Agent isn't currently supported.

Download sample ER configurations to generate printable FTI forms

You can download sample ER configurations to use as a template for your FTI solution. The configurations are stored in the Shared asset library in Microsoft Dynamics Lifecycle Services (LCS). The configurations include:

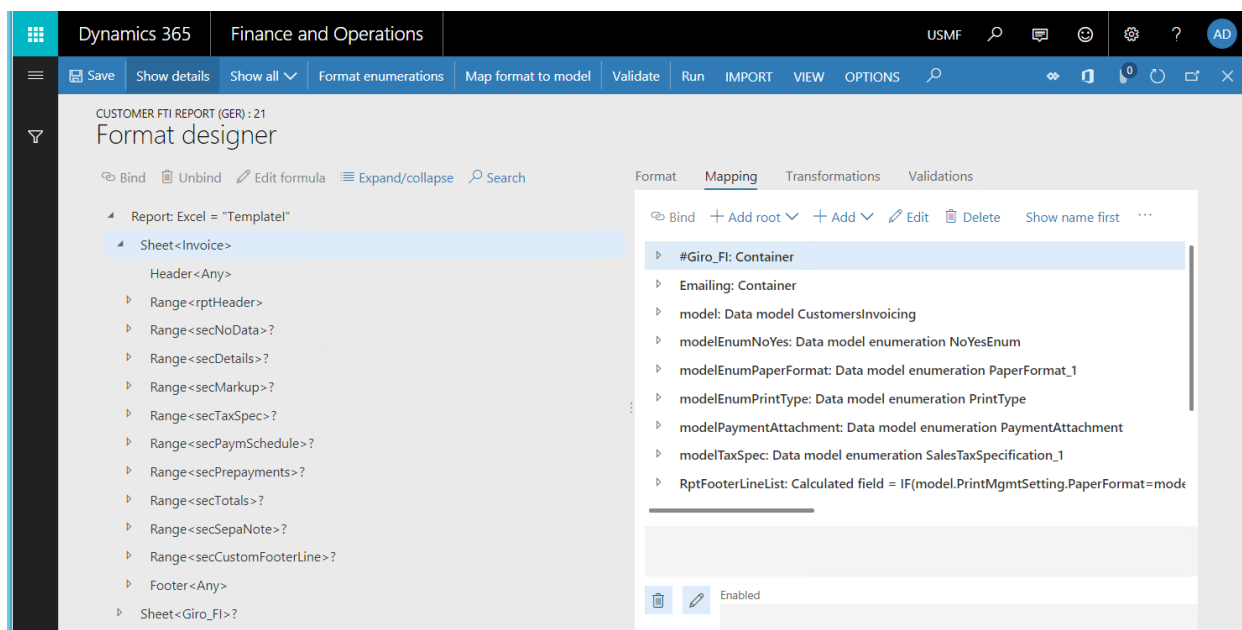
- The **Customer invoicing model** configuration contains the required data model and model mapping.
- The **Customer FTI report (GER)** configuration contains the sample format.

NOTE

These configurations have been created as samples to help clarify possible scenarios. The future of these configurations depends on the results of this evaluation and any feedback that is received.

Features that are implemented in the sample ER format

In the sample ER format configuration, an Excel file is used as a template to generate FTI forms.



Currently, this sample ER format supports the following features to generate FTI forms:

- FTI forms are generated for both original invoices that have been posted and original invoices that haven't yet been posted. Corrected invoices and credit notes aren't supported.
- FTI forms are generated in the invoice language. The format of values and dates in the generated forms is based on the settings of the user's client locale.
- Generated invoices show data unavailability notifications if there are no lines in the invoices that are processed.
- Generated invoice headers are based on the paper format that has been selected for the FTI form on the **Accounts receivable parameters** page. Company details appear in the header of the generated invoice form only if the paper format is blank.
- Generated invoice forms show company and customer tax exempt numbers when the appropriate option has been selected for the FTI form on the **Accounts receivable parameters** page.
- The generated invoice lines and invoice totals sections show the default invoice's monetary details in the invoice registration currency.
- The generated invoice totals section can show monetary details in the euro currency and the invoice registration currency when the **Print amount in currency representing the euro** option is enabled on the **Accounts receivable parameters** page.
- Generated invoice forms show any process invoice notes that are available, based on settings on the **Accounts receivable parameters** page. Notes are included for both the whole invoice and each invoice

line.

- Generated invoice forms include notes for the customer FTI form and the processing invoice language when they have been configured in the AR form notes list.
- Depending on the Print management settings, generated invoices include custom footer text when it has been configured for the invoice language, the ER format, and the FTI document scope.
- The totals section of generated invoice forms includes any cash discount information that is available.
- The payment schedule section of generated invoice forms includes any payment schedule details that are available.
- The markup section of generated invoice forms includes any charges transactions that are available.
- Generated invoice forms include sales tax details, based on the **Sales tax specification** setting on the **Accounts receivable parameters** page. This section can show tax details either in the invoice registration currency only, or in the invoice registration currency and the company accounting currency at the same time.
- Generated invoice forms show direct debit notification details. For example, they show when the method of payment that has the mandatory direct debit mandate ID was selected for the invoice, when the processing invoice was registered in the euro currency, and when the direct debit mandate ID was defined for the invoice.
- Generated invoices show any prepayment details that are available for posted invoices.
- Generated invoice forms can be sent to an invoice customer as an email attachment. The appropriate ER file destination should be configured for the ER format that is being used.

Country/region-specific features

The following country/region-specific features are included in the sample ER format to show how specific requirements can be handled in ER configurations.

Norway

The Enterprise register term is put on the header of the generated invoice form when the invoice is processed for a legal entity that is configured in the following manner:

- The country/region context for Norway is used.
- The **Print Foretaksregisteret** parameter is active on sales documents.

Spain

The **Special regime for cash accounting method** term is put on the header of the generated invoice form when the invoice is processed for a legal entity that is configured in the following manner:

- The country/region context for Spain is used.
- The special regime for the cash accounting method is enabled on the invoice processing date.

When cash discount details, such as the cash discount amount and invoice line net amount, are available, they are presented in the invoice totals section of the generated invoice form when it has been processed for a legal entity that is configured in the following manner:

- The country/region context for Spain is used.
- **Cash discount is applied in the invoice** is turned on in the invoice option (**General ledger parameters > Sales tax section**).

Italy

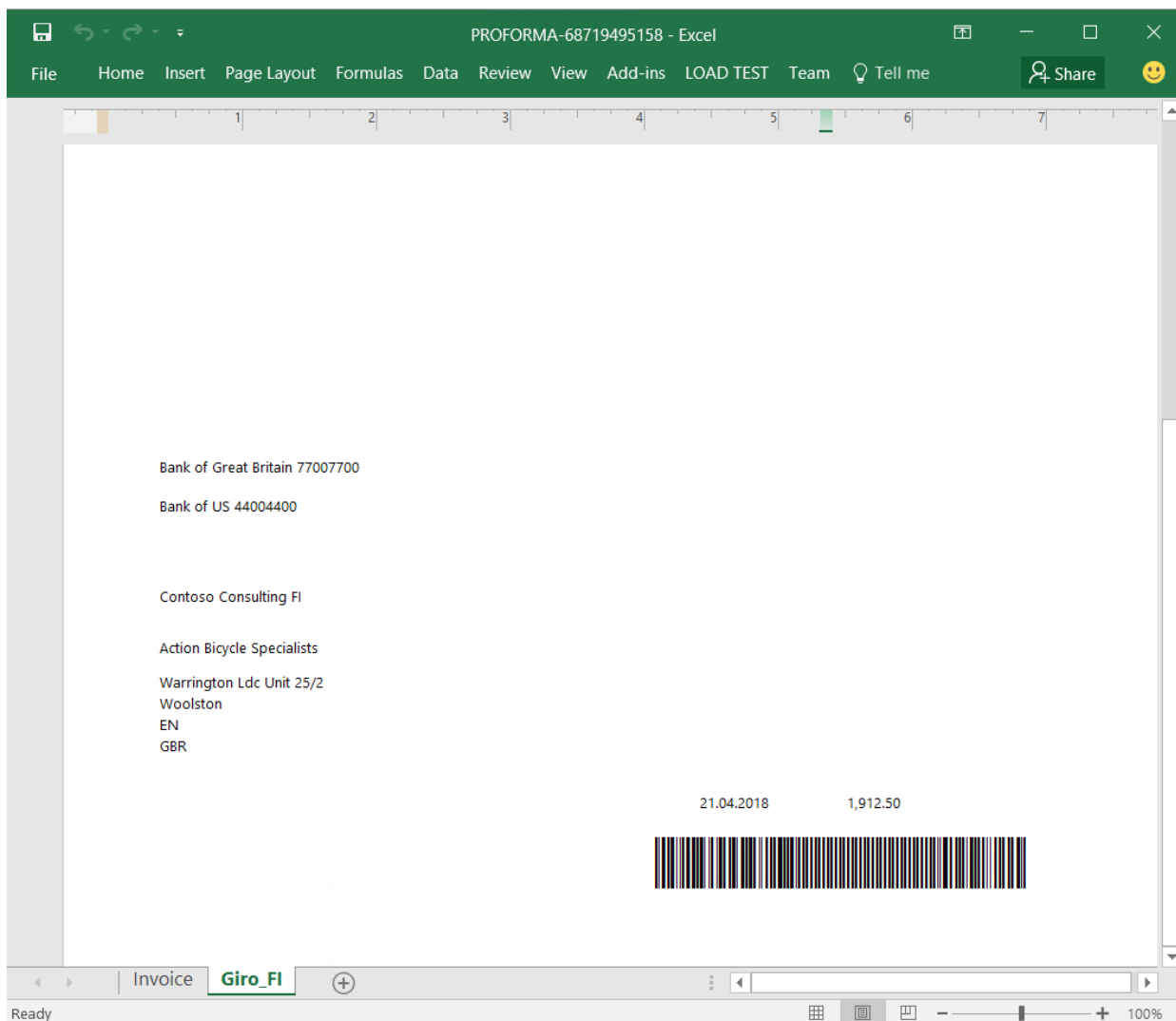
The goods discount mark is included on the invoice lines of the generated invoice when it's being processed for a legal entity that is configured using the country/region context for Italy.

Finland

In addition to the generated invoice form, Giro money transfer slips can be generated as follows:

- For the legal entity that uses the country/region context for Finland, and that has at least one bank account that is marked as **Giro account** and **Bank bar code**.

- For an invoice that is marked as required for the **Finnish** associated payment attachment.



NOTE

The sample ER format has been configured to optionally generate the Giro money transfer slips in the separate worksheet.

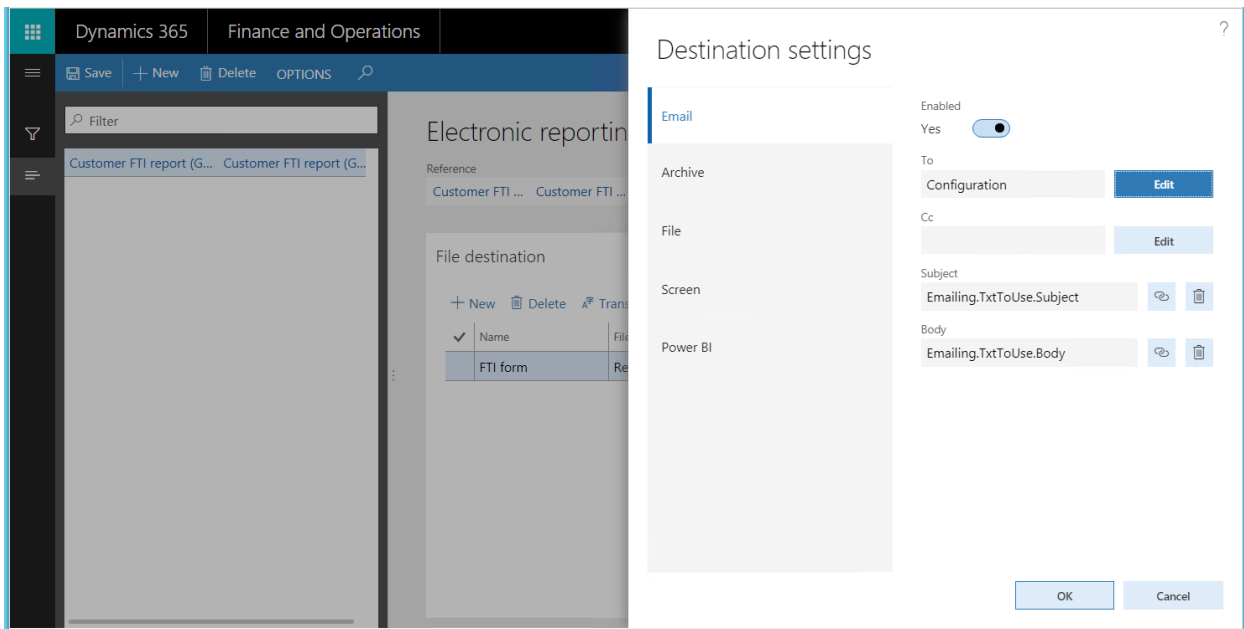
NOTE

You must first install the font that is used to generate the bar code on the local machine where the generated invoice form in Excel format will be previewed.

Use the sample ER format to configure email destinations

Use the following elements of the sample ER format to configure email destinations:

- The email address of a customer contact can be accessed through the following ER expression: **model.InvoiceBase.Contact.ElectronicMail**.
- The email subject text can be accessed through the following ER expression: **Emailing.TxtToUse.Subject**.
- The email body text can be accessed through the following ER expression: **Emailing.TxtToUse.Body**.

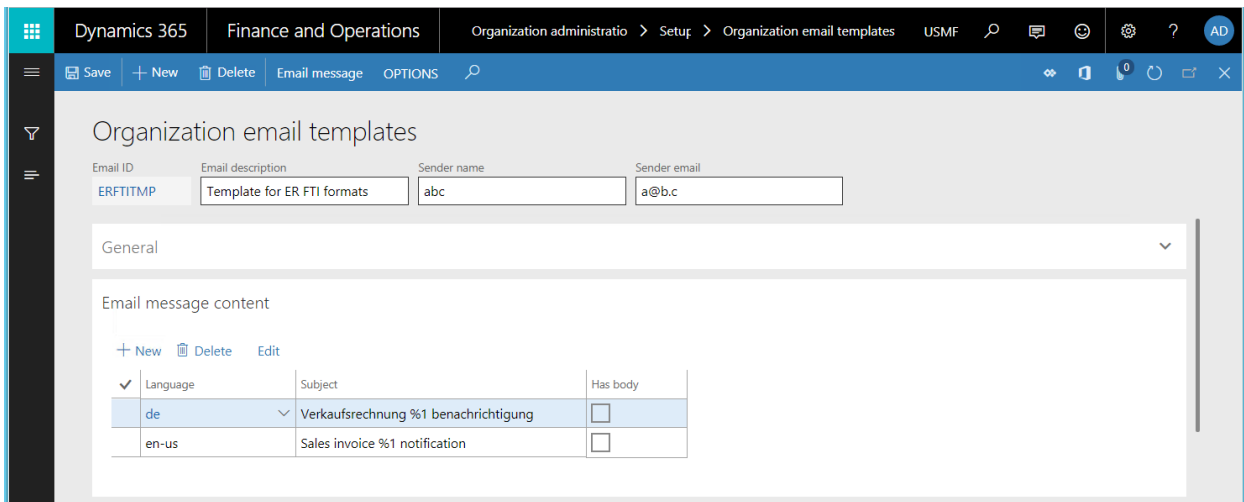


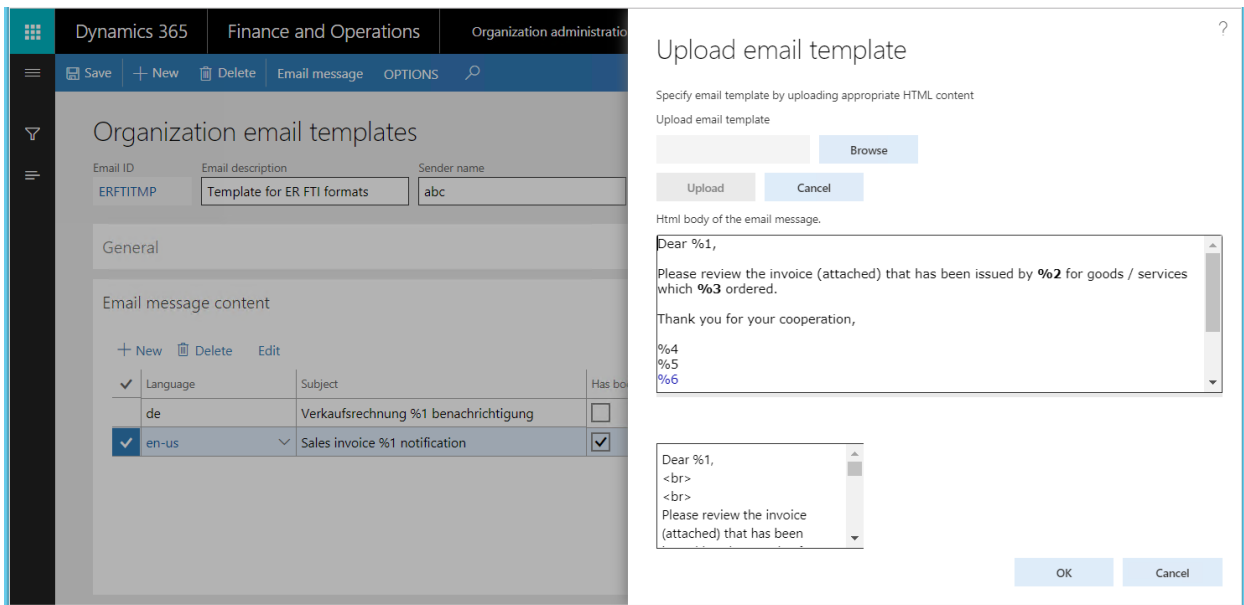
The default text of the email's subject and body is defined in the sample ER format. The language depends on the format's labels. This default text will be used for emails if a custom organization email template that has the predefined **ERFTITMP** ID hasn't been added.

NOTE

The **ERFTITMP** email template ID has been defined in the sample ER format. It can be changed as required in a new ER format that is created from this sample format.

If the organization email template that has the predefined **ERFTITMP** ID has been added for the legal entity that you're processing the invoice for, the template for the email subject and body text will be used to generate the email.

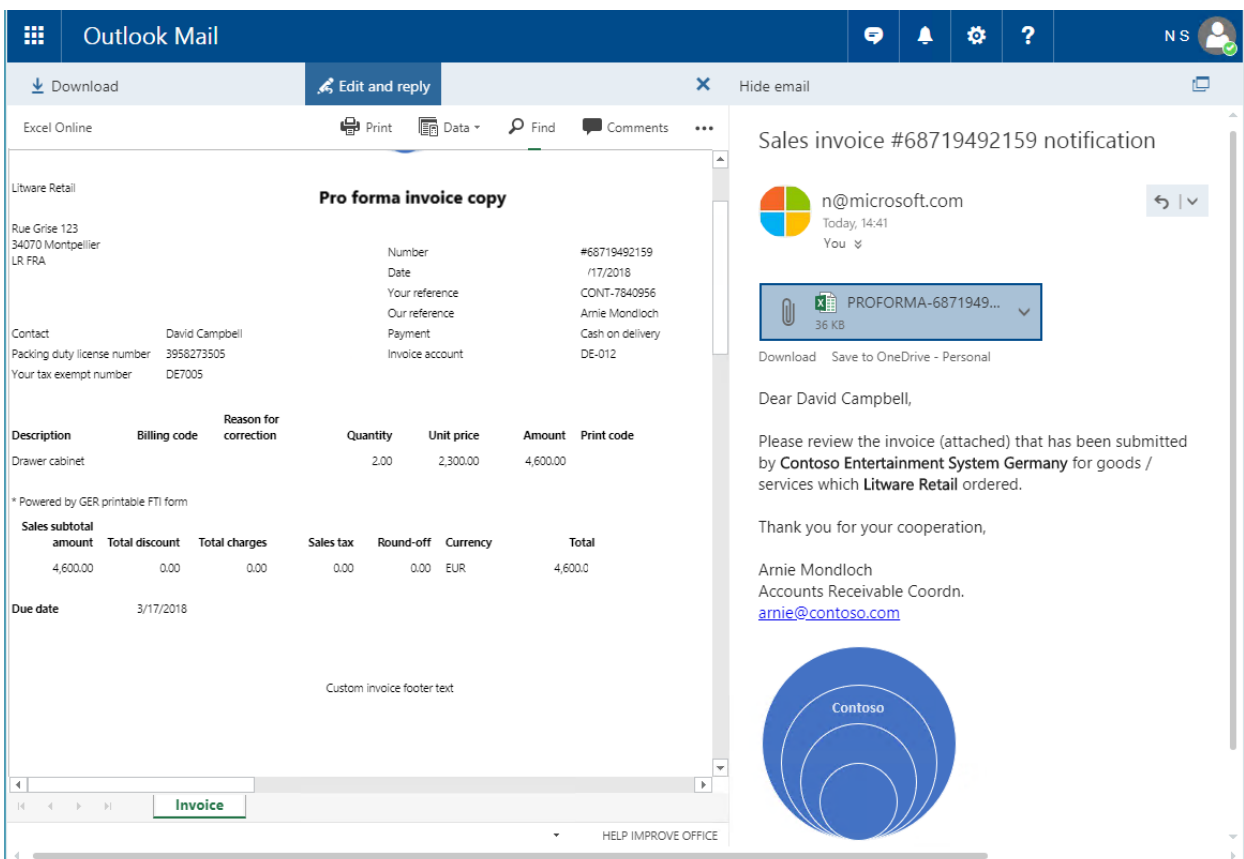




The `Emailing.TxtToUse.Subject` ER expression of the sample ER format is configured to replace any occurrences of the placeholder `%1` by the processing invoice ID.

The `Emailing.TxtToUse.Body` expression of the sample format is configured for the following substitutions for placeholders:

- `"%1"` is replaced with the name of the customer's contact person.
- `"%2"` is replaced with the company name.
- `"%3"` is replaced with the customer name.
- `"%4"` is replaced with the name of the company's contact person.
- `"%5"` is replaced with the job title of the company's contact person.
- `"%6"` is replaced with the email address of the company's contact person.



Additional resources

Electronic reporting (ER) overview

NOTE

Can you tell us about your documentation language preferences? [Take a short survey](#).

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Trace the execution of ER formats to troubleshoot performance issues

2/18/2021 • 15 minutes to read • [Edit Online](#)

As part of the process of designing Electronic reporting (ER) configurations to generate electronic documents, you define the method that is used to get data out of the application and enter it in the output that is generated. The ER performance trace feature helps significantly reduce the time and cost that are involved in collecting the details of ER format execution and using them to troubleshoot performance issues. This tutorial provides guidelines about how to take performance traces for executed ER formats, and how to use the information from these traces to help improve performance.

Prerequisites

To complete the examples in this tutorial, you must have the following access:

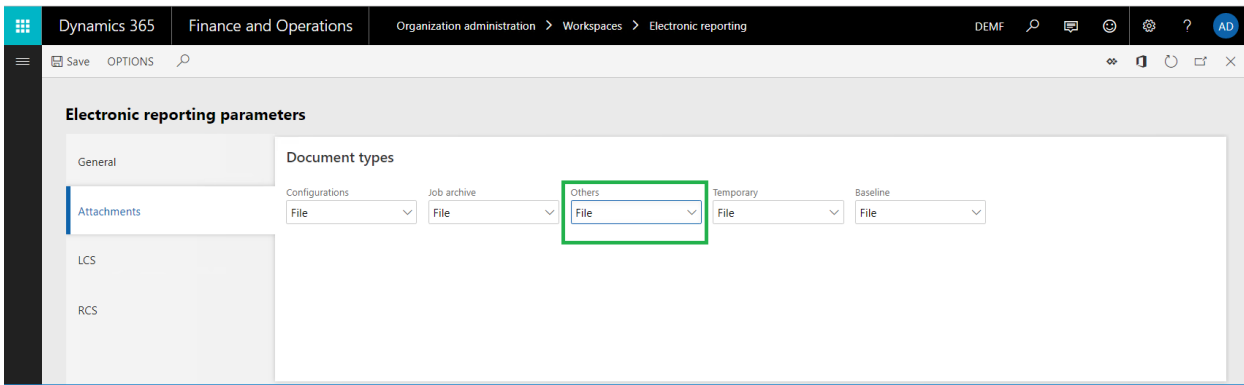
- Access to one of the following roles:
 - Electronic reporting developer
 - Electronic reporting functional consultant
 - System administrator
- Access to the instance of Regulatory Configuration Services (RCS) that has been provisioned for the same tenant as the application, for one of the following roles:
 - Electronic reporting developer
 - Electronic reporting functional consultant
 - System administrator

You must also download and locally store the following files.

FILE	CONTENT
Performance trace model.version.1	Sample ER data model configuration
Performance trace metadata.version.1	Sample ER metadata configuration
Performance trace mapping.version.1.1	Sample ER model mapping configuration
Performance trace format.version.1.1	Sample ER format configuration

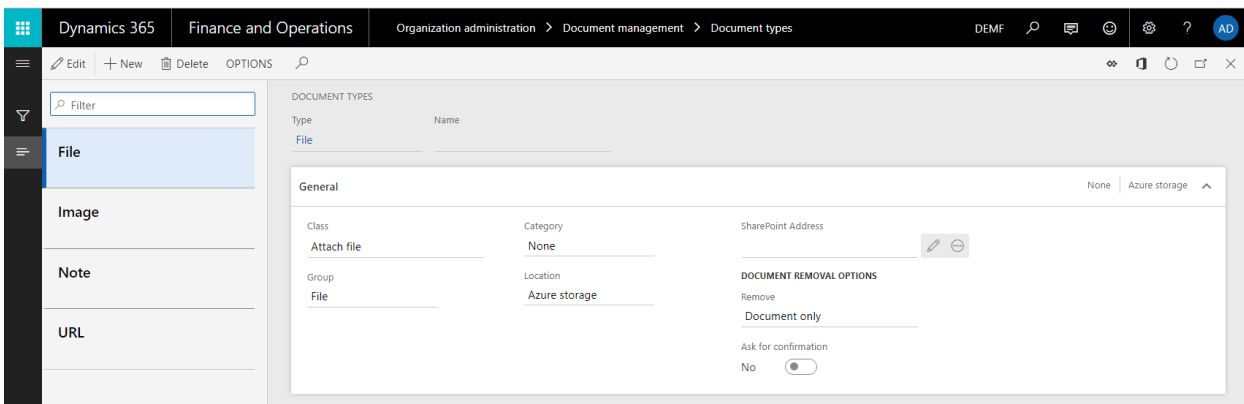
Configure ER parameters

Each ER performance trace that is generated in the application is stored as an attachment of the execution log record. The Document management (DM) framework is used to manage these attachments. You must configure ER parameters in advance, to specify the DM document type that should be used to attach performance traces. In the **Electronic reporting** workspace, select **Electronic reporting parameters**. Then, on the **Electronic reporting parameters** page, on the **Attachments** tab, in the **Others** field, select the DM document type to use for performance traces.



To be available in the **Others** lookup field, a DM document type must be configured in the following manner on the **Document types** page (**Organization administration > Document management > Document types**):

- **Class:** Attach file
- **Group:** File

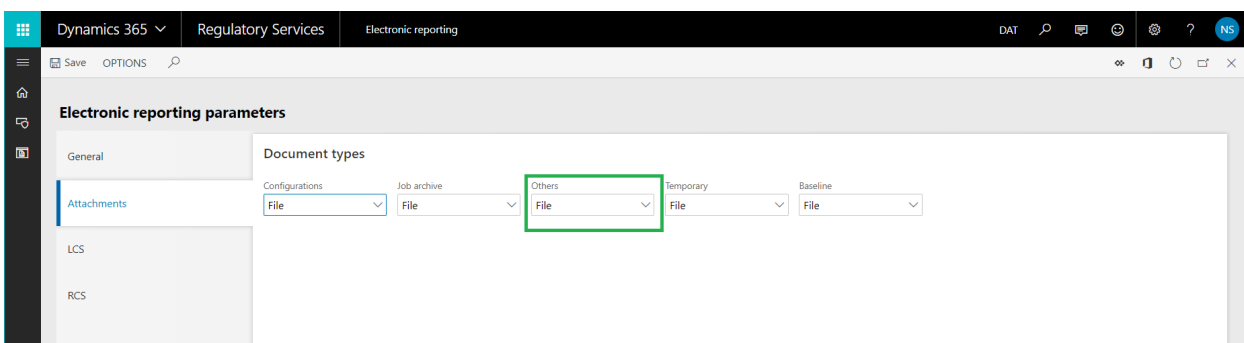


NOTE

The selected document type must be available in every company of the current instance, because DM attachments are company-specific.

Configure RCS parameters

ER performance traces that are generated will be imported into RCS for analysis by using the ER format designer and the ER mapping designer. Because ER performance traces are stored as attachments of the execution log record that is related to the ER format, you must configure RCS parameters in advance, to specify the DM document type that should be used to attach performance traces. In the instance of RCS that has been provisioned for your company, in the **Electronic reporting** workspace, select **Electronic reporting parameters**. Then, on the **Electronic reporting parameters** page, on the **Attachments** tab, in the **Others** field, select the DM document type to use for performance traces.



To be available in the **Others** lookup field, a DM document type must be configured in the following manner on

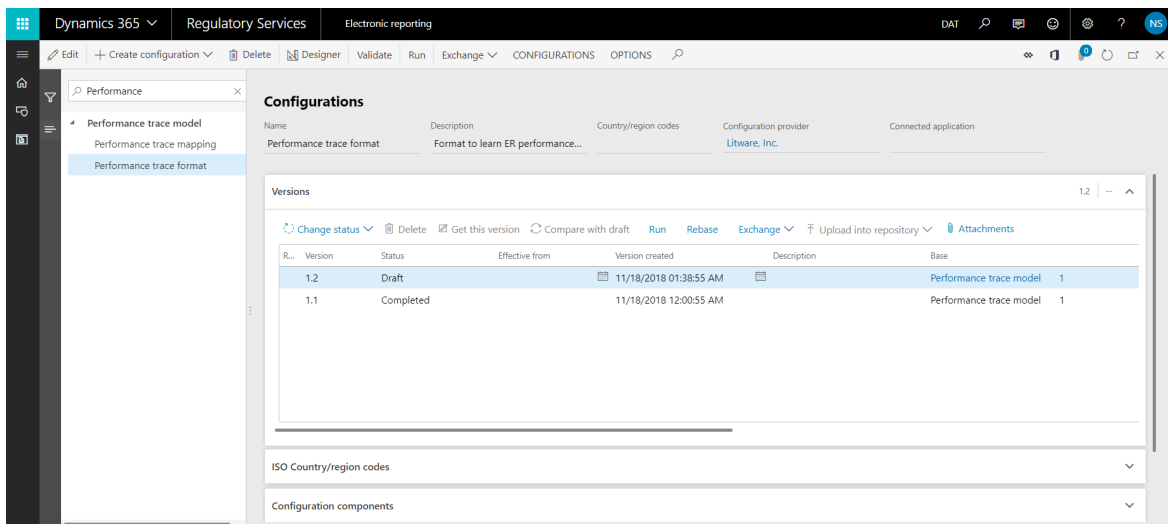
the Document types page (Organization administration > Document management > Document types):

- Class: Attach file
- Group: File

Design an ER solution

Assume that you've started to design a new ER solution to generate a new report that presents vendor transactions. Currently, you can find the transactions for a selected vendor on the **Vendor transactions** page (go to **Account payable > Vendors > All vendors**, select a vendor, and then, on the Action Pane, on the **Vendor** tab, in the **Transactions** group, select **Transactions**). However, you want to have all vendor transaction at the same time in one electronic document in XML format. This solution will consist of several ER configurations that contain the required data model, metadata, model mapping, and format components.

1. Sign in to the instance of RCS that has been provisioned for your company.
2. In this tutorial, you will create and modify configurations for the **Litware, Inc.** sample company. Therefore, make sure that this configuration provider has been added to RCS and selected as active. For instructions, see the [Create configuration providers and mark them as active](#) procedure.
3. In the **Electronic reporting** workspace, select the **Reporting configurations** tile.
4. On the **Configurations** page, import the ER configurations that you downloaded as a prerequisite into RCS, in the following order: data model, metadata, model mapping, format. For each configuration, follow these steps:
 - a. On the Action Pane, select **Exchange > Load from XML file**.
 - b. Select **Browse** to select the appropriate file for the required ER configuration in XML format.
 - c. Select **OK**.



Run the ER solution to trace execution

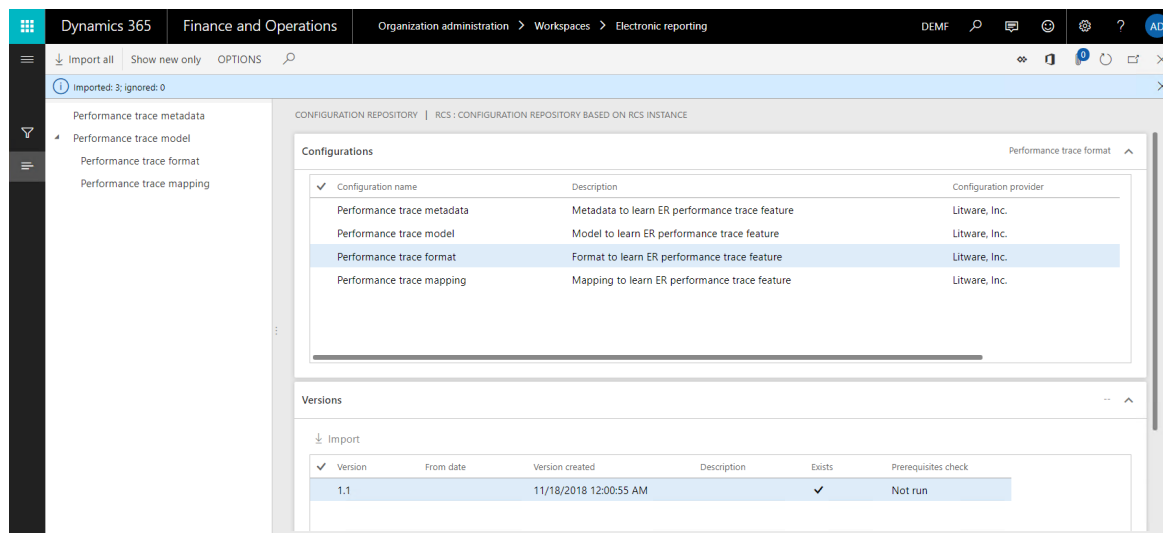
Assume that you've finished designing the first version of the ER solution. You now want to test it in your instance and analyze execution performance.

Import an ER configuration from RCS into Finance and Operations

1. Sign in to your application instance.
2. For this tutorial, you will import configurations from your RCS instance (where you design your ER components) into your instance (where you test and finally use them). Therefore, you must make sure that all the required artifacts have been prepared. For instructions, see the [Import Electronic reporting](#)

(ER) configurations from Regulatory Configuration Services (RCS) procedure.

3. Follow these steps to import the configurations from RCS into the application:
 - a. In the **Electronic reporting** workspace, on the tile for the **Litware, Inc.** configuration provider, select **Repositories**.
 - b. On the **Configuration repository** page, select the repository of the **RCS** type, and then select **Open**.
 - c. On the **Configurations** FastTab, select the **Performance trace format** configuration.
 - d. On the **Versions** FastTab, select version **1.1** of the selected configuration, and then select **Import**.



The corresponding versions of the data model and model mapping configurations are automatically imported as prerequisites for the imported ER format configuration.

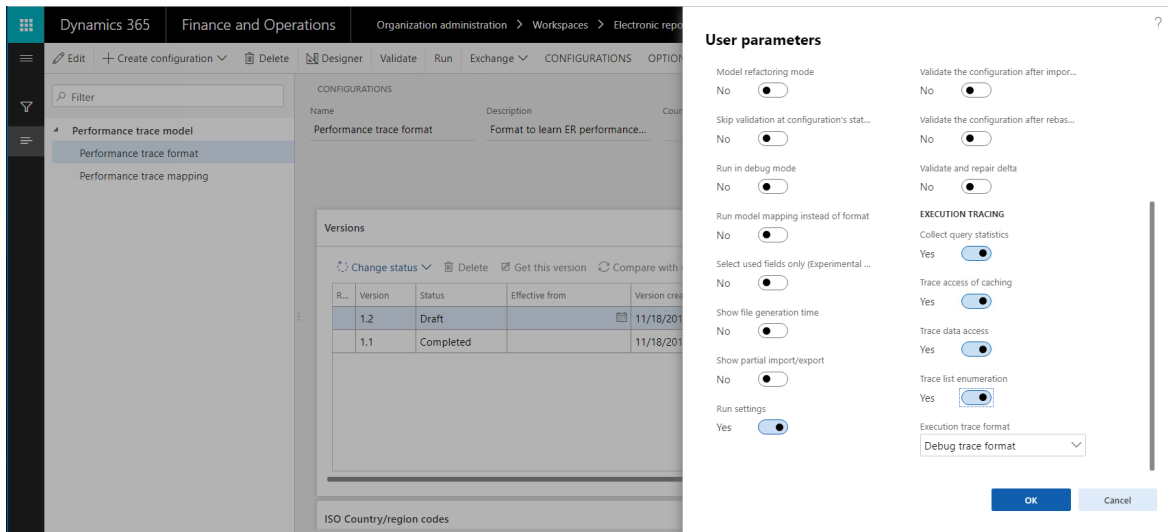
Turn on the ER performance trace

1. Go to **Organization administration > Electronic reporting > Configurations**.
2. On the **Configurations** page, on the Action Pane, on the **Configurations** tab, in the **Advanced settings** group, select **User parameters**.
3. In the **User parameters** dialog box, in the **Execution tracing** section, follow these steps:
 - a. In the **Execution trace format** field, select **Debug trace format** to start to collect the details of ER format execution. When this value is selected, the performance trace will collect information about the time that is spent on the following actions:
 - Running each data source in the model mapping that is called to get data
 - Processing each format item to enter data in the output that is generatedYou use the **Execution trace format** field to specify the format of the generated performance trace that the execution details are stored in for ER format and mapping elements. By selecting **Debug trace format** as the value, you will be able to analyze the content of the trace in ER Operation designer, and see the ER format or mapping elements that are mentioned in the trace.
 - b. Set the following options to **Yes** to collect specific details of the execution of the ER model mapping and ER format components:
 - **Collect query statistics** – When this option is turned on, the performance trace will collect the following information:
 - The number of database calls that were made by data sources
 - The number of duplicate calls to the database
 - Details of the SQL statements that were used to make database calls

- **Trace access of caching** – When this option is turned on, the performance trace will collect information about the ER model mapping's cache usage.
- **Trace data access** – When this option is turned on, the performance trace will collect information about the number of calls to the database for executed data sources of the record list type.
- **Trace list enumeration** – When this option is turned on, the performance trace will collect information about the number of records that are requested from data sources of the record list type.

NOTE

The parameters in the **User parameters** dialog box are specific to the user and the current company.



Run the ER format

1. Select the DEMF company.
2. Go to **Organization administration > Electronic reporting > Configurations**.
3. On the **Configurations** page, in the configuration tree, select the **Performance trace format** item.
4. On the Action Pane, select **Run**.

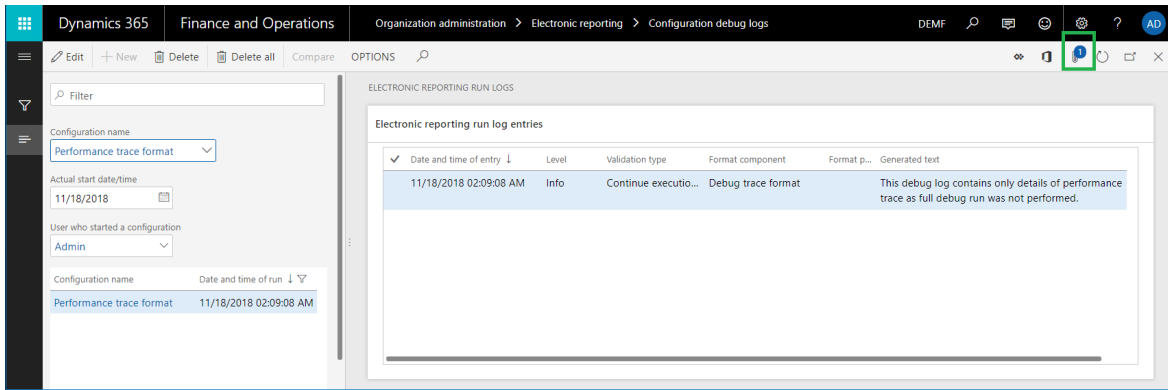
Notice that the file that is generated presents information about 265 transactions for six vendors.

Review the execution trace

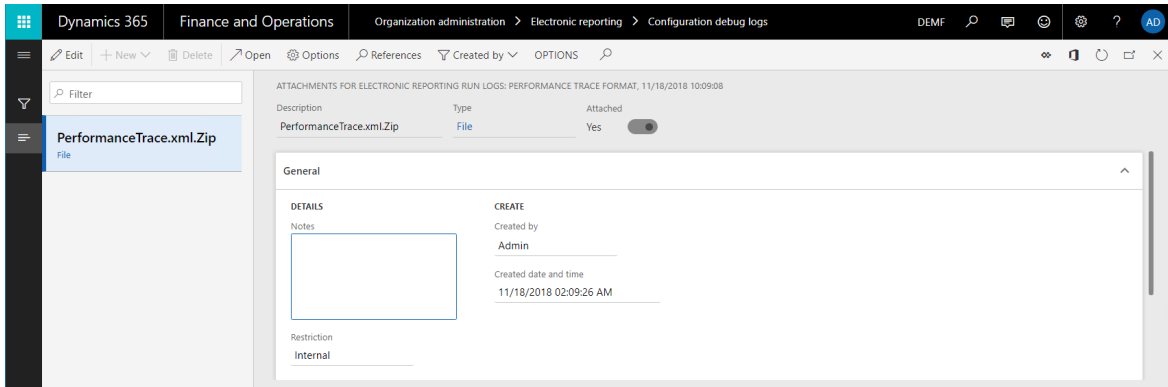
Export the generated trace from the application

Performance traces are decoupled from the source ER format and can be serialized to an external zip file.

1. Go to **Organization administration > Electronic reporting > Configuration debug logs**.
2. On the **Electronic reporting run logs** page, in the left pane, in the **Configuration name** field, select **Performance trace format** to find the log records that have been generated by the execution of the **Performance trace format** configuration.
3. Select the **Attachments** button (the paper clip symbol) in the upper-right corner of the page, or press **Ctrl+Shift+A**.



4. On the **Attachments for Electronic reporting run logs** page, on the Action Pane, select **Open** to get the performance trace as a zip file and store it locally.



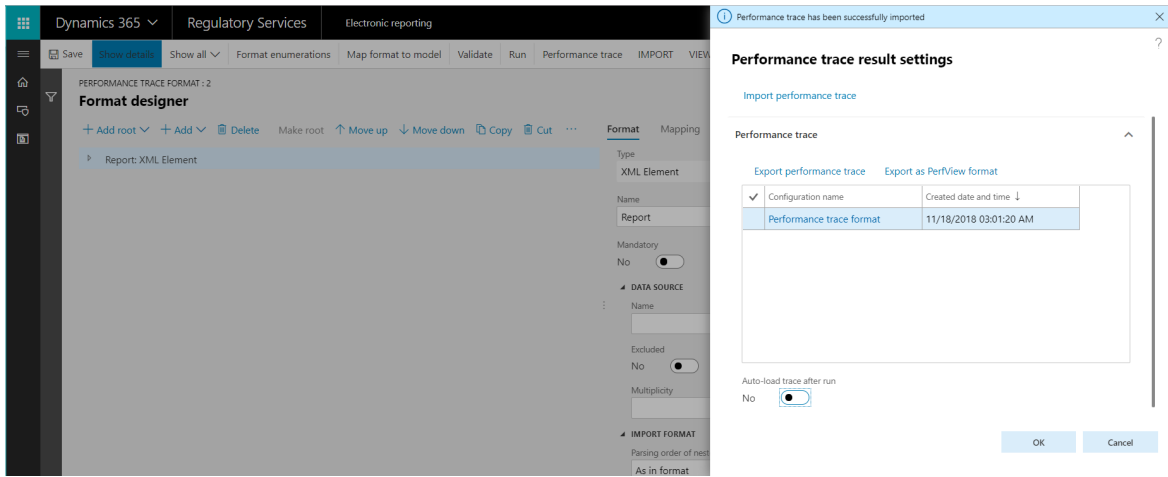
NOTE

The trace that is generated has a reference to the source ER report via a unique report identifier in **GUID** format only. The version numbering of the format isn't considered.

Notice that the association between the performance trace that has been generated for the executed ER format and the ER model mapping is based on the root descriptor that was used and the common data model. The version numbering of the format and model mapping isn't considered. The setting of the **Default for model mapping** flag for the model mapping also isn't considered.

Import the generated trace into RCS

1. In RCS, in the **Electronic reporting** workspace, select the **Reporting configurations** tile.
2. On the **Configurations** page, in the configuration tree, expand the **Performance trace model** item, and select the **Performance trace format** item.
3. On the Action Pane, select **Designer**.
4. On the **Format designer** page, on the Action Pane, select **Performance trace**.
5. In the **Performance trace result settings** dialog box, select **Import performance trace**.
6. Select **Browse** to select the zip file that you exported earlier.
7. Select **OK**.

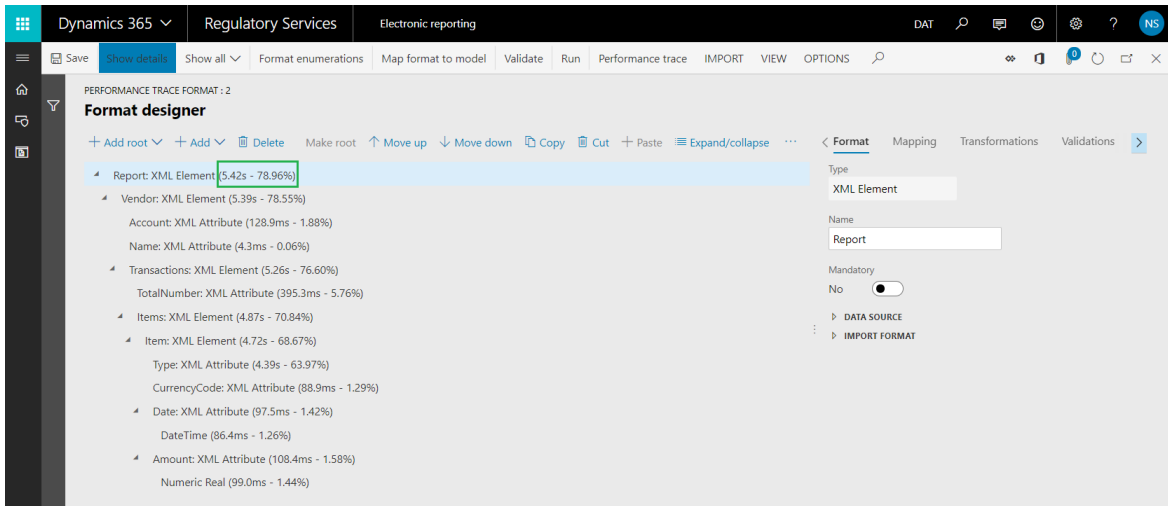


Use the performance trace for analysis in RCS – Format execution

1. In RCS, on the **Format designer** page, select **Expand/collapse** to expand the content of all format items.

Notice that additional information is shown for some items of the current format:

- The actual time that was spent entering data in the generated output by using the format item
- The same time expressed as a percentage of the total time that was spent generating the whole output



2. Close **Format designer** page.

Use the performance trace for analysis in RCS – Model mapping

1. In RCS, on the **Configurations** page, in the configuration tree, select the **Performance trace mapping** item.
2. On the Action Pane, select **Designer**.
3. Select **Designer**.
4. On the **Model mapping designer** page, on the Action Pane, select **Performance trace**.
5. Select the trace that you imported earlier.
6. Select **OK**.

Notice that new information becomes available for some data source items of the current model mapping:

- The actual time that was spent getting data by using the data source
- The same time expressed as a percentage of the total time that was spent running the whole model mapping

Notice that ER informs you that the current model mapping duplicates database requests while the `VendTable/<Relations/VendTrans.VendTable_AccountNum` data source is run. This duplication occurs because the list of vendor transactions is called two times for each iterated vendor record:

- One call is made to enter details of each transaction in the data model, based on configured bindings.
- One call is made to enter the calculated number of transactions per vendor in the data model.

The screenshot shows the 'Model mapping designer' interface. A yellow warning banner at the top states: 'Detected number of duplicate queries to database - 6. Consider caching them.' The interface is divided into several sections:

- DATA SOURCE TYPES:** A tree view on the left showing 'Data model' selected.
- DATA SOURCES:** A tree view in the center showing 'VendTable (3.04s - 76.16%)[12][Q:6]' selected. Underneath it, '<Relations (2.67s - 66.89%)' is expanded to show 'VendTrans.VendTable_AccountNum (2.67s - 66.89%)[530][Q:530]'.
- DETAILS:** A section at the bottom left containing a 'Performance statistics' table and a 'Find in tree' search box.
- DATA MODEL:** A section on the right showing the data model structure with 'Vendor = VendTable' and 'Transactions'.
- SQL Query:** A text area on the right showing a complex SQL SELECT query.

Path	Queries	Duplicated queries	Description
VendTable/<Relations/VendTrans.VendTable_AccountNum	12	6	
VendTable	1	0	

The value [Q:530] indicates that the VendTrans table was called 530 times to return a record from that table to the VendTable/<Relations/VendTrans.VendTable_AccountNum data source. The value [530] indicates that the VendTable/<Relations/VendTrans.VendTable_AccountNum data source was called 530 times to return a record from that data source and enter the details from it in the data model.

We recommend that you use caching for the VendTable/<Relations/VendTrans.VendTable_AccountNum data source, to reduce the number of calls that are made to get the details for 265 transactions and help improve the performance of the model mapping.

It can also be useful to reduce the number of calls that are made to the LedgerTransTypeList data source. This data source is used to associate each value of the LedgerTransType enumeration with its label. By using this data source, you can find an appropriate label and enter it in the data model for each vendor transaction. The current number of calls to this data source (9,027) is quite high for 265 transactions.

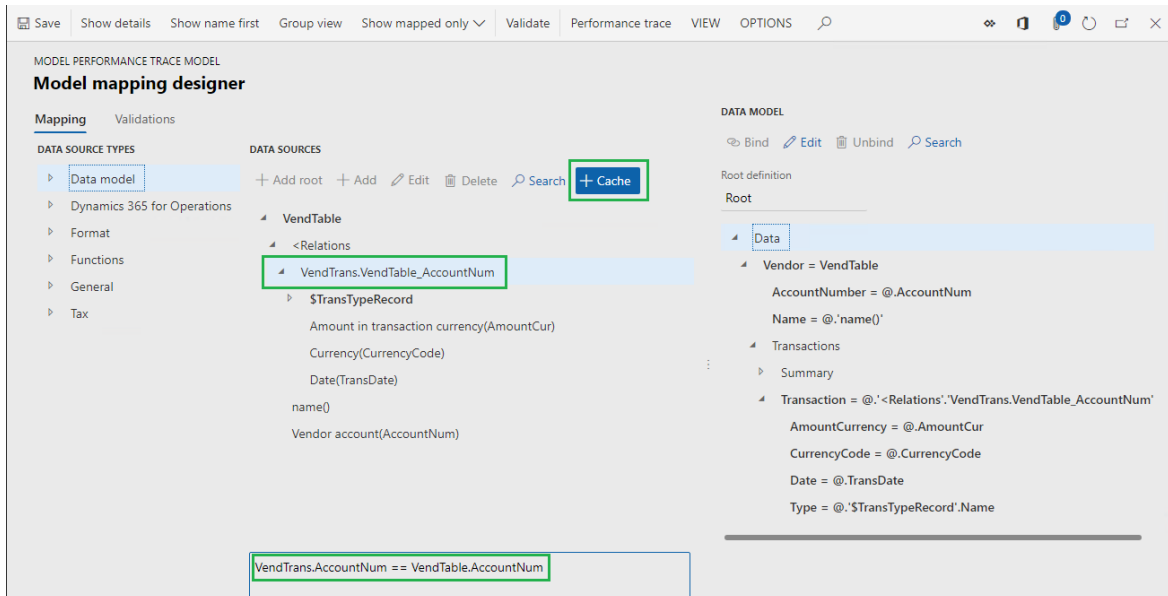
The screenshot shows the 'Model mapping designer' interface. A yellow warning banner at the top states: 'Detected number of duplicate queries to database - 6. Consider caching them.' The interface is divided into several sections:

- DATA SOURCE TYPES:** A tree view on the left showing 'Data model' selected.
- DATA SOURCES:** A tree view in the center showing 'LedgerTransTypeList (28.4ms - 0.71%)[9027]' selected.
- DATA MODEL:** A section on the right showing the data model structure with 'Vendor = VendTable' and 'Transactions'.
- SQL Query:** A text area on the right showing a complex SQL query.

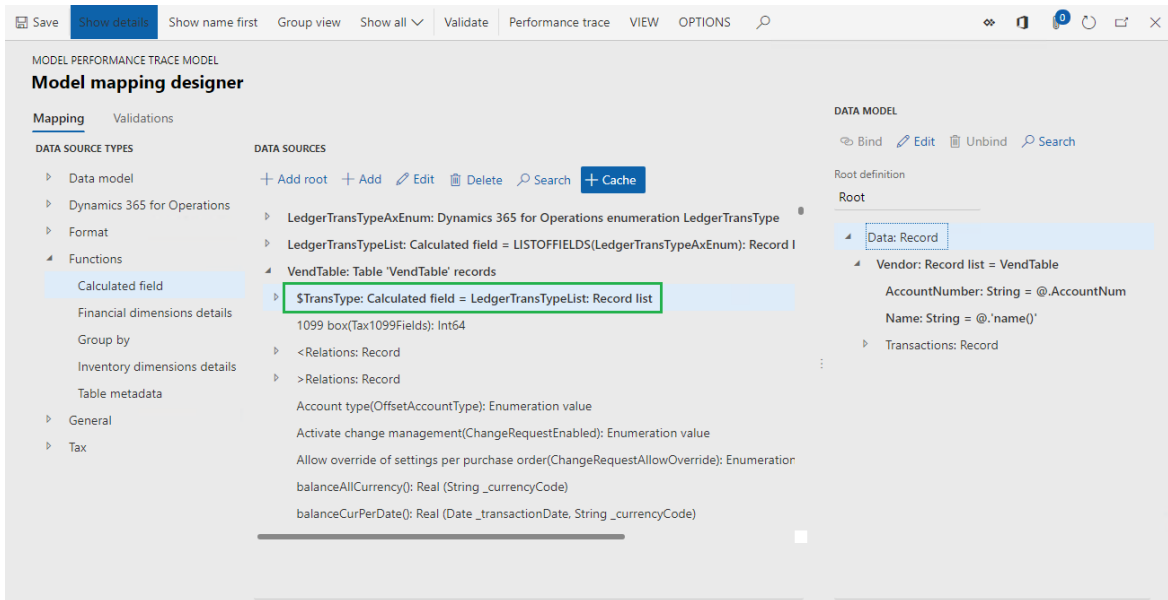
Improve the model mapping based on information from the execution trace

Modify the logic of the model mapping

1. Follow these steps to use caching, to help prevent duplicate calls to the database:
 - a. In RCS, on the **Model mapping designer** page, in the **Data sources** pane, select the **VendTable** item.
 - b. Select **Cache**.
 - c. Expand the **VendTable** item, expand the list of one-to-many relations for the VendTable data source (the **<Relations** item), and select the **VendTrans.VendTable_AccountNum** item.
 - d. Select **Cache**.



2. Follow these steps to bring the LedgerTransTypeList data source into the scope of the VendTable data source:
 - a. In the **Data source types** pane, expand the **Functions** item, and select the **Calculated field** item.
 - b. In the **Data sources** pane, select the **VendTable** item.
 - c. Select **Add**.
 - d. In the **Name** field, enter **\$TransType**.
 - e. Select **Edit formula**.
 - f. In the **Formula** field, enter **LedgerTransTypeList**.
 - g. Select **Save**.
 - h. Close the **Formula editor** page.
 - i. Click **OK**.
3. Follow these steps to do caching of the **\$TransType** field:
 - a. Select the **LedgerTransTypeList** item.
 - b. Select **Cache**.
 - c. Select the **VendTable.\$TransType** item.
 - d. Select **Cache**.



4. Follow these steps to change the **\$TransTypeRecord** field so that it starts to use the cached **\$TransType** field:

a. In the **Data sources** pane, expand the **VendTable** item, expand the **<Relations** item, expand the **VendTrans.VendTable_AccountNum** item, and select the **VendTable.VendTrans.VendTable_AccountNum.\$TransTypeRecord** item.

b. Select **Edit**.

c. Select **Edit formula**.

d. In the **Formula** field, find the following expression:

```
FIRSTORNUL (WHERE (LedgerTransTypeList, LedgerTransTypeList.Enum = @.TransType))
```

e. In the **Formula** field, enter the following expression:

```
FIRSTORNUL (WHERE (VendTable.'$TransType', VendTable.'$TransType'.Enum = @.TransType)).
```

f. Select **Save**.

g. Close the **Formula editor** page.

h. Select **OK**.

5. Select **Save**.

6. Close the **Model mapping designer** page.

7. Close the **Model mappings** page.

Complete the modified version of the ER model mapping

1. In RCS, on the **Configurations** page, on the **Versions** FastTab, select version 1.2 of the **Performance trace mapping** configuration.

2. Select **Change status**.

3. Select **Complete**.

Import the modified ER model mapping configuration from RCS into the application

Repeat the steps in the [Import an ER configuration from RCS into Finance and Operations](#) section earlier in this topic to import version 1.2 of the **Performance trace mapping** configuration.

Run the modified ER solution to trace execution

Run the ER format

Repeat the steps in the [Run the ER format](#) section earlier in this topic to generate a new performance trace.

Work with the execution trace

Export the generated trace from the application

Repeat the steps in the [Export the generated trace from the application](#) section earlier in this topic to save a new performance trace locally.

Import the generated trace into RCS

Repeat the steps in the [Import the generated trace into RCS](#) section earlier in this topic to import the new performance trace into RCS.

Use the performance trace for analysis in RCS – Model mapping

Repeat the steps in the [Use the performance trace for analysis in RCS – Model mapping](#) section earlier in this topic to analyze the latest performance trace.

Notice that the adjustments that you made to the model mapping have eliminated duplicate queries to database. The number of calls to database tables and data sources for this model mapping has been also reduced. Therefore, the performance of the whole ER solution has improved.

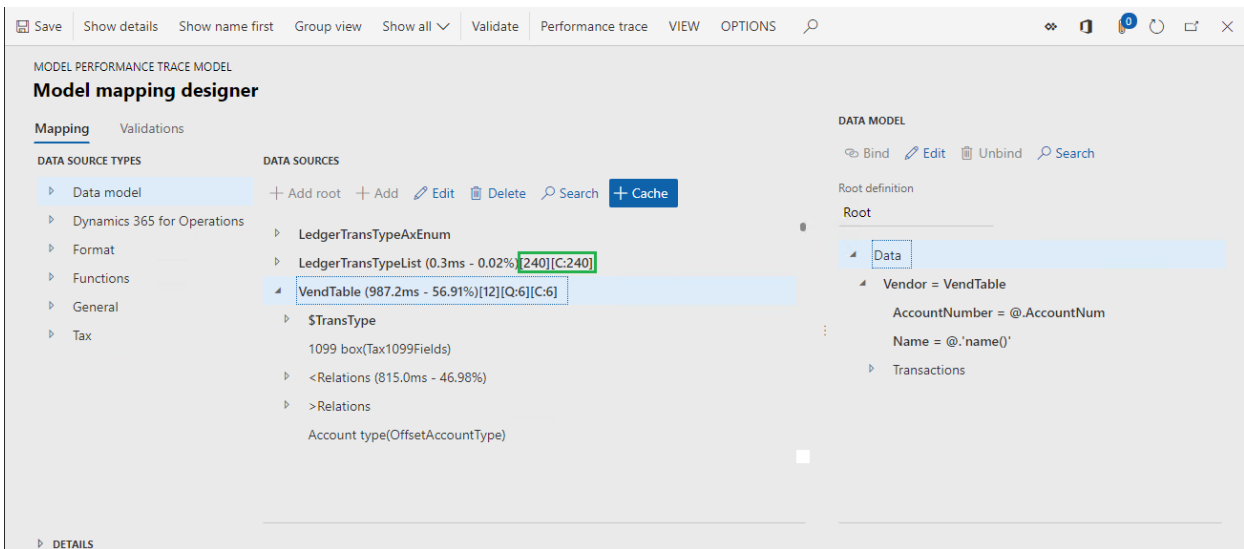
The screenshot shows the 'Model mapping designer' interface. The 'Performance statistics' table is highlighted with a green border. The table has the following data:

Path	Queries	Duplicated queries	Description
VendTable/<Relations/VendTrans.VendTable_AccountNum	6	0	
VendTable	1	0	

Below the table, a query snippet is visible, showing a complex SQL query with various table names and conditions, including 'VENDTABLE T1'.

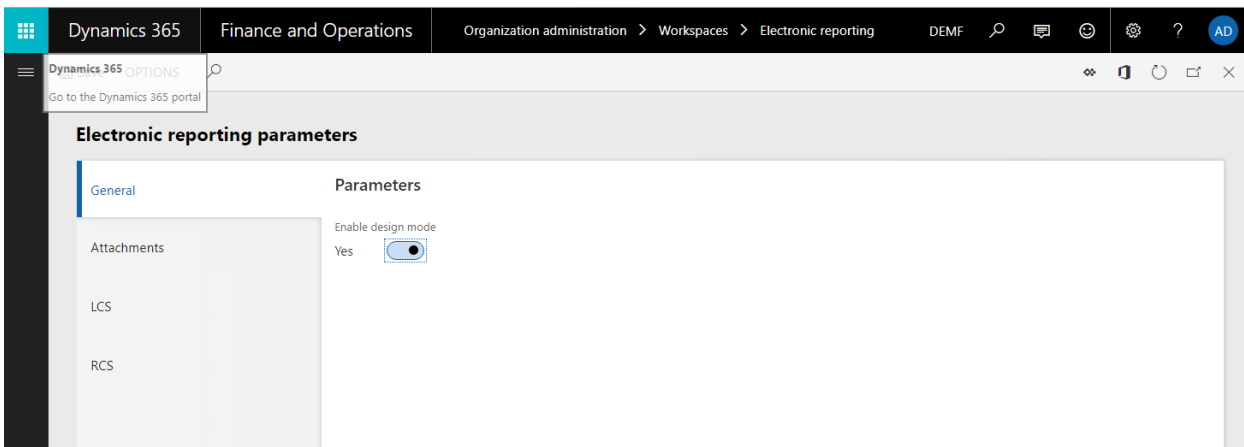
In the trace information, the value [12] for the VendTable data source indicates that this data source was called 12 times. The value [Q:6] indicates that six calls were translated to database calls to the VendTable table. The value [C:6] indicates that the records that were fetched from the database were cached, and six other calls were processed by using the cache.

Notice that the number of calls to the LedgerTransTypeList data source has been reduced from 9,027 to 240.



Review the execution trace in the application

In addition to RCS, some versions might offer capabilities for an ER framework designer experience. These versions have an **Enable design mode** option that can be turned on. You can find this option on the **General** tab of the **Electronic reporting parameters** page, which you can open from the **Electronic reporting** workspace.



If you use one of these versions, you can analyze the details of generated performance traces directly in the application. You don't have to export them from the application and import them into RCS.

Review the execution trace by using external tools

Configure user parameters

1. Go to **Organization administration > Electronic reporting > Configurations**.
2. On the **Configurations** page, on the Action Pane, on the **Configurations** tab, in the **Advanced settings** group, select **User parameters**.
3. In the **User parameters** dialog box, in the **Execution tracing** section, in the **Execution trace format** field, select **PerfView XML**.

Run the ER format

Repeat the steps in the [Run the ER format](#) section earlier in this topic to generate a new performance trace.

Notice that the web browser offers a zip file for download. This file contains the performance trace in PerfView format. You can then use the PerfView performance analysis tool to analyze the details of ER format execution.

Stacks(9,692,330 metric) ExecutionTrace.PerfView.Xml.Zip in PerfView (C:\Temp\PerfView\ExecutionTrace.PerfView.Xml.Zip)

File View Diff Regression Preset Help Stack View Help (F1) Understanding Perf Data Starting an Analysis Troubleshooting Tips

Update Back Forward Totals Metric: 9,692,330.0 Count: 27,450.0 First: 10,455.000 Last: 9,689,060.000 Last-First: 9,678,605.000 Metric/Interval: 1.00 TimeBucket: 302,783.1

Start: 0 End: 9,689,060.00 Find:

GroupPats: Fold%: FoldPats: IncPats: ExcPats:

By Name? Caller-Callee? CallTree? Callers? Calleees? Flame Graph? Notes?

Name	Exc %	Exc	Exc Ct	Inc %	Inc	li	li	F	F	V	V
Format:Report/Vendor/Transactions/Items/Item/Date/DateTime	0.3	29,103	530	1.9	188,945.0	116	1.5	0	0	—	—
Format:Report/Vendor/Transactions/Items/Item/CurrencyCode	0.3	29,009	530	1.8	176,177.0	110	1.5	0	0	—	—
Format:Report/Vendor/Transactions/Items/Item/Type	0.3	26,467	530	37.5	3,637,389.0	178	20.0	0	0	—	—
ModelMapping:VendTable/name()	0.2	21,010	12	0.2	21,010.0	1.7	12.0	0	0	—	—
FormatMapping:model/Data/Vendor	0.2	15,659	2	0.2	23,775.0	5.9	4.0	0	0	—	—
FormatMapping:model/Data/Vendor/AccountNumber	0.1	14,097	12	11.5	1,110,588.0	46.0	24.0	0	0	—	—
ModelMapping:VendTable	0.1	8,116	2	0.1	8,116.0	4.0	2.0	0	0	—	—
ModelMapping:LedgerTransTypeAxEnum	0.1	5,453	92	0.1	5,453.0	59.0	92.0	0	0	—	—
ModelMapping:VendTable/\$TransType	0.0	4,256	10	2.0	192,529.0	16.0	12.0	0	0	—	—
ModelMapping:LedgerTransTypeList/Name	0.0	3,629	92	0.0	3,629.0	39.0	92.0	0	0	—	—
Format:Report/Vendor	0.0	1,869	12	67.4	6,531,173.0	238	27.0	0	0	—	—
Format:Report/Vendor/Transactions	0.0	1,683	12	55.7	5,394,750.0	197	27.0	0	0	—	—
FormatMapping:model/Data/Vendor/Transactions/Transaction	0.0	1,666	12	0.0	1,666.0	13.0	12.0	0	0	—	—
Format:Report/Vendor/Transactions/TotalNumber	0.0	1,218	12	10.3	1,000,553.0	1.7	57.0	0	0	—	—
FormatMapping:model/Data/Vendor/Name	0.0	1,144	12	0.2	22,154.0	92.0	24.0	0	0	—	—
Format:Report/Vendor/Name	0.0	1,027	12	0.2	23,181.0	64.0	36.0	0	0	—	—
Format:Report/Vendor/Account	0.0	785	12	11.5	1,111,373.0	30.0	36.0	0	0	—	—
ROOT	0.0	0	0	100.0	9,692,330.0	353	27.0	0	0	—	—

Notes typed here will be saved when the view is saved. F2 will hide/unhide.

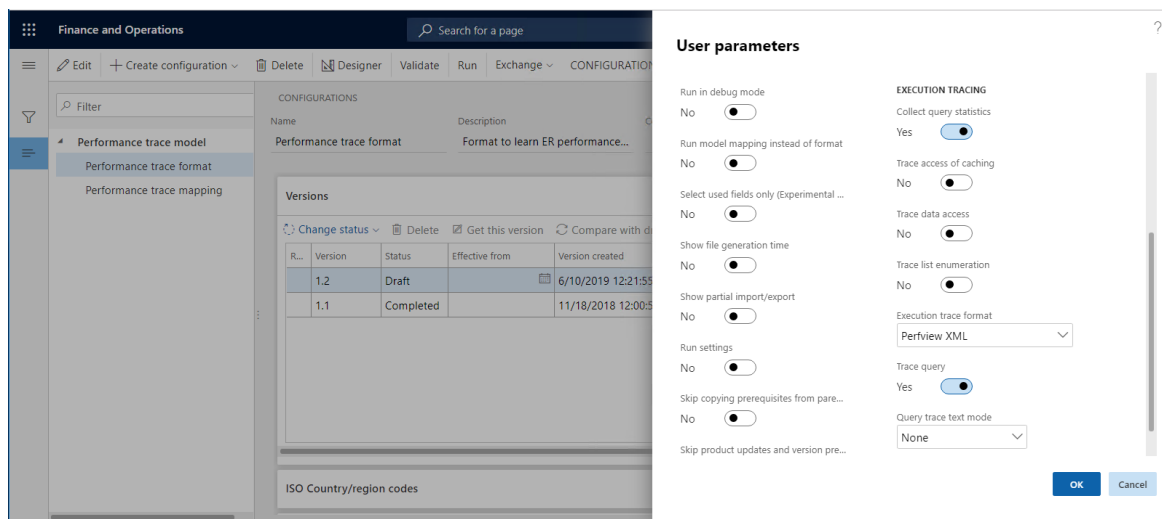
Ready Log Cancel

Use external tools to review an execution trace that includes database queries

Because of improvements that have been made to the ER framework, the performance trace that is generated in PerfView format now offers more details about ER format execution. In Microsoft Dynamics 365 for Finance and Operations version 10.0.4 (July 2019), this trace can also include details of executed SQL queries to the application database.

Configure user parameters

1. Go to **Organization administration > Electronic reporting > Configurations**.
2. On the **Configurations** page, on the Action Pane, on the **Configurations** tab, in the **Advanced settings** group, select **User parameters**.
3. In the **User parameters** dialog box, in the **Execution tracing** section, set the following parameters:
 - In the **Execution trace format** field, select **PerfView XML**.
 - Set the **Collect query statistics** option to **Yes**.
 - Set the **Trace query** option to **Yes**.



Run the ER format

Repeat the steps in the [Run the ER format](#) section earlier in this topic to generate a new performance trace.

Notice that the web browser offers a zip file for download. This file contains the performance trace in PerfView format. You can then use the PerfView performance analysis tool to analyze the details of ER format execution. This trace now includes the details of SQL database access during the execution of the ER format.

Name	E	E	E	I	I	I	I	F	F	V
ModelMapping:VendTable/name()	0.1	19,	12	0.1	19,	1,6	12	0	0	0
Query::SELECT T1.POSTINGPROFILE,T1.ACCOUNTINGEVENT,T1.ACCOUNTNUM,T1.AMOUNTCUR,T1.AMOUNTMST,T1.APPROVE	0.1	18,	54	24,	3,9	3,6	1,0	0	0	0
FormatMapping:model/Data/Vendor	0.1	14,	2	0.1	23,	5,7	4	0	0	0
FormatMapping:model/Data/Vendor/AccountNumber	0.1	12,	12	6,9	1,1	4,7	24	0	0	0
ModelMapping:VendTable	0.1	8,2	2	0.1	8,2	4,1	2	0	0	0
ModelMapping:LedgerTransTypeAxEnum	0.0	5,2	92	0.0	5,2	5,6	92	0	0	0
ModelMapping:VendTable/\$TransType	0.0	4,2	10	1.1	18,5	15,	12	0	0	0
ModelMapping:LedgerTransTypeList/Name	0.0	3,7	92	0.0	3,7	4,0	92	0	0	0
FormatMapping:model/Data/Vendor/Transactions/Transaction	0.0	2,8	12	0.0	2,8	24,0	12	0	0	0
Format:Report/Vendor	0.0	1,9	12	7,7	12,	4,5	2,7	0	0	0
Format:Report/Vendor/Transactions	0.0	1,7	12	7,0	11,	4,1	2,7	0	0	0
Format:Report/Vendor/Transactions/TotalNumber	0.0	1,6	12	5,0	8,2	7,2	1,1	0	0	0
FormatMapping:model/Data/Vendor/Name	0.0	1,1	12	0.1	21,	8,7	24	0	0	0
Format:Report/Vendor/Name	0.0	1,0	12	0.1	22,	6,1	3,6	0	0	0
Format:Report/Vendor/Account	0.0	8,6	12	6,9	1,1	3,1	3,6	0	0	0
Query::SELECT T1.TAXWITHHOLDGROUP,T1.RESIDENCEFOREIGNCOUNTRYREGIONID,T1.PAYMTERMID,T1.LINEDISC,T1.ACCOUN	0.0	4,8	14	1.4	2,2	7,9	2,8	0	0	0
QueryFirst::SELECT T1.POSTINGPROFILE,T1.ACCOUNTINGEVENT,T1.ACCOUNTNUM,T1.AMOUNTCUR,T1.AMOUNTMST,T1.APPR	0.0	3,9	12	1.2	1,9	5,5	3,6	0	0	0
QueryFirst::SELECT T1.TAXWITHHOLDGROUP,T1.RESIDENCEFOREIGNCOUNTRYREGIONID,T1.PAYMTERMID,T1.LINEDISC,T1.ACC	0.0	5,8	2	0.3	4,2	7,1	6	0	0	0
ROOT	0.0	0	0	10,0	16,	5,8	2,8	0	0	0

Additional resources

- [Electronic Reporting overview](#)
- [Improve performance of ER solutions by adding parameterized CALCULATED FIELD data sources](#)

NOTE

Can you tell us about your documentation language preferences? [Take a short survey.](#)

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Business document management overview

2/18/2021 • 25 minutes to read • [Edit Online](#)

Business users use the [Electronic reporting \(ER\)](#) framework to configure formats for outbound documents in accordance with the legal requirements of various countries/regions. Users can also define the dataflow to specify what application data is placed in generated documents. The ER framework generates outbound documents in Microsoft Office formats (Excel workbooks or Word documents) by using predefined templates. The templates are populated with required data in accordance to configured dataflow while required documents are generated. Each configured format can be published as part of an ER solution to generate specific outbound documents. This is represented by an ER format configuration that can contain templates you can use to generate different outbound documents. Business users can use this framework to manage required business documents.

Business document management is built on top of the ER framework and enables business users to edit business document templates by using Microsoft 365 service or appropriate Microsoft Office desktop application. Edits to the documents might include changing business document designs and adding placeholders for additional data without source code changes and new deployments. No knowledge of the ER framework is required to update templates of business documents.

NOTE

Be aware that Business document management allows you to modify templates that are used to produce business documents such as orders, invoices, etc. While a template has been modified and a new version of it has been published, this version is used to generate required business documents. Business document management cannot be used to modify already generated business documents.

Supported deployments

Currently, the Business document management feature is implemented only for cloud deployments. If this feature is critical to your on-premises deployment, let us know by providing feedback on the [Ideas](#) site.

Supported Microsoft Office applications

To use Business document management for editing templates in Excel or Word formats by using Microsoft Office desktop applications, you must have Microsoft Office 2010 or later installed. This is supported in cloud and on-premises deployments.

To use Business document management for editing templates in Excel or Word formats by using Microsoft 365 applications, you must have Microsoft 365 Office for the web subscription. This is supported in cloud deployment.

Business document availability

For a complete list of all the reports planned for the October 2019 release, see [Configurable business documents reporting in Word and Excel](#).

For a complete list of all the reports planned for the October 2020 release, see [Configurable business documents – Word templates](#).

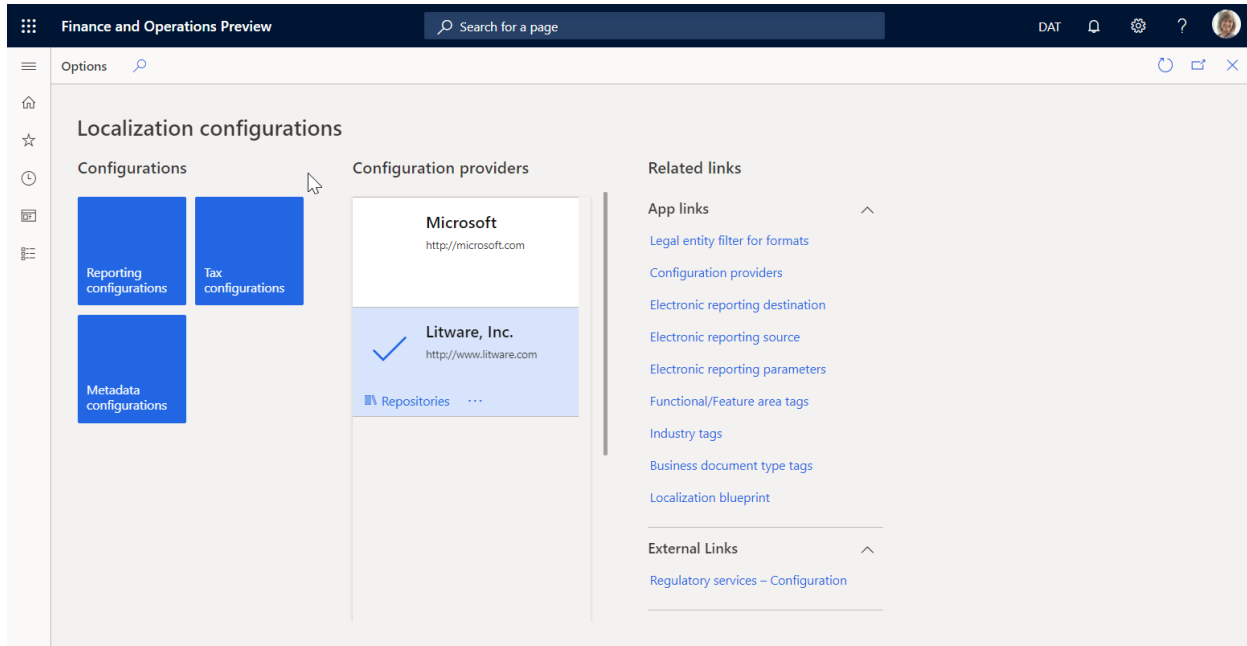
More reports will become available in future releases. Special notifications about additional reports will be sent

separately. To learn how to review the list of currently available reports, see the section [List of ER configurations that have been released in Finance to support configurable business documents](#) below.

To learn more about this feature, complete the example in this topic.

Configure ER parameters

Because Business document management is built on top of the ER framework, you must configure the ER parameters to start working with Business document management. To do this, you need to set up the ER parameters as described in [Configure the Electronic reporting \(ER\) framework](#). You also need to add a new configuration provider as described in [Create configuration providers and mark them as active](#).



Import ER solutions

Sample ER configurations are used in the example of this procedure. You must import, into your current instance of Dynamics 365 Finance, the ER configurations that contain the business document templates that can be edited by using Business document management. Download, and then locally store the following files to complete this procedure.

Sample ER customer invoicing solution

FILE	CONTENT
Customer invoicing model.version.2.xml	ER data model configuration
Customer FTI report (GER).version.2.3.xml	Free text invoice ER format configuration

Sample ER payment checks solution

FILE	CONTENT
Model for cheques.version.10.xml	ER data model configuration
Cheques printing format.version.10.9.xml	Payment cheque ER format configuration

Sample ER foreign trade solution

FILE	CONTENT
Intrastat model.version.1.xml	ER data model configuration
Intrastat report.version.1.9.xml	Intrastat control report ER format configuration

Use the following procedure to import each file. Import the ER *data model* configuration of each ER solution in the tables above before you import the corresponding ER *format* configuration.

1. Open the **Organization administration > Electronic reporting > Configurations** page.
2. On the top of the page, select **Exchange**.
3. Select **Load from XML file**.
4. Select **Browse** to load the required XML file.
5. Select **OK** to confirm configuration's import.

The screenshot shows the 'Customer invoicing model' configuration page in Dynamics 365 Finance and Operations. The left sidebar shows a tree view with 'Customer invoicing model' selected. The main area displays configuration details for 'Customer invoicing model', including a description and a 'Microsoft' configuration provider. Below this is a 'Versions' table with one entry: Version 2, Status Completed, Effective from (blank), Version created 1/15/2019 07:54:01 AM, and Description (blank). The top navigation bar includes 'Exchange' and 'Configurations' tabs.

Alternatively, you can import the officially published ER format configurations from Microsoft Dynamics Lifecycle Service (LCS). For example, to complete this procedure you can import the latest version of the **Free text invoice (Excel)** ER format configuration. The corresponding ER data model and ER model mapping configurations will be imported automatically.

The screenshot shows the 'Shared asset library' in Dynamics 365 Lifecycle Services. The left sidebar shows 'GER Configuration (1705)' selected. The main area displays a table of 'GER Configuration files'. The 'Free text invoice (Excel),version.155.77' configuration is selected. The right sidebar shows 'Additional details' for this configuration, including its description, asset ID, validation status, and creation/modification information.

Name	Valid	Version	Scope	Status	Modified date	Size
Cust account statement, Ext (Excel),version.24.10		1	Global	Published	11/1/2019	234 KB
Cust account statement, Ext (CN) (Excel),version.24.10.4		1	Global	Published	11/1/2019	237 KB
Reconciliation model mapping.version.24.8		1	Global	Published	11/1/2019	65 KB
Reconciliation model.version.24		1	Global	Published	11/1/2019	722 KB
Load tender model mapping.version.32.2		1	Global	Published	10/31/2019	32 KB
Free text invoice (Excel),version.155.77		1	Global	Published	10/31/2019	869 KB
Container contents model mapping.version.11.2		1	Global	Published	10/31/2019	32 KB
Container contents (Excel),version.11.2		1	Global	Published	10/31/2019	190 KB
Production pick list (Excel),version.11.5.2		1	Global	Published	10/31/2019	192 KB
Shipping pick list for load (Excel),version.11.5.3		1	Global	Published	10/31/2019	182 KB
Shipping pick list for shipment (Excel),version.11.5.3		1	Global	Published	10/31/2019	182 KB
Shipping pick list model mapping.version.11.2		1	Global	Published	10/31/2019	32 KB

For more information about importing ER configurations, see [Manage the ER configuration lifecycle](#).

Enable Business document management

To start Business document management, you need to open the **Feature management** workspace and enable the **Business document management** feature.

Use the following procedure to enable Business document management functionality for all legal entities.

1. Open the **Feature management** workspace.
2. On the **New** tab, select the **Business document management** feature in the list.
3. Select **Enable now** to turn on the selected feature.
4. Refresh the page to access the new feature.

NOTE

For more information about using the new document user interface in Business document management, see [New document user interface in Business document management](#).

The screenshot displays the 'Feature management' workspace. At the top, there are statistics: New (19), Not enabled (33), and Scheduled (0). Below these are buttons for 'Enable all' and 'Check for updates'. The main area shows a list of features with the following data:

Feature name	Enable date	Feature added	Module
Attachment recovery	8/1/2019	8/1/2019	System administration
Feature management enablement enhancements	8/1/2019	8/1/2019	System administration
Enable master plan setup wizard features.	8/1/2019	8/1/2019	Master planning
Keep GST tax document for confirmation journal	8/1/2019	8/1/2019	Tax
Business document management	8/2/2019	6/3/2019	Organization administration
Enable fixed exchange rate for reporting currency on sales ...	8/1/2019	5/9/2019	Shared AP and AR

The right-hand pane for 'Business document management' shows it was added on 6/3/2019 and enabled on 8/2/2019. The description states: 'This feature provides a new Business document management workspace, a new form for visibility of pre-loaded business document templates, and redesigned business document templates.' There is a 'Disable' button at the bottom of the pane.

For more information about activating new features, see [Feature management overview](#).

Configure parameters

Use the information in the following sections to set up the basic parameters for Business document management.

Prerequisites for parameter setup

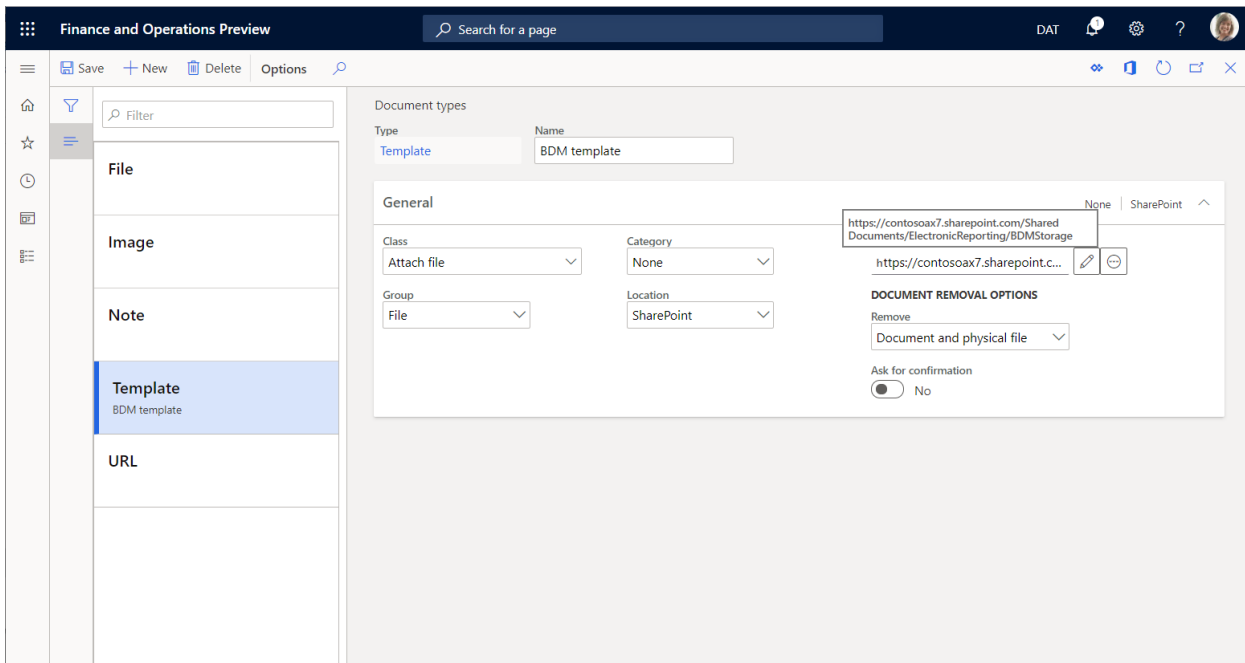
Before you can set up Business document management, you must set up the required document type in the Document management framework. This document type is used to specify a temporary storage of documents in Office formats (Excel and Word) that are used as templates for ER reports. The temporary storage template can be edited by using the Office desktop applications.

For this document type, the following attribute values must be selected.

ATTRIBUTE NAME	ATTRIBUTE VALUE
Class	Attach file

ATTRIBUTE NAME	ATTRIBUTE VALUE
Group	File
Location	SharePoint

For information about how to set up the required document management parameters and document types, see [Configure document management](#).



Set up parameters

Basic Business document management parameters can be set up on the **Business document parameters** page. Only specific users can access the page. This includes:

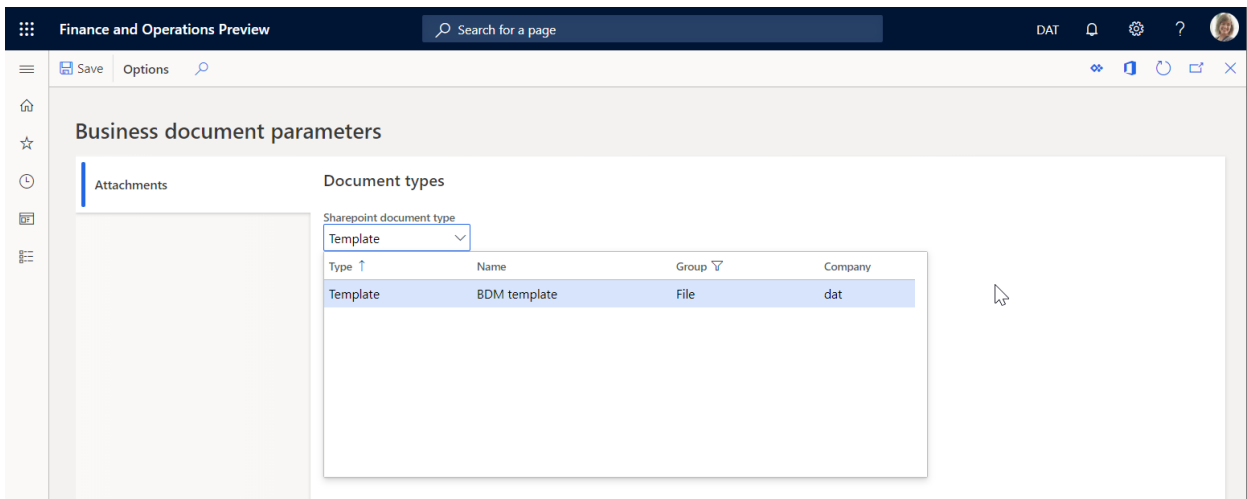
- Users who are assigned to the **System administrator** role.
- Users who are assigned to any role that is configured to perform the duty, **Maintain Business document management parameters** (AOT name **ERBDMaintainParameters**).

Use the following procedure to set up the basic parameters for all legal entities.

1. Sign in as a user with access to the **Business document parameters** page.
2. Go to **Organization administration > Electronic reporting > Business document management > Business document parameters**.
3. On the **Business document parameters** page, on the **Attachments** tab, in the **SharePoint document type** field, define the document type that should be used to temporarily store templates in Office formats while they are edited using the Office desktop applications.

NOTE

Only document types that are configured using a SharePoint location are available for this parameter.



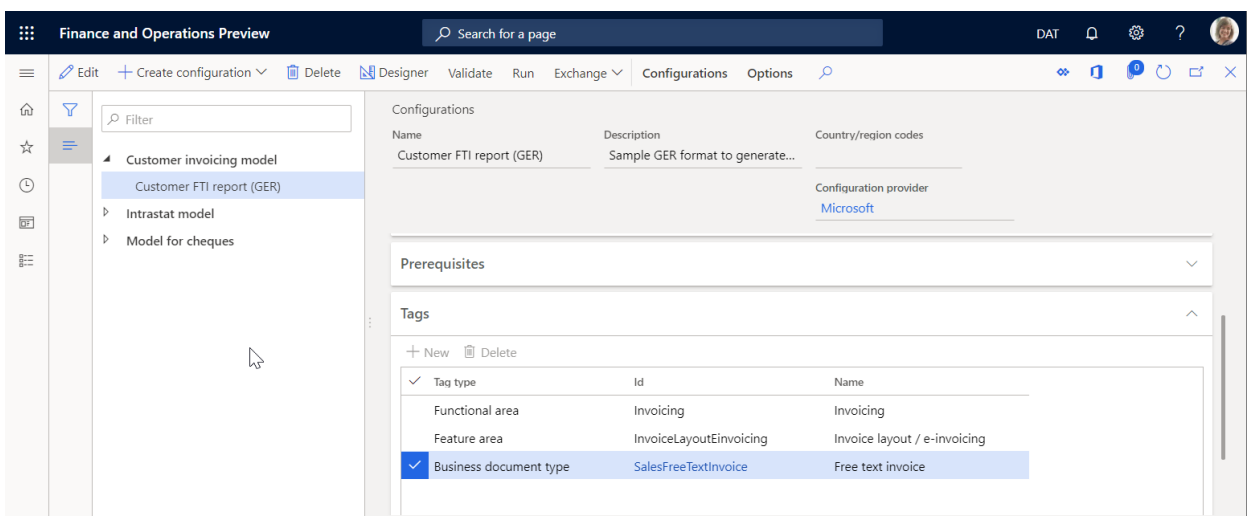
The selected document type is company-specific and will be used when the user is working with Business document management in the company for which the selected document type is configured. When the user is working with Business document management in another company, the same selected document type will be used if one has not been configured for this company. When a document type has been configured, it will be used instead of the one selected in the **SharePoint document type** field.

NOTE

The **SharePoint document type** parameter defines a SharePoint folder as temporary storage for templates that are editable using either Microsoft Excel or Word. You need to set up this parameter if you plan to use these Office desktop applications for editing templates. For more information, see [Edit a template in the Office desktop application](#). You can keep this parameter blank if you plan to modify the template by only using the functionality in Microsoft 365. For more information, see [Edit a template in Microsoft 365](#).

Configure access permissions

By default, when access to Business document management permissions is not enabled, every user with access to the Business document management workspace will see all of the ER solution templates that are available. The Business document management workspace will show only those templates that reside in ER format configurations and that are marked by a **Business document type** tag.



The list of templates available in the Business document management workspace can be restricted by configuring access permissions. This may be important when different templates are used to produce business documents for different business domains (functional areas), and you want to allow specific users access to different templates for editing in the Business document management workspace.

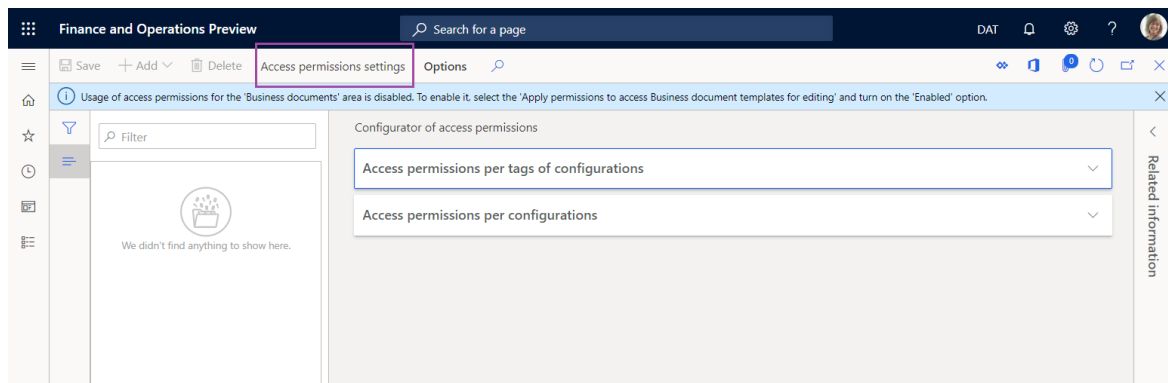
Business document management access permissions can be set on the **Configurator of access permissions**. Only the following users can access the page:

- Users assigned to the **System administrator** role.
- Users assigned to any other role that is configured to perform the duty, **Configure permissions to access Business document templates for editing** (AOT name ERBDTemplatesSecurity).

Use the following procedure to set up the access Business document management permissions for all legal entities.

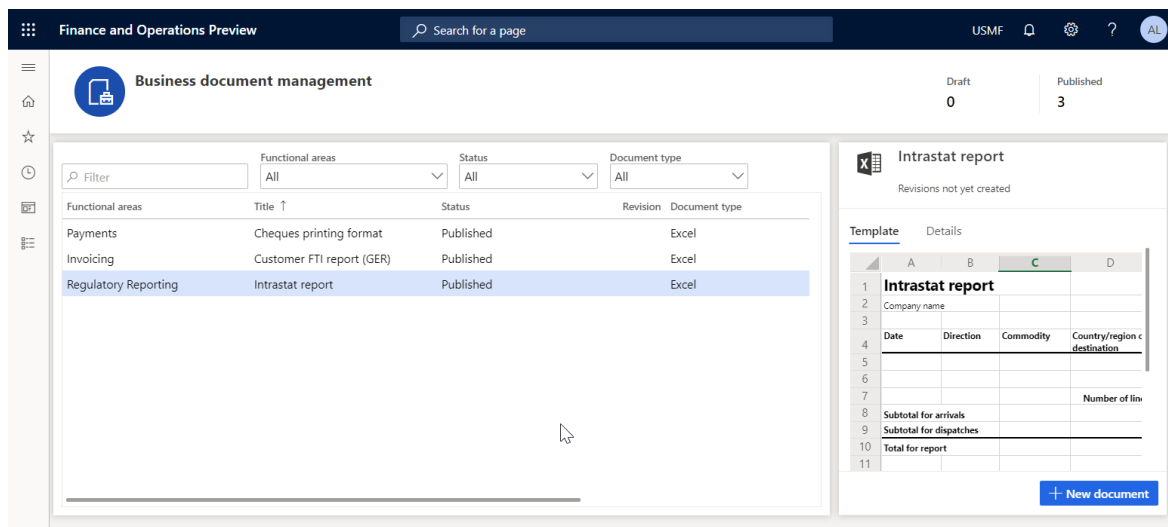
1. Sign in as a user with access to the **Configurator of access permissions** page.
2. Go to **Organization administration > Electronic reporting > Business document management > Manage access permissions**.

Pay attention to the notification informing you that the usage of access permissions for Business document management is currently not enabled.



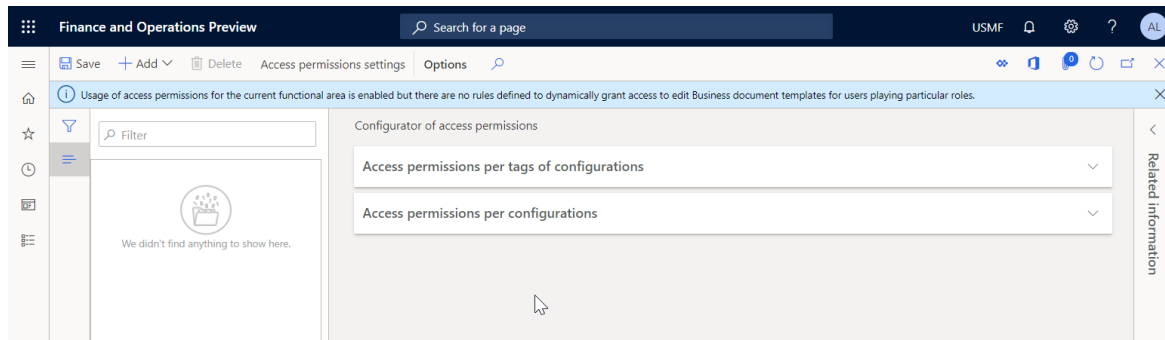
With this setting, every user assigned to any security role that is configured to perform the **Manage Business document templates** (AOT name ERBDManageTemplates) duty is able to open the Business document management workspace and can edit any template that is available.

The following graphic shows what is available in the Business document management workspace for users assigned to the **Accounts receivable clerk** role. With the current access permissions setting, the user can edit business document templates from different functional areas including invoicing, regulatory reporting, and payments.



3. On the **Configurator of access permissions** page, select **Access permissions setting**.
4. In the **Settings of access permissions to edit templates** dialog box, enable the **Apply configured access permissions** option.

5. Select **OK** to confirm that Business document management access permissions have been enabled.



6. Select **Add** to enter a new business role for which permissions to access Business document management templates must be configured.

7. In the **Security roles** dialog box, select the **Accounts receivable clerk** role and then select **OK** to confirm the role selection.

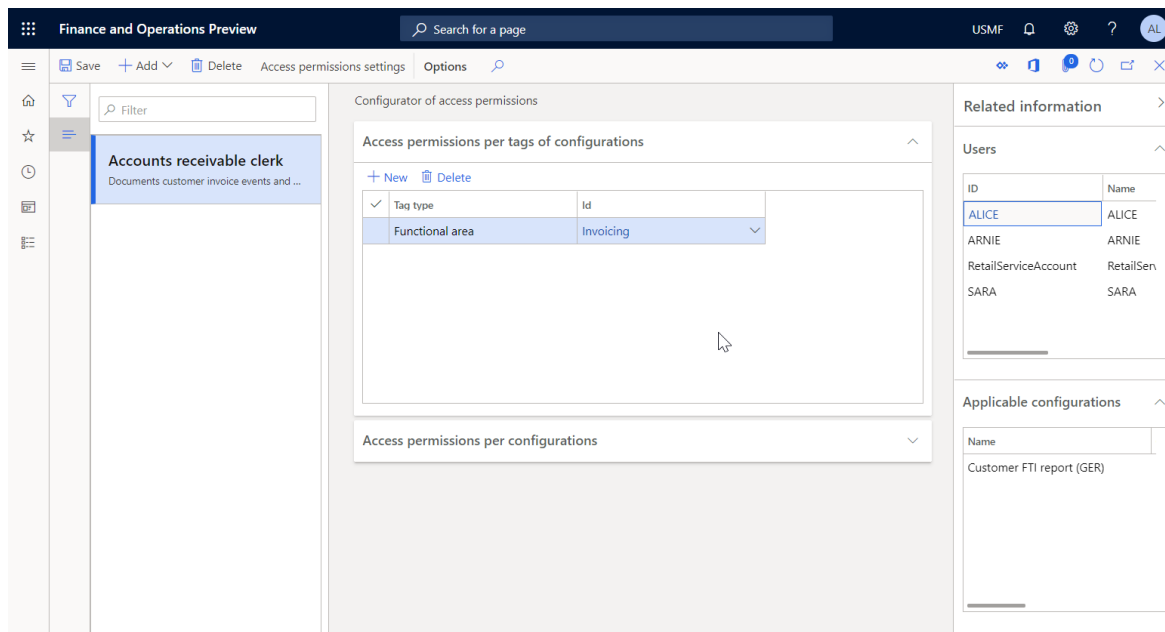
8. On the **Access permissions per tags of configurations** tab, select **New**.

9. In the **Tag type** field, select **Functional area**, and in the **ID** field, select **Invoicing**.

10. Select **Save** to store configured access permissions for the selected role.

The current setting means that for any user who is assigned to the **Accounts receivable clerk** role and performing the duty, **Manage Business document templates** (AOT name **ERBDManageTemplates**), ER format configuration templates that have the **Invoicing** value for the **Functional area** tag will be available to edit in the Business document management workspace.

11. Switch the **Related information** pane from the right side of the current page. The **Related information** pane shows how the configured access permissions will be applied, including what ER configuration templates will be available for users that are assigned to the **Accounts receivable clerk** role.



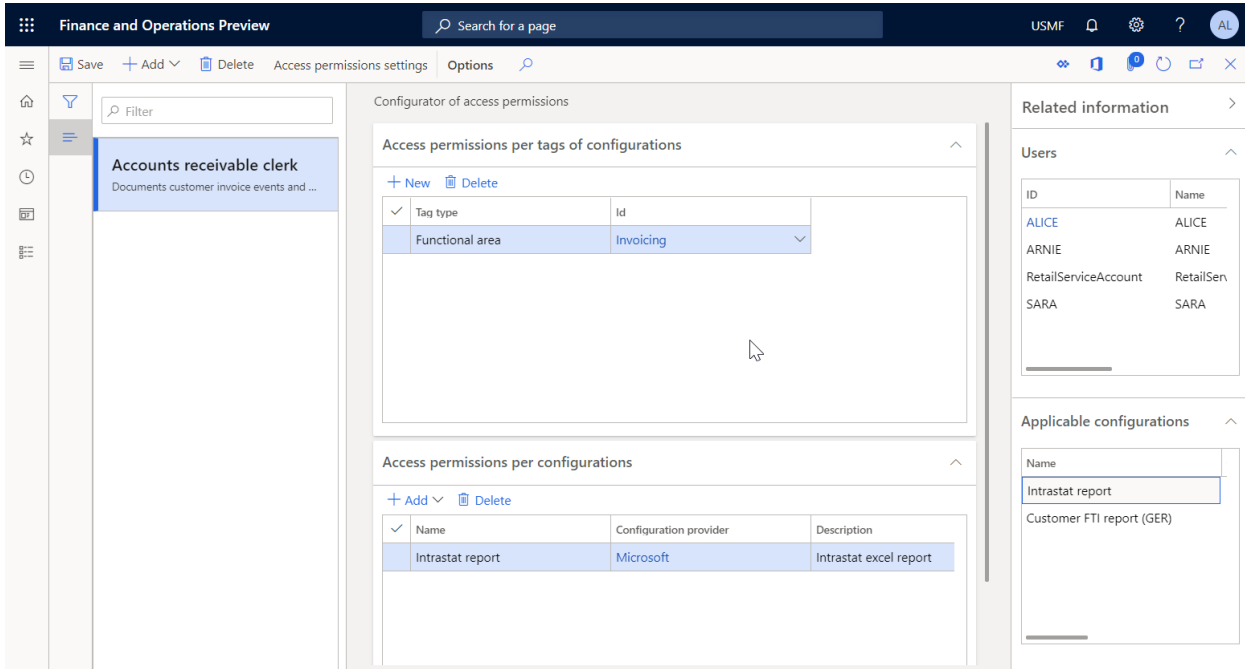
12. On the **Access permissions per configurations** tab, select the **Add** option.

13. In the **Select configuration** dialog box, mark the **Intrastat report** ER format configuration.

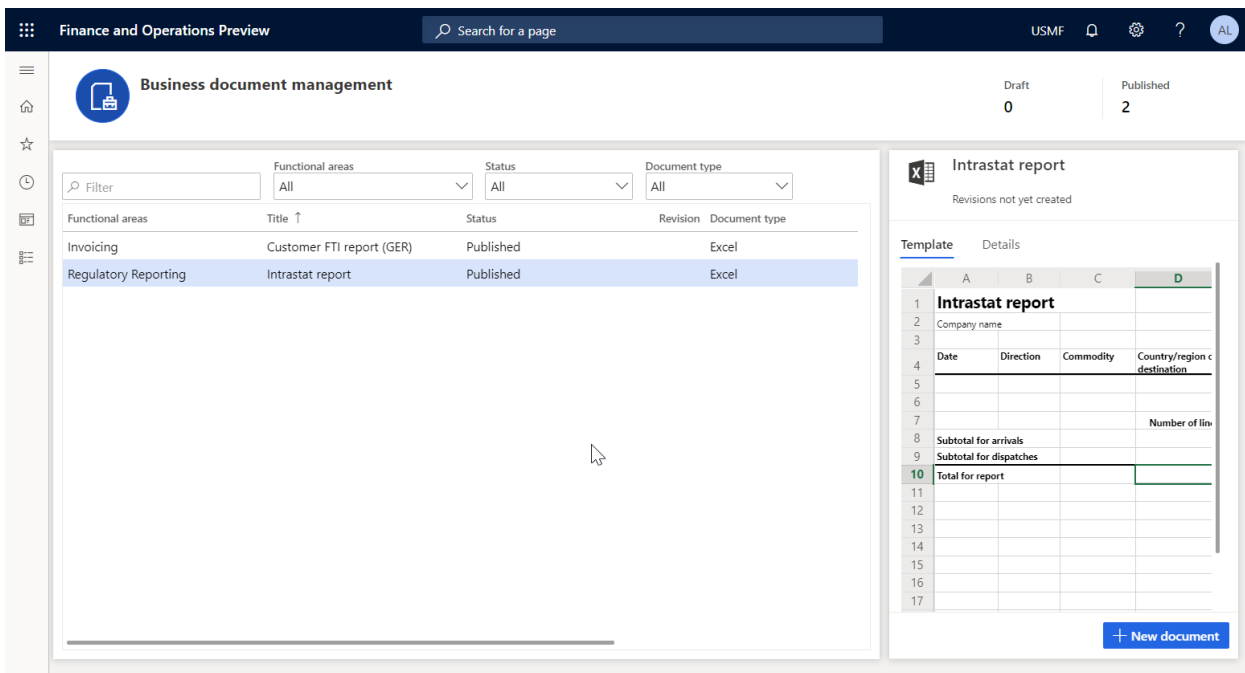
14. Select **OK** to confirm the entry of the selected configurations and then select **Save** to store the configured access permissions for the selected role.

The current setting means that for any user assigned to the **Accounts receivable clerk** role and performing the duty, **Manage Business document templates** (AOT name ERBDManageTemplates), the following templates will be available to edit in the Business document management workspace:

- Templates that have the value, **Invoicing** for the **Functional area** tag.
- Templates from ER format configurations that are listed on the **Access permissions per configurations** tab (templates from the **Intrastat report** format configuration of the **Statutory reporting** domain in this example).



The following graphic shows what the Business document management workspace provides to a user assigned to the **Accounts receivable clerk** role. With the current Business document management access permissions setting, the user can edit business document templates from the **Invoicing** domain and the **Intrastat report** ER format configuration. Templates from the **Payments** domain are not accessible for the **Accounts receivable clerk** role.



NOTE

The **Access permissions per configurations** rules are stored by using the unique identification ID of an ER format configuration. This means that these rules will not be deleted when an ER configuration that refers to them are deleted. When you import deleted configurations back to this instance, these rules will refer to them again. There is no need to set up the rules again after the deleted configurations are imported again.

Use Business document management to edit templates

Business users can access business document templates for editing in the Business document management workspace. Only the following users can access the Business document management workspace:

- Users assigned to the role, **System administrator**.
- Users assigned to any role that is configured to perform the duty, **Manage Business document templates** (AOT name **ERBDManageTemplates**).

Use the following procedure to edit free text invoice templates in the Business document management workspace. Before you complete this procedure, you must have completed all of the preceding procedures in this topic.

1. Sign in as a user with access to the Business document management workspace.
2. Open the Business document management workspace.

When the **Office-like UI experience for Business document management** feature is turned off in the **Feature management** workspace, the main grid in the **Business document management** workspace shows the following templates:

- Templates that are owned by your ER configuration provider (that is, the provider that is currently marked as active in the **Electronic reporting** workspace). After you select one of these templates, you can select **Edit template** to start or continue to edit it.
- Templates that are owned by other ER configuration providers. After you select one of these templates, you can select **New document** to create a copy of it that is owned by your ER configuration provider, and then start to edit the copy.

The screenshot displays the 'Business document management' workspace. At the top, there is a search bar and navigation icons. Below the search bar, there are filters for 'Functional areas', 'Status', and 'Document type', all set to 'All'. A table lists the following templates:

Functional areas	Title	Status	Revision	Document type	Modified date and time	Modified by
Payments	Cheques printing format	Published		Excel	8/2/2019 07:50:56 AM	Admin
Invoicing	Customer FTI report (GER)	Published		Excel	8/2/2019 06:21:34 AM	Admin
Regulatory Reporting	Intrastat report	Published		Excel	8/2/2019 07:47:23 AM	Admin

On the right side, the 'Intrastat report' template is previewed. It shows a grid with columns A, B, C, and D, and rows 1 through 12. The grid contains the following text:

Date	Direction	Commodity	Country/region c destination
Subtotal for arrivals			
Subtotal for dispatches			
Total for report			

At the bottom right of the preview, there is a '+ New document' button.

The **Template** tab presents the content of the selected template. Select the **Details** tab to review details of the selected template as well as details of an ER format configuration this template resides in. Notice that all of the templates have a status of **Published**, and contain no details in the **Revision** column. This means that these templates are not currently being edited.

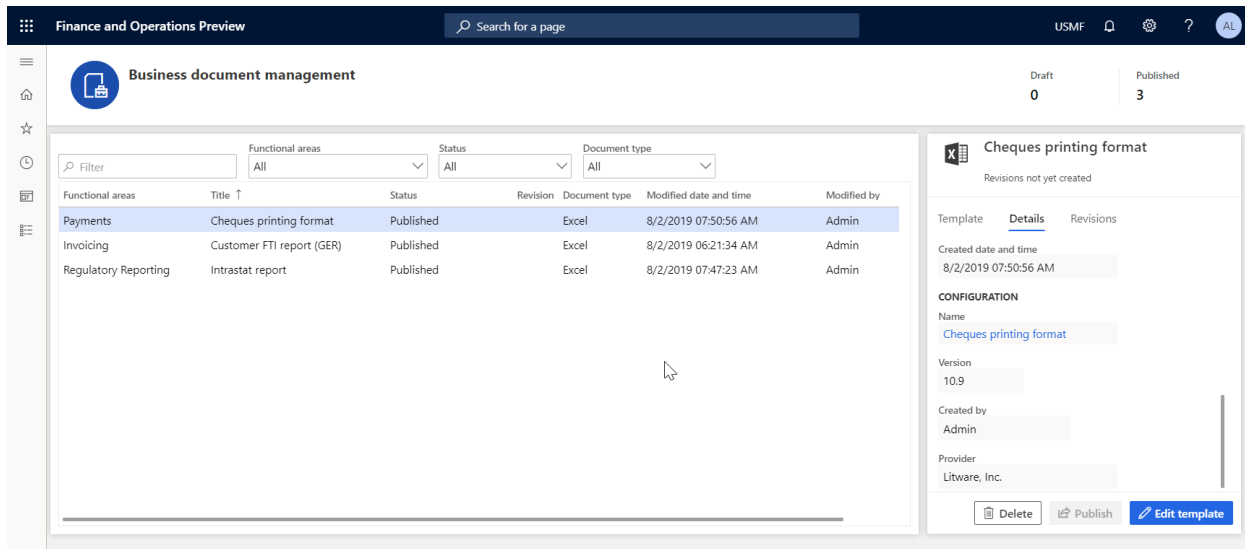
When the **Office-like UI experience for Business document management** feature is turned on in the

Feature management workspace, the main grid in the **Business document management** workspace shows templates that are owned by your ER configuration provider (that is, the provider that is currently marked as active in the **Electronic reporting** workspace). After you select one of these templates, you can select **Edit template** to start or continue to edit it.

To work with templates that are owned by other ER configuration providers, select **New document** to create a copy of the template that is owned by your ER provider. You can then start to edit the copy. For more information, see [New document user interface in Business document management](#).

Initiate editing templates owned by your configuration provider

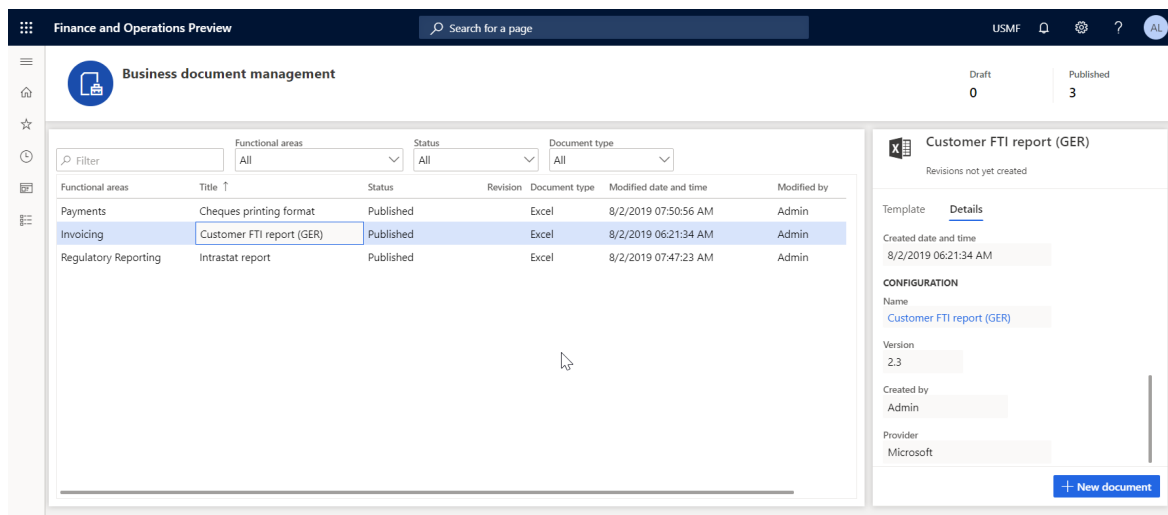
1. In the Business document management workspace, select the **Cheques printing format** template in the list.
2. Select the **Details** tab.



The **Edit template** option is available for the selected template. This option is always available for a template in an ER format configuration that is owned by the active ER configuration provider (**Litware, Inc.** in this example). When **Edit template** is selected, the existing template from the draft version of the underlying ER format configuration will be available to edit.

Initiate editing templates owned by other providers

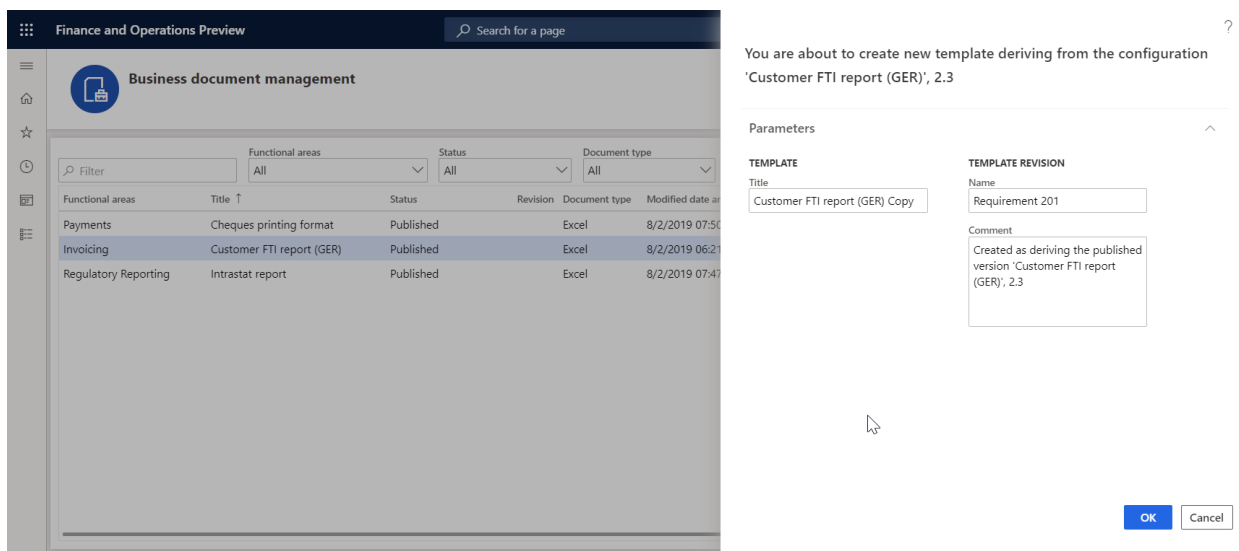
1. In the Business document management workspace, select the document that you want to use as a template.



2. Select **New document**, and in the **Title** field, change the title of the editable template if needed. The text will be used to name the ER format configuration that is automatically created. Note that the draft version of this configuration (**Customer FTI report (GER) Copy**) that will contain the edited template will

automatically be marked to run this ER format for the current user. At the same time, the non-modified original template from the base ER format configuration will be used to run this ER format for any other user.

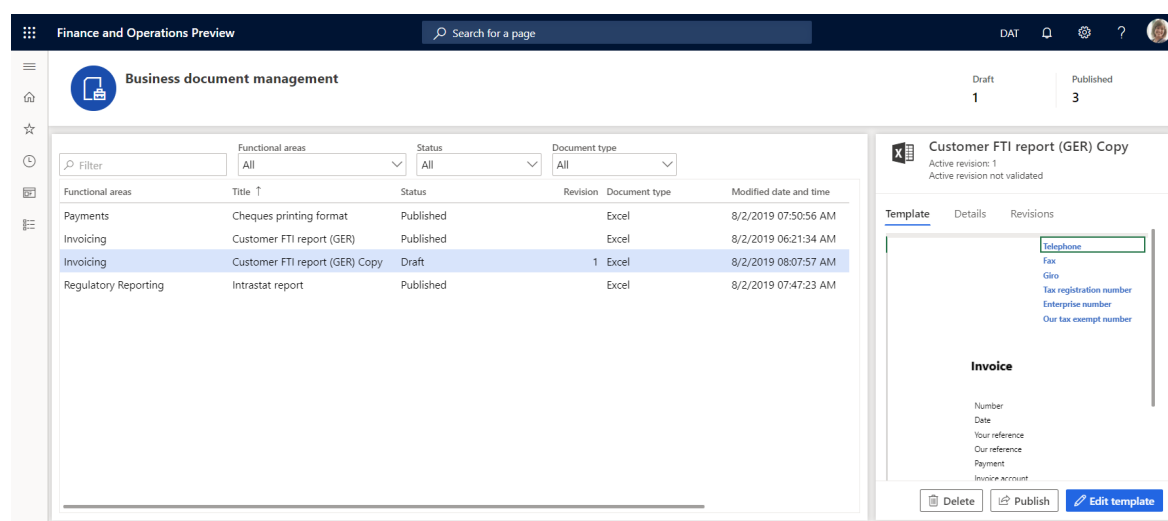
3. In the **Name** field, change the name of the first revision of the editable template that will be created automatically.
4. In the **Comment** field, change the comment for the automatically created revision of the editable template.
5. Select **OK** to confirm the start of the editing process.



The **New document** option is always available for a template in an ER format configuration provided by current and another provider (Microsoft in this example) that doesn't have any revision. The edited template will then be stored in a new ER format configuration that is automatically generated.

Start editing a template

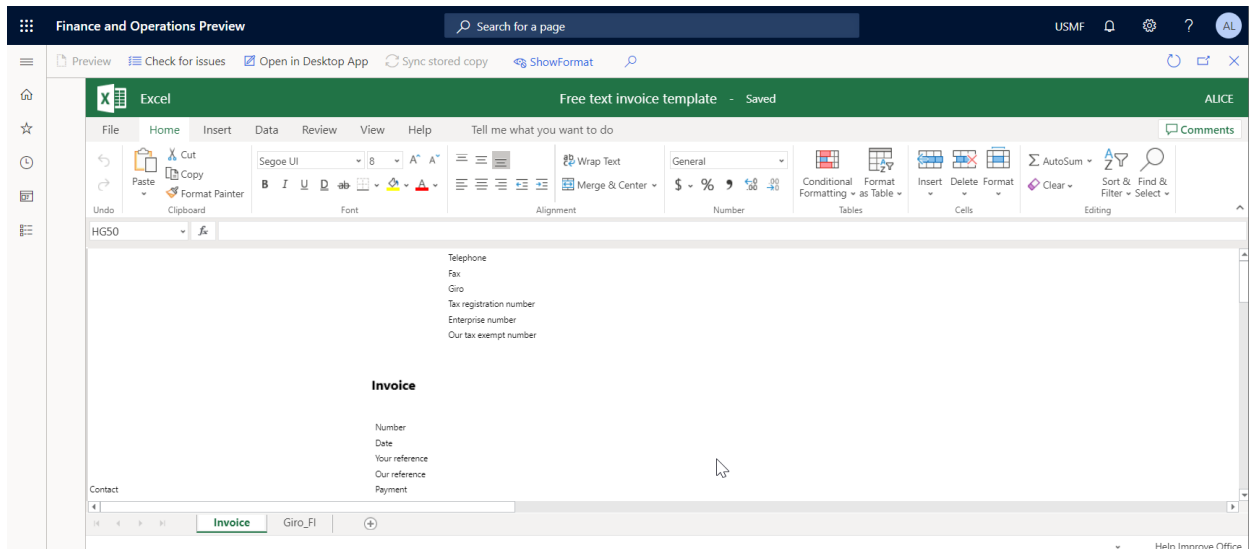
1. From the selected template, select **Edit document**.
2. In the **Name** field, change the name of the first revision of the editable template that will be created automatically.
3. In the **Comment** field, change the remark for the automatically created revision of the editable template.



4. Select **OK** to confirm the start of the editing process.

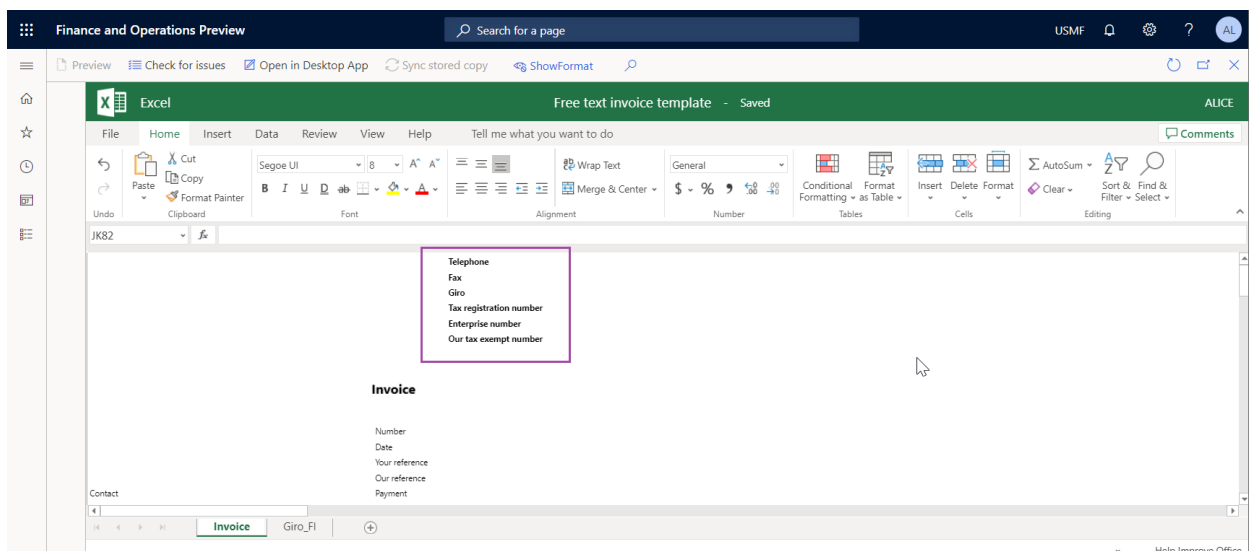
The **BDM template editor** page will open. The selected template will be available for online editing by using

Microsoft 365.



Edit a template in Microsoft 365

You can modify the template using Microsoft 365. For example, in Office online, change the font of the field prompts in the template header from **Regular** to **Bold**. These changes are automatically stored in the editable template that is stored in the primary template's storage (by default, the Azure blob storage). This is configured for the ER framework.

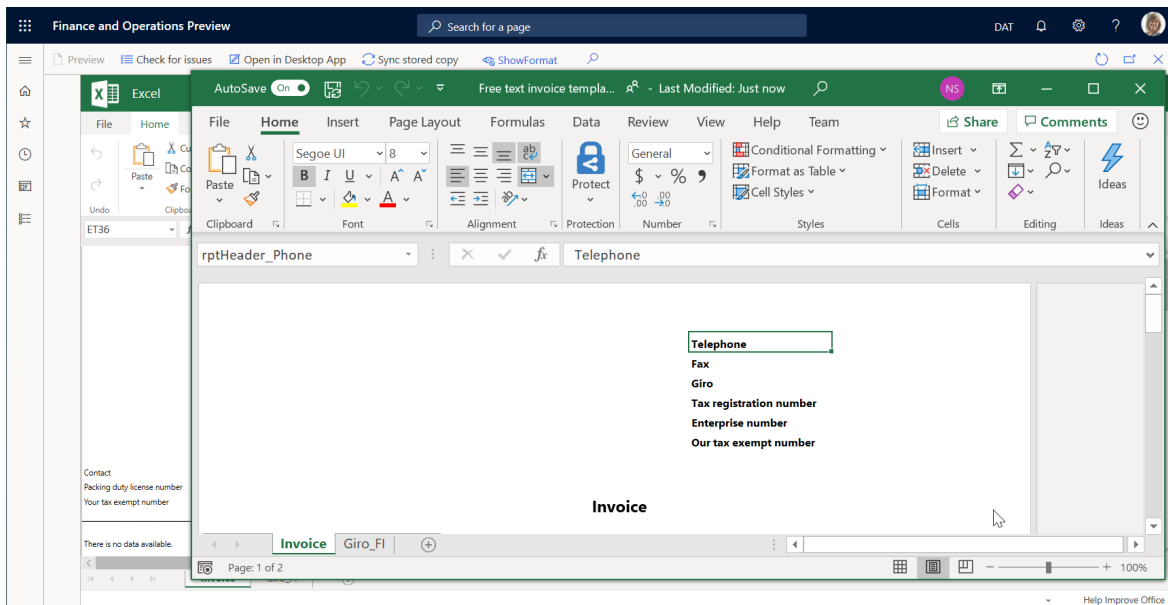


Edit a template in the Office desktop application

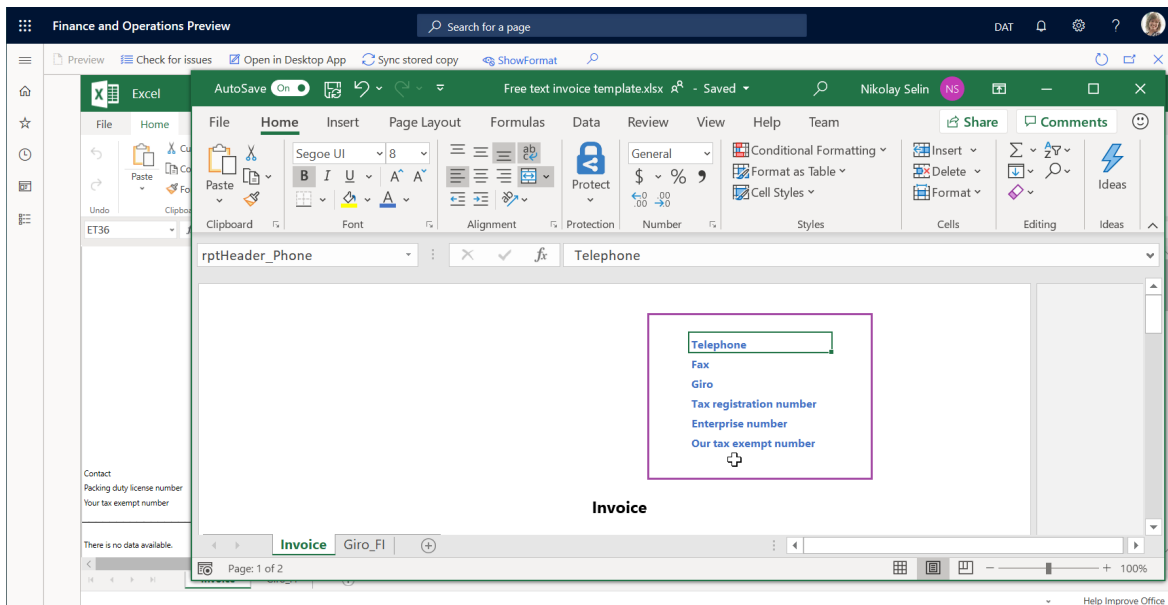
NOTE

This function is only available when the **SharePoint document type** parameter is properly configured. For more information, see [Configure parameters](#).

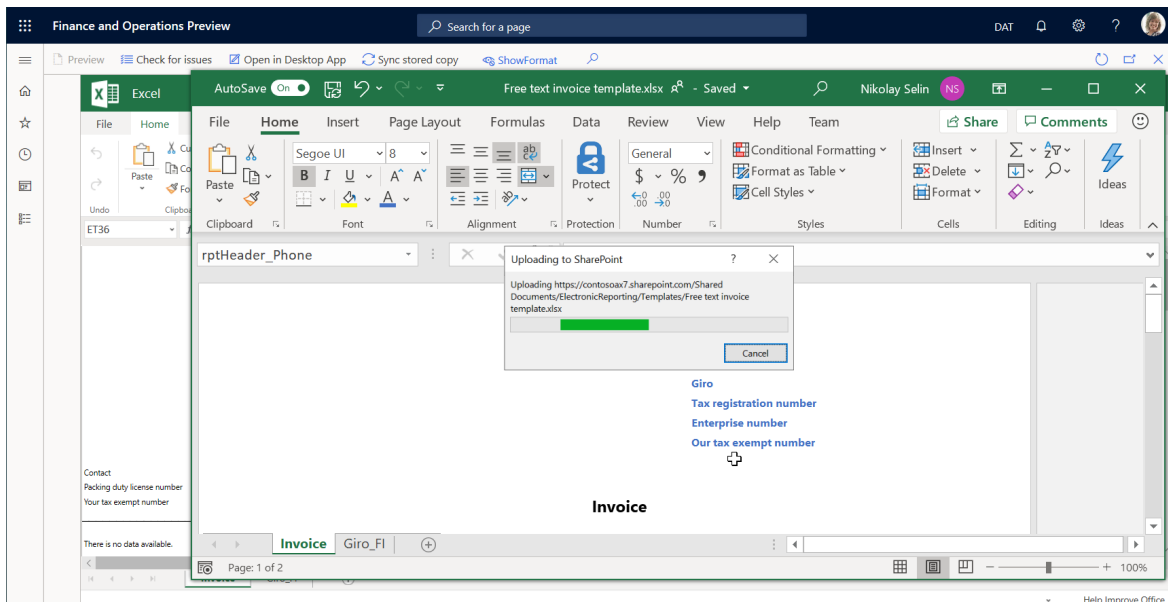
1. Select the **Open in Desktop App** option to modify the template by using the functionality of the Office desktop application (Excel in this example). The editable template is copied from the permanent storage to the temporary storage configured in the Business document management parameters as a SharePoint folder.
2. Confirm that you want to open the template from the temporary file storage in the Office desktop Excel application.



3. Modify the template. For example, change the font of the fields prompts in the template header by updating color from Black to Blue.



4. Select Save in the Excel desktop application to store the template changes in the temporary storage.



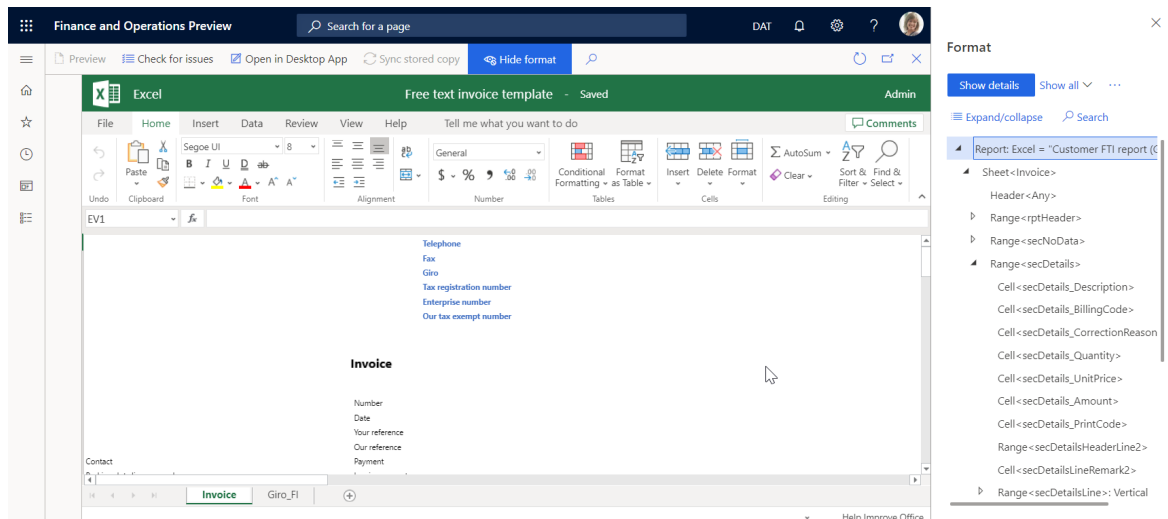
- Close the Excel desktop application.
- Select **Sync stored copy** to synchronize the temporary template storage to the permanent template storage.

NOTE

The copy of the editable template in the temporary file storage is kept for only the current session of template editing. When you finish this session by closing the **BDM template editor** page, this copy will be deleted. If you adjusted the template in the temporary file storage and did not select **Sync stored copy**, when you try to close the **BDM template editor** page, a message will ask whether you want to store introduced changes. Select **Yes** if you want to save your changes to the template in the permanent file location.

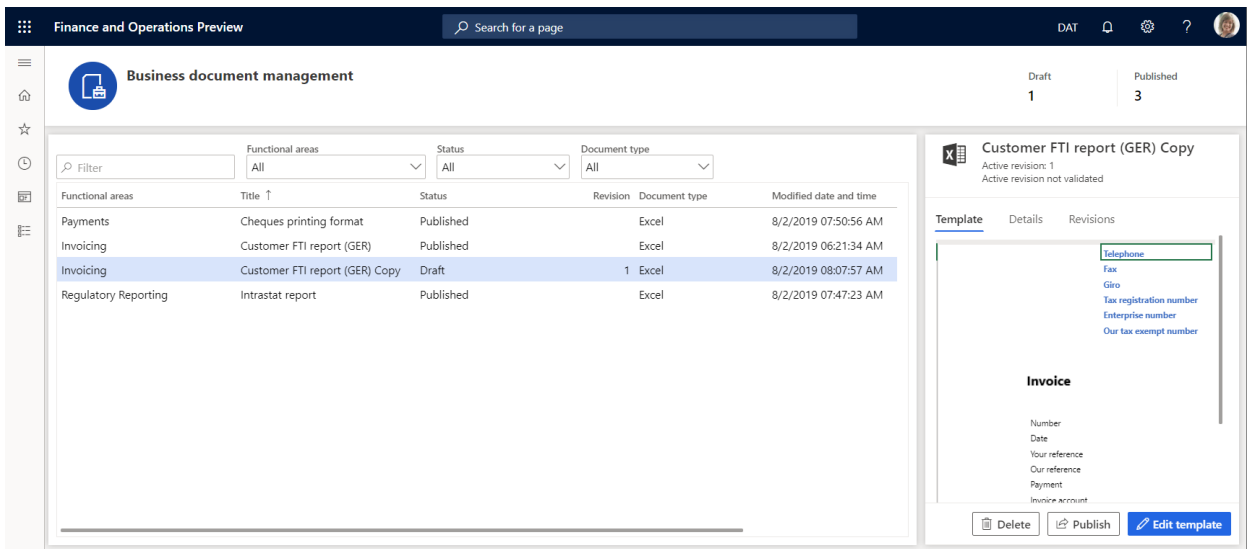
Validate a template

- On the **BDM template editor** page, select **Check for issues** to validate the modified template against the underlying ER format configuration. Follow the recommendations (if any) to align the template with the structure of the format from the base ER format configuration.
- Select **Show format** to view the current structure of the format from the base ER format configuration that must be aligned with the editable template.
- Select **Hide format** to close the pane.



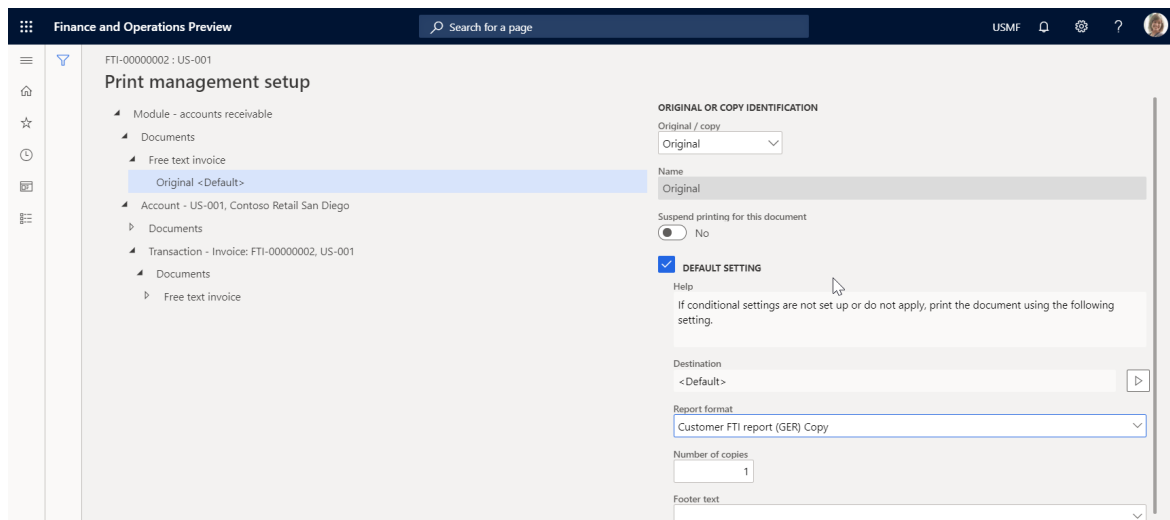
- Close the **BDM template editor** page.

The updated template is shown on the **Template** tab. Notice that the status of the edited template is now **Draft** and the current revision is no longer empty. This means that the process of this template's editing has been started.

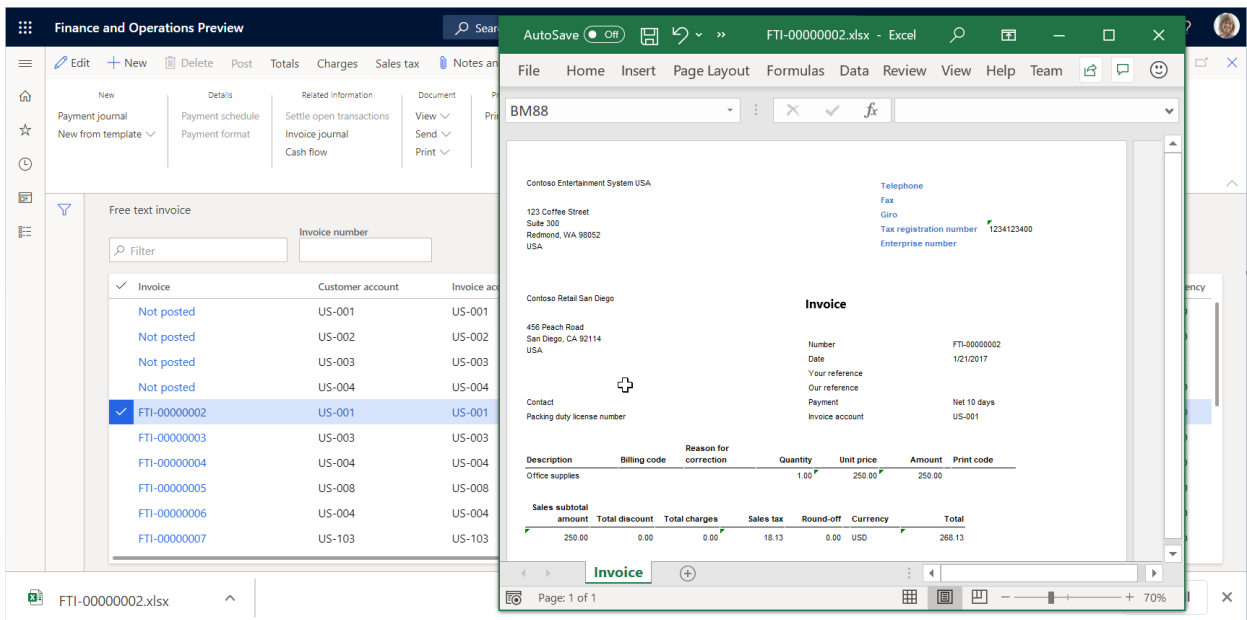


Test the modified template

1. In the application, change to the company, USMF.
2. Go to **Accounts receivable > Invoices > All free text invoices**.
3. Select the FTI-00000002 invoice, and then select **Print management**.
4. Select the **Module - accounts receivable > Documents > Free text invoice > Original document** level to specify the scope of invoices for processing.
5. In the **Report format** field, select the **Customer FTI report (GER) Copy** ER format for the specified document level.



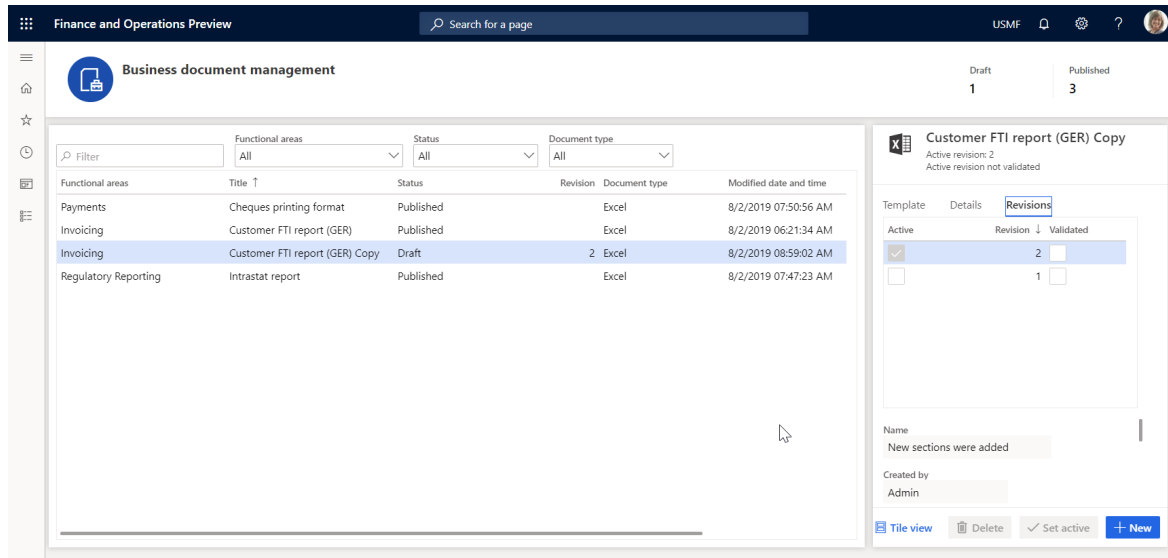
6. Press **Escape** to close the current page.
7. Select **Print**, and then select **Selected**.
8. Download the document and open it using the Excel desktop application.



The modified template is used to generate the free text invoice report for the selected item. To analyze how this report is affected by the changes that you introduced to the template, you can run this report in one application session right after you modified the template in another application session.

Create an alternative template revision

1. Open the **BDM template editor** page and select the **Customer FTI report (GER) Copy** template.
2. On the **Revisions** tab, select **New**.
3. If needed, in the **Name** field, change the name of the second revision and base it on the currently active first revision.
4. If needed, in the **Comment** field, change the remark for the automatically created revision of the editable template.



You created a new revision of your template that has been stored in the permanent template's storage. Now you can continue editing the template of the second revision that is currently selected as active.

5. Select the first revision and then select **Set active**. You can select another revision as active if at any time you want to return to that revision of the template.
6. Select the second revision, and then select **Delete**.
7. Select **OK** to confirm that you want to delete the selected revision. You can delete any of the non-active

revisions when they are no longer needed.

Delete a modified template

1. On the **BDM template editor** page, select the **Template** tab.
2. Select **Delete**.
3. If you select **OK** to confirm deletion, the **Customer FTI report (GER) Copy ER** format with the modified template will be deleted. Select **Cancel** to explore other options.

Revoke changes of template

When you edit the template from an ER format that is owned by the current active provider, you will be offered the option to revoke changes introduced for the template.

The screenshot shows the 'Business document management' interface. On the left, there is a navigation pane with icons for home, star, clock, and list. The main area displays a table of templates with filters for Functional areas, Status, and Document type. The table lists several templates, including 'Cheques printing format' which is currently in Draft status. On the right, a preview of the 'Cheques printing format' template is shown, displaying a grid with columns A, B, C, and D, and rows 1 through 18. The preview includes 'Undo', 'Publish', and 'Edit template' buttons.

Functional areas	Title	Status	Revision	Document type	Modified date and time
Payments	Cheques printing format	Draft	1	Excel	8/2/2019 09:02:04 AM
Invoicing	Customer FTI report (GER)	Published		Excel	8/2/2019 06:21:34 AM
Invoicing	Customer FTI report (GER) Copy	Draft	1	Excel	8/2/2019 09:02:28 AM
Regulatory Reporting	Intrastat report	Published		Excel	8/2/2019 07:47:23 AM

1. On the **BDM template editor** page, select the **Template** tab.
2. Select **Undo**.
3. If you select **OK** to revoke the changes introduced for the template, the modified template will be replaced by the original template and all changes will be removed. When you revoke changes to the template, you will be able to delete the template. Select **Cancel** to explore other options.

Publish a modified template

1. On the **BDM template editor** page, on the **Template** tab, select **Publish**.
2. If you select **OK** to confirm publishing, the draft version of the derived **Customer FTI report (GER) Copy ER** format that contains the modified template will be marked as completed. The modified template becomes available for other users. The completed versions of this ER format will keep only the last active revision of your template. Other revisions will be deleted. Select **Cancel** to explore other options.

Frequently asked questions

I selected **Edit document**, but instead of going to the **BDM template editor** page in **Finance**, I was sent to the **Microsoft 365** webpage.

This issue is a known issue that involves Microsoft 365 redirection. It occurs when you sign to Microsoft 365 for the first time. To work around this issue, select **Back** in your browser to return to the previous page.

I understand how to edit a template by using **Microsoft 365** in the first application session, and how to use the template in the second application session and adjust the template to see how my changes affect the generated business document. Can I use the **Office desktop** application in the same way?

Yes, you can. In the first application session, select **Open in Desktop App**. Your template will be stored in the temporary file storage and opened in the Office desktop application. Next, complete the following steps to preview your template changes in the generated business document:

1. Make changes in the template by using the Office desktop application.
2. Select **Save** in the Office desktop application.
3. On the **BDM template editor** page of the first application session, select **Sync stored copy**.
4. Execute this template ER format in the second application session.

When I select Open in Desktop App, I receive the following error message: "Value cannot be null. Parameter name: externalId." How do I work around this issue?

Most likely you signed in to the current instance of the app of the Azure AD domain which differs from the Azure AD domain that was used to deploy this instance. Because the SharePoint service, which is used to store templates for making them available for editing by using the Office desktop applications, belongs to the same domain, we have no permissions to access the SharePoint service. To resolve this issue, sign in to the current instance using the credentials of a user with the correct Azure AD domain.

Additional resources

[Electronic reporting \(ER\) overview](#)

[ER Design a configuration for generating reports in OPENXML format \(November 2016\)](#)

[Design ER configurations to generate reports in Word format](#)

[Embed images and shapes in documents that you generate by using ER](#)

[Configure Electronic reporting \(ER\) to pull data into Power BI](#)

List of ER configurations that have been released in Finance to support configurable business documents

The [list](#) of ER configurations for Finance is constantly updated. Open the [Global repository](#) to review the list of ER configurations that are currently supported. You can [filter](#) the Global repository to review the list of ER configurations that are used to support configurable business documents.

The screenshot shows the 'Configuration repository' interface in Finance and Operations. The left sidebar lists various configuration categories, with 'Picking list (Excel)' selected. The main area displays a table of configurations and a table of versions.

Configuration name	Description	Configuration provider	Location
Container contents model mapping		Microsoft	Global Repository
Load list (Excel)		Microsoft	Global Repository
Load list (Word)	Initial version	Microsoft	Global Repository
Load list model mapping (RDP)		Microsoft	Global Repository
Picking list (Excel)		Microsoft	Global Repository
Picking list (CZ) (Excel)		Microsoft	Global Repository

Version	Status	From date	Supported until	Version created
9.12	Shared			11/20/2019 3:49:49 PM
9.10	Shared			10/18/2019 10:20:32 AM

The following table shows the list of ER configurations that support configurable business documents and that have been released in Finance up until December 2020.

DATA MODEL CONFIGURATION	FORMAT CONFIGURATIONS
Bill of lading model	Bill of lading (Excel)
	Bill of lading (Word)
Certificate of origin model	Certificate of origin (Excel)
	Certificate of origin (Word)
Invoice model	Customer Debit and Credit Note (Excel)
	Customer Debit and Credit Note (Word)
	Free text invoice (Excel)
	Free text invoice (Excel) (BH)
	Free text invoice (FR) (Excel)
	Free text invoice (LT) (Excel)
	Free text invoice (LV) (Excel)
	Free text invoice (PL) (Excel)
	Free text invoice (CZ) (Excel)
	Free text invoice (EE) (Excel)
	Free text invoice (HU) (Excel)
	Free text invoice (TH) (Excel)
	Free text invoice (Word)
	Project contract line items (Excel)
	Project contract line items (CZ) (Excel)
Project contract line items (Excel) (BH)	
Project contract line items (HU) (Excel)	
Project contract line items (LT) (Excel)	
Project contract line items (PL) (Excel)	
Project contract line items (Word)	
Project customer retention release (Excel)	

DATA MODEL CONFIGURATION	FORMAT CONFIGURATIONS
	Project customer retention release (CZ) (Excel)
	Project customer retention release (HU) (Excel)
	Project customer retention release (LT) (Excel)
	Project customer retention release (PL) (Excel)
	Project customer retention release (TH) (Excel)
	Project customer retention release (Word)
	Project invoice (Excel)
	Project Invoice (Word)
	Project invoice (AE) (Excel)
	Project invoice (CZ) (Excel)
	Project invoice (Excel) (BH)
	Project invoice (HU) (Excel)
	Project invoice (JP) (Excel)
	Project invoice (LT) (Excel)
	Project invoice (PL) (Excel)
	Project invoice (TH) (Excel)
	Project invoice full (MY) (Excel)
	Project invoice simple (MY) (Excel)
	Project manage invoice (Excel)
	Project manage invoice (CZ) (Excel)
	Project manage invoice (Excel) (BH)
	Project manage invoice (HU) (Excel)
	Project manage invoice (JP) (Excel)
	Project manage invoice (LT) (Excel)
	Project manage invoice (PL) (Excel)

DATA MODEL CONFIGURATION	FORMAT CONFIGURATIONS
	Project manage invoice (Word)
	Purchase advance invoice (Excel)
	Purchase advance invoice (Word)
	Sales advance invoice (Excel)
	Sales advance invoice (Word)
	Sales advance invoice (PL) (Excel)
	Sales invoice (Excel)
	Sales invoice (Excel) (BH)
	Sales invoice (Excel) (CZ)
	Sales invoice (Excel) (EE)
	Sales invoice (Excel) (FR)
	Sales invoice (Excel) (HU)
	Sales invoice (Excel) (IN)
	Sales invoice (Excel) (LT)
	Sales invoice (Excel) (LV)
	Sales invoice (Excel) (PL)
	Sales invoice (Excel) (TH)
	Sales invoice (Word)
	TMS Commercial Invoice (Excel)
	TMS Commercial Invoice (Word)
	Vendor invoice document (Excel)
	Vendor invoice document (CZ) (Excel)
	Vendor invoice document (HU) (Excel)
	Vendor invoice document (IN) (Excel)
	Vendor invoice document (LT) (Excel)

DATA MODEL CONFIGURATION	FORMAT CONFIGURATIONS
	Vendor invoice document (LV) (Excel)
	Vendor invoice document (MY) (Excel)
	Vendor invoice document (Word)
Order model	Agreement confirmation (Excel)
	Agreement confirmation (Word)
	Purchase agreement confirmation (Excel)
	Purchase agreement confirmation (Word)
	Purchase order (Excel)
	Purchase order (CZ) (Excel)
	Purchase order inquiry (CZ) (Excel)
	Purchase order (HU) (Excel)
	Purchase order inquiry (HU) (Excel)
	Purchase order (Word)
	Purchase order inquiry (Excel)
	Purchase order inquiry (Word)
	Sales order confirmation (Excel)
	Sales order confirmation (CZ) (Excel)
	Sales order confirmation (HU) (Excel)
	Sales order confirmation (Word)
Packing list model	Container contents (Excel)
	Container contents (Word)
	Load list (Excel)
	Load list (Word)
	Picking list (Excel)
	Picking list (CZ) (Excel)

DATA MODEL CONFIGURATION	FORMAT CONFIGURATIONS
	Picking list (Word)
	Production pick list (Excel)
	Production pick list (Word)
	Shipping pick list for load (Excel)
	Shipping pick list for load (Word)
	Shipping pick list for shipment (Excel)
	Shipping pick list for shipment (Word)
	Shipping pick list for wave (Excel)
	Shipping pick list for wave (Word)
Payment model	Customer payment advice (Excel)
	Customer payment advice (Word)
	Vendor payment advice (Excel)
	Vendor payment advice (Word)
Quotation model	Project quotation (Excel)
	Project quotation (Word)
	Request for quotation (Excel)
	Request for quotation (Accept) (Excel)
	Request for quotation (Accept) (Word)
	Request for quotation (Reject) (Excel)
	Request for quotation (Reject) (Word)
	Request for quotation (Return) (Excel)
	Request for quotation (Return) (Word)
	Request for quotation (Word)
	Sales quotation (Excel)
	Sales quotation (CZ) (Excel)

DATA MODEL CONFIGURATION	FORMAT CONFIGURATIONS
	Sales quotation (HU) (Excel)
	Sales quotation (Word)
	Sales quotation confirmation (Excel)
	Sales quotation confirmation (Word)
Reconciliation model	Cust account statement, Ext (Excel)
	Cust account statement, Ext (CN) (Excel)
	Cust account statement, Ext (Word)
	Cust account statement, France (Excel)
Reminder model	Collection letter note (Excel)
	Collection letter note (CN) (Excel)
	Collection letter note (Word)
	Customer interest note (Excel)
	Customer interest note (Word)
Waybill model	Load tender (Excel)
	Load tender (Word)
	Purchase order packing slip (Excel)
	Purchase order packing slip (CZ) (Excel)
	Purchase order packing slip (Word)
	Route (Excel)
	Route (Word)
	Sales order packing slip (Excel)
	Sales order packing slip (CZ) (Excel)
	Sales order packing slip (LT) (Excel)
	Sales order packing slip (PL) (Excel)
	Sales order packing slip (Word)

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

New document user interface in Business document management

2/18/2021 • 2 minutes to read • [Edit Online](#)

Business document management lets business users edit business document templates by using a Microsoft 365 service or the appropriate Microsoft Office desktop application. Edits might include design changes or new deployments, or users might add placeholders to include additional data without having to change the source code. For more information about how to work with Business document management, see [Business document management overview](#).

The new document user interface (UI) is clearer and more comfortable to use. The **Business document** area shows only the templates that are available for the current provider.

The **New document** button lets users create and edit a template in an Electronic reporting (ER) format configuration that is provided by another provider. In the example in this topic, the provider is Microsoft.

Make the new document UI in Business document management available

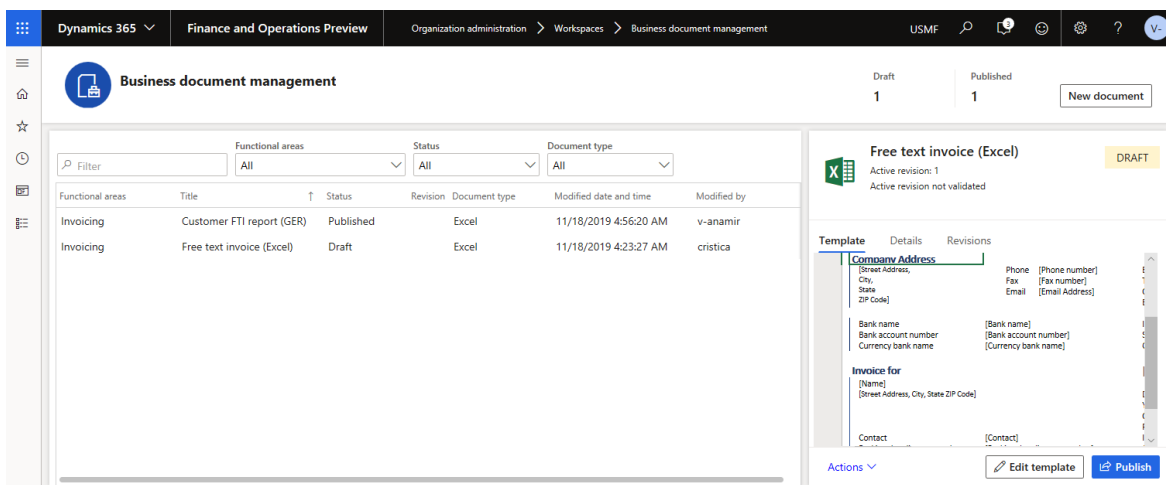
To start to use the new document UI in Business document management, you must turn on the **Office-like UI experience for Business document management** feature in the **Feature management** workspace.

Follow these steps to turn on this feature for all legal entities.

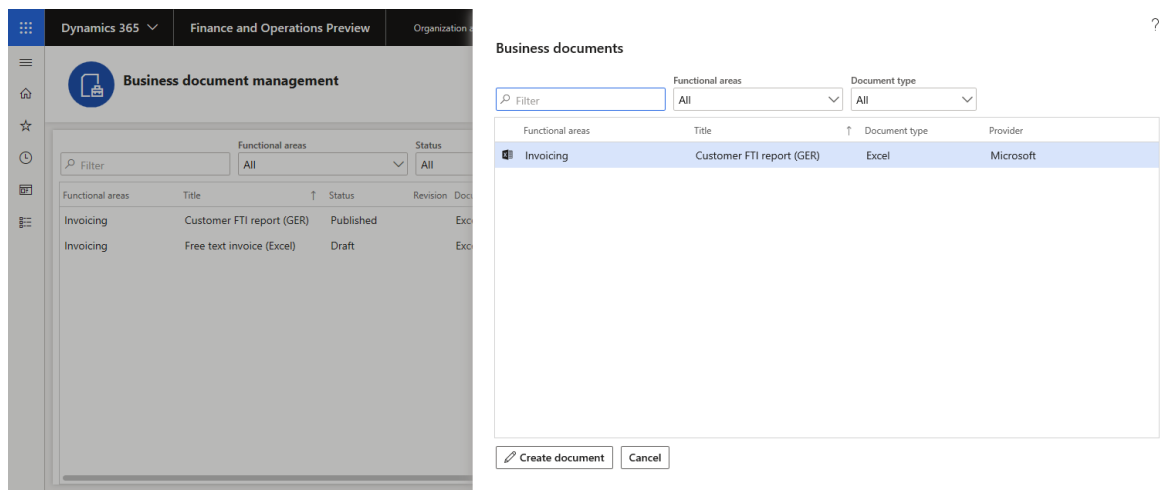
1. In the **Feature management** workspace, on the **New** tab, select the **Office-like UI experience for Business document management** feature in the list.
2. Select **Enable now** to turn on the selected feature.
3. Refresh the page to access the new feature.

Edit templates that are owned by other providers

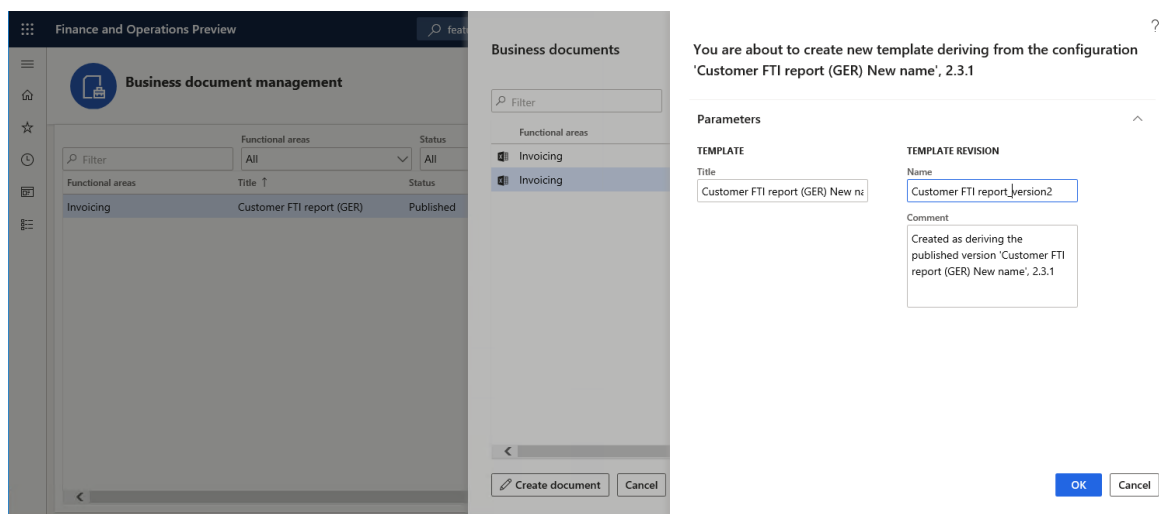
1. In the **Business document management** workspace, select **New document**.



2. In the dialog box, select the document to use as a template, and then select **Create document**.



3. In the new dialog box, in the **Title** field, change the title as you require. The title text is used to name the new ER format configuration that is automatically created. The draft version of this configuration (**Customer FTI report (GER) Copy**) will contain the edited template and will be used to run this ER format for the current user. The original template from the base ER format configuration will be used to run this ER format for every other user.
4. In the **Name** field, change the name of the first revision of the editable template that will be automatically created.
5. In the **Comment** field, update the remarks for the revision of the editable template that will be automatically created.
6. Select **OK** to confirm the start of the editing process.



The **New document** button is used to create and edit a template in an ER format configuration that is provided by another provider. In this example, the provider is Microsoft. When you select **New document**, you can view all the templates that are owned by current and other providers. After you select the template, it's opened for editing. The edited template will then be stored in a new ER format configuration that is automatically generated.

For more information, see [Business document management overview](#).

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Add new fields to a business document template in Microsoft Excel

2/18/2021 • 5 minutes to read • [Edit Online](#)

You can add new fields to a template that is used to generate business documents in Microsoft Excel format. These fields can be added as placeholders that are used to fill generated documents with required information from the application. For every field that you add, you can also specify a binding to the data sources, to specify what application data will be entered in the field when the template is used to generate business documents.

To learn more about this feature, complete the example in this topic. This example shows how to update a template to fill in the fields in free text invoice forms that are generated.

Configure Business document management to edit templates

Because Business document management (BDM) is built on top of the [Electronic reporting \(ER\) overview](#) framework, you must configure the required ER and BDM parameters before you can start to work with BDM.

1. Sign in to the instance of Microsoft Dynamics 365 Finance as the system administrator.
2. Complete the following steps of the example in the [Business document management overview](#) topic:
 - a. Configure ER parameters.
 - b. Turn on BDM.

You can now start to use BDM to edit business document templates.

Import ER solutions that contain a template

The example in this procedure uses the officially published ER solution. You must import the ER configurations of this solution into your current instance of Finance.

The **Free text invoice (Excel)** ER format configuration of this solution contains the business document template in Excel format that can be edited by using BDM. Import the latest version of this ER format configuration from Microsoft Dynamics Lifecycle Service (LCS). The corresponding ER data model and ER model mapping configurations will be imported automatically.

For more information about how to import ER configurations, see [Manage the ER configuration lifecycle](#).

Lifecycle Services

Shared asset library

Select asset type

- Business database (0)
- Configuration (0)
- Cortana intelligence application (1)
- Data package (197)
- Database backup (0)
- Deployment (0)
- Downloadable VHD (229)
- Dynamics 365 Retail SDK (0)
- e-Commerce package (0)
- GER Configuration (1715)**
- Localized financial report (3)
- Localized financial report 2012 (4)
- Marketing asset (2)
- Model (24)

GER Configuration files

Asset Name	Count	Scope	Status	Created	Size
VAT Invoices (PL).version.32.22.42	1	Global	Published	11/5/2019	484 KB
Free text invoice (LT) (Excel).version.155.77.34	1	Global	Published	11/5/2019	700 KB
Cust account statement, Ext (Excel).version.24.10	1	Global	Published	11/1/2019	234 KB
Cust account statement, Ext (CN) (Excel).version.24.10.4	1	Global	Published	11/1/2019	237 KB
Reconciliation model mapping.version.24.8	1	Global	Published	11/1/2019	65 KB
Reconciliation model.version.24	1	Global	Published	11/1/2019	722 KB
Load tender model mapping.version.32.2	1	Global	Published	10/31/2019	32 KB
Free text invoice (Excel).version.155.77	1	Global	Published	10/31/2019	869 KB
Container contents model mapping.version.11.2	1	Global	Published	10/31/2019	32 KB
Container contents (Excel).version.11.2	1	Global	Published	10/31/2019	190 KB
Production pick list (Excel).version.11.5.2	1	Global	Published	10/31/2019	192 KB
Shipping pick list for load (Excel).version.11.5.3	1	Global	Published	10/31/2019	182 KB
Shipping pick list for shipment (Excel).version.11.5.3	1	Global	Published	10/31/2019	182 KB
Shipping pick list model mapping.version.11.3	1	Global	Published	10/31/2019	33 KB
Shipping pick list for wave (Excel).version.11.5.3	1	Global	Published	10/31/2019	182 KB

Additional details

Free text invoice (Excel).

Description

-

Asset ID
027e4cd3-1d40-4aa0-9195-bc

Validation status
Not validated

Created by
System Account (Admin)

Created Date
10/31/2019 3:08 PM

Modified by
System Account (Admin)

Modified at
10/31/2019 3:08 PM

Edit the ER solution template

1. Sign in as a user who has access to the **Business document management** workspace.
2. Open the **Business document management** workspace.

Finance and Operations Preview

Search for a page

USMF

Business document management

Draft: 0, Published: 1

Filter: Functional areas: All, Status: All, Document type: All

Functional areas	Title	Status	Revision	Document type	Modified date and time
Invoicing	Free text invoice (Excel)	Published		Excel	11/6/2019 01:35:45 AM

Free text invoice (Excel) PUBLISHED

Revisions not yet created

Template Details

Free text invoice

[Your Company Name]

Company Address

[Street address] Phone [Phone number] B
 City, Fax [Fax number] T
 State, Email [Email Address] C
 ZIP Code E

Bank name [Bank name] B
 Bank account number [Bank account number] S
 Currency bank name [Currency bank name] C

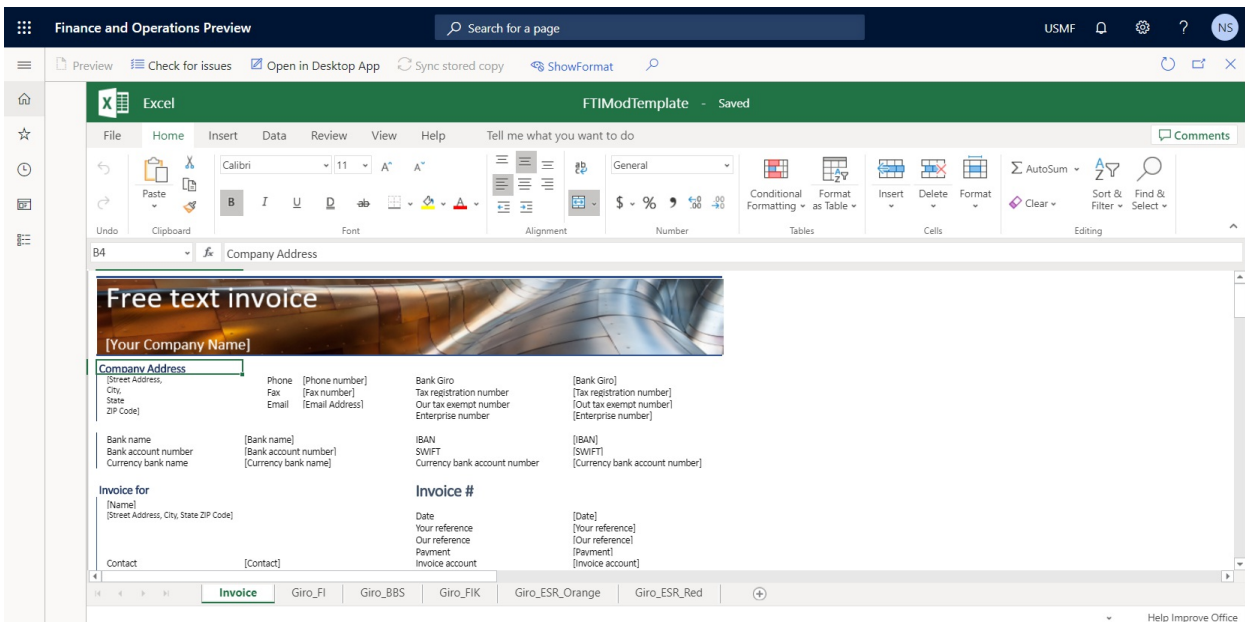
Invoice for

[Name] C
 Street Address, City, State ZIP Code V

+ New template

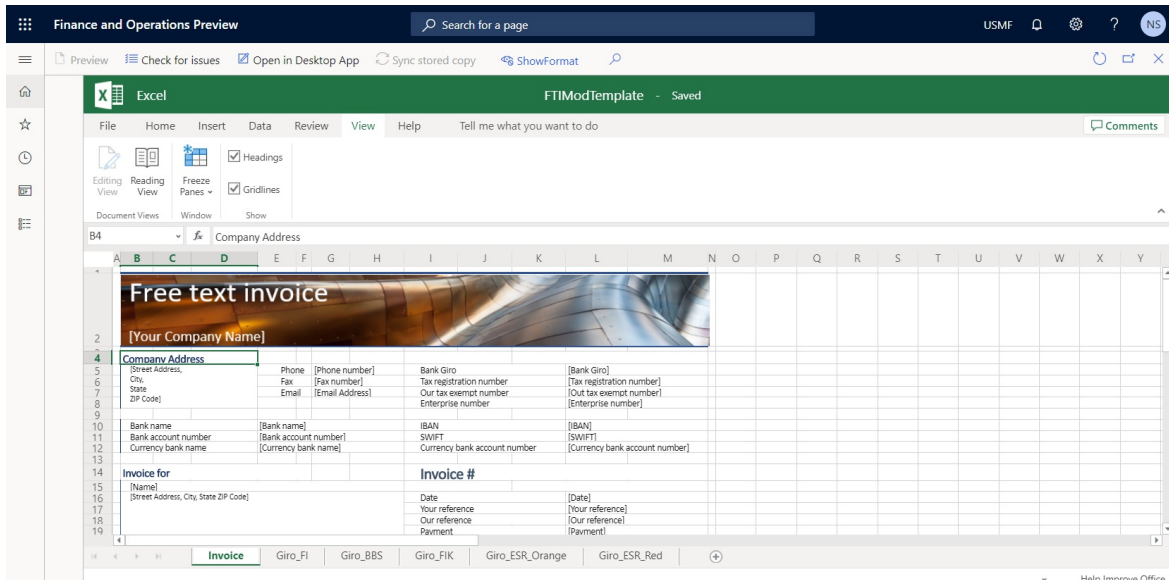
3. In the grid, select the **Free text invoice (Excel)** template.
4. In the right pane, select **New template** to create a new template that is based on the selected template.
5. In the Title field, enter **Free text invoice (Excel) Contoso** as the title of the new template.
6. Select **OK** to confirm the start of the editing process.

The BDM template editor page appears. You can use Microsoft 365 to edit the selected template online in the embedded control.

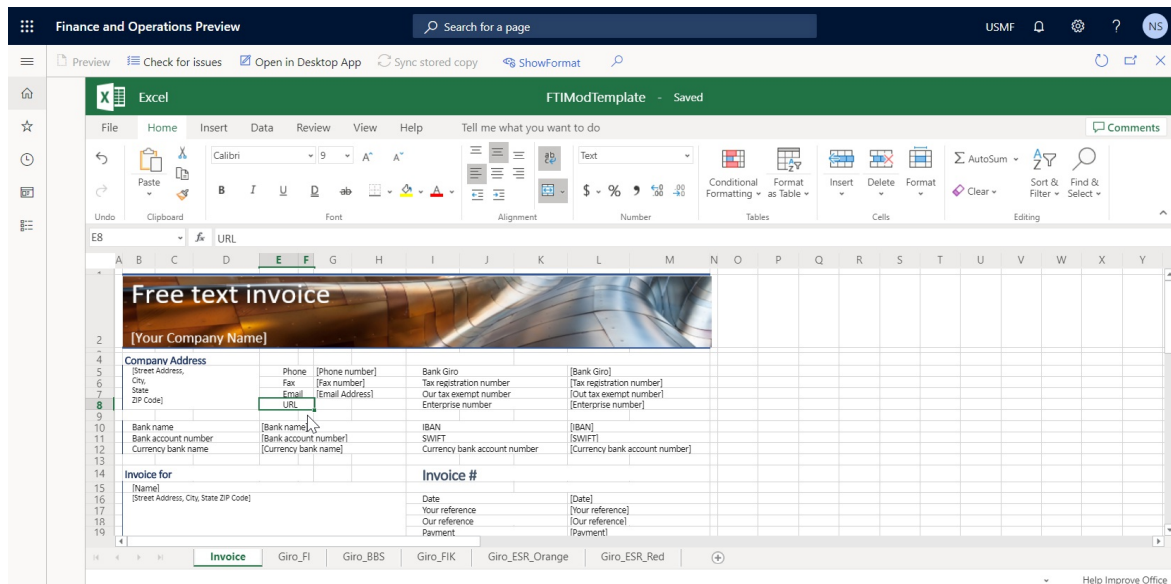


Add the label for a new field to the template

1. On the BDM template editor page, on the Excel ribbon, on the View tab, select the Headings and Gridlines check boxes for the editable Excel template.

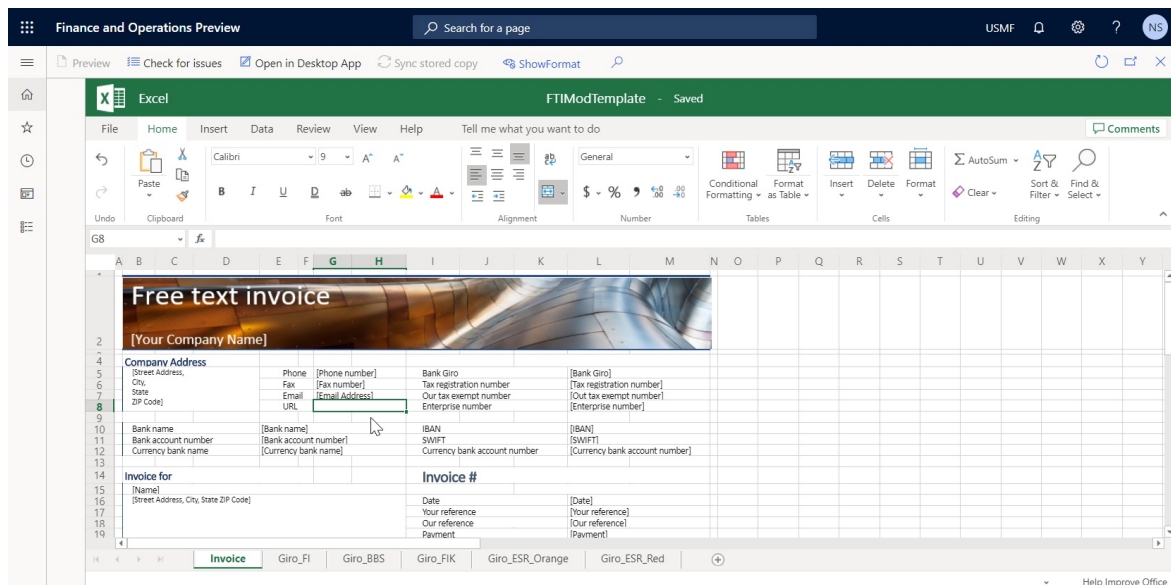


2. Select cells E8:F8.
3. On the Excel ribbon, on the Home tab, select Merge & Center to merge the selected cells into a new merged E8:F8 cell.
4. In the merged cell E8:F8, enter URL.
5. Select merged cell E7:F7, select Format painter, and then select merged cell E8:F8 to format it in the same way as merged cell E7:F7.



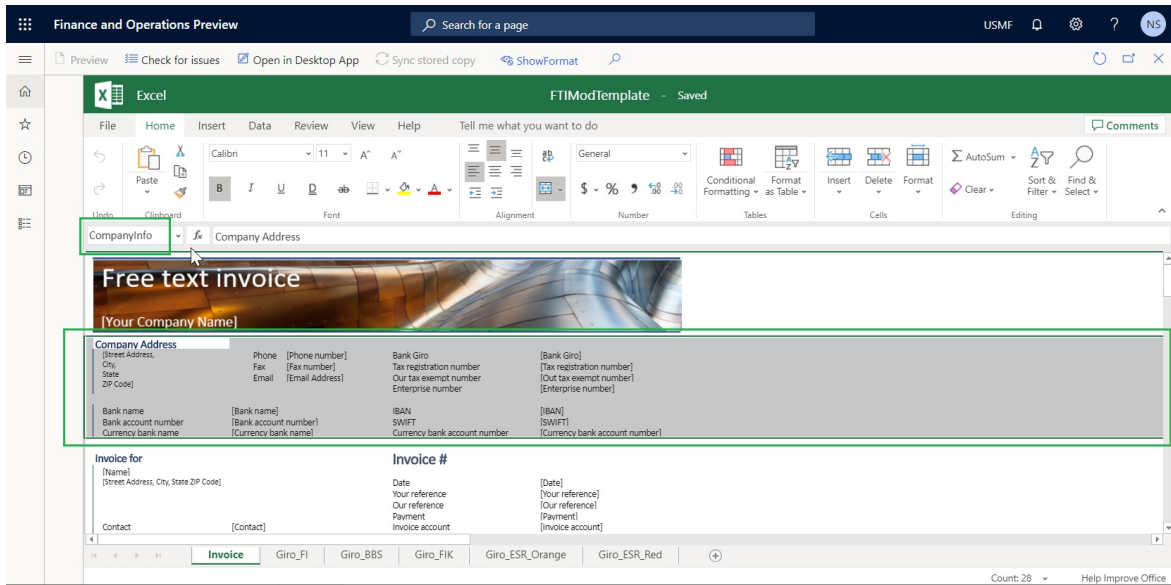
Format the template to reserve space for a new field

1. On the BDM template editor page, select merged cell G8:H8.
2. On the Excel ribbon, on the Home tab, select Merge & Center to merge the selected cells into a new merged G8:H8 cell.
3. Select merged cell G7:H7, select Format painter, and then select merged cell G8:H8 to format it in the same way as merged cell G7:H7.



4. In the Name box field, select CompanyInfo.

The **CompanyInfo** range of the current Excel template holds all the fields that are used to fill the header of a generated report with the details of the current company as a seller party.

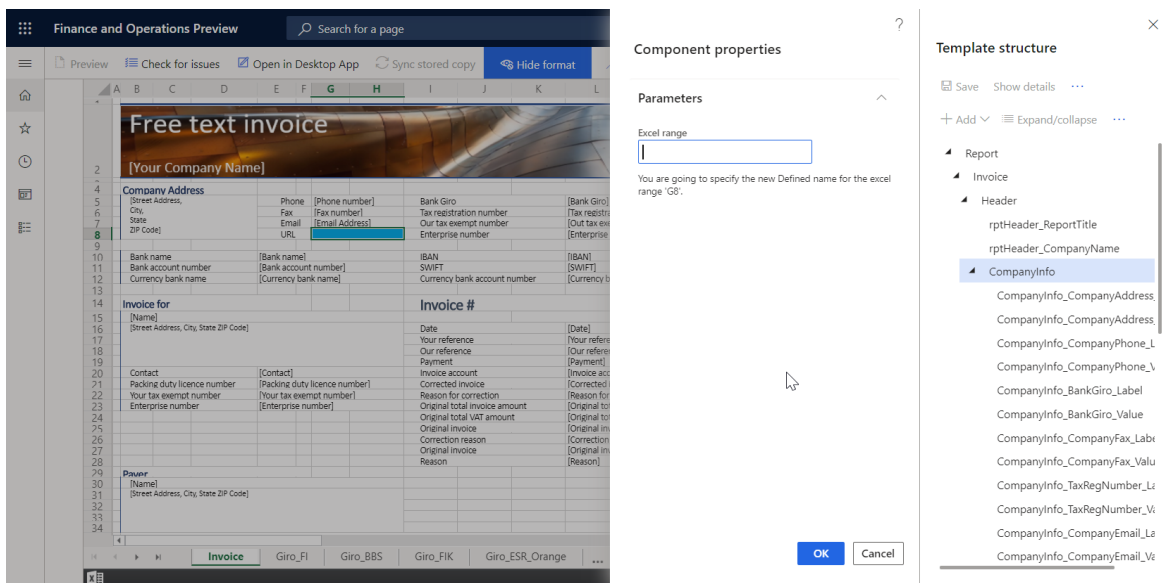


Add a new field to the template

1. On the BDM template editor page, on the Action Pane, select **Show format**.
2. In the **Template structure** pane, select **Add**.

NOTE

You must adjust the section of the template that you want to use as a new field. You already made this adjustment by formatting merged cell G8:H8.

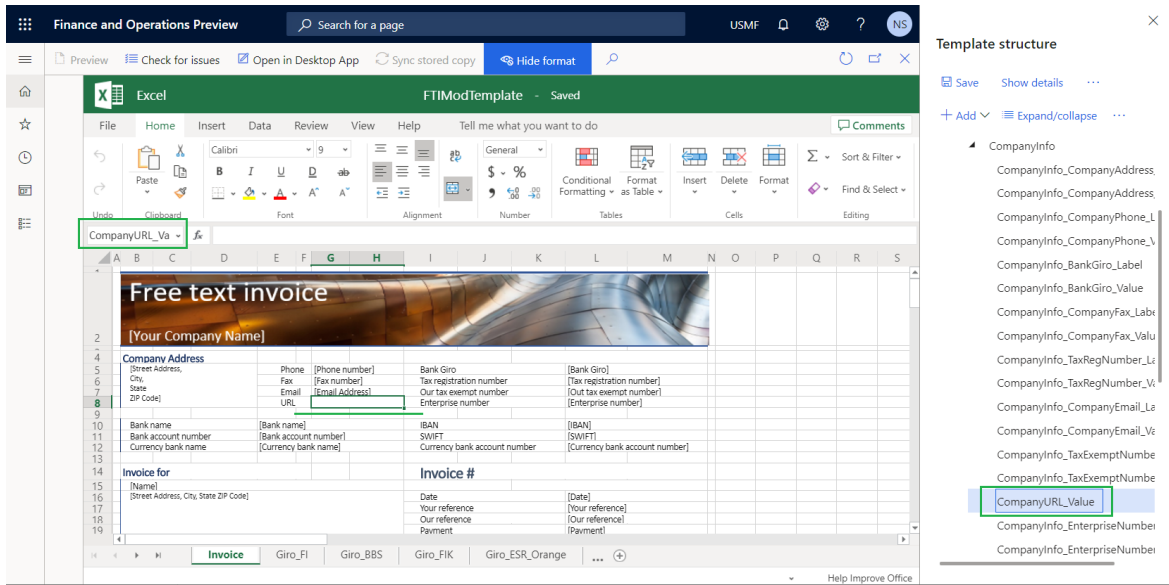


3. Select **Excel\Cell** to add a new field as a cell in the template.

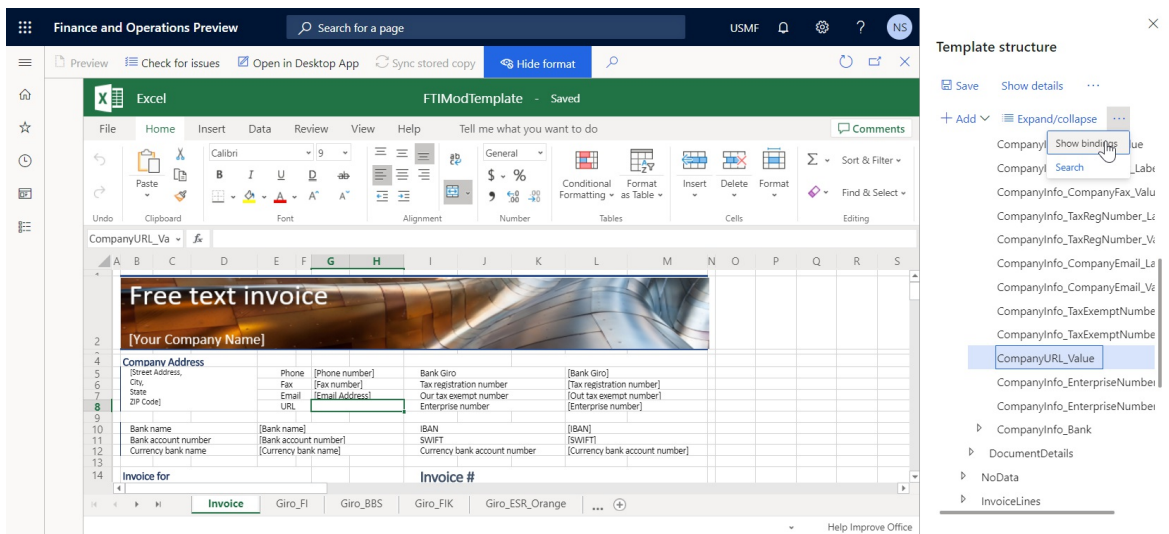
You can select **Excel\Range** if you want to add a new range to the template. The range that is entered can contain multiple cells. You can add these cells later.

Notice that the **CompanyInfo** template component, is automatically selected in the **Template structure** pane, because it's the most suitable parent component in the current template structure for the field that you're adding.

4. In the **Excel range** field, enter **CompanyURL_Value**.
5. Select **OK**.



6. In the Template structure pane, select the ellipsis button (...), and then select Show bindings.

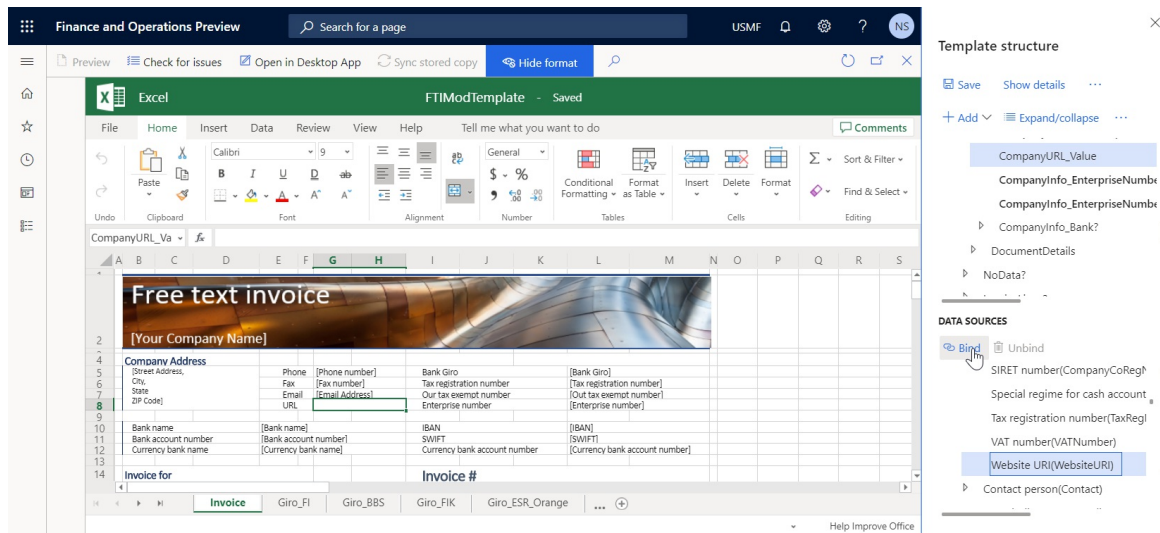


The Template structure pane now shows the data sources that are available in the underlying ER format.

7. Select CompanyInfo_Value as the field that you plan to bind to a data source of the underlying ER format.

8. In the Data sources section of the Template structure pane, expand Model > InvoiceBase > CompanyInfo.

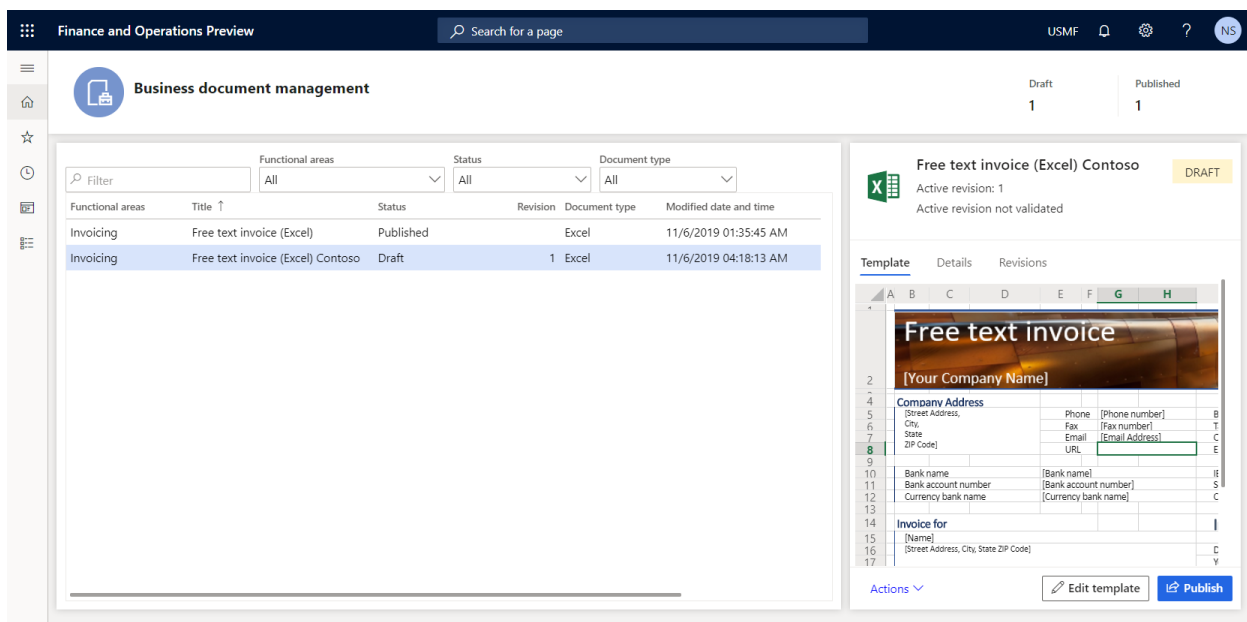
9. Under CompanyInfo, select the WebsiteURI item.



10. Select **Bind**.

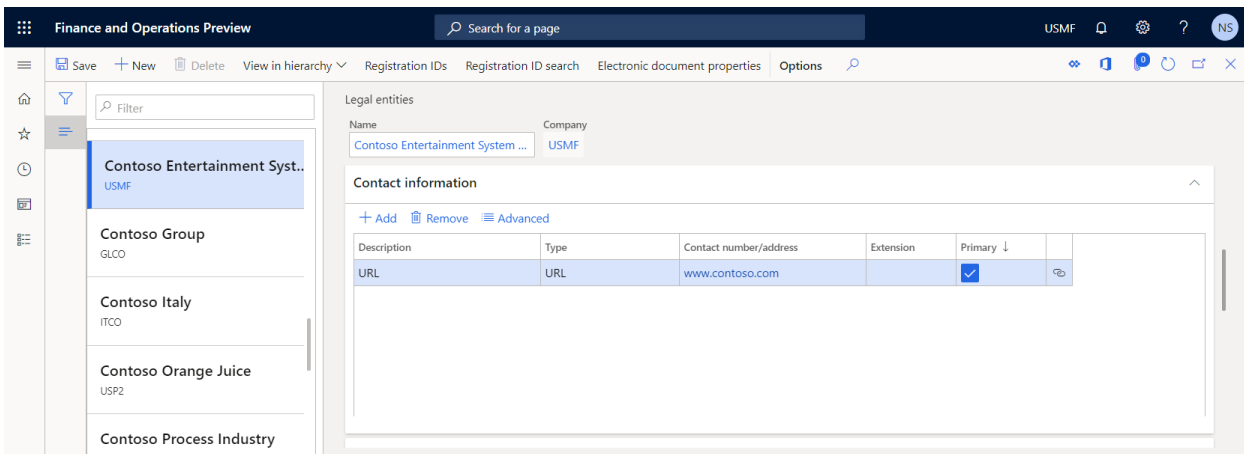
11. In the **Template structure** pane, select **Save**, and then close the BDM template editor page.

In the **Business document management** workspace, the **Template** tab in the right pane shows the updated template. In the grid, notice that the **Status** field for the edited template has been changed to **Draft**, and the **Revision** field is no longer blank. These changes indicate that the process of editing this template has been started.



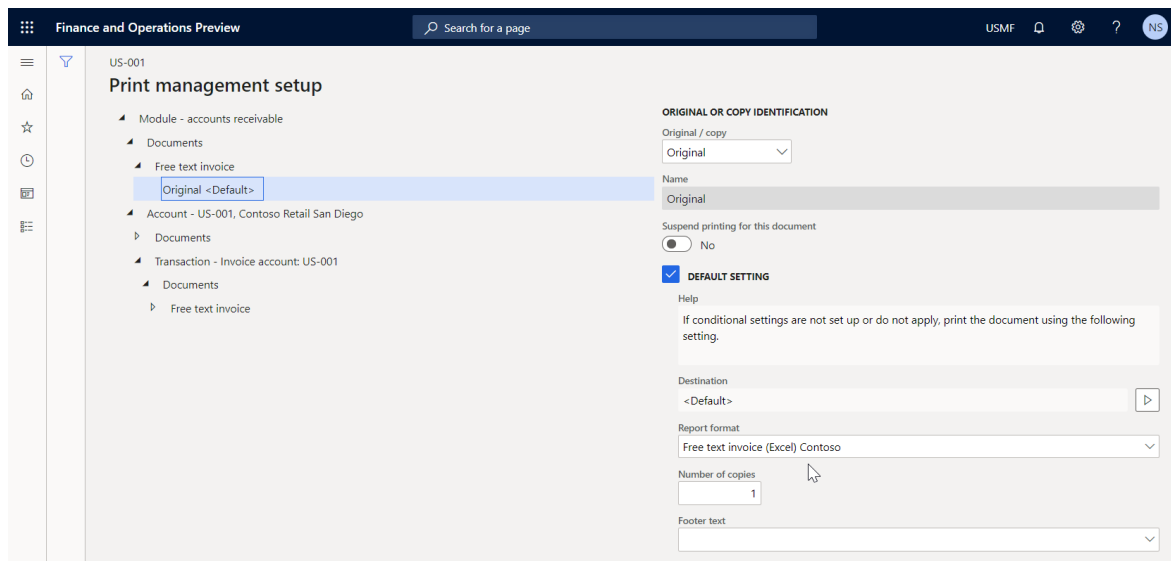
Review company settings

1. Go to **Organization administration > Organizations > Legal entities**.
2. On the **Contact information** FastTab, verify that the company URL is entered.

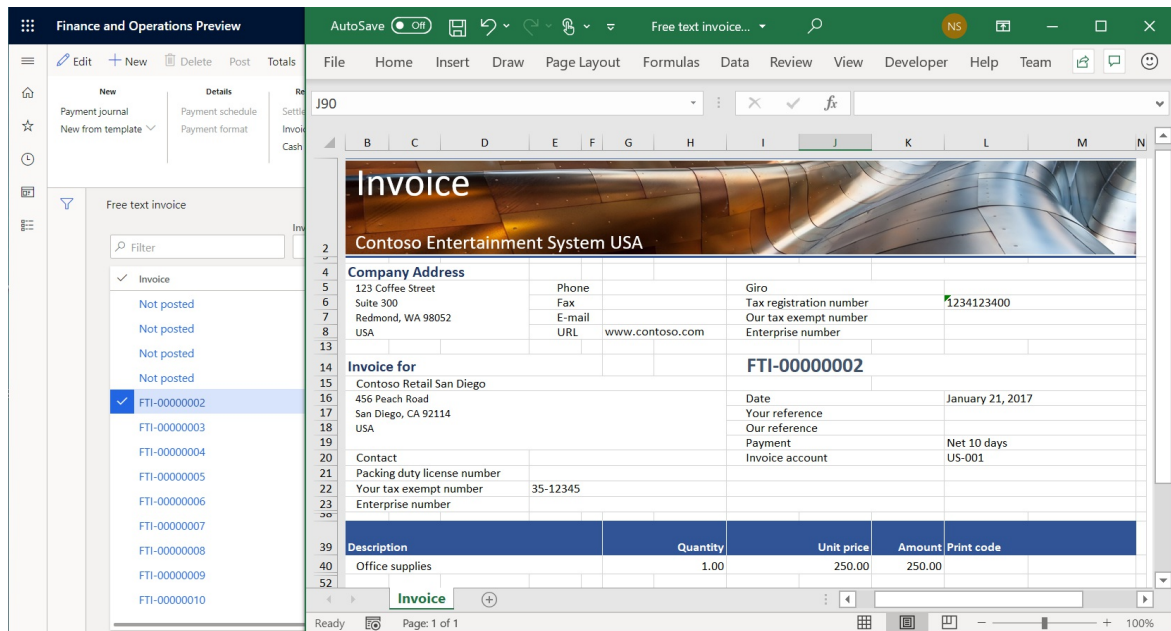


Generate business documents to test the updated template

1. In the application, change the company to USMF, and go to **Accounts receivable > Invoices > All free text invoices**.
2. Select invoice FTI-00000002, and then select **Print management**.
3. In the left pane, expand **Module - accounts receivable > Documents > Free text invoice**.
4. Under **Free text invoice**, select the **Original document** level to specify the scope of invoices for processing.
5. In the right pane, in the **Report format** field, select the **Free text invoice (Excel) Contoso** template for the specified document level.



6. Press **Esc** to close the current page.
7. Select **Print > Selected**.
8. Download the generated document, and open it in Excel.



The modified template is used to generate the free text invoice report for the selected item. To analyze how this report is affected by changes that you make to the template, run the report in one application session immediately after you change the template in another application session.

Related links

[Electronic reporting \(ER\) overview](#)

[Business document management overview](#)

[Design a configuration for generating reports in OPENXML format](#)

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Extend the list of Electronic reporting (ER) functions

2/18/2021 • 2 minutes to read • [Edit Online](#)

Various types of functions are supported in Electronic reporting expressions for data transformation – text, date and time, mathematical logical, information, data type conversion, and other (business domain-specific functions). In addition to built-in functions, Electronic reporting lets you extend the list of available functions. This article includes an overview of key tasks that you must complete to introduce a new function.

All Electronic reporting functions in application code are represented as classes that extend the **ERExpression** class. Two types of functions are recognized:

- **Fixed number of arguments** – These functions are represented by classes that include methods that have the prefix **parm** (see **parmInput**, **parmStartNum** in the sample code the follows). The order of arguments is set by the **SysOperationDisplayOrderAttribute** attribute.
- **Variable number of arguments** – These functions (see the **ERExpressionGenericCase** class) are represented by classes that implement the **ERObjectContainer** interface. An additional **Add** method is used to declare the types that a function accepts.

Here are the recommended steps for introducing a new function for Electronic reporting expressions:

- Select a base class for your function, based on the return value type (see **ERExpressionString** in the sample code that follows).
 - Create a new class that extends the selected class (see **ERExpressionStringMid** in the sample code the follows).
 - Provide required attributes:
 - **SysOperationLabelAttribute** – This attribute defines the function’s name.
 - **SysOperationHelpTextAttribute** – This attribute defines the function’s Help text.
 - **ERComponentGroupAttribute** – This attribute defines the group that the function belongs to. (For more information, see [Formula designer in Electronic reporting \(ER\)](#).)
 - Provide arguments:
 - For a fixed number of arguments function, provide methods that have the prefix **parm**, and use the **SysOperationDisplayOrderAttribute** attribute to set the order of the arguments.
 - For a variable number of argument function, implement the **ERObjectContainer** interface.
 - Provide an evaluation method.

Here is an example.

```

/// <summary>
/// Returns the characters from the middle of a text string, given a starting position and length.
/// </summary>
[
    SysOperationLabelAttribute ('MID'),
    SysOperationHelpTextAttribute ("@ElectronicReporting:ExpressionStringMidHelpText"),
    ERComponentGroupAttribute ("@ElectronicReporting:String")
]
class ERExpressionStringMid extends ERExpressionString
{
    ERExpressionString input;
    ERExpressionInt startNum;
    ERExpressionInt numChars;
    public str evaluateString(ERIDataContext _dataContext)
    {
        return subStr(
            this.parmInput().evaluateString(_dataContext),
            this.parmStartNum().evaluateInt(_dataContext),
            this.parmNumChars().evaluateInt(_dataContext));
    }
    [DataMemberAttribute, SysOperationLabelAttribute ("@ElectronicReporting:Input"),
    SysOperationDisplayOrderAttribute ("1")]
    public ERExpressionString parmInput(ERExpressionString _input = input)
    {
        input = _input;
        return input;
    }
    [DataMemberAttribute, SysOperationLabelAttribute ("@ElectronicReporting:NumChars"),
    SysOperationDisplayOrderAttribute ("3")]
    public ERExpressionInt parmNumChars(ERExpressionInt _numChars = numChars)
    {
        numChars = _numChars;
        return numChars;
    }
    [DataMemberAttribute, SysOperationLabelAttribute ("@ElectronicReporting:StartNum"),
    SysOperationDisplayOrderAttribute ("2")]
    public ERExpressionInt parmStartNum(ERExpressionInt _startNum = startNum)
    {
        startNum = _startNum;
        return startNum;
    }
    public str toString()
    {
        return ERExpressionStringPresenter::namedFunctionToStr(this);
    }
}

```

Suggested guidance

The following guidance is intended to help you design your custom Electronic reporting functions:

- Reuse the names of Microsoft Excel functions whenever you can, so that Electronic reporting formulas remain Excel-like. In this way, you will keep Electronic reporting formulas intelligible for end users.
- Electronic reporting doesn't support list types for primitive data types. Therefore, we have decided to use a data container list that has a single **Value** item in it.
- Release a new function's list extension as a new application hotfix. Electronic reporting designers will refer to the hotfix number in Electronic reporting configurations that use that new custom function. Whenever a configuration of this type is imported into a new instance, Electronic reporting will evaluate whether the required hotfix has been installed, to maintain compliance between the Electronic reporting configuration and the version that configuration is imported into.

Additional resources

[Electronic reporting \(ER\) overview](#)

[Formula designer in Electronic reporting \(ER\)](#)

NOTE

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ER framework API changes for Application update 7.3

2/18/2021 • 2 minutes to read • [Edit Online](#)

This topic describes how the API of the Electronic reporting (ER) framework has been changed in the Dynamics 365 for Finance and Operations, Enterprise edition Application update 7.3.

There are two types of changes to the ER APIs:

- Several X++ classes were moved from X++ to an external assembly.
- The rest of X++ classes were marked as internal.

How to access classes that were moved from X++ to an external assembly

To access external classes, you need to add the **using** directive to the beginning of your file.

```
using Microsoft.Dynamics365.LocalizationFramework;
```

You can then access an external class without any additional changes, for example.

```
var destination = new ERFileDestinationMemory();
```

You can also create an alias for your namespace.

```
using LF = Microsoft.Dynamics365.LocalizationFramework;
```

You can then refer to an external class by using the namespace alias that you created.

```
var destination = new LF.ERFileDestinationMemory();
```

How to access internal X++ objects by using ERObjectsFactory

In Application update 7.3 and later updates, the calling code must access the ER objects by using the methods of the **ERObjectsFactory** class. Several examples of these changes are shown.

Code to display a format mapping lookup

Before Application update 7.3

```
// pattern
ERFormatMappingTableLookup::lookupFormatMapping(<form control>, <model name>[, <data container name>]);
// sample code
ERFormatMappingTableLookup::lookupFormatMapping(_referenceGroupControl, bankLCMiscChargeReportERModelName);
```

Application update 7.3 and later

```
// pattern
ERObjectsFactory::createFormatMappingTableLookupForControlAndModel(<form control>, <model name>[, <data
container name>]).performFormLookup();
// sample code
ERObjectsFactory::createFormatMappingTableLookupForControlAndModel(_referenceGroupControl,
bankLCMiscChargeReportERModelName).performFormLookup();
```

Code to run a format mapping for data export

Before Application update 7.3

```
// pattern
ERFormatMappingRun::constructByFormatMappingId(<format mapping id>, <file name>, <show prompt
dialog>).run();
// sample code
ERFormatMappingRun::constructByFormatMappingId(erBinding, '', true).run();
```

Application update 7.3 and later

```
// pattern
ERObjectsFactory::createFormatMappingRunByFormatMappingId(<format mapping id>, <file name>, <show prompt
dialog>).run();
// sample code
ERObjectsFactory::createFormatMappingRunByFormatMappingId(erBinding, '', true).run();
```

Code to run a format mapping for data import

Before Application update 7.3

```
// pattern
ERModelMappingDestinationRun::constructByImportFormatMappingId(<mapping id>, <integration point>).run();
// sample code
ERModelMappingDestinationRun::constructByImportFormatMappingId(custPaymModeTable.ERModelMappingTable,
CustVendOutPaymConstants::IntegrationPoint).run();
```

Application update 7.3 and later

```
// pattern
ERObjectsFactory::createMappingDestinationRunByImportFormatMappingId(<mapping id>, <integration
point>).run();
// sample code
ERObjectsFactory::createMappingDestinationRunByImportFormatMappingId(custPaymModeTable.ERModelMappingTable,
CustVendOutPaymConstants::IntegrationPoint).run();
```

Code to create a browser file destination

Before Application update 7.3

```
// sample code
new ERFileDestinationBrowser();
```

Application update 7.3 and later

```
// sample code
ERObjectsFactory::createFileDestinationBrowser();
```

Code to create an attachment file destination

Before Application update 7.3

```
// pattern
ERFileDestinationAttachment::construct(<record>, ERDocuManagement::instance().otherDocuType());
// sample code
ERFileDestinationAttachment::construct(_cashRegisterFiscalTrans_W,
ERDocuManagement::instance().otherDocuType());
```

Application update 7.3 and later

```
// pattern
ERObjectsFactory::createFileDestinationAttachmentWithOtherDocuType(<record>);
// sample code
ERObjectsFactory::createFileDestinationAttachmentWithOtherDocuType(_cashRegisterFiscalTrans_W);
```

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Specify a custom storage location for generated documents

2/18/2021 • 4 minutes to read • [Edit Online](#)

The application programming interface (API) of the Electronic reporting (ER) framework lets you extend the list of storage locations for documents that ER formats generate. This topic includes an overview of the main tasks that you must complete to add a custom storage location.

Prerequisites

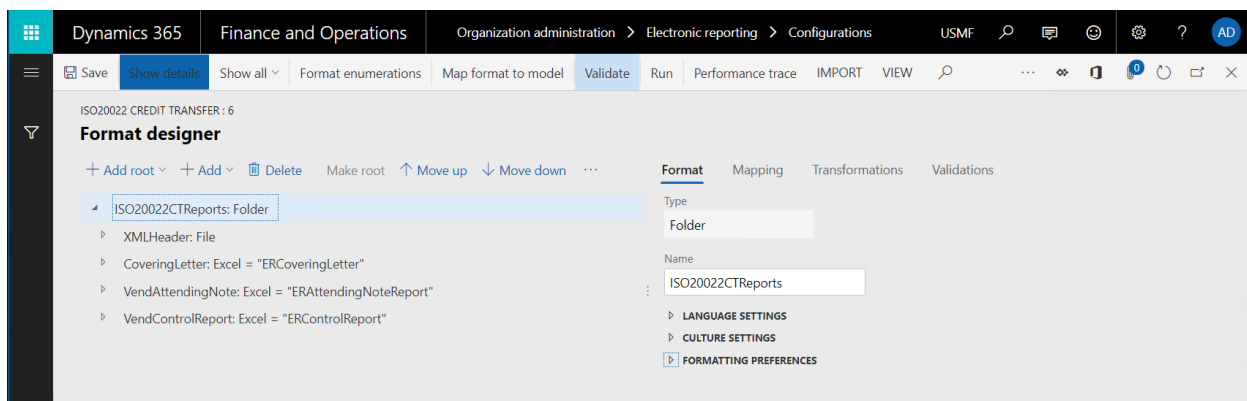
You must deploy a topology that supports continuous build. (For more information, see [Deploy topologies that support continuous build and test automation](#).) You must have access to this topology for one of the following roles:

- Electronic reporting developer
- Electronic reporting functional consultant
- System administrator

You must also have access to the development environment for this topology.

Create or import an ER format configuration

In the current topology, [create a new ER format](#) to generate documents that you plan to add a custom storage location for. Alternatively, [import an existing ER format into this topology](#).



IMPORTANT

The ER format that you create or import must contain at least one of the following format elements:

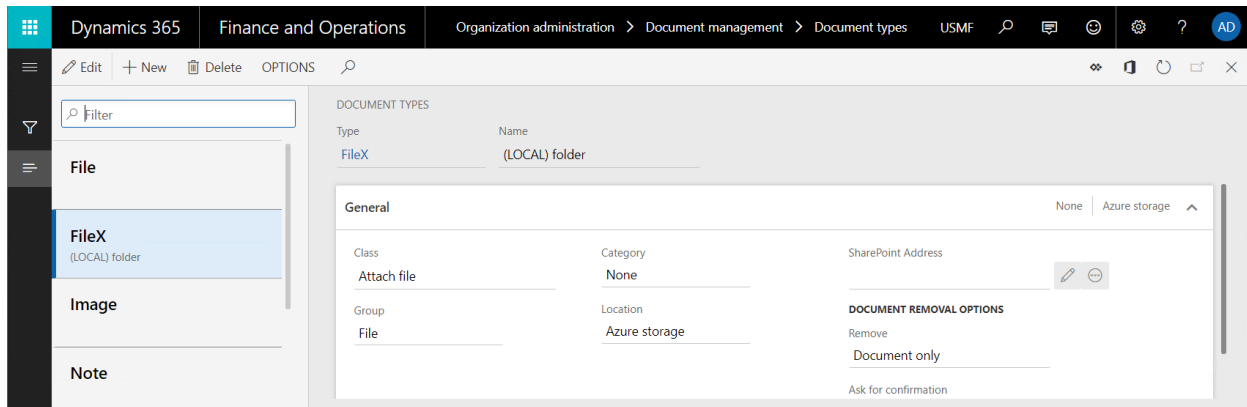
- File
- Folder
- Merger
- Attachment

Create a new document type

To specify how documents that an ER format generates are routed, you must configure [Electronic reporting \(ER\) destinations](#). In each ER destination that is configured to store generated documents as files, you must specify a

document type of the Document management framework. Different document types can be used to route documents that different ER formats generate.

1. Add a new **document type** for the ER format that you created or imported earlier. In the illustration that follows, the document type is **FileX**.
2. To differentiate this document type from other document types, include a specific keyword in its name. For example, in the illustration that follows, the name is **(LOCAL) folder**.
3. In the **Class** field, specify **Attach file**.
4. In the **Group** field, specify **File**.



NOTE

Document types are company-specific. To use an ER format with a configured destination in multiple companies, you must configure a separate document type in each company.

Review source code

Review the code of the `insertFile()` method of the `ERDocuManagement` class. Notice that the `AttachingFile()` event is raised while the generated file is attached to a record.

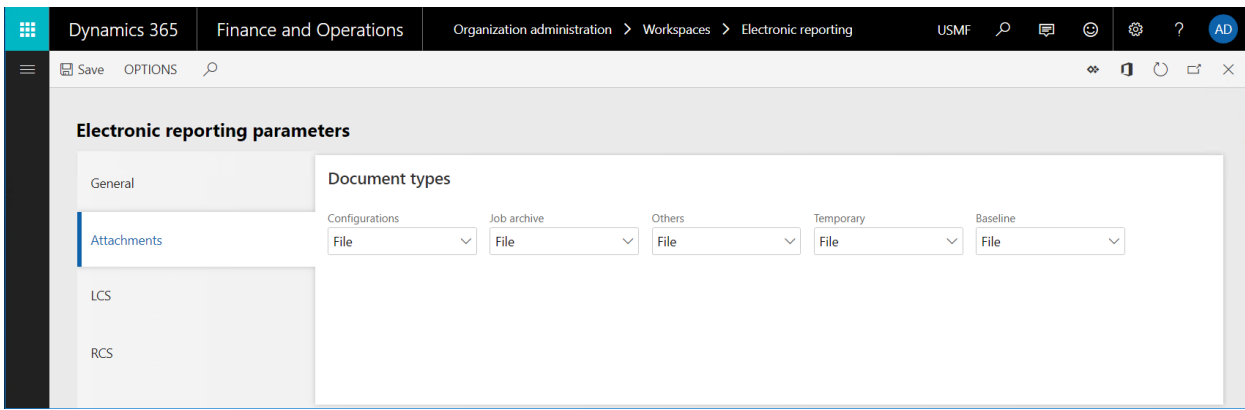
```

/// <summary>
/// Inserts file as attachment in Document Management.
/// </summary>
/// <param name = "_owner">A record as the attachment owner.</param>
/// <param name = "_stream">The file stream.</param>
/// <param name = "_filePath">The file path with name.</param>
/// <param name = "_attachmentName">The name of file attachment.</param>
/// <returns>The reference to inserted file.</returns>
[Hookable(false)]
public DocuRef insertFile(
    Common _owner,
    System.IO.Stream _stream,
    str _filePath,
    str _attachmentName,
    DocuTypeId _docuTypeId)
{
    DocuRef docuRef;
    if (_stream)
    {
        DocuType::createDefaults();
        if (!this.isDocuTypeValid(_docuTypeId))
        {
            throw error(strFmt("@ElectronicReporting:DocuTypeIsValid", _docuTypeId));
        }
        var args = ERDocuManagementAttachingFileEventArgs::construct(_owner, _stream, _filePath,
            _attachmentName, _docuTypeId);
        ERDocuManagementEvents::onAttachingFile(args);
        if (args.isHandled())
        {
            docuRef = args.getDocuRef();
        }
        else
        {
            docuRef = this.attachFile(_owner, _stream, _filePath, _attachmentName, _docuTypeId);
        }
    }
    return docuRef;
}

```

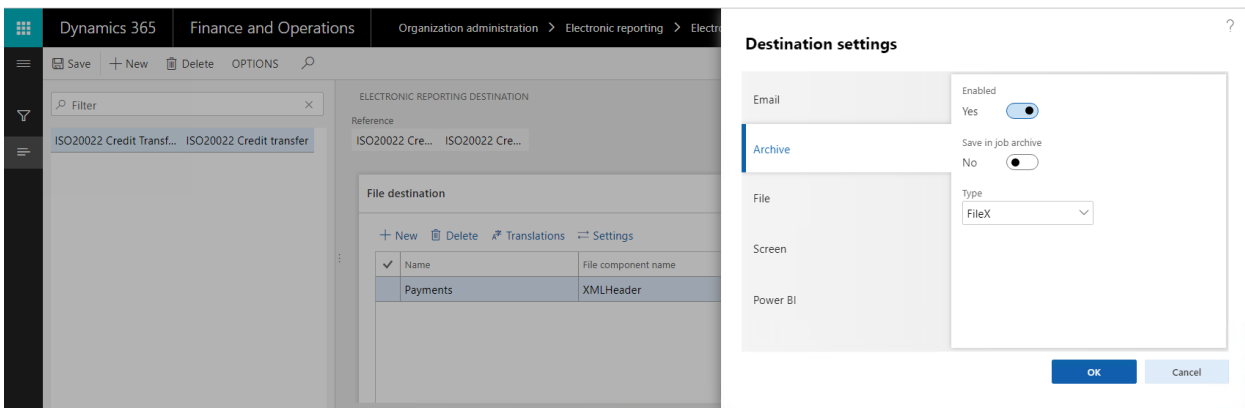
The **AttachingFile()** event is raised when the following ER destinations are processed:

- **Archive** – When this destination is used, a new record for the ER format that is run is created in the ERFormatMappingRunJobTable table. The **Archived** field in this record is set to **False**. If the ER format is successfully run, the generated document is attached to this record, and the **AttachingFile()** event is raised. The document type that is selected in this ER destination determines the storage location for the attached file (Microsoft Azure Storage or a Microsoft SharePoint folder).
- **Job archive** – When this destination is used, a new record for the ER form that is run is created in the ERFormatMappingRunJobTable table. The **Archived** field in this record is set to **True**. If the ER format is successfully run, the generated document is attached to this record, and the **AttachingFile()** event is raised. The document type that is configured in the ER parameters determines the storage location for the attached file (Azure Storage or a SharePoint folder).



Configure an ER destination

1. Configure the archived destination for one of the previously mentioned elements (file, folder, merger, or attachment) of the ER format that you created or imported. For guidance, see [ER Configure destinations](#).
2. Use the document type that you added earlier for the configured destination. (For the example in this topic, the document type is FileX.)



Modify source code

1. Add a new class to your Microsoft Visual Studio project, and write code to subscribe to the **AttachingFile()** event that was mentioned earlier. (For more information about the extensibility pattern that is used, see [Respond by using EventHandlerResult](#).) For example, in the new class, write code that performs the following actions:
 - a. Store generated files in a folder of the local file system of the server that runs the Application Object Server (AOS) service.
 - b. Store these generated files only when the new document type (for example, the **FileX** type that has the "(LOCAL)" keyword in its name) is used while a file is attached to the record in the ER execution job log.

```

class ERDocuSubscriptionSample
{
    void new()
    {
    }
    [SubscribesTo(classStr(ERDocuManagementEvents),
    staticDelegateStr(ERDocuManagementEvents,
    attachingFile))]
    public static void ERDocuManagementEvents_attachingFile(ERDocuManagementAttachingFileEventArgs
    _args)
    {
        if (!_args.isHandled())
        {
            DocuType docuType = DocuType::find(_args.getDocuTypeId());
            if (strContains(docuType.Name, '(LOCAL)'))
            {
                _args.markAsHandled();
                var stream = _args.getStream();
                if (stream.CanSeek)
                {
                    stream.Seek(0, System.IO.SeekOrigin::Begin);
                }
                using (var localStream = System.IO.File::OpenWrite(@"c:\0\" +
                _args.getAttachmentName()))
                {
                    stream.CopyTo(localStream);
                }
            }
        }
    }
}

```

2. Rebuild your project.

Run the ER format that you created or imported

1. Execute the ER format that you created or imported.
2. Go to **Organization administration > Electronic reporting > Electronic reporting jobs**. Find the record that was created for this execution job, and that has the generated file attached to it.
3. Explore the local C:\0 folder to find same generated file.

Additional resources

- [Electronic reporting \(ER\) destinations](#)
- [Extensibility home page](#)

NOTE

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Inventory management overview

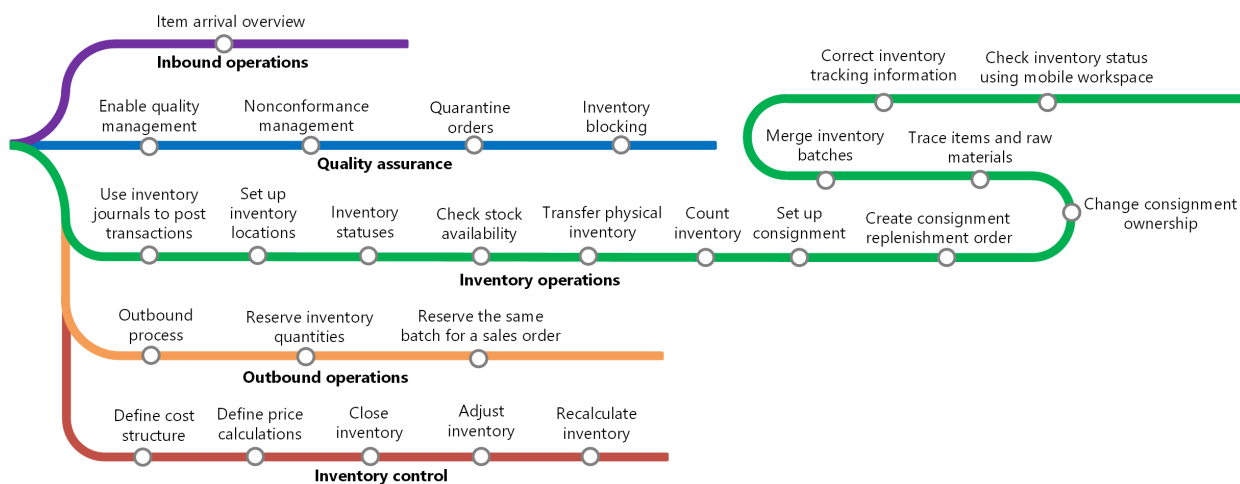
2/18/2021 • 2 minutes to read • [Edit Online](#)

You can use Inventory management to perform the following tasks:

- [Inbound operations](#)
- [Quality assurance](#)
- [Inventory activities](#)
- [Outbound operations](#)
- [Inventory control](#)

Learning map

The following learning map shows the major concepts and tasks that make up the framework of the Inventory management module. Click the learning map below to expand it. This learning map will help you get started.



Additional resources

What's new and in development

Go to the [Microsoft Dynamics 365 Roadmap](#) to see what new features have been released and what new features are in development.

Inventory accounting

To learn more, see [Inventory close](#).

Manufacturing and Supply Chain Management blogs

You can find opinions, news, and other information about Inventory management and other solutions on the [Dynamics AX Manufacturing R&D Team Blog](#) and [Supply Chain Management in Dynamics AX R&D Team Blog](#).

Task guides

Additional help is available as task guides. To access task guides, click the **Help** button on any page

NOTE

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Arrival overview

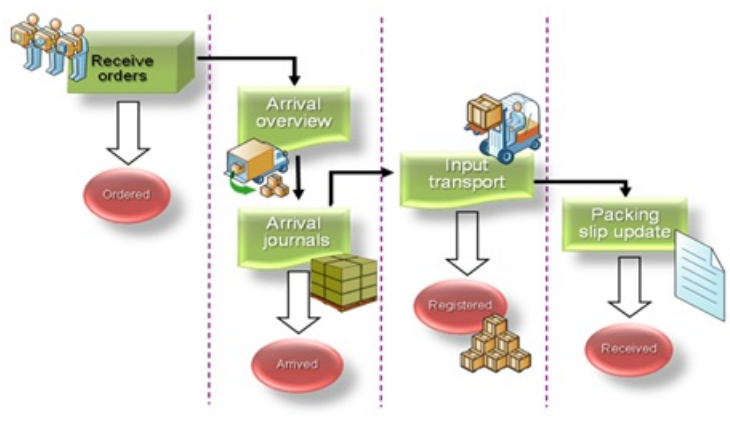
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This topic provides information about the Arrival overview feature. The Arrival overview page is part of this feature and provides an overview of all items that are expected to arrive as incoming items.

The **Arrival overview** page provides an overview of all expected incoming items. It also shows arrivals that can be initialized based on the overview. This topic focuses on the receiving process.

Business scenario

Consider the following scenario in the inbound processes.



Sammy, a receiving clerk, wants to know what is expected to be received on the current day. On the **Arrival overview** page, Sammy can get an overview of the current tasks, and a rough estimate of quantities, volume, weight, different order types, and so on. Later, a delivery arrives at one of the inbound docks, and Sammy receives a list of the delivery. On the **Arrival overview** page, Sammy can perform the following tasks:

- Identify the matching receipt order, and register the receipt as **In progress**. The lines that are required for a registration are automatically generated, and the receipt can be monitored, even though the transactions haven't yet been posted as **Registered**.
- Access the appropriate arrival journal reference (that is, the **Item arrival** journal or the **Production input** journal), and identify journals that are ready for a product receipt update.

Arrival overview page

To open the **Arrival overview** page, click **Inventory management > Inbound orders > Arrival overview**. You can view a list of orders that are expected to be received. The overview is divided into a header and lines. The header information is grouped by the order type, expected receipt date, and delivery destination. When a header line is selected for arrival, all the detail lines that are related to the receipt reference are selected for arrival in the line details part of the page. When all related journal lines have been posted, this information isn't shown.

Arrival overview profiles

The **Arrival overview** page provides an overview of items that are expected to arrive and the date when they are expected to arrive. As part of the arrival process, multiple sets of personal settings can be used. Individual users can define their personal settings on the **Arrival overview profiles** page.

Set up item arrival

In our example, Sammy wants to set up a new computer at a location that will be used to receive finished goods that come from production at Site 1. On the **Arrival overview profiles** page, Sammy creates a new setup that is named **Site 1 production** and specifies the following settings.

1. On the **Arrival options** FastTab, in the **Range** field group, enter information about a day interval and the warehouses to include in the overview.
2. On the **Arrival options** FastTab, in the **Journal** field group, enter a receiving warehouse, a location, and a journal name (item arrival/production input).
3. On the **Arrival query details** FastTab, in the **Site** field group, in the **Restrict to site** field, enter a site to limit the view in the overview area.
4. On the **Arrival query details** FastTab, in the **Transaction types shown** field group, set the **Production orders** option to **Yes**.
5. On the **Arrival query details** FastTab, in the **Miscellaneous** group, set the **Update on startup** option to **Yes** if the view should be automatically updated at startup. Set the **Update on range change** option to **Yes** if the view should be automatically updated when range values are changed.

For this example, the **Arrival overview profile name** field on the **Arrival options** FastTab of the **Arrival overview** page is set to **Site 1 production**.

Prerequisites for arrival journals

To automatically create arrival journals from the **Arrival overview** page, you must define appropriate information in the **Journal** field group on the **Arrival options** FastTab.

- You must specify a journal name to create a journal.

JOURNAL

Name

WArr

Warehouse

22

Location

In_01

- If you specify values in the **Warehouse** and **Location** fields, those values are applied on the journal lines. If you don't specify values, the system uses the values from the dimension that is specified on the inventory transactions.

Items that are received from one expected receipt order

On the **Receipts** FastTab, Sammy selects a line and then clicks **Start arrival**. All related lines that are in the specified range and that have a quantity to register are automatically selected. An item arrival journal is generated that has a match between the expected receipt order and the journal. The quantity is automatically initialized on all lines that are created.

Items that are received from more than one expected receipt order

On the **Receipts** FastTab, Sammy selects multiple lines and then clicks **Start arrival**. An item arrival journal is generated that has a match between all the expected receipt orders and the journal. All lines are created on one item arrival journal header, and the quantity is automatically initialized.

Receive items from one or more expected receipt orders

View information

To get an overview of expected receipts in a date interval, Sammy enters the following information in the fields on the **Arrival options** FastTab on the **Arrival overview** page and then clicks **Update** to update the view:

- Arrival overview profile name: **Inquiry**
- Show lines: **All**

- Days back: (Blank)
- Days forward: 0
- Warehouses: **GW, MW**

Sammy can view the following information:

- All related receipt orders for the system date and an infinite number of days back from it (the **InventTrans.StatusDate** interval), and receipts to warehouses GW and MW, regardless of status.
- Detailed line information for more than one order. Sammy can select multiple header lines in the overview and then click **Show all selected** to view all the corresponding line detail information for all selected orders.
- Information about a specific purchase order. To show only information that is related to a specific reference number in the overview, Sammy can enter an account number in the **Account number** field and an order number in the **Reference number** field.
- An overview of the registration tasks that are due for all the order lines that an item arrival journal has been created for but hasn't yet been posted. To view this information, Sammy can select **In progress** in the **Show lines** field.

Update journals

To register one or more order lines that are due to be processed, Sammy can select the lines in the overview grid or in the line grid, and then click **Journals > Show arrivals from receipts**. The item arrival headers that match the lines are shown. To update the purchase order product receipt for the registered items, Sammy can access the item arrival journal headers that are ready for update. To access these item arrival journal headers, he clicks **Journals > Product receipt ready journals**. All the header lines that are ready for product receipt update in the specified warehouse range are shown. (The header lines that are shown aren't related to the day interval).

Start an arrival registration

By selecting multiple lines on the **Arrival overview** page, Sammy can start an arrival of more than one receipt reference. When he selects a line from the receipts overview, the corresponding line details are selected. If a quantity for registration exists, the **Start arrival** button is available. Sammy can use two methods to start the arrival registration:

- To filter the page so that it shows only records that meet specific criteria, in the **Vendor reference** field, scan a reference number from a vendor, such as the bar code for a delivery note.
- In the overview part or the details part of the **Arrival overview** page, manually select or cancel the selection of records for arrival registration. Then, when Sammy clicks **Start arrival**, the selected records are automatically created in an item arrival journal. The records include line information, and all unique field information is assigned.

Update arrival information and process a product receipt

When all goods have been registered, the warehouse manager or purchasing manager can update the received items with a product receipt to add the physical cost. To update arrival information and post a product receipt, follow these steps.

1. Click **Inventory management > Inbound orders > Arrival overview**.
2. On the **Arrival overview** page, click **Journals > Product receipt ready journals** to show a list of the journals that are ready for product receipt update.
3. Select the journals that must be updated, and then click **Functions > Product receipt**.
4. On the **Posting** page, enter the product receipt number, if it isn't already available on the journal, and then click **OK** to process the product receipt.

Summary

The **Arrival overview** page can help the warehouse manager and warehouse workers achieve an overview of expected work that must be done as part of an inbound process. The page can also be used to start the item arrival process, to help guarantee that items are tracked at the first entry into the warehouse.

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Set up an item arrival overview profile

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1

This topic focuses on the setup of an arrival overview profile. The arrival overview profile is a collection of rules that will be applied when the Arrival overview page is opened by a user. You can use this procedure in demo data company USMF. This procedure would typically be carried out by a receiving clerk.

1. In the navigation pane, go to **Modules > Inventory management > Setup > Distribution > Arrival overview profiles**.
2. Select **New**. Because you will almost always work in the same warehouse offloading full truck loads, you should create an arrival overview profile to simplify the process of registering received items.
3. In the **Arrival overview profile name** field, type a value.
4. In the **Show lines** field, select an option. Select which lines to show for the receipts:
 - **All** – Show all lines, regardless of status.
 - **In progress** – Show lines for receipts in which the progress is Complete or Partly. This means that for each line, either the full quantity or part of the quantity has been registered in an arrival journal.
 - **Not complete** – Show lines for receipts in which the progress is None or Partly. This means that for each line, nothing or only part of the quantity has been registered in an arrival journal.
5. Expand or collapse the **Arrival options** section.
6. In the **Days forward** field, type a value. This sets a filter to show the receipt lines expected to be received within the next few days (depending on the number you set).
7. In the **Days back** field, type a value. This sets a filter to show the receipt lines expected to be received a number of days before today.
8. In the **Warehouses** field, type a value. Filter on one or more warehouses.
9. In the **Mode of delivery** field, select a value. This sets a filter to show only the receipt lines with this Mode of delivery.
10. In the **Name** field, select WHS.
11. In the **Warehouse** field, select warehouse 24. This is the default warehouse that will be used for registered receipt lines that use this profile.
12. In the **Location** field, select **Baydoor**. This is the default location that will be used for registered receipt lines that use this profile.
13. Expand or collapse the **Arrival query details** section.
14. In the **Restrict to site** field, select site 2. This sets a filter to show only the receipt lines with this site.
15. Set the **Purchase orders** option to **Yes**. Select receipt lines from purchase orders.
16. Set the **Transfer orders** option to **Yes**. Select receipt lines from transfer orders.
17. Select **Save**.
18. Close the page.

NOTE

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Quality management overview

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This topic describes how you can use quality management in Dynamics 365 Supply Chain Management to help improve product quality within your supply chain.

Quality management can help you manage turnaround times when you handle nonconforming products, regardless of their point of origin. Because diagnostic types are linked to correction reporting, Supply Chain Management can schedule tasks to correct problems and prevent them from recurring.

In addition to functionality for managing nonconformance, quality management includes functionality for tracking issues by problem type (even internal problems), and for identifying solutions as short-term or long-term. Statistics about key performance indicators (KPIs) provide insight into the history of previous nonconformance issues and the solutions that were used to correct them. You can use historical data to review the effectiveness of previous quality measures and determine appropriate measures to use in the future.

When you set up a quality association, Supply Chain Management can generate quality orders for various business processes, events, and conditions. The quality association can cover a specific item, a specific group of items, or all items.

Examples of the use of quality management

Quality management is flexible and can be implemented in various ways to meet the requirements of specific levels of supply chain operations. The following examples illustrate possible uses of these features:

- Automatically start a quality control process, based on predefined criteria (upon warehouse registration of a purchase order from a specific vendor).
- Block inventory during inspection to prevent non-approved inventory from being used (full blocking of purchase order quantities).
- Use item sampling as part of a quality association to define the amount of current physical inventory that must be inspected. Sampling can be based on fixed quantities, a percentage, or full license plate.

NOTE

The *Quality management for warehouse processes* feature extends the capabilities of quality management. If you are using this feature, then see [Quality management for warehouse processes](#) for examples of how quality management works when it's enabled.

- Create quality orders for partial receipts. To create a quality order that is based on the quantity that is physically received with an order, you must select the **Per updated quantity** check box on the **Item sampling** form.
- Create test types that include minimum, maximum, and target test values, and perform qualitative-versus-quantitative testing that has predefined validation results.
- Specify an acceptable quality level (AQL) to control quality measure tolerances.
- Specify the resources that an inspection operation requires, such as a test area and test instruments.

Working with quality associations

The business process that uses a quality association can be related to various source documents, such as purchase orders, sales orders, or production orders.

Each quality association record defines the set of tests, the AQL, and the sampling plan that applies to the quality orders that are generated. You must define a quality association record for each variation in a business process. For example, you can set up a quality association that generates a quality order when a purchase order product receipt is updated. Depending on the setup of the execution plan, the triggering process itself can be blocked while there is an open quality order, or the next processes, such as purchase order invoicing, can be blocked.

Note: While there are open quality orders, inventory quantities are automatically blocked from being issued. Depending on the **Full blocking** setting on the **Item samplings** page, the quantity is either the quantity on the quality order or the quantity on the source document line.

For a given business process, the quality association record identifies the event and the conditions that a quality order is generated for. The conditions can be specific to either a site or a legal entity. A quality order that involves destructive tests can be generated only when on-hand inventory exists for the event.

The following examples illustrate how a quality association record is defined for the variations in each business process. For each example, the following table summarizes the events and conditions that are defined by a quality association record.

REFERENCE TYPE	EVENT TYPE	EXECUTION	EVENT BLOCKING	DOCUMENT REFERENCE	
Inventory	Not applicable	Not applicable	None	All	
Sales	Picking process is scheduled	Before	None	Specific ID, Group, or All only	
			Picking process		
			Packing slip		
	Invoice				
	Packing slip	Before	None		
			Packing slip		
Invoice					
Purchase	Receipt list	Before	None		
			Receipt list		
			Product receipt		
			Invoice		
	Registration	Not applicable	None		None
					Product receipt
					Invoice
					Product receipt

			Invoice	
	Product receipt	Before	None	
			Product receipt	
		After	None	
			Invoice	
Production	Registration	Not applicable	None	All
			Report as finished	
			End	
	Report as finished	Before	None	
			Report as finished	
			End	
After	None			
	End			
Quarantine	Report as finished	Before	Report as finished	
			End	
		After	End	
	End	Before	End	
Route operation	Report as finished	Before	None	Specific ID, Group, or All, and Resource specific, Group, or All
			Report as finished	
		After	None	
Co-product production	Registration	Not applicable	None	All
	Report as finished	Before		
		After		

The following table provides more information about how quality orders can be generated for specific types of processes.

TYPE OF PROCESS	WHEN QUALITY ORDERS CAN BE AUTOMATICALLY GENERATED	WHEN QUALITY ORDERS CAN BE GENERATED IF DESTRUCTIVE TESTING IS REQUIRED	CONDITION INFORMATION	MANUAL GENERATION INFORMATION
Purchase order	Before or after a receipts list or product receipt for the material that is received is posted	After the product receipt for the material that is received is posted, because the material must be available for destructive testing	The requirement for a quality order can reflect a particular site, item, or vendor, or a combination of these conditions.	A manually generated quality order that refers to a purchase order can use information in a quality association record, such as the test sampling plan.
Quarantine order	Before or after the quarantine order is reported as finished or ended	Quality orders that require destructive tests can't be generated. It's assumed that the quarantine order functionality handles the disposition of the material that is destroyed.	The requirement for a quality order can reflect a particular site, item, or vendor, or a combination of these conditions.	A manually generated quality order that refers to a quarantine order can use information in a quality association record, such as the test sampling plan.
Sales order	Before a scheduled picking process or packing slip update for the items that are being shipped	At any step	The requirement for a quality order can reflect a particular site, item, or customer, or a combination of these conditions.	A manually generated quality order that refers to a sales order can use information in a quality association record, such as the test sampling plan.
Production order	Before or after the finished quantity for the production order is reported	After the finished quantity for the production order is reported	The requirement for a quality order can reflect a particular site or item, or a combination of these conditions.	A manually generated quality order that refers to a production order can use information in a quality association record, such as the test sampling plan.
Production order that has a route operation	Before or after the report is finished for an operation	After the reporting production is finished for the last operation	The requirement for a quality order can reflect a particular, site, item, or operations resource, or a combination of these conditions.	A manually generated quality order that refers to a route operation can use information in a quality association record, such as the test sampling plan.
Inventory	A quality order cannot be automatically generated for a transaction in an inventory journal or for transfer order transactions.			A quality order must be created manually for an item's inventory quantity. Physical on-hand inventory is required.

Quality order auto-generation examples

Purchasing

In purchasing, if you set the **Event type** field to **Product receipt** and the **Execution** field to **After** on the **Quality associations** page, you get the following results:

- If the **Per updated quantity** option is set to **Yes**, a quality order is generated for every receipt against the purchase order, based on the received quantity and settings in the item sampling. Every time that a quantity is received against the purchase order, new quality orders are generated based on the newly received quantity.
- If the **Per updated quantity** option is set to **No**, a quality order is generated for the first receipt against the purchase order, based on the received quantity. Additionally, one or more quality orders are created based on the remaining quantity, depending on the tracking dimensions. Quality orders aren't generated for subsequent receipts against the purchase order.

Production

In production, if you set the **Event type** field to **Report as finished** and the **Execution** field to **After** on the **Quality associations** page, you get the following results:

- If the **Per updated quantity** option is set to **Yes**, a quality order is generated based on every finished quantity and settings in the item sampling. Every time that a quantity is reported as finished against the production order, new quality orders are generated based on newly finished quantity. This generation logic is consistent with purchasing.
- If the **Per updated quantity** option is set to **No**, a quality order is generated the first time that a quantity is reported as finished, based on the finished quantity. Additionally, one or more quality orders are created based on the remaining quantity, depending on the tracking dimensions of the item sampling. Quality orders aren't generated for subsequent finished quantities.

QUALITY SPECIFICATION	PER UPDATED QUANTITY	PER TRACKING DIMENSION	RESULT
Percentage: 10%	Yes	Batch number: No Serial number: No	Order quantity: 100 1. Report as finished for 30 <ul style="list-style-type: none">• Quality order #1 for 3 (10% of 30) 2. Report as finished for 70 <ul style="list-style-type: none">• Quality order #2 for 7 (10% of the remaining order quantity, which equals 70 in this case)

<p>Fixed quantity: 1</p>	<p>No</p>	<p>Batch number: No Serial number: No</p>	<p>Order quantity: 100</p> <ol style="list-style-type: none">1. Report as finished for 30<ul style="list-style-type: none">• Quality order #1 for 1 (for the first reported-as-finished quantity, which has a fixed value of 1)• Quality order #2 for 1 (for the remaining quantity, which still has a fixed value of 1)2. Report as finished for 10<ul style="list-style-type: none">• No quality orders are created.3. Report as finished for 60<ul style="list-style-type: none">• No quality orders are created.
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Fixed quantity: 1	Yes	Batch number: Yes Serial number: Yes	Order quantity: 10 1. Report as finished for 3: 1 for #b1, #s1; 1 for #b2, #s2; and 1 for #b3, #s3 <ul style="list-style-type: none">• Quality order #1 for 1 of batch #b1, serial #s1• Quality order #2 for 1 of batch #b2, serial #s2• Quality order #3 for 1 of batch #b3, serial #s3 2. Report as finished for 2: 1 for #b4, #s4; and 1 for #b5, #s5 <ul style="list-style-type: none">• Quality order #4 for 1 of batch #b4, serial #s4• Quality order #5 for 1 of batch #b5, serial #s5 Note: The batch can be reused.
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Fixed quantity: 2	No	Batch number: Yes Serial number: Yes	Order quantity: 10 1. Report as finished for 4: 1 for #b1, #s1; 1 for #b2, #s2; 1 for #b3, #s3; and 1 for #b4, #s4 <ul style="list-style-type: none"> • Quality order #1 for 1 of batch #b1, serial #s1 • Quality order #2 for 1 of batch #b2, serial #s2 • Quality order #3 for 1 of batch #b3, serial #s3 • Quality order #4 for 1 of batch #b4, serial #s4 • Quality order #5 for 2, without a reference to a batch and a serial number 2. Report as finished for 6: 1 for #b5, #s5; 1 for #b6, #s6; 1 for #b7, #s7; 1 for #b8, #s8; 1 for #b9, #s9; and 1 for #b10, #s10 <ul style="list-style-type: none"> • No quality orders are created.
-------------------	----	---	---

NOTE

The *Quality management for warehouse processes* feature adds capabilities for quality order processing for production with **Event type** set to *Report as finished* and **Execution** set to *After*, and for purchases with **Event type** set to *Registration*. For details, see [Quality management for warehouse processes](#).

Quality management pages

PAGE	DESCRIPTION	EXAMPLE
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PAGE	DESCRIPTION	EXAMPLE
Quality associations	See the previous sections of this article.	<p>A quality association defines all the following information for a quality order that is generated:</p> <ul style="list-style-type: none"> • The transaction event • The set of tests that must be performed on the items • The AQL • The sampling plan <p>You must define a quality association for each variation in a business process that requires automatic generation of quality orders. For example, a quality order can be generated in the business processes for purchase orders, quarantine orders, sales orders, and production orders.</p>
Tests	<p>Use this page to define and view the individual tests that determine whether your products meet quality specifications. You can assign one or more individual tests to a test group. In this case, you also specify test-specific information, such as the acceptable measurement values. Measurement values are used for quantitative tests, and test variables are used for qualitative tests.</p> <ul style="list-style-type: none"> • A quantitative test has a test type of Integer or Fraction, and also has a designated unit of measure. Quality specifications and test results are expressed as numbers. • A qualitative test has a test type of Option. Qualitative tests require additional information about the test variable that is being measured and its enumerated options. Quality specifications and test results are expressed according to an outcome. 	<p>A manufacturing company performs two tests on purchased material: a quantitative test about material quality and a qualitative test about packaging damage. The company defines additional information about the qualitative test to identify the test variable (damaged packaging) and its outcomes. The company uses the Test groups page to assign the two tests to a test group and to specify the test-specific information. The test group is assigned to a quality order, so that the company can report test results for the two tests.</p>

PAGE	DESCRIPTION	EXAMPLE
Test groups	<p>Use this page to set up, edit, and view test groups and the individual tests that are assigned to a test group. The upper pane displays test groups, and the lower pane displays the tests that are assigned to a selected test group. You assign several policies to a test group, such as a sampling plan, an AQL, and the requirement for destructive testing. When you assign an individual test to a test group, you define additional information, such as the sequence, documents, and validity dates. For a quantitative test, the information that you define also includes the acceptable measurement values. For a qualitative test, the information includes the test variable and default outcome. The test group that is assigned to a quality order defines the default set of tests that must be performed on the specified item. However, you can add, delete, or change tests on the quality order. Test results are reported for each test on a quality order.</p>	<p>A manufacturing company defines a test group for each variation of its quality guidelines. The various test groups reflect differences in the sampling plans, the sets of tests that must be performed together, the AQL, and other factors. For quantitative tests, there are also differences in the acceptable measurement values. To enforce its quality guidelines, the company assigns a test group to each rule for automatically generating quality orders on the Quality associations page, and also assigns a test group to quality orders that are manually created.</p>
Item quality groups	<p>Use this page to set up, edit, and view the items that are assigned to a quality group or the quality groups that are assigned to an item. A quality group represents common testing requirements for items. After you define the test requirements on the Test groups page, you can define the rules for automatically generating quality orders. To simplify the process, you don't define rules for individual items. Instead, you define rules for a quality group, by using the Quality associations page. You can also use the Item quality groups page for a selected quality group to assign relevant items to that group. You can also use the Item quality groups page for a selected item to assign relevant quality groups to that item.</p>	<p>A manufacturing company purchases various raw materials that have the same testing requirements for incoming inspection. The company defines a quality group and then assigns the item numbers that are associated with the raw materials to that group. Later, the company purchases a new type of raw material that has the same testing requirements. Instead of setting up new testing requirements for the new material, the company adds the item number for the new material to the existing quality group. The same manufacturing company also produces items that have the same production testing requirements and ships items that have the same requirement for pre-shipment testing. The company defines two additional quality groups and then assigns the relevant item numbers to each group.</p>

PAGE	DESCRIPTION	EXAMPLE
Test variables	Use this page to define and view the variables that are associated with a qualitative test. For each variable, you define enumerated outcomes that represent the possible options. You define tests on the Tests page. For qualitative tests, you must set the test type to Option . Use the Test groups page to assign a test variable to an individual test.	A manufacturing company that produces cookies uses an inspection test for the finished product. This inspection test has several variables. One variable is taste, and the possible outcomes for this variable are good and bad. A second variable is color, and the possible outcomes are too dark, too light, and correct.
Test variable outcomes	Use this page to set up, edit, and to view the possible test results for a test variable that is associated with a qualitative test. For each outcome, you assign a pass or fail status. You must define a variable and its outcomes for each qualitative test that is defined on the Tests page. (For qualitative tests, the test type is set to Option on the Tests page.) Use the Test groups page to assign a test variable and the default outcome to an individual qualitative test.	A manufacturing company that produces cookies uses an inspection test for the finished product. This inspection test has of several variables. One variable is taste, and the possible outcomes for this variable are good and bad. A second variable is color, and the possible outcomes are too dark, too light, and correct. A status of pass or fail is assigned to each outcome. During the inspection test for each variable, the inspector reports the test result by selecting one of the outcomes.

Additional resources

[Quality management processes](#)

[Nonconformance management](#)

[Quality management for warehouse processes](#)

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Quality management processes

2/18/2021 • 7 minutes to read • [Edit Online](#)

This article provides information about the quality management process for nonconforming products. It describes how you can use quality control functionality, how to define and maintain nonconformances, and how to handle corrections.

Quality assurance involves product testing and the management of nonconforming material. Quality management processes help guarantee a high level of product quality in your supply chain. These processes also help optimize supply chain processes and increase customer satisfaction. Quality management can help you manage turnaround times when you're dealing with nonconforming products, regardless of point of origin of those products. You can link diagnostic results to correction tasks. The system can schedule tasks to correct problems and therefore help prevent recurrences of those problems in the future. Quality management also lets you track issues (including internal problems) by problem type, and lets you identify solutions as either short-term or long-term. Statistics about key performance indicators (KPIs) provide insight into nonconformance problems that have previously occurred and the solutions that were applied to correct them. You can use historical data to help review the effectiveness of quality measures that have previously been taken and to determine appropriate measures in the future.

Controlling the quality management process

Here are some of the ways that you can control the quality management process:

- Create quality orders that are based on trigger points such as "at product receipt" for inbound operations or "at product pick-up" for outbound operations.
- Document test results, and determine whether the results meet the established test criteria and acceptable quality levels.
- Use document management for detailed product specifications and user-specific notes as part of reporting during the inspection process.
- Maintain nonconforming products, and correlate these products with additional nonconformance information to track down the original cause of a problem.
- Document the cost of managing a nonconformance. This cost can include the items (such as spare parts), miscellaneous charges, and the timesheet hours that are required in order to correct the nonconformance.
- Schedule error correction processes by using correction handling that is linked to quality orders.



Product testing and quality orders

Product testing is typically referred to as quality control and uses quality orders. By using the quality control functionality, you can do the following:

- Define the tests that must be performed for material. These tests include the quality specifications, the applicable test instrument, documents that describe the test, a sampling plan, and the acceptable quality levels (AQL).
- Create a quality order that identifies the tests that must be performed for a specific order, such as a purchase or production order, or for a specific inventory quantity. You can create a quality order manually or generate a quality order automatically, based on quality guidelines.
- Define the quality guidelines that are related to purchase, quarantine, production, or sales orders in each business process, so that a quality order can be automatically generated that identifies the testing requirements for incoming or outgoing material.
- Record the test results in a quality order, validate the test results against the AQL, and print a certificate of analysis that displays the test results.

Nonconformance

A nonconformance describes an item that has a quality problem. The nonconformance process lets you create a nonconformance order that describes a quantity of nonconforming material, the problem source, the problem type, and explanatory notes. You can define a classification of problem types to make analysis of nonconforming material easier. You can also print a nonconformance tag and a nonconformance report to guide the disposition of nonconforming material. For example, the tag and report might indicate a condition of **Unusable** or **Restricted usage**.

The following table lists the six default nonconformance types and describes the information that must be recorded for each type.

NONCONFORMANCE TYPE	SOURCE INFORMATION
Customer	The customer account number, the sales order number, or a lot number of a sales order transaction. For example, the nonconformance might be related to a specific sales order shipment or to customer feedback about product quality.
Service request	The customer account number, the sales order number, or a lot number of a sales order transaction. For example, the nonconformance might be related to a specific sales order shipment or to a customer's complaint about item quality.
Vendor	The vendor account number, the purchase order number, or a lot number of a purchase order transaction. For example, the nonconformance might be related to a purchase order receipt or to a vendor's concern about a part that it supplies.
Production	The production order number or a lot number of a production order transaction. For example, the nonconformance might be related to a specific batch that was produced.
Internal	The quality order number or a lot number of a quality order transaction. For example, the nonconformance might be related to the tests that are performed as part of a quality order or to an employee's concern about product quality.
Co-product production	A co-product production order nonconformance that is related to batch production orders.

Nonconformances are associated with a problem type. Problem types are defined on the **Problem types** page, where you specify which problem types can be associated with each nonconformance type. For example, the problem types for nonconformances of the **Service request** type might reflect a classification of customer complaints, whereas the problem types for nonconformances of the **Internal** type might represent a classification of defect codes.

When you create a new nonconformance, you select the nonconformance type and the problem type. The initial approval status is **New**, which represents a request for action. The next step is to change the approval status to **Approved** or **Refused**, to indicate that you will or won't take action on the nonconformance. You can also close a nonconformance (by selecting a separate check box) to indicate that you're finished with it, or you can reopen a nonconformance to indicate that additional consideration is required.

You can enter comments for a nonconformance by attaching a document. It's a good idea to define a unique document type for nonconformances by using the **Document type** page. You can then use the **Report setup** page to define whether comments for this document type should be printed on the nonconformance report and nonconformance tag. The conformance report and nonconformance tag can help with material disposition. You can selectively generate reports and tags, based on selection criteria that are associated with a nonconformance. These criteria include the nonconformance number, item, customer, vendor, and status.

The nonconformance report displays the nonconformance number, item, and problem type. Depending on your report setup policy, the report might also display related notes about the nonconformance. The nonconformance tag displays similar information, and also includes the quarantine zone and type (such as **Restricted usage** or **Unusable**) that you assigned to the nonconformance to help guide disposition of the defective material.

Approved nonconformance

You can optionally define one or more related operations for an approved nonconformance. A related operation describes the work that should be performed, and contains a list of the quality operations that you've defined and descriptive text about the reason for the work. After you define an operation, you can optionally define the miscellaneous charges, items, and timesheet labor hours that are required in order to perform the work. The calculated costs are shown for the related operation, and the total calculated costs are shown for the nonconformance. The calculated costs and the underlying details (about items, labor hours, and miscellaneous charges) represent reference information, and they are used only in the quality management function.

You can optionally create a quality order from a nonconformance by first performing an inquiry for quality orders and then creating the new quality order. For example, a quality order might identify the need to test (or retest) the defective material. The newly created quality order displays the link to the originating nonconformance.

You can optionally link one nonconformance to another and create a new nonconformance from an existing one. For example, the link can reflect the interconnection between quality problems.

Correction handling

The **Corrections** page lets you create a list of nonconformances that must be corrected. Each correction item is associated with the diagnostic type that caused the problem to be discovered. The **Corrections** page also contains information about who must perform a corrective action, and when. You can describe the details of the problem and the corrective action that is required by attaching a document to the correction. After the nonconformance has been addressed or corrected, you "close" the correction item by selecting the **Completed** option. You can also indicate that the solution was a short-term solution.

It's a good idea to define a unique document type for corrections by using the **Document type** page. You can then use the **Report setup** page to define whether comments for this document type are printed on the correction report. A printed correction report displays information about the nonconformance and the related nonconformance notes. The report also includes correction information, such as the diagnostic type, and the related correction notes.

Additional resources

[Quality management overview](#)

[Nonconformance management](#)

[Inventory blocking](#)

[Quarantine orders](#)

[Set up quality orders](#)

[Inspect the quality of goods](#)

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Quality management for warehouse processes

2/18/2021 • 39 minutes to read • [Edit Online](#)

The *Quality management for warehouse processes* feature lets you integrate item sampling controls into the warehouse receiving process by using advanced warehouse management. Warehouse work can be automatically generated to move inventory to the quality control location, based on a percentage or a fixed quantity, or based on every n th license plate. After a quality order has been completed, work can be automatically generated to move inventory to the next location in the process, depending on the quality results.

The *Quality management for warehouse processes* feature extends the capabilities of the basic quality management feature. It provides the option to create quality orders for the inventory that is sent to the quality control location, although quality orders aren't always required. Therefore, it allows for a lightweight quality control process that is based on warehouse work.

Turn on the Quality management for warehouse processes feature

Before you can use this feature, it must be turned on in your system. Admins can use the [feature management](#) settings to check the status of the feature and turn it on. In the **Feature management** workspace, the feature is listed in the following way:

- **Module:** *Warehouse management*
- **Feature name:** *Quality management for warehouse processes*

Key benefits

The *Quality management for warehouse processes* feature automatically generates work as part of the receiving process, to move the inventory quantity that is required for quality control to a quality control location. If the quantity that is received exceeds the quantity that is required for quality control (according to the item sampling setup), the excess quantity is moved to an inbound location that is defined in the location directive setup. After the quality order is validated, work is automatically generated to move the quantity for the quality order to a new inbound or return location, based on the validation result and the location directive setup. The automatic generation of work that has only the quantity that must be moved to and from quality control provides an integrated process experience.

NOTE

When the *Quality management for warehouse processes* feature is turned on, you can still take advantage of the manual process. In the manual process, inventory movement and movement by template are used to have a warehouse worker trigger the creation of warehouse work to move inventory from a quality control location to a new location. You can also still set up an inbound location directive that moves inventory in its entirety from a receiving location to a quality control location without considering the item sampling setup.

Quality management and the Quality management for warehouse processes feature

When the *Quality management for warehouse processes* feature is turned on, it changes the setup of key warehouse management and quality management entities. The following illustration provides an overview of the entities that enable quality orders for warehouse processes. Text in parentheses indicates suggested actions when quality management was applied before the *Quality management for warehouse management processes*

feature was turned on.

Quality Association (New & Adjust)	
Item Sampling (New & Adjust)	
Enable for each Warehouse	
Mobile device menu item & Menu device menu (New & Adjust)	
Work Template (New & Adjust)	Location Directive (New & Adjust)
Work Classes (New)	

Enablers: The Quality item sampling and Quality order work order types

The *Quality management for warehouse processes* feature introduces two work order types that enable the work creation process:

- **Quality item sampling** – This work order type is used to create work that moves registered inventory to quality control.
- **Quality order** – This work order type is used to create work that moves inventory from quality control to a new location, based on the location directive setup.

Work classes, location directives, and work templates

The *Quality item sampling* and *Quality order* work order types are consumed by location directives, work classes, and work templates.

Before warehouse work can be automatically generated to move inventory to quality control, you must follow these steps to set up your system.

1. Create separate work classes for the *Quality item sampling* and *Quality order* work order types. In this way, you ensure that appropriate work can be automatically generated based on the two work order types, and that this work can then be run by using the warehouse app.
2. Set up a work template for each work order type:
 - Set up a work template that uses the *Quality item sampling* work order type to automatically move registered inventory to a quality control location.
 - Set up a work template that uses the *quality order* work order type to move inventory from a quality control location after quality control is completed.
3. For each work order type, set up location directives that apply the correct quality control locations that the inventory should be moved to. After quality control is completed, the location directive for the *Quality order* work order type ensures that a new destination location will be selected so that the inventory can be moved out of the quality control location.
4. Set up the relevant mobile device menu items to support the movement of received inventory to the quality control location, and the movement of inventory that passes or fails quality control from the quality control location to a new location.

For a step-by-step example that shows how to complete this setup, see the [example scenario](#) at the end of this topic.

Enable a warehouse for quality management

Before the *Quality management for warehouse processes* feature can be applied for a specific warehouse, you must follow these steps to make the feature available for that warehouse.

1. Go to **Warehouse management > Setup > Warehouse > Warehouses**.
2. Select the warehouse to enable for quality management.
3. On the **Warehouse** FastTab, set the **Enable quality order for warehouse processes** option to *Yes*. (Note that this option can be set to *Yes* only for warehouses that use warehouse management processes.)

When the **Enable quality order for warehouse processes** option is set to *Yes*, the quality association setup controls whether the *Quality management for warehouse processes* feature is actually applied for the selected warehouse. You can change the setting of the option to *No* at any time. In that case, the feature will no longer apply for the warehouse, regardless of the quality association setup.

Quality control

The *Quality management for warehouse processes* feature controls several key settings for quality associations and item sampling.

Quality associations

Each [quality association record](#) defines the set of tests, the acceptable quality level (AQL), and the sampling plan that apply to the quality orders that are generated. To set up a quality association record, follow these steps.

1. Go to **Inventory management > Setup > Quality control > Quality associations**.
2. Create or select the quality association entry for the item or group that you're working with, or for all items.
3. On the **Conditions** FastTab, set the **Applicable warehouse type** field to one of the following values:
 - **Quality management for warehouse processes only** – Activate the *Quality management for warehouse processes* feature. You can select this value only if the reference type is either *Purchase* or *Production*.
 - **All** – Inactivate the *Quality management for warehouse processes* feature. Select this value for all reference types except *Purchase* and *Production*.

NOTE

The *Quality management for warehouse processes* feature takes effect only if the item on the source document line uses advanced warehouse management processes, and if the **Enable quality order for warehouse processes** option is set to *Yes* for the warehouse on the source document line.

As each item is registered (or reported as finished), the system determines which quality associations apply to it.

When the *Quality management for warehouse processes* feature is turned on, the applicable warehouse type is logically inserted into the fourth search group of the quality association search hierarchy. The following table provides a logical representation of the search hierarchy.

SEARCH GROUP	DESCRIPTION
Group 1	For each quality association, check the Reference type , Event type , and Execution match values against the item. If there is a match against the source document line, move on to group 2.

SEARCH GROUP	DESCRIPTION
Group 2	For each quality association, check the Item code value (<i>Table</i> , <i>Group</i> , or <i>All</i>) against the item. <i>Table</i> is more specific than <i>Group</i> , and <i>Group</i> is more specific than <i>All</i> . If there is a match for <i>Table</i> (a specific item), move on to group 3. If there is no match for <i>Table</i> , search for a match for <i>Group</i> . If there is no match for <i>Group</i> , <i>All</i> applies. If there is a match, move on to group 3.
Group 3	For each quality association, check the Account code and Resource code values against the item. The logic that is applied resembles the logic that is applied for the Item code value.
Group 4	For each quality association, check the Applicable warehouse type value (<i>Quality management for warehouse processes only</i> or <i>All</i>) against the item. If the Enable quality order for warehouse processes option is set to <i>Yes</i> for the warehouse on the source document, and the item on the source document line is set to <i>Use warehouse management processes</i> , both associations where there is a match for <i>Quality management for warehouse processes only</i> and associations where there is a match for <i>All</i> will be applicable in parallel, if both exist. If the Enable quality order for warehouse processes option is set to <i>No</i> for the warehouse on the source document, and the item on the source document line is set to <i>Use warehouse management processes</i> , only quality management will be applicable.

For example, you've defined a warehouse where the **Enable quality order for warehouse processes** option is set to *Yes*, and you have two quality associations that are defined for the *Purchase* reference type: one for all items and one for the *Registration* event type. The only difference between the two quality associations is the **Applicable warehouse type** value: it's set to *All* for one quality association and *Quality management for warehouse processes only* for the other. In this case, both quality associations are equally specific, and both will be applicable.

The value of the **Test group** field for the quality associations is also a factor. This field defines the test procedure that must be applied. If the **Test group** value is the same for both associations, only one quality order will be created, for the quality association where the **Applicable warehouse type** value is *Quality management for warehouse processes only*. If the **Test group** value isn't the same for both associations, two quality orders will be created. The first quality order will be created for the quality association where the **Applicable warehouse type** value is *Quality management for warehouse processes only*. The second quality order will be created for the quality association where the **Applicable warehouse type** value is *All*.

NOTE

The *Quality management for warehouse processes only* value is considered more specific than *All* when the criteria for the quality associations for groups 1 and 2 are the same, and when the test group is the same. Two quality orders will be created only when the test groups differ.

Reference types

When the **Reference type** value is *Purchase*, and the **Applicable warehouse type** value is *Quality management for warehouse processes only*, the **Event type** field on the **Process** FastTab must be set to *Registration*. *Registration* is the only supported event type for the *Purchase* reference type when you are using the *Quality management for warehouse processes* feature.

Quality processing policy

The *Quality management for warehouse processes* feature enables work to be created based only on item sampling. Therefore, it allows for a lightweight process. The inventory that work is created depends on the item sampling that is associated with the quality association. When the lightweight process is used, after a worker puts the quantity in the quality control location, the quality department can manually create a quality order, if a quality order is required.

The **Quality processing policy** field on the **Quality order process** FastTab controls whether a quality order is also created when work is created to move an item to the quality control location. This field can be set to *Create quality order* or *Create work only*. The default value is *Create quality order*.

NOTE

Regardless of whether you create quality orders manually or automatically, the system automatically generates work to move items out of the quality control location when the quality order is marked as validated.

The creation of quality order work is unrelated to the quality association setup. If a work template exists that has a **Work order type** value of *Quality order*, and if the query criteria are met for that work template, validation of a quality order will trigger the creation of quality order work.

Referenced item sampling

Each quality association must reference an item sampling. An item sampling defines the quantity that will be sent for quality control. It can be set up so that it applies only to quality associations where the **Applicable warehouse type** value is *Quality management for warehouse processes only*. If the **Sampling scope** value for an item sampling is *Load* or *Shipment*, or the **Quantity specification** value is *Full license plate*, the item sampling can be referenced only by quality associations where the **Applicable warehouse type** value is *Quality management for warehouse processes only*.

If you define an item sampling that uses the *Quality management for warehouse processes only* applicable warehouse type, you will receive an error if you try to reference it from a quality association that doesn't use the *Quality management for warehouse processes* feature.

NOTE

Item sampling that uses full blocking isn't supported for quality associations where the **Applicable warehouse type** field is set to *Quality management for warehouse processes only*.

Item sampling

Item sampling controls how often items are sent for quality control. The *Quality management for warehouse processes* feature introduces the concept of *item sampling scope*. The system uses the item sampling scope when it evaluates whether and how quality orders and/or quality item sampling work and quality order work should be created.

To set up item sampling, go to **Inventory management > Setup > Quality control > Item sampling**, and set the **Sampling scope** field to one of the following values:

- **Order** – The source document line will be the basis for evaluating whether and how quality orders and/or quality item sampling work and quality order work are created. This value is the default value, and when it's selected, the system works the same way that it works when the *Quality management for warehouse processes* feature isn't turned on.
- **Load** – Loads will be used as the basis for evaluating whether and how a quality order and/or work is created. This value is available only when the *Quality management for warehouse processes* feature is turned on.
- **Shipment** – Shipments will be used as the basis for evaluating whether and how a quality order and/or

work is created. This value is available only when the *Quality management for warehouse processes* feature is turned on.

NOTE

When the **Sampling scope** field is set to *Load or Shipment*, the load entity and shipment entities will be used, if they are available. If they aren't available, the order entity will be used.

The *Quality management for warehouse processes* feature also introduces the *Full license plate* value for the **Quantity specification** field. This value supports the creation of quality order work and quality item sampling work, based on license plates. When you select this value, the following changes occur:

- The **Break count by item** option and the **Per nth license plate** field on the **Process** FastTab become available.
- The **Value** field on the **Sampling quantity** FastTab becomes unavailable.
- The **Per updated quantity**, **Location**, and **License plate** options are all set to *Yes*, and the settings can't be changed.

The **Break count by item** option controls whether the license plate count is evaluated per item or across all items in the sampling scope. Product variants are treated as the same item. This option also controls whether the license plate count is reset for each item.

The value of the **Per nth license plate** field controls how often quality orders are created in relation to the number of items that are registered. For example, a value of *3* will send every third item to quality control, starting with the first item. The value must be more than 0 (zero).

While workers receive items by using the warehouse app, the system validates whether a quality association is set up for each incoming item. If a quality association is set up, the system uses the item sampling record that is configured for that quality association to determine how it will create quality orders, quality item sampling work, and purchase order work.

NOTE

When receipt registration is done in the web client (by using the small registration page or the item arrival journal for purchase order lines), no quality item sampling work or purchase order work will be created, regardless of the setup. Instead, for items that match a quality association, the referenced item sampling will be used to control the creation of quality orders only.

Examples of automatic generation of quality orders

The following examples show how the setup of a quality association and an associated item sampling affects the generation of quality orders when the **Applicable warehouse type** field is set to *Quality management for warehouse processes only*.

When the **Quantity specification** value is *Full license plate*, the **Per nth license plate** field controls which license plates quality item sampling work is created for. The first license plate always goes to quality control, and then the value of this field specifies that every *n*th license plate after that license plate should also go.

The **Reference type** value for the following examples is *Purchase*, and the **Event type** value is *Registration*.

SAMPLING SCOPE	QUANTITY SPECIFICATION	PER UPDATED QUANTITY	PER STORAGE DIMENSION	BREAK COUNT BY ITEM	PER NTH LICENSE PLATE	RESULT
Order	Full license plate	Yes <i>(locked/not</i>	Location:	No	3	Order

SAMPLING SCOPE	QUANTITY SPECIFICATION	PERCENTAGE (locked/not editable) PER UPDATED QUANTITY	PER STORAGE DIMENSION Plate: Yes (locked/not editable)	BREAK COUNT BY ITEM	PER NTH LICENSE PLATE	line quantity RESULT
						<p>1. Register receipt in the warehouse app for 20 EA, LP1 Quality item sampling work for 20 EA Quality order 1 for 20 EA</p> <p>2. Register receipt in the warehouse app for 20 EA, LP2 Purchase order work for 20 EA (p</p>

SAMPLING SCOPE	QUANTITY SPECIFICATION	PER UPDATED QUANTITY	PER STORAGE DIMENSION	BREAK COUNT BY ITEM	PER NTH LICENSE PLATE	ut - RESULT away) 3. Register receipt in the warehouse app for 20 EA, LP3 Purchase order r work for 20 EA (put - away) 4. Register receipt in the warehouse app for 20 EA, LP4 Quality item sampling work for 20 EA 5. Register receipt

SAMPLING SCOPE	QUANTITY SPECIFICATION	PER UPDATED QUANTITY	PER STORAGE DIMENSION	BREAK COUNT BY ITEM	PER NTH LICENSE PLATE	in the warehouse app for 20 EA, LP5 Purchase order work for 20 EA (put-away)
Order	Fixed quantity = 1	Yes	Location: Yes License Plate: Yes	No	Not applicable	<p>Order line quantity : 100</p> <p>1. Register receipt in the warehouse app for 20 EA, LP1 Quality item sampling work for 1 EA Quality or</p>

SAMPLING SCOPE	QUANTITY SPECIFICATION	PER UPDATED QUANTITY	PER STORAGE DIMENSION	BREAK COUNT BY ITEM	PER NTH LICENSE PLATE	de r 1 RESPT 1 EA Pu rc ha se or de r w or k for 19 EA (p ut - aw ay) 2. Regist er receipt in the wareh ouse app for 20 EA, LP2 Q ua lit y Ite m sa m pli ng w or k for 1 EA Q ua lit y or de r 1 for 1 EA Pu rc

SAMPLING SCOPE	QUANTITY SPECIFICATION	PER UPDATED QUANTITY	PER STORAGE DIMENSION	BREAK COUNT BY ITEM	PER NTH LICENSE PLATE	RESULT
						<p>has se de r w or k for 19 (p ut - aw ay)</p> <p>3. Register receipt in the warehouse app for 20 EA, LP3 Quality item sampling work for 1 EA</p> <p>Quality order for 1 EA Purchase order work for</p>

SAMPLING SCOPE	QUANTITY SPECIFICATION	PER UPDATED QUANTITY	PER STORAGE DIMENSION	BREAK COUNT BY ITEM	PER NTH LICENSE PLATE	RESULT
						<p>19 EA - aw ay)</p> <p>4. Register receipt in the warehouse app for 20 EA, LP4 Quality item sampling work for 1 EA Quality order for 1 EA Purchase order work for 19 EA (put - aw ay)</p>

SAMPLING SCOPE	QUANTITY SPECIFICATION	PER UPDATED QUANTITY	PER STORAGE DIMENSION	BREAK COUNT BY ITEM	PER NTH LICENSE PLATE	5. Register receipt in the warehouse app for 20 EA, LP5 Quality item sampling work for 1 EA Quality order 1 for 1 EA Purchase order work for 19 EA (put-away)
Order	Percent = 10	No	Location: No License Plate: No	No	Not applicable	Order line quantity : 100 EA 1. Register

SAMPLING SCOPE	QUANTITY SPECIFICATION	PER UPDATED QUANTITY	PER STORAGE DIMENSION	BREAK COUNT BY ITEM	PER NTH LICENSE PLATE	er receipt in the warehouse app for 50 EA, LP1 Quality item sampling work for 10 EA Quality order 1 for 10 EA Purchase order work for 40 EA (put - away) 2. Register receipt in the warehouse app for 50 EA,

SAMPLING SCOPE	QUANTITY SPECIFICATION	PER UPDATED QUANTITY	PER STORAGE DIMENSION	BREAK COUNT BY ITEM	PER NTH LICENSE PLATE	LP2 Pu RESULT has se or de r w or k for 50 EA (p ut - aw ay)
Load	Percent = 5	Yes <i>(locked/not editable)</i>	Location: No License Plate: No	No	Not applicable	<p>Order line quantity : 500 EA</p> <p>Two loads: first load 200 EA, second load 300 EA</p> <p>1. Register receipt in the warehouse app for first load for 100 EA Quality item sampling work for 5 EA</p>

SAMPLING SCOPE	QUANTITY SPECIFICATION	PER UPDATED QUANTITY	PER STORAGE DIMENSION	BREAK COUNT BY ITEM	PER NTH LICENSE PLATE	Q u a l i t y R E S U L T
						<p>o r d e r 1 f o r 5 E A</p> <p>P u r c h a s e o r d e r w o r k f o r 95 E A (p u t - a w a y)</p> <p>2. R e g i s t e r r e c e i p t i n t h e w a r e h o u s e a p p f o r f i r s t l o a d f o r 100 E A</p> <p>Q u a l i t y i t e m s a m p l i n g w o r k f o r 5 E A</p> <p>Q u a l i t y o r</p>

SAMPLING SCOPE	QUANTITY SPECIFICATION	PER UPDATED QUANTITY	PER STORAGE DIMENSION	BREAK COUNT BY ITEM	PER NTH LICENSE PLATE	de r 1 for 5 EA Pu rc ha se or de r w or k for 95 EA (p ut - aw ay) 3. Regist er receipt in the wareh ouse app for secon d load for 300 EA Q ua lit y ite m sa m pli ng w or k for 15 EA Q ua lit y or de r 1 for 15 EA

SAMPLING SCOPE	QUANTITY SPECIFICATION	PER UPDATED QUANTITY	PER STORAGE DIMENSION	BREAK COUNT BY ITEM	PER NTH LICENSE PLATE	Purchase order work for 285 EA (put-away)
Order	Percent = 10	No	Location: Yes License Plate: Yes	No	Not applicable	<p>Order line quantity : 100</p> <p>1. Register receipt in the warehouse app for 50 EA, LP1 Quality item sampling work for 5 EA Quality order for 5 EA</p>

SAMPLING SCOPE	QUANTITY SPECIFICATION	PER UPDATED QUANTITY	PER STORAGE DIMENSION	BREAK COUNT BY ITEM	PER NTH LICENSE PLATE	Purchase Order Number
						<p>se or de r w or k for 45 EA (p ut - aw ay)</p> <p>2. Register receipt in the warehouse app for 50 EA, LP2 Quality item sampling work for 5 EA</p> <p>Quality order 1 for 5 EA</p> <p>Purchase order</p>

SAMPLING SCOPE	QUANTITY SPECIFICATION	PER UPDATED QUANTITY	PER STORAGE DIMENSION	BREAK COUNT BY ITEM	PER NTH LICENSE PLATE	w or RESULT for
						45 (put-away)
Load	Full license plate	Yes <i>(locked/not editable)</i>	Location: Yes License Plate: Yes <i>(locked/not editable)</i>	No	3	<p>Two items:</p> <ul style="list-style-type: none"> • Order line quantity for item A: 120 EA (4 pallets) • Order line quantity for item B: 90 EA (3 pallets) <p>One load, two load lines with each order line</p> <p>1. Register receipt in the warehouse app for item A, 30 EA, LP1 Quality item</p>

SAMPLING SCOPE	QUANTITY SPECIFICATION	PER UPDATED QUANTITY	PER STORAGE DIMENSION	BREAK COUNT BY ITEM	PER NTH LICENSE PLATE	RESULT
						<p>sa m pling work for 30 EA</p> <p>Q ua lit y or de r 1 for 30 EA</p> <p>2. Regist er receipt in the wareh ouse app for item A, 30 EA, LP2 Pu rc ha se or de r w or k for 30 EA (p ut - aw ay)</p> <p>3. Regist er receipt in the wareh ouse app for item A, 30 EA, LP3</p>

SAMPLING SCOPE	QUANTITY SPECIFICATION	PER UPDATED QUANTITY	PER STORAGE DIMENSION	BREAK COUNT BY ITEM	PER NTH LICENSE PLATE	Purchase order work for 30 EA (put away) RESULT
						<p>4. Register receipt in the warehouse app for item A, 30 EA, LP4 Quality item sampling work for 30 EA Quality order 1 for 30 EA</p> <p>5. Register receipt in the warehouse</p>

SAMPLING SCOPE	QUANTITY SPECIFICATION	PER UPDATED QUANTITY	PER STORAGE DIMENSION	BREAK COUNT BY ITEM	PER NTH LICENSE PLATE	app for item B, 30 EA, LP5 PURCHASE ORDER WORK FOR 30 EA (put away) 6. Register receipt in the warehouse app for item B, 30 EA, LP6 PURCHASE ORDER WORK FOR 30 EA (put away) 7. Register receipt in the warehouse app for item

SAMPLING SCOPE	QUANTITY SPECIFICATION	PER UPDATED QUANTITY	PER STORAGE DIMENSION	BREAK COUNT BY ITEM	PER NTH LICENSE PLATE	RESULT A, 30 EA, 120 EA, 90 EA Quality item sampling work for 30 EA Quality order 1 for 30 EA
Load	Full license plate	Yes <i>(locked/not editable)</i>	Location: Yes License Plate: Yes <i>(locked/not editable)</i>	Yes	3	<p>Two items:</p> <ul style="list-style-type: none"> • Order line quantity for item A: 120 EA (4 pallets) • Order line quantity for item B: 90 EA (3 pallets) <p>One load, two load lines with each order line</p>

SAMPLING SCOPE	QUANTITY SPECIFICATION	PER UPDATED QUANTITY	PER STORAGE DIMENSION	BREAK COUNT BY ITEM	PER NTH LICENSE PLATE	<p>1. Register receipt in the warehouse app for item A, 30 EA, LP1 Quality item sampling work for 30 EA Quality order 1 for 30 EA</p> <p>2. Register receipt in the warehouse app for item A, 30 EA, LP2 Purchase order work for 30 EA</p>

SAMPLING SCOPE	QUANTITY SPECIFICATION	PER UPDATED QUANTITY	PER STORAGE DIMENSION	BREAK COUNT BY ITEM	PER NTH LICENSE PLATE	(p ut RESULT aw ay)
						<p>3. Register receipt in the warehouse app for item A, 30 EA, LP3 Purchase order drawn or k for 30 EA (p ut - aw ay)</p> <p>4. Register receipt in the warehouse app for item A, 30 EA, LP4 Quality item sampling work for</p>

SAMPLING SCOPE	QUANTITY SPECIFICATION	PER UPDATED QUANTITY	PER STORAGE DIMENSION	BREAK COUNT BY ITEM	PER NTH LICENSE PLATE	30 EA RESULT Q
						ua lit y or de r 1 for 30 EA 5. Regist er receipt in the wareh ouse app for item B, 30 EA, LP5 Q ua lit y ite m sa m pli ng w or k for 30 EA Q ua lit y or de r 1 for 30 EA 6. Regist er receipt in the wareh ouse app for item B, 30 EA, LP6 Pu rc

SAMPLING SCOPE	QUANTITY SPECIFICATION	PER UPDATED QUANTITY	PER STORAGE DIMENSION	BREAK COUNT BY ITEM	PER NTH LICENSE PLATE	RESULT
						<p>purchase order work for 30 EA (put away)</p> <p>7. Register receipt in the warehouse app for item A, 30 EA, LP7 Purchase order work for 30 EA (put away)</p>
Load	Percent = 10	Yes <i>(locked/not editable)</i>	Location: No License Plate: No	No	Not applicable	<p>Order line quantity : 100 EA</p> <p>No loads are created. Order scope is applied.</p> <p>1. Register receipt in the</p>

SAMPLING SCOPE	QUANTITY SPECIFICATION	PER UPDATED QUANTITY	PER STORAGE DIMENSION	BREAK COUNT BY ITEM	PER NTH LICENSE PLATE	warehouse app for 50 EA, LP1 Quality item sampling work for 5 EA Quality order 1 for 5 EA Purchase order work for 45 EA (put-away) 2. Register receipt in the warehouse app for 50 EA, LP2 Quality

SAMPLING SCOPE	QUANTITY SPECIFICATION	PER UPDATED QUANTITY	PER STORAGE DIMENSION	BREAK COUNT BY ITEM	PER NTH LICENSE PLATE	RESULT
						lit y ite m sa m pli ng wo rk for 5 EA Q ua lit y or de r 1 for 5 EA Pu rc ha se or de r wo rk for 45 EA (p ut - aw ay)

When a worker validates one of the quality orders that are shown in the previous table, the system automatically generates quality order work to move inventory from the quality control location to the location that is defined in the location directive for the *Quality order* work order type. You can set up any location for this purpose, such as a return or storage location, depending on the test result for the quality order. For an example of this setup, see the [example scenario](#) at the end of this topic.

You can reopen a quality order that has already been validated, provided that the quality order work that is related to moving the inventory from the quality control location doesn't have a **Work status** value of *Closed* or *In progress*.

Process insights when multiple quality associations coexist

More than one quality associations can be defined for and applied to the same source document line, and the **Applicable warehouse type** field can be set to *Quality management for warehouse processes only* for some of those quality associations and *All* for others.

In the following example, the **Reference type** value is *Purchase*.

1. The first quality association is set up in the following way:

- **Applicable warehouse type:** *Quality management for warehouse processes only*
- **Item code:** *A0001*
- **Account code:** *All*
- **Test group:** *Enclosure*
- **Item sampling:** *5 pcs*

2. The second quality association is set up in the following way:

- **Applicable warehouse type:** *All*
- **Item code:** *All*
- **Account code:** *All*
- **Test group:** *Enclosure*
- **Item sampling:** *1 pcs*

3. The third quality association is set up in the following way:

- **Applicable warehouse type:** *Quality management for warehouse processes only*
- **Item code:** *All*
- **Account code:** *104*
- **Test group:** *Impedance*
- **Item sampling:** *Every second license plate* (This setting means that the first, third, fifth, and so on, license plates that are received will create a quality order.)

4. The fourth quality association is set up in the following way:

- **Applicable warehouse type:** *All*
- **Item code:** *All*
- **Account code:** *All*
- **Test group:** *Impedance*
- **Item sampling:** *5 pcs*

5. The fifth quality association is set up in the following way:

- **Applicable warehouse type:** *All*
- **Item code:** *All*
- **Account code:** *All*
- **Test group:** *Cone*
- **Item sampling:** *10%*

A purchase order for a quantity of 10 of item A0001 is now created for vendor 104. Then a purchase order line that has a quantity of 10 is registered as received on one license plate by using the warehouse app. Here is the result:

- There is one quality order from the first quality association for the *Enclosure* test group. The quantity is 5. There is no quality order from the second quality association, because the criteria for the first quality association are more specific relative to the *Enclosure* test group.
- There is one quality order for the third quality association for the *Impedance* test group. The quantity is 10. There is no quality order from the fourth quality association, because the criteria for the first quality association are more specific relative to the *Impedance* test group.
- There is one quality order for the fifth quality association for the *Cone* test group. The quantity is 1.

In connection with the creation of one quality order for each of the three quality associations, quality item

sampling work is also created. The registered quantity is only 10. However, because of the item sampling setup, the sum of the quality order quantities that are created for the *Quality management for warehouse processes* *only* applicable warehouse type is 16, which exceeds the physical registered quantity of 10. Therefore, work won't be created for the full quality order quantities (16), because only 10 are physically available for movement to the quality control location. The priority that is used to create quality item sampling work follows the order of quality order creation:

- **First quality order (quantity = 5):** Quality item sampling work is created for 5. A quantity of 5 (10 – 5) now remains for subsequent creation of quality item sampling work.
- **Second quality order (quantity = 10):** Quality item sampling work is created for 5. A quantity of 0 (zero) now remains for subsequent creation of quality item sampling work.
- **Third quality order (quantity = 1):** No quality item sampling work is created.

As part of the process of creating the quality orders, an inventory blocking of a quantity of 10 is created. This inventory blocking is referenced against each of the three quality orders. The sum of the quality order quantities is 16.

When the quality orders are validated, the system tries to create quality order work for each quality order that is validated. Because the sum of the quality order quantities exceeds the quantity that is actually blocked and therefore available for work creation, quality order work can't be created for the full quality order quantities, as shown here. (This example continues the previous example.)

1. Validate the second quality order that is created (quantity = 10). Quality order work is created for a quantity of 4.

The creation of quality order work is triggered by a change in the inventory blocking quantity. Because the sum of quality order quantities was 16, validation of a quantity of 10 will cause the remaining quality order quantities to be validated as equal to 6. The inventory blocking quantity is reduced from 10 to 6. The reduced quantity of 4 is allotted to quality order work creation.

2. Validate the first quality order that is created (quantity = 5). Quality order work is created for a quantity of 5.

The creation of quality order work is triggered by a change in the inventory blocking quantity. Because the sum of quality order quantities was 6, validation of a quantity of 5 will cause the remaining quality order quantities to be validated as equal to 1. The inventory blocking quantity is reduced from 6 to 1. The reduced quantity of 5 is allotted to quality order work creation.

3. Validate the third quality order that is created (quantity = 1). Quality order work is created for a quantity of 1.

The creation of quality order work is triggered by a change in the inventory blocking quantity. Because the sum of quality order quantities was 1, validation of a quantity of 1 will cause the remaining quality order quantities to be validated as equal to 0 (zero). The inventory blocking is removed (that is, the inventory blocking quantity is reduced from 1 to 0). The reduced quantity of 1 is allotted to quality order work creation.

NOTE

The creation of quality order work depends on the inventory blocking quantity that is referenced against one or more quality orders. If the sum of the quality order quantities exceeds the referenced inventory blocking quantity, the order that the quality orders are validated in determines the creation of quality order work.

Canceling quality item sampling work

You can cancel the work that is created for quality item sampling. To control what occurs when this work is canceled, follow these steps.

1. Go to **Warehouse management > Setup > Warehouse management parameters**.
2. On the **General** tab, on the **Work** FastTab, set the **Unregister receipt when cancelling work** option to one of the following values:
 - **Yes** – When quality item sampling work is canceled, the associated quality order is deleted, and the inventory is unregistered.
 - **No** – When quality item sampling work is canceled, the associated quality order isn't deleted, and the inventory isn't unregistered.

Cross-docking

You can have a quality association setup that creates item sampling work. However, when cross-docking exists in parallel with a quality association that creates quality item sampling work, if there is only enough quantity to satisfy cross-docking, only item sampling work is created. In cases where the **Enable quality order for warehouse processes** option set to *Yes* for the receiving warehouse, and the **Applicable warehouse type** field is set to *Quality management for warehouse processes only* for a quality association, the creation of quality item sampling work takes precedence over the creation of cross-docking work. If the quantity exceeds the requirement for cross-docking, the system still creates only item sampling work.

Destructive testing

You can define a test group that performs destructive testing. In the case of a destructive test, the assumption is that, regardless of the test result, the quantity of the item that is tested will be destroyed as part of the test. The way that the *Quality Management for warehouse processes* feature supports destructive testing resembles the way that quality management supports it when the feature isn't turned on. Before the quality order can be validated, the quality controller must specify the pick location for the quantity that has been destroyed. You can register picking from the quality order page by selecting **Inventory > Pick** on the Action Pane. After the pick for the quality order quantity is registered, validation can be completed.

Example scenario

Prepare the scenario

To work through this scenario, you must prepare your system in the following way:

- Make sure that demo data is installed on the system, and select the **USMF** legal entity.
- Turn on the *Quality management for warehouse processes* feature in [feature management](#).
- Configure warehouse 51 to use the *Quality management for warehouse processes* feature by following these steps:
 1. Go to **Warehouse management > Setup > Warehouse > Warehouses**.
 2. Select warehouse 51.
 3. On the **Warehouse** FastTab, set the **Enable quality order for warehouse processes** option to *Yes*.

Quality-in setup – Move to the quality control location

You must now prepare a basic setup that will enable your system to support the *Quality Management for warehouse processes* feature for warehouse 51. (The demo data defines a quality management location that is named *QMS*. That location is referenced several times in this scenario.) You will prepare the following elements, as described in the subsections of this section:

- Work class

- Work template
- Location directive
- Item sampling
- Quality association
- Mobile device menu items

Work class for quality-in

1. Go to **Warehouse management > Setup > Work > Work classes**.
2. Create a work class, and set the following values:
 - **Work class ID:** *QualityIn*
 - **Description:** *Quality item sampling*
 - **Work order type:** *Quality item sampling*

Work template

1. Go to **Warehouse management > Setup > Work > Work templates**.
2. Set the **Work order type** field to *Quality item sampling*.
3. Create a work template, and set the following values:
 - **Work template:** *51 Quality*
 - **Work template description:** *51 Quality*
4. Add a line to the work template, and set the following values:
 - **Work type:** *Pick*
 - **Work class ID:** *QualityIn*
5. Add a second line to the work template, and set the following values:
 - **Work type:** *Put*
 - **Work class ID:** *QualityIn*

Location directive

1. Go to **Warehouse management > Setup > Location directives**.
2. Set the **Work order type** field to *Quality item sampling*.
3. Create a location directive, and set the following values:
 - **Name:** *51 to quality*
 - **Work type:** *Put*
 - **Site:** 5
 - **Warehouse:** *51*
4. Add a line for the location directive, and set the following values:
 - **From quantity:** *1*
 - **To quantity:** *1000000*
5. Create a location directive action, and set the following value:
 - **Name:** *Quality*
6. For the new location directive action, select **Edit query**, and specify a **Range** record that has the following values:
 - **Table:** *Locations*
 - **Field:** *Location profile ID*

- **Criteria:** *QMS*

7. Select **OK** to save the query, and save the new location directive.

Next, you must change the sequence of the existing purchase order location directives for warehouse 51. The demo data includes two location directives that have a **Work order type** value of *Purchase*: one is named *51 QMS*, and the other is named *51 PO Direct*. To ensure that the *Quality management for warehouse processes* feature is applied for warehouse 51, you must make sure that the *51 QMS* location directive isn't applied. However, instead of deleting that location directive (because you might want to use it in the future), you can just change the sequence.

1. Go to **Warehouse management > Setup > Location directives**.
2. Set the **Work order type** field to *Purchase order*.
3. In the sequence list, select sequence number 5, for the *51 PO Direct* location directive.
4. Move the selected sequence up to sequence number 4.
5. Verify that sequence number of the *51 QMS* location directive is now at least 5.

Item sampling

The *Quality management for warehouse processes* feature adds some new item sampling capabilities. The **Sampling scope** value can now be *Order*, *Shipment*, or *Load*, and the **Sampling quantity** value can now be *Full license plate*.

1. Go to **Inventory management > Setup > Quality control > Item sampling**.
2. Create an item sampling record, and set the following values:
 - **Item sampling:** *3rd LP*
 - **Description:** *Every third license plate*
 - **Sampling Scope:** *Order*
3. On the **Sampling quantity** FastTab, set the **Quantity specification** field to *Full license plate*.
4. On the **Process** FastTab, set the **Per nth license plate** field to *3*.
5. In the **Per storage dimension** section, enable both **Warehouse** and **Inventory status**.

Quality associations

Create a quality association that will use the new item sampling.

1. Go to **Inventory management > Setup > Quality control > Quality associations**.
2. Create a quality association record, and set the following values:
 - **Reference type:** *Purchase*
 - **Item code:** *Table*
 - **Item:** *M9201*
 - **Site:** *5*
3. On the **Process** FastTab, set the **Event type** field to *Registration*.
4. On the **Conditions** FastTab, set the **Applicable warehouse type** field to *Quality management for warehouse processes only*.
5. On the **Quality order process** FastTab, set the **Quality processing policy** field to *Create quality order*.
6. On the **Specifications** FastTab, right-click in the **Test Group** field, and then select **View details** to open the **Test groups** page.
7. On the **Test groups** page, on the **Overview** tab of the upper grid, create a test group, and set the following values:

- **Test Group:** *QMS*
 - **Description:** *QMS test*
 - **Acceptable quantity:** *100*
 - **Item Sampling:** *3rd LP (Select)*
8. On the **Overview** tab of the lower grid, add a record for one test, and set the following values:
 - **Sequence:** *1*
 - **Test:** *Enclosure measuring*
 9. On the **Test** tab of the lower grid, set the following values:
 - **Test variables:** *Pass/Fail*
 - **Default outcome:** *Pass*
 10. Save the new test group, and close the **Test groups** page.
 11. Back on the **Quality associations** page, in the **Test group** field, select **QMS**.
 12. Save the record.

Mobile device menu items for quality-in

To complete the setup to move goods to the quality control location, you must make the quality item sampling work available from a mobile device menu item.

1. Go to **Warehouse management > Setup > Mobile device > Mobile device menu items**.
2. Select the **Purchase Put-away** mobile device menu item.
3. On the **Work classes** FastTab, add the *QualityIn* work class ID.

Summary: Your setup to move goods to quality control

You've now defined a quality association that uses the *Quality management for warehouse processes* feature to trigger the creation of a quality order. You've set up the work and location data for warehouse 51 to ensure that specific work is created when purchase registration is done for item M9201. This setup ensures that every third license plate that is registered will be moved to a quality location (*QMS*), and that a quality order will be created for the license plate quantity. Everything else will be moved to put-away instead of the quality control location.

Process quality management work

1. Go to **Procurement and sourcing > Purchase orders > All purchase orders**.
2. Create a purchase order, and set the following values:
 - **Specify Vendor account:** *104*
 - **Warehouse:** *51*
3. Add a purchase order line, and set the following values:
 - **Item:** *M9201*
 - **Quantity:** *20*
 - **UoM:** *ea*
 - **Warehouse:** *51*
4. Write down the purchase order number, so that you can use it later.
5. Go to a mobile device or emulator that is running the warehouse app, and sign in to warehouse 51 by using *51* as the user ID and *1* as the password.
6. Go to **Inbound > Purchase Receive**, and enter the following values:
 - **PONum:** The number of the purchase order that you just created
 - **Qty:** *5*
 - **Unit:** *ea*

7. Continue to receive against the line, *5 ea* at a time, until the line is fully received. (A total of four license plates will be created.)
8. Sign out of the warehouse app.
9. Back in the web client, go to **Procurement and sourcing > Purchase orders > All purchase orders**.
10. Find and open your purchase order.
11. In the **Purchase order lines** section, select the line for item number *M9201*, and then select **Purchase order lines > Work details**.
12. Notice that the second and third work headers that were created are regular put-away work, whereas the first and the fourth work headers are quality item sampling work. This result is consistent with the item sampling setup, which is configured to sample every third license plate.

Move to the quality control location

You will now move the license plates to their designated locations. The first and fourth license plates will go to the quality control location, whereas the second and third license plates will go directly to storage.

1. Go to a mobile device or emulator that is running the warehouse app, and sign in to warehouse 51 by using *51* as the user ID and *1* as the password.
2. Go to **Inbound > Purchase put away**, and put away each license plate from the previous procedure until you've closed all the work.

Summary: Process quality management work

You've now run the quality item sampling work for the first and fourth license plates by moving them to the quality control location. You've also put away the second and third license plates. The next step is to do the quality order testing and control.

Quality-out setup: Move from the quality control location to storage or return

When workers report quality order results, the system automatically generates work.

You will now continue with the required base setup of the work class, work template, and location directive to enable quality management for warehouse processes, so that the required work can be created to move the quality order quantity from the quality control location to a designated warehouse location.

Work class for quality-out

1. Go to **Warehouse management > Setup > Work > Work classes**.
2. Create a work class, and set the following values:
 - **Work class ID:** *QualityOut*
 - **Description:** *Quality Out*
 - **Work order type:** *Quality Order*

Work templates

1. Go to **Warehouse management > Setup > Work > Work templates**.
2. Change the **Work order type** value to *Quality order*.
3. Create a work template, and set the following values:
 - **Work template:** *51 quality out*
 - **Work template description:** *51 quality out*
4. Add a line, and set the following values:
 - **Work type:** *Pick*

- **Work class ID:** *QualityOut*

5. Add a second line, and set the following values:

- **Work type:** *Put*
- **Work class ID:** *QualityOut*

Location directives

1. Go to **Warehouse management > Setup > Location directives**.

2. Change the **Work order type** value to *Quality order*.

3. Create a location directive, and set the following values:

- **Name:** *51 Pass*
- **Work type:** *Put*
- **Site:** *5*
- **Warehouse:** *51*

4. On the Action Pane, select **Edit query** to open the query editor dialog box.

5. On the **Range** tab, set the following values:

- **Table:** *Quality orders*
- **Field:** *Status*
- **Criteria:** *Pass*

6. Select **OK** to save the query and close the dialog box.

7. On the **Lines** FastTab, add a line, and set the following values:

- **From quantity:** *1*
- **To quantity:** *1000000*

8. On the **Location directive actions** FastTab, add a row, and set the following value:

- **Name:** *Pass*

9. On the **Location directive actions** FastTab, select **Edit query** to open the query editor dialog box.

10. On the **Range** tab, set the following values:

- **Table:** *Locations*
- **Field:** *Zone ID*
- **Criteria:** *Bulk*

11. Select **OK** to save the query and close the dialog box.

12. On the Action Pane, select **Save** to save the new location directive.

13. Create a second location directive, and set the following values:

- **Name:** *51 Fail*
- **Work type:** *Put*
- **Site:** *5*
- **Warehouse:** *51*

14. On the Action Pane, select **Edit query** to open the query editor dialog box.

15. On the **Range** tab, set the following values:

- **Table:** *Quality orders*
- **Field:** *Status*
- **Criteria:** *Fail*

16. Select **OK** to save the query and close the dialog box.
17. On the **Lines** FastTab, add a line, and set the following values:
 - **From quantity:** 1
 - **To quantity:** 1000000
18. On the **Location directive actions** FastTab, add a row, and set the following value:
 - **Name:** *Fail*
19. On the **Location directive actions** FastTab, select **Edit query** to open the query editor dialog box.
20. On the **Range** tab, set the following values:
 - **Table:** *Locations*
 - **Field:** *Zone ID*
 - **Criteria:** *Return*
21. Select **OK** to save the query and close the dialog box.
22. On the Action Pane, select **Save** to save the new location directive.

Mobile device menu items for quality-out

1. Go to **Warehouse management > Setup > Mobile device > Mobile device menu items**.
2. Select the **QMS put-away** mobile device menu item.
3. On the **Work classes** FastTab, add the *QualityPut* work class ID.

Warehouse workers will now be able to pick quality order work by using the **QMS Put-away** menu item. Goods that failed quality control goods can be put in a return location, and goods that passed can be put in the bulk-001 location.

Summary: Your setup to move goods from quality control

You've set up the work and location data for warehouse 51, to ensure that work is automatically created when quality orders are completed. This setup ensures that each quality-controlled license plate is moved to either a bulk location or a return location.

Process quality management work

1. Go to **Inventory management > Periodic tasks > Quality management > Quality orders**.
2. Select the first quality order for the quantities that were registered.
3. Select **Validate**. The status of the test is updated to *Fail*.
4. Go to **Warehouse management > All work**.
5. Open the work that you just created, and notice that the **Work order type** value is *Quality order*. The work includes a line where the put location is *Return* and the status is *Fail*. (If the status of the quality order were *Pass*, the put location would be *Bulk* instead.)
6. Go back to **Inventory management > Periodic tasks > Quality management > Quality orders**.
7. Select the second quality order for the items that were registered.
8. Select **Results** above the lower grid. Update the **Result quantity** value to 5, and verify that the **Test result** value is changed to a check mark.
9. Select **Validate**, and close the page.
10. Back on the **Quality orders** page, select **Validate**, and do the validation. The status is updated to *Pass*.

NOTE

The validation event triggers the creation of the quality order work to move the quantity from the quality control location to a new location.

11. Go to **Warehouse management > All work**.
12. Select the work that was just created, and notice that a second quality order work header has been created, where the put location is *BULK-001*.
13. Go to a mobile device or emulator that is running the warehouse app, and sign in to warehouse 51 by using *51* as the user ID and *1* as the password.
14. Go to **Quality > Put Away from QMS**, and process each of the two license plates that are related to both pieces of work, so that all work is closed.

NOTE

Consider adding the quality-out entry to a mobile device menu item where the activity code is *Display open work list*. For an example, see the mobile device menu item that is named **Work list** in the demo data. First add the *Quality order* work class to a user-directed menu item, because this work class is required for work to be shown in the work list. Then add the *Quality order* work class to the **Work list** menu item. Users who have access to the work list will then be able to pick and process the work that is automatically generated by quality order validation.

NOTE

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Nonconformance management

2/18/2021 • 3 minutes to read • [Edit Online](#)

This article describes the basic setup that is required in order to use nonconformances. Additional setup is required if you want to use quality orders.

To enable nonconformance management, follow these steps:

1. Define the Inventory and warehouse management parameters that are related to nonconformances:
 - Set the **Use quality management** option to **Yes**.
 - In the **Hourly rate** field, enter an hourly labor rate in the local currency. The hourly rate is used to calculate costs for operations that are related to a nonconformance. The hourly rate and calculated costs provide reference information for a nonconformance. They don't interact with other functionality.
 - Use the **Quality management** tab on the **Report setup** page to define the type of document to print. You can print a nonconformance report, a nonconformance tag, or a correction report. You can define more than one record to print different document types on a report, or to print internal and external notes. You might find it helpful to use the **Document type** page to define a unique document type for nonconformances and a unique document type for corrections. For example, want to enter notes about a nonconformance by using the unique document type for nonconformances. In this case, identify the unique document type in the report options.
 - Enable number sequences for nonconformance and correction references.
2. Enable user approval of nonconformances. Use the **Name** field on the **Users** page to assign an employee to each user who must approve a nonconformance. The system uses the employees who change the status of a nonconformance to track the nonconformance history. Users can't approve a nonconformance unless they have been assigned an employee identifier.
3. Define the problem types that will be assigned to nonconformances. Use the **Problem types** page to define a classification of quality problems that are encountered for the various nonconformance types. You can set up the following nonconformance types: **Internal**, **Customer**, **Vendor**, **Service request**, **Production**, and **Co-product production**. Use the **Non conformance types** page to authorize a problem type to be used in one or more nonconformance types. For example, a problem type that is related to a defect code might apply to all nonconformance types, whereas a problem type that is related to customer complaints might apply only to the **Customer** and **Service request** nonconformance types.
4. Define quarantine zones to provide guidance about defective material should be handled. Use the **Quarantine zones** page to define zones that can be assigned to a nonconformance. The printed nonconformance tag will show the assigned quarantine zone and information about usage, to provide guidance about how to handle defective material. The zones might correspond to inventory locations or operations resources.
5. Define the diagnostic types that will be assigned to corrections. Use the **Diagnostic types** page to define a classification of diagnostic actions. A correction specifies what type of diagnostic action should be taken for an approved nonconformance, and who should take that action. It also specifies the requested completion date and the planned completion date.
6. Define the related operations that will be assigned to nonconformances. Use the **Operations** page to define a classification of the work that can be performed for an approved nonconformance. When you assign a related operation to a nonconformance, you can provide detailed information, such as

information about the associated material, labor hours, and miscellaneous charges that are required in order to perform the operation. This information is used to calculate an estimated cost for the operation. The detailed information and estimated costs are for reference. The related operations for quality differ from the operations that can be defined for a production route.

Additional resources

[Create and process a conformance](#)

[Quality management processes](#)

[Set up prerequisites for nonconformance management](#)

NOTE

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Set up prerequisites for nonconformance management

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Use this topic to enable nonconformance management processes. A nonconformance describes a procedure or item that has a quality problem, where the descriptive information includes the source and type of problem. This procedure uses the USMF demo data company. This procedure is typically performed by a quality manager.

Enable quality management processes within the company

1. In the navigation pane, go to **Modules > Inventory management > Setup > Inventory and warehouse management parameters**.
2. Select the **Quality management** tab.
3. Select **Yes** in the **Use quality management** field to enable quality management processes for the company.
4. In the **Hourly rate** field, enter a number in the local currency. The hourly rate is used for calculating costs for operations that are related to a nonconformance. The hourly rate and calculated costs provide reference information for a nonconformance, and they do not interact with other functionality.
5. Select **Report setup** to define the quality report note types that will be used on different kinds of quality management reports.

Enable user for nonconformance processing

1. In the navigation pane, go to **Modules > System administration > Users > Users**.
2. Use the Quick Filter to find the user who will be approving or rejecting the nonconformance records. For example, filter on the **Name** field with a value of . To process the approval of a nonconformance, the user who approves or rejects nonconformances must have a "Name" value assigned on the **Users** page. To use the document notes, the user must also have Document handling activated in the user options.
3. Mark the row of the desired record.
4. Select **User options**.
5. Select the **Preferences** tab.
6. Select **Yes** in the **Enable document handling** field.

Define diagnostic types for nonconformance processing

1. In the navigation pane, go to **Modules > Inventory management > Setup > Quality management > Diagnostic types**. Use the **Diagnostic types** page to define a classification of diagnostic actions. A correction identifies what type of diagnostic action should be taken on an approved nonconformance, who should perform it, and the requested and planned completion date.
2. Select **New**.
3. In the **Diagnostic** field, type a value.
4. In the **Description** field, type a value.

Define quality charges for nonconformance processing

1. In the navigation pane, go to **Modules > Inventory management > Setup > Quality management > Quality charges**. Use the **Quality charges** page to define a classification of charges that will be used in operations related to nonconformances.

2. Select **New**.
3. In the **Charges code** field, type a value.
4. In the **Description** field, type a value.

Define the operations for nonconformance processing

1. In the navigation pane, go to **Modules > Inventory management > Setup > Quality management > Operations**. Use the **Operations** page to define a classification of the work that may be performed for an approved nonconformance. When you relate an operation to a nonconformance, you can define information about the associated material, labor hours, and miscellaneous charges that are required to perform the operation. This information provides the basis for calculating an estimated cost for performing the operation.
2. Select **New**.
3. In the **Operation** field, type a value.
4. In the **Description** field, type a value.

Define problem types for nonconformance processing

1. In the navigation pane, go to **Modules > Inventory management > Setup > Quality management > Problem types**. Use the **Problem types** page to define a classification of quality problems that are encountered in the various nonconformance types. The nonconformance types include **Internal**, **Customer**, **Vendor**, **Service request**, **Production**, and **Co-product production**. A single problem type can be associated with multiple nonconformance types.
2. Select **New**.
3. In the **Problem type** field, type a value.
4. In the **Description** field, type a value.
5. Select **Non conformance types**. Use the **Non conformance types** page to authorize the use of a problem type for one or more of the nonconformance types. For example, a problem type regarding a defect code could apply to all nonconformance types, whereas a problem type about customer complaints may only apply to the customer and service request nonconformance types.
6. Select **New**.
7. In the **Non conformance type** field of the new row, select an option.

Define quarantine zones for nonconformance processing

1. In the navigation pane, go to **Modules > Inventory management > Setup > Quality management > Quarantine zones**.
2. Select **New**.
3. In the **Quarantine zone** field, type a value.
4. In the **Description** field, type a value.
5. Close the page.

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Create and process a conformance

2/18/2021 • 2 minutes to read • [Edit Online](#)

This topic explains how to perform nonconformance management, based on an existing quality order. You can run this recording in the USMF demo company and can use the suggested values. Typically, this procedure is performed by a quality clerk. As a prerequisite, complete the instructions in [Inspect the quality of goods](#). To process the approval of a nonconformance, the user who runs the task recording must have a "Name" value assigned on the Users page. To use the document notes, the user must also have Document handling activated in the user options.

Select a quality order

1. In the navigation pane, go to **Modules > Inventory management > Periodic tasks > Quality management > Quality orders**.
2. In the list, select the quality order that was created in [Inspect the quality of goods](#).

Create a nonconformance

1. On the Action Pane, select **Inquiries**.
2. Select **Non conformances**.
3. Select **New**.
4. In the drop-down menu of the **Problem type** field, select the problem that was found during the inspection process.
5. Select **OK**.

Approve/reject a nonconformance

1. Select **Functions**.
2. Select **Approve non conformance**. For this example, approve the nonconformance. Approved nonconformances can be associated with related operations to record work that is done as part of the nonconformance handling and, as in this topic, the processing of correction handling.
3. Select **Yes**.

Create a correction action

1. Select **Corrections**.
2. Select **New**.
3. In the **Personnel number** field of the new row, select the desired record from the drop down menu.
4. Click **Select**.
5. Select **Attach**. Create a note about the correction. For this example, the action is to contact the vendor to discuss the nonconformance case.
6. Select **New**.
7. Select **Note**. Depending on the report setup, different document types can be printed on the reports that are related to nonconformance management.
8. In the **Description** field, type a value.
9. Close the page.

Maintain a correction

1. Select **Mark complete**.
2. Select **OK**.
3. Close the page.

Close a nonconformance

1. Select **Functions**.
2. Select **Close non conformance**.
3. Select **Yes**.
4. Close the pages.

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Quarantine orders

2/18/2021 • 2 minutes to read • [Edit Online](#)

This topic describes how quarantine orders are used to block inventory.

Quarantine orders can be used to block inventory. For example, you might want to quarantine items for quality control reasons. Inventory that has been quarantined is transferred to a quarantine warehouse. **Note:** If you're using advanced warehouse management processes (in Warehouse management), quarantine order processing is used only for return sales orders.

Quarantine on-hand inventory items

When you quarantine items, you can either create the quarantine orders manually or set up the system to create the quarantine orders automatically during inbound processing. To create quarantine orders automatically, select the **Quarantine management** option on the **Inventory policies** tab on the **Item model groups** page. You must also specify a default quarantine warehouse in the **Quarantine warehouse** field for the receiving warehouses. When the physically on-hand inventory is recorded in a purchase order or production order, quarantined items are automatically moved to a quarantine warehouse in Supply Chain Management. This movement occurs because the status of the quarantine order is changed to **Started**. When you create quarantine orders manually, the item doesn't have to be set up for quarantine management in the associated item model group. For this process, you must specify the on-hand inventory that should be quarantined and the quarantine warehouse that should be used. You can use the quarantine order statuses to help plan the process.

Quarantine order statuses

Quarantine orders can have the following statuses:

- Created
- Started
- Reported as finished
- Ended

Created

When a quarantine order has been created manually, but the item isn't yet in the quarantine warehouse, the quarantine order has a status of **Created**. Two inventory transactions are generated. One transaction is an issue transaction that can have a status of **On order**, **Reserved physical**, or **Picked**. The other transaction is a receipt transaction that can have a status of **Ordered** or **Registered** at the quarantine warehouse. You can reserve, pick, and register updates to the inventory by using the usual processes.

Started

When a quarantine order has a status of **Started**, the inventory is transferred from the regular warehouse to the quarantine warehouse, and two inventory transactions are generated. One transaction has a status of **Deducted**, and the other transaction has a status of **Received**. At the same time, two inventory transactions are created to handle the return transfer. These transactions aren't dated. One transaction has a status of **Reserved physical**, and the other transaction has a status of **Ordered**.

Reported as finished

By clicking **Report as finished**, you can report a started quarantine order as finished. The item is released from quarantine but isn't yet moved back to the regular warehouse. The movement back to the regular warehouse can be processed via an Item arrival journal that can be initialized during the Report as finished process.

Ended

When a quarantine order is ended, the item is moved from the quarantine warehouse back to the regular warehouse. The status of the item transaction is set to **Sold** at the quarantine warehouse and **Purchased** at the regular warehouse.

Quarantine order scrap

As part of the quarantine order process, you can scrap inventory. When you process scrap, the status of the inventory will be set to **Sold** by an issue transaction from the quarantine warehouse.

Additional resources

[Inventory blocking](#)

NOTE

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Set up quality orders

2/18/2021 • 5 minutes to read • [Edit Online](#)

This procedure shows you how to enable a quality management process where incoming inventory must be inspected immediately after arrival registration. The procedure will typically be carried out by a quality manager. The process includes the creation of a quality group, to define the items that are going to be sampled, and a test group to group the tests that are to be performed on items in the quality group. You can run this guide in the USMF demo data company.

Enable quality management

1. Go to **Navigation pane > Modules > Inventory management > Setup > Inventory and warehouse management parameters**.
2. Click the **Quality management** tab.
3. Set the **Use quality management option** to 'Yes'.
4. Click **Report setup**. In USMF, the report setup for quality management is already defined. If this wasn't done, you'd add new lines here for the different report types, and select the type of document to be used for each report.
5. Close the page.
6. Close the page.

Create a test

1. Go to **Inventory management > Setup > Quality control > Tests**.
2. Click **New**.
3. In the **Test** field, type a value.
4. In the **Description** field, type a value.
5. In the **Type** field, select 'Option'. In this example, we'll select "Option" which will make it possible to assign the test results based on pre-defined values.
6. Click **Save**.
7. Close the page.

Create Test variables to define the way test results are recorded

1. Go to **Inventory management > Setup > Quality control > Test variables**.
2. Click **New**.
3. In the **Variable** field, type a value.
4. In the **Description** field, type a value.
5. Click **Save**.
6. Click **Outcomes**.
7. Click **New**.
8. In the **Outcome** field, type a value.
9. In the **Description** field, type a value.
10. In the **Outcome status** field, select 'Pass'.
11. Click **Save**.
12. Click **New**.

13. In the **Outcome** field, type a value.
14. In the **Description** field, type a value.
15. Click **Save**.
16. Close the page.
17. Close the page.

Set up item sampling

1. Go to **Inventory management > Setup > Quality control > Item sampling**.
2. Click **New**.
3. In the **Item sampling** field, type a value.
4. In the **Description** field, type a value.
5. In the **Value** field, enter a number. This value relates to the Quantity specification that's selected in the adjacent field.
6. Expand or collapse the **Process** section.
7. Select or clear the **Full blocking** check box. If you select this option, the whole lot or order line quantity is blocked if a test is failed. If you don't select it, only the items in the quality order are blocked.
8. Click **Save**.
9. Close the page.

NOTE

The *Quality management for warehouse processes* feature provides additional item sampling capabilities. It adds a concept of *item sampling scope* and the ability to define a full license plate as the quantity specification. If you have enabled this feature, then see [Quality management for warehouse processes](#) for details.

Create a quality group

1. Go to **Inventory management > Setup > Quality control > Quality groups**.
2. Click **New**.
3. In the **Quality group** field, type a value. Use a descriptive name to help you identify which kind of items the group will contain (your sampling criteria).
4. In the **Description** field, type a value.
5. Click **Save**.
6. Click **Add items**.
7. Select the **Item number** row. In this example the filtering will be run based on the item number.
8. In the **Criteria** field, type a value. For example, type T* to filter on the item numbers that start with T.
9. Click **OK**.
10. Click **OK**.
11. Click **Item quality groups**.
12. Close the page.
13. Close the page.

Create a test group

1. Go to **Inventory management > Setup > Quality control > Test groups**.
2. Click **New**.
3. In the **Test group** field, type a value. Give the **Test group** a name that will help you remember what kind of tests are being run, and which quality group it should be associated with. For example, it's to be used with a

quality group that selects items starting with "T", you could call it "T-item tests".

4. In the **Description** field, type a value.
5. In the **Item sampling** field, select the item sampling line that you created before.
6. In the list, find and select the desired record.
7. Click **Add**.
8. In the **Sequence number** field, enter a number.
9. In the **Test** field, select the test that you created earlier.
10. In the list, find and select the desired record.
11. Click the **Test** tab.
12. In the **Variable** field, select the test variable that you created before
13. In the list, find and select the desired record.
14. In the **Default outcome** field, click the drop-down button to open the lookup.
15. In the list, click the link in the selected row.
16. Click **Save**.
17. Close the page.

Define when quality orders will be created

1. Go to **Inventory management > Setup > Quality control > Quality associations**.
2. Click **New**.
3. In the **Reference type** field, select an option.
4. In the **Item code** field, select 'Group'. In this example, we'll select "Group" and use the quality group we created before. You could also set this to "Table" to specify the items manually, or select "All" to add all items to the quality order.
5. In the **Item** field, select the quality group that you created before. The options available in the Item field depend on what you set in the Item code field.
6. In the list, find and select the desired record.
7. Expand or collapse the **Process** section.
8. In the **Event type** field, select an option. This is the event that triggers the test. The options available here depend on which process you selected in the Reference type field.
9. In the **Execution** field, select an option.
10. Expand or collapse the **Quality order process** section.
11. In the **Event blocking** field, click the drop-down button to open the lookup. This field shows the list of processes that it's possible to block if the quality order is still open. The options depend on what you selected in the Event type field.
12. In the list, click the link in the selected row. This will be depending on the previous selected values. Select if the following processes must be blocked while having open quality orders linked to a source document line.
13. Expand or collapse the **Specifications** section.
14. In the **Test group** field, select the test group that you created before.
15. In the list, find and select the desired record.
16. Click **Save**.
17. Close the page.

NOTE

The *Quality management for warehouse processes* feature provides additional options for setting up quality associations. It adds a new condition (**Applicable warehouse type**) and a new setting (**Quality processing policy**). If you have enabled this feature, then see [Quality management for warehouse processes](#) for details.

NOTE

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Inspect the quality of goods

2/18/2021 • 2 minutes to read • [Edit Online](#)

This topic explains how to process a quality order. You can run this guide in demo data company USMF. Before you start this example procedure, you need to confirm purchase order "000016" and post a product receipt. This will automatically create a quality order. Quality inspections are typically carried out by a quality clerk.

Select a quality order

1. In the navigation pane, go to **Modules > Inventory management > Periodic tasks > Quality management > Quality orders**.
2. Select the quality order that was created before you started this procedure.

Record test results

1. Select **Results**.
2. Select **Edit**.
3. In the **Result quantity** field, enter a number.
4. In the **Outcome** field, select the desired record in the drop-down menu.
 - In this example the result is based on a pre-defined outcome. Normally you would record a more specific test result, for example a size or other dimension.
5. Select **Save**.
6. Close the page.

Validate the quality order

1. Select **Validate**.
2. In the **Validated by** field, select the user performing the inspection from the drop-down menu.
3. Click **Select**.
4. Select **OK**.
5. Close the page.

NOTE

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Inventory blocking

2/18/2021 • 3 minutes to read • [Edit Online](#)

This topic provides an overview of inventory blocking, which is part of the quality inspection process in Supply Chain Management. You can use inventory blocking to prevent items from being processed or consumed.

You can block inventory items in the following ways:

- Manually
- By creating a quality order
- By using a process that generates a quality order
- By using inventory status blocking

Blocking items manually

You can block a quantity of an item by creating a transaction on the **Inventory blocking** page. Only items that are available as on-hand inventory can be blocked manually. For manually blocked quantities, you must decide whether planning activities include expected receipts as an expected on-hand quantity. Expected receipts are blocked items that you expect to be available as on-hand inventory after inspection is completed. You can maintain the expected date. By default, the **Expected receipts** option is selected for items that are blocked through a quality order. You can cancel a manual block on a quantity by deleting the transaction on the **Inventory blocking** page.

Blocking items by creating a quality order

You can specify items that must be inspected by creating a quality order on the **Quality orders** page. When you create a quality order, the quantity that you specify for an item is blocked. The sampling plan that is associated with a quality order controls only the quantity of items that must be inspected, not the quantity that is blocked. The quantity that is entered on the quality order is the quantity that is blocked, regardless of the quantity that the sampling plan specifies should be sent for inspection.

NOTE

Using both the batch expiry date and blocking inventory status features is not supported by master planning. This could result in double exclusion of on-hand inventory, which can occur during master planning. We recommend that you rely on batch disposition codes, instead of inventory status, for blocking expired batches.

Blocking items by using a process that generates a quality order

If a quality process specifies that an item must be inspected, a quantity of the item is blocked automatically. Therefore, when a quality order is generated automatically, the item sampling plan that is associated with the quality order controls the both quantity of items that is blocked and the quantity that must be inspected. If the **Full blocking** option on the **Item sampling** page is selected, the full quantity of, for example, a purchase order line is blocked during inspection, regardless of the item sampling quantity.

Example

In the following example, a quality order is generated when a purchase order packing slip is posted. On the **Quality associations** page, you specified that posting of a purchase order packing slip is the process that activates a quality order.

SETUP	USER ACTION	RESULT
<p>A quality association specifies that a quality order must be generated when a purchase order packing slip is posted. The item sampling setup of the quality order specifies that 10 percent of the quantity on the purchase order line must be inspected. Furthermore, because the Full blocking option selected in the item sampling setup, the full quantity of the purchase order line must be blocked during inspection, regardless of the quantity that is sent for inspection.</p>	<p>The packing slip is posted.</p>	<p>A quality order is generated. Ten percent of the purchase order quantity for the item is sent to inspection. The full quantity of the purchase order line is blocked.</p>

Blocking items by using inventory status blocking

You can specify which inventory statuses are blocking statuses by using the **Inventory blocking** parameter on the **Inventory statuses** page. You can't use inventory statuses as blocking statuses for production orders, sales orders, transfer orders, outbound transactions, or project integrations. For outbound work, use items that have an available inventory status. If items have a status of **Broken**, and master planning is run on those items, the items are considered missing, and inventory is automatically replenished.

Additional resources

[Create and maintain an inventory blocking](#)

[Quality management processes](#)

[Inspect the quality of goods](#)

NOTE

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Create and maintain an inventory blocking

2/18/2021 • 2 minutes to read • [Edit Online](#)

This procedure shows how to prevent physical on-hand inventory from being reserved by other outbound source documents by using the inventory blocking. You can run the procedure in demo data company USMF using the example values that are shown. You need to have an item with physical on-hand inventory available before you start this procedure.

Create an inventory blocking

1. In the **Navigation pane**, go to **Modules > Inventory management > Periodic tasks > Inventory blocking**.
2. Click **New**.
3. In the **Item number** field, click the drop-down button to open the lookup.
4. In the list, select the item you want to choose. Select an item number with physical on-hand inventory that you want to block. If you're using USMF you can select item M9201.
5. In the **Quantity** field, enter a number. If you're using item M9201, you need to select less than 200.
6. Expand the **Inventory dimensions** fastTab.
7. In the **Warehouse** field, click the drop-down button to open the lookup.
8. In the list, find and select the desired record. If you're using item M9201, you can select warehouse 51.
9. Click **Save**.

Update the conditions of the inventory blocking

1. In the **General** fastTab, in the **Quantity** field, enter a number. Update the inventory quantity field to reflect the quantity to block.
2. In the **Expected date** field, enter a date. You might want to indicate when the blocked inventory is expected to become available for reservation by assigning an expected date. If the Expected receipts option is selected for the inventory blocking, as it is by default when you manually create a blocking, this date will appear on the expected transaction.
3. Click **Save**.

Remove the inventory blocking

1. On the **Action Pane**, click **Delete**.
2. Click **Yes**.
3. Close the page.

NOTE

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Inventory journals

2/18/2021 • 5 minutes to read • [Edit Online](#)

This topic describes how you can use inventory journals to post various types of physical inventory transactions.

The inventory journals in Supply Chain Management are used to post physical inventory transactions of various types, such as the posting of issues and receipts, inventory movements, the creation of bills of materials (BOMs), and the reconciliation of physical inventory. All these inventory journals are used in a similar way, but they are divided into different types.

Types of inventory journals

The following types of inventory journals are available:

- Movement
- Inventory adjustment
- Transfer
- BOM
- Item arrival
- Production input
- Counting
- Tag counting

Movement

When you use an inventory movement journal, you can add cost to an item when you add inventory, but you must manually allocate the additional cost to a particular general ledger account by specifying a general ledger offset account when you create the journal. This inventory journal type is useful if you want to overwrite the default posting accounts.

Inventory adjustment

When you use an inventory adjustment journal, you can add cost to an item when you add inventory. The additional cost is automatically posted to a specific general ledger account, based on the setup of the item group posting profile. Use this inventory journal type to update gains and losses to inventory quantities when the item should keep its default general ledger offset account. When you post an inventory adjustment journal, an inventory receipt or issue is posted, the inventory values are changed, and ledger transactions are created.

Transfer

You can use transfer journals to transfer items between stocking locations, batches, or product variants without associating any cost implications. For example, you can transfer items from one warehouse to another warehouse within the same company. When you use a transfer journal, you must specify both the "from" and "to" inventory dimensions (for example, for Site and Warehouse). The on-hand inventory for the defined inventory dimensions is changed accordingly. Inventory transfers reflect the immediate movement of material. In-transit inventory isn't tracked. If in-transit inventory must be tracked, you should use a transfer order instead. When you post a transfer journal, two inventory transactions are created for each journal line:

- An inventory issue at the "from" location.
- An inventory receipt at the "to" location.

BOM

When you report a BOM as finished, you can create a BOM journal. By using a BOM journal, you can post the

BOM directly. This posting generates an inventory receipt of the product, together with an associated BOM and an inventory issue of the products that are included in the BOM. This inventory journal type is useful in simple or high-volume production scenarios where routes aren't required.

Item arrival

You can use the item arrival journal to register the receipt of items (for example, from purchase orders). An item arrival journal can be created as part of arrival management from the **Arrival overview** page, or you can manually create a journal entry from the **Item arrival** page. If you enable the item arrival journal name to check for picking locations, Supply Chain Management looks for a location for received items and, if there is room, generates location destinations for the incoming items.

Production input

Production input journals work like the item arrival journals but are used for production orders.

Counting

Counting journals let you correct the current on-hand inventory that is registered for items or groups of items, and then post the actual physical count, so that you can make the adjustments that are required to reconcile the differences. You can associate counting policies with counting groups to help group items that have various characteristics, so that those items can be included in a counting journal. For example, you can set up counting groups to count items that have a specific frequency, or to count items when stock falls to a particular level. For information about how to define counting groups, see [Define inventory counting processes](#).

Tag counting

Tag counting journals are used to assign a numbered tag to a count lot. The tag should contain a tag number, item number, and item quantity. To ensure that a tag is used only one time, and that all tags are used, every item number should have a unique set of tags that has its own number sequence. Three status values can be set for each tag:

- **Used** – The item number is counted for this tag.
- **Voided** – The item number is voided for this tag.
- **Missing** – The item number is missing for this tag.

When you post a tag counting journal, a new counting journal is created, based on the tag counting journal lines. For more information about tag counting, see [Inventory tag counting](#).

Working with journals

A journal can be accessed by only one user at a time. If several users must access journals at the same time to create journal lines, those users must select journals that aren't currently being used, to prevent information from being overwritten. In situations where multiple departments use the same journal type, it's helpful to create multiple journal names (for example, one per department). It can also be helpful to divide journals so that each posting routine is entered in its own unique inventory journal. For posting routines that are associated with inventory transactions, create one journal for periodic inventory adjustments and another for inventory counting.

Posting journal lines

You can post the journal lines that you create at any time until you've locked an item from additional transactions. The data that you enter in a journal remains in that journal, even if you close the journal without posting the lines.

Data entity support for inventory journals

Data entities support the following types of integration scenarios:

- Synchronous service (OData)
- Asynchronous integration

For more information, see [Data entities](#).

NOTE

Not all inventory journals are OData-enabled, therefore you cannot use the Excel data connector to get data published, updated, and imported back to Supply Chain Management.

Another difference between the journal data entities is the ability to use composite entities that include both the header and line data. Currently, you can use the composite entities for:

- Inventory adjustment journal
- Inventory movement journal

These two inventory journals only support the *Initialize stock* scenario as part of a data management import project:

- When a journal header number is not specified, but a number sequence is specified for the journal type, the import job will automatically create journal headers per 1000 lines. For example, importing 2020 lines will result in the following three journal headers:
 - Header 1: will contain 1000 lines
 - Header 2: will contain 1000 lines
 - Header 3: will contain 20 lines
- It is assumed that unique line information exists per inventory dimension, which can be a product, storage, and tracking dimension. Therefore, it's not possible to import journal lines where only the date field differs on the lines within the same import project.

Additional resources

[Data entities](#)

NOTE

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Inventory journal approval workflows

2/18/2021 • 5 minutes to read • [Edit Online](#)

This topic describes how to set up and use inventory journal approval workflows for various types of physical inventory transactions, such as issues and receipts, inventory movements, bills of materials (BOMs), and the reconciliation of physical inventory. Inventory journal workflows help ensure that only approved inventory journals can be posted to transactions.

NOTE

Inventory journal approval workflows apply only to transactions recorded using the Inventory Management module. They don't work with inventory journals triggered from the Warehouse Management module.

Turn on the inventory journal approval workflows feature

Before you can use this feature, it must be turned on in your system. Admins can use the [feature management](#) settings to check the status of the feature and turn it on. In the **Feature management** workspace, the feature is listed in the following way:

- **Module:** *Inventory and warehouse management*
- **Feature name:** *Inventory journal approve workflow*

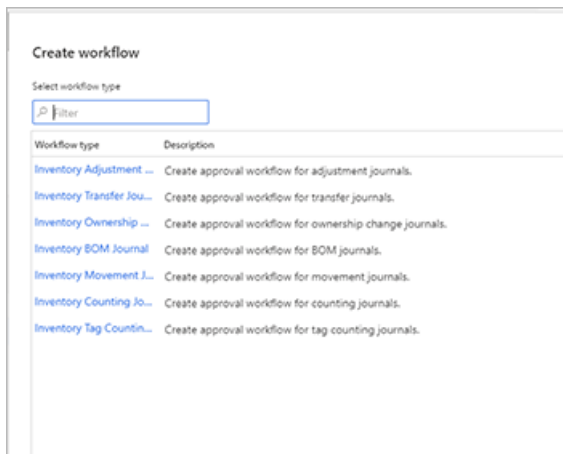
Create your inventory journal approval workflows

To set up this feature, you must create a workflow for each of the inventory journal types you want to control. Because different inventory journal types can have different approval hierarchies and workflow steps, you can configure individual workflows for each inventory journal type.

Workflows support version control, and each has a workflow ID and an active version. You can choose to activate each new workflow version immediately upon creation or keep it inactive. If you need different workflows for the same journal type, then create multiple workflows for that journal type, and then assign each of these to a different journal name that uses that type.

To create your inventory journal approval workflows:

1. Go to **Inventory Management > Setup > Inventory management workflows**.
2. Select **New** on the Action Pane.
3. Choose the inventory journal type for which you want to set up a workflow:
 - **Inventory tag counting journal**
 - **Inventory ownership change journal**
 - **Inventory movement journal**
 - **Inventory transfer journal**
 - **Inventory counting journal**
 - **Inventory BOM journal**
 - **Inventory adjustment journal**



- The workflow editor app launches on your machine. (You may be asked to approve this action.) Use it to design your workflow as needed. For details about how to use the workflow editor, see [Workflow system overview](#).
- After saving and closing the workflow editor app, you must choose whether to activate this workflow version or keep it as inactive.

NOTE

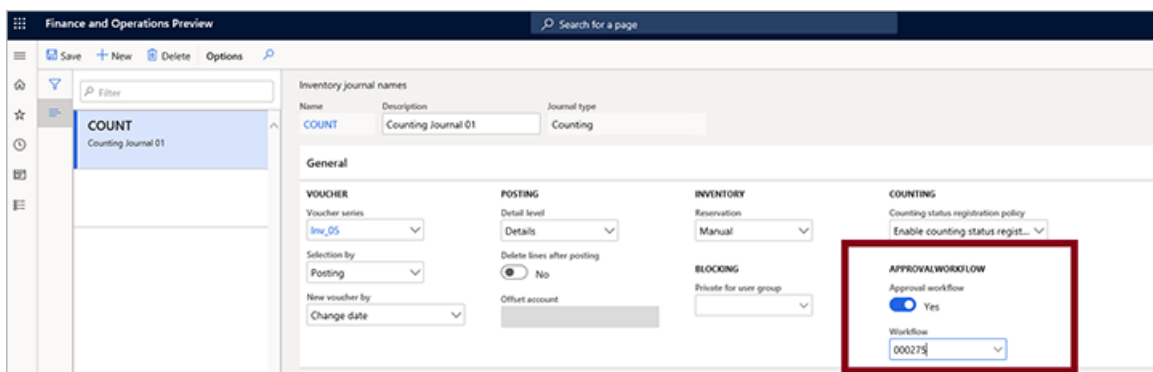
Workflows provide version control, which means that you can view a list of versions you have created and choose which one is active. To view the list of available versions and choose which to activate, select a workflow listed on the **Inventory management workflows** page. On the Action Pane, open the **Workflow** tab, and select **Versions**. Only one version can be active at a time for each workflow ID.

Assign approval workflows to inventory journal names

The next step is to assign an inventory journal workflow to each inventory journal name. For each inventory journal type, you can set up multiple inventory journal names.

To associate an inventory journal workflow with an inventory journal name:

- Go to **Inventory management > Setup > Journal names > Inventory**.
- Select a journal name from the list column to open its settings page.
- On the **General** FastTab, set **Approval workflow** to **Yes**. If you are prompted to approve the action, select **Yes**.

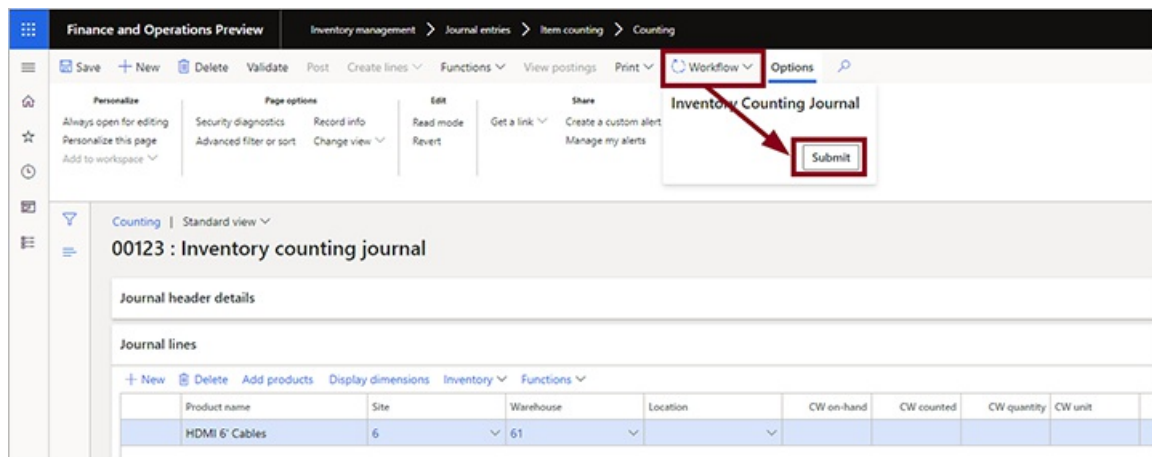


- Open the **Workflow** drop-down list and select the appropriate workflow. The list shows each active workflow that you have created using the workflow editor app.

Create an inventory journal and send it for approval

After you associate an inventory journal name with its matching inventory journal approval workflow, you'll be able to create new inventory journals that use that name and then send these journals for approval using that workflow. You won't be able post the inventory journal until it has been approved by the approvers configured in the workflow.

1. On the navigation pane, expand **Inventory management > Journal entries > Items** and then select an inventory journal type.
2. Select **New** to create a new journal of your selected type.
3. The **Create inventory journal** dialog box opens. Fill out the form as needed and then select **OK** to save the journal.
4. Complete the journal as required.
5. When you create or open an inventory journal with an approval workflow associated with it, the **Workflow** button will be active in the Action Pane. When you are ready to submit the journal for approval, select the **Workflow** button to open a drop-down dialog box and then select **Submit**. The approval request will then route to the relevant approver, who will be alerted using the notification method configured for the workflow.



To recall an approval request, open the relevant journal, select the **Workflow** button and then select **Recall**. This will reset the workflow.

When your journal has been approved, you'll be able to post it. To post the journal, select **Post** from the Action Pane. If the **Post** button isn't active the journal hasn't been approved yet.

Respond to an inventory journal approval request

If you are an approver, you should receive a message each time your approval is needed (as configured in the relevant workflow). Then you can approve or reject a journal approval request by doing the following:

1. On the navigation pane, expand **Inventory management > Journal entries > Items** and then select an inventory journal type.
2. Open the relevant journal and review it.
3. Select the **Workflow** button on the Action Pane to open a drop-down dialog box. Select one of the following:
 - **Approve** - To approve the request.
 - **Reject** - To reject the reject the request.
 - **More > Request change** - To send a message to the requester asking them to change something specific and then resubmit.
 - **More > Delegate** - To delegate the approval to another user.
 - **More > Recall** - To recall the approval request (resets the workflow).
 - **More > Workflow history** - To view the history of this approval workflow so far.

Review the approval history

As with other types of workflows, you can use the **Workflow history** page to view the approval workflow history for any journal.

To review the workflow history for a journal:

1. On the navigation pane, expand **Inventory management > Journal entries > Items** and then select an inventory journal type.
2. Open the relevant journal.
3. Select the **Workflow** button on the Action Pane to open a drop-down dialog box. Select **Workflow history**. For more information, see [View workflow history](#).

NOTE

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Inventory locations

2/18/2021 • 2 minutes to read • [Edit Online](#)

Inventory locations are used with basic warehousing (WMS I) to determine where items are stored and where items are picked from in a WMS I warehouse.

This topic applies to features in the Inventory management module. It does not apply to features in the Warehouse management module.

The term location refers to the place that items are stored and drawn from.

For each location, the place where the item is inserted can also be specified. By default, they are the same. Items are usually inserted and drawn from the same side of a location, but not always. For example, items that are stored in live storage racks are inserted from one aisle and drawn from another. The main input is given by a location name, which is usually determined by its coordinates: warehouse, aisle, rack, shelf, and bin. This name or ID can be entered manually or generated from the location coordinates—for example, 01-02-03-4 for aisle 1, rack 2, shelf 3, bin 4 in the Inventory locations page. Location properties

A location has the following characteristics:

- Size (height, width, depth, and thereby volume)
- Warehouse, aisle, rack, shelf, and bin position
- Location type (bulk location, picking location, inbound dock, outbound dock, production input location, inspection location, or kanban supermarket)

Check text can be used in online systems to verify that the operator has selected the correct location for a specific item. This check text can be created manually or by default.

Sort codes

Use sort codes to optimize the handling of picking lines, which describe the information that is required for picking items from inventory, including the picking order. Sort codes can be specified by the aisle and other coordinates, or assigned manually for the location.

Blocked locations

Occasionally, you might want to indicate that a location is blocked for a period of time, for example, to allow for repairs. At other times, you may want to indicate blocking of only the input or only output.

Tree structure

In the Inventory locations page, you can view the warehouse layout in a tree structure based on the coordinates of inventory locations, in a defined display format.

Maintain inventory locations via the warehouse form

It is possible to copy locations from one warehouse to another and to create locations via a wizard. Before you run the wizard you should make sure that you have defined the default location names on the Warehouse page.

Additional resources

[Create a new warehouse layout](#)

NOTE

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Inventory statuses

2/18/2021 • 4 minutes to read • [Edit Online](#)

This article describes how you can use inventory statuses to categorize and keep track of inventory.

Set up and use inventory statuses

You can use inventory statuses to categorize inventory. You can then initiate appropriate actions, such as replenishment or put-away work.

Here are some examples of ways that you can use inventory statuses:

- Create inventory statuses for on-hand inventory, inbound transactions, and outbound transactions.
- Specify a default inventory status for warehouse transactions.
- Change an inventory status for items before arrival, during arrival, or when the items are put away during inventory movement.
- Use an inventory status to price items that are returned and to plan item coverage during master planning.

An inventory status is one of the dimensions in the storage dimension group. Inventory statuses can be categorized as available or unavailable, and you can use the **Inventory blocking** parameter to block items that have an unavailable inventory status. Items that have a blocked status are considered physical inventory, and they can't be used on a production order, sales order, transfer order, or outbound transaction.

You can use warehouse items that have either available or unavailable inventory statuses for inbound work. For example, you create an available status that is named *Ready*, an unavailable status that is named *Damaged*, and a blocked status that is named *Blocked*. When you create a purchase order for received or returned items, if any items are damaged or broken, you can change the inventory status of those items to *Damaged* on the purchase order line. After these items are received, the status is automatically set to *Blocked*. If you scan the damaged items by using a mobile device, Supply Chain Management can use location directives and work templates to show information about an appropriate location or range of locations where you can put away those items. For returned items, an issue type of *Reservation* is created on the **Inventory transactions** page.

NOTE

You can't change the status of inventory at locations where open work exists. For example, if you did a purchase receive for an item, but didn't do the putaway step, then open work would exist for the receiving location and you would get an error if you tried to change the status of inventory at that location. Completing or cancelling the related work would allow you to change the status.

For outbound work, use items that have an available inventory status. If you have items that have a status of *Broken*, and master planning is run on these items, the items are considered missing, and inventory is automatically replenished.

After you set up inventory statuses, you can set the default inventory status for a site, item, and warehouse. You can also set a default status for sales, transfer, and purchase orders. The default status for sales orders and outbound transfer order can't have the **Inventory blocking** option set to *Yes*. The inventory status that is inherited from the default settings on a site, warehouse, item, purchase order, transfer order or sales order can be changed by using the mobile device, or on the purchase order, sales order, or transfer order line.

To plan coverage for items that have an available inventory status, select the **Coverage plan by dimension** option for a storage dimension on the **Storage dimension groups** page. When you open the **Item Coverage**

wizard, items that have an available status appear on the **Status** page. To create coverage settings for these items, select the inventory status ID for the available inventory statuses. Based on the coverage settings, you can calculate the item requirements and forecast the supply and demand of available items during master planning. You can't create an item coverage setup that has a blocked inventory status. Alternatively, use the **Item coverage** page to create or modify the item coverage parameters.

Change inventory statuses

You can change inventory statuses either by using the **On-hand by location** page or by using the *Inventory status change* periodic task.

- When using the *Inventory status change* periodic task, you can select which records to include and set the task to run in the batch at the desired interval.
- To change inventory status as an ad-hoc process, go to **On-hand by location** page, select the relevant records, and then select the **Inventory status change** button.

NOTE

The *Change the inventory status of items controlled by tracking dimensions* feature allows you to change the inventory status of items controlled by tracking dimensions, including the ability to update only selected records. Use [feature management](#) to enable the feature as needed. When the feature is enabled, you'll be able to do the following:

- On the **On-hand by location** page, you can group lines based on shown dimensions using the **Display dimensions** button and change the status for the selected lines.
- On the **On-hand by location** page, you can select multiple records and then use the **Inventory status change** button to change all of them at once.
- On the **Inventory status change** periodic task you will be able to filter by tracking dimensions.

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Create a new warehouse layout

2/18/2021 • 2 minutes to read • [Edit Online](#)

This topic describes how to set up information about the locations in a warehouse. This applies only to warehouses created using "basic warehousing" in the Inventory management module, not to warehouses created in the Warehouse management module. You can use this procedure in demo data company USMF, or on your own data.

Set the default location capacity

1. In the navigation pane, go to **Modules > Inventory management > Setup > Inventory and warehouse management parameters**.
2. Select the **Locations** tab.
3. In the **Standard width** field, enter a number.
4. In the **Standard depth** field, enter a number.
5. In the **Standard height** field, enter a number.
6. Select **Save**.
7. Close the page.

Define the location name format

1. In the navigation pane, go to **Modules > Inventory management > Setup > Inventory breakdown > Warehouses**.
2. Select **New**.
3. In the **Warehouse** field, type a value.
4. In the **Name** field, type a value.
5. In the **Site** field, select the desired record in the lookup.
6. Toggle the expansion of the **Location names** section. The options in this section define the default format for location names. In our example, we'll include the aisle number, rack number and shelf number.
7. Set the **Include aisle** option to **Yes**.
8. Set the **Include rack** option to **Yes**.
9. In the **Format** field, for the rack, type a value.
10. Set the **Include shelf** option to **Yes**.
11. In the **Format** field, for the shelf, type a value.

Define warehouse locations

1. On the Action Pane, select **Warehouse**.
2. Select **Location Wizard**.
3. Select **Next**.
4. De-select the **Outbound docks** option
5. De-select the **Bulk locations** option
6. Select **Next** until you come to the option to select **Finish**.
7. Close the page.
8. Refresh the page.

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Maintain barcode types

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This procedure shows you how to set up a new barcode definition which can then be used as part of the picking list report. You can walk through this procedure in demo data company USMF, or using your own data. If you are using USMF you can use the example values that are shown. These tasks would typically be carried out by a warehouse manager.

1. Go to Bar codes.
2. Click New.
3. In the Barcode setup field, type a value.
4. In the Description field, type a value.
5. In the Bar code type field, select an option.
 - If you're using USMF, you can select 'Code 39'.
6. In the Size field, enter a number.
7. In the Maximum length field, enter a number.
8. Click Save.
9. Close the page.
10. Go to Inventory and warehouse management parameters.
11. In the Barcode setup field, enter or select a value.
 - Select the barcode setup that you created before, but be aware that the bar code format must match the format of the unique identifier for the record type used in the process. For example, for picking routes, the bar code format should match the format of the picking route reference, which is typically a number sequence.
12. Click Save.
13. Close the page.

NOTE

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Check the availability of stock

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This procedure shows you how to check on-hand and physical on-hand inventory for a specific item number. It also shows you how to get supply information related to an item. Physical on-hand inventory is the on-hand inventory that's available – that is, it's purchased, received and registered. On-hand inventory includes the available on-hand inventory, but also the inventory that's been ordered and is expected, but not yet received or registered. You can walk through this procedure in demo data company USMF, or using your own data. If you are using USMF you can use the example values that are shown. These tasks would typically be carried out by a warehouse worker.

Check on-hand inventory for an item

1. Go to **Navigation pane > Modules > Inventory management > Inquiries and reports > On-hand inventory**.
2. Select the **Item number** row. To query the on-hand inventory by item number, select the row where the Table is set to **On-hand inventory** and Field is set to **Item number**.
3. In the **Criteria** field, select the item you want to query. If you're using the USMF demo data company, you can select 'M9201'.
4. Click **OK**.
5. On the **Action Pane**, click **Dimensions**. The **Dimensions** tab allows you select how much detail you want to see about your on-hand inventory. If you need data related to reservation, you must display all inventory dimensions for the items that use advanced warehouse (WMS) processes.
6. Click **OK**.
7. On the **Action Pane**, click **Related information**. If you don't see this option, you may need to click on the Ellipsis button (...) to see additional Action Pane options.
8. Click **Supply overview**. The **Supply overview** tab provides supply information for a specific item, such as the quantity on-hand, the lead time, and vendor information.
9. Expand the **On-hand** section.
10. Expand the **Vendors** section.
11. Close the page.
12. Close the page.

Check physical on-hand inventory

1. Go to **Navigation pane > Modules > Warehouse management > Inquiries and reports > Physical on-hand inventory**.
2. In the **Item number** field, type a value. You can use the Site and Warehouse fields to filter the list of items.
3. Refresh the page.
4. On the **Action Pane**, click **Display Dimensions**. The **Dimensions Display** tab allows you select how much detail you want to see about your on-hand inventory.
5. Click **OK**.
6. Close the page.

Check on-hand inventory by location

1. Go to **Navigation pane > Modules > Warehouse management > Inquiries and reports > On hand**

by location.

2. In the **Warehouse** field, type a value. If you're using the USMF demo data company, you can use '51'.
3. Refresh the page.
4. Click **Display Dimensions**.
5. Click **OK**.
6. Close the page.

NOTE

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Inventory on-hand list

2/18/2021 • 7 minutes to read • [Edit Online](#)

This topic describes how to use the **On-hand list** page to inspect on-hand inventory details. It shows a few of the ways that the various filtering and sorting options work together, and how those options can sometimes produce unexpected results when they are combined.

Query your on-hand inventory

To check the availability of inventory, go to **Inventory management > Inquiries and reports > On-hand list**.

The **On-hand list** page is automatically updated when transactions are made in inventory. Those transactions might be forecasted, physical, or financial transactions.

Use the following tools to find the set of products that you're looking for:

- On the Action Pane, select **Dimensions** to open a dialog box where you can add or remove columns that are shown in the **On-hand** grid.
- In the **Filters pane**, enter values for specific fields to show only records that match those values. Note that filters that you define here apply to source tables that might be aggregated later, according to the dimensions that you've selected to show. For information about how this behavior can affect your results, see the [examples](#) later in this topic.
- In the **Filters pane**, select **Apply** to generate the list of matching on-hand inventory in the **On-hand** grid.
- In the **On-hand** grid, select any column heading to sort or filter by values in that column. A QuickFilter at the top of the grid provides additional filtering options. These filters apply to the results, not to the source tables. For information about how this behavior can affect your results, see the [examples](#) later in this topic.

For each matching item, the **On-hand** grid provides the following columns of inventory information.

COLUMN	DESCRIPTION
Physical inventory	The physical quantity that is available in inventory.
Physical reserved	The total quantity that was physically reserved.
Available physical	The available (not reserved) quantity that is available in physical inventory. Available physical is a calculated field. The value equals the Physical inventory value minus the Physical reserved value.
Available physical on extra dimensions	The available physical quantity for all the dimensions that are shown in the grid.
Ordered in total	The total quantity that is included on inbound orders or that has a positive quantity in various inventory journals.
On order	The total quantity that is included on outbound orders or that has a negative quantity in various inventory journals.

COLUMN	DESCRIPTION
Ordered reserved	The total quantity that is reserved on ordered receipts. The value in this field represents the total quantity of items in outbound transactions that have a status of <i>Ordered reserved</i> . Items that are reserved as ordered aren't physically available in inventory. Therefore, they can't be directly picked and delivered.
Available for reservation	The total quantity of on-hand inventory that can be reserved. Note: If the Reserve ordered items check box is selected on the Inventory and warehouse management parameters page, the value in this field includes expected receipts. If the check box is cleared, the value excludes expected receipts.
Total available	The total available quantity. Total available is a calculated field. The value equals the Available physical value plus the Ordered in total value minus the On order value.

Apply filters to find the records that you're looking for

Use the **Filters** pane to filter the on-hand inventory list so that it includes only records where the field values match the filtering criteria. To define a filter, follow these steps.

1. In the **Filters** pane, find the field that you want to filter on.
2. In the field below the name of the target field, select a logical operator (for example, *starts with*, *equal to*, or *greater than*).
3. Enter or select the value to look for.

IMPORTANT

The **On-hand list** page is assembled from a detailed on-hand inventory table that includes all available dimensions. However, the list on this page is a summary. Therefore, it might combine rows from the source table by aggregating values according to the dimensions that are shown.

The filters that you define in the **Filters** pane apply to the source table, not to the aggregated list. This behavior can sometimes produce unexpected results. For information about how this behavior can affect your results, see the [examples](#) later in this topic.

However, the [filters that are provided in the grid](#) do apply to the aggregated list. These filters include both the QuickFilter at the top of the grid and the filter for each column heading.

You can modify the set of filters that is available in the **Filters** pane by following these steps.

- To remove a filter from the pane, select its **Close** button (X).
- To add a filter, select **Add** at the top of the **Filters** pane. The **Add filter fields** dialog box that appears shows a list of the available fields. It also shows information about the data type and table for each field. Use the column headings to filter and sort the list as you require, and then select the check box for each field that you want to add to the **Filter** pane. When you've finished, select **Insert** to apply your changes.

Select which dimensions to show

Dimensions tell you more about each item in the on-hand inventory list, and give you more ways to sort and filter the list. The dimensions that you select to show also affect how rows are aggregated on the **On-hand list** page. This aggregation, in turn, can affect how rows from the source tables are combined in the results that you see. For information about how this behavior can affect your results, see the [examples](#) later in this topic.

To customize the selection of inventory dimensions that is shown, follow these steps.

1. On the Action Pane, select **Dimensions**.

The **Dimension display** dialog box that appears shows every dimension.

2. Select the check box for each dimension that you want to include in the grid.
3. If you want your selection to be used by default the next time that you open the **On-hand list** page, set the **Save setup** option to **Yes**. If you set this option to **No**, your selection will be used only during the current session. Therefore, the next time that you open the page, the current default selection will be used.
4. Select **OK** to close the dialog box and apply your changes.

Filter on the output of the inventory on-hand list

You can select any column heading in the **On-hand** grid to sort or filter by values in that column. A QuickFilter at the top of the grid provides additional filtering options. These filters apply to the results, not to the source tables. For information about how this behavior can affect your results, see the [examples](#) later in this topic.

NOTE

You can't filter and sort by all columns. Most of the quantity columns don't include sorting and filtering controls, because they are calculated fields. The **On order** column is an exception.

Examples

Your system includes a detailed (non-aggregated) inventory table that shows the following on-hand inventory.

ITEM NUMBER	SITE	WAREHOUSE	PHYSICAL INVENTORY	AVAILABLE PHYSICAL
IA0001	1	1	1	1
IA0001	1	2	2	2
IA0001	1	3	1	1

Scenario 1

The **On-hand list** page is set up to show the following final dimensions:

- Item number
- Site
- Warehouse

In the **Filters** pane, the following filtering criteria are set up:

- **Item Number** | is exactly | *IA0001*
- **Available Physical** | less than or equal | *1*

Here is the resulting output.

ITEM NUMBER	SITE	WAREHOUSE	PHYSICAL INVENTORY	AVAILABLE PHYSICAL
IA0001	1	1	1	1
IA0001	1	3	1	1

Scenario 2

The **On-hand list** page is set up to show the following final dimensions:

- Item number
- Site

In the **Filters** pane, the following filtering criteria are set up:

- **Item Number** | is exactly | *IA0001*
- **Available Physical** | less than or equal | *1*

Here is the resulting output.

ITEM NUMBER	SITE	PHYSICAL INVENTORY	AVAILABLE PHYSICAL
IA0001	1	2	2

Note that the settings in the **Filters** pane apply to the detailed (non-aggregated) inventory table that is shown at the beginning of this section. Therefore, the criterion **Available Physical** | less than or equal | *1* finds two rows from that table (the first and third rows, each of which shows an **Available Physical** value of *1*). However, in this scenario, the **On-hand list** page isn't set up to show the **Warehouse** dimension. Therefore, it aggregates the two original rows into a single resulting row, because both rows have identical values in all the dimensions that are shown. This row appears to violate the filtering criterion, because the **Available Physical** value is shown as *2*. However, the result is correct, because the settings in the **Filters** pane apply to the source table, not to the aggregated table that is shown on the **On-hand list** page.

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Initialize stock levels in the warehouse

2/18/2021 • 2 minutes to read • [Edit Online](#)

This procedure shows you how to get the on-hand inventory updated manually using an Inventory movement journal. (It's also possible to update on-hand inventory by importing transactions in data entities.) You can run this guide in demo data company USMF where all the prerequisites like journal name, item setup, posting profiles, and accounts are available. The guide suggests specific values for the item and dimensions that are used. If you choose a different item, you may need to enter values for different dimensions.

1. Go to Inventory management > Journal entries > Items > Movement.
2. Click New.
3. In the Name field, click the drop-down button to open the lookup.
4. Select IMov.
 - It's a good practice to use different journal name templates for the different business purposes.
5. In the list, click the link in the selected row.
6. In the Offset account field, specify the values '140200'.
 - This is the offset account that will be the default account on the journal lines. It's possible to override the default to assign different offset accounts per line.
7. Click OK.
8. Click New.
9. In the Item number field, click the drop-down button to open the lookup.
10. Select item A0001.
11. In the list, click the link in the selected row.
12. Click the Inventory dimensions tab.
13. In the Site field, click the drop-down button to open the lookup.
14. Select site 1.
15. In the Warehouse field, click the drop-down button to open the lookup.
16. Select warehouse 13.
17. In the list, click the link in the selected row.
18. In the Location field, click the drop-down button to open the lookup.
19. Select location 13.
20. In the Quantity field, enter a number.
21. Click Save.
22. Click Post.
23. Check or uncheck the Transfer all posting errors to a new journal check box.
 - If you enable this option, any lines that fail to post will be copied to a new journal. You can use the information in the log to correct the issues and then re-post the lines.
24. Click OK.
25. Close the page.
26. Close the page.

NOTE

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Transfer physical inventory within the warehouse

2/18/2021 • 2 minutes to read • [Edit Online](#)

This procedure walks you through the process of creating and posting an inventory transfer journal in order to register movement of an item from one location in a warehouse to another. You need to have an inventory journal name set up for inventory transfers before you start this. You can walk through this procedure in demo data company USMF using the example values that are shown, or using you can use your own data if you have products and locations set up. These tasks would normally be carried out by a warehouse employee.

Create an inventory transfer journal

1. In the **Navigation pane**, go to **Inventory management > Journal entries > Items > Transfer**.
2. Click **New**.
3. In the **Name** field, enter or select a value.
4. Click **OK**. There is the option to specify 'From' and 'To' dimensions for each journal line. These are essential for this journal type. You can transfer items to locations using different rules. In this example we'll transfer an item within the same warehouse, from a license plate controlled location to a location that is not license plate controlled.

Create journal lines

1. In the **Journal lines fastTab**, click **New**.
2. In the **Item number** field, enter or select a value. If you are using USMF, you can select 'A0001'.
3. In the **From site** field, enter or select a value. If you are using USMF, you can select '2'.
4. In the **To site** field, enter or select a value. If you are using USMF, you can select '2'.
5. In the **From warehouse** field, enter or select a value. If you are using USMF, you can select '24'.
6. In the **To warehouse** field, enter or select a value. If you are using USMF, you can select '24'.
7. In the **From location** field, enter or select a value. If you are using USMF, you can select 'FL-001'.
8. In the **To location** field, enter or select a value. If you are using USMF, you can select 'BULK-001'.
9. In the **Quantity** field, enter a number.
10. In the **Line details fastTab**, click the **Inventory dimensions** tab.
11. In **From inventory dimensions**, in the **License plate** field, enter or select a value. If you are using USMF, you can select '24'.
12. Click **Save**.

Post the inventory transfer journal

1. On the **Action Pane**, click **Post**.
2. Click **OK**.

View inventory transactions

1. Click **Inventory**.
2. Click **Transactions**. Here you can see the transactions that were created when you posted your journal.

NOTE

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Adjust stock levels in the warehouse (basic warehousing)

2/18/2021 • 2 minutes to read • [Edit Online](#)

This procedure walks you through the process of creating and posting an inventory adjustment journal in order to adjust stock levels of products in the warehouse. You need to have an inventory journal name set up for inventory adjustments before you start this. You can walk through this procedure in demo data company USMF, or using your own data. These tasks would normally be carried out by a warehouse employee.

Create an inventory adjustment journal

1. Go to Inventory management > Journal entries > Items > Inventory adjustment.
2. Click New.
3. In the Name field, click the drop-down button to open the lookup.
4. In the list, click on the inventory adjustment journal name you want to use.
 - Some other fields will be populated based on the setup of the inventory adjustment journal name you select.
5. Click OK.

Create journal lines

1. Click New.
2. In the list, mark the item number field.
3. In the Item number field, Select an item. If you are using demo data company USMF, type 'D0001'.
4. In the Site field, click the drop-down button to open the lookup.
5. In the list, select a site.
6. In the Warehouse field, click the drop-down button to open the lookup.
7. In the list, select a warehouse.
 - If you have selected an item with Location as a mandatory dimension, you would have to specify the location here.
8. In the Quantity field, enter a number.
 - The cost price field specifies the cost per unit for inventory receipts. If the cost is not specified for the item number or if you wanted to change it manually, you would do this here.

Validate and post the inventory adjustment journal

1. Click Validate.
2. Click OK.
3. Click Post.
 - When you post this kind of journal, an inventory receipt or issue is posted, the inventory level and value are changed, and ledger transactions are generated.
4. Click OK.
5. Close the form.
6. Close the page.

NOTE

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Inventory tag counting

2/18/2021 • 2 minutes to read • [Edit Online](#)

This topic provides information about tag counting, which you use to compare the actual contents of a warehouse with the on-hand inventory.

By creating lines on the **Tag counting** page, you place a tag number on each inventory item, such as a number from 1 to 500. During the count, you enter the item number and the quantity on a corresponding tag. This tag can then be used as the basis for input in the tag counting journal. After you post the tag counting journal, a new counting journal is created on the **Counting** page. The new journal is based on the tag counting journal lines that you created. To tag-count items by a specific inventory dimension, select the dimension on the **Display dimension** page that is displayed when you create the tag counting journal. For example, to count items in a specific warehouse, select the **Warehouse** check box. If the **Lock items during count** slider on the **Inventory and warehouse management parameters** page is selected, items can't be physically updated during counting. However, items in tag counting journals aren't locked during counting. Inventory transactions aren't created until the tag counting lines are posted and transferred to a counting journal. If tags are entered randomly, and you want to identify missing tags, click the **Tag** column header to sort the lines by tag.

Additional resources

[Cycle counting](#)

NOTE

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Count inventory in a warehouse

2/18/2021 • 2 minutes to read • [Edit Online](#)

This topic describes the process of creating and posting an inventory counting journal in order to count a specific item at a location in the warehouse. The procedure applies to "basic warehousing" functionality, available in the Inventory management module, not to the warehousing functionality that's available in the Warehouse management module. You can walk through this procedure in demo data company USMF, or using your own data. If you're using your own data, make sure that you have products and locations set up, and that you've created an inventory journal name for counting journals. Inventory counting is normally carried out by a warehouse employee.

Create an inventory counting journal

1. Go to **Navigation pane > Modules > Inventory management > Journal entries > Item counting > Counting**.
2. Select **New**.
3. In the **Name** field, select the inventory counting journal name you want to use from the drop-down list. Some other fields will be populated based on the setup of the inventory counting journal name that you select.
4. In the **Worker** field, select the drop-down button to open the lookup.
5. In the list, **Select** the worker you want to use.
6. Select **OK**.

Create journal lines

1. Select **New**.
2. In the **Item number** field, select the desired record from the drop-down list. If you are using demo data company USMF, select **A0001**.
3. In the **Site** field, select the desired record from the drop-down list. If you are using demo data company USMF, select site **2**.
4. In the **Warehouse** field, select the desired record from the drop-down list. If you are using demo data company USMF, select warehouse **24**.
5. In the **Location** field, select the desired record from the drop-down list. If you are using demo data company USMF, select location **BULK-001**.
6. In the **Counted** field, enter a number. If you enter a counted number that's different to the number shown in the **On-hand** field, the **Quantity** field is updated to show the discrepancy.
7. Select **Save**.

Post the inventory counting journal

1. Select **Post**. When you post an inventory counting journal, if the counted amount differs from amount that's reported in the **On-hand** field an inventory receipt or issue is posted, the inventory level and value are changed, and ledger transactions are generated.
2. Select **OK**.

View inventory transactions

1. Select **Inventory**.

2. Select **Transactions**. Here you can see any related transactions that will be created when you post your inventory counting journal.

NOTE

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Define inventory counting processes

2/18/2021 • 4 minutes to read • [Edit Online](#)

This topic describes the configuration of basic inventory counting processes by creating a counting group and a counting journal. It also shows you how to enable counting policies on a warehouse and item level. These tasks would typically be carried out by a warehouse supervisor. It is a prerequisite to have some existing released products and warehouses. If you're using a demo data company, you can run this procedure in the USMF company with any stocked item.

Create a counting group

1. In the navigation pane, go to **Modules > Inventory management > Setup > Inventory > Counting groups**.
2. Select **New**.
3. In the **Counting group** field of the new row, type a value.
4. In the **Name** field, type a value.
5. In the **Counting code** field, select an option.
 - **Manual** – Includes lines every time you run the job. In other words, you decide the counting interval for the counting group.
 - **Period** – Includes lines for the period in the counting journal when the period interval has expired.
 - **Zero in stock** – If on-hand inventory reaches zero (0), lines are generated in the counting journal when the job is run. If the on-hand inventory reaches 0 after a count, lines are generated the next time that you start the count.
 - **Minimum** – Inserts lines in the counting journal if the on-hand inventory is equal to or less than the minimum that is specified.
 - Optional: If you have specified **Period** in the **Counting code** field, you must type the interval for the period in the **Counting period** field. The unit for intervals is days.
 - When you run the job for creating new lines in the counting journal, new lines are created at the interval specified in this field, regardless of how often you run the same job. For example, if **Counting period** is set to 7, and journal lines were last generated for a count on January 1, if another job is started on January 5, seven days have not passed and so no lines are generated in the journal for that period interval. If you start the job again on January 8, lines are generated for the period in the counting journal, because 7 days have passed.
6. Select **Save**.

Create a counting journal name

1. In the navigation pane, go to **Modules > Inventory management > Setup > Journal names > Inventory**.
2. Select **New**.
3. In the **Name** field, type a value.
4. In the **Description** field, type a value.
5. In the **Journal type** field, select **Counting**. Optional: you can select a different voucher series ID if you

want a specific number sequence for the voucher IDs generated when creating counting journals. Voucher series are created in the **Number sequences** page.

6. In the **Detail level** field, select an option.

- This is the level of detail that is applied when the journal is posted.
- Optional: you can change the value in the Reservation field. This is the method used to reserve items during counting.
- **Manual** – The items are reserved manually in the Reservation form.
- **Automatic** – The order quantity is reserved from the available, on-hand inventory for the item.
- **Explosion** – The reservation is part of the master planning of the transaction.

7. Select **Save**.

Set standard counting journal name

1. In the navigation pane, go to **Modules > Inventory management > Setup > Inventory and warehouse management parameters**.
2. Select the **Journals** tab.
3. In the drop down menu of the **Counting** field, select the journal you previously created. This journal will then be the default journal name for inventory journals of the **Counting** type.
4. Select the **General** tab. Optional: Select this option to lock an item during the counting process to prevent updates for packing slips, picking lists, or picking list registrations.

Set the counting policy for an item

1. In the navigation pane, go to **Modules > Product information management > Products > Released products**.
2. In the list, select the link for the Item number of the product that you want to set counting policies on. You must select an item that is inventory tracked. A non-stocked product can't be counted. If you are using USMF demo data you can select item A0001.
3. Select **Edit**.
4. Toggle the expansion of the **Manage inventory** section.
5. In the drop-down menu of the **Counting group** field, select the counting group you previously created. This product will now be included when inventory counting journal lines are created using this counting group.
6. Select **Save**.

Set the counting policy for an item in a specific warehouse

1. On the Action Pane, select **Manage inventory**.
2. Select **Warehouse items**.
3. Select **New**.
4. In the drop-down menu of the **Warehouse** field, select the warehouse you want to set up specific counting policies for.
5. In the drop-down menu of the **Counting group** field, select a counting group. You can select a specific counting group that should apply to the item in the specific warehouse you have selected. When counting is performed in that warehouse, this counting policy will override the general counting policy for the item.
6. Select **Save**.

NOTE

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Set up consignment

2/18/2021 • 6 minutes to read • [Edit Online](#)

This topic explains how to use the inbound consignment inventory processes.

Consignment inventory is inventory that's owned by a vendor, but stored at your site. When you're ready to consume or use the inventory, you take over the ownership of the inventory. This topic includes information about how to physically receive vendor-owned inventory on-hand without creating general ledger transactions, how to start a production process where the vendor-owned inventory can be physically reserved, and how to change the ownership of the raw material in order to be able to process the consumption as part of the production order processing. There's also some information about how vendors can monitor consumption of their inventory using the vendor collaboration interface.

Overview of the consignment process

In this example scenario, company USMF has a consignment agreement with vendor US-104 for the raw material M9211CI.

1. A consignment replenishment order is manually created by someone in USMF, based on the expected demand. The order is created for vendor US-104 and a line is added for item MS9211CI.
2. The vendor gets informed about the expected delivery. This can happen in one of three ways:
 - Someone working at USMF sends the order information to the vendor.
 - The vendor can monitor the expected inventory on-hand using the vendor collaboration interface.
 - Someone working at USMF filters the data on the **On-hand inventory** page to show only the records for vendor US-104, where the receipt status is **Ordered**, and then sends this information to the vendor.
3. The inventory is delivered from US-104 to USMF.
4. When the material arrives at USMF, the consignment replenishment order is updated with a product receipt. Only the physical quantities of the vendor-owned inventory are recorded. There are no general ledger transactions created, because the inventory is still owned by the vendor.
5. The vendor monitors updates to the physical on-hand inventory using the **On-hand consignment inventory** page.
6. Now that the physical inventory is on-hand, the production process reserves the vendor-owned inventory and starts the production order for the finished goods that are going to consume the raw material M9211CI.
7. The owner of the reserved raw materials that are going to be consumed in today's production is changed from US-104 to USMF. This is done using an Inventory ownership change journal. This process creates purchase orders where the **Origin** field is set to **Consignment**.
8. The vendor monitors the consumption (change of ownership) on the **Products received from consignment inventory** page and issues an invoice based on the agreements between the two companies.
9. The production process consumes the raw material via a production picking list. The physical reservation is automatically updated to reflect that the on-hand inventory is owned by USMF.
10. The invoice from US-104 is processed against the purchase orders which were auto-generated when the inventory ownership change journal was processed. Payment is made to vendor US-104 for the inventory that was consumed.

USMF carries out additional periodic processes:

- The physical movement of the vendor-owned inventory between different warehouses is processed using a transfer journal.

- The physical inventory on-hand is updated using an **Item counting** journal. Counting can also be used by the vendor to update the on-hand inventory, if they have permission to do this.

The vendor, US-104, can monitor the updates using the **On-hand consignment inventory** page.

Consignment replenishment orders

A consignment replenishment order is a document that is used to request and keep track of inventory quantities of products that a vendor intends to deliver within a certain date interval by creating ordered inventory transactions. Typically, this will be based on the forecast and actual demand of the specific products. The inventory that's going to be received against the consignment replenishment order remains in the ownership of the vendor. Only the possession of the products related to the physical receipt update is recorded and therefore no general ledger transaction updates occur.

The **Owner** dimension is used to separate information about which inventory is owned by the vendor and which is owned by the receiving legal entity. Consignment replenishment order lines have an **Open order** status as long as the full quantity of the lines has not been received or cancelled. When the full quantity has been received or canceled, the status is changed to **Completed**. The physical on-hand inventory that's related to a consignment replenishment order can be recorded using a Registration process as well as a Product receipt update process. Registration can be done as part of the item arrival process or by manually updating the order lines. When the Product receipt update process is used, a record is made in the product receipt journal, which can be used to acknowledge the receipt of goods to the vendors.

The screenshot shows the 'RECEIVE' page in a software application. The page is divided into several sections:

- Top Bar:** Includes 'Save', '+ New', 'Delete', and tabs for 'RECEIVE', 'GENERAL', and 'OPTIONS'.
- GENERATE and JOURNALS:** Two columns with 'Product receipt' options.
- CONSIGNMENT REPLENISHMENT ORDERS:** A section with the order ID 'USMF-000000003'.
- Replenishment order header:** Contains fields for 'Vendor account' (US-103) and 'Vendor name' (Rain Projectors).
- GENERAL:** A section with 'Consignment replenishment order' (USMF-0000...) and a 'Contact' dropdown menu.
- Replenishment order lines:** A table with columns for 'Line number', 'Item number', 'Product name', 'Quantity', 'Unit', 'Requested delivery date', and 'Confirmed delivery date'. The first line is highlighted with a blue checkmark and contains the following data:

Line number	Item number	Product name	Quantity	Unit	Requested delivery date	Confirmed delivery date
1	M9211CI	Wiring harness	800.00	ea		

Inventory ownership change journal

The process of changing the owner of the inventory from the vendor to the receiving legal entity is done using an Inventory ownership change journal. No expected inventory transactions are created for the journal. The only inventory transactions created are those that relate to a posted journal. When the journal is posted:

- The vendor-owned inventory is issued using an **Ownership change** reference with a **Sold** status.
- On-hand inventory is received by the legal entity that's consuming it using a product receipt updated inventory transaction on the purchase order. This sets the status of the order to **Received**. Purchase orders used for consignment have the **Origin** field set to **Consignment**.

It's not possible to update the quantity on consignment purchase order lines after the order has been created.

Operation completed

INVENTORY OWNERSHIP CHANGE JOURNAL
00077 : Inventory ownership change journal

Journal header details

Journal lines

+ New Delete Inventory Functions

✓	Date	Item number	From site	To site	From warehouse	To warehouse	From owner	To owner	Quantity
	9/20/2016	M9211CI	5	5	51	51	US-104	USMF	500.00
	9/20/2016	M9211CI	5	5	51	51	US-103	USMF	700.00

Vendor collaboration in consignment processes

The vendor collaboration interface has three pages related to the inbound consignment process:

- **Purchase orders consuming consignment inventory** - Shows detailed purchase order information related to the ownership change from the consignment process.
- **Products received from consignment inventory** - Shows information about the items and quantities that have product receipts updated during the ownership change process.
- **On-hand consignment inventory** - Shows information about the consignment items that they are expected to deliver, and the items that are already physically available at the customer site.

Inventory owners

In order to record physical inbound consignment inventory, you need to define a vendor owner. This is done on the **Inventory owner** page. When you select a **Vendor account** this generates default values for the **Name** and **Owner** fields. The value in the **Owner** field will be visible to the vendor, so you might want to change it if your vendor account names aren't easy for external people to recognize. It's possible to edit the **Owner** field, but only up to the point when you save the **Inventory owner** record. The **Name** field is populated with the name of the party that the vendor account is associated with, and this cannot be changed.

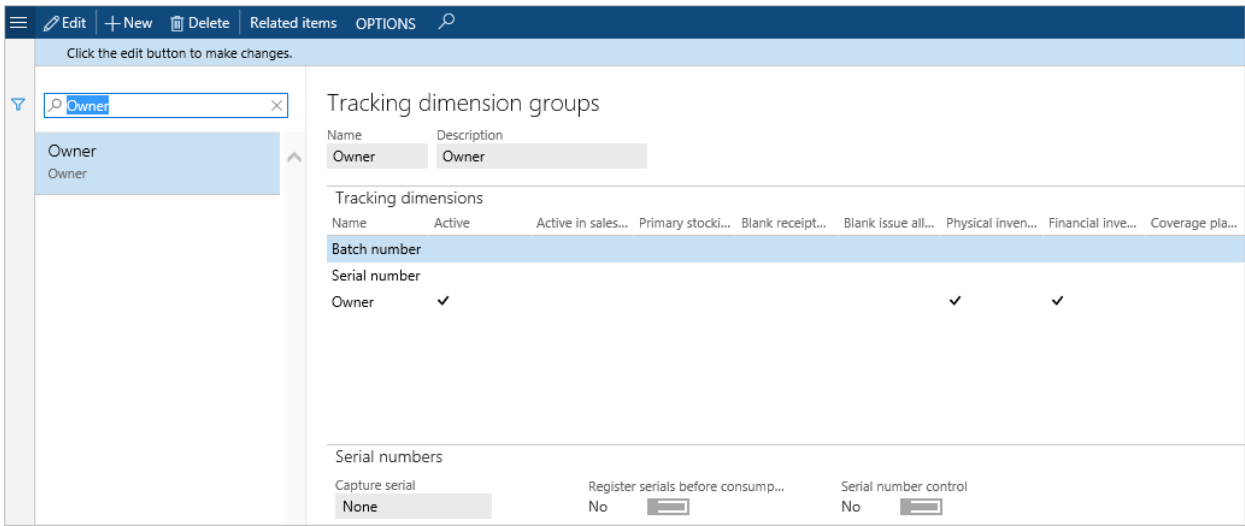
Inventory owners

Filter

Vendor account	Name	Owner ↑
US-103	Rain Projectors	US-103
1001	Acme Office Supplies	1001
US-101	Fabrikam Electronics	US-101
US-104	Fabrikam Supplier	US-104
	Contoso Entertainment System...	USMF

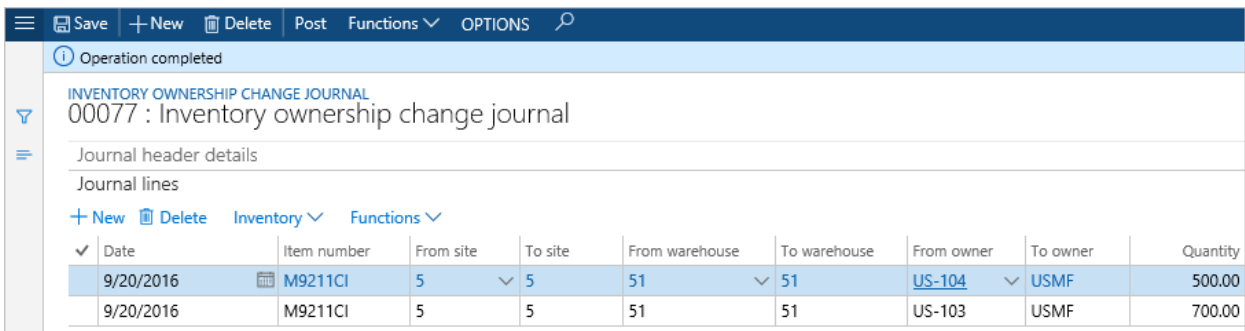
Tracking dimension group

Items that are going to be used in consignment processes must be associated with a **Tracking dimension group** where the **Owner** dimension is set to **Active**. The **Owner** dimension always has the **Physical inventory** and **Financial inventory** options selected. The **Coverage plan by dimension** is never selected.



Inventory ownership change journal

The **Inventory ownership change** journal is used to record the transfer of ownership of consignment inventory from the vendor to the legal entity that's consuming it. Like any inventory journal, it must be identified with an Inventory journal name. These names are created on the **Inventory journal names** page, and the **Journal type** must be set to **Ownership change**.



Vendor collaboration in consignment processes

If your vendors are using the vendor collaboration interface, they can use this to monitor the consumption of inventory at your site. For more information about setting up vendors to use vendor collaboration, see [Vendor portal user security](#).

NOTE

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Change the ownership of consignment inventory based on production demand

2/18/2021 • 2 minutes to read • [Edit Online](#)

This procedure shows how to change the owner of consignment inventory from the vendor to your legal entity when there is demand for the inventory in production. This change of ownership is done by creating and posting an inventory ownership change journal. The ownership change journal lines can be created manually or, as shown in this recording, based on existing production demand. Typically, a shop floor supervisor performs this task. You can use this procedure in the USMF demo data company or on your own data. If you're using your own data, make sure that you have the following prerequisites: an inventory journal name that has been set up for inventory ownership change, physically recorded vendor-owned on-hand items, and one or more production order lines for the material. This procedure is for a feature that was added in Dynamics 365 for Operations, version 1611.

NOTE

Outbound consignment processes are not supported out-of-the-box and automatic ownership journal processing is not supported.

Create an inventory ownership journal

1. Go to Inventory management > Journal entries > Items > Inventory ownership change.
2. Click New.
 - The inventory ownership change journal is used to change the owner of consignment inventory from the vendor to the current legal entity. This change of ownership is done by releasing the on-hand inventory that is owned by the vendor and then receiving that inventory in the current legal entity.
3. In the Name field, enter or select a value.
 - You can select only inventory journal names that have a journal type of Ownership change.
4. Click OK.
5. Click Functions.
6. Click Create journal lines from production orders.
 - You can start the change of ownership process by querying all the production lines that have demand for consumption of raw material.
7. In the Inventory issue statuses to include field, select an option.
 - This option lets you filter by the issue status of the inventory transactions. For example, you can create journal lines for inventory that has the Picked and Reserved physical statuses.
8. Expand the Records to include section.
 - This section lets you apply additional filtering. For example, you can select a specific raw material date.
9. Click OK.

Post the inventory ownership change journal

1. Click Post.
 - When the journal is posted, the vendor-owned inventory is released by using an "Ownership change" reference. The inventory is then received as on-hand by using an inventory transaction that is updated with a purchase order product receipt. Note that only transactions that are related to the posted

journal are created. No expected inventory transactions are created.

2. Click OK.
3. Close the page.

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Create a consignment replenishment order

2/18/2021 • 2 minutes to read • [Edit Online](#)

This topic explains how to create a consignment replenishment order where you can track the expected delivery from a vendor into your consignment inventory. It also shows how to record a receipt of products so that the consignment inventory is registered as on-hand inventory owned by the vendor. This procedure would typically be done by a procurement professional. You can use this guide in demo data company USMF. This procedure is for a feature that was added in Dynamics 365 for Operations, version 1611.

Create a consignment replenishment order

1. In the navigation pane, go to **Modules > Procurement and sourcing > Consignment > Consignment replenishment orders**.
2. Select **New**.
3. In the **Vendor account** field, select vendor **US-104** (you must select a vendor that's registered as an owner in the **inventory owners** page).
4. Select **OK**.
5. Select **Add line**.
6. In the **Item number** field, type (you must select an item that is set up for consignment inventory).
7. In the **Quantity** field, enter a number.
8. In the **Requested delivery date** field, enter a date. The requested and confirmed dates are used by the MRP engine for the expected arrival of the goods.
9. In the **Confirmed delivery date** field, enter a date.
10. Expand the **Line details** section.
11. Select the **Inventory dimensions** tab.
12. To show the owner in the **Inventory dimensions owner** field, refresh the page. Vendor US-104 is now listed as the owner.

Check the inventory transaction status

1. Select **Inventory**.
2. Select **Transactions**.
3. In the desired row, notice that the **Receipt** field is set to **Ordered**.
4. Close the page.

Receive items

1. Select **Product receipt**.
2. In the **External product receipt** field, type a value.
3. In the **Quantity** field, enter a number that's lower than the number that's shown there.
4. Select **OK**.

Check the on-hand inventory

1. Select **Inventory**.
2. Select **On-hand**.
3. Select **Overview**. The items that have been received as consignment inventory owned by the vendor are

available on-hand. The remaining quantity on the consignment replenishment order is shown in the **Ordered in total** field.

4. Close the page.

NOTE

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Monitor consignment inventory using vendor collaboration

2/18/2021 • 2 minutes to read • [Edit Online](#)

This procedure shows how to use vendor collaboration to see information about the stock level of product that you have placed in consignment with a customer. You can also monitor the consumption of the stock when the customer takes ownership of the inventory. You can use this procedure in the USMF demo data company. This procedure is for a feature that was added in Dynamics 365 for Operations, version 1611.

View consumed inventory

1. Go to Vendor collaboration > Consignment inventory > Products received from consignment inventory.
 - The list shows the product receipt lines that were generated when ownership of the consignment inventory was changed from the vendor to the customer. You might have to scroll to the right to see quantities and other information. You can use the information in this list to generate invoices for your customer. You can also export the data to Microsoft Excel.
2. Click View purchase order.
3. Expand the Line details section.
 - The line is marked as Consignment, and the header section shows that the purchase order has a status of Received.
4. Close the page.

View on-hand inventory

1. Go to Vendor collaboration > Consignment inventory > On-hand consignment inventory.
 - The On-hand consignment inventory page shows the stock that you own at the customer's warehouse. You can show additional dimensions, such as the site and warehouse, by clicking the Display dimensions tab.

NOTE

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Item and raw material tracing in inventory, production, and sales

2/18/2021 • 10 minutes to read • [Edit Online](#)

This topic describes how you can use item tracing to identify where items or raw materials have been used, are being used, or will be used in production and sales processes.

Item tracing functionality is available on the **Item tracing** page. The following sections describe how you can use item tracing, and what the options and limitations are.

What is item tracing?

Item tracing is a business intelligence (BI) tool that provides visibility into the source and destination of items and raw materials in the supply chain. Manufacturers can trace items, raw materials, or ingredients back to the vendor, and forward through the production and sale of the finished product. Item tracing helps manufacturers comply with regulatory requirements, and also helps quality officers and production managers analyze and take action to address variances in the quality of products and materials. Here are some examples of the ways that manufacturers can use item tracing:

- Identify the amount of an item or raw material that is currently in inventory, and where it's stored.
- Determine how much of the item or raw material has been shipped, and which customers it was shipped to.
- Identify any planned shipments that include the item or raw material.
- Locate production orders that use the item or raw material, and that are planned, in progress, or reported as finished.
- Find out where the item or raw material was purchased.
- Investigate where an item or raw material was consumed in the production of another item.

What can I trace, and are there any limitations?

You can trace historical inventory transactions for items and raw materials, based on an item number and a tracking dimension, such as a serial number, batch number, or vendor batch number. You can trace an item or raw material only if a tracking dimension is assigned to it. Because tracing is based on inventory transactions, there are some limitations when you trace items. For example, there are limitations that are related to transactions for projects, fixed assets, and commerce. Additionally, co-products are shown in the trace details, but by-products aren't included. The trace includes all warehouse transactions from one location to another. Therefore, users might find the amount of information overwhelming. The trace is displayed for one legal entity at a time. There are no cross-company capabilities in an intercompany context. You must start a new trace for each company where an item is received or issued.

What criteria can I specify for an item trace?

The criteria that are required for an item trace are the item number, a tracking dimension (such as a batch number or serial number), and the direction. The following table describes the criteria that you can use in an item trace.

FIELD GROUP	DESCRIPTION
-------------	-------------

FIELD GROUP	DESCRIPTION
Item number	Enter the identifier for the item or raw material that you're tracing.
Product dimensions	Optional: Trace specific aspects of the product definition, such as a configuration, size, color, or style.
Tracking dimensions	Enter a batch number, vendor batch number, or serial number tracking dimension. When you use the batch number as a criterion, the vendor batch number is displayed if you've captured that information.
Storage dimensions	Optional: Trace items that have been stored in a specific location.
Period	Optional: Enter dates to limit the trace to a specific period. The trace details will show only documents and transactions that were created between these dates.
Forward or backward	Select the direction for the trace. You can trace forward or backward: <ul style="list-style-type: none"> • Backward – Trace downstream to identify the source, the quantity that remains on hand, and any production orders that are at least partially reported as finished. • Forward – Trace upstream to identify the destination. You can find the sales orders, and the customers that the traced item or raw material has been at least partially shipped to.

What information is included in the trace details?

The results of a trace appear in chronological order in the tree on the **Details** FastTab of the **Item tracing** page. The order varies, depending on the trace direction. The details include all transactions from the purchase of the item from the vendor to the sale of the item to the customer. Trace results also include interim products that are related to the item or the tracking dimension that was specified in the trace criteria. The top node shows the quantity of the item, in the inventory unit, that remains on hand, based on the storage dimensions that were specified in the trace criteria. **Note:** The trace details provide a snapshot of the information that was available when the trace was done. The trace details aren't updated if the information changes after the trace is done.

Why don't some nodes contain any details?

To reduce the amount of information in the trace details, only the node for the first instance of the item or raw material includes details. If a selected node doesn't contain details, you can view the node that does contain details by clicking **Go to traced line**. You can then return to the node that you left by clicking **Go back**.

Can I view only a particular type of document? For example, can I view only production orders, customers, or vendors?

Yes, from the trace details, you can open list pages that include only a particular type of document or transaction. You can access these pages from the **Tracing** menu item on the Action Pane, in the **Item**, **Sales**, **Purchase**, **Production**, and **Quality** groups. For example, to view a list of the vendors in the trace details, click **Tracing > Purchase > Vendors**. The list pages summarize the documents or transactions from the trace

details. The **Pending transactions**, **Pending orders**, and **Not shipped sales orders** list pages also show other information that isn't included in the trace details. Additionally, they always show results as of the current date, even if a date range was specified. The following table describes the additional details that these pages can include.

LISTS	DESCRIPTION
Not shipped sales orders	View sales order lines that haven't been picked, and that therefore aren't shown in the trace details.
Pending orders	View all pending production orders for the traced item, regardless of the tracking dimensions that were used in the trace criteria. You can also view pending production orders where the traced item is an ingredient, and where no registrations have been made and no transactions are reported as finished for the order.
Pending transactions	View pending inventory transactions for the traced item that includes the specified tracking dimensions or a blank tracking dimension. You can also view pending inventory transactions for items and tracking dimension combinations, or a blank value, in the trace details.

How many levels can I trace up or down in a BOM or formula?

You can trace one level up or down in a bill of materials (BOM) or formula. For example, if you run a trace on raw materials, you can see the finished product and any co-products. However, if you trace a co-product, the trace details don't include the finished product.

How can I view more details about a document or transaction in the trace details?

On the **Details** FastTab, there are two ways to view more information about a selected document or transaction in the trace details:

- When you select a node in the trace details on the **Details** FastTab, the other FastTabs on the page display information about the document or transaction in the node.
- Open the details page for the document in a selected node by clicking **View details**. For example, if you select a node that describes a production order, and you click **View details**, the **Production orders details** page appears.

Some FastTabs give you access to additional information about the selected node. For example, on the **Non conformances** FastTab, you can click **Inquiries** to investigate whether there is a history of non-conformance. On the **Batch** FastTab, you can click **On-hand list** to view the amount of physical inventory that is currently on hand and any inventory transactions that involve the batch.

Can I run more than one trace and then compare the details?

After you run the trace, you can use the following options on the **Trace from node** button to run a new trace on the transaction in the selected node:

- **Backward** or **Forward** – Start a new trace for the selected node, and overwrite the details of the current trace.
- **New backward** or **New forward** – Start a new trace in a new window, and keep the details of the current trace.

If you want to use the **New backward** or **New forward** option, you must use the **Open in a new window** functionality to have a new trace appear in a new window.

Can I save the trace details?

You can save the information on the **Details** tab as an XML file by clicking **Export** below the *Tracing* action on the Action Pane. In addition to the trace details, the XML file includes the trace criteria, parent node, and on-hand quantity. The capability to save the details of a trace is useful if, for example, you want to attach the information to a quality order or other compliance documentation. You can specify where the file is saved. To view the file immediately, select the **Show document** option. **Note:** The file is always saved, even if you only want to view it. By default, the XML file opens in a browser window. However, you can right-click the file, select **Open with**, and then select the program to use to display the contents.

Can I calculate a balance for a particular item or ingredient?

You can export the information from the summary pages to Microsoft Excel. Open the relevant page, click the **Open in Microsoft Office** icon, and then select **Export to Microsoft Excel**. This functionality is especially useful when you want to calculate a mass balance for an item or ingredient from the **Transactions summary** page. On the **Transactions summary** page, you can filter on the item or ingredient, and optionally on the batch, and then export the information to Excel. In Excel, you can isolate, for example, the on-hand quantity, the quantity that was sold, and the amount that was used in production.

Can I investigate whether there is a history of issues with items or raw materials?

The trace details include information about quality orders and nonconformances that involve the item or raw material. To view a summary of quality orders and nonconformances, click **Quality orders** or **Non conformances** on the Action Pane. **Note:** Destructive quality orders can appear more than one time in the trace details. When a destructive quality order is created for a document, such as a purchase order, it appears for each transaction for that document.

Are there any reporting capabilities that are related to item tracing?

You can generate the **Shipped to customers** report to identify the amount of the item or raw material that has been shipped and the customers that it was shipped to. For an inquiry that is related to compliance, you can generate the report for all customers. For an inquiry that is related to customer service, you can generate the report for a selected customer. If the product was a raw material that was used in the production of a finished item, the finished item is also included. **Note:** If you're using the features for deleting or archiving sales orders, the report results also include any sales orders that have been deleted or archived.

Can I trace coproducts and byproducts?

You can trace co-products, but you can't trace a by-product, because tracking dimensions aren't typically assigned to by-products. When you trace an item, the trace details include any related co-products. A node that contains a co-product includes the word "co-product" in the details. You can also view details about a co-product by selecting the node in the trace details and then clicking the **Production** FastTab.

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Trace an item or raw material

2/18/2021 • 2 minutes to read • [Edit Online](#)

This procedure demonstrates how to use item tracing to identify where items or raw materials have been used or are being used. With this procedure, you can identify an item, trace it back to the source, and then trace forward through the production and sale of the finished product. The process can be used to investigate the customers impacted, the sales orders affected, and more. This procedure uses demo data company USP2.

Trace an item backwards using a known batch number

1. In the **Navigation pane**, go to **Modules > Inventory management > Inquiries and reports > Tracking dimensions > Item tracing**.
2. In the **Item number** field, select 'P9100'.
3. In the list, click the link in the selected row.
4. In the **Forward or backward** field, select 'Backward'.
5. In the **Batch number** field, select 'as-12-344-01'.
6. In the list, click the link in the selected row.
7. Click **OK**.

Identify an item, trace it forward, and make an analysis

The top node of the tree represents the on hand quantity of the selected item and batch. You need to expand the nodes of the tree to find the item that the forward trace should be executed on.

1. In the tree, expand 'the nodes described below, and then select the last node'.

Expand: 'P9100 / 1 / 10 / as-12-344-01 ● 2 keg ● 7.00 gal \P9100 ● Picked ● Sales order 000072 ● 12/22/2015 ● -1 keg ● -4.00 gal ● Site=1, Warehouse=10, Batch number=as-12-344-01 \P9100 ● Production B-000050 ● 12/9/2015 ● 7 keg ● 27.00 gal ● Site=1, Warehouse=10, Batch number=as-12-344-01 ● Co-products: P9101' and then select that node.

2. In the tree, expand 'the node described below and then select that node'.

Starting from the node that you've just selected, expand 'M9103 ● Production line B-000050 ● 12/9/2015 ● -160.00 lb ● Size=70, Color=OK, Site=1, Warehouse=10, Batch number=App01' and then select that node.

3. Click **Trace from node**.
4. Click **Forward**.
5. On the **Action Pane**, click **Tracing**.

There are several tracing options which provide information about the customers impacted by the item that you're tracing, and the sales orders related to the item which have and haven't been shipped.

6. Click **Customers**.
7. Close the page.
8. On the **Action Pane**, click **Tracing**.
9. Click **Shipped sales orders**.

10. Close the page.

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Merge inventory batches

2/18/2021 • 8 minutes to read • [Edit Online](#)

This article provides information about how to consolidate two or more inventory batches into a merged batch.

When you merge batches, calculations can help optimize the characteristics and batch attributes of the merged batch. After you select the source batches, you can review and change the merged batch before you post it. You can also transfer the batch merge to an inventory journal for approval. Inventory can then be reserved or posted directly from that inventory journal. When you post a merged batch, the inventory is adjusted for the source batches and the merged batch.

Are there any prerequisites?

Yes, there are some things that you must set up before you can use the merge batch tools. The following table describes the prerequisites.

PAGE	DESCRIPTION
Journal names, inventory	You must create a journal name of the type BOM that is used by default when you post batch merges in inventory journals. Optional but recommended: You can specify that reservations should be made automatically when the batch merge is transferred to the inventory journal. Otherwise, there is a risk that the on-hand inventory might be changed after the batch merge details are set up and the journal is posted. To enable automatic reservations for the journal name, select Automatic in the Reservation field.
Inventory and warehouse management parameters	You must specify the default journal name for the inventory journal.

PAGE	DESCRIPTION
Released products	<p>Here are the recommended settings for the item:</p> <ul style="list-style-type: none"> • To automatically generate batch numbers for merged batches, you must assign the released product to a batch number group. You can also enter a batch number manually when you create a merged batch, or select an existing batch number. If you select an existing batch number, make sure that the selected batch hasn't been included in any inventory transactions. • If you're using shelf life or best-before dates for the released product, the dates for a merged batch are calculated based on the selection in the Batch merge date calculation field. The following options are available: <ul style="list-style-type: none"> ◦ Earliest – The calculation is based on the earliest date that is specified for a source batch that is selected for the batch merge. ◦ Latest – The calculation is based on the latest date that is specified for a source batch that is selected for the batch merge. ◦ Manual – No calculation is done. If a date is the same on all source batches, a date is suggested. You can change that date. If a date isn't the same on the source batches, you can manually enter the date.
Batch number group	Optional: To generate a batch number when you create a merged batch, you must assign a batch number group to the released product. Otherwise, you can enter a batch number manually.

When might I want to merge batches of inventory?

Here are some examples of scenarios where it might be useful to merge batches:

- As Sammy is walking through his warehouse, he notices that several batches of the same item have low quantities. He is expecting to receive several new shipments, and he realizes that he can free some floor space by merging the odd quantities into a new batch.
- Sammy is receiving inventory, and he wants to combine the new batch with one that he has already received, to improve the batch attribute value of the existing batch. By doing so you create a new batch.

Can I merge batches across sites and legal entities?

No, you can merge only batches that have the same site and warehouse storage dimensions in one legal entity. However, you can specify a different location and pallet ID for the merged batch.

Can I merge partial quantities?

No, you can merge only the full quantity of batches. The batch merge functionality is intended as an inventory feature, not a production feature.

What if the batches have different batch attribute values?

When you select the source batches to combine in the merged batch, Supply Chain Management verifies whether all the batches have the characteristics or attribute values. When an attribute value is the same, a value

is suggested for the merged batch. You can change that value. Attribute values that aren't the same are left blank for the merged batch, and you can enter those values manually. If the batch attribute type for the attribute value is an integer or a fraction, and the values aren't the same for all the source batches, the value is calculated by using a weighted average calculation. The calculated value is rounded up or down to the nearest increment. If the value is blank for a source batch, the batch and its quantity aren't included in the calculation. **Example** The following example shows a weighted average calculation for a merged batch. Two of the source batches have a blank value for a batch attribute type that is an integer. The following attribute is assigned to the source batches.

ATTRIBUTE	MINIMUM	INCREMENT	MAXIMUM
Grade	3	3	30

The source batches have the following attribute values for the **Grade batch** attribute.

BATCH	QUANTITY	ATTRIBUTE	ATTRIBUTE VALUE
B1	10	Grade	Blank
B2	15	Grade	15
B3	20	Grade	20
B4	25	Grade	Blank
B5	30	Grade	25

When you add these batches as source batches, the following values are assigned to the merged batch.

BATCH	QUANTITY	ATTRIBUTE	ATTRIBUTE VALUE
B6	100	Grade	21

The values and quantities for batches B1 and B4 aren't included in the weighted average calculation. Therefore, here is how the value for the merged batch is calculated.

VALUE	QUANTITY (WEIGHT)	RELATIVE WEIGHT	RELATIVE WEIGHT × VALUE
15	15	0.230769231	3.461538462
20	20	0.307692308	6.153846154
25	30	0.461538462	11.53846154
	Total: 65, which is the sum of the weights		Total: 21.5384615, which is rounded to 21 (the nearest increment)

What if the batches have different batch dates?

If the batches have different batch dates, some of the dates are calculated based on the values in the **Batch dates** group on the **Merged batch** FastTab of the **Batch merge** page. The system calculates values for the fields in the **Batch dates** group. These values include the manufacturing date, expiration date, shelf advice date, and best-before date. The dates are calculated based on settings for the item in the **Item data** field group of the

Released product details page. You can change the values or enter them manually. For all other dates, no calculation is done. The same principle is used for batch attribute values. If a date is the same for all the source batches, that date is suggested for the merged batch. If the date isn't the same for all source batches, the date is blank on the merged batch, and you can enter it manually.

What if the dimensions are different on the batches that I want to merge?

Here is how product dimensions, tracking dimensions, and storage dimensions are handled:

- **Product dimensions** – All product dimensions for the selected item must be the same. You can't merge batches across product dimensions.
- **Tracking dimensions** – A new batch number is automatically generated if a batch number group is specified for the item. If a batch number group isn't assigned to an item, you can select an existing batch or enter the number manually. Serial numbers are transferred from the source batch to the inventory journal lines for the merged batch.
- **Storage dimensions** – The site and warehouse storage dimensions must be the same for all the source batches and the merged batch. However, you can specify a new location and pallet ID for the merged batch.

How does posting work?

Posting works in two ways, depending on whether you use an approval process for journals. You can use the **Transfer to journal** and **Post the batch merge** actions to transfer the batch merge to a journal where it can be verified and posted, or you can post the batch merge directly. The main difference between the two actions is that a transfer to a journal doesn't post the batch merge. Both actions create a new batch if an existing batch isn't selected, update all batch details and attribute values, and create an inventory journal.

- **Transfer to journal** – Transfer the batch merge details to a new inventory journal. If you've set up automatic reservations, the quantities in the source batches are reserved. The details of the batch merge can't be changed. To modify the batch merge, you must delete the journal. The journal can be used as a task that another employee must perform later. The reservation of the batch quantity to the journal line is secured. This allocation lets a quality planner or a warehouse manager create tasks for his or her employees.
- **Post the batch merge** – Post the batch merge directly. This action can be performed after the physical merge has occurred.

You can approve the inventory journal for the batch merge from the **All batch merges** list page. Click **Journal > Post**. After a journal is posted, you can't change the details in the merged batch. After you transfer a batch merge to an inventory journal, you can change the details only if the journal is deleted.

After I merged a catchweight item, why can't I see the catchweight information in the inventory journal?

You can merge batches of catch-weight items just like all other items. However, the catch-weight information doesn't appear in the inventory journal. We recommend that you verify the catch-weight information before you transfer the batch merge to the inventory journal.

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Correct inventory tracking information

2/18/2021 • 2 minutes to read • [Edit Online](#)

This procedure walks you through the process of creating and posting an inventory transfer journal in order to correct inventory tracking information. In this example, we'll update the information of a batch controlled item by changing an incorrectly registered batch to another batch. You can walk through this procedure in demo data company USPI, or using your own data. If you use your own data, you need to have an item that's batch-enabled, and it must not be location-controlled. You also need to have an inventory journal name set up for inventory transfers. These tasks would normally be carried out by a warehouse employee.

Create an inventory transfer journal

1. Go to Transfer.
2. Click New.
3. In the Name field, enter or select a value.
4. Click OK.

Create journal lines

1. Click New.
2. In the Item number field, enter or select a value.
 - If you are using USPI, select item M5003.
3. In the Quantity field, enter a number.
4. Click the Inventory dimensions tab.
5. In the Batch number field, enter or select a value.
6. In the Site field, enter or select a value.
7. In the Warehouse field, enter or select a value.
8. In the Batch number field, enter or select a value.

Post the journal

1. Click Post.
2. Click OK.

Check tracing information

1. Click Inventory.
2. Click Trace.
3. Click OK.
 - Using this tracing information you can back trace which batch you corrected inventory from. You can also use the Item tracing page to see this information.
4. Close the page.

Check inventory transactions

1. Click Inventory.
2. Click Transactions.

- Here you can see the transactions that were created when you posted your journal.

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Working with serialized items

2/18/2021 • 6 minutes to read • [Edit Online](#)

This topic explains how you can register serial numbers on packing slips or invoices during the sales process. This functionality is useful if a company wants to capture serial numbers for service and warranty purposes, but doesn't have to maintain serial numbers in inventory from receipt to issue.

Many companies just want to capture serial numbers for service and warranty purposes, and don't have to maintain serial numbers in inventory from receipt to issue. In these scenarios, you can register the serial numbers on the packing slips or invoices when products are sold. If products are later returned, you can trace each product to an invoice to determine whether you sold the product, and whether the service or warranty obligations are valid.

You must enable serial numbers for the sales process by selecting the **Active in sales process** option on the **Tracking dimension groups** page. The following events then occur in Supply Chain Management:

- On the **Serial numbers** FastTab, the **Serial number control** option is selected. When this option is selected, you must register one serial number for each item on the packing slip or invoice.
- All selections on the tracking dimension group for serial numbers are cleared, except the **Blank issue allowed** option. You can select the **Blank issue allowed** option to override the serial number control, and allow products to be packed and invoiced without registering serial numbers.

When do I register serial numbers during the sales process?

You can register serial numbers either on the packing slip for a sales order or on the invoice. When you prepare an invoice for a serialized item that was shipped together with a packing slip, you can select which serial numbers on the packing slip to invoice. The number of registered serial numbers must not exceed the quantity of items that were shipped. If you're creating a partial invoice, you can select fewer serialized items than were registered on the packing slip. When you print a packing slip or an invoice, the serial numbers that were registered are included.

Can I enter serial numbers by scanning them, or do I have to type them?

You can either scan or type serial numbers. When you use a scanner, the scan mode determines whether the serial numbers are added to or removed from the list of serial numbers on the invoice or packing slip. If you want to scan serial numbers by using, for example, a hand-held bar code scanner, configure the scanner to send an Enter or TAB command after the serial number. This command will indicate the end of the data stream. Otherwise, you must press Enter or TAB on the keyboard after you scan each serial number.

If I enable serial numbers for the sales process, do I have to register all serial numbers for all items?

The setup of the tracking dimension group that is assigned to the product determines whether serial numbers must be registered for all items on a packing slip or invoice. When you enable serial numbers for the sales process, the **Serial number control** option is automatically selected. You must then register one serial number, or register a blank registration for an unreadable number, for each item on the packing slip or invoice. If you don't want to require a serial number for each item, select the **Blank issue allowed** option on the tracking dimension group that is assigned to the item. You can then register fewer serial numbers than the quantity of items that are being shipped. If you register more serial numbers than the quantity of items that are being

shipped, you won't be able to post the packing slip or invoice.

Can I register serial numbers for partial invoices and partial shipments?

You can create partial invoices and packing slips for sales orders, and register only the serial numbers for the items that those invoices and packing slips include. If you want to create a partial invoice, and you have more than one packing slip for the sales order, you can include serial numbers from more than one packing slip. However, there can be only one packing slip that doesn't include all serial numbers. For example, if you have three packing slips, and each packing slip includes two serialized items, you can't create a partial invoice for one item from each packing slip.

What do I do when a serial number isn't readable?

If a serial number can't be read or scanned, you can create a blank line for the item by clicking **Not readable** on the **Serial numbers** page. If the serial number becomes available later, you can update the invoice or packing slip. For more information, see the next section, "Can I correct or change the serial numbers I have registered for a sales order?"

Can I correct or change the serial numbers that I have registered for a sales order?

Yes, you can correct serial numbers if the following conditions are met:

- **Invoices** – You can change the serial numbers for items that you haven't yet invoiced. The packing slip is then also updated. However, if a sales order line was corrected by registering a negative quantity, you can't change serial numbers for the sales order line.
- **Packing slips** – You can't partially correct a packing slip line that contains serialized items. You must reverse the full quantity for the line. If a packing slip has been canceled or corrected, you don't have to register the reversed serial numbers again when you create a new packing slip for the same serialized items. The numbers that were registered will be used.

Can I view the serial numbers that were shipped together with a specific packing slip, or that were included on an invoice?

Yes, you can run an inquiry on the packing slip journal line or invoice journal line to view a list of all serial numbers that were included in the document.

Can I view the serialized items that I have on hand?

No, you can't view the serialized items that you have on hand, because serial numbers aren't registered for items until the items are sold.

Can I register serial numbers for catchweight items?

No, you can't register serial numbers for catch-weight items during the sales process. Additionally, if a product is set up as a catch-weight item, you can't assign the product to a tracking dimension group that is set up to use serial numbers only during the sales process.

Can I register serial numbers at the retail POS?

Yes, the retail point of sale (POS) will prompt the user to enter a serial number when the user sells an item that is assigned a tracking dimension group that is set up to use serial numbers only during the sales process.

What security roles are required in order to register serial numbers during the sales process?

This functionality is available to all roles that can maintain sales packing slips and sales invoices. The following duties let workers correct serial numbers, and register blank entries for serial numbers that can't be read or scanned:

- Maintain serial number corrections
- Maintain registration of non-readable serial numbers

NOTE

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Inventory on-hand mobile workspace

2/18/2021 • 3 minutes to read • [Edit Online](#)

This topic provides information about the **Inventory on-hand** mobile workspace. This workspace helps you gain insights into reserved and available inventory anytime and anywhere.

This mobile workspace is intended to be used with the Finance and Operations mobile app.

Overview

Typically, companies have multiple shipments and multiple receipts of inventory every day. These movements constantly change the on-hand inventory status. The **Inventory on-hand** mobile workspace lets you see the cross-company on-hand inventory status, so that you can gain the latest insights into inventory data on the mobile device of your choice. Regardless of whether you work in the warehouse, purchasing, sales, manufacturing, or management, or have other roles, you can access on-hand inventory data anytime and anywhere.

The mobile workspace provides an instant view of the on-hand status across facilities. It lets you view on-hand inventory across facilities, current material reservations, and unreserved on-hand inventory. You can also enter item numbers to query on-hand inventory, and can do a filtered search for on-hand products or variants.

Specifically, the mobile workspace provides these features:

- You can search by product number or product name to find products to view the on-hand inventory status for.
- For the selected products, you can view the following information:
 - On-hand inventory per site
 - On-hand inventory per warehouse
 - On-hand inventory per location
 - On-hand inventory per batch (for batch-controlled products)
 - On-hand inventory per inventory status
- Product on-hand inventory is shown in the following ways:
 - By physical inventory (This view represents the total amount.)
 - By physical reserved (This view represents the reserved amount.)
 - By available physical (This view represents available amount that has no reservations.)

Prerequisites

The prerequisites differ, based on the version of Supply Chain Management that has been deployed for your organization.

Prerequisites if you use Supply Chain Management

If Supply Chain Management has been deployed for your organization, the system administrator must publish the **Inventory on-hand** mobile workspace. For instructions, see [Publish a mobile workspace](#).

Prerequisites if you use Platform update 3 or later

If Platform update 3 or later has been deployed for your organization, the system administrator must complete the following prerequisites.

PREREQUISITE	ROLE	DESCRIPTION
Implement KB 4013633.	System administrator	KB 4013633 is an X++ update or metadata hotfix that contains the Inventory on-hand mobile workspace. To implement KB 4013633, your system administrator must follow these steps. <ol style="list-style-type: none"> 1. Download the metadata hotfix from Microsoft Dynamics Lifecycle Services (LCS). 2. Install the metadata hotfix. 3. Create a deployable package that contains the SCMMobile model, and then upload the deployable package to LCS. 4. Apply the deployable package.
Publish the Inventory on-hand mobile workspace.	System administrator	See Publish a mobile workspace .

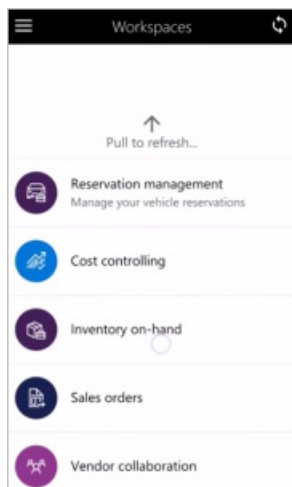
Download and install the mobile app

Download and install the Finance and Operations mobile app:

- [For Android phones](#)
- [For iPhones](#)

Sign in to the mobile app

1. Start the app on your mobile device.
2. Enter your Dynamics 365 URL.
3. The first time that you sign in, you're prompted for your user name and password. Enter your credentials.
4. After you sign in, the available workspaces for your company are shown. Note that if your system administrator publishes a new workspace later, you will have to refresh the list of mobile workspaces.



View the on-hand inventory for a product by using the Inventory on-hand mobile workspace

1. On your mobile device, select the **Inventory on-hand** workspace.
2. Select **Check on-hand for an item**. You see a list of the products that are loaded into your app for offline use. By default, 50 items are loaded, but a developer can change this number. For more information, developers should see [Mobile platform](#).
3. If your item isn't in the list, select **Search more**. Search by product number, or switch to a search by product name.
4. Select a product. If the item has an image, the image is shown.
5. Select one of the following options to view the status of on-hand inventory:
 - View on-hand per site
 - View on-hand per warehouse
 - View on-hand per location
 - View on-hand per batch (for batch-controlled products)
 - View on-hand per inventory status

Product on-hand inventory is shown in the following ways:

- By physical inventory (This view represents the total amount.)
- By physical reserved (This view represents the reserved amount.)
- By available physical (This view represents the available amount that has no reservations.)

NOTE

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Troubleshoot inventory operations

2/18/2021 • 7 minutes to read • [Edit Online](#)

This topic describes how to fix issues that you might encounter while you work with inventory operations.

I can't find the "Workflow" drop-down dialog box for inventory journals.

Issue description

You can't find the **Workflow** drop-down dialog box on the journal page, or related workflow operations aren't available.

This issue can occur for three reasons, as described in the following subsections.

Issue resolution 1

If the issue applies to all users, it might be occurring because the approval workflow hasn't been assigned to the journal name. To fix the issue, follow these steps.

1. Go to **Inventory Management > Setup > Journal names > Inventory**.
2. In the list pane, select a journal name to open its settings.
3. On the **General** FastTab, set the **Approval workflow** option to *Yes*. If you're prompted to confirm the change, select **Yes**.
4. In the **Workflow** field, select the workflow that you want to use for the selected journal name.

Issue resolution 2

If your workflow uses customized code, issues might occur after you upgrade the system. For example, in the journal workflow, the **Submit** button might be grayed out so you can't select it to approve a submission.

If the **Submit** button is grayed out, your workflow might have been customized, which means the method of the workflow, `canSubmitToWorkflow()` in `FormDataUtil`, has been extended. To fix this issue, change the way that you extend the method of the `canSubmitToWorkflow()` to use the structure in the following example.

```
[ExtensionOf(formStr(InventJournalMovement))]  
public final class InventJournalMovement_extension  
{  
    public boolean canSubmitToWorkflow()  
    {  
        boolean ret = YourLogicOfCanSubmitToWorkflow();  
  
        return ret;  
    }  
}
```

Issue resolution 3

If the issue applies only to a few specific users, those users might not have the security privileges that are required to run workflow operations on inventory journals. Verify that each affected user has the *Maintain inventory journal workflow* security privilege. By default, this privilege is assigned to a duty that has same name, and that duty is applied to the *Warehouse worker* and *Warehouse manager* roles.

My inventory journal remains in system-locked status, and the

workflow batch job doesn't work.

Issue description

One of your inventory journals is locked by some operation and isn't being released. For example, if an unknown error occurs during posting (which is a system lock operation), the journal might remain in system-locked status. In this case, the workflow work item handler will throw an error while it does lock validation.

Issue resolution

Sign in to the SQL Server instance for Supply Chain Management, and check whether

`InventJournalTable.SystemBlocked` is set to `1`. If it is, make sure that the journal should not be in locked status, and then reset `InventJournalTable.SystemBlocked` to `0`.

My inventory journal workflow is never completed, and the journal can't be edited or posted.

Issue description

After you submit a journal approval workflow, workflow processing stops responding, and you can't edit or process your journals.

Issue resolution

There are several reasons why workflow processing might not be completed. Check for the following issues:

- Go to **Inventory management > Setup > Inventory management workflows**, and review the configuration of the affected workflow. For more information, see [Inventory journal approval workflows](#).
- The workflow might be encountering an exception or error. Review the work item history of the affected workflow to see whether it includes an application error that terminates the workflow.
- The inventory journal can be updated or edited only if it's approved. If recall is active, you can try to recall the journal. Execution of the workflow batch job might be suspended for multiple reasons. Some of these reasons might be caused by the workflow framework issue.

Inventory journal workflow conditions apply only at the journal level, not at the line level

Issue description

You might experience this issue if, for example, you try to set up an inventory journal workflow condition on the cost amount. You set up the condition so that step 1 is run only when the cost amount is less than 100. You then set up another condition so that step 2 is run only when the cost amount is more than or equal to 100. Then, when the workflow is run, the workflow history shows only one line, and the first condition is always evaluated as *true*, regardless of the value that is submitted.

Issue workaround

In the current release, inventory workflow conditions apply only at the journal level, not at the line level. This behavior is by design. We recommend that you set your condition criteria only on journal-level attributes.

The filter pane on the On-hand list page doesn't filter results as I expect.

Issue description

The filters in the filter pane on the **On-hand list** page don't filter results as you expect.

Issue resolution

This behavior is by design.

The **On-hand** listpage is assembled from a detailed on-hand inventory table that includes all available dimensions. However, the list on this page is a summary. Therefore, it might combine rows from the source table by aggregating values according to the dimensions that are shown.

Filters that are set up in the filterpane apply to the source table, not to the aggregated list. This behavior can sometimes produce unexpected results, as shown in [these examples](#).

However, the [filters that are provided in the grid](#) do apply to the aggregated list. These filters include both the QuickFilter at the top of the grid and the filter for each column heading.

The unit and unit quantity aren't working correctly in the inventory journal.

Issue description

You might encounter one or both of the following issues when you work with units and quantities in an inventory journal:

- You don't see units or unit quantities in the inventory journal while a unit of conversion is set up for the released product, and you can't change the unit in the inventory journal.
- You see the **Quantity** and **Unit** fields in the inventory journal, but you don't see the **Unit quantity** field. If you change the unit, enter a quantity, and post the journal, the journal still shows the original unit of measurement for that quantity.

Issue resolution

To fix this issue, follow these steps.

1. In the **Feature management** workspace, make sure that the *Using unit of measure and unit quantity in inventory journals* feature is turned on. This feature adds the **Unit** and **Unit quantity** fields to the journal.
2. After the feature is turned on, use the **Quantity**, **Unit quantity**, and **Unit** fields in the following way:
 - **Quantity** – Specify the quantity by using the default unit that is defined for the released product. However, the default unit itself isn't shown here. If a conversion is set up between the default unit and the unit that is selected in the **Unit** field, the **Quantity** field is automatically updated, based on the selections in the **Unit quantity** and **Unit** fields.
 - **Unit quantity** – Specify the quantity by using the unit that is selected in the **Unit** field.
 - **Unit** – Select the unit to apply to the value in the **Unit quantity** field.

I receive the following error message: "Maximum number of decimals for the stock keeping unit is 0."

Issue description

When you try to post an inventory transaction or an inventory reservation, you receive the following error message: "Maximum number of decimals for the stock keeping unit is 0."

This issue occurs when the inventory transaction quantity is specified as a decimal value that is below the level of precision that the field supports. For example, a quantity of *0.5* has been specified for an inventory transaction, but only integer quantities are supported. Therefore, the value should be *1* instead of *0.5*.

Issue resolution

1. Run the following script on your SQL Server instance to round quantities in the inventory transactions. This script will correct values in the **inventTrans** table.

```
update it set it.QTY = round(it.qty, decimalPrecisionValue) from inventtrans it where
it.DATAAREAID='XXXX' and it.PARTITION=XXXXXX and it.qty <> round(it.qty, decimalPrecisionValue) and
exists (select 'x' from INVENTTABLEMODULE a, unitofmeasure b where a.unitid =b.SYMBOL and
a.partition=it.partition and a.PARTITION=b.PARTITION and MODULETYPE =0 and
b.DECIMALPRECISION=decimalPrecisionValue and a.DATAAREAID='XXXX' and a.ITEMID =it.ITEMID and
it.DATAAREAID=a.DATAAREAID)
```

2. Run an on-hand consistency check where the **fix error** option is turned on. This check will correct values in the **inventSum** table.

IMPORTANT

We strongly recommend that you carefully edit the script as required for your environment, test it in a test environment, and then check the resulting data before you run the script in a production environment.

NOTE

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Outbound process overview

2/18/2021 • 2 minutes to read • [Edit Online](#)

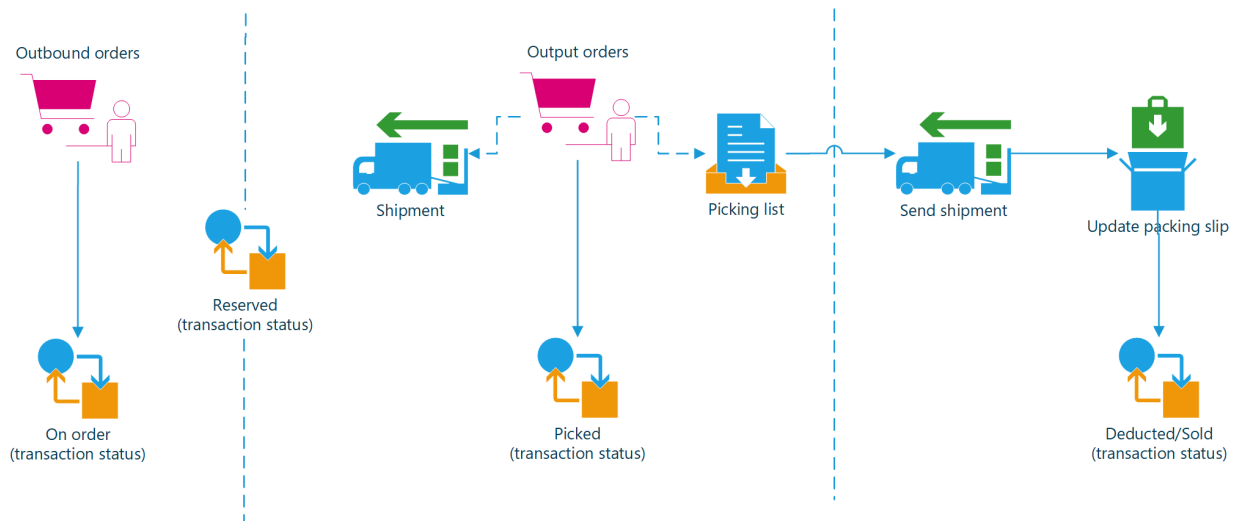
This topic provides an overview of the outbound process in Inventory management.

Output orders

Output orders are used to link sales order lines and transfer order lines with the outbound picking processes that use picking lists.

When picking lists are generated from either sales orders or transfer orders, output orders and shipments are automatically created. A picking list has a one-to-one relationship with a shipment. The transfer order shipment or the sales order packing slip can be processed from the shipment.

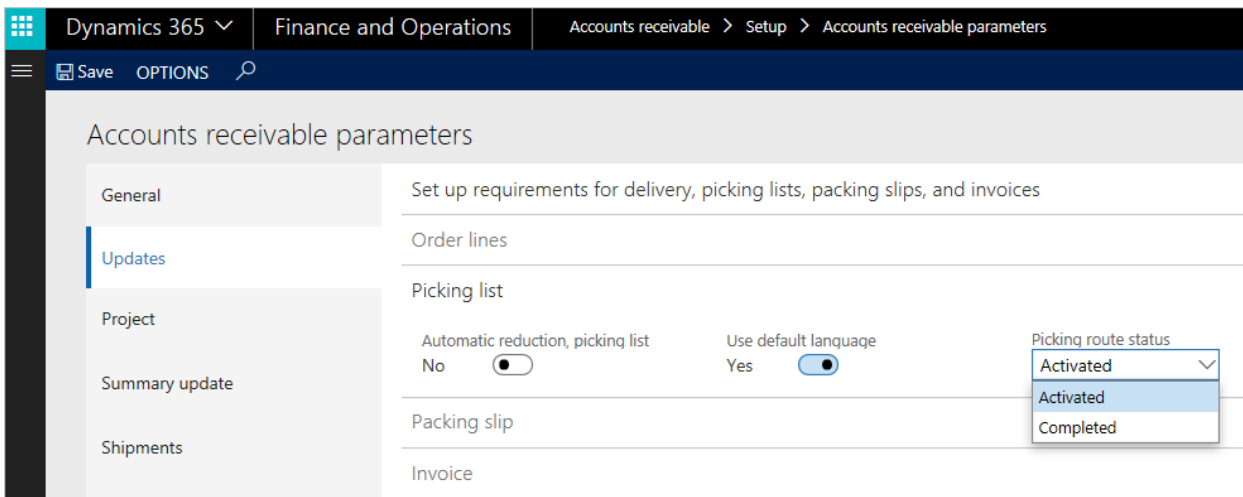
The following diagram shows an overview of the process for outbound orders.



You can set up outbound rules to define how the program should handle the outbound process. You can use these rules to control the shipment process. In particular, you can use the rules to control which stage in the process a shipment can be sent during. The following settings define how the outbound processes are handled.

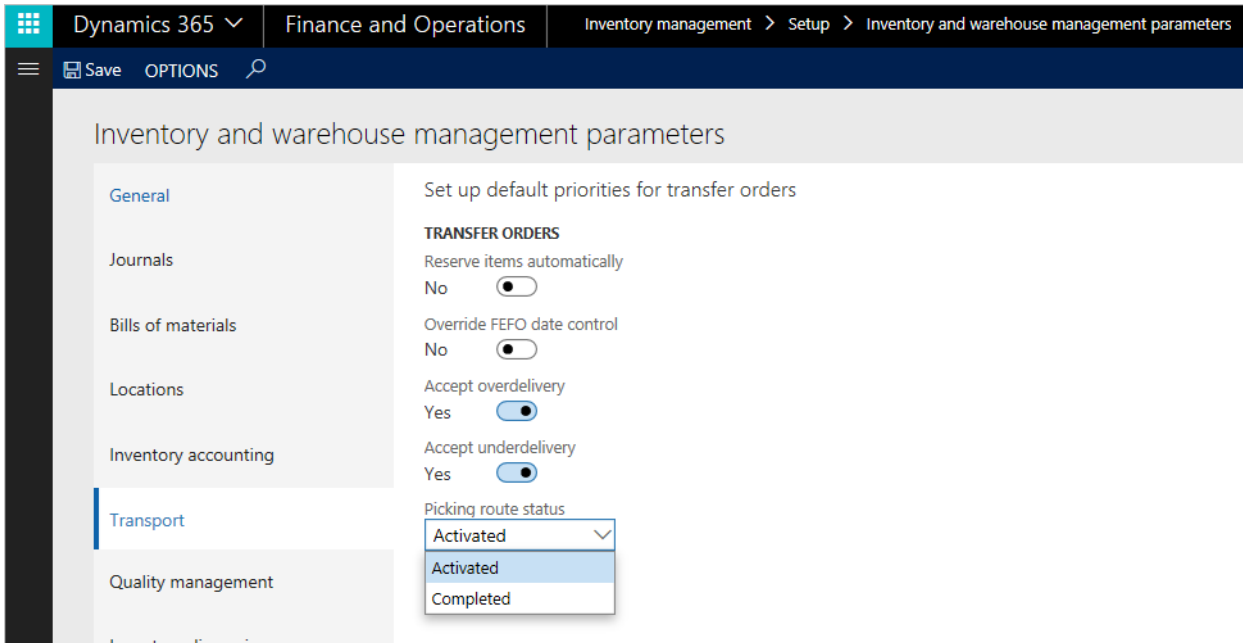
Picking route status for sales and transfer orders

Go to **Account receivable > Setup > Account receivable parameters**, and then, on the **Updates** tab, select a value in the **Picking route status** field.



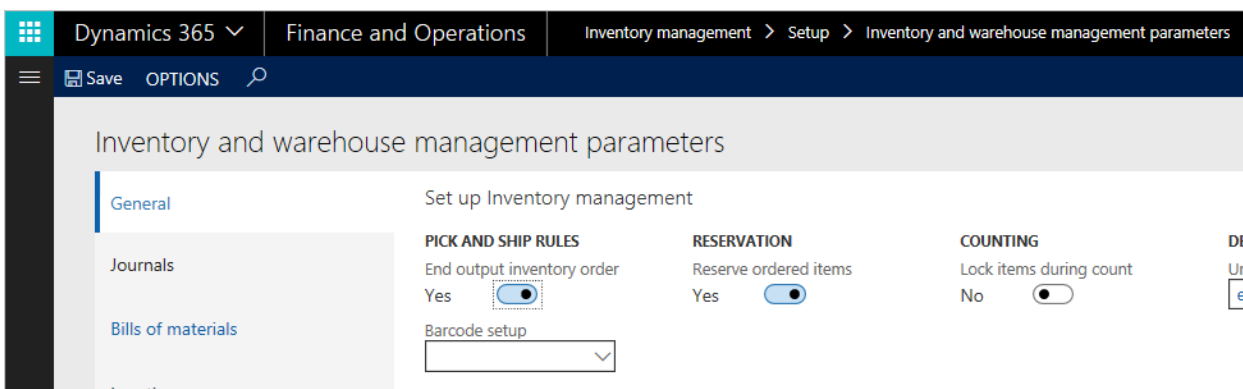
If the **Picking route status** field is set to **Completed**, the picking process occurs automatically as part of the process of generating picking lists. If the field is set to **Activated**, the picking list lines must be manually updated.

The same setup applies to transfer orders. Go to **Inventory management > Setup > Inventory and warehouse management parameters**, and then, on the **Transport** tab, select a value in the **Picking route status** field.

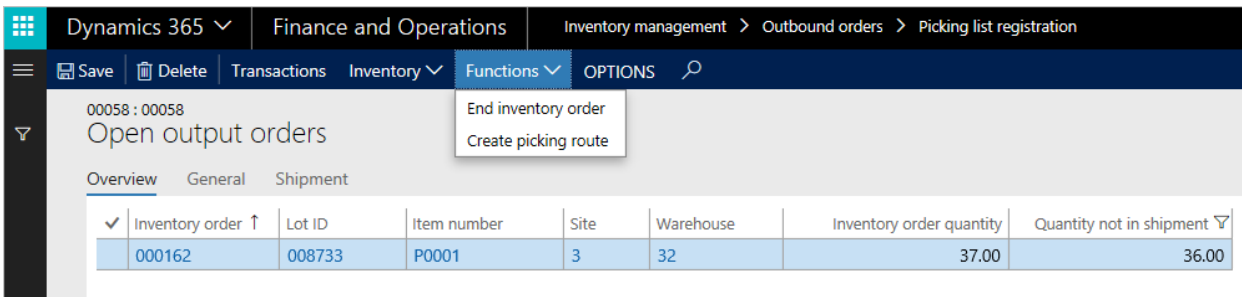
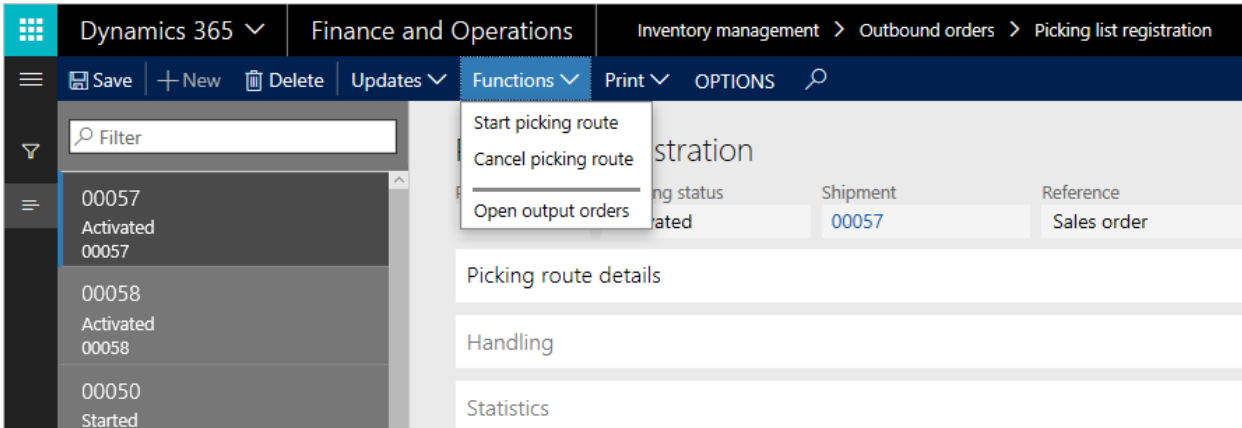


End output inventory orders

Go to **Inventory management > Setup > Inventory and warehouse management parameters**, and then, on the **General** tab, set the **End output inventory order** option.

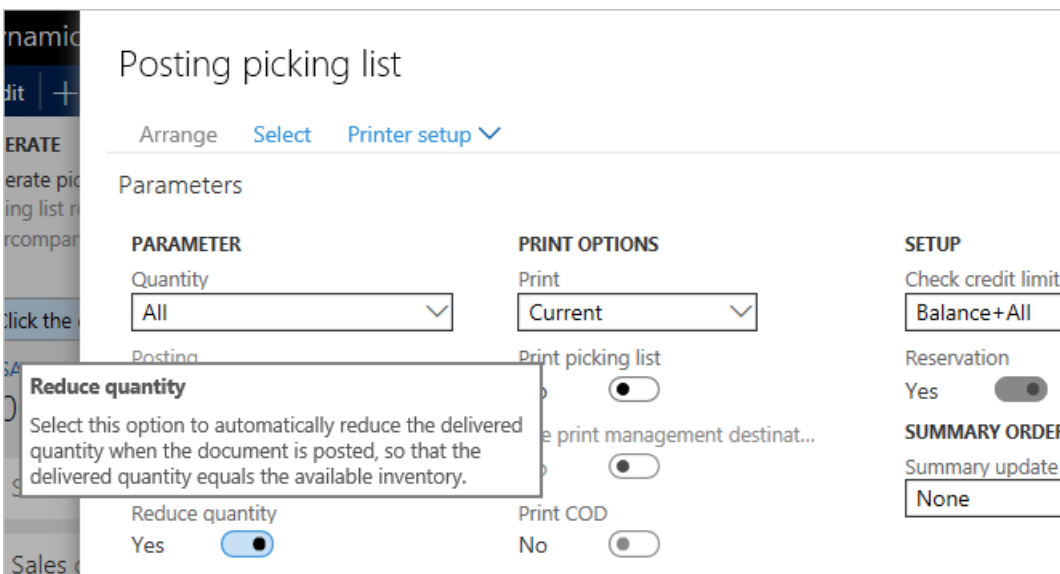


When the warehouse worker reduces the picking list quantities, then the corresponding inventory order quantities will be removed from the shipment. When the picking list is updated at a point in time, the remaining quantities get reported back to the order if the **End output inventory order** option is set to **Yes**. If the **End output inventory order** option is set to **No**, the remaining quantities are kept as an open output order quantity and must be added to a new picking list as part of the **Open output orders** functionality.



Reduce quantity

The third parameter that you can use as part of the process of generating picking lists is the **Reduce quantity** parameter. The setting of this parameter works together with the **Reservation** setting that triggers a reservation process as part of the release to the warehouse.



Example of an outbound process for a sales order

For this example, there is a sales order for two items. During picking list generation, you select the **Reduce quantity** parameter. Therefore, you release and create picking lines only for available on-hand inventory. The picking must be reported via a registration process for picking lists (**Picking route status = Activated**).

The inventory that hasn't already been reserved is reserved during picking list generation. The unavailable inventory can be either removed from the sales order or released to the warehouse for outbound processing later, when inventory is available for picking.

Picking list registration

Picking route: 00065 | Handling status: Started | Shipment: 00065 | Reference: Sales order

Picking route details

Handling

Statistics

Delivery

Customer: US-001 | Requested ship date: 9/11/2017 | Mode of transport: 10

Lines

Select	Handling status	Item number	Pick quantity
<input type="checkbox"/>	Picked	D0001	1.00
<input checked="" type="checkbox"/>	Activated	D0003	1.00

As soon as all the picking lines have been picked on the **Picking list registration** page, the associated shipment is completed. The process for sales order packing slips can then be initialized based on the picked inventory.

SHIPMENTS

00065

Header

IDENTIFICATION: Shipment 00065 | Name: | STATUS: Status Sent | Pick: Completed | Requested ship date: | Dispatch date: 9/11/2017 11:47:10 AM | Physical update status: Ready for update

Lines

Inventory order ↑	Item number	Handling status	Quantity	CW quantity	Reserved	Route
000178	D0001	Completed	1.00		✓	00065
000179	D0003	Completed	1.00		✓	00065

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Reserve inventory quantities

2/18/2021 • 5 minutes to read • [Edit Online](#)

This topic describes the different options that are available for reserving inventory.

You can automatically reserve inventory quantities for a specific sales order. This means that reserved inventory cannot be withdrawn from the warehouse for other orders unless the inventory reservation, or part of the inventory reservation, is canceled.

There are several reasons for reserving inventory:

- First ordered, first delivered, which means that customers get available items in the same order in which they place their orders.
- Shortage of items due to a long or unknown delivery time from the vendor. You might want to make sure that certain customers or orders get delivery of the first-available items.
- Certain customers and certain types of orders have first priority for delivery.
- Items with serial or batch numbers. You can mark certain items that have been or will be delivered to specific orders.
- Specially ordered items that are reserved for certain orders.
- Production orders. For example, you can mark items that are produced for and adjusted to specific orders.

Inventory can be reserved automatically when a new order line is created, or inventory can be reserved manually on the individual orders. It's also possible to reserve inventory at different stages in a production process. Only stocked products can be reserved. Services cannot be reserved, because there is no on-hand inventory. Both physical on-hand inventory and ordered, but not yet received, inventory can be reserved. If a larger quantity is reserved than what the on-hand inventory contains, a message displays that you cannot reserve such a large quantity. You can then either reserve the quantity anyway, or change the ordered quantity. The quantity can be either reserved or changed. If more items are reserved than are available, the shortage is covered the next time that items are available for delivery.

Inventory reservation policies

Inventory reservation policies are set on the **Item model groups** page, the **Inventory and warehouse management parameters** page, and the **Production parameters** page.

Policies on the Item model groups page

The **Inventory policies** section contains the following reservation policies.

Reservation policy	Description
FIFO date-controlled	If you select the FIFO date-controlled option, the inventory reservation is controlled by a sorting date according to the FIFO principle. Batches are reserved based on the earliest date of receipt of items, according to the principle of first in, first out (FIFO).

Backward from ship date	This option becomes available if you have selected the FIFO date-controlled option. If you select Backward from ship date , the inventory is reserved backward from the desired ship date according to the principle of last in, first out (LIFO). If no receipts are available before the ship date, a FIFO reservation is used.
Item sales reservation	Determines whether item reservation is manual or automatic. If a reservation is automatic, inventory is reserved when order lines are created. It's possible to make reservations at the item number level for BOMs (Automatic option), or for the individual elements of a BOM (Explosion option). The default value for Item sales reservation may be inherited from Accounts receivable parameters . On that page, the value is set in the Reservation field in the Sales default values section on the General tab.
Same batch selection	Same batch reservation lets you reserve inventory for a sales order line against a single batch of inventory. If you want to use this option, you must also set the Consolidate requirement option to Yes . There are additional settings that are required for the tracking dimension group and storage dimension group. For more information, see Reserve the same batch for a sales order .
Consolidate requirement	This option is similar to the Same batch selection option, and it consolidates inventory that's reserved for sales order lines into a single requirement.
FEFO date-controlled	This option allows you to reserve batches that are close to their expiration date or best before date. You also need to set the Pick criteria field to select either Expiration date or Best before date .

Example for FIFO date-controlled and Backward from ship date

In this example, on-hand inventory for item number A exists for three different batch numbers.

ITEM NUMBER	BATCH NUMBER	QUANTITY	DATE
A	1000	5	February 2, 2016
A	1001	3	January 1, 2016
A	1002	7	March 3, 2016

A sales order that should be automatically reserved and delivered on April 4, 2016, reserves the following batch:

- If both the **FIFO date-controlled** and **Backward from ship date** check boxes are cleared, batch 1000 is reserved because it is the batch with the lowest number.
- If the **FIFO date-controlled** check box is selected and the **Backward from ship date** check box is cleared, batch 1001 is reserved because it is the batch with the first date of receipt (FIFO).
- If both the **FIFO date-controlled** and **Backward from ship date** check boxes are selected, batch 1002 is reserved because it is the batch receipt closest to the sales order ship date.

Policies on the Inventory and warehouse management parameter page

There are two options related to reservations on the **Inventory and warehouse management parameters**

page:

- The **Reserve ordered items** option on the **General** tab lets you to reserve item receipts that are ordered against item issues in Accounts receivable, Project management and accounting, and Production control. If you clear this option, you can only reserve items that have been physically received. If a particular item has been set up to accept negative inventory, this field is not relevant.
- The **Reserve items automatically** option on the **Transport** tab determines the default setting if items are automatically reserved for transfer orders. The default setting can be overridden on individual transfer orders.

Inventory reservation policies on the Production parameters page

The value of the **Reservation** field on the **General** tab on the **Production parameters** page determines the default point in the production process at which inventory should be reserved. For example, inventory could be reserved when work is scheduled, or when work is started.

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Reserve the same batch for a sales order

2/18/2021 • 2 minutes to read • [Edit Online](#)

This article explains how to set up a product to allow reservation of inventory against a single batch of inventory.

Same batch reservation lets you reserve inventory for a sales order line against a single batch of inventory. For example, a customer who orders wallpaper can request that the whole order be filled from the same batch or lot, to avoid inconsistencies among the rolls. To set up a product to use same batch reservation, the following settings must be active in the item model group, tracking dimension group, and storage dimension group that you assign to the product:

- **Item model groups** – The item model group must have the **Same batch selection** and **Consolidate requirement** fields selected in the **Reservation** field group for inventory policies.
- **Tracking dimensions groups** – The tracking dimension group must have the **Coverage plan by dimension** field selected for the batch number.
- **Storage dimensions groups** – The storage dimension group must have the **Coverage plan by dimension** field selected for **Site** and **Warehouse**.

When you reserve inventory for a product on a sales order line that is set up for same batch selection, the system tries to reserve the ordered quantity from a single inventory batch. Any specific batch attribute requirements are also considered. If the quantity can't be filled from a single batch, the **Same batch reservation conflict** page appears. This page describes the issues and also the actions that you can take to continue with the reservation. The following conditions might prevent the batch from being reserved:

- The batch disposition code has **Block reservation** for sales flagged as **Blocked**.
- The batch has expired, based on the expiration date and any applicable customer sellable days. The item can still be considered for reservation if the item model group for the item is First Expiry First Out (FEFO) date-controlled, and if the best-before date is selected as the pick criterion.
- The batch doesn't have enough shelf-life days remaining, based on the expiration date and best-before date, plus any customer sellable days.

For items associated with a storage dimension group that has **Use warehouse management processes** enabled, you can reserve specific batch numbers by using a reservation hierarchy with the batch number inventory dimension defined above the location dimension. The **Batch reservation** page for sales and transfer order lines also lets you select and reserve multiple lines based on the available batch numbers. For more information about what to do if you are using a reservation hierarchy that has the batch number dimension below the location, see [Flexible warehouse-level dimension reservation policy](#).

NOTE

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Inventory close

2/18/2021 • 5 minutes to read • [Edit Online](#)

As part of the process to settle issue transactions with receipt transactions, you can also choose to have the general ledger updated to reflect the adjustments that have been made.

The inventory close process settles issue transactions to receipt transactions, based on the inventory valuation method that is selected in the item's item model group. As part of the settlement process, you can specify that the general ledger should be updated, so that it reflects the adjustments that have been made. However, until inventory close or recalculation has been run, issue transactions are posted at the calculated running average cost price.

After inventory close, you can no longer post in periods that are before the inventory closing date that you set, unless you reverse a completed inventory close process. For example, if inventory close is run for the period that ends on January 31, you can't post transactions that have a date that is earlier than January 31.

Items in inventory are assigned to one of two inventory types: item or service. Inventory close performs the same functions for both types. However, for service items, inventory close still settles issues to receipts.

How often the inventory close process is run varies by company. However, transaction volume should help determine how often you decide to run inventory close. In general, most companies run inventory close as part of their month-end close and reconciliation procedures.

Inventory recalculation and the general ledger

If adjustments to inventory and the general ledger are required during a month or other inventory period, you can run inventory recalculation instead of inventory close. Inventory recalculation makes adjustments but doesn't make settlements to inventory transactions.

During inventory recalculation, on-hand inventory is adjusted, inventory transactions are adjusted, and inventory recalculations and inventory closes are run. These tasks affect any ledger account that is linked to the original inventory transaction.

Example

When you create a purchase order from a sales order, the general ledger accounts that are used for the original sales order are updated. Even if the ledger accounts for the item group that is assigned to the item were changed after the sales order was posted, and an inventory recalculation created an adjustment amount, the adjustment amount is posted to the original ledger accounts. The adjusted amount isn't posted to the new ledger accounts that are assigned to the item.

After the update is completed, you can review the ledger voucher that is posted because of one of these tasks.

1. On the **Closing and adjustment** page, on the **Overview** tab, select the update to review.
2. Click **Details**, and then select **Voucher**.

Effects of the inventory close process on the general ledger

Several of the tasks that you can perform on the **Closing and adjustment** page cause an update to general ledger. For example, the general ledger is updated when you make inventory on-hand adjustments, make inventory transaction adjustments, run inventory recalculation, and run inventory close.

The ledger accounts that are updated because of these tasks are linked to the original inventory transaction. For

example, if a sales order is settled to a purchase order, the general ledger accounts that were used for the original sales order are adjusted. This behavior occurs even if the ledger accounts for the item group that is assigned to the item have changed since the sales order was posted. After inventory close creates a settlement amount, the settlement amount is still posted to the original ledger accounts, not to the new ledger accounts that are assigned to the item. The general ledger might also be updated if you reverse an inventory close.

NOTE

- Inventory close is a required step in the month-end closing procedure for all inventory models except moving average. You will be warned if you try to close a financial period without first performing the inventory close as of the period end date.
- Before you run the closing procedure, you can view a list of items that can't be settled during the update.
- We recommend that you run inventory close during off-peak hours, to distribute computing resources more evenly.

The inventory close log

After the inventory close process has been completed, a message in the message center might inform you that a unit cost price might be incorrect because a transaction could not be fully settled.

Before this message is shown, the system reports the item number and the affected transaction. The message informs you that the cost amount that is used for this transaction wasn't updated because of the inventory close. This message appears when a transaction of the issue type can't be settled.

During the inventory close process, the system checks each financial dimension to see whether there are more issues than receipts up to the specified closing date. This type of imbalance can occur when an inventory transaction from a purchase order isn't fully posted financially, either because the vendor invoice hasn't been received, or because bill of materials (BOM) components that are included in a production on a higher level aren't financially posted. (The sub-production isn't cost-calculated.) In this case, the subsequent close won't adjust all issues to the correct cost price, because not enough receipt information is available.

For each run of the closing procedure, the system indicates whether a log that contains the warnings is stored and can be viewed.

If you receive many warnings in the message, we recommend that you perform the following actions:

- Update receipts financially.
- Advance the closing date.
- Reevaluate the business procedures.

In some circumstances, you might not be able to do anything about the warnings. For example, if marking is used, and the marked purchase order has a financial date that is after the closing date, the closing date can't be changed.

Reversing a completed inventory close

Occasionally, you might have to reverse a completed inventory close to return settlements to the state that they had before adjustments were made. When you reverse a completed inventory close, inventory is reopened to enable posting in the period that the inventory close covers. Related changes might also be made in the general ledger. After you've finished making adjustments, you can run inventory close again for the period that you're working with.

NOTE

Only the last inventory period that was closed can be reopened. To reverse an earlier inventory close, you must reverse each subsequent inventory close one at a time, starting with the most recent close.

NOTE

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Running average cost price

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The inventory close process settles issue transactions to receipt transactions, based on the inventory valuation method that is selected in the item's item model group. However, before inventory close is run, the system calculates a running average cost price that is typically used when issue transactions are posted.

The system estimates this running average cost price for an item by using the following formula:

Estimated price = (Physical amount + Financial amount) ÷ (Physical quantity + Financial quantity)

Using the running average cost price

The following table shows when the system posts inventory transactions by using the running average cost price, and when it uses the cost price that is defined on the item master record instead.

CONDITION	THE SYSTEM USES THE ESTIMATED RUNNING AVERAGE COST PRICE	THE SYSTEM USES THE COST PRICE THAT IS DEFINED ON THE ITEM MASTER
Both the numerator* and denominator** are positive.	Yes	No
The numerator*, denominator**, or both are negative.	No	Yes
The denominator** is 0 (zero).	No	Yes

* Numerator = (Physical amount + Financial amount) ** Denominator = (Physical quantity + Financial quantity)

Note: If the **Include physical value** option isn't selected for an item, the system uses 0 (zero) for both the physical amount and the physical quantity. For information about this option, see [Include physical value](#).

Avoiding pricing amplification

On rare occasions, the system prices several issues before it has enough receipts to base the price on. This scenario can cause estimates of the running average cost price to be overly inflated. However, there are steps that you can take to avoid pricing amplification, or to reduce its impact when it does occur. **Scenario** The following transactions occur for an item that you've selected the **Include physical value** option for:

1. You financially receive a quantity of 100 at USD 100.00.
2. You financially issue a quantity of 200.
3. You physically receive a quantity of 101 at USD 202.00.

When you examine the estimated running average cost price for the item, you expect a cost price of USD 1.51. Instead, you find an estimated running average of USD 102.00, which is based on the following formula:
Estimated price = $[202 + (-100)] \div [101 + (-100)] = 102 \div 1 = 102$ This pricing amplification occurs because, when 200 items are issued financially in step 2, the system must price 100 of the items before it has any corresponding receipts. This situation causes negative inventory. The system then estimates a unit price of USD 1.00, as we might expect. However, when the corresponding 100 receipts arrive, they are at a unit price of USD 2.00 each.

Note: Although the issues create negative inventory, inventory is positive when the issue price is calculated.

Therefore, the running average cost price is used instead of the price on the item master. At this point, the system has an inventory value offset of USD 100.00. Although that offset was built up over 100 pieces, where there was a unit offset of USD 1.00 each, we now have only one piece in inventory. Therefore, the offset of USD 100.00 is allocated to this one piece. The result is the overly inflated estimated cost price.

Note: For comparison, notice that if steps 2 and 3 are reversed in the scenario, 200 items will be issued at a unit price of USD 1.51, and one piece will remain at a unit price of USD 1.51. Because this pricing amplification scenario can occur when negative inventory is involved, it's difficult to avoid in the following cases:

- You must estimate issue prices on the on-hand value and quantity.
- You must adjust the on-hand value and quantity on issues and receipts.
- Your business model allows you to send out, or price, more pieces than you have.
- You must accept any receipt value and quantity that are submitted to you.

However, if your business model allows for the following practices, they can help you avoid the negative quantities that make the pricing amplification scenario possible:

- If you select the **Include physical value** option for an item, clear the **Physical negative inventory** check box on the **Item model groups** page.
- If you do *not* select the **Include physical value** option for an item, clear the **Financial negative inventory** option on the **Item model groups** page.

Additionally, consider that the maximum offset in your physical inventory value is limited by the number of physical transactions, and the difference between physical and financial prices. Provided that all physical transactions are eventually updated financially, the physical value can't rise to extreme levels. Finally, note that the amplification effect decreases significantly when the accumulated offset is spread out over several on-hand pieces instead of just one.

NOTE

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Adjust on-hand inventory cost values

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Use the Adjustment of on-hand inventory page to adjust the cost value of the on-hand inventory quantities after an inventory close process is run.

You can use the **Adjustment of on-hand inventory** page to adjust the cost value of on-hand inventory quantities after an inventory close process is run. **Note:** To open the **Adjustment of on-hand inventory** page, on the **Closing and adjustment** page, select the record of a completed inventory close process, and then click **Adjustment > On-hand**. **Example:** You have the following transactions in February:

- February 1: An inventory financial receipt for a quantity of 2 at a cost of USD 10.00
- February 5: An inventory financial receipt for a quantity of 1 at a cost of USD 13.00
- February 19: An inventory financial issue for a quantity of 1 at a running average cost of USD 11.00

This item was set up with the first in, first out (FIFO) inventory model, and inventory close was performed as of February 28. The financial issue transaction of USD 11.00 will be settled against the financial receipt that is dated February 1, and an adjustment of USD 1.00 will be made. The following inventory receipts will then contain open inventory quantities:

- February 1: A quantity of 1 at a cost of USD 10.00
- February 5: A quantity of 1 at a cost of USD 13.00

To set the cost of these two items to USD 15.00, use the on-hand adjustment option to adjust the open on-hand quantities as of the last inventory close period. **Note:** The posting date of the on-hand adjustment transaction will be the date of the last inventory close. This date can't be modified.

NOTE

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Track running average cost per inventory dimension

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An inventory dimension group is attached to every inventory item. Therefore, the running average cost price of an item is calculated based on the selected inventory dimensions that are being tracked financially.

There are three types of inventory dimensions: product, storage, and tracking. Product dimensions include configuration, size, and color. Product dimensions are always tracked financially. Storage and tracking dimensions include site, warehouse, location, inventory status, license plate, batch number, and serial number. You can decide which storage and tracking dimensions are tracked financially.

Example 1

If the storage dimension group that is attached to the item is financially tracked by warehouse, the running average cost price is calculated per warehouse. The following purchase orders have been invoiced:

- A purchase order for a quantity of 2 at a cost price of USD 10.00 has been invoiced for warehouse GW.
- A purchase order for a quantity of 3 at a cost price of USD 12.00 has been invoiced for warehouse GW.
- A purchase order for a quantity of 5 at a cost price of USD 15.00 has been invoiced for warehouse MW.

The running average cost price for warehouse GW is USD 11.20, and the running average cost price for warehouse MW is USD 15.00. A sales order invoice is posted for warehouse GW. The value of the inventory and the cost of goods sold (before inventory close is run and without marking) is USD 11.20. Another sales order is posted for warehouse MW. The value of the inventory and the cost of goods sold (before inventory close is run and without marking) is USD 15.00.

Example 2 If the storage dimension group that is attached to the item is financially tracked by warehouse, and the tracking dimension group is financially tracked by batch number, the running average cost price is calculated for each batch.

Note: We recommend that you always view the cost price for all financial dimensions that are being tracked. The following purchase orders have been invoiced:

- A purchase order for a quantity of 2 at a cost price of USD 10.00 has been invoiced for warehouse GW and batch AAA.
- A purchase order for a quantity of 3 at a cost price of USD 12.00 has been invoiced for warehouse GW and batch AAA.
- A purchase order for a quantity of 2 at a cost price of USD 15.00 has been invoiced for warehouse GW and batch BBB.

The running average cost price for warehouse GW and batch AAA is USD 11.20, and the running average cost price for warehouse GW and batch BBB is USD 15.00.

NOTE

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Inventory Visibility Add-in

2/18/2021 • 13 minutes to read • [Edit Online](#)

IMPORTANT

Some or all of the functionality noted in this topic is available as part of a preview release. The content and the functionality are subject to change. For more information about preview releases, see [One version service updates FAQ](#).

NOTE

Effective November 2020:

- Common Data Service has been renamed to Microsoft Dataverse. For more information, see [Power Automate Blog](#).
- Some terminology in Microsoft Dataverse has been updated. For example, *entity* is now *table* and *field* is now *column*. For more information, see [Terminology updates](#).

This topic will be updated soon to reflect the latest terminology.

The Inventory Visibility Add-in is an independent and highly scalable microservice that enables real-time on-hand inventory tracking, thus providing a global view of inventory visibility.

All information that relates to on-hand inventory is exported to the service in near real-time through low-level SQL integration. External systems access the service through RESTful APIs to query on-hand information on given sets of dimensions, thus retrieving a list of available on-hand positions.

Inventory Visibility is a microservice built on Microsoft Dataverse, which means you can extend it by building Power Apps and applying Power BI to provide customized functionality to meet your business requirements. It is also possible to upgrade the index to do inventory queries.

Inventory Visibility provides configuration options that let it integrate with multiple third-party systems. It supports the standardized inventory dimension, customized extensibility, and standardized, configurable calculated quantities.

This topic describes how to install and configure the Inventory Visibility Add-in for Dynamics 365 Supply Chain Management, and how to use its application programming interface (API).

Install the Inventory Visibility Add-in

You need to install the Inventory Visibility Add-in using Microsoft Dynamics Lifecycle Services (LCS). LCS is a collaboration portal that provides an environment and a set of regularly updated services that help you manage the application lifecycle of your Dynamics 365 Finance and Operations apps.

For more information, see [Lifecycle Services resources](#).

Prerequisites

Before you install the Inventory Visibility Add-in, you must do the following:

- Obtain an LCS implementation project with at least one environment deployed.
- Generate the beta keys for your offering in LCS.
- Enable the beta keys for your offering for your user in LCS.
- Contact the Microsoft Inventory Visibility product team and provide an environment ID where you want to

deploy the Inventory Visibility Add-in.

If you have any questions about these prerequisites, please contact the Inventory Visibility product team.

Install the add-in

To install the Inventory Visibility Add-in, do the following:

1. Sign in to the [Lifecycle Services \(LCS\)](#) portal.
2. On the home page, select the project where your environment is deployed.
3. On the project page, select the environment where you want to install the add-in.
4. On the environment page, scroll down until you see the **Environment add-ins** section. If the section isn't visible, make sure the prerequisite beta keys have been fully processed.
5. In the **Environment add-ins** section, select **Install a new add-in**.

The screenshot displays the environment configuration page for 'ivtsrv-dev-demo-3'. At the top, there are action buttons: Deallocate, Edit, Stop, History, and Microsoft Azure settings. Below this is a table of users with columns for user name, role, and status. The 'AZURE CONNECTOR' section shows a table with one entry: 'DEVTEST (West US)' with subscription ID '7cecb429-6008-4b29-ae38-8...' and region 'West US 2'. The 'CLOUD SERVICE NAME' is 'ivtsrv-dev-demo-3-D2-9be917b01b320f89' and the 'RESOURCE GROUP' is 'ivtsrv-dev-demo-3'. At the bottom, the 'Environment add-ins' section contains a button labeled '+ Install a new add-in'.

6. Select the **Install a new add-in** link. A list of available add-ins opens.
7. Select **Inventory service** from the list. (Note, this may now be listed as **Inventory Visibility Add-in for Dynamics 365 Supply Chain Management**.)
8. Enter values for the following fields for your environment:
 - AAD application ID
 - AAD tenant ID

Setup add-in

Inventory Service

The Inventory Service add-in for Dynamics 365 Finance and Operations allows tracking of inventory for high volume, and exposing it through a REST Api

[Learn more](#)

AAD application ID [What is this?](#)

AAD tenant ID [What is this?](#)

9. Agree to the terms and condition by selecting the **Terms and conditions** check box.
10. Select **Install**. The status of the add-in will show as **Installing**. When it's done, refresh the page to see the status change to **Installed**.

Get a security service token

Get a security service token by doing the following:

1. Sign in to Azure Portal and use it to find the `clientId` and `clientSecret` for your Supply Chain Management application.
2. Fetch an Azure Active Directory token (`aadToken`) by submitting an HTTP request with the following properties:

- **URL** - `https://login.microsoftonline.com/{aadTenantId}/oauth2/token`
- **Method** - `GET`
- **Body content (form data):**

KEY	VALUE
client_id	<code>\${aadAppId}</code>
client_secret	<code>\${aadAppSecret}</code>
grant_type	<code>client_credentials</code>
resource	<code>0cdb527f-a8d1-4bf8-9436-b352c68682b2</code>

3. You should receive an `aadToken` in response, which resembles the following example.

```

{
  "token_type": "Bearer",
  "expires_in": "3599",
  "ext_expires_in": "3599",
  "expires_on": "1610466645",
  "not_before": "1610462745",
  "resource": "0cdb527f-a8d1-4bf8-9436-b352c68682b2",
  "access_token": "eyJ0eX...8WQ"
}
```

4. Formulate a JSON request that resembles the following:

```
{
  "grant_type": "client_credentials",
  "client_assertion_type": "aad_app",
  "client_assertion": "{Your_AADToken}",
  "scope": "https://inventoryservice.operations365.dynamics.com/.default",
  "context": "5dbf6cc8-255e-4de2-8a25-2101cd5649b4",
  "context_type": "finops-env"
}
```

Where:

- The `client_assertion` value must be the `aadToken` you received in the previous step.
- The `context` value must be the environment ID where you want to deploy the add-in.
- Set all of other values as shown in the example.

5. Submit an HTTP request with the following properties:

- **URL** - `https://securityservice.operations365.dynamics.com/token`
- **Method** - `POST`
- **HTTP header** - Include the API version (key is `Api-Version` and value is `1.0`)
- **Body content** - Include the JSON request that you created in the previous step.

6. You will get an `access_token` in response. This is what you need as a bearer token to call the Inventory Visibility API. Here is an example.

```
{
  "access_token": "{Returned_Token}",
  "token_type": "bearer",
  "expires_in": 1200
}
```

Uninstall the add-in

To uninstall the add-in, select **Uninstall**. Refresh LCS and the Inventory Visibility Add-in will be removed. The uninstall process will remove the add-in registration and also start a job to clean up all of the business data stored in the service.

Inventory Visibility Add-in public API

The public REST API of the of the Inventory Visibility Add-in presents several specific endpoints of integration. It supports three main interaction types:

- Posting on-hand changes to the add-in from an external system.
- Querying current on-hand quantities from an external system.
- Automatic synchronization with Supply Chain Management on-hand.

The automatic synchronization isn't part of the public API but is instead handled in the background for environments that have enabled the Inventory Visibility Add-in.

Authentication

The platform security token is used to call the Inventory Visibility Add-in, so you must generate an Azure Active Directory token using your Azure Active Directory application.

For more information about how to get the security token, see [Install the Inventory Visibility Add-in](#).

Configure the Inventory Visibility API

Before using the service, you must complete the configurations described in the following subsections. The

configuration may vary based on the details of your environment. It primarily includes four parts:

- [Partitioning](#)
- [Dimension configurations](#)
- [Indexing](#)
- [Custom measurement](#)

Partitioning

Partitioning can significantly influence the performance of the Inventory Visibility API. It's a good idea to define a scheme that allows for small groupings of data while still allowing for meaningful data queries.

The `organizationId` (`dataAreaId` in Supply Chain Management) will always be part of the partitioning, and by default Inventory Visibility is set to partition by dimensions as *Site + Location*. This means that the service must always be queried with these dimensions defined on the filters.

NOTE

Site and *Location* are two general default dimensions in Inventory Visibility. In Supply Chain Management, those dimensions are called *Site* (`InventSiteId`) and *Warehouse* (`InventLocationId`)

Dimension configurations

Inventory Visibility will provide a list of general default dimensions to enable the multiple source system integration.

The following table lists the inventory dimensions that will be the default dimension names in Inventory Visibility.

DIMENSION TYPE	DIMENSION NAME
Product	<code>ColorId</code>
Product	<code>SizeId</code>
Product	<code>StyleId</code>
Product	<code>ConfigId</code>
Tracking	<code>BatchId</code>
Tracking	<code>SerialId</code>
Location	<code>LocationId</code>
Location	<code>SiteId</code>
Inventory Status	<code>StatusId</code>
Warehouse Specific	<code>WMSLocationId</code>
Warehouse Specific	<code>WMSpalletId</code>
Warehouse Specific	<code>LicensePlateId</code>

NOTE

The dimension type listed in the previous table is for reference only. You don't need to define the dimension type in Inventory Visibility.

If a custom dimension exists and needs to flow to a default value when consumed by Inventory Visibility, you can configure the **Custom dimension** name in Inventory Visibility.

External systems access Inventory Visibility through RESTful APIs that enable on-hand information on given sets of dimensions to be queried. For the integration, Inventory Visibility enables you to configure the *external channel data source* and the source dimension to the *target dimensions* in Inventory Visibility.

The target dimensions should be one of the following:

- Default dimensions in Inventory Visibility
- Custom dimensions

The purpose of dimension configuration is to standardize the multi-system integration for the query on dimensions and the posting event with dimensions.

Indexing

Most of the time, the inventory on-hand query will not only be on the highest "total" level, but you may want to see results aggregated based on the inventory dimensions.

Inventory Visibility provides flexibility by allowing you to set up the indexes, which are based on the dimension or the combination of the dimensions.

NOTE

Currently, you can only configure indexes to a maximum of five. You need to carefully consider which dimension or dimension combination you will use before the implementation to ensure that it will meet your business needs. For example, if you want to query products as follows:

- Query the aggregated product on-hand by the *Color* and *Size* dimensions.
- In some cases, you just want to query on the product in total.

You would have two indexes defined as the following:

- ["ColorId", "SizeId"]
- []

The empty bracket will aggregate based on the product ID within the partition.

The indexing defines how you can group your results based on the `groupBy` query setting. In this case if you don't define any `groupBy` values, you'll get totals by `productId`. Otherwise if you define `groupBy` as `groupBy=ColorId&groupBy=SizeId`, you'll get multiple lines returned, based on the different color and size combinations in the system.

You can put your query criteria in the request body.

Here is a sample query on the product with color and size combination.


```

{
  "filters": {
    "OrganizationId": ["usmf"],
    "ProductId": ["MyProduct"],
    "LocationId": ["21"],
    "SiteId": ["2"],
    "ColorId": ["Red"]
  },
  "groupByValues": [
    "SizeId",
    "ColorId"
  ],
  "returnNegative": true
}

```

Custom measurement

The default measurement quantities are linked to Supply Chain Management, however you may want to have a quantity that is made up of a combination of the default measurements. To do this, you can have a configuration of custom quantities, which will be added to the output of the on-hand queries.

The functionality simply allows you to define a set of measures that will be added, and/or a set of measures that will be subtracted, in order to form the custom measurement.

For example, with the following query condition, you will configure the custom measurement quantity as

`MyCustomAvailableforReservation` to be consumed by the consumption system.

```

[
  {
    "productId": "MyProduct",
    "dimensions": {
      "colorid": "Red"
    },
    "quantities": {
      "mypos": {
        "outbound": 20.0,
        "inbound": 80.0
      },
      "fno": {
        "availphysical": 100.0,
        "orderedintotal": 50.0,
        "orderedreserved": 10.0
      },
      "exterchannel": {
        "received": 90.0,
        "scheduled": 30.0,
        "issued": 60.0,
        "reserved": 40.0
      }
    }
  }
]

```

CONSUMPTION SYSTEM	CALCULATED MEASURERS	DATA SOURCE	MODIFIER	MODIFIER CALCULATION TYPE
CustomChannel	MyCustomAvailableforRe	fno tion	availphysical	Addition
CustomChannel	MyCustomAvailableforRe	fno tion	orderedintotal	Addition

CONSUMPTION SYSTEM	CALCULATED MEASURERS	DATA SOURCE	MODIFIER	MODIFIER CALCULATION TYPE
CustomChannel	MyCustomAvailableforRe	fno tion	orderedreserved	Subtraction
CustomChannel	MyCustomAvailableforRe	mypos on	inbound	Addition
CustomChannel	MyCustomAvailableforRe	mypos on	outbound	Subtraction
CustomChannel	MyCustomAvailableforRe	exterchannel	received	Addition
CustomChannel	MyCustomAvailableforRe	exterchannel	scheduled	Addition
CustomChannel	MyCustomAvailableforRe	exterchannel	issued	Subtraction
CustomChannel	MyCustomAvailableforRe	exterchannel	reserved	Subtraction

With that, the query on the custom measurement quantity will return the following output.

```
[
  {
    "productId": "MyProduct",
    "dimensions": {
      "colorid": "Red"
    },
    "quantities": {
      "mypos": {
        "outbound": 20.0,
        "inbound": 80.0
      },
      "fno": {
        "availphysical": 100.0,
        "orderedintotal": 50.0,
        "orderedreserved": 10.0
      },
      "exterchannel": {
        "received": 90.0,
        "scheduled": 30.0,
        "issued": 60.0,
        "reserved": 40.0
      },
      "CustomChannel": {
        "MyCustomAvailableforReservation": 220.0
      }
    }
  }
]
```

The `MyCustomAvailableforReservation` output is based on the calculation setting in the custom measurements as: $100 + 50 + 80 + 90 + 30 - 10 - 20 - 60 - 40 = 220$

Posting on-hand changes

The exact URL that the event will be posted to will depend on your geographical region. It will take the form:

```
https://{serviceURL}/api/environment/{environmentId}/onhand
```

When authenticated, this URL can be used along with the HTTP `POST` method to send on-hand change events to the service.

A special header is used for communicating with Dynamics 365 services through HTTP requests, denoting the environment ID of the Supply Chain Management instance the data is linked to. For example:

```
x-ms-environment-id: 2db79622-f97a-4d64-9844-d12efed41796
```

Posting on-hand changes query example 1

This example shows a scenario where you will set up the dimension configuration in Power Apps.

Use the following query to configure the dimension mapping in Power Apps:

```
{
  "PosSizeId": "SizeId",
  "PosColorId": "ColorId",
  "PosSiteId": "SiteId",
  "PosLocationId": "LocationId"
}
```

Now you can specify the `dimensionDataSource` and use custom dimensions in your queries. The system will automatically convert custom dimensions to base dimensions.

```
{
  "id": "demo-test-00007",
  "organizationId": "usmf",
  "productId": "MyProduct",
  "quantities": {
    "pos": {
      "Outbound": 1
    }
  },
  "dimensionDataSource": "pos",
  "dimensions": {
    "PosSizeId": "Large",
    "PosColorId": "Red",
    "PosSiteId": "2",
    "PosLocationId": "21"
  }
}
```

Posting on-hand changes query example 2

This example shows a scenario where no mappings are set up for the dimension configuration in Power Apps, so the posting should also use the base dimensions. All dimensions must be base dimensions when the `dimensionDataSource` field is null, empty, or whitespace.

```
{
  "id": "demo-test-00007",
  "organizationId": "usmf",
  "productId": "MyProduct",
  "quantities": {
    "pos": {
      "Outbound": 1
    }
  },
  "dimensions": {
    "SizeId": "Large",
    "ColorId": "Red",
    "SiteId": "2",
    "LocationId": "21"
  }
}
```

The fields from the JSON query examples provided previously have the properties listed in the following table.

FIELD ID	DESCRIPTION
<code>id</code>	A unique ID for the specific change event. This ID is used to ensure that if communication with the service fails during posting, resubmitting the event would not result in the same event being counted twice in the system.
<code>organizationId</code>	The identifier of the organization linked to the event. This maps to Supply Chain Management organizations or data area IDs.
<code>productId</code>	The identifier of the product in question.
<code>quantity</code>	The quantity by which the on-hand needs to be changed. If, for instance, 10 new bagels were added to a shelf, this value would be 10. If 3 bagels were then removed from the shelf or sold, this value would be -3.
<code>dimensionDataSource</code>	The data source of the dimensions used in the posting change event and query. If you specify the data source, you can use the custom dimensions from the specified data source. With the dimension configuration, Inventory Visibility can map the custom dimensions to the general default dimensions. If the <code>dimensionDataSource</code> is not specified, you can only use the general default dimensions in your queries.
<code>dimensions</code>	A dynamic bag of key/value pairs. These will map to some of the dimensions in Supply Chain Management, but you could also add custom dimensions (like <i>Source</i>) that may denote if the event was coming from Supply Chain Management or an external system.

Querying current on-hand

The endpoint for querying the current on-hand will have a similar URL:

```
https://{serviceURL}/api/environment/{environmentId}/onhand/indexquery
```

It will be queried with the HTTP `POST` method.

Current on-hand query example 1

This example shows a scenario where you have already completed the dimension configuration in Power Apps.

Use the following query to configure the dimension mapping in Power Apps:

```
{
  "PosSizeId": "SizeId",
  "PosColorId": "ColorId",
  "PosSiteId": "SiteId",
  "PosLocationId": "LocationId"
}
```

Now you can specify the `dimensionDataSource` and use custom dimensions in your queries. The system will automatically convert custom dimensions to base dimensions. You can specify the `DimensionDataSource` in `filters` and specify custom dimensions in both `filters` and `groupByValues`. The system will automatically convert custom dimensions to base dimensions.

```

{
  "filters": {
    "OrganizationId": ["usmf"],
    "ProductId": ["MyProduct"],
    "DimensionDataSource": ["Pos"],
    "PosLocationId": ["21"],
    "PosSiteId": ["2"],
    "PosColorId": ["Red"]
  },
  "groupByValues": [
    "PosSizeId",
    "PosColorId"
  ],
  "returnNegative": true
}

```

Current on-hand query example 2

This example shows a scenario where no mappings are set up for the dimension configuration in Power Apps, so the posting should also use the base dimensions. All dimensions must be base dimensions when the `dimensionDataSource` field, under `filters` is null, empty, or whitespace.

```

{
  "filters": {
    "OrganizationId": ["usmf"],
    "ProductId": ["MyProduct"],
    "LocationId": ["21"],
    "SiteId": ["2"],
    "ColorId": ["Red"]
  },
  "groupByValues": [
    "SizeId",
    "ColorId"
  ],
  "returnNegative": true
}

```

Example return result

The queries shown in the previous examples could return a result like this.

```
[
  {
    "productId": "MyProduct",
    "dimensions": {
      "colorid": "Red"
    },
    "quantities": {
      "mypos": {
        "outbound": 20.0,
        "inbound": 80.0
      },
      "fno": {
        "availphysical": 100.0,
        "orderedintotal": 50.0,
        "orderedreserved": 10.0
      },
      "exterchannel": {
        "received": 90.0,
        "scheduled": 30.0,
        "issued": 60.0,
        "reserved": 40.0
      },
      "CustomChannel": {
        "MyCustomAvailableforReservation": 220.0
      }
    }
  }
]
```

Note that the quantities fields are structured as a dictionary of measures and their associated values.

NOTE

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IoT Intelligence home page

2/18/2021 • 2 minutes to read • [Edit Online](#)

IMPORTANT

This feature is currently only available in the following countries/regions:

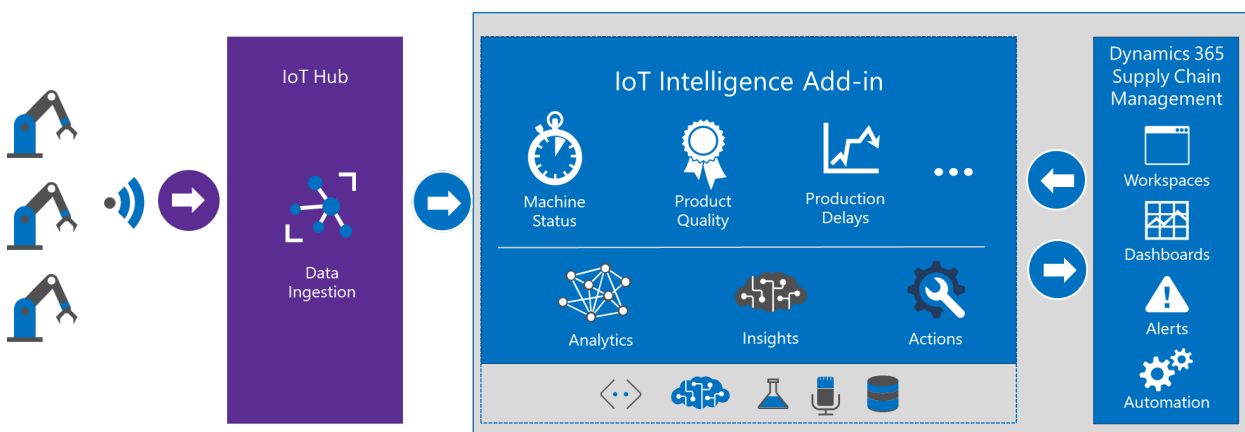
- US (United States of America)
- EU (European Union)
- AU (Australia)
- CA (Canada)
- UK (United Kingdom)

IoT Intelligence is an add-in for Microsoft Dynamics 365 Supply Chain Management. It integrates Internet of Things (IoT) signals with data in Supply Chain Management to produce actionable insights.

IoT Intelligence supports the following scenarios:

- **Production delays** – This scenario compares actual cycle time to planned cycle time. Supply Chain Management notifies you when production isn't on schedule, so that you can intervene to maximize operating efficiency and avoid order delays.
- **Equipment downtime** – This scenario compares measured uptime to user-defined parameters. Supply Chain Management notifies you when an outage threshold is exceeded, so that you can take actions such as rescheduling a production work order or creating a maintenance work order.
- **Product quality** – This scenario compares sensor readings, such as moisture and temperature, to user-defined quality metrics. Supply Chain Management notifies you when a deviation occurs, so that you can intervene to maintain quality standards and minimize waste.

The following illustration shows the interaction of Azure IoT Hub, IoT Intelligence, and Supply Chain Management.



Setup

You can set up and configure IoT Intelligence without writing any code. Here are the basic steps.

1. [Set up Azure resources](#) – Create an IoT hub, a Redis cache, and a key vault that can be accessed from Supply Chain Management.
2. [Message schema formats for IoT Hub](#) – Configure your devices to send messages to IoT Hub, and define the

JavaScript Object Notation (JSON) message format.

3. In Feature Management, enable the IoT Intelligence feature flag.
4. [Install the IoT Intelligence add-in in Microsoft Dynamics Lifecycle Services \(LCS\)](#) – Install the add-in in LCS, and configure the Azure secrets.
5. [Set up metrics](#) – Set up metrics in Supply Chain Management.
6. [Scenario setup](#) – Set up the scenarios in Supply Chain Management.

Tracking and maintenance

- [Monitor scenarios in Dynamics 365 Supply Chain Management](#)
- [Disable a scenario](#)
- [Uninstall the add-in](#)
- [Modify a running IoT Intelligence scenario](#)
- [Simulation options](#)

NOTE

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Set up Azure resources for IoT Intelligence

2/18/2021 • 4 minutes to read • [Edit Online](#)

This topic explains how to create and configure the Microsoft Azure resources that you require for IoT Intelligence.

Create Azure resources

Follow these steps to create an IoT hub, a Redis cache, and a key vault that can be accessed by Microsoft Dynamics 365 Supply Chain Management.

Verify that the Microsoft Dynamics ERP Microservices first-party app ID is in your tenant

To verify that the app ID for the Microsoft Dynamics ERP Microservices first-party app is in your tenant, follow these steps.

1. Sign in to the Azure portal at <https://portal.azure.com>.
2. Go to **Azure Active Directory**.
3. Go to **Enterprise applications**.
4. In the **Application type** field, select **Microsoft applications**.
5. In the search field, enter **Microsoft Dynamics ERP Microservices**.
6. Verify that **Microsoft Dynamics ERP Microservices** is in the list. Other applications have similar names. Therefore, make sure that you find the correct application. The app ID is **0cdb527f-a8d1-4bf8-9436-b352c68682b2**.

If the application isn't in the list, you must add it to your tenant:

- a. In the Azure portal, on the toolbar, select the button to open Azure Cloud Shell.
- b. Run the command **Install-Module AzureAD**. Enter Y to install the module.
- c. Run the command **Get-InstalledModule -Name "AzureAD"** to verify that the module is installed.
- d. Run the command **Connect-AzureAD -Confirm** to run the authentication.
- e. Run the command **New-AzureADServicePrincipal -AppId 0cdb527f-a8d1-4bf8-9436-b352c68682b2**.

You can now repeat steps 1 through 6 to verify that the app ID is in your tenant.

Create a key vault resource

To create a key vault resource, follow these steps.

1. In the Azure portal, create or go to a resource group.
2. Select **Add**.
3. On the **New** page, in the search field, enter **Key vault**. Then select **Create**.
4. On the **Create key vault** page, in the **Key vault name** field, enter a name.
5. Review the default values, and then select **Review + create**.
6. Select **Create**.

The key vault is created in the background.

Create an IoT hub resource

To create an IoT hub resource, follow these steps.

1. Create or go to a resource group.
2. Select **Add**.
3. On the **New** page, in the search field, enter **IoT Hub**. Then select **Create**.
4. In the **IoT hub name** field, enter a name.
5. Review the default values, and then select **Review + create**.
6. Select **Create**.

The IoT hub is created in the background.

NOTE

We recommend that you create only one IoT hub resource per environment.

Create a Redis cache resource

To create a Redis cache resource, follow these steps.

1. Create or go to a resource group.
2. Select **Add**.
3. On the **New** page, in the search field, enter **Azure Cache for Redis**. Then select **Create**.
4. In the **DNS name** field, enter a name.
5. Review the default values, and then select **Create**.

The Redis cache is created in the background.

NOTE

We recommend that you create only one Redis cache per environment.

All the resources have now been created.

Configure the Azure resources

Configure the IoT hub

To configure the IoT hub, follow these steps.

1. In your resources, select the IoT hub resource.
2. In the left navigation pane, select **Built-in endpoints**.
3. Under **Consumer groups**, paste the following consumer groups. These consumer groups correspond to the out-of-box scenarios.
 - microsoft.dynamics.iotintelligence-1
 - microsoft.dynamics.iotintelligence-2
 - microsoft.dynamics.iotintelligence-3

Configure the key vault

To configure the key vault, follow these steps.

1. In your resources, select the key vault resource.
2. In the left navigation pane, select **Access policies**.
3. Select **Add an access policy**.

4. On the **Add access policy** page, in the **Secret permissions** field, select **Get** and **List**.
5. Click in the **Select principal**.
6. In the **Principal** dialog box, search for and select **Microsoft Dynamics ERP Microservices**. Then select **Select**.
7. Select **Add**.
8. Select **Save**.

The app now has access to the secrets in the key vault.

Save the IoT hub connection string secret

To save the secret for the IoT hub connection string, follow these steps.

1. In your resources, select the IoT hub resource.
2. In the left navigation pane, select **Built-in endpoints**.
3. Copy the value in the **Event Hub-compatible endpoint** field.
4. Go to the key vault resource.
5. In the left navigation pane, select **Secrets**.
6. Select **Generate/Import**.
7. In the **Name** field, enter a name.
8. In the **Value** field, paste the endpoint value that you copied earlier.
9. Select **Create**.

Save the Redis cache connection string secret

To save the secret for the Redis cache connection string, follow these steps.

1. In your resources, select the Redis cache resource.
2. Select **Access keys**.
3. Copy the value in the **Primary connection string** field.
4. Go to the key vault resource.
5. In the left navigation pane, select **Secrets**.
6. Select **Generate/Import**.
7. In the **Name** field, enter a name.
8. In the **Value** field, paste the connection string that you copied earlier.
9. Select **Create**.

NOTE

Whenever you update one of the connection strings, you must also update the secret values.

You've now finished provisioning the required Azure resources. The next step is to [install the IoT Intelligence add-in in Microsoft Dynamics Lifecycle Services \(LCS\)](#).

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Schema formats for IoT Hub messages

2/18/2021 • 2 minutes to read • [Edit Online](#)

This topic explains how you should design a message schema that you can use in IoT Intelligence.

Message requirements

The following rules apply to the monitoring of messages in IoT Intelligence:

- Message schemas must be in JavaScript Object Notation (JSON) format.
- A UNIX **timestamp** property, where the value is expressed in milliseconds (ms), must be present in the Microsoft Azure IoT Hub message.
- A message is tracked only if it contains all the properties that are defined in the scenario setup. For example, if you define **id**, **timestamp**, and **value** properties, the following message is monitored.

```
{
  "id": "IoTInt.Machine1225.PartOut",
  "timestamp": 1576016821614,
  "value": True
}
```

This message isn't monitored, because the **value** property is missing.

```
{
  "id": "IoTInt.Machine1225.PartOut",
  "timestamp": 1576016821614,
}
```

- IoT Intelligence ignores properties in the message that aren't defined in the scenario configuration. For example, if you define **id**, **timestamp**, and **value** properties, IoT Intelligence will monitor all the following messages.

```
{
  "id": "IoTInt.Machine1225.PartOut",
  "timestamp": 1576016821614,
  "value": True
},
{
  "id": "IoTInt.Machine1225.PartOut",
  "timestamp": 1576016821614,
  "value": True,
  "machine" : "Machine1225",
},
{
  "id": "IoTInt.Machine1225.PartOut",
  "timestamp": 1576016821614,
  "value": True,
  "activity": "PartOut"
},
```

- IoT Intelligence silently ignores messages that don't match the scenario configuration criteria.
- You can define and use multiple types of message schemas.

- Not every type of message schema must be defined. Only schemas that will be used for the IoT Intelligence scenarios must be defined.

Id-value pair schema

An id-value pair is a common pattern for IoT Intelligence message schemas. By using an id-value pair, you ensure that your message schema is the same across all the scenarios. For example, here is a message for the **Equipment downtime** or **Production delays** scenario.

```
{
  "id": "IoTInt.Machine1225.PartOut",
  "timestamp": 1576016821614,
  "value": True
}
```

Here is a message for the **Product quality** scenario.

```
{
  "id": "IoTInt.Machine1225.Temperature",
  "timestamp": 1576016821614,
  "value": 105
}
```

Both the preceding messages contain **id** and **value** properties. The **id** values can be mapped in the **Signal Data Values** table during scenario setup. For the **Equipment downtime** scenario, you will map the **IoTInt.Machine1225.PartOut** value. For the **Product quality** scenario, you will map the **IoTInt.Machine1225.Temperature** value.

For more information, see [Azure IoT Hub Documentation](#).

NOTE

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Install the IoT Intelligence add-in in LCS

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This topic explains how to install the IoT Intelligence add-in in Microsoft Dynamics Lifecycle Services (LCS). Note that add-ins cannot be installed on a demo/trial environment. Before you can install the add-in, you must [create the Azure resources](#).

Set up the LCS environment

1. Open LCS, and go to your Microsoft Dynamics 365 Supply Chain Management environment.
2. Scroll to the **Environment add-ins** section.
3. Select **Install a new add-in** to show the list of add-ins that have been enabled for the environment.
4. In the **Select an add-in to install** dialog box, select **IoT Intelligence**.
5. In the **Setup add-in** dialog box, provide the details of your IoT hub and Redis cache. You can find the required values in the key vault that you created in [Create Azure resources](#).
 - **Tenant ID** – In the Azure portal, go to the key vault, and then, in the left navigation pane, select **Overview**, and copy the **Directory ID** value. Paste that value in the **Setup add-in** dialog box.
 - **IoT Event Hub-compatible endpoint Key Vault URI** – Go to the key vault, and then, in the left navigation pane, select **Overview**, and copy the **DNS name** value. Paste that value in the **Setup add-in** dialog box.
 - **IoT Event Hub-compatible endpoint secret name** – Go to the key vault, and then, in the left navigation pane, select **Secrets**, and copy the name of the secret where the event hub connection string for the IoT hub is stored. Paste that value in the **Setup add-in** dialog box.
 - **Redis cache key vault URI** – Go to the key vault, and then, in the left navigation pane, select **Overview**, and copy the **DNS name** value. Paste that value in the **Setup add-in** dialog box.
 - **Redis cache endpoint secret name** – Go to the key vault, and then, in the left navigation pane, select **Secrets**, and copy the name of the secret where the connection string for the Redis cache is stored. Paste that value in the **Setup add-in** dialog box.
6. Select the check box to accept the terms and conditions.
7. Select **Install**.
8. A message box appears that states, "Add-in has been successfully triggered for installation." Select **OK**.

LCS setup is now completed. The next step is to [set up the scenarios](#).

Uninstall the add-in

1. In Supply Chain Management, [disable the scenarios](#).
2. In LCS, go to your Supply Chain Management environment details.
3. Scroll to the **Environment add-ins** section.
4. Select **Uninstall** for the IoT Intelligence add-in.

NOTE

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Set up metrics for IoT Intelligence

2/18/2021 • 2 minutes to read • [Edit Online](#)

Configure metrics

If you want to view the time series charts of your messages in Microsoft Dynamics 365 Supply Chain Management, you must set up the metrics by following these steps.

1. Copy the connection string for the Redis cache:
 - a. In the Azure portal, go to the Redis cache.
 - b. Go to **Settings** > **Access keys**.
 - c. Copy the value in the **Primary connection string** field.
2. In Supply Chain Management, go to **Production control** > **Setup** > **IoT Intelligence** > **Scenario parameters**.
3. On the **Scenario parameters** page, on the **Time series** tab, in the **Redis metric store connection string** field, paste the connection string that you copied earlier. This step enables the metrics from Azure IoT Hub to be visualized in Supply Chain Management. When you paste the value into the field, it's shown as *********.

NOTE

Whenever you update the Redis cache connection string, you must also update this field.

4. Go to **Production control** > **Inquiries and reports** > **IoT Intelligence** > **Metric keys**.
5. On the **Metric keys** page, select **Update**.
6. In the **Update metric keys** dialog box, notice that **Run in the background** is selected in the field. Select **OK**.

All the metric keys in the Redis cache are retrieved and added to the **Metric keys** list. Metric values won't appear until you [enable the scenarios](#).

Configure the Resource Status time series

To configure the **Resource Status** time series, follow these steps.

1. In Supply Chain Management, go to **Production control** > **Manufacturing execution** > **Resource Status**.
2. On the **Resource status** page, select **Configure**.
3. In the **Configure** dialog box, in the **Resource** list, select an item to monitor.
4. Select the **Edit** button for **Time series 1**.
5. In the **Select time series** dialog box, select a metric in the grid. (You can also use the **Update metric keys** link to update the metric keys from this dialog box.)
6. Select **OK** to return to the **Configure** dialog box.
7. Enter a display name.
8. In the **Show data from** field, select a time frame.
9. Select **OK**.

The chart is shown.

Delete a metric key

1. In Supply Chain Management, go to **Production control > Inquiries and reports > IoT Intelligence > Metric keys**.
2. On the **Metric keys** page, select the metric key to delete.
3. Select **Delete**.

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Scenario setup for IoT Intelligence

2/18/2021 • 6 minutes to read • [Edit Online](#)

This topic explains how to configure scenarios for IoT Intelligence in Microsoft Dynamics 365 Supply Chain Management. Before you can set up the scenarios, you must [set up Microsoft Dynamics Lifecycle Services \(LCS\)](#).

In this topic, you will configure the **Equipment downtime** scenario so that a notification is generated in Supply Chain Management when a machine goes down. The topic also shows how to configure the **Product quality** scenario so that a notification is generated if an attribute of an item is outside a specified range, and how to configure the **Production delays** scenario so that a notification is generated if the production throughput falls below a threshold value.

Configure the Equipment downtime scenario in Supply Chain Management

The **Equipment downtime** scenario maps a **PartOut** signal to a machine alert threshold. The machine is monitored only when it's selected for the scenario and when is set to **Running** in Supply Chain Management. If the time since a **PartOut** signal was last received from the machine exceeds the alert threshold, a **Machine down** notification is triggered. If the machine is still running, a **Machine up** notification is triggered when the next **PartOut** signal is received. If a machine stays down for 30 minutes, a new **Machine down** notification is triggered.

The **Equipment downtime** scenario has the following dependencies:

- An alert can be triggered only if a production order is running on a mapped machine.
- A signal that represents a mapped machine's **PartOut** signal must be sent to the IoT hub, and a unique property name must be included.
- A UNIX **timestamp** property, where the value is expressed in milliseconds (ms), must be present in the Azure IoT Hub message.

To configure the scenario, follow these steps.

1. Sign in to Supply Chain Management.
2. Enable the IoT Intelligence feature flag. For more information, see [Feature management overview](#).
3. Configure the metrics. For more information, see [How to configure metrics](#).
4. Go to **Production control > Setup > IoT Intelligence > Scenario management**.
5. On the **Equipment downtime** tile, select **Configure** to open the configuration wizard.

The first page in the wizard is the **Equipment sensor schema definition** page. On this page, your goal is to set up the schema in Supply Chain Management so that it matches the JavaScript Object Notation (JSON) format of the IoT Hub messages. Multiple message schemas can be defined. For more information, see [Schema formats for IoT Hub messages](#). In this example, the message payload contains a batch of messages that has the following format.

```

{
  "timestamp": 1576016821614,
  "payload": [
    {
      "id": "IoTInt.Machine1225.PartOut",
      "timestamp": 1576016821614,
      "value": True
    },
    {
      "id": "IoTInt.Machine1226.PartOut",
      "timestamp": 1576016991616,
      "value": True
    }
  ]
}

```

6. Add a row to the table, and set the following values:
 - a. Set the **Schema name** field to **ID**.
 - b. Set the **Schema path** field to **/payload[*]/id**.
 - c. Set the **Description** field to **Message ID**.
7. Add another row to the table, and set the following values:
 - a. Set the **Schema name** field to **Timestamp**.
 - b. Set the **Schema path** field to **/payload[*]/timestamp**.
 - c. Set the **Description** field to **Message timestamp**.
8. Add another row to the table, and set the following values:
 - a. Set the **Schema name** field to **Value**.
 - b. Set the **Schema path** field to **/payload[*]/value**.
 - c. Set the **Description** field to **Message value**.

NOTE

You don't have to define all the properties in the message. Define only the properties that you require. In the preceding steps, you didn't create a row for **Root timestamp**. The path of **Root timestamp** would be **/timestamp**.

9. Select **Next** to go to the **Equipment sensor schema map** page.
10. In the row for **Equipment resource ID**, in the **Schema name** field, select **ID**.
11. In the row for **UTC time**, in the **Schema name** field, select **Timestamp**.
12. In the row for **Part produced signal**, in the **Schema name** field, select **Value**.
13. Select **Next** to go to the **Equipment resource ID configuration** page.
14. Follow these steps to map the values in the IoT Hub message to the Supply Chain Management resources:
 - a. In the **Signal Data Values** table, add a new row. In the **Value** field, enter **IoTInt.Machine1225.PartOut**. This value comes from the JSON **id** property in the IoT Hub message.
 - b. Select **Save**.
 - c. In the **Business Record Mapping** table, select **New**. A default value for the **Business record type** field is automatically filled in, and you don't have to change it.
 - d. In the **Business record** field, select the Supply Chain Management machine resource that the signal

value is being sent from.

- e. Select **Save**.
 - f. Repeat these steps to add a new business record mapping for **Machine1226**. You can map multiple signal data values to a single record in Supply Chain Management.
15. Use the **Selected** column to select the machines that you want to process. You don't have to define all signal values, and you don't have to select all machines.
 16. Select **Next** to go to the **Part produced signal configuration** page.
 17. In the **Signal Data Values** table, add a row, and set the **Value** field to **True**. This value comes from the JSON **value** property in the IoT Hub message. You can add as many values as you require for your scenario.
 18. Select **Save**.
 19. Select **Next** to go to the **Equipment downtime threshold** page. The machines that are listed are the machines that were previously mapped to signal values. On this page, you will define a threshold to determine whether a machine is down. For example, if you set the threshold to **10**, Supply Chain Management will generate a notification if no **PartOut** signal is received from a machine for 10 minutes.
 20. Select **Next** to go to the **Enable scenario** page. Set the option to enable the scenario.
 21. Select **Finish**.

The scenario setup is now completed. IoT Intelligence will automatically start to process the IoT Hub messages.

Configure the Product quality scenario in Supply Chain Management

The **Product quality** scenario generates a notification if an attribute of an item is outside a specified range. For example, a sensor sends the weight of each item to IoT Hub. If an item is too heavy or too light, a notification is generated in Supply Chain Management.

The **Product quality** scenario has the following dependencies:

- An alert can be triggered only if a production order is running on a mapped machine and producing a product that has a mapped batch attribute.
- A signal that represents the batch attribute must be sent to the IoT hub, and a unique property name must be included.
- A UNIX **timestamp** property, where the value is expressed in ms, must be present in the IoT Hub message.

Configure the Production delays scenario in Supply Chain Management

The **Production delays** scenario generates a notification if the production throughput falls below a threshold value. In this scenario, a **PartOut** signal is sent to IoT Hub for each item that is produced. In Supply Chain Management, the order delay is calculated based on the amount of time that the production order is scheduled to run, the number of items that should be produced, the amount of time that the job has been running, and the number of **PartOut** signals that are received. A delay notification is generated if the number of **PartOut** signals for the job falls below the threshold value.

The **Production delays** scenario has the following dependencies:

- An alert can be triggered only if a production order is running on a mapped machine.
- A signal that represents a mapped machine's **PartOut** signal must be sent to the Azure IoT hub, and a unique property name must be included.
- A UNIX **timestamp** property, where the value is expressed in ms, must be present in the IoT Hub message.

Disable a scenario

To disable a scenario, follow these steps.

1. In Supply Chain Management, go to **Production control > Setup > IoT Intelligence > Scenario management**.
2. On the tile for the scenario, select **Configure**.
3. Select **Next** to go to the last wizard page.
4. Set the option to disable the scenario.

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Monitor and manage IoT Intelligence

2/18/2021 • 2 minutes to read • [Edit Online](#)

This topic explains how to monitor and manage IoT Intelligence.

Monitor scenarios in Microsoft Dynamics 365 Supply Chain Management

You can monitor IoT Intelligence processing from several places:

- **Modules > Production control > Inquiries and reports > IoT Intelligence > Notifications** – View the list of unresolved notifications.
- **Modules > Production control > Inquiries and reports > IoT Intelligence > Closed notifications** – View the list of notifications that have been resolved or dismissed.
- **Modules > Production control > Inquiries and reports > IoT Intelligence > Metric keys** – View the metric keys for the **Resource Status** times series charts.
- **Modules > Production control > Manufacturing execution > Resource status** – Track specific metrics by using the **Configure** dialog box. If a scenario detects an exception, a notification shows the details of the exception.
- **Workspaces > Production floor management > Notifications** – View the list of unresolved notifications.

Modify a running IoT Intelligence scenario

When a scenario is running, you can make these changes:

- Add new sensor schema definitions.
- Select new signal data values.
- Cancel the selection of existing signal data values.
- Add and map new signal data values.
- Update threshold values.

When a scenario is running, these changes are prohibited:

- Delete or modify any schema definitions that are currently consumed by an enabled scenario.
- Change the enabled scenario's selected schema paths.

Simulation options

You can simulate factory machine signals. For more information, see these topics:

- [Connect IoT DevKit AZ3166 to Azure IoT Hub](#)
- [Connect Raspberry Pi online simulator to Azure IoT Hub \(Node.js\)](#)
- [Device Simulation solution accelerator overview](#)

NOTE

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Master planning home page

2/18/2021 • 2 minutes to read • [Edit Online](#)

At its core, Master planning allows companies to determine and balance the future need for raw materials and capacity to meet company goals. Master planning assesses the following:

- What raw materials and capacities are currently available?
- What raw materials and capacities are required to complete production? For example, what must be manufactured, purchased, transferred, or set aside as safety stock before you can complete production.

Master planning uses the information to calculate the requirements and generate planned orders.

The three main planning processes are:

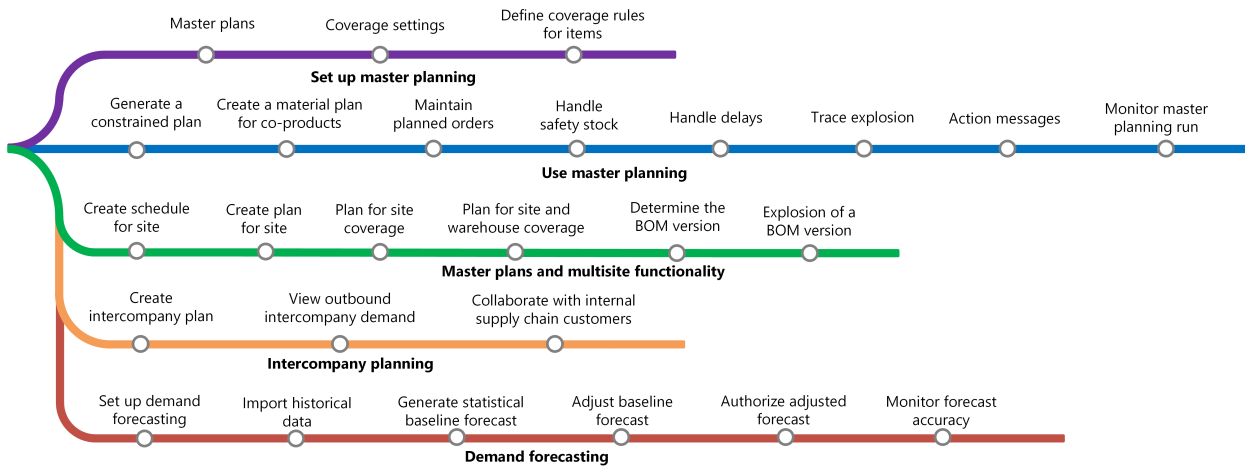
- **Master planning** - The Master plan calculates net requirements. It is based on actual current orders and enables companies to control inventory replenishment on a short-term, day-to-day basis. Another term to describe it is the *Net requirements plan*. For more information, see [Master plans overview](#).
- **Forecast planning** - The Forecast schedule calculates gross requirements. It is based on future projections (or forecasts), and enables companies to conduct long-term planning of materials and capacity. For more information, see [Demand forecasting overview](#).
- **Intercompany master planning** - The Intercompany master plan calculates net requirements across legal entities. It connects demand and supply between companies not only for short term, firm demand and supply but also for long-term, planned (that is not yet firmed) demand and supply. For more information, see [Intercompany master planning](#) (eLearning) (requires CustomerSource account).

Companies can change the output of the plan. They can run regenerative, net change, or both. Regenerative plans update all requirements, whereas, net change plans only update the plan on items with new requirements that have come in since the last scheduling run.

Master scheduling plans typically involve the short term, which can be anywhere from one week to six months. The Master planning module determines the supply (materials) and capacity (resources) needs that will meet current demand (the net requirements). In most companies this is extended to include the longest cumulative lead time among the products to be received.

Learning map

The following learning map shows the major concepts and tasks that make up the framework of the Master planning module. Click the links in the [Quick links](#) section to learn how to use the module.



Quick links

- [Master plans overview](#)
- [Generate a constrained plan](#)
- [Create a material plan for co-products](#)
- [Master planning and multisite functionality overview](#)
- [Create an intercompany plan](#)
- [Demand forecasting overview](#)
- [Forecast reduction keys](#)

Additional resources

Roadmaps

Go to the [Microsoft Dynamics 365 Roadmap](#) to see what new features have been released and what new features are in development.

Blogs

You can find opinions, news, and other information about Master planning and other solutions on the [Dynamics AX Manufacturing R&D Team blog](#) and [Supply Chain Management in Dynamics AX R&D Team blog](#).

Task guides

Additional help is available as task guides. To access task guides, click the **Help** button on any page.

Webinars

[Use Azure machine learning for demand forecasting](#)

Tech conference recordings

- [Extend the demand forecasting functionality](#)
- [Master planning - tips and tricks for troubleshooting performance](#)
- [Help! MRP is slow!](#)

NOTE

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Migration to Planning Optimization for master planning

2/18/2021 • 5 minutes to read • [Edit Online](#)

The built-in master planning engine is scheduled to be made obsolete (deprecated). It's being replaced by the Planning Optimization Add-in for Microsoft Dynamics 365 Supply Chain Management. This topic provides information about the impact on new and existing deployments. It includes information about required actions.

Planning Optimization enables master planning calculations to occur outside Supply Chain Management and its Azure SQL database. The benefits that are associated with Planning Optimization include improved performance and minimized impact on the SQL database during master planning runs. Because quick planning runs can be done even during office hours, planners can immediately react to demand or parameter changes.

For more information about Planning Optimization, see [Planning Optimization overview](#).

Obsolescence of the existing master planning engine

Microsoft is in the process of making the built-in planning engine obsolete in favor of Planning Optimization. This change affects all cloud environments. On-premises installations aren't affected. In version 10.0.16 and later, you will receive an error message if you run the built-in master planning without generating planned production orders. However, the master planning run will be successfully completed despite the error message.

For more information about the obsolescence of the built-in planning engine, see the announcements in [Removed or deprecated features in Dynamics 365 Supply Chain Management](#).

Migration, messages, and exceptions

Owners of existing environments who run the built-in master planning engine without generating planned production orders will receive an email that provides details about the exception process. We recommend that you work with a partner to evaluate and plan the migration to Planning Optimization.

As has been mentioned, you will receive an error message in version 10.0.16 and later if you run the built-in master planning without generating planned production orders. This error message includes guidance about migration and instructions for requesting an exception.

New deployments

Planning Optimization should be considered the default master planning engine for all new deployments in the cloud. In general, Planning Optimization should be used for all new deployments that don't generate planned production orders during master planning. If a new deployment depends on functionality that Planning Optimization doesn't currently support, you can request an exception so that you can continue to use the built-in master planning engine.

Existing deployments

Owners of existing cloud-based deployments that depend on master planning should plan to migrate to Planning Optimization. If your implementation depends on functionality that Planning Optimization doesn't currently support, you can request an exception so that you can continue to use the built-in master planning engine.

For environments that currently use master planning processes that are being made obsolete, Microsoft will send an email to the environment admin. This email will provide information about the actions that are required to migrate or to request an exception.

The exception process

You can request an exception if you must continue to use the built-in master planning engine because your business processes depends heavily on at least one feature that isn't currently implemented in Planning Optimization. For a list of available features, see [Planning Optimization fit analysis](#).

Currently, exceptions for Planning Optimization migration are only relevant if your master planning process doesn't include production (that is, planned production orders that are generated by master planning), and you require the built-in master planning engine beyond version 10.0.15.

After the required features become available, Microsoft will provide a grace period until the exception expires. The environment admin will be informed when the required features have become available and the grace period has started.

NOTE

You can only request an exception for production environments, not for sandbox environments. If you need to disable the Planning Optimization exception error on an infrastructure as a service (IaaS) sandbox environment, run the SQL query provided in [Sandbox environments](#).

Frequently asked questions

Sandbox environments

Can I use built-in master planning on my sandbox environment? Do I need an exception?

Answer: Exceptions aren't normally relevant for sandbox environments because the Planning Optimization exception error doesn't prevent the built-in master planning engine from running successfully. However, if the error message disturbs you, you can disable it on an IaaS (not Service Fabric) sandbox environment by running the following query on your database:

```
-- Insert or update an enabled flight:
DECLARE @flightName NVARCHAR(100) = 'ReqPlanningOptimizationExceptionToggle';
IF NOT EXISTS (SELECT TOP 1 1 FROM SysFlighting WHERE flightName = @flightName)
    INSERT INTO SYSFLIGHTING(FLIGHTNAME,ENABLED, FLIGHTSERVICEID,PARTITION)
    SELECT @flightName, 1, 12719367,RECID FROM DBO.[PARTITIONS];
ELSE
    UPDATE SysFlighting SET enabled = 1, flightServiceId = 12719367 WHERE flightName = @flightName;
```

On-premises environments

My environment is on-premises. Do I need an exception?

Answer: No. An exception isn't required for on-premises environments. You can continue to use the built-in master planning. Your environment admin will be informed if any action is required.

Production scenarios

We use planned production orders, but I'm concerned about what will happen when we upgrade to version 10.0.16. Should I take any action?

Answer: You should not be concerned. You can continue to use the built-in master planning in version 10.0.16. However, we recommend that you evaluate whether migration to Planning Optimization can start with the current functionality. We also recommend that you remain informed about new functionality.

Email from Microsoft

Our environment admin received an email from Microsoft. This email states that we should migrate to Planning Optimization or request an exception. Do I need to take any action?

Answer: Yes. Your environment will be affected unless you follow the instructions in the email. You can either migrate to Planning Optimization by the date specified or request an exception by using the link in the email. This link opens a questionnaire. After you've completed and submitted this questionnaire, you will receive a reply via email. Although this process is manual, Microsoft tries to reply within a week after the questionnaire is submitted.

Error messages

I'm using version 10.0.16 or later, and I receive the following error message when I run master planning. Is master planning blocked?

You receive this error message because the built-in master planning engine was used for scenarios supported by Planning Optimization. You should migrate to Planning Optimization now, as the current built-in master planning will be deprecated. Note that this master planning run did complete successfully.

In case your migration has strong dependencies on pending features, an exception to continued usage of the built-in master planning engine can be requested.

Please complete the following questionnaire to get started and if relevant request exception from migration to Planning Optimization.

Answer: No, master planning isn't blocked. Your master planning run was successfully completed, and you can use the result in the usual way. However, to avoid receiving this error message during future master planning runs, you must either migrate to Planning Optimization immediately or request an exception by using the link in the error message.

NOTE

Can you tell us about your documentation language preferences? [Take a short survey.](#)

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

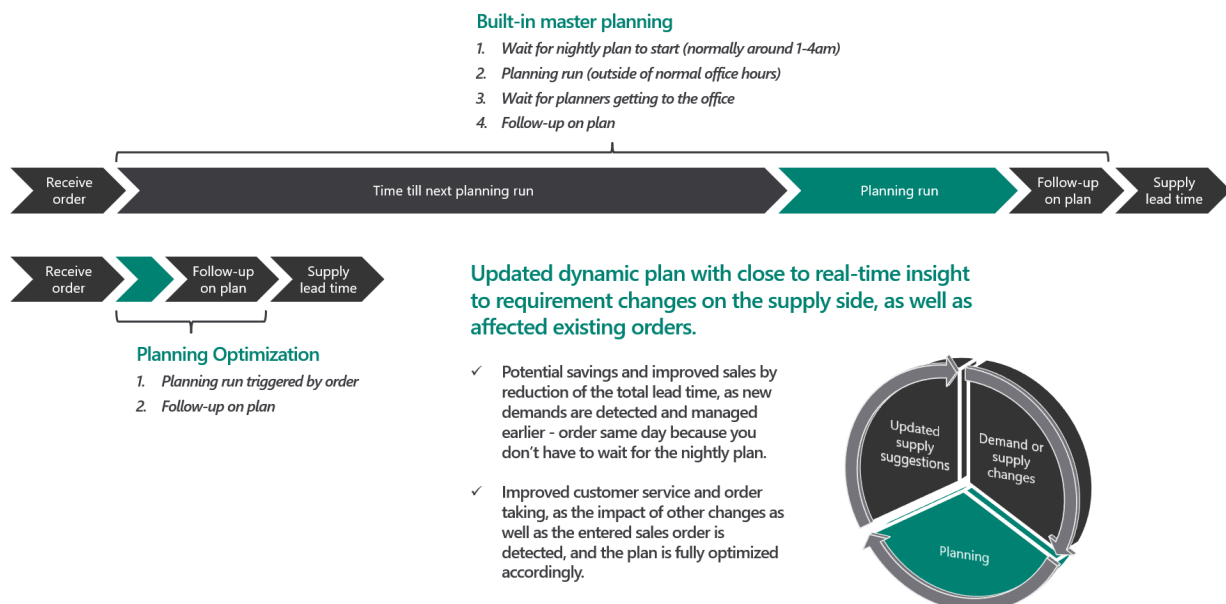
Planning Optimization overview

2/18/2021 • 2 minutes to read • [Edit Online](#)

The Planning Optimization Add-in for Microsoft Dynamics 365 Supply Chain Management enables master planning calculation to occur outside Dynamics 365 Supply Chain Management and the related SQL database. The benefits that are associated with the Planning Optimization functionality include improved performance and minimal impact on SQL database during master planning runs. Quick planning runs can be done even during office hours, so that planners can immediately react to demand or parameter changes.

To use Planning Optimization, you must install the Planning Optimization Add-in from your project in Microsoft Dynamics Lifecycle Services (LCS) and turn on the Planning Optimization functionality in Supply Chain Management. For more information, see [Get started with Planning Optimization](#).

The following illustration shows the advantage of running Planning Optimization during office hours.



Improved performance

Planning Optimization can be used in scenarios that involve long-running master plans. It's specifically designed for very fast calculations that involve very large volumes of data. Because it's built as a hyper-scalable multitenant service, multiple instances can work together simultaneously to calculate the plan. Additionally, the planning service removes the load of master planning from your system and works with a data stream that minimizes the server load.

Planning Optimization can help you achieve the following goals:

- Improve planning performance through a shorter runtime.
- Reduce the impact on other processes during the master planning run.
- Do more frequent planning runs. (You aren't limited to daily runs.)
- Be confident that future business growth won't overload the planning system.

Architecture and data flow

When the Planning Optimization Add-in is installed from LCS, a secure connection to the Planning Optimization service is established. The service is located in the same data center country or region as the related Supply

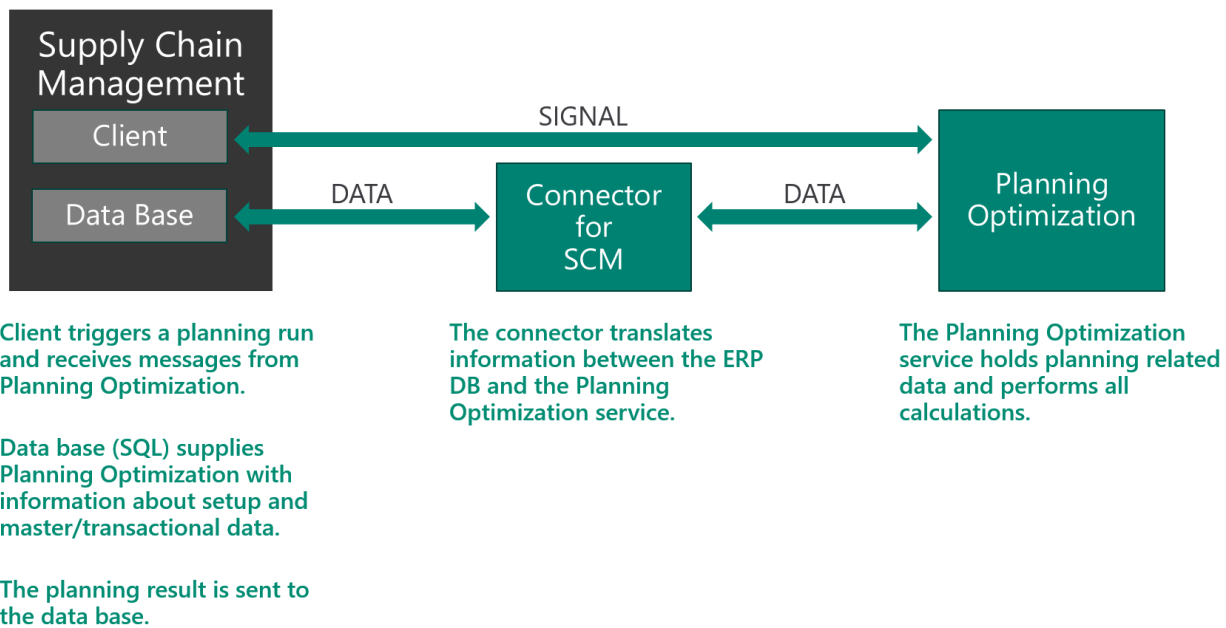
Chain Management instance. After Planning Optimization is set up, when master planning is run, master data and transactional data are sent from Supply Chain Management to the Planning Optimization service.

If the Planning Optimization Add-in is uninstalled, all related data in the Planning Optimization service is removed.

High-level data flow for regeneration runs

1. The Supply Chain Management client sends a signal to request a planning run from Planning Optimization.
2. Planning Optimization requests the required data via the integrated connector.
3. The SQL database sends the requested information about setup, master, and transactional data to Planning Optimization via the connector. The connector translates information between Supply Chain Management and the Planning Optimization service.
4. The Planning Optimization service holds planning-related data in memory and does the required calculations.
5. The planning result is sent to the Supply Chain Management database via the connector. The results include information such as planned orders and pegging information. Planning Optimization sends a signal to Supply Chain Management to indicate that the planning run has been completed. It also sends any relevant messages and warnings.

The following illustration shows the data flow.



Related resources

[Get started with Planning Optimization](#)

[Planning Optimization fit analysis](#)

[View plan history and planning logs](#)

[Apply filters to a plan](#)

[Cancel a planning job](#)

NOTE

Can you tell us about your documentation language preferences? [Take a short survey.](#)

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Get started with Planning Optimization

2/18/2021 • 5 minutes to read • [Edit Online](#)

As [previously announced](#), Planning Optimization is scheduled to replace the existing built-in master planning engine.

If you currently use the built-in master planning engine, you should start planning your migration to Planning Optimization now. It is important to start the migration process right away because your operations may be impacted when deprecation is enforced. To avoid last-minute issues when deprecation is enforced, we strongly encourage you to complete the migration before December 1, 2020.

The Planning Optimization functionality doesn't currently support all the features that are available in the planning engine that is built into Supply Chain Management. Therefore, it's important that you evaluate whether the feature set that is currently available in Planning Optimization will meet your requirements. The Planning Optimization functionality isn't currently turned on by default in Dynamics Lifecycle Services (LCS), so you have the opportunity to do your evaluation before the feature is turned on.

NOTE

You need to request an exception from migration to Planning Optimization if your master planning process does not include production (master planning generated planned production orders) and you require the built-in master planning engine beyond version 10.0.15. Starting in version 10.0.16, an error will be shown in environments when running built-in master planning without generation of planned production orders. Planning Optimization should be used for all new deployments that do not generate planned production orders during master planning. Owners of existing environments running the built-in master planning engine without generation of Planned production orders, will receive a mail with details about the exception process. We recommend that you work with a partner to evaluate and plan the migration to Planning Optimization.

Before you turn on Planning Optimization, we strongly recommend that you evaluate the results of the Planning Optimization fit analysis. For more information, see [Planning Optimization fit analysis](#).

Availability

Planning Optimization is currently available in the following Azure geographies: United States, Canada, Europe, United Kingdom, Australia, and Asia Pacific. If you try to install the add-in from another geographic region, then LCS will show a message that this geographic is not supported.

Note that Planning Optimization does not support on-premises deployments of Dynamics 365 Supply Chain Management.

Licensing

If you can run master planning by using your current license, you don't have to buy an additional license to start to use Planning Optimization.

Install and enable Planning Optimization

To use Planning Optimization, you must make sure your system has all of the prerequisites in place and then enable its license key and install the Planning Optimization Add-in for Dynamics 365 Supply Chain Management.

Prerequisites

Before you install the Planning Optimization Add-in, the following prerequisites must be in place:

- You must be running Supply Chain Management on an LCS enabled high-availability environment, tier 2 or higher (not a OneBox environment), with Dynamics 365 Supply Chain Management version 10.0.7 or later. If you try to install the add-in on a OneBox environment, the installation will not complete and you will need to cancel the installation.
- Your system must be set up for Power Platform integration. For more information, see [Prerequisites for setting up add-ins](#) and [Set up add-ins](#).

Enable the Planning Optimization license

To use Planning Optimization, you must enable its configuration key. To do so:

1. Put your system into maintenance mode, as described in [Maintenance mode](#).
2. Go to **System administration > Setup > License configuration**.
3. On the **Configuration keys** tab, select the check box for **Planning Optimization**.
4. Turn off maintenance mode, as described in [Maintenance mode](#).

Install the Planning Optimization Add-in

You must install the add-in from your LCS project and then turn on the Planning Optimization functionality from the Supply Chain Management user interface.

To install the Planning Optimization Add-in:

1. Sign in to LCS, and open the desired environment.
2. Go to **Full details**.
3. Scroll down to the **Environment add-ins** FastTab.
4. Select **Install a new add-in**.
5. Select **Planning Optimization**.
6. Follow the installation guide, and agree to the terms and conditions.
7. Select **Install**.
8. On the **Environment add-ins** FastTab, you should see that Planning Optimization is installing.
9. After a few minutes, **Installing** should change to **Installed** (you may need to refresh the page). When installed, you are ready to activate Planning Optimization in Dynamics 365 Supply Chain Management.

The main purpose of installing the Planning Optimization Add-in is to connect the service and the environment. Therefore, you must install the add-in separately on each environment where you will use Planning Optimization, regardless of any code moved between the environments.

Integrate Planning Optimization with your system

To configure whether the Planning Optimization Add-in should be used for master planning, go to **Master planning > Setup > Planning Optimization parameters**.

Connection status

The connection status indicates the current status of the connection between Supply Chain Management and the Planning Optimization service. The following table shows the possible values.

CONNECTION STATUS	DESCRIPTION	CAN PLANNING OPTIMIZATION BE USED?
-------------------	-------------	------------------------------------

CONNECTION STATUS	DESCRIPTION	CAN PLANNING OPTIMIZATION BE USED?
Connected	A connection has been established between the Planning Optimization service and Supply Chain Management.	Yes
Enabling connection	A request to turn on the connection to the Planning Optimization service is currently in progress.	No
Disconnected	There is no connection to the Planning Optimization service. The connection can be turned on from LCS, as described earlier in this topic.	No
Disabling connection	A request to turn off the connection to the Planning Optimization service is currently in progress.	No
Getting status	The system is waiting for status information from the Planning Optimization service.	No

The Use Planning Optimization option

The setting of the **Use Planning Optimization** option determines which planning engine is used for master planning:

- **Yes** – Planning Optimization is used for master planning.
- **No** – The built-in Supply Chain Management planning engine is used for master planning.

NOTE

If existing planning batch jobs that were created for the built-in Supply Chain Management planning engine are triggered while the **Use Planning Optimization** option is set to **Yes**, those jobs will fail.

Integration with the setup

If the Planning Optimization is turned on, master planning is done by using the Planning Optimization Add-in. In this case, master planning results and features are affected.

Additional resources

[Terms and conditions for the preview](#)

[Planning Optimization overview](#)

[Planning Optimization fit analysis](#)

[View plan history and planning logs](#)

[Apply filters to a plan](#)

[Cancel a planning job](#)

NOTE

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Planning Optimization fit analysis

2/18/2021 • 12 minutes to read • [Edit Online](#)

You should analyze the result from the Planning Optimization fit analysis as part of the migration process. Note that the scope of Planning Optimization is not equal to the current built-in master planning functionality. We recommend that you work with your partner and read the documentation to prepare for the migration.

Planning Optimization fit analysis helps you to identify where the result might differ between the built-in master planning engine and Planning Optimization. This analysis is done based on your current setup and data.

To see the Planning Optimization fit analysis result, go to **Master planning > Setup > Planning Optimization fit analysis**, and then select **Run analysis**. If the analysis finds any inconsistencies, they are listed on the same page. (The analysis can take a few minutes to run.)

NOTE

If inconsistencies are found, you can still use Planning Optimization. The results of the fit analysis just show places where the planning service won't honor your current setup. In other words, they show places where some processes might be ignored or might not be supported.

Analysis results: Example 1

- **Feature:** Production
- **Issue:** Items with a bill of materials (BOM) level greater than zero: 56
- **Explanation:** The fit analysis found 56 items that have a BOM setup for production. Because the current version of Planning Optimization doesn't support production, Planning Optimization will generate planned purchase orders instead of planned production orders. It will also show a warning that lists the affected items.

Analysis results: Example 2

- **Feature:** Actions
- **Issue:** Coverage groups with actions calculation enabled: 6
- **Explanation:** The fit analysis found six coverage groups where action calculation is turned on. Because the current version of Planning Optimization doesn't support actions, no actions will be generated during master planning.

Overview of possible results from the fit analysis

The following table shows the various results that can be shown after a fit analysis. Number signs (#) will be replaced with a number that indicates the number of records that have the listed issue. Supported or in-preview features are available with version 10.0.9 or later (unless a higher version number is listed in the "Expected availability" column).

FEATURE	LISTED ISSUE	EXPLANATION	EXPECTED AVAILABILITY
---------	--------------	-------------	-----------------------

FEATURE	LISTED ISSUE	EXPLANATION	EXPECTED AVAILABILITY
Actions	Coverage groups with Actions calculation enabled: #	This feature is pending. Currently, actions aren't generated during master planning when Planning Optimization is enabled, regardless of this setting. The main purpose of actions is to suggest changes to existing orders. Evaluate if actions are actively applied as part of your business processes or if the delay information related to the orders is sufficient.	October 2021
Base calendars	Calendars using base calendar: #	This feature is pending. Currently, the base calendar is ignored when Planning Optimization is enabled. Evaluate if the base calendar is needed for your business processes or if direct setup in calendars is sufficient.	April 2021
Batch disposition codes	Non-nettable batch disposition masters: #	This feature is pending. Currently, batch disposition codes are ignored when Planning Optimization is enabled.	October 2021
Capable to promise (CTP)	Default order settings with delivery date control set to CTP: #	This feature is pending. Currently, CTP is ignored when Planning Optimization is enabled, regardless of this setting.	October 2021
Copy static to dynamic plan	Copy of static to dynamic plan is enabled on the master planning parameters.	Planning Optimization doesn't copy the static plan to the dynamic plan, regardless of this setting. In general, this concept is less relevant because of the speed and complete regeneration that Planning Optimization provides. If two or more plans are used, master planning should be triggered for each plan.	October 2021

FEATURE	LISTED ISSUE	EXPLANATION	EXPECTED AVAILABILITY
Firming	Coverage groups with auto firming time fence set: #	In version 10.0.7 and later, firming is supported as a separate firming batch job after master planning is completed (provided the <i>Auto-firming for Planning Optimization</i> feature has been enabled in feature management). Note that auto firming for Planning Optimization is based on the order date (start date), not the requirement date (end date). This behavior ensures that firming of planned orders occurs in due time, without having to include lead time in the firming time fence.	Supported
Firming	Item coverage records with auto firming set: #	In version 10.0.7 and later, auto firming is supported as a separate firming batch job after master planning is completed (provided the <i>Auto-firming for Planning Optimization</i> feature has been enabled in feature management). Note that auto firming for Planning Optimization is based on the order date (start date), not the requirement date (end date). This behavior ensures that firming of planned orders occurs in due time, without having to include lead time in the firming time fence.	Supported
Firming	Master plans with auto firming set: #	In version 10.0.7 and later, auto firming is supported as a separate firming batch job after master planning is completed (provided the <i>Auto-firming for Planning Optimization</i> feature has been enabled in feature management). Note that auto firming for Planning Optimization is based on the order date (start date), not the requirement date (end date). This behavior ensures that firming of planned orders occurs in due time, without having to include lead time in the firming time fence.	Supported

FEATURE	LISTED ISSUE	EXPLANATION	EXPECTED AVAILABILITY
FitAnalysisPlanningItems	Planning Items: #	This feature is pending. Currently, planning items are handled like regular items when Planning Optimization is enabled.	October 2021
Forecast	Coverage groups with "Include intercompany orders" enabled: #	This feature is pending. Currently, master planning doesn't include downstream planned demand when Planning Optimization is enabled, regardless of this setting. Note that released/firmed orders still work with the regular intercompany functionality and will cover most scenarios.	In preview
Forecast	Coverage groups with "Reduce forecast by" setting set to a value different than "Orders": #	By default, Planning Optimization uses "Reduce forecast by" for orders, regardless of this setting.	Supported
Forecast	Forecast models with sub models: #	This feature is pending. Currently, forecasts that use sub-models aren't supported when Planning Optimization is enabled. They will be ignored, regardless of this setting.	April 2021
Forecast	Master plans with "Include supply forecast" enabled: #	This feature is pending. Currently, supply forecasts aren't supported when Planning Optimization is enabled. They will be ignored, regardless of this setting.	October 2021
Freeze time fence	Coverage groups with freeze time fence set: #	The freeze time fence isn't often used, and there are currently no plans to include it for Planning Optimization. Currently, the freeze time fence setup is ignored when Planning Optimization is enabled, regardless of this setting.	N/A
Freeze time fence	Item coverage records with freeze time fence set: #	The freeze time fence isn't often used, and there are currently no plans to include it for Planning Optimization. Currently, the freeze time fence setup is ignored when Planning Optimization is enabled, regardless of this setting.	N/A

FEATURE	LISTED ISSUE	EXPLANATION	EXPECTED AVAILABILITY
Freeze time fence	Master plans with freeze time fence set: #	The freeze time fence isn't often used, and there are currently no plans to include it for Planning Optimization. Currently, the freeze time fence setup is ignored when Planning Optimization is enabled, regardless of this setting.	N/A
Intercompany	Master plans including planned downstream demand: #	This feature is pending. Currently, master planning doesn't include downstream planned demand when Planning Optimization is enabled, regardless of this setting. Note that released/firmed orders still work with the normal intercompany functionality and will cover most scenarios.	In preview
Kanban	Item coverage records with planned order type kanban: #	This feature is pending. Currently, item coverage that is set to kanban will be ignored when Planning Optimization is enabled. The kanban planned order type will create a warning during master planning, and planned purchase orders will be created to cover the related demand.	October 2021
Kanban	Items with default order type kanban: #	Currently, a default order type that is set to kanban will be ignored when Planning Optimization is enabled. The kanban default order type will create a warning during master planning, and planned purchase orders will be created to cover the related demand.	October 2021
Product lifecycle state	Product lifecycle states not active for planning: #	This is a pending feature. Currently the Product lifecycle state is ignored with Planning Optimization enabled. You can adjust the plan level product filter to avoid including products where product lifecycle state is disabled for planning.	Supported

FEATURE	LISTED ISSUE	EXPLANATION	EXPECTED AVAILABILITY
Production	BOM lines with rounding or multiple setup: #	This feature is pending. Currently, rounding and multiple setups are ignored on BOM lines when Planning Optimization is enabled, regardless of this setting.	April 2021
Production	BOM/formula lines with formula measurement: #	This feature is pending. Currently, formula measurement is ignored on BOM and formula lines when Planning Optimization is enabled, regardless of this setting.	October 2021
Production	BOM/formula lines with item substitution (plan groups): #	This feature is pending. Currently, item substitution (plan groups) is ignored on BOM and formula lines when Planning Optimization is enabled, regardless of this setting.	October 2021
Production	BOM/formula lines with negative quantity: #	This feature is pending. BOM and formula lines that have negative quantity will be included with a quantity of 0 (zero) and a warning will be issued when Planning Optimization is enabled. Update master data to avoid warnings.	October 2021
Production	BOM/formula lines with resource consumption: #	This feature is pending. Currently, BOM and formula lines that have resource consumption are ignored when Planning Optimization is enabled. When this feature is supported, the material requirement will be set to the production start date. Until this feature is supported, requirements will not be generated for materials that are marked with a resource consumption flag.	April 2021
Production	BOM/formula lines with step consumption: #	This feature is pending. Currently, step consumption is ignored on BOM and formula lines when Planning Optimization is enabled.	October 2021

FEATURE	LISTED ISSUE	EXPLANATION	EXPECTED AVAILABILITY
Production	BOMs with constant scrap or variable scrap defined: #	This feature is pending. Currently, constant scrap and variable scrap that are defined on BOMs are ignored when Planning Optimization is enabled.	October 2021
Production	BOMs with subcontracting: #	This feature is pending. Currently, the subcontracting setup on BOMs is ignored when Planning Optimization is enabled, regardless of this setting.	October 2021
Production	BOMs without a site: #	This feature is pending. Currently, BOMs without a site are ignored when Planning Optimization is enabled.	Supported
Production	Demand with specific BOM or route requirements defined: #	This feature is pending. Currently, the specific BOM or route requirements that are defined on the demand (such as a sub-BOM or sub-route on a sales order) are ignored when Planning Optimization is enabled. The standard BOM or route will be used, regardless of this setting.	October 2021
Production	Formula versions with Co/By products: #	This feature is pending. Currently, co-products and by-products that are associated with the formula version are ignored when Planning Optimization is enabled.	October 2021
Production	Formula versions with Yield: #	This feature is pending. Currently, yield that is associated with the formula version is ignored when Planning Optimization is enabled.	October 2021
Production	Plans including sequencing: #	This feature is pending. Currently, sequencing is ignored when Planning Optimization is enabled, regardless of this setting.	October 2021

FEATURE	LISTED ISSUE	EXPLANATION	EXPECTED AVAILABILITY
Production	Released production orders that are not started, where scheduled start is earlier than today: #	This feature is pending. Currently, if a production order is delayed, then master planning will assume that it will be completed today. This is relevant for released production orders where a delivery date is in the past, but it has not been completed yet.	October 2021
Production	Resources scheduled with finite capacity: #	This feature is pending. Currently, resources that are scheduled with finite capacity are ignored when Planning Optimization is enabled. Scheduling is done based on the default lead time from the product.	April 2021
Production	Routes used in planning: #	This feature is pending. Currently, routes are ignored when Planning Optimization is enabled. The default lead time from the product is used.	April 2021
Production	Sales line reservation using explosion: #	Sales line reservation that uses explosion isn't supported when Planning Optimization is enabled.	October 2021
Production	Scheduling with explosion of production orders: #	Scheduling that uses explosion of production orders isn't supported when Planning Optimization is enabled. Production orders can be scheduled individually.	October 2021
Request for quotations	Master plans with request for quotations enabled: #	This feature is pending. Currently, requests for quotation (RFQs) aren't considered as demand when Planning Optimization is enabled. They will be ignored, regardless of this setting.	October 2021
Requisitions	Master plans with requisitions enabled: #	This feature is pending. Currently, requisitions aren't considered when Planning Optimization is enabled. They will be ignored, regardless of this setting.	October 2021

FEATURE	LISTED ISSUE	EXPLANATION	EXPECTED AVAILABILITY
Safety margins	Coverage groups with safety margin: #	This feature is pending. Currently, safety margin is ignored when Planning Optimization is enabled. To compensate for this behavior, you can increase the lead time so that it includes the safety margin.	Receipt margin: Supported. Reorder margin and issue margin: April 2021
Safety margins	Master plans with safety margin: #	This feature is pending. Currently, safety margin is ignored when Planning Optimization is enabled, regardless of this setting. To compensate for this behavior, you can increase the lead time so that it includes the safety margin.	Receipt margin: Supported. Reorder margin and issue margin: April 2021
Safety stock fulfillment	Item coverage records with "Fulfill minimum" different from "Today's date + procurement time": #	Planning Optimization always uses <i>Today's date + procurement time</i> . This change is made to prepare for a simplified planning setup in the future, and to provide an actionable result. If the procurement time isn't included for safety stock, planned orders that are created for current low on-hand inventory will always be delayed because of the lead time. This behavior can cause significant noise and unwanted planned orders. The best practice is to change the setting so that <i>Today's date + procurement time</i> is used. Update master data to avoid warnings.	N/A
Sales quotations	Master plans with sales quotations enabled: #	This feature is pending. Currently, quotations aren't considered when Planning Optimization is enabled. They will be ignored, regardless of this setting.	October 2021
Shelf life	Master plans with shelf life enabled: #	This feature is pending. Currently, shelf life isn't considered when Planning Optimization is enabled, regardless of this setting.	October 2021

Additional resources

[Planning Optimization overview](#)

[Get started with Planning Optimization](#)

[View plan history and planning logs](#)

[Apply filters to a plan](#)

[Cancel a planning job](#)

NOTE

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Apply filters to a plan

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When the Planning Optimization functionality is used, you can apply a filter to a plan. The **Plan filter** will always be applied during a master planning run. A **Plan filter** is useful when you want to limit a plan to a specific group of items and make sure that no other items are included as part of the resulting master planning.

If a **Plan filter** is applied, and a runtime filter is also applied during the master planning run, only the intersection of the two filters is included in the planning run.

The **Plan filter** can be accessed from **Master plans** when Planning Optimization is used.

Example scenario

A plan filter is set up that includes items A, B, and C. Master planning runs are then run for the same plan, but different runtime filters are applied:

- **Runtime filter that includes item D:** No items are planned, because there is no intersection between the plan filter and the runtime filter.
- **Runtime filter that includes item A and D:** Only item A is included in the planning run, because item D isn't part of the plan filter.
- **Runtime filter that includes item B:** Only item B is included in the planning run, and the previous planning output for item A is kept.
- **Runtime filter that includes all items (blank filter):** Items A, B, and C are included in the planning run, and the previous planning output for items A and B is overwritten.

NOTE

You should avoid setting a plan filter on the plan that is selected as **Current dynamic master plan** on the **Master planning parameters** page. Otherwise, the dynamic master plan functionality will be limited to the filtered items. For example, if the net requirements are updated for an item that isn't part of the plan filter, no result will be generated.

Related resources

[Planning Optimization overview](#)

[Get started with Planning Optimization](#)

[Planning Optimization fit analysis](#)

[View plan history and planning logs](#)

[Cancel a planning job](#)

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Master planning with demand forecasts

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You can use a demand forecast together with Planning Optimization to account for expected demand in your master planning. You can manually create a demand forecast, import it, or generate it by using the demand forecasting functionality in Microsoft Dynamics 365 Supply Chain Management. For more information about demand forecasting, see [Demand forecasting overview](#).

NOTE

Separate forecast planning isn't supported with Planning Optimization. Therefore, the **Current forecast plan** setting on the **Master planning parameters** page has no effect when you use Planning Optimization.

Set up a master plan to include a demand forecast

To configure a master plan so that it includes a demand forecast, follow these steps.

1. Go to **Master planning > Setup > Plans > Master plans**.
2. Select an existing plan, or create a new plan.
3. On the **General** FastTab, set the following fields:
 - **Forecast model** – Select the forecast model to apply. This model will be considered when a supply suggestion is generated for the current master plan.
 - **Include demand forecast** – Set this option to *Yes* to include the demand forecast in the current master plan. If you set it to *No*, demand forecast transactions won't be included in the master plan.
 - **Method used to reduce forecast requirements** – Select the method that should be used to reduce forecast requirements. For more information, see the [Forecast reduction keys](#) section later in this topic.
4. On the **Time fence in days** FastTab, you can set the following fields to specify the period that the demand forecast is included during:
 - **Forecast plan** – Set this option to *Yes* to override the forecast plan time fence that originates from the individual coverage groups. Set it to *No* to use the values from the individual coverage groups for the current master plan.
 - **Forecast time period** – If you set the **Forecast plan** option to *Yes*, specify the number of days (from today's date) that the demand forecast should be applied.

IMPORTANT

The **Forecast plan** setting isn't yet supported with Planning Optimization.

Set up a coverage group to include a demand forecast

To configure a coverage group so that it includes a demand forecast, follow these steps.

1. Go to **Master planning > Setup > Plans > Coverage groups**.
2. Select an existing coverage group, or create a new group.

3. On the **Other** FastTab, set the following fields:

- **Forecast plan time fence** – Enter the number of days (from today's date) that the demand forecast should be applied for. This value can be overridden by using the **Forecast plan** option on the master plan, as described in the previous section.
- **Reduction key** – Select the reduction key to apply. For more information, see the [Create and set up a forecast reduction key](#) and [Use a reduction key](#) sections later in this topic.
- **Reduce forecast by** – For master plans where the **Method used to reduce forecast requirements** field is set to *Transactions - reduction key* or *Transactions - dynamic period*, specify which transactions should reduce the forecast. Select one of the following values:
 - **All transactions** – All transactions should reduce the forecast.
 - **Orders** – Only sales orders should reduce the forecast.

NOTE

If you select *All transactions*, transactions that have both demand and supply in the same inventory dimensions are considered neutral and are ignored during the forecast reduction. For example, if the planning dimension is set to site only, not warehouse, a transfer order between site 1, warehouse 11, and site 1, warehouse 13, will be ignored and won't reduce the remaining demand forecast.

- **Include intercompany orders** – Set this option to *Yes* if intercompany orders should be included when the forecast is reduced. Otherwise, set it to *No*.
- **Include customer forecast in the demand forecast** – Specify whether a customer forecast should be included in the overall forecast. This option determines how actual demand reduces the forecasted demand. You can use it to ensure that master planning covers the supply of items that are purchased by specific customers.
 - Set this option to *Yes* to include a customer forecast in the overall forecast. In this case, actual customer demand reduces both the customer forecast and the overall forecast. Master planning generates planned orders to cover only the overall forecast quantity.
 - Set this option to *No* if you don't want to include a customer forecast in the overall forecast. In this case, actual customer demand reduces only the customer forecast. Master planning generates planned orders to cover both the overall forecast quantity and the forecast for each customer quantity.

Forecast reduction keys

This section provides information about the different methods that are used to reduce forecast requirements. It includes examples of the results of each method. It also explains how to create, set up, and use a forecast reduction key. Some methods use a forecast reduction key to reduce forecast requirements.

Methods that are used to reduce forecast requirements

When you include a forecast in a master plan, you can select how the forecast requirements are reduced when actual demand is included. Note that master planning excludes forecast requirements from the past, which means all forecast requirements before today's date.

To include a forecast in a master plan and select the method that is used to reduce forecast requirements, go to **Master planning > Setup > Plans > Master plans**. In the **Forecast model** field, select a forecast model. In the **Method used to reduce forecast requirements** field, select a method. The following options are available:

- None

- Percent – reduction key
- Transactions – reduction key (not yet supported with Planning Optimization)
- Transactions – dynamic period

The following sections provide more information about each option.

None

If you select **None**, the forecast requirements aren't reduced during master scheduling. In this case, master planning creates planned orders to supply the forecasted demand (forecast requirements). These planned orders maintain the suggested quantity, regardless of other types of demand. For example, if sales orders are placed, master planning creates additional planned orders to supply the sales orders. The quantity of the forecast requirements isn't reduced.

Percent – reduction key

If you select **Percent - reduction key**, the forecast requirements are reduced according to the percentages and periods that are defined by the reduction key. In this case, master planning creates planned orders where the quantity is calculated as forecasted quantity × reduction key in each period. If there are other types of demand, master planning also creates planned orders to supply that demand.

Example: Percent – reduction key

This example shows how a reduction key reduces demand forecast requirements according to the percentages and periods that are defined by the reduction key.

For this example, you include the following demand forecast in a master plan.

MONTH	DEMAND FORECAST
January	1,000
February	1,000
March	1,000
April	1,000

On the **Reduction keys** page, you set up the following lines.

CHANGE	UNIT	PERCENT
1	Month	100
2	Month	75
3	Month	50
4	Month	25

You assign the reduction key to the item's coverage group. Then, on the **Master plans** page, in the **Method used to reduce forecast requirements** field, you select **Percent - reduction key**.

In this case, if you run forecast scheduling on January 1, the demand forecast requirements are consumed according to the percentages that you set up on the **Reduction keys** page. The following requirement quantities are transferred to the master plan.

MONTH	PLANNED ORDER QUANTITY	CALCULATION
January	0	= 0% × 1,000
February	250	= 25% × 1,000
March	500	= 50% × 1,000
April	750	= 75% × 1,000
May through December	1,000	= 100% × 1,000

Transactions – reduction key

If you select **Transactions - reduction key**, the forecast requirements are reduced by the transactions that occur during the periods that are defined by the reduction key.

Example: Transactions – reduction key

This example shows how actual orders that occur during the periods that are defined by the reduction key reduce demand forecast requirements.

For this example, you select **Transactions - reduction key** in the **Method used to reduce forecast requirements** field on the **Master plans** page.

The following sales orders exist on January 1.

MONTH	NUMBER OF PIECES ORDERED
January	956
February	1,176
March	451
April	119

If you use the same demand forecast of 1,000 pieces per month that was used in the previous example, the following requirement quantities are transferred to the master plan.

MONTH	NUMBER OF PIECES REQUIRED
January	44
February	0
March	549
April	881
May through December	1,000

Transactions – dynamic period

If you select **Transactions - dynamic period**, the forecast requirements are reduced by the actual order transactions that occur during the dynamic period. The dynamic period covers the current forecast dates and ends at the start of the next forecast. In this case, master planning creates planned orders to supply the forecasted demand (forecast requirements). However, when actual order transactions are placed, the forecast

requirements are reduced. The actual transactions consume part of the forecasted requirements.

When this option is used, the following behavior occurs:

- Reduction keys aren't required or used.
- If the forecast is completely reduced, the forecast requirements for the current forecast become 0 (zero).
- If there is no future forecast, forecast requirements from the last forecast that was entered are reduced.
- Time fences are included in the forecast reduction calculation.
- Positive days are included in the forecast reduction calculation.
- If actual order transactions exceed the forecasted requirements, the remaining transactions aren't forwarded to the next forecast period.

Example 1: Transactions - dynamic period

Here a simple example that shows how the **Transactions - dynamic period** method works.

For this example, you include the following demand forecast in a master plan.

DATE	DEMAND FORECAST
January 1	1,000
February 1	1,000

You also create the following sales orders.

DATE	SALES ORDER QUANTITY
January 15	200
February 15	400

In this case, the following planned orders are created.

DEMAND FORECAST DATE	QUANTITY	EXPLANATION
January 1	800	Forecast requirements (= 1,000 – 200)
January 15	200	Sales orders requirements
February 1	600	Forecast requirements (= 1,000 – 400)
February 15	400	Sales orders requirements

Example 2: Transactions - dynamic period

In most cases, systems are set up so that transactions reduce demand forecast in specific forecast periods: weeks, months, and so on. These periods are defined in the reduction key. However, the time between two demand forecast lines can also *imply* a period.

For this example, you create a demand forecast for the following dates and quantities.

DATE	DEMAND FORECAST
January 1	1,000
January 5	500

DATE	DEMAND FORECAST
January 12	1,000

Notice that, in this forecast, there isn't a clear period between the forecast dates. Between the first and second dates there is a four-day span, and between the second and third dates there is a seven-day span. These spans are the dynamic periods.

You also create the following sales order lines.

DATE	SALES ORDER QUANTITY
December 15 in the previous year	500
January 3	100
January 10	200

In this case, the forecast is reduced in the following manner:

- Because the first sales order isn't in any period, it doesn't reduce any forecast.
- Because the second sales order is between January 1 and January 5, it reduces the forecast for January 1 by 100.
- Because the third sales order is between January 5 and January 12, it reduces the forecast for January 5 by 200.

Therefore, the following planned orders are created.

DEMAND FORECAST DATE	QUANTITY	EXPLANATION
December 15 in the previous year	500	Sales order requirements
January 1	900	Forecast requirements period January 1 to January 5 (= 1,000 – 100)
January 3	100	Sales order requirements
January 5	300	Forecast requirements period January 5 to January 10 (= 500 – 200)
January 12	1,000	Forecast requirements period January 12 to end

Create and set up a forecast reduction key

A forecast reduction key is used in the **Transactions - reduction key** and **Percent- reduction key** methods for reducing forecast requirements. Follow these steps to create and set up a reduction key.

1. Go to **Master planning > Setup > Coverage > Reduction keys**.
2. Select **New** to create a reduction key.
3. In the **Reduction key** field, enter a unique identifier for the forecast reduction key. Then, in the **Name** field, enter a name.
4. Define the periods and the reduction key percentage in each period:

- The **Effective date** field indicates the date when creation of the periods starts. When the **Use the effective date** option is set to **Yes**, the periods start on the effective date. When it's set to **No**, the periods start on the date when master planning is run.
- Define the periods that the forecast reduction should occur during.
- For a specific period, specify the percentages that the forecast requirements should be reduced by. You can enter positive values to decrease requirements or negative values to increase requirements.

Use a reduction key

A forecast reduction key must be assigned to the coverage group of the item. Follow these steps to assign a reduction key to an item's coverage group.

1. Go to **Master planning > Setup > Coverage > Coverage groups**.
2. On the **Other** FastTab, in the **Reduction key** field, select the reduction key to assign to the coverage group. The reduction key then applies to all items that belong to the coverage group.
3. To use a reduction key to calculate forecast reduction during master scheduling, you must define this setting in the setup of the forecast plan or the master plan. Go to one of the following locations:
 - **Master planning > Setup > Plans > Forecast plans**
 - **Master planning > Setup > Plans > Master plans**
4. On the **Forecast plans** or **Master plans** page, on the **General** FastTab, in the **Method used to reduce forecast requirements** field, select either **Percent - reduction key** or **Transactions - reduction key**.

Reduce a forecast by transactions

When you select **Transactions - reduction key** or **Transactions - dynamic period** as the method for reducing forecast requirements, you can specify which transactions reduce the forecast. On the **Coverage groups** page, on the **Other** FastTab, in the **Reduce forecast by** field, select **All transactions** if all transactions should reduce the forecast or **Orders** if only sales orders should reduce the forecast.

Forecast models and submodels

This section describes how to create forecast models and how to combine multiple forecast models by setting up submodels.

A *forecast model* names and identifies a specific forecast. After you've created the forecast model, you can add forecast lines to it. To add forecast lines for multiple items, use the **Demand forecast lines** page. To add forecast lines for a specific selected item, use the **Released products** page.

A forecast model can include forecasts from other forecast models. To achieve this result, you add other forecast models as *submodels* of a parent forecast model. You must create each relevant model before you can add it as a submodel of a parent forecast model.

The resulting structure gives you a powerful way to control forecasts, because it lets you combine (aggregate) the input from multiple individual forecasts. Therefore, from a planning point of view, it's easy to combine forecasts for simulations. For example, you might set up a simulation that is based on the combination of a regular forecast with the forecast for a spring promotion.

Submodel levels

There is no limit on the number of submodels that can be added to a parent forecast model. However, the structure can be only one level deep. In other words, a forecast model that is a submodel of another forecast model can't have its own submodels. When you add submodels to a forecast model, the system checks whether that forecast model is already a submodel of another forecast model.

If master planning encounters a submodel that has its own submodels, you receive an error message.

Submodel levels example

Forecast model A has forecast model B as a submodel. Therefore, forecast model B can't have its own submodels. If you try to add a submodel to forecast model B, you receive the following error message: "Forecast model B is a submodel for model A."

Aggregating forecasts across forecast models

Forecast lines that occur on the same day will be aggregated across their forecast model and its submodels.

Aggregation example

Forecast model A has forecast models B and C as submodels.

- Forecast model A includes a demand forecast for 2 pieces (pcs) on June 15.
- Forecast model B includes a demand forecast for 3 pcs on June 15.
- Forecast model C includes a demand forecast for 4 pcs on June 15.

The resulting demand forecast will be a single demand for 9 pcs (2 + 3 + 4) on June 15.

NOTE

Each submodel uses its own parameters, not the parameters of the parent forecast model.

Create a forecast model

To create a forecast model, follow these steps.

1. Go to **Master planning > Setup > Demand forecasting > Forecast models**.
2. On the Action Pane, select **New**.
3. Set the following fields for the new forecast model:
 - **Model** – Enter a unique identifier for the model.
 - **Name** – Enter a descriptive name for the model.
 - **Stopped** – Usually, you should set this option to *No*. Set it to *Yes* only if you want to prevent editing of all forecast lines that are assigned to the model.

NOTE

The **Include in cash flow forecasts** field and the fields on the **Project** FastTab aren't related to master planning. Therefore, you can ignore them in this context. You must consider them only when you work with forecasts for the **Project management and accounting** module.

Assign submodels to a forecast model

To assign submodels to a forecast model, follow these steps.

1. Go to **Inventory management > Setup > Forecast > Forecast models**.
2. In the list pane, select the forecast model to set up a submodel for.
3. On the **Submodel** FastTab, select **Add** to add a row to the grid.
4. In the new row, set the following fields:
 - **Submodel** – Select the forecast model to add as a submodel. This forecast model must already exist, and it must not have any submodels of its own.
 - **Name** – Enter a descriptive name for the submodel. For example, this name might indicate the submodel's relation to the parent forecast model.

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Master planning with purchase trade agreements

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This topic describes how Planning Optimization can find the vendor and/or lead time for a planned order, based on the best price or lead time that is found among all purchase trade agreements that have been specified for a given product.

Turn on the Purchase trade agreements for Planning Optimization feature

Before you can use this feature, it must be turned on in your system. Admins can use the [Feature management](#) workspace to check the status of the feature and turn it on if it's required. There, the feature is listed in the following way:

- **Module:** *Master planning*
- **Feature name:** *Purchase trade agreements for Planning Optimization*

Prepare your system to evaluate purchase trade agreements during master planning

Follow these steps to configure your system to apply Planning Optimization that evaluates purchase trade agreements.

1. Go to **Master planning > Setup > Master planning parameters**. On the **Planned orders** tab, in the **Vendor** section, set the following values:
 - **Find trade agreement** – Set this option to **Yes** to include purchase trade agreements in master planning.
 - **Search criterion** – Select the factor that you want to prioritize for each purchase trade agreement: **Minimum lead time** or **Lowest unit price**.
2. Go to **Procurement and sourcing > Setup > Prices and discounts > Activate price/discount**, and make sure that the **Vendor** option is set to **Yes**.
3. Go to **Product information management > Setup > Dimension and variant groups > Storage dimension groups**, and select a storage dimension group that applies to products that master planning should evaluate purchase trade agreements for. Make sure that each relevant storage dimension in this group has a check mark in the **For purchase prices** column. Repeat this step for every other relevant storage dimension group.

Prepare a released product to evaluate purchase trade agreements during master planning

After your system is prepared as described in the previous section, you should follow these steps to make sure that each product that you want to use with this feature is correctly set up.

1. Go to **Product information management > Products > Released products**, and open a target product.
2. On the **Purchase** FastTab, make sure that no vendor is assigned in the **Vendor** field.
3. On the Action Pane, on the **Plan** tab, in the **Coverage** group, select **Item coverage** to open the **Item**

coverage page for the selected product. Verify the following settings:

- On the **General** tab, you can set up vendor overrides. If you want Planning Optimization to use purchase trade agreements to select a vendor, you should prevent vendor overrides by clearing the **Use specific setting** check box.
 - On the **Lead time** tab, you can set up lead-time overrides. If you want Planning Optimization to use purchase trade agreements to select lead times, you should prevent lead-time overrides. Clear the check box for each type of lead time that you want to select by using purchase trade agreements (**Purchase, Production, and/or Transfer**).
4. Close the **Item coverage** page to return to the details page for the selected product.
 5. On the Action Pane, on the **Plan** tab, in the **Forecast** group, select **Supply forecast** to open the **Supply forecast** page. Make sure that no row that is shown here has a value in the **Vendor account** column.
 6. Close the **Supply forecast** page to return to the details page for the selected product.
 7. On the Action Pane, on the **Purchase** tab, in the **Trade agreements** group, select **View trade agreements**. Make sure that all the relevant purchase trade agreements are listed. Also make sure that the **Disregard lead time** option is set to **No** for each agreement where you want Planning Optimization to use the lead time that is specified for that agreement.
 8. On the Action Pane, on the **Plan** tab, in the **Order settings** group, select **Default order settings** to open the **Default order settings** page for the selected product. On the **Purchase order** FastTab, view the value of the **Purchase lead time** field. If no item coverage lead-time override is defined, Planning Optimization will use this value when it selects trade agreements where the **Disregard lead time** option is set to **Yes**. Therefore, you should adjust this value as you require.
 9. Repeat this procedure for each relevant product.

NOTE

Currency on the purchase trade agreement line must match the currency of the selected vendor. Master planning will only include information from purchase trade agreement lines where the currency matches the currency on the vendor.

Examples of how Planning Optimization finds vendor and lead times

The following table provides examples that show how various settings for a released product and its associated purchase trade agreements affect the values that are found for the resulting planned purchase order. The **bold** values in the two rightmost columns are the values that are selected by Planning Optimization. The **bold and italic** values in the other columns are the settings that produced those resulting values for each row.

RELEASED PRODUCT: VENDOR	DEFAULT ORDER SETTINGS: LEAD TIME	ITEM COVERAG E: OVERRIDE VENDOR	ITEM COVERAG E: OVERRIDE LEAD TIME	TRADE AGREEME NT: VENDOR	TRADE AGREEME NT: LEAD TIME	TRADE AGREEME NT: DISREGAR D LEAD TIME	RESULTIN G VENDOR	RESULTIN G LEAD TIME
<i>US001</i>	1	No	No	US003	3	No	US001	1
US001	1	<i>Yes: US002</i>	<i>Yes: 2</i>	US003	3	No	US002	2
<i>(Blank)</i>	1	No	No	<i>US003</i>	<i>3</i>	No	US003	3
<i>(Blank)</i>	1	No	No	<i>US003</i>	3	Yes	US003	1

RELEASE D PRODUCT: VENDOR	DEFAULT ORDER SETTINGS : LEAD TIME	ITEM COVERAG E: OVERRIDE VENDOR	ITEM COVERAG E: OVERRIDE LEAD TIME	TRADE AGREEME NT: VENDOR	TRADE AGREEME NT: LEAD TIME	TRADE AGREEME NT: DISREGAR D LEAD TIME	RESULTIN G VENDOR	RESULTIN G LEAD TIME
<i>(Blank)</i>	<i>1</i>	<i>Yes: US002</i>	No	US003	3	No	US002	1
<i>(Blank)</i>	<i>1</i>	<i>Yes: US002</i>	No	US003	3	No	US002	1
<i>(Blank)</i>	1	No	Yes: 2	<i>US003</i>	<i>3</i>	No	US003	3
<i>(Blank)</i>	1	No	<i>Yes: 2</i>	<i>US003</i>	3	Yes	US003	2

Additional resources

Purchase agreements

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Safety margins

2/18/2021 • 8 minutes to read • [Edit Online](#)

This topic describes how safety margins can be used with the Planning Optimization Add-in for Microsoft Dynamics 365 Supply Chain Management.

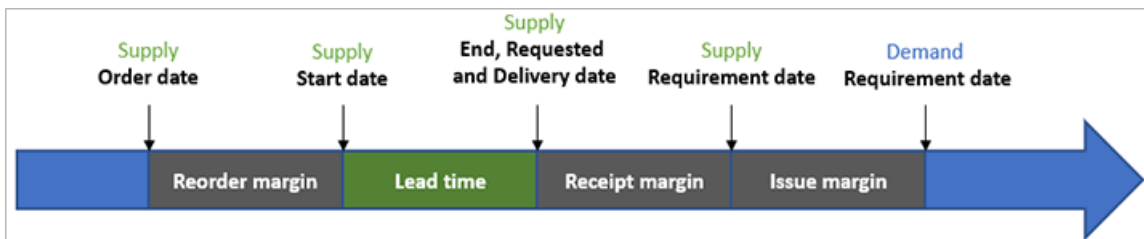
Safety margins overview

The purpose of safety margins is to enable a setup that provides some buffer time beyond the normal lead time. For example, when material must be unpacked or inspected after it arrives from the vendor, you can't just add the extra time to the purchase lead time, because this approach will give the additional buffer time to the supplier. In this example, the receipt margin can be used to ensure that the supplier delivers earlier. This approach provides buffer time so that the goods can be handled internally.

There are three types of safety margins:

- **Reorder margin** – The buffer time for placing the supply order
- **Receipt margin** – The buffer time for handling incoming supply
- **Issue margin** – The buffer time for handling shipments

The following illustration shows how these safety margins apply over time.

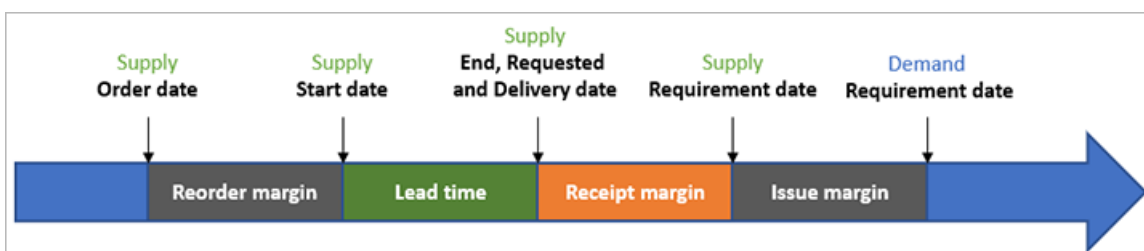


All margins are defined in days. The default value, 0 (zero), indicates that no margin is applied. If you set up multiple margins, they all add to the total time from the supply *order date* to the demand *requirement date*. For example, a setup has no lead time, and all three margin types are set to one day. In this case, there will be three days between the supply order date and the demand requirement date, so if the order date is July 1, the requirement date would be July 4.

Receipt margin

The receipt margin is probably the most used of the three safety margins. It's applied to the *delivery date* and backward from the *requirement date*. In other words, the products should be received the specified number of receipt margin days before they are required.

The following illustration highlights the receipt margin.



The receipt margin is typically used as a buffer to ensure time for warehouse registration or other time-consuming processes that aren't captured as part of the general lead time in the system. For purchases, one

benefit is that the *delivery date* of the purchase order is moved forward accordingly. If you increase the lead time instead of using a safety margin, the vendor will still be asked to deliver at the last minute.

Notice that the receipt margin doesn't change the *requirement date* of the supply. Therefore, the receipt margin isn't directly visible when requirement dates for demand and supply are compared (for example, on the **Net requirements** page). For example, if the receipt margin is set to four days, and a purchase order line is planned for receipt on the fifteenth of the month, master planning calculates the adjusted receipt date as the nineteenth of the month.

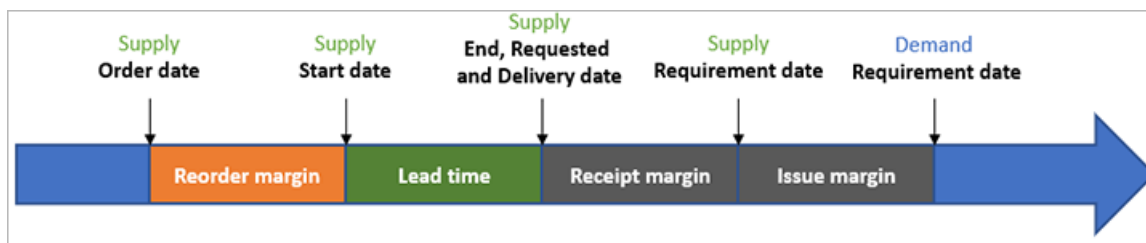
Note that a receipt margin isn't applied when on-hand inventory is used as the supply. All on-hand inventory is assumed to be available immediately, regardless of when it was actually received.

Reorder margin

NOTE

Coming soon: This feature isn't yet supported for Planning Optimization. Until it's supported, all values that are entered for **Reorder margin added to item lead time** will be treated as 0 (zero).

The following illustration highlights the reorder margin.



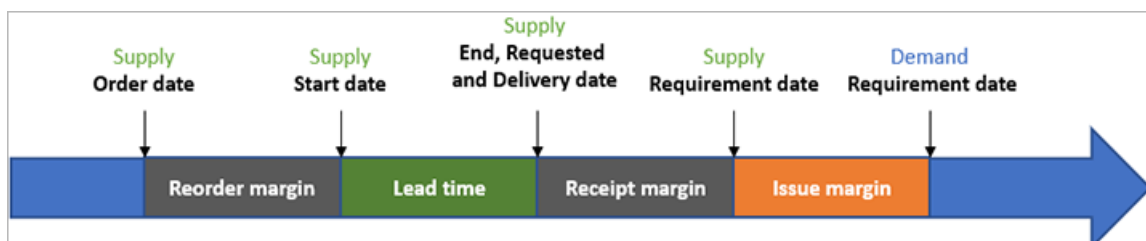
The reorder margin is added before the item lead time for all planned orders during master planning. Therefore, it ensures additional time for a supply order to be placed. This margin is typically used as a buffer to ensure time for approval processes or other internal processes that are required during the creation of supply orders. The reorder margin is put between the supply *order date* and *start date*.

Issue margin

NOTE

Coming soon: This feature isn't yet supported for Planning Optimization. Until it's supported, all values that are entered for **Issue margin deducted from requirement date** will be treated as 0 (zero).

The following illustration highlights the issue margin.



The issue margin is deducted from the demand requirement date during master planning. It helps ensure that you have time to react to and ship incoming demand orders. This margin is typically used as a buffer to ensure time for shipment and related outbound warehouse processes.

Notice that when an issue margin is applied, related supply and demand requirement dates don't match. Instead, they differ by the issue margin, because the issue margin is added between the supply *requirement date* and the demand *requirement date*.

Set up safety margins

Turn on safety margins in Feature management

Before you can use this feature with Planning Optimization, it must be turned on in your system. Admins can use the [Feature management](#) workspace to check the status of the feature and turn it on if it's required. There, the feature is listed in the following way:

- **Module:** *Master planning*
- **Feature name:** *Margins for Planning Optimization*

Define safety margins

Safety margins have a flexible setup. They can be set on both the *coverage group* and the *master plan*. It's important that you understand that the margins are added on top of each other. For example, a receipt margin of two days on the coverage group and three days on the master plan will produce an effective receipt margin of five days.

The ability to set the margin on the master plan can be useful when you want to simulate longer lead times or uncertainty for a specific plan, but without affecting the daily planning.

Coverage group safety margins

To apply a safety margin to a coverage group, follow these steps.

1. Go to **Master planning > Setup > Coverage groups**.
2. In the list pane, select the desired coverage group.
3. On the **Other** FastTab, in the **Safety margins in days** section, use the following fields to set the required safety margins (in days):
 - Receipt margin added to requirement date
 - Issue margin deducted from requirement date
 - Reorder margin added to item lead time

Master plan safety margins

To apply a safety margin to a master plan, follow these steps.

1. Go to **Master planning > Setup > Plans > Master plans**.
2. In the list pane, select the desired master plan.
3. On the **Safety margins in days** FastTab, use the following fields to set the required safety margins (in days):
 - Receipt margin added to requirement date
 - Issue margin deducted from requirement date
 - Reorder margin added to item lead time

Define whether calculations are based on calendar days or work days

You can set all safety margins so that they are calculated based on either calendar days or work days.

1. Go to **Master planning > Setup > Master planning parameters**.
2. On the **General** tab, in the **Safety margins in days** section, set the **Working days** option to *Yes* to calculate margins based on working days. Set the option to *No* to calculate margins based on calendar days.

For example, a calendar is open from Monday through Friday and closed from Saturday through Sunday. If there is a receipt margin of one day, a requirement date on a Monday produces a delivery date on the previous Friday, because Saturday and Sunday aren't working days.

The calendar that is used to determine the working days depends on the setup and the supply type. It can be controlled by the calendars of the coverage group, the warehouse, and the vendor.

NOTE

If *warehouse* isn't part of the coverage dimension (in other words, planning is based only on *site*), the warehouse calendar isn't used.

The system can handle a setup where one or more calendars are defined. The following subsections describe the possible combinations that can be used to control the result.

Calendar that is used for the duration

The defined calendars control the actual total lead time in calendar days, from the supply order date to the demand requirement date. The following calendar prioritization is used:

- **Purchase lead time** – Only the coverage group calendar is considered.
- **Receipt margin** – The coverage group calendar is used, if it's defined. Otherwise, the warehouse calendar is used.
- **Issue margin** – The coverage group calendar is used, if it's defined. Otherwise, the warehouse calendar is used.
- **Order margin** – Only the coverage group calendar is considered.

Calendar that is used for the final date

The following rules are applied to determine whether the planning engine can use a given date for a given date type:

- **Purchase receipt date** – The vendor calendar is used, if it's defined. Otherwise, the coverage group calendar is used, if it's defined. If neither of those calendars is defined, the warehouse calendar is used.
- **Transfer receipt date** – The coverage group calendar is used, if it's defined. Otherwise, the warehouse calendar is used.
- **Production receipt date** – The coverage group calendar is used, if it's defined. Otherwise, the warehouse calendar is used.
- **Demand issue open day** – The warehouse calendar is used, if it's defined. Otherwise, the coverage group calendar is used.
- **Order open day** – A combination (intersection) of the coverage group calendar and the vendor calendar is used. Both calendars must be open to use the date. If only one of the calendars is defined, that calendar is used alone.

Calendar setup overview matrix

The following illustration presents a matrix that summarizes which calendars apply when safety margins are calculated. (Select the image to open a high-resolution version of it.) The following abbreviations and colors are used to indicate where each type of calendar is specified:

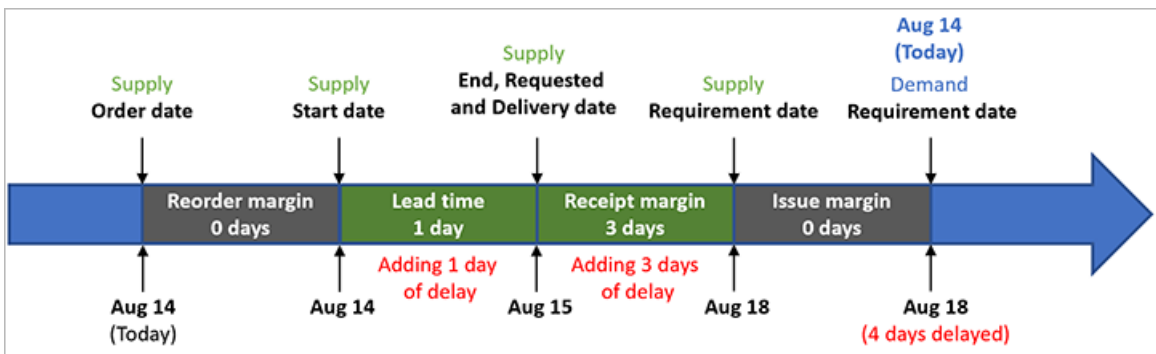
- **Coverage group (CG):** Green
- **Warehouse (WH):** Yellow
- **Vendor (V):** Blue

Calendar is specified on			Calendar used for duration Only counting open days				Calendar used for final date Is the date open or closed				
Coverage group (CG)	Warehouse (WH)	Vendor (V)	Lead time	Receipt margin	Issue margin	Order margin	Purchase requirement date	Transfer requirement date	Production requirement date	Demand requirement date	Supply Order date
Yes	Yes	Yes	CG	CG	CG	CG	V	CG	CG	WH	CG+V
No	Yes	Yes	None	WH	WH	None	V	WH	WH	WH	V
Yes	No	Yes	CG	CG	CG	CG	V	CG	CG	CG	CG+V
Yes	Yes	No	CG	CG	CG	CG	CG	CG	CG	WH	CG
Yes	No	No	CG	CG	CG	CG	CG	CG	CG	CG	CG
No	Yes	No	None	WH	WH	None	WH	WH	WH	WH	None
No	No	Yes	None	None	None	None	V	None	None	None	V
No	No	No	None	None	None	None	None	None	None	None	None

Calculating delays

All three types of safety margins are included when the system determines whether an order is delayed.

For example, an item has lead time of one day and a receipt margin of three days. A sales order for this item is set as required today. In this case, the delay is calculated as $lead\ time + receipt\ margin = four\ days$. Therefore, if today is August 14, the four days of delay produces a delivery on August 18. The following illustration shows this example.



Additional resources

[Get started with Planning Optimization](#)

[Planning Optimization fit analysis](#)

NOTE

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Purchase requisitions

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Master planning can replenish approved purchase requisitions. Therefore, to cover purchase requisitions, users don't have to use a workflow to create purchase orders. Instead, purchase requisitions can be covered by master planning. Because of this functionality, a purchase requisition can produce a purchase order, a transfer order, or a production order, depending on the **Planned order type** value that is set for the related product.

Enable master plans to include requisitions

To include requisitions during the coverage calculation for a master plan, follow these steps.

1. Go to **Master planning > Setup > Plans > Master plans**.
2. Create or select a master plan.
3. On the **General** FastTab, set the **Include requisitions** option to *Yes*.
4. Repeat steps 2 and 3 for each additional master plan where you want to include requisitions.

Approved requisitions time fence

The *approved requisitions time fence* establishes how far back (in days) a master plan will include demand from approved replenishment requisitions. You can set an approved requisitions time fence at both the coverage group level and the master plan level.

Set the approved requisitions time fence for a coverage group

1. Go to **Master planning > Setup > Coverage > Coverage group**.
2. Create or select a coverage group.
3. On the **Other** FastTab, set the **Approved requisitions time fence (days)** field to the number of days to include in the time fence.
4. Repeat steps 2 and 3 for each additional coverage group where you want to set an approved requisitions time fence.

Set the approved requisitions time fence for individual master plans

When you set an approved requisitions time fence for an individual master plan, the setting overrides the time fence setting for any applicable coverage group.

1. Go to **Master planning > Setup > Plans > Master plans**.
2. Create or select a master plan.
3. On the **Time fences in days** FastTab, set the **Approved requisitions time fence (days)** field to the number of days to include in the time fence.
4. Repeat steps 2 and 3 for each additional master plan where you want to set an approved requisitions time fence.

IMPORTANT

Coming soon: Approved requisitions time fences aren't yet supported for Planning Optimization. Until they are supported, all values that you enter in the **Approved requisitions time fence (days)** field will be ignored.

Independent supply, regardless of coverage code

Purchase requisitions are always covered by independent planned orders, regardless of the coverage code. This behavior ensures clear traceability and workflows between purchase requisitions and replenishment orders.

Example 1

A product is set up so that it has a **Coverage code** value of *Min/max*. It has the following inventory and requisition statuses:

- Inventory on-hand quantity = 10.
- Minimum inventory quantity = 15.
- Maximum inventory quantity = 20.
- A purchase requisition for one piece exists. It has a requested date of today.

When master planning runs, two planned orders are created: one for 10 pieces to replenish inventory to the maximum quantity, and one for one piece to replenish the purchase requisition.

Example 2

A product is set up so that it has a **Coverage code** value of *Min/max*. It has the following inventory and requisition statuses:

- Inventory on-hand quantity = 17.
- Minimum inventory quantity = 15.
- Maximum inventory quantity = 20.
- A purchase requisition for one piece exists. It has a requested date of today.

When master planning runs, one planned order for one piece is created to replenish the purchase requisition.

Example 3

A product is set up so that it has a **Coverage code** value of *Period* and a period length of seven days. It has the following inventory, sales order, and requisition statuses:

- Inventory on-hand quantity = 0.
- A sales order for five pieces exists. It has an expected ship date of today plus one day.
- A purchase requisition for three pieces exists. It has a requested date of today plus three days.

When master planning runs, two planned orders are created: one for three pieces to replenish the purchase requisition and one for five pieces to replenish sales order demand.

NOTE

After a planned order that is pegged to a purchase requisition is firm, the planning engine keeps the pegging to the purchase requisition. If the firm order is later found to be missing some quantity that is required to fulfill the purchase requisition, the system will create a new planned order for the difference.

For more information about purchase requisitions, see [Purchase requisition overview](#).

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Production planning

2/18/2021 • 4 minutes to read • [Edit Online](#)

Planning Optimizations supports several production scenarios. If you're migrating from the existing, built-in master planning engine, it's important that you be aware of some changed behavior.

The following video gives a short introduction to some of the concepts discussed in this topic: [Dynamics 365 Supply Chain Management: Planning Optimization enhancements](#).

Planned production orders

When master planning creates planned orders to fulfill requirements, the order type is determined by the value of the **Planned order type** field. If the **Planned order type** field is set to *Production*, planned production orders are created. These planned production orders include information about the active bill of materials (BOM) and the route ID from the related production setup.

Requirements from BOMs

BOM information is honored during master planning. The plan output includes material supply to cover related material demand for production.

During master planning, the current, active BOM is used to determine the materials that are required for production. This step is done through all levels of the BOM structure that is related to the required production order. Material requirement is fulfilled by using available on-hand inventory, existing on-order supply, and approved planned orders. If additional material is required anywhere, a planned order is created to cover the demand.

Scheduling during firming

Planned production orders include the route ID that is required for production scheduling. However, scheduling support during the planning run for planned orders is pending. The route ID is used to schedule planned production orders during firming. Therefore, the lead time on planned production orders can differ from the lead time on related scheduled, firmed production orders that are generated from them, as described here:

- **Planned production order** – The lead time is based on the static lead time from the released product.
- **Firmed production order** – The lead time is based on scheduling that uses route information and related resource constraints.

For more information about expected feature availability, see [Planning Optimization fit analysis](#).

If you depend on production functionality that isn't yet available for Planning Optimization, you can continue to use the built-in master planning engine. No exception is required.

Delays

If the lead time for required material is longer than the period between today's date and the material requirement date, the planned order for the required material and the related production order will be delayed. For planned orders, the delay (in days) is calculated based on the lead time from the released product. The delay information is then propagated through all levels of the BOM structure. Therefore, you can follow the impact of delayed raw material all the way to the customer sales order.

Modifying planned orders

When you change information on a planned order, you receive the following message: "Note that the impact of manual changes on planned orders won't be reflected in the rest of the plan until the next master planning run."

If you want to change information on a planned order and see the impact on the related material requirements, follow these steps.

1. Update the planned order.
2. Approve the planned order.
3. Run master planning.

When you run master planning, you should not use filters if planned production orders are included. For more information, see the [Filters](#) section later in this topic.

NOTE

If the delivery date of the planned order is changed to a later date, the demand might be pegged against a new planned order. This behavior occurs when the new supply date causes a delay for the pegged demand but, according to the lead time settings, the delay can be avoided.

Explosion page

You can use the **Explosion** page to analyze the demand that is required for a specific production order or planned production order, the related coverage, and pegging information. Information on the **Explosion** page is updated during master planning. You can't update the information directly from the **Explosion** page.

Filters

For planning scenarios that include production, we recommend that you avoid filtered master planning runs. To ensure that Planning Optimization has the information that is required to calculate the correct result, you must include all products that have any relation to products in the whole BOM structure of the planned order.

Although dependent child items are automatically detected and included in master planning runs when the built-in master planning engine is used, Planning Optimization doesn't perform this action.

For example, if a single bolt from the BOM structure of product A is also used to produce product B, all products in the BOM structure of products A and B must be included in the filter. Because it can be very complex to ensure that all products are part of the filter, we recommend that you avoid filtered master planning runs when production orders are involved.

NOTE

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Inventory marking with Planning Optimization

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This topic provides information about the options that are available for marking inventory in firm orders when you use Planning Optimization.

Marking is used to link supply and demand. It resembles *pegging*, which indicates how master planning expects to cover demand. From a planning point of view, the main difference is that marking is more permanent than pegging.

Marking was introduced to support special costing scenarios for first in, first out (FIFO) and last in, first out (LIFO). However, it's now also used for some non-costing scenarios. Marking between supply and demand is optional and almost permanent. Marking can be removed manually by a user, or it can be removed by running a sales order line explosion where the **Remove marking** option is selected.

Pegging is controlled by master planning during coverage to link demand with the required supply. Pegging can be updated for each planning run to optimize the supply that is required to cover demand. When master planning updates pegging information, it respects any existing marking.

Pegging starts by including relevant marking, on-hand reservations, and on-order reservations, in the following sequence:

1. Marking between demand and supply
2. On-hand reservations
3. On-order reservations

When you firm a planned order, the **Firming** dialog box provides an **Update marking** field that you use to set marking options for the orders that are created during firming. Select one of the following values:

- **No** – No inventory marking is applied.
- **Standard** – Inventory marking is updated according to the pegging. A requirement order (demand) is marked against a fulfillment order (supply). If some quantity remains on the fulfillment order, it isn't marked, and the reference information is left blank. For example, if a sales order for 100 ea is pegged against a purchase order for 150 ea, reference information will be assigned only to the sales order.
- **Extended** – Both the requirement order (demand) and the fulfillment order (supply) are marked, regardless of any quantity that remains on the fulfillment order. For example, if a sales order for 100 ea is pegged against a purchase order for 150 ea, reference information will be assigned to both the sales order and the purchase order.

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Intercompany planning

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For some organizations, logistics operations depend on other legal entities (companies) in the organization. These operations are handled by using intercompany sales and purchases, because each legal entity has a separate chart of accounts.

This topic describes intercompany planning and explains how to configure intercompany planning with Planning Optimization in Microsoft Dynamics 365 Supply Chain Management.

This topic uses the following important intercompany terms:

- **Upstream** – A relative reference in a firm or supply chain. It indicates movement in the direction of the raw material supplier.
- **Downstream** – A relative reference in a firm or supply chain. It indicates movement in the direction of the customer.
- **Planned intercompany demand** – Planned demand for a product in a company, based on planned demand for the product from a downstream company.

In master planning, a plan in one company can include planned intercompany demand that is related to planned orders from a plan in another company. This capability is useful, because it provides full visibility into planned orders across companies. It also ensures that all required planned supply orders are created, but without requiring that planned orders be firmed for the intercompany demand.

If you run master planning from a master plan that includes planned downstream demand, planned purchase orders from the related intercompany vendors will be included in the plan as demand.

Required setup

To use intercompany planning, you must prepare your system in the following way:

1. The relevant products must be released in all the relevant companies. For more information, see [Configure and use intercompany trade in Dynamics 365 Supply Chain Management](#) on Microsoft Learn.
2. Downstream demand must be covered by purchases from a vendor that has an intercompany relation to the upstream company and relevant default inventory dimensions (site and warehouse) on the customer. For more information, see [Configure and use intercompany trade in Dynamics 365 Supply Chain Management](#) on Microsoft Learn.
3. The master plan in the upstream company must include planned downstream demand, and the relevant company and master plan must be specified in the downstream plans.

Include planned downstream demand

Follow these steps to configure your master plan so that it includes planned downstream demand.

1. Go to **Master planning > Setup > Plans > Master plans**.
2. Select or create a master plan.
3. On the **Intercompany planning** FastTab, set the following fields:
 - **Include planned downstream demand** – Set this option to *Yes* to enable intercompany planning for the master plan.
 - **Downstream plans** – If you set the **Include planned downstream demand** option to *Yes*, use the

toolbar and grid to add the desired master plans from other companies.

Peg across companies by using multilevel pegging

In multilevel pegging, you can view pegging across companies to see the initial source of demand that is being covered by a supply.

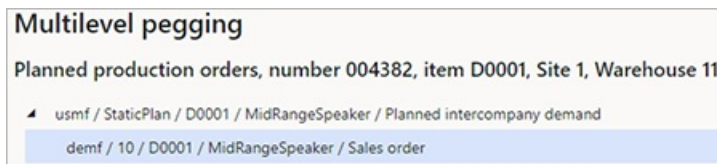
To view multilevel pegging information, follow these steps.

1. Go to **Master planning > Master planning > Planned orders**.
2. Select or open a planned order.
3. On the Action Pane, on the **View** tab, in the **Requirements** group, select **Multilevel pegging**.

Intercompany example that involves two companies

For this example, a planned production order is created in the USMF company to cover a sales order in the DEMF company. In USMF, the direct demand is planned intercompany demand. To make this demand appear in USMF, master planning is run first in DEMF and then in USMF.

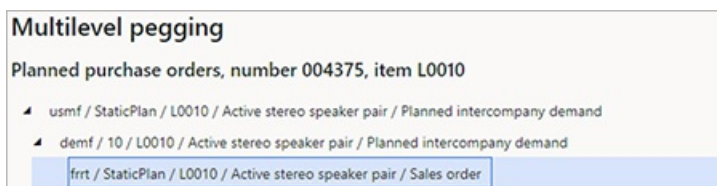
The following illustration shows how this example might appear on the **Multilevel pegging** page for the planned production order.



Intercompany example that involves three companies

For this example, a planned purchase order is created in the USMF company to cover a sales order in the FRRT company. In the DEMF and USMF companies, the direct demand is planned intercompany demand. To make this demand appear in USMF, master planning is run first in FRRT, then in DEMF, and finally in USMF.

The following illustration shows how this example might appear on the **Multilevel pegging** page for the planned production order.



NOTE

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Exclude products that have specific product lifecycle states

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Released products and released product versions include a **Product lifecycle state** field. This field lets you control, among other things, which products are included during master planning. You can add, remove, and edit lifecycle states as required by going to **Product information management > Setup > Product lifecycle state**. For each product lifecycle state, set the **Is active for planning** option to *Yes* if products that have that state should be included during master planning. When the option is set to *No*, the associated products and variants will be excluded from all master planning and all calculations at the bill of materials (BOM) level.

Released products and variants where the **Product lifecycle state** field is left blank are treated as though they have a product lifecycle state where the **Is active for planning** option is set to *Yes*. In other words, they will be included during master planning.

NOTE

To help avoid unnecessary supply suggestions, we strongly recommend that you associate all obsolete released products and variants with a product lifecycle state where the **Is active for planning** option is set to *No*. This approach is especially important when you work with product configuration variants that aren't reusable, because it will help prevent waste.

Related resources

For more information about product lifecycle states, see [Product lifecycle state overview](#).

For detailed information that includes steps for using product lifecycle states to exclude products from master planning and BOM-level calculations, see [Create a product lifecycle state to exclude products from Master planning](#).

NOTE

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Coverage time fences

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This topic describes how to set up *coverage time fences* when you're using Planning Optimization. Planners can define the planning horizon (the coverage time fence in days), and exclude supply and demand that falls beyond that horizon. Therefore, coverage time fences help prevent "noise" that is caused by supply suggestions that you don't have to react to for months. Examples include next year's forecast and customer orders that are placed far beyond the normal lead time.

A coverage time fence is the number of days after today's date (or, more precisely, the date when you do the planning run) that supply and demand is excluded. To help avoid delays, you must ensure that the coverage time fence is longer than the total lead time. The default system value is 100 days.

You can specify a coverage time fence at each of the following levels:

- **Coverage group** – You can set a default coverage time fence for each coverage group.
- **Item coverage** – You can override the coverage time fence that is inherited from the coverage group that is assigned to an item.
- **Master plan** – You can override the coverage time fences that are inherited from the coverage group and item coverage settings.

The following sections explain how to specify a coverage group at each level.

Set a coverage time fence for a coverage group

When you specify a coverage time fence for a coverage group, the setting applies to all items (products) that belong to that group. However, you can override the setting for specific items or specific master plans.

To specify a coverage time fence for a coverage group, follow these steps.

1. Go to **Master planning > Setup > Coverage > Coverage groups**.
2. Select an existing coverage group in the list, or create a new coverage group.
3. On the **General** FastTab, set the **Coverage time fence (days)** field to the number of days that you want to use as the coverage time fence for the coverage group.

Set a coverage time fence for a specific item

Every item (product) belongs to a coverage group. If no coverage group is explicitly assigned to an item, a default coverage group applies. Every item inherits a coverage time fence from its coverage group. However, you can override this time fence for specific items as you require.

To specify a coverage time fence for a specific item, follow these steps.

1. Go to **Product information management > Products > Released products**.
2. Select a product in the grid.
3. On the Action Pane, on the **Plan** tab, in the **Coverage** group, select **Item coverage**.
4. On the **Item coverage** page, on the **Overview** tab, select or create a row for the site where you want to set a coverage time fence.
5. Select the **General** tab to open the settings for the selected site.
6. Select the **Override coverage group settings** check box.
7. Set the **Coverage time fence (days)** field to the number of days that you want to use as the coverage time

fence for the item.

Set a coverage time fence for a specific master plan

You can specify a coverage time fence at the master plan level. In this way, you define the number of days that the master planning calculation covers for a master plan. This setting overrides any coverage time settings that have been defined for each relevant item and coverage group.

To specify a coverage time fence for a specific master plan, follow these steps.

1. Go to **Master planning > Setup > Plans > Master plans**.
2. Select an existing master plan in the list, or create a new master plan.
3. On the **Time fences in days** FastTab, set the **Coverage** option to **Yes**. Then, in the field under the option, enter the number of days that you want to use as the coverage time fence for the master plan.

Considerations for coverage time fences

As you're setting up coverage time fences, consider the following points:

- Coverage time fences affect only input data for master planning. If delays occur, the resulting planned orders might have a date that is after today's date plus the coverage time fence.
- Coverage time fences are specified in calendar days. Calendars that use working days won't affect the time fence calculation. For example, a week is always considered seven days, even if weekends are set up as closed days in the working time calendar.
- Requirement transactions won't be generated for any supply and demand that falls outside the coverage time fence.
- If any approved supply and demand falls outside the coverage time fence, it won't be loaded into the engine. Therefore, it won't trigger any replenishment, and delays won't be calculated. Nevertheless, this supply and demand should not be wiped from the system.
- Variations in safety stock quantities (from minimum keys) will be ignored if they fall outside the coverage time fence.
- Intercompany demand will be ignored if the requested ship date that is calculated isn't inside the coverage time fence. Note that, for built-in master planning, intercompany demand isn't limited by the coverage time fence.
- Demand forecasts will be ignored if the budget date isn't inside the coverage time fence. Note that, for built-in master planning, demand forecasts aren't limited by the coverage time fence.
- Planning Optimization is time zone-aware. It considers the time zone at the supply and demand sites, and the time of the planning run. For example, master planning is triggered at 11 AM on October 15 from a site in Denmark (GMT+1 time zone), and a coverage time fence of ten days is used. In this case, supply and demand from a site in Seattle (GMT-8 time zone) is included until 2 AM on October 25 (= ten 24-hour days after master planning was triggered, minus the time zone difference of nine hours). Note that the built-in master planning engine considers only the date of the time fence. Therefore, the result can differ.

NOTE

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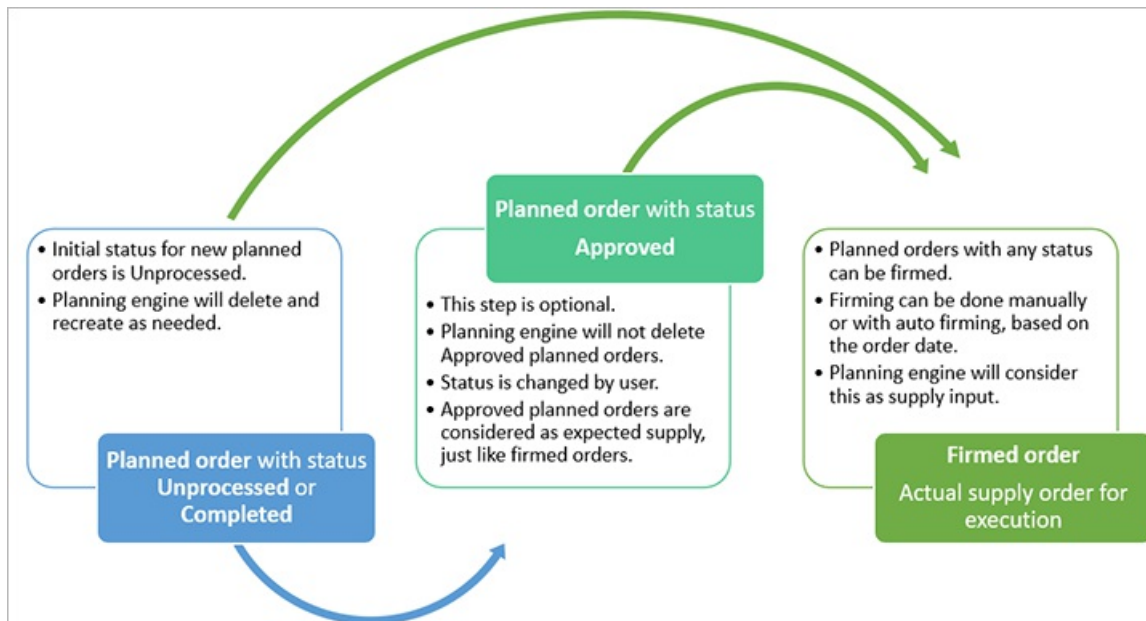
The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Approve planned orders

2/18/2021 • 2 minutes to read • [Edit Online](#)

This topic provides information about how to update the status of planned orders in Planning Optimization.

Note that approval of planned orders is an optional step, on the way to create a firmed order from a planned order. It is recommended to approve modified planned orders, otherwise the edits will be ignored and overwritten by the next planning run.



The **Status** field helps you track your progress using the following values:

- **Unprocessed:** When master planning generates planned orders, the planned orders have a status of *Unprocessed*. Planned orders with this status will be deleted during the next planning run.
- **Completed:** If you decide not to firm a planned order, you can change the status to *Completed* to indicate that you completed evaluating this planned order. Note that a status of *Unprocessed* and *Completed* are treated the same by the system.
- **Approved:** If you want to keep edits or are planning to firm a planned order, change the status to *Approved*. Planned orders with *Approved* status are considered as fixed and expected supply by master planning, so they are not modified or deleted during later master planning runs. To achieve this, the planning logic copies the *Approved* planned orders from the old plan version to the new plan version during master planning. Note that *Approved* planned orders are only considered supply within the specific master plan.

You can manage planned orders from the **Master planning** workspace, the **Planned order** list, or the **Planned production orders**, **Planned purchase orders**, and **Planned transfer** lists.

NOTE

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Autofirming with Planning Optimization

2/18/2021 • 3 minutes to read • [Edit Online](#)

Automatic firming lets you firm (that is, release) planned orders as part of the master planning process. When planned orders are firming, they are transformed into actual purchase orders, transfer orders, or production orders. When Planning Optimization is used, planned orders are firming during a master planning run when the order date (that is, the start date) is within the time fence for firming.

NOTE

Auto-firming of a planned purchase order can occur only if the item is associated with a vendor.

Turn on autofirming

To turn on autofirming, follow these steps.

1. In the **Feature management** workspace, on the **New** tab, select **Auto-firming for Planning Optimization** in the list. If the feature doesn't appear on the **New** tab, look on the **Not enabled** and **All** tabs.
2. Select **Enable now**. Alternatively, select **Schedule**, and then select the time when you want the feature to be turned on.

Set up the firming time fence

The firming time fence is calculated forward from the master planning run date. It's defined by the number of days that you enter. You can control the firming time fence in the following ways:

- To define the default firming time fence for a coverage group, go to **Master planning > Setup > Coverage > Coverage groups**, and select a coverage group. Then, on the **Other** FastTab, in the **Automatic firming time fence (days)** field, enter the number of days.
- To overwrite the firming time fence that is defined for the coverage group for a specific item, go to **Product information management > Released products**, then from the Action Pane select **Plan** and then select **Item coverage**. Then, on the **General** tab, select **Override time fence** and in the **Automatic firming time fence (days)** field, enter the number of days.
- To overwrite the firming time fence that is defined for the coverage group and item coverage for a specific master plan, go to **Master planning > Setup > Master plans**, and select a Master plan. Then, on the **Time fence in days** FastTab, set **Firming** to **Yes**, and enter the number of days.

If autofirming is turned on for a master planning run that uses Planning Optimization, the autofirming process is done according to the autofirming setup. If autofirming isn't turned on, or if planning is started from the **Net requirements** page, the autofirming process is skipped.

Planning Optimization vs. the built-in Supply Chain Management planning engine

Both Planning Optimization and the planning engine that is built into Microsoft Dynamics 365 Supply Chain Management can be used to autofirm planned orders. However, there are some important differences. For example, whereas Planning Optimization uses the order date (that is, the start date) to determine which planned orders to firm, the built-in Supply Chain Management planning engine uses the requirement date (that is, the

end date). Here is a summary of the differences.

Planning Optimization

- Autofirming is based on the order date (start date).
- Because the order date (start date) triggers the firming, you don't have to consider the lead time as part of the firming time fence.
- If you want to firm all orders that must start during the current week, the firming time fence must be one week.

Built-in Supply Chain Management planning engine

- Autofirming is based on the requirement date (end date).
- To help guarantee that orders are firming in due time, the firming time fence must be longer than the lead time.
- If you want to firm all orders that must start during the current week, the firming time fence must be the lead time plus one week.

NOTE

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Planning with negative on-hand quantities

2/18/2021 • 2 minutes to read • [Edit Online](#)

If the system shows a negative aggregate on-hand quantity, the planning engine treats the quantity as 0 (zero) to help avoid over-supply. Here is how this functionality works:

1. The planning optimization feature aggregates on-hand quantities at the lowest level of coverage dimensions. (For example, if *location* isn't a coverage dimension, planning optimization aggregates on-hand quantities at the *warehouse* level.)
2. If the aggregate on-hand quantity at the lowest level of coverage dimensions is negative, the system assumes that the on-hand quantity is really 0 (zero).

IMPORTANT

The planning system can be only as precise as the input data. If the input data is inaccurate, negative on-hand records will indicate that the inventory information in Microsoft Dynamics 365 Supply Chain Management is out of sync with the real world. Therefore, the planning result will be flawed. To get a precise planning result, you should minimize the number of records that show a negative on-hand quantity.

Example 1

Warehouse 13 is configured in the following manner:

- **Coverage code:** Min./Max.
- **Minimum:** 15 pieces (pcs.)
- **Maximum:** 25 pcs.

The lowest level of coverage dimensions is *warehouse*, and the following on-hand quantities are recorded at the *location* level:

- **Site 1, warehouse 13, location 1:** 20 pcs.
- **Site 1 warehouse 13, location 2:** -8 pcs.

Therefore, the aggregate on-hand quantity for warehouse 13 is 12 pcs. (= 20 pcs. - 8 pcs.).

In this case, the planning engine uses an aggregate on-hand quantity of 12 pcs. for warehouse 13.

The result is a planned order of 13 pcs. (= 25 pcs. - 12 pcs.) to refill warehouse 13 from 12 pcs. to 25 pcs.

Example 2

Warehouse 13 is configured in the following manner:

- **Coverage code:** Min./Max.
- **Minimum:** 15 pcs.
- **Maximum:** 25 pcs.

The lowest level of coverage dimensions is *warehouse*, and the following on-hand quantities are recorded at the *location* level:

- **Site 1, warehouse 13, location 1:** 4 pcs.
- **Site 1 warehouse 13, location 2:** -8 pcs.

Therefore, the aggregate on-hand quantity for warehouse 13 is -4 pcs. ($= 4$ pcs. $- 8$ pcs.). In other words, it's less than 0 (zero).

In this case, the planning engine assumes that the on-hand quantity for warehouse 13 is 0 pcs. instead of -4 pcs.

The result is a planned order of 25 pcs. ($= 25$ pcs. $- 0$ pcs.) to refill warehouse 13 from 0 pcs. to 25 pcs.

Related resources

[Planning Optimization overview](#)

[Get started with Planning Optimization](#)

[Planning Optimization fit analysis](#)

[View plan history and planning logs](#)

[Cancel a planning job](#)

NOTE

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View plan history and planning logs

2/18/2021 • 2 minutes to read • [Edit Online](#)

This topic explains how to view the history of planning jobs that are triggered by the Planning Optimization functionality in Microsoft Dynamics 365 Supply Chain Management.

To view the history for a plan, open the plan by going to **Master planning > Setup > Plans > Master plans** and selecting **History**. The history lists all the jobs for the selected plan. The list includes completed and active jobs.

In addition to seeing the start time and status of jobs, you can view the log for a specific job. The log includes additional information and warnings. Not all jobs have a log. To view the log for a job, select **Log**.

Related resources

[Planning Optimization overview](#)

[Get started with Planning Optimization](#)

[Planning Optimization fit analysis](#)

[Apply filters to a plan](#)

[Cancel a planning job](#)

NOTE

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Cancel a planning job

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In Microsoft Dynamics 365 Supply Chain Management, you can cancel an active planning job that uses the Planning optimization functionality. When you select **Cancel** in the dialog box when a Planning optimization job is triggered directly from the user interface (not in the background), this will not cancel the Planning optimization job. Even if you receive a warning such as "Operation canceled", you will still need to use the following steps to cancel a planning job with Planning optimization.

To cancel an active planning job, follow these steps.

NOTE

Only active jobs can be canceled.

1. Go to **Master planning > Setup > Plans**.
2. Select an appropriate plan for the planning run.
3. Select **History**.
4. Select the planning job to cancel.
5. Select **Cancel**.

The job status will be **Canceling** until the Planning Optimization service confirms that the job has been canceled. The status will then be changed to **Canceled**.

NOTE

To see status changes, you must refresh the page by selecting the **Refresh** button.

Additional resources

[Planning Optimization overview](#)

[Get started with Planning Optimization](#)

[Planning Optimization fit analysis](#)

[View plan history and planning logs](#)

[Apply filters to a plan](#)

NOTE

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Troubleshoot Planning Optimization

2/18/2021 • 2 minutes to read • [Edit Online](#)

This topic describes how to fix common issues that you might encounter while working with Planning Optimization.

Installation of the Planning Optimization add-in doesn't complete

Planning Optimization requires a Lifecycle Services (LCS) enabled, high-availability environment, tier 2 or higher (not a OneBox environment), with Dynamics 365 Supply Chain Management version 10.0.7 or later. If you try to install the add-in on a OneBox environment, the installation won't complete.

Fix: Cancel the installation and use a high-availability environment, tier 2 or higher (not a OneBox environment).

Planning of batch jobs fails when Planning Optimization is enabled

When you enable Planning Optimization, the built-in master planning engine is automatically disabled. Master planning batch jobs that were created for the built-in Supply Chain Management planning engine will fail if they are triggered while Planning Optimization is enabled. You may receive an error message such as *This operation triggered master planning that isn't supported when Planning Optimization is enabled*.

Fix: Cancel all master planning batch jobs that were created for the built-in Supply Chain Management planning engine.

Planning Optimization results are different from earlier results

Planning Optimization differs from the built-in master planning design in some areas. This can also be caused by pending features.

Fix: Run Planning Optimization fit analysis and then analyze the results while referring to the related documentation to understand the impact. For more information, see [Planning Optimization fit analysis](#).

Can't enable Planning Optimization

The **Connection status** must be **Connected** before you can set **Use Planning Optimization** to **Yes**. For more information, see [Get started with Planning Optimization](#).

Fix: Make sure that the Planning Optimization add-in was installed successfully.

Error message is shown during CTP

If you try to run capable to promise (CTP) from a sales order when Planning Optimization is enabled, you will receive the following error message: *This operation triggered master planning that isn't supported when the Planning Optimization is enabled*.

This is related to a pending feature that is planned as part of the support for production orders.

Fix: Avoid CTP calculations when Planning Optimization is enabled until CTP support is available.

Additional resources

[Get started with Planning Optimization](#)

Planning Optimization fit analysis

NOTE

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Planning Optimization extensibility

2/18/2021 • 2 minutes to read • [Edit Online](#)

This topic describes the extensibility scenarios that are related to master planning and supported in Planning Optimization. These capabilities are available starting in Microsoft Dynamics 365 Supply Chain Management version 10.0.13.

Custom processing when master planning is completed

In the most common extensibility scenario in Planning Optimization, custom processing is done after the plan has been updated. For example, you might add a column to the planned orders table (`ReqPO`), or you might want to derive some statistical information from the generated plan. The main extensibility point that enables these scenarios is the `jobCompletedSuccessfully` method in the `MpsMasterPlanningEvents` class.

```
public static void jobCompletedSuccessfully(MpsMasterPlanningJobCompletedSuccessfullyEventArgs _args)
```

Here is an example of an extension that sets a custom `CstmOrderPriority` field on the planned order.

```
[ExtensionOf(classStr(MpsMasterPlanningEvents))]
public static final class MpsMasterPlanningEvents_Cstm_Extension
{
    public static void jobCompletedSuccessfully(MpsMasterPlanningJobCompletedSuccessfullyEventArgs _args)
    {
        ttsbegin;

        var affectedPlannedOrdersQuery =
        _args.parmPostProcessingQueryBuilder().buildAffectedPlannedOrdersQuery();
        var affectedPlannedOrdersQueryRun = new QueryRun(affectedPlannedOrdersQuery);

        while (affectedPlannedOrdersQueryRun.next())
        {
            ReqPO reqPO = affectedPlannedOrdersQueryRun.get(tableNum(ReqPO));
            reqPO.selectForUpdate(true);
            reqPO.CstmOrderPriority = reqPO.RegDate - systemDateGet() < 7 ? CstmPlannedOrderPriority::Urgent
: CstmPlannedOrderPriority::Regular;
            reqPO.doUpdate();
        }

        ttscommit;

        next jobCompletedSuccessfully(_args);
    }
}
```

When you add custom logic, consider the following constraints and best practices:

- The `jobCompletedSuccessfully` method is called outside the transaction scope. Therefore, the plan is already visible to the user when the custom logic starts to run. If your customization sets additional fields on planned orders, it's important that you let users know that the values of those fields will eventually be consistent (in other words, they might be out of date immediately after a planning job is completed).
- Another master planning job can start when the `jobCompletedSuccessfully` method is called. The new job might affect the full plan or part of the plan. The new job might update or delete the same planned orders or requirement transactions that were created or updated as part of the planning job that was handled in

`jobCompletedSuccessfully` . Update conflict exceptions must be handled when this event is extended.

- Avoid using single transaction scope when you extend this method. A single master planning run can produce millions of requirement transactions and hundreds of thousands of planned orders. If all these transactions and planned orders are processed in the scope of a single transaction, many SQL locks will occur and block other planning processes. Additionally, if the transaction is held for a long time, "ghost records" will be created in the SQL database. Ghost records will negatively affect every process in the system.

NOTE

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Master plans overview

2/18/2021 • 2 minutes to read • [Edit Online](#)

Use various master plans to support your company's daily working operations, simulate different planning strategies that you want to monitor, and implement a company policy, such as a policy about internal performance or customer satisfaction.

You can configure master plans on the **Master plans** page.

There are two types of plans:

- **Static plan** – The master planning calculation uses the current data to generate a net requirements plan. This plan remains unchanged until the next time that you run master planning or manually change the plan. This is an operating plan that various company personnel, such as a purchaser or production planner, can use to base their decisions on and perform their daily activities.
- **Dynamic plan** – This plan starts with the same net requirements plan that was generated by master planning. However, you can update the dynamic plan every time that the master data changes. This could be when you create a new sales order, for example. This enables you to monitor the changing order network and item availability without disturbing the static plan that others are using for their work processes.

A company may choose to work with just a dynamic plan or it may use both static and dynamic plans. In addition, you can configure any master plan to reflect a particular strategy or address an issue. Examples are as follows:

- Set higher inventory levels to guarantee against stockouts.
- Set longer safety margins to protect against unreliable vendors.

You can also set up the starting dynamic plan so that it is updated with the new requirements plan every time that you run master planning. You can specify these settings on the **Master planning parameters** page.

Additional resources

[Coverage settings](#)

[Separating tactical and operative planning for master scheduling](#)

[Master Planning: Use a static and dynamic Master Plan or use one plan?](#)

NOTE

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Set up master planning

2/18/2021 • 16 minutes to read • [Edit Online](#)

This topic describes various important strategies and parameters that are used to set up master planning. It includes an overview of the types of plans that are used by master planning and explains which plan strategy you should use, depending on your business requirements. It also describes the main parameters that affect the plan and explains how those parameters influence the planned orders that are suggested.

Types of master plans

Master planning has two types of plans: static and dynamic. Each type is designed for a different use. For the best performance, we recommend that you use the appropriate plan for your scenario.

Static plan

The static plan remains unchanged, regardless of any changes in the supply and demand, until the next time that master planning is run.

The static plan is used to approve and firm the orders that are suggested. It's an operating plan that various company personnel (such as a purchaser or production planner) can base their decisions on and use to perform their daily tasks and activities.

The static plan also supports regeneration. A totally new optimized plan is calculated every time that master planning is run, and existing orders that haven't been approved are deleted.

Dynamic plan

The dynamic plan usually starts as a copy of the static plan, but it can be updated every time that master data changes. For example, if the data changes, a new sales order is created.

The dynamic plan is used for ad-hoc planning. It lets the company monitor the changing order network and item availability without disturbing the static plan that other people are using for their work processes. It's especially used for capable to promise (CTP). The dynamic plan is the default plan when net requirements are opened from order pages (such as sales order, purchase order, or production order pages).

The dynamic plan uses net change. Therefore, it helps guarantee a faster running time.

Strategies for using master plans

You can use either one plan or two plans in master planning. The strategy that you use depends on your business requirements.

One-plan strategy

For the one-plan strategy, you use the same master plan for the static plan and the dynamic plan. This strategy is used for make-to-stock scenarios, where you don't usually have to simulate a plan that fulfills an order.

The one-plan strategy is typically used in retail and distribution industries, or where sales delivery dates are confirmed based on service level agreements (SLAs) or lead times. For the plan, delivery date control can be used without CTP.

If you must do a simulation, the plan can be run again for the items that require the simulation. The planned orders that order simulations produce are usually firmed.

Two-plan strategy

For the two-plan strategy, you use a static plan and a different dynamic plan. The two-plan strategy is typically used for configure-to-order and make-to-order scenarios, where you must do sales order simulations and calculate exact delivery dates for sales orders, but the calculations must not affect everyday operations. These simulations are always done in the dynamic plan. The two-plan strategy is useful in the automotive and original equipment manufacturer (OEM) industries, for example.

For the two-plan strategy, delivery date control CTP can be used. When CTP is used, it automatically triggers the run in the dynamic plan.

Setting up the plans

You can create plans on the **Master plans** page (**Master planning > Setup > Plans > Master plans**).

You can specify which plans will be used for the static plan and the dynamic plan by setting the **Current static master plan** and **Current dynamic master plan** fields on the **Master planning parameters** page (**Master planning > Setup > Master planning parameters**). To use a one-plan strategy, select the same plan in the **Current static master plan** and **Current dynamic master plan** fields.

Types of planning methods

Three calculation methods can be used to run master planning: regeneration and net change. Each method produces a different plan when it's run.

You specify the planning method in the **Master planning run** dialog box. To open this dialog box, go to **Master planning > Master planning > Run > Master planning**, or select **Run** in the **Master planning** workspace.

Regeneration

The regeneration planning method deletes existing planned orders, unless they are firmed. It generates new planned orders, based on all the requirements. Regeneration is the only planning method that is available for static plans.

- Changes in supply are considered. These changes include changes in the forecast.
- This method respects the **Period** coverage code.
- This method supports product substitution functionality (PI).

Net change

The net change planning method generates planned orders to cover the requirements that have been created or changed since the last master planning run. Changes in supply aren't considered when this method is run. The system doesn't consider any new supplies, and previously created planned orders aren't deleted if they are no longer required. The net change planning method runs faster than the regeneration method. It's available only for dynamic plans.

- Action dates and futures are updated for all requirements.
- This method doesn't respect the **Period** coverage code.
- This method doesn't fulfill the forecast, even if it's selected on the plan.
- This method doesn't support product substitution functionality (PI).

Net change minimized

The net change minimized planning method generates planned orders to cover only the requirements that have been created or changed since the last master planning scheduling run. For this method, unlike the net change method, action dates and future dates are updated only for new or changed requirements. This planning method is available only for dynamic plans.

Types of scheduling methods

For each plan, on the **General** FastTab of the **Master plans** page (**Master planning > Setup > Plans > Master plans**), you must select the scheduling method that is used for production orders. You can schedule production at the operation level and the job level.

Operations scheduling

You can use operations scheduling to provide a general estimate of the production process over time. Operations scheduling doesn't explode the operations for the production route into jobs. For more information about operations scheduling, see [Operations scheduling](#).

Job scheduling

Job scheduling is a more detailed scheduling method, where each operation is divided into its individual tasks or jobs. Job scheduling includes information about capacity. It's typically used to schedule individual jobs on the shop floor for an immediate or short-term time frame. For more information about job scheduling, see [Job scheduling](#).

Time fences in days

For each plan, you can select how far in the future the various requirements and other considerations must be calculated by master planning. The period is known as a *time fence*. For the best performance in master planning, we recommend that you adjust the various time fences to meet your business requirements. For each plan, you can find the time fences on the **Time fences in days** FastTab of the **Master plans** page (**Master planning > Setup > Plans > Master plans**).

NOTE

The time fences indicate how far in the future the various requirements and other considerations are calculated by master planning. The time fences selected in this page will override the time fences defined in the coverage group. This means setting a time fence option to yes and defining the days will override the time fence defined in the coverage group. When setting to No, the time fence will be defined in the coverage group. Finally, if you don't want or need to use an option (for example you do not want to use action messages), set it to **Yes**, and then set the time fence to **0** (zero) days.

Coverage

The coverage time fence represents the scheduling period, or how far out the demand should be included. In other words, it indicates your planning horizon.

By setting the **Coverage** option to **Yes**, you can override the coverage time fence that is defined for the item during master scheduling. In this case, enter the number of days that the master scheduling calculation should cover requirements. The coverage time fence is calculated forward from the current date. Requirements that occur before the current date are always processed.

NOTE

For the best performance in master planning, we recommend that you adjust the coverage time fence to your planning horizon.

Freeze

The freeze time fence represents the period when existing planned orders aren't changed when a new master schedule is run. The planned orders are frozen, and no new planned orders will be suggested.

By setting the **Freeze** option to **Yes**, you can override the freeze time fence that is defined for the item during master scheduling. In this case, enter the number of days that planning activity should be frozen. Remember that, during this period, no new planned orders are generated, and existing planned orders can't be changed.

Firming

The firming time fence indicates the time horizon in which planned orders are automatically converted to production and purchase orders. This process is also known as *automatic firming of planned orders*.

By setting the **Firming** option to **Yes**, you can override the firming time fence that is defined for the item during master scheduling. In this case, enter the number of days that planned purchase orders and planned production orders should be automatically firming. The firming time fence is calculated forward from the master scheduling date. Automatic firming of a planned purchase order can occur only if the item is associated with a vendor.

Forecast plan

The forecast plan time fence indicates how far in the future master planning creates planned orders for items that have forecasted demand.

By setting the **Forecast plan** option to **Yes**, you can override the forecast plan time fence that is defined for the item during master scheduling. In this case, enter the number of days that the sales forecast from the forecast plan should be included in master planning.

Capacity

The capacity time fence indicates how far in the future the system considers the maximum capacity of your resources when it schedules orders. In other words, the plan schedules the production orders by using the production route for the items, and it considers the production route's resources and the maximum capacity of each resource.

By setting the **Capacity** option to **Yes**, you can override the capacity time fence that is defined for the item during master scheduling. In this case, enter the number of days that capacity should be planned for planned production orders. Master scheduling uses the active production route for the item and schedules backward from the requirement date. If the requirement date for a planned production order is outside the capacity time fence, the lead time is determined by the delivery time of the item. The capacity time fence is calculated forward from the current date.

Action message

Action messages suggest changes that can be made to the existing supply order to help optimize the supply plan. For example, they might recommend that you advance or postpone orders, or that you increase or decrease the order quantities.

By setting the **Action message** option to **Yes**, you can override the action message time fence that is defined for the item during master scheduling. In this case, enter the number of days that master scheduling should generate action messages for requirements. The action message time fence is calculated forward from the current date.

For more information about action messages, see [Action messages](#).

NOTE

The calculation of action messages causes a longer running time for master planning. If action messages aren't regularly analyzed and applied (daily, weekly, and so on), consider turning off the calculation during the master planning run. To turn off the calculation, on the **Master plans** page, set the **Action message** time fence to **0** (zero) for the master plan that you're running. Also make sure that the **Action message** setting is turned off for all the coverage groups.

Calculated delays

You can specify how far in the future possible delays in planned orders are detected and reported. In this way, you can schedule possible (delayed) delivery dates.

If a planned order can't be fulfilled for the requested date, it's planned for the earliest fulfillment date for a transaction, based on lead times, and material and capacity availability.

Approved requisitions time fence

You can set up master planning to create planned orders for requisition demand. Set the **Include requisitions** option to **Yes** on the **General** FastTab of the **Master plans** page. Then, when the purpose of an approved requisition is replenishment, master planning automatically creates a corresponding planned order to fulfill it. The replenishment method is determined by the supply policies that have been set up for the items in your organization. After the replenishment requisition is created and approved, no additional user action is required.

By setting the **Approved requisitions time fence** option to **Yes** on the **Time fences in days** FastTab, you can override the approved requisitions time fence that is defined for the item during master scheduling. In this case, enter the number of days in the past that demand from approved requisitions that have the replenishment purpose should be included in master scheduling. For example, you can specify that only unfulfilled, past-due demand from approved requisitions that were created in the last 10 days should be considered and planned for.

Sequencing

Sequencing enables planned orders to be arranged based on sequencing attributes that are associated with the finished product. It's often used to prepare production orders for packaging. For example, it can be used to pack boxes in a specific sequence, based on color and size.

By setting the **Sequencing** option to **Yes**, you can specify how far in the future the operations or jobs should be sequenced. Keep in mind that the longer the time fence is, the longer it will take for master planning to run.

Calculated delays

Delay options help guarantee that the orders have feasible planned dates. The following options are available on the **Calculated delays** FastTab of the **Master plans** page:

- **Ensure that the planned orders are not created prior to master planning run date** – Set this option to **Yes** to help guarantee that orders can't be scheduled for dates in the past.
- **Add the calculated delay to the requirement date (under Planned purchase orders)** – Set this option to **Yes** to add the calculated delay to the requirements.
- **Add the calculated delay to the requirement date (under Planned production orders)** – Set this option to **Yes** to add the calculated delay to the requirements.
- **Add the calculated delay to the requirement date (under Planned transfer)** – Set this option to **Yes** to add the calculated delay to the requirements.
- **Add the calculated delay to the requirement date (under Planned kanban)** – Set this option to **Yes** to add the calculated delay to the requirements.

When you set the **Add the calculated delay to the requirement date** options to **Yes** to add the delays to the requirements, the system considers the capacity of the resources and creates feasible planned orders. Recalculation of the planned order dates increases the running time for master planning. Therefore, if you don't need to use the delays, set the options to **No**.

Positive and negative days

Positive and negative days affect how master planning suggests planned orders and actions. Positive and negative days are set on the item coverage group of the item. You can define the various coverage groups and set their parameters on the **Coverage groups** page (**Master planning > Setup > Coverage > Coverage groups**).

Positive days

Positive days indicate how far in the future master planning considers the current inventory or receipts to fulfill a future demand. For example, if the positive days are set to **100**, the current inventory can be used to fulfill demand in the next 100 days. If there is an order 150 days from the current date, master planning will create a planned order to satisfy that demand, even though the on-hand inventory for the item can satisfy the order. For fast-moving items that have a short lead time, you might not want to use the on-hand inventory for an order that is far in the future. In this fast-moving case, the current on-hand inventory will be gone quickly, and more

orders could be placed in the future to fulfill a future demand on time, which would be possible due to the short lead time of the item.

The positive days also affect the action messages. For example, the system might recommend that you increase a planned purchase order so that it includes a demand that is within the number of positive days in the future. If the positive days are set to **100**, and if there is demand for an item in 30 days from the current date, the system will create a planned order to satisfy that demand. If there is demand for the same item in 90 days from the current date, the system will recommend that you increase the quantity of the order in 30 days from the current date, so that the order also covers the demand in 90 days. However, if there is demand for the item in 150 days from the current date, the system won't recommend that you increase the quantity of the order that was already planned. Instead, a new planned order will be created.

As a rule, the positive days are set to a number that is between the longest lead time of the items and the coverage time fence. We recommend that you assign items that are regularly procured or produced to a coverage group where the positive days equal the item's lead time.

Negative days

Negative days indicate how late item receipts will be allowed. They represent the number of days that you're willing to wait before you order new replenishment when you have negative inventory or don't have enough inventory. Negative days answer the question, Should we create a new purchase order for the item, or should we use an existing purchase, even though we know that the item will be late?

For example, you have a sales order for an item 15 days from the current date. You also have a purchase order for the same item. This purchase order will be received in 20 days from the current date. Do you want the system to create a purchase order for that sales order, or do you want to use the existing order, even though you can't fulfill the sales order on time? If the negative days are set to less than 5 to indicate the item can be delayed a maximum of five days, the system creates a new planned purchase order to satisfy the sales order. If the negative days are set to greater than 5, the system uses the existing order for the item.

The negative days also affect the performance of master planning. If the negative days are set to a high number, lots of action messages will be generated.

We recommend that you set the negative days to a number that is less than the lead time of the item.

Dynamic negative days

Dynamic negative days consider the item's lead time and the negative days that you specified. The system will create a new planned purchase order, based on the negative days time fence that is calculated by using the following formula:

Lead time + Negative days + Current date – Requirement date

The system uses only the planned supply orders that are within this time fence, and it creates a new planned order outside it. The advantage of dynamic negative days is that it will include the individual product lead time, to reuse existing orders and avoid creating new planned orders that will end up with a later day, due to delays caused by lead time.

For more information, see [Negative days and dynamic negative days](#).

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Master planning setup wizard

2/18/2021 • 10 minutes to read • [Edit Online](#)

This topic provides a guide for the **Master planning setup wizard**. It explains how parameter suggestions are calculated and also provides examples that show how different companies set up master planning, based on their business needs.

The [Master planning setup wizard in Dynamics 365 Supply Chain Management](#) video (shown above) is included in the [Finance and Operations playlist](#) available on YouTube.

Specific requirements of your company

The first page of the wizard asks about the specific requirements of your company. Your answers to these questions don't have to be exact, but you should be able to provide a rough approximation of the number of items and planned orders that there will be for the legal entity. Your answers are used to configure parameters that apply to your legal entity, not just to the master plan that you selected. The following sections describe the parameters that are calculated and the formulas that are used.

Number of threads

- **If you manufacture any of the items:** Number of threads = Number of planned orders ÷ 1,000
- **If you don't manufacture any of the items:** Number of threads = Number of items ÷ 1,000

If the number of threads that is calculated exceeds 75 percent of the available number of threads, it's capped at 75 percent of the number of threads that is available for each customer. (The number of available threads will be determined for each customer.)

For more information, see [Number of threads](#).

Bundle size

The bundle size will be set to 1. This value is often the best value, because it helps improve the performance of master planning.

For more information, see [Number of tasks in helper task bundle](#).

Firming bundle size

- **If you manufacture any of the items:** The firming bundle size will be set to the larger of these two values: 10 and the bundle calculation
- **If you don't manufacture any of the items:** The firming bundle size will be set to the larger of these two values: 50 and the bundle calculation

Bundle calculation = (Number of planned orders × (Firming time fence ÷ Coverage time fence) ÷ Number of threads) ÷ 10

Cache size

The cache size will be set to **Maximum**. This value is often the best value, because it helps improve the performance of master planning.

For more information, see [Allocate time to jobs in a job bundle](#).

Manufacturing setup

If you manufacture items, a **Manufacturing setup** page will appear later in the wizard.

Scope of the current plan

On the **Scope of the current plan** page of the wizard, you answer questions that are related to how far in the future various requirements will be considered and calculated in master planning. Each question asks whether you want to use a feature and how you want to configure it.

For example, for the forecast plan feature, the wizard asks, "Do you want to use a forecast plan in master planning so that planned orders will be suggested to fulfill the forecasted demand?"

The following options are available:

- **No** – Master planning won't suggest planned orders to fulfill a forecast. On the **Time fences** tab of the **Master plans** page (**Master planning > Setup > Plans > Master plans**), the wizard will set the **Forecast plan (time fence)** option to **Yes** and set the number of days to **0** (zero). This setup will override the time fence that is specified in the coverage group. Because the number of days is set to **0** (zero), the feature won't be used.
- **Yes, as defined in this master plan** – A field becomes available, where you can enter the number of days that master planning will suggest planned orders to fulfill the forecasted demand. The wizard will set the **Forecast plan (time fence)** option to **Yes** and set the number of days to the number of days that is entered in the **Forecast plan** field on the **Time fences** tab of the **Master plans** page. This setup will override the values that are set in the coverage groups.
- **Yes, as defined in the coverage** – The wizard will set the **Forecast plan (time fence)** option to **No**. The time fences that are specified in the coverage group will be used to specify how long you will plan for the forecast.

The remaining questions on this page and their answers follow the same schema:

- **No** – The **Forecast plan (time fence)** option will be set to **Yes**, and the number of days will be set to **0** (zero).
- **Yes, as defined in this master plan** – The **Forecast plan (time fence)** option will be set to **Yes**. The number of days that you enter will be used and will override the values that are set in the coverage groups.
- **Yes, as defined in the coverage group** – The **Forecast plan (time fence)** option will be set to **No**.

For more information, see [Job scheduling](#).

Scheduling options

The **Scheduling options** page appears only if you answered **Yes** to the "Do you manufacture any of the items planned?" question on the first page of the wizard.

Your answer to the first question on this page ("Do you need to schedule operations divided into individual jobs?") determines the scheduling method on the **General** tab of the **Master plans** page.

- **Yes** – Job scheduling will be used.
- **No** – Operations scheduling will be used.

For more information, see [Operations scheduling](#) and [Job scheduling](#).

Updates of demand and supply

The questions on the **Updates of demand and supply** page are related to firming, action messages, and delays.

The master planning setup will be updated based on your answers, according to the same schema that is described in the previous section:

- **No** – The **Time fence** option on the **Master plans** page will be set to **Yes**, and the number of days will be set to **0** (zero).
- **Yes, as defined in this master plan** – The **Time fence** option will be set to **Yes**. The number of days that you enter will be used and will override the values that are set in the coverage groups.
- **Yes, as defined in the coverage group** – the **Time fence** option will be set to **No**.

For calculated delays, your answers to the questions in the wizard will update the corresponding parameters on the **Calculated delays** tab of the **Master plans** page.

Summary of your changes

The last page of the wizard shows the changes that are recommended based on your responses. It shows both the value in your setup (**Current setup**) and the value that the wizard recommends (**New configuration**).

You can also modify the parameters in the new configuration. The parameters are separated into parameters that apply to your legal entity and parameters that apply only to the master plan that you selected. To view all the setup parameters that can be changed by using the wizard, select **Show all parameters** at the bottom of the page. You can then change the parameters.

Finally, when you select **Finish**, the new configuration is applied. If you select **Cancel**, none of the changes are applied.

Examples

This section describes the setup of two fictional companies to show how the setup can change according to the needs of each business.

Example 1: Contoso Manufacturer

Contoso Manufacturer is a manufacturing company that produces speakers. It purchases the various raw materials and components that are used for the final speakers from various suppliers. Here are some of the characteristics of its supply and manufacturing:

- The final items that the company manufactures have a bill of materials (BOM) structure.
- All final items and components are planned by master planning. Manual planning isn't done.
- A route of operations is defined for the production of each final item.
- The manufacturing plant produces the final items. It has a defined number of milling and drilling machines that are used to process the components. The various components must be processed by these machines.
- There are many suppliers. The average lead time for items is one week. A group of items from the same supplier will have a lead time of seven weeks.

In the wizard, the following values are entered for Contoso Manufacturer:

- **Coverage:**
 - **Question:** "Do you want to specify the number of days of your planning horizon?"
 - **Answer:** "Yes, as defined in the coverage groups."

Because the lead time for items is very different, Contoso doesn't have to plan all the items for the same period in the future. Coverage groups for the items are created. Items that have a similar lead time are assigned to the same coverage group. The planning horizon for each coverage group (that is, the coverage time fence) is approximately the lead time plus a margin of one week. Master planning then makes sure that the items are planned in advance, based on their lead time.

Therefore, two coverage groups will be created for this example. One coverage group will have a coverage time fence of two weeks, and the other will have a coverage time fence of eight weeks.

If **Yes, as defined in this master plan** is selected as the answer, the number of days that is entered should exceed the longest lead time of all the items. However, because many items don't have to be planned so far in advance, many planned orders will be calculated but never used. Therefore, the master planning runtime will increase.

- **Scheduling:**

- **Question:** "Do you need to schedule operations divided into individual jobs?"
- **Answer:** "Yes."

Contoso Manufacturing must plan and schedule the individual jobs that will be performed on the shop floor. Therefore, it will use job scheduling.

- **Capacity:**

- **Question:** "Do you want to schedule using the capacity of resources?"
- **Answer:** "Yes, as defined in this master plan." **10 days** is entered.

The number of milling and drilling machines is limited. Production planning must take this limitation into account and arrange the jobs in time according to the capacity of the resources. In other words, the jobs that are scheduled will be replanned based on the limitations of the resources. Planning will use the lead time in addition to the period that is defined. (Planned production orders can overlap.) Because the production lead time for the items is seven days, the capacity of the resources for master planning will be considered during 10 days.

- **Sequencing:**

- **Question:** "Do you want to sequence planned orders using the product's sequence values?"
- **Answer:** "Yes, as defined in the coverage groups."

A route is defined for the production of each final item. Therefore, master planning will schedule the orders in time according to the defined routes.

- **Explosion:**

- **Question:** "Do you want to plan orders for all the elements in a Bill of Materials (plan for the parent and all children items)?"
- **Answer:** "Yes, as defined in the coverage groups."

All the items that are used for the production must be planned. Because the items have very different lead times, master planning will have better performance when it uses the coverage groups. Again, a margin of one week can be entered, and explosion can be done for the same time as the coverage.

Example 2: Contoso Retailer

Contoso Retailer is a distribution company in the fashion industry. It uses master planning to calculate when purchase orders should be placed, based on its forecasted sales. Here are some of its characteristics:

- Contoso Retailer uses a demand forecast to predict sales. Purchase orders will be planned according to the forecast.
- Stores use requisitions for replenishment.
- The lead time from the main warehouse to each store is approximately two weeks for all items.

In the wizard, the following values are entered for Contoso Retailer:

- **Forecast demand:**

- **Question:** "Do you want to use a forecast plan in master planning so that planned orders will be suggested to fulfill the forecasted demand?"
- **Answer:** "Yes, as defined in this master plan."

Contoso has included a demand forecast to predict its sales. Therefore, master planning must

recommend planned orders to fulfill the forecast.

- **Firming:**

- **Question:** "Do you want master planning to automatically firm planned orders into order documents, for example production or purchase orders?"
- **Answer:** "Yes, as defined in this master plan." **1 day** is entered.

Because Contoso Retailer will create purchase orders directly from the planned purchase orders, it's useful if the planned purchase orders are automatically firmed. Because the company runs master planning every day, a firming time fence of one day will automatically firm all the orders that are required for the next day.

- **Approved requisitions:**

- **Question:** "Do you want to include demand from approved requisitions to replenish retail stores?"
- **Answer:** "Yes, as defined in this master plan." **1 day** is entered.

Contoso uses the approved requisitions from its stores to create planned purchase orders to replenish those stores. Because master planning is run every day, the requisitions from the last day will be included in the planning.

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Coverage settings

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Master scheduling uses coverage settings to calculate item requirements.

You can specify coverage settings in several ways:

- Specify coverage settings for a coverage group.

You can create a coverage group that contains settings for all products that are linked to the coverage group. To create a coverage group, go to **Master planning > Setup > Coverage > Coverage groups**. You can link a coverage group to a product. If the link is specific to a site, warehouse, or product dimension, use the **Coverage group** field on the **Item coverage** page. If the link is generic, regardless of the product dimensions, use the **Coverage group** field on the **Plan** FastTab of the **Product details** page. By default, if you don't link a coverage group to a product, master planning uses the general coverage group that is specified on the **Master planning parameters** page.

- Specify coverage settings for a product.

You can create coverage settings for a specific product. Go to **Product information management > Products > Released products**. Select the product, and then, on the Action Pane, on the **Plan** tab, in the **Coverage** group, select **Item coverage** to open the **Item coverage** page. If the product is already linked to a coverage group, you can override the coverage group settings by using the **Override** field. The coverage settings on the **Item coverage** page take precedence over the settings on the **Coverage group** page.

- Specify coverage settings for a product by using a wizard.

The wizard guides you step by step through the process of setting up the primary item coverage parameters. On the **Item coverage** page, on the Action Pane, select **Wizard** to open the **Item Coverage Wizard**.

- Specify coverage settings for a dimension group.

Go to **Product information management > Products > Released products**. On the **Released product details** page, on the **General** FastTab, in the **Administration** section, select the link in the **Storage dimension group** field. On the **Storage dimension groups** page, select the **Coverage plan by dimension** check box to create the coverage settings for a dimension in the storage dimension group. The **Coverage plan by dimension** field must be selected for all product dimensions, such as configuration, color, size, and style.

Coverage codes

Master planning can be configured to use different replenishment methods. The replenishment methods or lot-sizing methods are the techniques used by the system to determine the batch size for purchased or produced items.

Each replenishment method is assigned one of the following coverage codes:

- **Manual** - The lot-sizing method where the system does not suggest purchased, transfer, or production orders for the item. The planner for the item will be in charge of creating the required orders for the replenishment of the item.
- **Per requirement** - The lot-sizing method in which the system creates a planned purchase, transfer, or

production order per requirement for the item. This is generally used for expensive items with intermittent demand.

- **Per period** - The lot-sizing method that combines all the demand for a period into one order for the item. The order will be planned for the first day of the period and its quantity will fulfill the net requirements during the established period. The period starts with the first demand of the item and covers the defined length in time. The next period will start with the next requirements of the item.
- **Min/Max** - The lot-sizing method that contains the replenishment of inventory up to a certain level when the predicted on-hand is below a threshold. The replenishment quantity will be the difference between the maximum level and the predicted on-hand level.

Additional resources

[Master plans overview](#)

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Define coverage rules for items

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The demo data company used to create this procedure is USMF. This procedure shows how to create coverage rules and override coverage settings for a specific item. It also shows how to specify default inventory settings.

Create a coverage group

1. Go to **Navigation pane > Modules > Master planning > Setup > Coverage groups**.
2. Click **New**.
3. In the **Coverage group** field, type a value.
4. In the **Name** field, type a value.
5. In the **Calendar** field, type a value. Choose the calendar that master planning uses to create replenishment suggestions for items in this group.
6. In the **Coverage code** field, select an option. Select 'Requirement' for this procedure.
7. In the **Coverage time fence (days)** field, enter '90'. For items in this group, master planning will create replenishment suggestions for up to 90 days in the future.
8. In the **Negative days** field, enter '1'.
9. In the **Positive days** field, enter '1'.
10. Expand or collapse the **Other** section.
11. Under the **Safety margins in days** section, in the **Receipt margin added to requirement date** field, enter '1'. For example, if the receipt margin is set to 1 day, and a purchase order line is scheduled for receipt on May 15, master planning calculates the adjusted receipt date as May 16.
12. In the **Issue margin deducted from requirement date** field, enter '1'. For example, if the safety margin is set to 1 day, and a sales order line is scheduled for delivery on May 15, master scheduling calculates the adjusted delivery date as May 14.
13. In the **Reorder margin added to item lead time** field, enter '1'.
14. Click **Save**.

Create a new product

1. Go to **Navigation pane > Modules > Product information management > Products > Released products**.
2. Click **New**.
3. In the **Product number** field, type a value.
4. In the **Product name** field, type a value.
5. In the **Item model group** field, click the drop-down button to open the lookup.
6. In the list, find and select the desired record.
7. In the list, click the link in the selected row.
8. In the **Item group** field, click the drop-down button to open the lookup.
9. In the list, find and select the desired record.
10. In the list, click the link in the selected row.
11. In the **Storage dimension group** field, click the drop-down button to open the lookup.
12. In the list, find and select the desired record.
13. In the list, click the link in the selected row.
14. In the **Tracking dimension group** field, click the drop-down button to open the lookup.

15. In the list, find and select the desired record.
16. In the list, click the link in the selected row.
17. Click **OK**.

Setup default order settings

1. On the **Action Pane**, click **Plan**.
2. Under **Order settings**, click **Default order settings**.
3. Under **Purchase order**, in the **Default site** field, type the site used as default when purchase orders are created.
4. In the **Default warehouse** field, type the site where the item is stored.
5. Expand or collapse the **Inventory** section.
6. In the **Multiple** field, type '10'.
7. In the **Min. order quantity** field, type '10'.
8. In the **Max. order quantity** field, type '100'.
9. In the **Standard order quantity**, type '10'.
10. In the **Purchase lead time** field, enter a number.
11. Select or clear the **Working days** check box.
12. Click **Save**.
13. In the **Default order type** field select 'Purchase order'.
14. Click **Save**.
15. Close the page. Close the Default order settings page.

Add an item to a coverage group

1. Expand or collapse the **Plan** section.
2. In the **Coverage group** field, click the drop-down button to open the lookup.
3. In the list, find the **Coverage group** you have created.
4. In the list, click the link in the selected row.

Create item coverage rules

1. On the **Action Pane**, click **Plan**.
2. Under **Coverage**, click **Item coverage**.
3. Click **New**.
4. Click the **General** tab.
5. Check the box on the header of **Override coverage group** settings.
6. In the **Coverage time fence (days)** field, enter '60'. Although items in coverage group Requirements are planned 90 days ahead, this item will be planned 60 days ahead.
7. In the **Negative days** field, enter '2'.
8. In the **Positive days** field, enter '2'.
9. Click the **Lead time** tab.
10. Check the box on the header of **Purchase**.
11. In the **Purchase time** field, enter '5'.
12. Click **Save**.

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Generate a constrained plan

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This topic explains how to create a plan that takes into account both material and capacity constraints. The plan ensures that manufacturing doesn't start before materials are available and resources are not overbooked.

The demo data company used to create this procedure is USMF. This procedure is intended for the production planner.

Set up a constrained plan

1. In the home page, select the **Master planning** workspace.
2. Select **Master plans** in the list of links on the far right side of the workspace.
3. In the list, find and select the desired record. Example: **StaticPlan**
4. Select **Yes** in the **Finite capacity** field.
5. In the **Finite capacity time fence** field, enter .
6. Expand the **Time fences in days** section.
7. Select **Yes** in the **Capacity** field.
8. In the **Capacity scheduling time fence (days)** field, enter a number. Example:
9. Select **Yes** in the **Calculated delays** field.
10. In the **Calculate delays time fence (days)** field, enter a number. Example:
11. Expand the **Calculated delays** section.
12. Select **Yes** in all **Add the calculated delay to the requirement date** fields.
13. Close the page.

Create a constrained plan

1. Select **Run**.
2. In the **Master plan** field, enter or select the plan for which you have set up constraints.
3. Select **OK**.
4. Select **Planned orders**.

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Create a material plan for co products

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The production planner plans the material requirements for items that are formula co-products. The demo data company used to create this procedure is USP2.

Create requirement for a co-product

1. Go to Default dashboard.
2. Click Sales order processing and inquiry.
3. Click New.
4. Click Sales order.
5. In the Customer account field, type a value.
 - Example: US-001
6. Click OK.
7. In the Item number field, type a value.
 - Example: P6003
8. In the Quantity field, enter a number.
 - Example: 50000
9. Click Save.

Create a material plan for co-products

1. Close the page.
2. Close the page.
3. Click Master planning.
4. In the Plan field, click the drop-down button to open the lookup.
5. In the list, click the link in the selected row.
 - Example: MasterPlan
6. Click Run.
7. Expand or collapse the Records to include section.
8. Click Filter.
9. In the list, select the row for Field = Item number.
10. In the Criteria field, type a value.
 - Example: P6003
11. Click OK.
12. Click OK.
13. Click Planned orders.
14. Use the Quick Filter to find records. For example, filter on the Item number field with a value of 'P6000'.
 - Filter by the formula item that has as co-product of the item that you created a sales order for.
15. In the list, mark the selected row.
 - Select any of the rows returned by the filter.
16. In the list, click the link in the selected row.
17. Expand or collapse the Pegging section.
18. In the list, click the link in the selected row.

- The planned order is pegged to the sales order for the co-product.

19. Close the page.

Create requirement for a co-product

1. Go to Default dashboard.
2. Click Sales order processing and inquiry.
3. Click New.
4. Click Sales order.
5. In the Customer account field, type a value.
 - Example: US-001
6. Click OK.
7. In the Item number field, type a value.
 - Example: P6003
8. In the Quantity field, enter a number.
 - Example: 50000
9. Click Save.

Create a material plan for co-products

1. In the Plan field, click the drop-down button to open the lookup.
2. In the list, click the link in the selected row.
 - Example: MasterPlan
3. Click Run.
4. Expand or collapse the Records to include section.
5. Click Filter.
6. In the list, select the row for Field = Item number.
7. In the Criteria field, type a value.
 - Example: P6003
8. Click OK.
9. Click OK.
10. Click Planned orders.
11. Use the Quick Filter to find records. For example, filter on the Item number field with a value of 'P6000'.
 - Filter by the formula item that has as co-product of the item that you created a sales order for.
12. In the list, mark the selected row.
 - Select any of the rows returned by the filter.
13. In the list, click the link in the selected row.
14. Expand or collapse the Pegging section.
15. In the list, click the link in the selected row.
 - The planned order is pegged to the sales order for the co-product.
16. Close the page.
17. Click Master planning.
18. Go to Master planning > Setup > Master planning parameters.
19. Select No in the Disable all planning processes field.
20. Close the page.

NOTE

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Maintain planned orders

2/18/2021 • 2 minutes to read • [Edit Online](#)

This topic provides information about how to manage planned orders. It describes how you can update the status of planned orders, firm them, and filter for planned orders that have the same status as a selected planned order.

You can manage planned orders from the **Master planning** workspace, the **Planned order** list, or the **Planned production orders**, **Planned purchase orders**, and **Planned transfer** lists.

Planned order status

You can use the **Status** field to help track your progress. The following values are used:

- When master planning generates planned orders, the planned orders have a status of **Unprocessed**.
- If you decide not to firm a planned order, you can give it a status of **Completed**.
- If you want to firm a planned order, you can change the status to **Approved**. Planned orders with **Approved** status are respected by master planning, so they are not modified or deleted during a later master planning run. To achieve this, the planning logic copies the **Approved** planned orders from the old plan version to the new plan version during master planning.

Firming planned orders

By firming planned orders, real orders are created. These are also known as *released* or *open orders*. When a planned order is firming, it's moved to the orders section of the relevant module.

You can select two firming options from the **Planned orders** page:

- **Firm** – This will firm one or multiple selected planned orders.
- **Firm all** – This will firm all planned orders in the filter. Using **Firm all** you don't have to select the planned order, all planned orders within the filter will be firming. This option can be useful if you are firming a high number of planned orders.

NOTE

You can track a planned order that was firming from **Firming history** under **Planned orders form > View > Firming history**.

Parallelize firming

If you are planning to firm many orders at the same time, parallelizing the run can improve the run time or performance. This option is available when firming multiple planned orders with either **Firm** or **Firm all**. The following parameters are available:

- **Parallelize firming** – If **Yes**, the firming process will be parallelized with the number of threads defined in **Number of threads**.
- **Number of threads** – Controls the number of threads used to parallelize the firming process. The parameter is only shown when **Parallelize firming** is set to **Yes**.

NOTE

The option for **Parallelize firming** is only shown when you have more than one planned order selected for firming.

Additional resources

[Master plans overview](#)

NOTE

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Safety stock fulfillment for items

2/18/2021 • 9 minutes to read • [Edit Online](#)

Safety stock indicates an additional quantity of an item held in the inventory in order to reduce the risk that the item will be out of stock. Safety stock is used as a buffer stock in case sales orders come in and the supplier is unable to deliver the additional items to meet the customer's requested ship date. When safety stock is used to fulfill a sales order, the safety stock will be reduced. You can use Master planning to automatically bring the inventory back to the safety level.

Set up safety stock levels for items

Safety stock is set up as part of item coverage on the **Item coverage** page under **Released products > Plan > Coverage**.

In the **Minimum** field, enter the safety stock level that you want to maintain for the item. The value is expressed in inventory units. If you leave the field blank, the default value is zero. This field is available when you select **Period, Requirement, or Min/Max** in the **Coverage code** list. The stock level limit applies to the available inventory, which means that reservations and markings may trigger safety stock replenishment before the physical quantity goes below the specified minimum level.

NOTE

You must define all other planned coverage dimensions before you can define the **Minimum** field. This prevents an invalid record from being used during master planning. This situation can occur if, for example, a dimension group is extended with an additional planned coverage dimension for which the minimum and maximum inventory quantities are not yet defined.

You can use minimum keys to handle seasonal fluctuations in demand. For example, you can decrease the minimum inventory level for an item in the off-season, and then gradually increase the level during the other months. You create a minimum key by going to **Master planning > Setup > Coverage > Minimum/maximum keys**. You specify the minimum key to adjust the safety stock level by seasonality in the **Minimum key** field on the **Item coverage** page.

Example: Minimum key

If you want to set up a minimum key that accounts for increased seasonal demand during the spring and summer months, go to **Master planning > Setup > Coverage > Minimum/maximum keys** and follow these steps.

1. Create 12 lines and assign a number from 1 to 12 to the lines in the **Change** field.
2. In the **Unit** field, select **Months**.
3. In the **Factor** field, enter the values that are described in the following table.

LINE	ENTER THIS VALUE	RESULT
1-3	1	Minimum inventory is based on the setting for January through March on the Item coverage page.

LINE	ENTER THIS VALUE	RESULT
4-5	2	Minimum inventory is multiplied by a factor of 2 for April through May.
6-8	2.5	Minimum inventory is multiplied by a factor of 2.5 for June through August.
9-12	1	Minimum inventory reverts to the setting for September through December on the Item coverage page.

If the coverage code is **Min/Max**, you can also specify the **Maximum** inventory quantity that you want to maintain for the item. The value is also expressed in inventory units. If the projected available inventory falls below the minimum quantity, master planning generates a planned order to fulfill all open requirements and brings the available inventory up to the specified maximum quantity. Just like you set up **Minimum**, you must define all other planned coverage dimensions before you can define the **Maximum** field.

Example: Min/Max coverage code

The minimum quantity is 10, and the maximum quantity is 15. Current on-hand inventory is 4. This gives a minimum quantity requirement of 6. However, because the maximum quantity is 15, master planning generates a planned order for 11 items.

For items that follow seasonal demands, you may need to maintain different maximum levels. To do that, you need to define **Maximum keys** by going to **Master planning > Setup > Coverage > Minimum/maximum keys**. Fill in the **Maximum key** field on the **Item coverage** page. You can view the information about the safety stock levels, defined via minimum keys on the **Min/Max** tab, on the **Item coverage** page. You need to make sure that, for a certain period, the minimum and the maximum values are kept in sync.

Safety stock fulfillment

The **Fulfill minimum** parameter allows you to select the date or the period during which the inventory level must meet the quantity that you specified in the **Minimum** field. This field is available when you select **Period**, **Requirement**, or **Min/Max** in the **Coverage code** list.

If **Minimum keys** are used, select the **Minimum periods** check box to fulfill the minimum inventory level for all the periods that are set up in the minimum key. If you clear the check box, the minimum inventory is fulfilled for the current period only.

The following scenario shows how this parameter works and what are the differences between its values.

NOTE

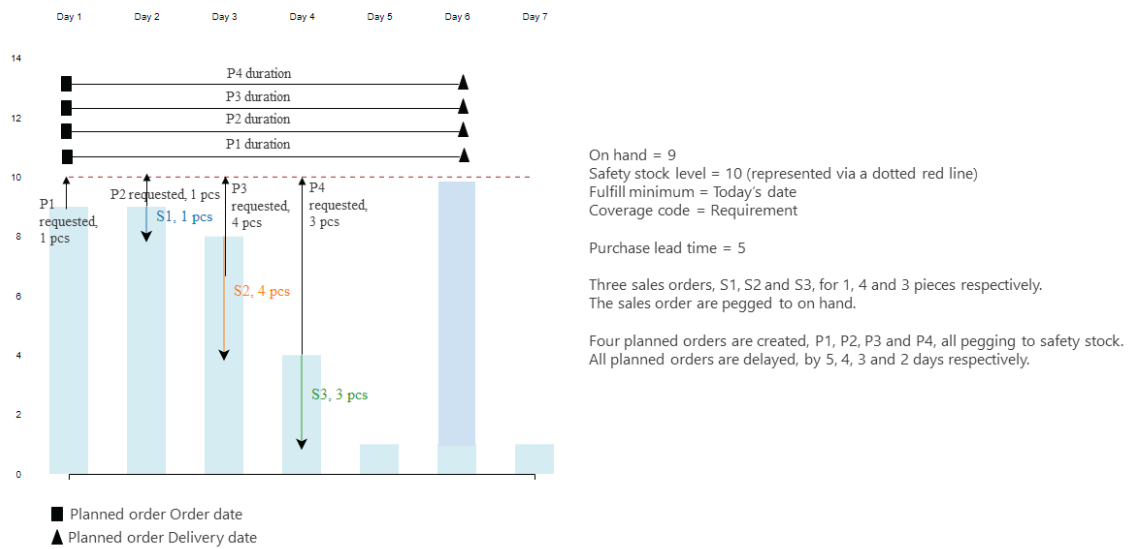
For all the illustrations in this topic, the x-axis represents inventory, the y-axis represents days, the bars represent the inventory level, the arrows represent transactions, such as sales order lines, purchase order lines, or planned orders.



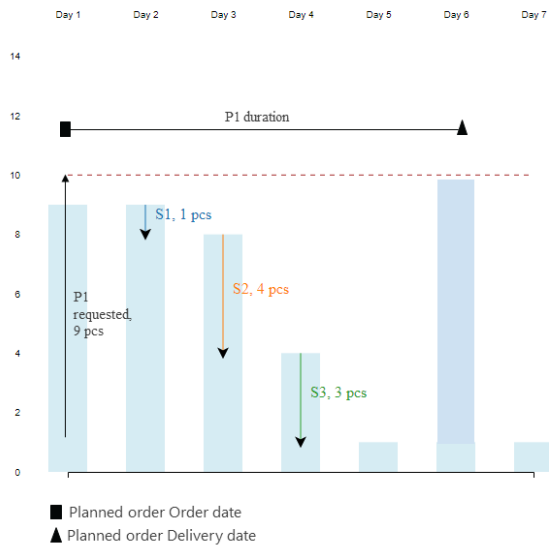
The Fulfill minimum parameter can have the following values:

Today's date

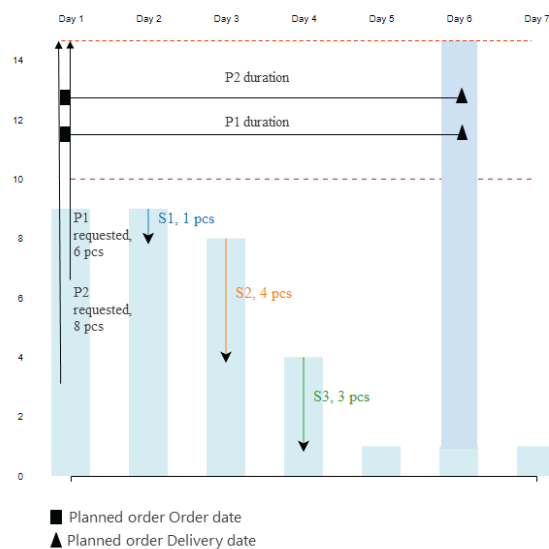
The specified minimum quantity is met on the date when master planning is run. The system tries to fulfill the safety stock limit as soon as possible, even though it can be unrealistic due to the lead time.



Planned order P1 is created for today's date to bring the available inventory above the safety stock level on this date. The sales order lines S1 to S3 continue to lower the inventory level. Planned orders P2 to P4 are generated by master planning so that the inventory level is brought back to the safety limit after each sales order requirement. When the **Requirement** coverage code is used, multiple planned orders are created. It is always a good idea to use either **Period** or **Min/Max** coverage for items and materials in frequent demand, to bundle the replenishment. The following illustration shows an example for coverage code **Period**.

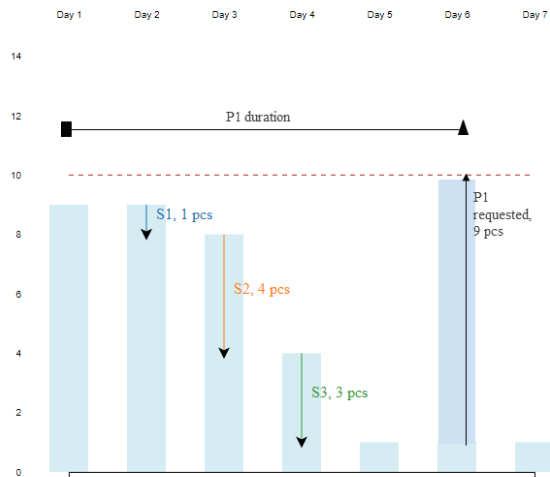


The following illustration shows an example for coverage code **Min/Max**.



Today's date + procurement time

The specified minimum quantity is met on the date when master planning is run, plus the purchase or production lead time. This time includes any safety margins. If the item carries a trade agreement, and the **Find trade agreements** check box is selected on the **Master planning parameters** page, the delivery lead time from the trade agreement is not considered. Lead times are taken from the item's coverage settings or from the item. This fulfillment mode will create plans with less delays and fewer planned orders regardless of the coverage group set up on the item. The following illustration shows the outcome of the plan if the coverage code is **Requirement or Period**.



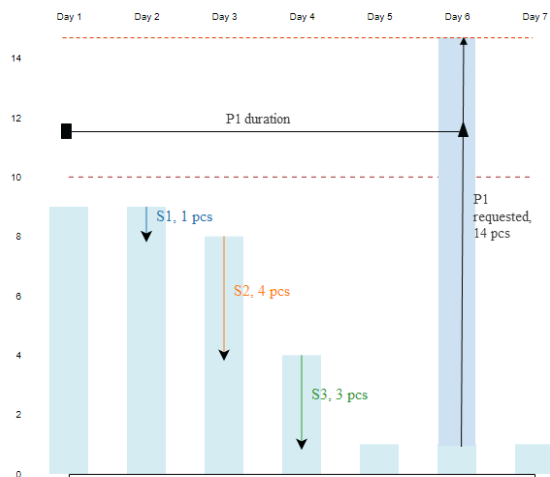
On hand = 9
 Safety stock level = 10 (represented via a dotted red line)
 Fulfill minimum = Today's date + procurement lead time
 Coverage code = Requirement or Period (Period = 5)

Purchase lead time = 5

Three sales orders, S1, S2 and S3, for 1, 4 and 3 pieces respectively.
 The sales order are pegged to on hand.

One planned order is created, requested on Day 6 (Day 1 + Procurement lead time).
 The planned order is pegged to safety stock and needs to replenish 9 pieces.
 The planned order is not delayed.

The following illustration shows the outcome of the plan if the coverage code is **Min/Max**.



On hand = 9
 Safety stock level = 10 (represented via a dotted red line)
 Fulfill minimum = Today's date + procurement lead time
 Coverage code = Min/Max.
 Maximum = 15

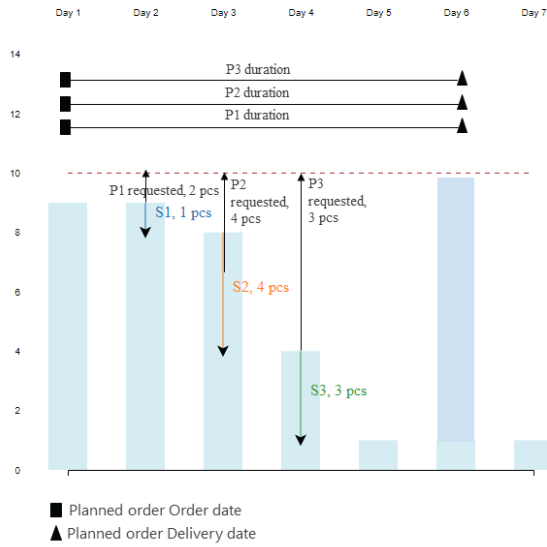
Purchase lead time = 5

Three sales orders, S1, S2 and S3, for 1, 4 and 3 pieces respectively.
 The sales order are pegged to on hand.

One planned order is created, requested on Day 6 (Day 1 + Procurement lead time).
 The planned order is pegged to safety stock and needs to replenish 14 pieces, to get to the maximum quantity.
 The planned order is not delayed.

First issue

The specified minimum quantity is met on the date when the available inventory goes below the minimum level, as shown in the following illustration. Even if the available inventory is below the minimum level on the date when master planning is run, **First issue** will not attempt to cover it until the next requirement comes in. The following illustration shows an example for coverage code **Requirement**.



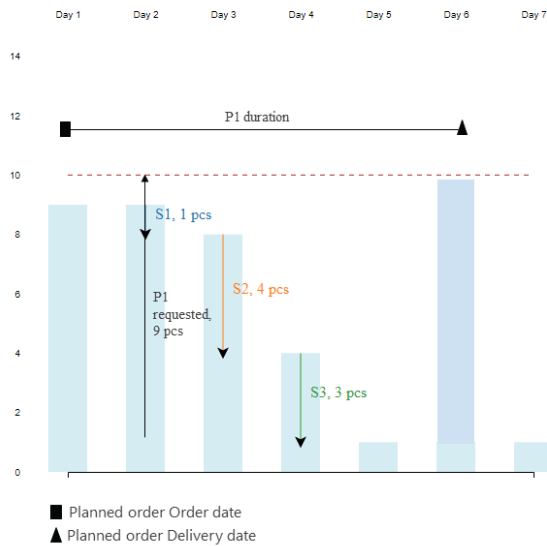
On hand = 9
 Safety stock level = 10 (represented via a dotted red line)
 Fulfill minimum = First issue
 Coverage code = Requirement

Purchase lead time = 5

Three sales orders, S1, S2 and S3, for 2, 4 and 3 pieces respectively.
 The sales order are pegged to on hand.

Three planned orders are created, P1, P2, P3, all pegging to safety stock.
 The safety stock limit is replenished only on the date of the first issue.
 All planned orders are delayed, by 4, 3 and 2 days respectively.

The following illustration shows an example for coverage code **Period**.

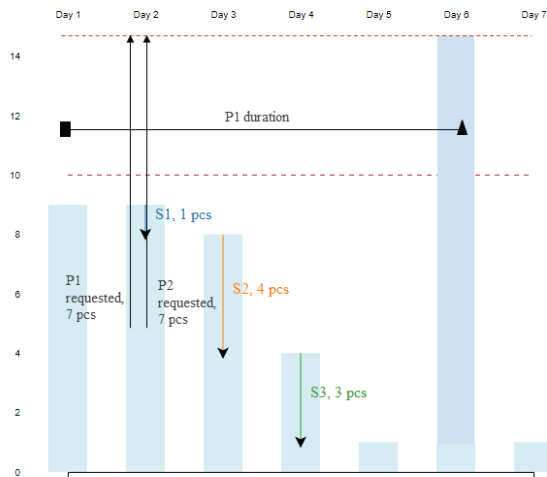


On hand = 9
 Safety stock level = 10 (represented via a dotted red line)
 Fulfill minimum = Today's date
 Coverage code = Period
 Period = Purchase lead time = 5

Three sales orders, S1, S2 and S3, for 1, 4 and 3 pieces respectively.
 The sales order are pegged to on hand.

One planned order is created, P1, covering 4 safety stock requirements of 1, 1, 3
 and 4 pieces respectively.
 The planned order is delayed for 4 days, due to the purchase lead time.

The following illustration shows an example for coverage code **Min/Max**.



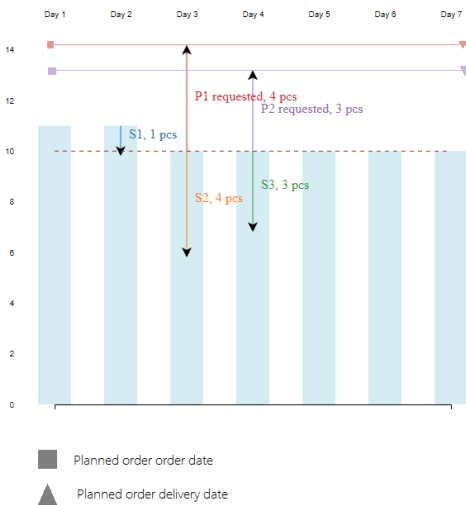
On hand = 9
 Safety stock level = 10 (represented via a dotted red line)
 Fulfill minimum = First issue
 Coverage code = Min./Max.
 Maximum = 15

Purchase lead time = 5

Three sales orders, S1, S2 and S3, for 1, 4 and 3 pieces respectively.
 The sales order are pegged to on hand.

Two planned orders, P1 and P2, are created, to fulfill the safety stock limit requirement.
 P1 covers a quantity of 7 pieces and is requested on the date of the first issue, to cover the reduction in inventory due to sales order S1 and the fact that we are already 1 piece under the safety limit.
 P2 covers a quantity of 7, because there are other issues (S2 and S3) that will bring the quantity under the minimum.
 Both planned orders are delayed, due to the lead time.

On the date when master planning is run, if the available inventory is already under the safety stock limit, **Today's date** and **Today's date + procurement time** will trigger the replenishment immediately. **First issue** will wait until there is another issue transaction, such as sales order and BOM line requirement, for the item, and then it will trigger the replenishment on the date of this transaction. On the date when master planning is run, if the available inventory is not under the safety stock limit, **Today's date** and **First issue** will provide exactly the same result, as shown in the illustration below.



Coverage code = Requirement
 Safety stock = 10
 On hand = 11
 Fulfill minimum = First issue

Purchase lead time = 5

Given three sales orders, S1, S2 and S3, master planning will create two planned orders, P1 and P2, as follows:

P1
 Quantity = 4
 Requested date = Day 3
 Order date = Day 1
 Delivery date = Day 1 + purchase lead time
 Pegging to safety stock requirement, coverage quantity 4
 Delay date = Day 1 + purchase lead time
 Delay = 3 days
 Requirement date = Delay date (per plan setup)

P2
 Quantity = 3
 Requested date = Day 4
 Order date = Day 1
 Delivery date = Day 1 + purchase lead time
 Pegging to safety stock requirement, coverage quantity 3
 Delay date = Day 1 + purchase lead time
 Delay = 2 days
 Requirement date = Delay date (per plan setup)

On the date when master planning is run, if the available inventory is not under the safety stock limit, **Today's date + procurement time** will provide the following result, because it postpones the fulfillment until the end of the procurement lead time.



Coverage code = Requirement
 Safety stock = 10
 On hand = 11
 Fulfill minimum = Today's date + procurement time

Purchase lead time = 5

Given three sales orders, S1, S2 and S3, master planning will create one planned order, P2, as follows:

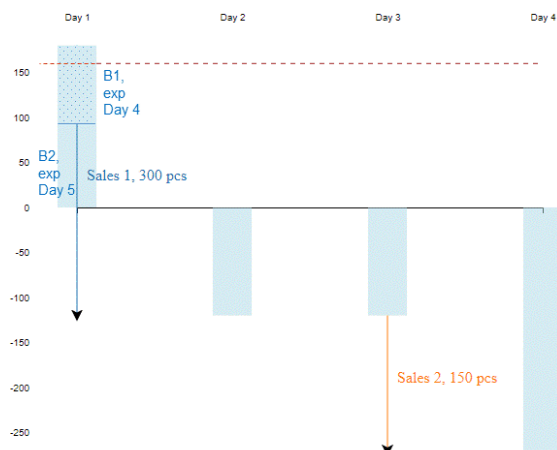
P2
 Quantity = 7
 Requested date = Day 1 + purchase lead time
 Order date = Day 1
 Delivery date = Day 1 + purchase lead time
 Pegging to safety stock, covered quantity = 7
 There are no delays
 The sales orders are all pegged to on hand.

Coverage time fence

The specified minimum quantity is met during the period that is specified in the **Coverage time fence** field. This option is useful when master planning does not allow available inventory to be used for real orders, such as sales or transfers, in the attempt to maintain the safety level. However, in a future release, this mode of replenishment will no longer be needed, and this option will be deprecated.

Plan safety stock replenishment for First Expired, First Out (FEFO) items

At any point in time, the inventory receipt with the latest expiry date will be used for safety stock to allow real demand, such as sale lines or BOM lines, to be fulfilled in the FEFO (First Expired, First Out) order. To show how this works, consider the following scenario.



On hand = 180, split in two batches B1 (100 pieces), B2 (80 pieces)
 Safety limit = 160

Two sales orders, S1 and S2, for 300 and 150 pieces respectively.

When planning is run, it will cover the first sales order from the existing on-hand inventory and an additional purchase order, for the remaining quantity.

Overview								
Warehouse	Site	CW minimum	Minimum	CW maximum	Maximum	Coverage group	Planned order type	
11	1		160.00		0.00	Req	Purchase order	

Overview								
Reference	Number	Item number	Requirement date	Expiration date	Requirement ...	Requirement ...	Accumulated	
On-hand		_Batch		11/13/2017	100.00		100.00	
On-hand		_Batch		11/14/2017	80.00		180.00	
Planned purchase orders	004461	_Batch	11/10/2017	11/16/2017	120.00		300.00	
Planned purchase orders	004462	_Batch	11/10/2017	11/16/2017	160.00		460.00	
✓ Sales order	000785	_Batch	11/10/2017		-300.00		160.00	
Planned purchase orders	004463	_Batch	11/13/2017	11/19/2017	150.00		310.00	
Sales order	000785	_Batch	11/13/2017		-150.00		160.00	
Expired batch		_Batch	11/16/2017		-10.00		150.00	
Expired batch		_Batch	11/19/2017		-150.00			

PEGGING							
Number	Reference	Item number	Requirement ...	Requirement ...	Requirement ...	Covered quan...	
On-hand		_Batch		100.00		100.00	
On-hand		_Batch		80.00		80.00	
004461	Planned purchase orders	_Batch	11/10/2017	120.00		120.00	

The first sales order is using the on hand and the remaining quantity is covered by a planned order.

A planned order is created to make sure that the available inventory is brought back to the safety limit.

Overview								
Warehouse	Site	CW minimum	Minimum	CW maximum	Maximum	Coverage group	Planned order type	
11	1		160.00		0.00	Req	Purchase order	

Overview								
Reference	Number	Item number	Requirement date	Expiration date	Requirement ...	Requirement ...	Accumulated	
On-hand		_Batch		11/13/2017	100.00		100.00	
On-hand		_Batch		11/14/2017	80.00		180.00	
Planned purchase orders	004461	_Batch	11/10/2017	11/16/2017	120.00		300.00	
✓ Planned purchase orders	004462	_Batch	11/10/2017	11/16/2017	160.00		460.00	
Sales order	000785	_Batch	11/10/2017		-300.00		160.00	
Planned purchase orders	004463	_Batch	11/13/2017	11/19/2017	150.00		310.00	
Sales order	000785	_Batch	11/13/2017		-150.00		160.00	
Expired batch		_Batch	11/16/2017		-10.00		150.00	
Expired batch		_Batch	11/19/2017		-150.00			

PEGGING							
Number	Reference	Item number	Requirement ...	Requirement ...	Requirement ...	Covered quan...	
Safety stock		_Batch	11/10/2017	-160.00		-160.00	

A planned order is created to cover safety stock.

When the second sales order is planned, the previously created planned order that covers the safety stock is used to cover this quantity. Hence, the safety stock is constantly rolling.

Warehouse	Site	CW minimum	Minimum	CW maximum	Maximum	Coverage group	Planned order type
11	1		160.00		0.00	Req	Purchase order

Reference	Number	Item number	Requirement date	Expiration date	Requirement ...	Requirement ...	Accumulated
On-hand		_Batch		11/13/2017	100.00		100.00
On-hand		_Batch		11/14/2017	80.00		180.00
Planned purchase orders	004461	_Batch	11/10/2017	11/16/2017	120.00		300.00
Planned purchase orders	004462	_Batch	11/10/2017	11/16/2017	160.00		460.00
Sales order	000785	_Batch	11/10/2017		-300.00		160.00
Planned purchase orders	004463	_Batch	11/13/2017	11/19/2017	150.00		310.00
Sales order	000785	_Batch	11/13/2017		-150.00		160.00
Expired batch		_Batch	11/16/2017		-10.00		150.00
Expired batch		_Batch	11/19/2017		-150.00		

Number	Reference	Item number	Requirement ...	Requirement ...	Requirement ...	Covered quan...
	Safety stock	_Batch	11/13/2017	150.00		150.00

A sales order coming at a later point in time is using the safety stock replenishment from the previously created planned order.

Finally, another planned order is created to cover the safety stock.

Warehouse	Site	CW minimum	Minimum	CW maximum	Maximum	Coverage group	Planned order type
11	1		160.00		0.00	Req	Purchase order

Reference	Number	Item number	Requirement date	Expiration date	Requirement ...	Requirement ...	Accumulated
On-hand		_Batch		11/13/2017	100.00		100.00
On-hand		_Batch		11/14/2017	80.00		180.00
Planned purchase orders	004461	_Batch	11/10/2017	11/16/2017	120.00		300.00
Planned purchase orders	004462	_Batch	11/10/2017	11/16/2017	160.00		460.00
Sales order	000785	_Batch	11/10/2017		-300.00		160.00
Planned purchase orders	004463	_Batch	11/13/2017	11/19/2017	150.00		310.00
Sales order	000785	_Batch	11/13/2017		-150.00		160.00
Expired batch		_Batch	11/16/2017		-10.00		150.00
Expired batch		_Batch	11/19/2017		-150.00		

Number	Reference	Item number	Requirement ...	Requirement ...	Requirement ...	Covered quan...
	Safety stock	_Batch	11/13/2017	-150.00		-150.00

A planned order is created to cover safety stock.

All the batches are expire accordingly, and planned orders are created to refill the safety stock after it has expired.

How master planning handles the safety stock constraint

Safety stock is tracked in the system as a requirement type, just like sales lines or BOM requirements. You can see the safety stock requirement line on the **Net requirements** page if you remove the default filter on the **Requirement type** column.

Fulfilling the safety stock requirement transaction is deprioritized if the system determines that this causes delays in the fulfillment of real demand, such as sales lines, BOM lines, transfer requirements, or demand forecast lines. Otherwise, making sure that the available inventory is above the safety stock quantity has the same priority as any other demand types. This ensures no delays for real transactions and helps to prevent over-replenishment and early-replenishment of safety stock.

During the coverage phase of master planning, safety stock replenishment is no longer deprioritized. On-hand inventory can be used before any other demand types. During the delay calculation, new logic will be added to

go over the delayed sales lines, BOM line requirements, and all the other demand types, to determine whether they could be delivered on time, provided that the safety stock is used. If the system identifies that it can minimize delays by using safety stock, then the sales lines or BOM lines will replace their initial coverage with the safety stock, and the system will trigger the replenishment for the safety stock instead.

If the plan or the item is not set up for delayed calculation, then the safety stock constraint will have the same priority as any other demand types. This means there is a reserve of on-hand and other available inventory before other demand types.

NOTE

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Delays

2/18/2021 • 2 minutes to read • [Edit Online](#)

This topic provides information about delayed dates in master planning. A delayed date is a realistic due date that a transaction receives if the earliest fulfillment date that master planning calculates is later than the requested date.

Master planning can calculate the earliest fulfillment date for a transaction, based on lead times, material availability, capacity availability, and various planning parameters.

If master planning calculates an order date that precedes the current date, the order can't be fulfilled on time. Therefore, the order is delayed. In this case, master planning forward-plans the order from the current date and includes lead times. These lead times start with any lower-level component items. The order then receives a delayed date. A delayed date is a realistic due date, based on the current data. Master planning also calculates the number of delay days.

In some situations, you might choose not to calculate delays, such as when users know that they can expedite lead times by selecting alternative modes of delivery.

You can configure how delays are calculated for a coverage group. You can then attach the coverage group to an item later.

On the **Master planning parameters** page, you can set the start time for the calculation of delays. If an order is fulfilled after this time, a delay of one day is added to the delay date of the order.

NOTE

In earlier versions, calculated delays were known as *futures messages*, the delayed date was known as the *futures date*, and a delayed transaction was referred to as *a transaction that was future set*.

Limited delays in production setup with multiple BOM levels

When you work with delays in a production setup that has multiple BOM levels, it is important to note that only the items directly above the item (in the BOM structure) causing the delay, will be updated with a delay as part of the master planning run. Other items in the BOM structure will not get the delay applied until the first master planning run, when the planned order for the top level is approved or firmed.

To work around this known limitation, the production orders on the top of the BOM structure with delays can be approved (or firmed) prior to the next master planning run. This way the delay from the delayed approved planned production order will be kept and all underlying components will be updated accordingly. Action messages can also be used to identify planned orders that can be moved to a later date, due to other delays in the BOM structure.

Desired date

On the **Planned order** page, under the **Delays** tab is the **Desired date** for the planned order. The desired date of a planned order is the base date for delays, which is a computed date that equals the **Requested date** calculated from the **Net Requirement**. If the planned order is a BOM line, production line or kanban line, the desired date is based on the **Requirement date** and the desired date will not be shown on the **Planned order** page.

Additional resources

Coverage settings

NOTE

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Cancel a master planning job

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In Microsoft Dynamics 365 Supply Chain Management, there are multiple options for canceling a master planning job. For example, you may want to cancel a master planning job if it was started by mistake or is running longer than expected and you want to end it. The best way to cancel a planning job is from the **Unfinished planning processes** page. Alternative options from the **Batch jobs** and **Batch jobs enhanced** pages should only be used if canceling the master planning job from the **Unfinished planning processes** page did not complete within a few minutes.

Preferred cancel option

Cancel master planning job from Unfinished planning processes page

1. Go to **Master planning > Inquiries and reports > Master planning > Unfinished planning processes**.
2. Select the line with the planning process that you want to cancel.
3. Click **Cancel**.

Additional cancel options

These should only be used if canceling the master planning job from the **Unfinished planning processes** page did not complete within a few minutes.

Delete master planning job from the Batch jobs page

1. Go to **System administration > Inquiries > Batch jobs**.
2. Select the line with the planning job that you want to delete.
3. Click **Delete**.

Abort master planning job task from the Batch jobs enhanced page

1. Go to **System administration > Inquiries > Batch jobs**.
2. If the job ID is not shown in the list, click **Switch to enhanced form**, otherwise proceed with the next step.
3. Open the batch job. Click the **Job ID** for the batch job with tasks that you want to end.
4. In **Batch tasks**, select the tasks to end.
5. Click **Change status**, choose **Canceling** and click **OK**.
6. On the **Batch tasks** FastTab, click **Abort**.

NOTE

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Use tracing for explosion

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This article explains how you can use tracing to explore the causes behind the outcome of an order explosion.

By enabling tracing, you can view information about the factors that contributed to the outcome of the explosion of a particular order. The following examples show how you can use the tracing information:

- View relations between the actions on planned orders to optimize the supply chain and inventory reservations.
- View relations to orders that are already approved. You can focus on automatically firming derived requirements and then prioritize orders more accurately.
- Simulate planning results to determine whether the planning parameters are optimal.
- Identify how information such as production dates, quantities, and priorities for an order were determined.

You can view details about futures and actions for a selected order. On the **Explosion** page, tracing information is available on the **Explanation** tab in the upper pane. Tracing occurs when you explode an order. To start tracing for the order, click **Update**, and then select the **Enable trace** check box. You can use the **Find text** field to search the log for specific information. Search results are highlighted in the tree.

Additional resources

[Master plans overview](#)

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Action messages

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An action message is a system-generated suggestion to change an existing planned or firmed order.

Introduction

Action messages are generated by the master planning calculation in response to changed requirements. For example, the ship date or quantity may have changed on a sales order for which you have already created a purchase order to fulfill the demand. In this case, one or multiple action messages are generated by the master planning calculation to update the purchase order. You decide whether to make the changes that are suggested.

You can set up how action messages are calculated for a coverage group that you attach to an item.

Select action messages

On the **Coverage groups** page, you can select the action messages that you want the system to generate, and the coverage groups or items that the messages apply to. You can select the following action messages.

MESSAGE	DESCRIPTION
Advance	If you select this message, the system will generate action messages, when needed, to move orders to an earlier date. In the Advance margin field, you can also specify the maximum number of days between receipt and issue without advance action.
Postpone	If you select this message, the system will generate action messages, when needed, to move orders to a later date. In the Postpone margin field, you can specify the maximum number of days between receipt and issue without postpone action.
Decrease	If you select this message, production orders, purchase orders, and other receipt transactions should be decreased to prevent excess inventory levels.
Increase	If you select this message, production orders, purchase orders, and other receipt transactions should be increased to prevent shortages in inventory.
Derived actions	If you select this message, action messages are created for derived requirements, for example, actions for component orders fulfilling the production.

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Monitor a master planning run

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Use a Gantt chart to visualize master planning progress

From the **View master planning progress** page, you can view details of historical master planning runs as a Gantt chart. This functionality can help you understand the time that is spent on the various phases of master planning. For a current active planning job, the **View master planning progress** page can be used to track progress and view the estimated remaining time.

Turn on and use the Master plan progress visualization feature

To use this functionality, follow these steps.

1. In the **Feature management** workspace, on the **New** tab, select **Master planning progress visualization** in the list. If the feature doesn't appear on the **New** tab, look on the **Not enabled** and **All** tabs.
2. Select **Enable now**. Alternatively, select **Schedule**, and then select the time when you want the feature to be turned on.

The **View master planning progress** page can display both historical planning jobs and active planning jobs.

To view historical planning jobs, there are two options.

1. Go to **Master planning > Setup > Plans > Master plans**, and then, on the Action Pane, select **History**. With the desired job selected, select **Inquiries**, and then select **View progress**
2. Go to **Master planning > Workspaces > Master planning**, on the Master planning tile click **History**. With the desired job selected, select **Inquiries**, and then select **View progress**

To view active planning jobs, there are two options.

1. Go to **Master planning > Workspaces > Master planning**, on the Action Pane, select **Unfinished planning process**. With the desired job selected, select **Inquiries**, and then select **View progress**.
2. Go to **Master planning > Workspaces > Master planning**, on the Master planning tile click **View progress**. With the desired job selected, select **Inquiries**, and then select **View progress**

Note you can view active jobs only when a planning job is processing.

Analyze a master planning job

In the Gantt chart, you can expand each of the following planning processes to view additional details about the time that is spent:

- Initializing
- Deleting and inserting data
- Coverage planning
- Delays
- Action messages
- Finalization
- Auto-firming

The Gantt chart is a useful tool if you want to view the impact of using action messages.

Navigation in the Gantt chart

- To expand the selected group and show the details, select the plus sign (+) in the tree view.
- To collapse the selected group, select the minus sign (–) in the tree view.
- You can use your keyboard for navigation. Use the **Up arrow** and **Down arrow** keys to move between rows. Use the **Right arrow** and **Left arrow** keys to expand and collapse groups.
- To open or close all levels in the Gantt chart, select **Expand all** or **Collapse all**.
- To view the related processing time, hover over a task. (Tasks are the lowest level in the Gantt chart.)

View an additional master planning run to compare jobs

By selecting a master planning job on field **Show additional master planning run**, you can view an additional master planning run in the Gantt chart and compare the two jobs.

BOM-level display

Bill of materials (BOM) levels are shown differently for coverage planning, delays, actions, and firming.

- **Coverage planning** – BOM levels are shown as expected. They are calculated from the top down.
Example: BOM level 0, 1, 2
- **Delays** – BOM levels are shown as the coverage planning BOM levels multiplied by –1. (In other words, they have a negative sign.)
Example: BOM level –2, –1, 0
- **Action message** – BOM levels are shown as expected. They are calculated from the top down.
Example: BOM level 0, 1, 2
- **Auto-firming** – BOM levels are shown as 999 minus the coverage planning BOM level.
Example: BOM level 999, 998, 997

The following table summarizes the behavior.

BOM LEVEL THAT IS SHOWN	END ITEM	SUBCOMPONENT	RAW MATERIAL
Coverage planning	0	1	2
Delays	0	–1	–2
Action message	0	1	2
Auto-firming	999	998	997

Visualize progress

If you view a master planning job that is currently running, progress is shown through colors in the Gantt chart. The following colors apply to the blue theme. For other color themes, the colors will differ.

- **Dark blue** – Completed planning tasks.
- **Orange** – The task that is currently in progress.
- **Light blue** – The estimate for remaining tasks.

The color is shown only on the lowest level in the Gantt chart. Select **Expand all** to view all tasks in the master planning job. The estimate of remaining tasks is based on historical master planning jobs.

Run master planning and track processing time

1. On the default dashboard, select **Master planning**.

2. In the **Plan** field, enter or select a value.
3. Select **Run**.
4. Set the **Track processing time** option to **Yes**.
5. In the **Number of threads** field, enter a number.
6. On the **Records to include** FastTab, select **Filter**.
7. In the grid, select the row where the **Field** field is set to **Item number**.
8. In the **Criteria** field, enter a value.
9. Select **OK**.

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Create a schedule for a site

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This procedure shows how to schedule production orders that are not yet started for a site. The demo data company USMF is used to complete this procedure.

Identify production orders that are not started

1. Go to Production control > Production orders > All production orders.
2. Use the Quick Filter to find records. For example, filter on the Site field with a value of '1'.
 - 1 represents a site in USMF. If you are not using USMF, select a site from your own company.
3. Open the Status column filter.
4. Apply a filter on the "Status" field, with a value of "Scheduled", using the "is exactly" filter operator.

Create a schedule

1. In the list, mark or unmark all rows.
2. On the Action Pane, click Schedule.
3. Click Schedule jobs.
4. In the Scheduling direction field, select 'Backward from delivery date'.
5. Select No in the Finite capacity field.
6. Select No in the Finite material field.
7. Click OK.
 - This may take a while.

View the result of scheduled production orders

1. In the list, mark the selected row.
 - You can mark any row.
2. On the Action Pane, click Production order.
3. Click All jobs.
 - On this page, you can see the list of jobs. On the Scheduling tab, you can see the Start date and End date for a job.
4. Click Materials.
 - On this page, you can see the estimated material consumption for the operations on the production order and the current available inventory.

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Create a plan for a site

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The production planner calculates the material and capacity requirements for the production of a specific item. After the sourcing suggestions are created, he finds the orders at the site for which he is planning and firms the orders, starting from the urgent ones. The most urgent orders are the ones that need to be firming on the current date. Use the demo data company USMF to perform these tasks.

Create a materials and capacity plan for an item

1. Click Master planning.
 - You need to navigate to the default Dashboard.
2. Click Run.
3. Expand the Records to include section.
4. Click Filter.
5. In the list, mark the selected row.
6. In the Criteria field, type a value.
 - Example: D0001
7. Click OK.
8. Click OK.
 - This may take a few minutes.
9. Refresh the page.

Identify the urgent planned orders for the item

1. Open Item number column filter.
2. Apply a filter on the "Item number" field, with a value of "D0001", using the "begins with" filter operator.
3. Open Order date column filter.
4. Apply a filter on the "Order date" field, with a value of current date, using the "is exactly" filter operator.

Firm all the urgent orders for the item

1. In the list, mark or unmark all rows.
2. Click Firm.
3. Click OK.

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Calendars and master planning

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This topic provides an overview of supply chain calendars and how they affect master planning. The different calendars used in master planning engine are explained, including how they affect the shipping and receiving dates in the planned orders. Finally, recommendations regarding the assignment, use and update of the calendars are given.

Definition of a calendar

You can define a calendar to use in your organization in the page in **Organization administration > Setup > Calendars > Calendars**.

Each date entry in a calendar can be **open** or **closed** or **base calendar**. This is specified in the **Control** column in the **Working times** page. For each date:

- **Open** - Indicates that work is performed on the selected day. The calendar will be updated according to the working time template.
- **Closed** - Indicates work that is not performed during the day.
- **Base calendar** - Indicates that the specific date will inherit the working times and open/closed from the base calendar. Therefore, when the base calendar is updated, the selected calendar will inherit operation times from it.

For any closed dates, the **Closed for pickup** check box will automatically be assigned. For open dates, you can manually select the **Closed for pickup** option. This indicates that work is performed on the date, but shipping is not performed.

Calendars that affect master planning

Calendar for a coverage group

A coverage group indicates a common set of parameters used for replenishment of the items that belong to the given coverage group.

To add a calendar for a coverage group, go to **Master Planning > Setup > Coverage > Coverage groups**. Find the coverage group to which you want to assign the calendar to and then select it on the **Calendar** field.

The coverage group can be assigned in different pages: - On the **Released product details** page of an item. To see the coverage group for an item, go to **Product information management > Products > Released products** and select the item to go to the **Released Products Details** page. You can see the item coverage group under the **Plan** FastTab. - On the **Item coverage** page. In the released products details page, click **Item coverage** to go to the item coverage page. In the overview tab you can see different parameters for replenishment depending on the site, warehouse, and product dimensions. The coverage group for each item will be inherited from the coverage group on the **Released product details** page. This can be overridden by using **Use specific settings** or **Override group setting** on the **General** tab. - On the **Master planning parameters** page. If an item does not have a coverage group set in the previous pages, master planning will take the general coverage group set on master planning parameters. This is set up in **Master planning > Setup > Master planning parameters** in the **General coverage group** field .

Calendar for a vendor

To indicate the working days of a vendor, you can assign a purchase calendar to the vendor on the **Purchase order defaults** page for a vendor.

To set a calendar for a vendor, you need to create the calendar in **Organization Administration > Calendars > Calendars**. When the calendar is created, you have to assign it to the vendor. Go to **Accounts Payable > Vendors > All vendors** and select the vendor that you want to assign the calendar to. Then, on the vendor's page on the **Purchase order defaults** FastTab assign the new purchase calendar using the drop-down menu.

The calendar for a vendor indicates the days on which they accept the placement of the purchase order and the dates when they can deliver the orders to your company. Consequently, the order dates for purchase orders for the vendor with a purchase calendar will be dates defined as open in the calendar. The delivery dates for those orders will also be in open days, and thus, will impact the lead time of the purchased item.

Define the lead time for a purchased item

To specify the purchase lead time (and if only working days should be considered) for an item, you need to go to the default order settings page for the product, found under **Product information management > Products > Released products** and select **Default order settings**.

NOTE

The **Working days** under purchase lead time indicates the working days of the vendor. For example, a calendar for delivery only on Tuesdays with a lead time of 10 days and working days check box selected indicates that it would take 10 weeks (10 Tuesdays) for the item to be delivered. Thus, in most cases it is not recommended to select working days for purchase order lead times.

Define lead times from the trade agreements page

Master planning can be set up to include all trade agreements for vendors. Trade agreements are fixed prices or discount agreements that are set up for one or more customers or vendors for the sale or purchase of individual or multiple products. Go to **Master planning > Setup > Master planning parameters** and on the **Planned orders** tab and select **Find trade agreements** to include the trade agreements when planning. Master planning can select the vendor with the **Minimum lead time** or with the **Lowest unit price**.

Calendar for a warehouse

You can assign a calendar to a warehouse to indicate the open dates for receiving and shipping. If no calendar has been assigned to a warehouse, it is assumed that it is open all days.

NOTE

Assigning a calendar to a transit warehouse does not have any impact. Transit warehouses are used for supporting transfer orders. The applicable shipping or receipt dates for the orders are defined by the open days within the "From" warehouse and the "To" warehouse, and the mode of delivery calendar.

Closed for pickup policy

To indicate that a warehouse is open for receiving but pickup is not possible, you can use the **Closed for pickup policy** within the warehouse calendar. This also applies to customer pickups.

Transport calendar

To indicate the dates that are available for shipping transfer orders from a **From warehouse**, you can assign a **Transport calendar**. You can set up a transport calendar per mode of delivery, or per mode of delivery and from warehouse. The transport calendar is set up in **Sales and marketing > Setup > Distribution > Modes of delivery**. Select a mode of delivery and click the **Transport calendar** button.

A line can be created for each warehouse and mode of delivery, where the calendar is added in the **Transport calendar** column. It will specify the transport calendar that will be applied when goods are shipped from the warehouse using the given mode of delivery. To apply a transport calendar to all shipments using a given mode of delivery, a line can be created without specifying the warehouse. It will affect all shipments using the given mode of delivery, regardless of the warehouse.

If no transport calendar is assigned, it is assumed that all days are open for transport.

Calendar for a customer

To indicate the dates when a customer can accept deliveries, you can assign a receipt calendar to the customer. If no calendar is assigned to a customer, it is assumed that the customer can receive orders on all days. This will affect the receipt date on the sales order lines. If you select a date in the sales order lines that is not "open" in the customer calendar, the system will indicate that the receipt date is not valid.

Note that it is only possible to include one calendar per customer. If you need to include a calendar for each different address for a customer, you can create one customer per address and then assign its respective calendar.

The requested receipt date on the sales order lines is affected by the customer calendar and by the delivery date control method. You can read more about how the earliest delivery date is calculated in [Order Promising](#).

Shipping calendar for a legal entity

To indicate the dates in which a legal entity can ship goods, you can set up a shipping calendar under **Organization administration > Organizations > Legal entities**. Select the legal entity and add the calendar in the **Foreign trade and logistics** tab in the **Shipping calendar** field. The shipping calendar will act as a source of defaults for all warehouse calendars in the legal entity.

How calendars affect dates in planning

Order date of a planned purchase order

The order date in a planned purchase order indicates the date when the order is placed. It will be an open date both in the vendor calendar and in the coverage group calendar. Sometimes, vendors need a few days of margin between when they receive the purchase order and when they are able to ship the goods. These dates are indicated in the vendor's margin days. However, if the item purchased is assigned to a coverage group with margin days, these margin days will override the vendor's margin days.

Delivery date of a planned purchase order

The receipt date of a purchase indicates the date when you will receive the goods. It will be an open date in the calendar. The calendar that will be taken into account to indicate which days the purchase orders can be received are the following, in order from highest to lowest priority:

1. Vendor's calendar
2. Coverage group calendar
3. Warehouse calendar for the receiving warehouse

Note that the coverage group calendar can be set in different pages and will take priority in the following order:

1. Item coverage group on the **Item coverage** page
2. Item coverage group on the **Released products details** page
3. Default item coverage group in **Master planning parameters**

Shipping date of a planned transfer order

When creating a transfer order between two warehouses, the shipping date and the receipt date are included in the transfer order header, along with the "From" warehouse and "To" warehouse. The difference between these two dates is the expected transportation time (in days) between the warehouses.

The shipping date of a planned transfer order indicates the date that the goods are shipped from the "From" warehouse. The calendars used for specifying the available shipping date are listed by priority:

1. Warehouse calendar of the "From" warehouse
2. Coverage group calendar (see fallback order for this calendar above) If there is a warehouse calendar set, the

shipping date will be an open date in the calendar. If there is not a warehouse calendar set, it will take the coverage group calendar.

Receipt date of a planned transfer order

The receipt date for a transfer order indicates the date that the goods are received in the "To" warehouse.

The calendars used for specifying the receipt date are the ones listed by priority:

1. Coverage group calendar
2. Warehouse calendar of the "To" warehouse If there is a coverage calendar set, the receipt date will be an open date in the calendar. If there is not a coverage group calendar set, it will take the warehouse calendar.

When finding the shipment and receiving dates for the planned transfer, the margins established by the user for shipping and receiving will also be considered.

Using calendars in master planning

Assignment of SCM calendars

It is important to set the calendars to identify the working days of the company. The best implementation is to set a calendar for each element with different working days. In other words, all external calendars (customer, vendor) and all internal (warehouse, coverage group, and mode of delivery) related to the company.

Recommendation on warehouse calendars

It is recommended to use one calendar per warehouse to include the specific changes only affecting the warehouse. For example, two or more warehouses could have the same working days but a different pickup policy. In that case, a calendar for each of the warehouses with its respective pickup policy is the best implementation for the system to include the best dates for planned purchase, transfer, and production orders. If no warehouse calendars are set, the legal entity calendar can be used as a source of defaults for the warehouse calendar.

Recommendation of coverage group calendars

Regarding the coverage group calendar, it is important to consider that that has an overriding behavior regarding receiving dates in master planning. Thus, it is recommended to use it with caution. Particularly, it is useful in the case when replenishment needs to be done specific days in the week.

Updating SCM related calendars

While it is important that all relevant calendars are assigned in their respective place (vendor, customer, warehouse, mode of delivery, or coverage group), updating them is as important so they reflect the changes. The system will define the production, transfer, purchase, and sales order dates depending on the combination of the assigned calendars. It is a best practice to clarify who holds the responsibility for assigning and updating the calendars in its corresponding areas. In case of a breakdown or any other unusual change in the working days, it is essential to update the calendars according to it. All tasks which depend on calendars, such as master planning and production scheduling, must be rerun when calendars are updated.

NOTE

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Improve master planning performance

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This topic explains the various options that can help you improve the performance of master planning or troubleshoot issues. It includes information about parameters and settings, as well as recommended configurations and actions. Also included is a summary of all the important parameters that you should consider when you have long-running master planning jobs.

This topic is intended for system admins or IT users who have the capability to troubleshoot. It's also intended for production or supply planners because it includes information about parameters that are related to business planning requirements.

Parameters related to master planning performance

Various parameters influence the running time of master planning and should be considered.

Number of threads

The **Number of threads** parameter lets you adjust the master scheduling process to help improve performance on the specific data set. This parameter specifies the total number of threads that will be used to run master planning. It causes parallelization of the master planning run, which helps decrease the running time.

You can set the **Number of threads** parameter in the **Master planning run** dialog box. To open this dialog box, go to **Master planning > Master planning > Run > Master planning**, or select **Run** in the **Master planning** workspace. To determine the best value for this parameter, you will have to rely on a trial-and-error process. However, you can use the following formulas to calculate an initial value:

- **If your industry is manufacturing:** (Number of threads) = (Number of planned orders ÷ 1,000)
- **Otherwise:** (Number of threads) = (Number of items ÷ 1,000)

The number of helpers used during master planning must be less than or equal to the maximum number of threads that are allowed on the batch server. If the number of helpers exceeds the number of threads on the batch server, the extra threads won't do any work.

NOTE

Setting the **Number of threads** parameter to 0 (zero) increases the master planning running time. Therefore, we recommend that you always set a value that is more than 0.

Number of tasks in helper task bundle

By changing the **Number of tasks in task bundle** setting (that is, the bundle size), you might be able to decrease the running time. This setting controls the number of items that are planned together by a single helper.

You can set the **Number of tasks in task bundle** parameter in the **Performance** section on the **General** tab of the **Master planning parameters** page (**Master planning > Setup > Master planning parameters**). The best value for this parameter depends on your data. Therefore, we recommend that you start with a value of **1**, and then use a trial-and-error process to determine the best value for your setup.

In general, we recommend that you increase the number of tasks when the number of items is very large (in the hundreds of thousands). Otherwise, you should decrease the number of tasks. For the following specific industries, consider these recommendations:

- In the retail and distribution industries where there are many independent items, use many helpers because there is no dependency between items.
- In the manufacturing industry where there are many bills of materials (BOMs) and shared subcomponents, use fewer helpers because dependencies between items might cause waiting times.

TIP

If you have performance issues, we recommend that you reduce the **Number of helpers in task bundle** setting to 1. You can then start the trial-and-error process to find the best value for your setup. In general, performance issues occur when one item takes longer to process than the remaining items. In this case, you will see that two subsequent tasks that have a status of **Coverage** in the master planning run take significantly different amounts of time to run. In extreme cases, this difference might be as much as 30 minutes. You can infer the amount of time that tasks take to run by looking at the duration of each task.

Use of cache

The **Use of cache** parameter lets you adjust the master scheduling process to help it perform better on the specific data set. For example, you can adjust it to achieve the following results:

- If more caching is done, more data is collected in data memory. The expectation is that the data will be used again later. If the data is in memory, you might save some database requests. However, if more caching is done, memory requirements increase.
- If less caching is done, the same data might have to be fetched from the database more often. Additionally, Application Object Server (AOS) stores little data in memory throughout the process.

It's difficult to predict which option will be better because each case depends not only on the data but also on the hardware. For example, because less caching causes additional load on the database server, it probably isn't a good idea to use that option if your database server is already overloaded.

You can set the **Use of cache** parameter in the **Performance** section on the **General** tab of the **Master planning parameters** page (**Master planning > Setup > Master planning parameters**). The effectiveness of caching depends heavily on the customer data. For example, if cached data is never needed, you just waste memory if you store data until the end of the scheduling process. In this case, if you configure less caching, performance might increase because AOS requires less memory and server resources are freed up for other tasks.

TIP

In general, we recommend that you set the **Use of cache** parameter to **Maximum**, because the parameter is intended as a performance enhancing feature. We recommend that you set the parameter to **Minimum** if you run on premises and have limited memory (approximately 2 gigabytes [GB]).

Number of orders in firming bundle

The **Number of orders in firming bundle** parameter specifies the total number of orders that will be processed at a time by each thread/batch. It causes parallelization of the autofirming process.

You can set the **Number of orders in firming bundle** parameter in the **Performance** section on the **General** tab of the **Master planning parameters** page (**Master planning > Setup > Master planning parameters**). Parallelization of the autofirming process is based on the orders that must be processed together. For example, if this parameter is set to 50, each thread or batch task will pick up 50 orders at a time and process them together. We recommend that you use a trial-and-error process to find the best value. However, you can use the following formula to calculate an initial value:

(Number of orders per bundle) = (Number of demand items ÷ Number of threads)

NOTE

If you set the **Number of orders in firming bundle** parameter to 0 (zero), no parallelization of the autofirming process will occur. The whole process will run on a single batch task and have a cumulative running time. Therefore, the running time of your master planning will increase. For this reason, we recommend that you set this parameter to a value that is more than 0 (zero).

Time fences

Time fences specify how far in the future the calculations and other requirements must be calculated by master planning. The larger the time fence is, the longer it will take master planning to run. Therefore, set the time fences according to your business requirements. For more information about time fences, see [Set up master planning](#).

Actions

Among the time fences, you can also find the **Action message** parameter. The calculation of action messages causes a longer running time for master planning. If action messages aren't regularly analyzed and applied (daily, weekly, and so on), consider turning off the calculation during the master planning run. To turn off the calculation, on the **Master plans** page (**Master planning > Setup > Plans > Master plans**), set the **Action message** time fence to 0 (zero). Also make sure that the **Action message** setting is turned off for all the coverage groups.

Futures

The calculation of futures causes a longer running time for master planning. If you aren't planning BOMs, or if delays don't have to be propagated from supply to demand during planning, consider turning off futures calculations during master planning. To turn off the calculations, set the **Futures** time fence to 0 (zero) for the master plan that you're running. Also make sure that the **Futures** setting is turned off for all the coverage groups.

One heavy routine at a time

When you schedule master planning, don't schedule any other batch job at the same time. Be especially careful that you don't schedule any other heavy routines, such as inventory close, at the same time.

Review the session log

The system can collect additional information about the tasks that run during master planning. To have the system collect this information, turn on the **Track processing time** setting in the **Master planning run** dialog box. The information that is collected can help you find bottlenecks in the run. For example, when the **Number of tasks in helper task bundle** parameter is set to 1, you can identify the item that has the longest running time. You can also compare the running times for the various threads that have a status of **Coverage** and compare the duration for each task.

To review the master planning runs of your system, follow one of these steps.

- In the **Master planning** workspace, select a master plan in the drop-down field, and then on the **Master planning** tile, select **History**. Select a job, select **Inquiries** on the FastTab, and then select **Process task duration**.
- On the **Master plans** page, select a plan in the left pane, and then select **History** on the FastTab. Select a job, select **Inquiries** on the FastTab, and then select **Process task duration**.

When you review the session log, consider the following:

- **Update** should not take a long time (in general, it should take up to 30 minutes), however, it's single-threaded.

- **Copy plan** should not take a long time (it should take about one minute).
- **Auto firming** usually takes about 30 minutes. However, it can take up to multiple hours, depending on the number of orders and the complexity of the items.
- **Auto firming** should take less time than **Coverage**.
- **Coverage** should take the longest time relative to the rest.
- **Action** and **Future message** can take a long time, depending on the data and the number of BOMs.

Filtering of items

Filters that are applied in the **Master planning run** dialog box affect the duration of the master planning run. Go to **Master planning > Master planning > Run > Master planning**, or select **Run** in the **Master planning** workspace. To exclude items from the run, we recommend that you filter by the lifecycle state of the item (not by item numbers). When you filter by lifecycle state, the update process will take less time than when you filter by item numbers.

Automatically filter by items with direct demand

To improve the master planning run time, you can choose to only include items with direct demand. This filter can only be used for a complete master planning run with no other filters applied in the **Records to include** field. A master planning run with filters will ignore the **Automatically filter by items with direct demand** setting.

The **Automatically filter by items with direct demand** field is found on the **Master planning parameters** page and can be used with both pre-processing and post-processing settings.

Pre-processing

The **Pre-processing: Automatically filter by items with direct demand** parameter ensures that the pre-processing phase of master planning only includes items that fulfill at least one of the following conditions:

- The item has an expected receipt or issue, such as a purchase order, sales order, quote, transfer order, or production order.
- The item has item coverage with safety stock (minimum on-hand inventory).
- Forecast demand after today exists for the item.
- Forecast supply after today exists for the item.
- The item includes any continuity lines from the call center module yet to be created.

NOTE

An item that has physically available on-hand inventory will not show a requirement transaction because there is no demand for the item.

Post-processing

The **Post-processing: Automatically filter by items with direct demand** option is only relevant if you set **BOM version requirement** in your coverage groups. Otherwise, you do not need to enable the parameter.

Before the coverage step starts, there is a pre-coverage step during which items with the coverage setting **BOM version requirement** enabled will be reprocessed. This is done to ensure that items from the required BOM version are planned. Items that are considered to have demand during pre-processing no longer have any demand and therefore should be excluded from the planning run.

Performance checklist summary

- **Number of threads** – Set to a value that is more than 0 (zero).

- **Number of tasks in helper task bundle** – Set to a value that is more than **0** (zero). (Use the formulas that are given earlier in this topic.)
- **Use of cache** – Set to **Maximum** unless your system is low on memory.
- **Number of orders in firming bundle** – Set to a value that is more than **0** (zero). (Use the formula that is given earlier in this topic.)
- **Time fences** – Adjust to your business needs.
- **Actions and futures** – Disable actions and future if you don't use them.
- **One heavy routine at a time** – Don't run master planning together with any other heavy routine.
- **Review the session log.**
- **Filtering of items** – Use the lifecycle state to exclude items from the master planning run. (Don't use the item numbers.)

NOTE

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Improve scheduling engine performance

2/18/2021 • 29 minutes to read • [Edit Online](#)

The resource scheduling engine is used when scheduling routes for planned and released production orders. The engine was originally released as part of Dynamics AX 2012 and has gone through several improvements since its release.

The [job shop scheduling problem](#) is an extremely complex combinatorial problem where solution time grows exponentially with the number of decision variables. Oftentimes, customers set up production routes and related data in a way that results in a scheduling problem that can't be solved in reasonable time even on the most modern hardware. This topic will help you understand the scheduling engine and how a specific setup can have influence on the performance.

When it comes to improving the performance of the scheduling, general guidelines recommend reducing the complexity of the problem the engine needs to solve. Some of the main factors that can affect performance include:

- Routes with many operations
- Routes with parallel operations
- Operations with quantity of resources higher than one
- Operations with many applicable resources
- Use of hard links
- Use of finite capacity
- The number of different calendars used
- The number of working time slots per day in the calendar
- Total duration of the route
- Running multiple scheduling engines in parallel

Overview of basic scheduling flow

To understand how a given setup can affect performance, it is important to understand something about how the process flows, both inside the engine and in the X++ code that surrounds it.

The basic process of scheduling an order consists of three main steps:

- **Loading data** – Here, the X++ data models are transformed into the engine's internal data model in the form of jobs and constraints.
- **Scheduling** – This is the main source for scheduling that processes the given model and constraints, and generates a result. During this process, the engine will request working time information and existing capacity reservations from X++ as needed.
- **Save data** – The engine result in the form of job capacity reservation slots is processed by X++ code to save capacity reservations and update the start and end times of the jobs/operation/order.

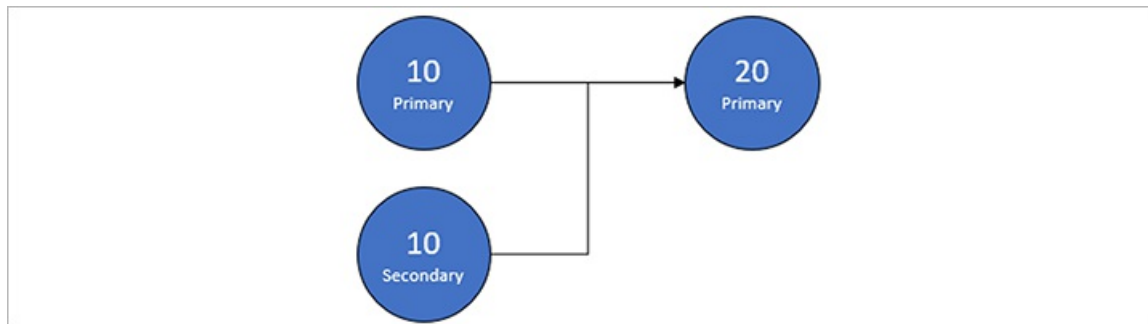
Load data into the engine

The scheduling engine has a more abstract data model than the Supply Chain Management database because it has been built as a generic engine that can handle different sources of data. The concepts of route, secondary operations, and run time need to be "translated" into the generic job and constraint model that the engine exposes. The logic for building the model has a significant amount of business logic to it and is different depending on the source data. The responsible X++ class is `WrkCtrScheduler` and it has derived classes for

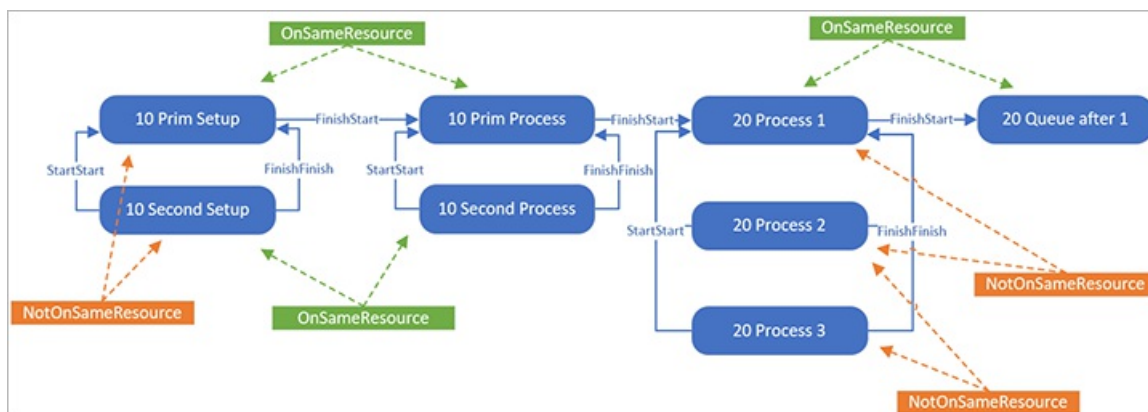
planned production orders, released production orders, and project forecasts.

As an example, consider a route shown in the following table and image, which seems relatively simple.

OPER. NO.	PRIORITY	SETUP TIME	RUN TIME	QUEUE TIME AFTER	QUANTITY OF RESOURCES	NEXT
10	Primary	1.00	2.00		1	20
10	Secondary 1				1	20
20	Primary		3.00	1.00	3	0



When sending this to the engine, it is split out into eight jobs, as shown in the following illustration (select the image to enlarge it).



The standard link between two jobs is `FinishStart`, meaning that the end time of one job must be before the start time of another job. Because the setup must be performed by the same resource that will later do the process, there are `OnSameResource` constraints between them. Between the jobs for primary and secondary operation for 10, there are `StartStart` and `FinishFinish` links, which means that the jobs must both start and end at the same time, and there are `NotOnSameResource` constraints, which will prevent the same resource for primary and secondary.

For operation 20, where the quantity of resources has been set to 3, the process job has been split into three distinct jobs where all the jobs must run at the exact same time. In this case, the route group has been set up to not reserve capacity for queue after times, which is why there is only a single job for the queue after.

The scheduling engine only understands the concepts of jobs and has no notion of operations. This means that when doing operation scheduling, the operations are also split into jobs, although these will not be persisted in the database.

For each job, we will also define what the job capacity requirement is (the number of seconds required). Depending on how the resource requirements have been defined, we may also, for each job, send a list of all the potential applicable resources that the job could run on and what the capacity requirement is for that specific resource. Even though the list of applicable resources is sent when building the model, the engine will still need

to ensure that the resource assignment is actually valid for the entire job duration.

Scheduling engine internals

Scheduling engine interface

To get an idea of how the engine works internally, it is best to look at the functionality it exposes externally. In X++, the main interface is `WrkCtrSchedulerEngineInterface`. It has the methods described in the following subsections.

General engine

METHOD	PURPOSE
<code>run</code>	Schedules all loaded jobs and returns the error code.
<code>getJobSchedulingSequenceResult</code>	Gets the scheduling result and the first error job for the sequence identified by a specific job.
<code>validateJobCapacityReservations</code>	Validates the capacity reservations for all the jobs stored by the engine.
<code>setReservationsTimeStamp</code>	Sends a timestamp to the engine set on all new capacity reservations for the scheduled jobs in the cache of the engine.
<code>addPropertyToGroupAggregation</code>	Adds a property prefix to the set of properties used when capacity is aggregated.
<code>addResource</code>	Adds a resource to the scheduling engine resource pool.
<code>addResourceGroup</code>	Adds a resource group to the scheduling engine resource group pool.
<code>addResourceGroupMembership</code>	Adds a resource as a member to a resource group.
<code>addOptimizationGoal</code>	Adds a scheduling optimization goal (duration or priority).

Individual jobs

METHOD	PURPOSE
<code>addJobInfo</code>	Adds a job information record that informs the engine about a job that should be scheduled.
<code>addConstraintJobEndsAt</code>	Adds a constraint that a job should end at a specified date and time.
<code>addConstraintJobStartsAt</code>	Adds a constraint that a job should start at a specified date and time.
<code>addConstraintMaxJobDays</code>	Defines the constraint that a job can span over a specified maximal number of days.
<code>addConstraintResourceRequirement</code>	Adds the constraint that the job must be scheduled on a specific resource.

METHOD	PURPOSE
<code>addJobBindPriority</code>	Adds a job bind priority for a (job, constraint level) pair. A higher priority value means the job variables will be bound earlier. The job will be processed before jobs with lower priority value in the same sequence.
<code>addJobCapacity</code>	Adds capacity load information for a job (like the required job runtime) independent on which resource the job runs on.
<code>addJobResourceCapacity</code>	Adds a resource to the set of resources that may be used to perform a job, and states the capacity required when running on that resource.
<code>addJobGoal</code>	Adds job goal information for a specific constraint level (earliest end time or latest start time).
<code>addJobResourcePriority</code>	Adds the priority to use when a job is scheduled on a resource.
<code>addJobResourceRuntime</code>	Specifies a job time that is dependent of the resource the job will be scheduled on.
<code>addJobRuntime</code>	Specifies a job time that is independent of the resource on which the job will be scheduled.
<code>scheduleJobOnResourceGroup</code>	Marks a job for scheduling on the resource group level.
<code>setJobResourcePreemptionAllowed</code>	Sets whether preemption is allowed for a job on a resource (if engine is allowed to schedule the job in noncontiguous capacity slots).
<code>setRequiredNumberOfResources</code>	Sets the number of resources required to schedule a job (only for operations scheduling).

Constraints between jobs

METHOD	PURPOSE
<code>addJobLink</code>	Adds a link (such as finish>start) between two jobs.
<code>addConstraintEndsDelayed</code>	Defines the constraint that a job cannot end before another jobs end plus some delay time.
<code>addConstraintJobListWorkingTimeIntersect</code>	Adds a constraint that the capacity slots reserved for the jobs must be on the intersecting working times for the two resources used by the jobs.
<code>addConstraintJobOverlap</code>	Add a constraint that defines how jobs are sequenced when a given quantity of an item can be moved between two resources while the first resource is still not finished processing, so that the second resource can start processing.
<code>addConstraintNotOnSameResource</code>	Adds a constraint that two jobs should not be scheduled on the same resource.

METHOD	PURPOSE
<code>addConstraintOnSameResource</code>	Adds a constraint that two jobs must be using the same resource.
<code>addJobSameReservations</code>	Adds a constraint that a job must end up having capacity reservations for the same time slots as the primary job.
<code>setPrimaryParallelJob</code>	Adds information about what job is the primary job in a set of parallel jobs.

Solver

The engine itself is essentially a specialized constraint solver with custom heuristics added. The solver is based on two main elements: variables and constraints.

Variable

A variable represents a domain of possible values. Scheduling engine has two types of variables:

- **DateTime variable** - Has a domain of all dates and times, and the domain can be restricted by moving the lower and upper bound for the time of the variable closer to each other.
- **Resource variable** - Has a domain of applicable resources, and the domain can be restricted by eliminating resources from the list.

Constraint

A constraint acts on variables by restricting their domains, but it also depends on variables so it gets activated when variables change. The process of "constraint propagation" is when a constraint performs its main function and reports back to the main logic if successful.

A variable is considered bound when it can't be restricted further, which for DateTime variable means that upper and lower bound is the same, and for the Resource variable that it has only a single applicable resource. When all variables are bound, a solution is found.

Constraint levels

When scheduling is executed as part of the material requirements planning (MRP) coverage phase, the orders will be scheduled backward from requirement date. However, if it is not possible to find a schedule that starts today or later and ends before the requirement date, then the scheduling direction will change to forward from today.

This main business rule is handled by organizing the constraints in levels. If no solution is found when using the constraints on the highest level, then the constraints on that level are all dropped, and the lower level is tried. In praxis, this means that for backward scheduling the model will contain a level 1 with job goals of latest start time given a maximum end time constraint (the requirement date), and a level 0 with job goals of earliest end time and given a minimum start time constraint of today.

Algorithm

The main steps of the engine algorithm are:

1. Find sequences (job chains) which can be solved separately.
2. Try to find an initial solution for the sequence for the highest constraint level.
 - a. Sort the jobs in the sequence based on job goal and priorities, such that a start job can be found.
 - b. Loop the jobs in the following sequence:
 - a. Find all constraints that need to be propagated and run propagation.
 - b. If all variables for the job have been bound, then a solution for that job has been found.
 - c. If one of the variables could not be bound without violating the constraints, then roll back the variable binding, try a different value in the domain (for resource variable), and rerun the

constraint propagation.

3. If no solution was found, then all constraints on the current constraint level is removed, the constraint level lowered (if any lower levels are available) and solution search retried with the new set of constraint.
4. If a feasible solution was found, then the optimization phase is started, which will try to find a better solution until the optimization timeout is reached or all resource combinations have been exhausted.

The constraint solver is not aware of the specifics of the scheduling algorithm. It is in the definition and combination of the various constraints that the "magic" happens.

Determining working times

A large part of the (internal) constraints in the engine controls the working time and capacity of a resource. Essentially, the task is to traverse the working time slots for a resource from a given point in a given direction, and find a long enough interval in which the jobs required capacity (time) can fit.

To do this, the engine needs to know the working times of a resource. Opposite to the main model data, the working times are *lazy loaded*, meaning that they are loaded into the engine as needed. The reason for this approach is that there are often working times in Supply Chain Management for a calendar for a very long period and typically many calendars exist so the data would be quite large to pre-load.

Calendar information is requested by the engine in chunks, by invoking the X++ class method `WrkCtrSchedulingInteropDataProvider.getWorkingTimes`. The request is for a specific calendar ID in a specific time interval. Depending on the state of the server cache in Supply Chain Management, each of these requests could end up in several database calls, which takes a long time (relative to the pure computational time). Also, if the calendar contains very elaborate working time definitions with many working time intervals per day, this adds to the time the loading takes.

When the working time data is loaded in the scheduling engine, this is retained in its internal cache for the specific calendar, meaning that if any other jobs or resources are using the same calendar then the next lookups can be performed quickly from memory. One common cause of bad performance is if a separate calendar ID is used for each resource, because data will then need to be requested for each calendar, even though the content of the calendars might be the same.

Finite capacity

When using finite capacity, the working time slots from the calendar are split and reduced based on the existing capacity reservations. These reservations are also fetched through the same

`WrkCtrSchedulingInteropDataProvider` class as the calendars, but instead use the method `getCapacityReservations`. When scheduling during master planning, the reservations for the specific master plan are considered and if enabled on the **Master planning parameters** page, the reservations from firmed production orders are also included. Similarly, when scheduling a production order, it is also an option to include reservations from existing planned orders, although this is not as common as the other way around.

Using finite capacity will cause scheduling to take longer due to several reasons:

- Fetching the capacity information from database is a slow operation and the server-side caching of capacity information is typically not as good as for working times because they are not shared among resources like calendars typically are.
- The number of working time slots to traverse increases due to the splits, and slots for a longer time period must typically be investigated before a solution can be found.
- After the scheduling is complete, a check for conflicting reservations must be performed (see the "Running scheduling engines in parallel" section for details).

Examining the resource combinations

If the job sequence only contains the standard `FinishStart` links, meaning it forms a simple chain without any branches, an optimal result (seen from the single order, not across orders) can be achieved by finding the best solution for the first job and then moving on to find the best solution for the next job. The best solution for a job

means finding the resource that can get the from and to date of the job closest to the job goal (in forward scheduling this means getting the end date of the job as early as possible) while still respecting the constraints.

When there are parallel jobs, finding a solution may involve examining different combinations of resources. The number of possible resource combinations is the product of the number of applicable resources for the connected parallel jobs. Especially when scheduling an order backwards from a requirement date, it can take quite a while for the logic to realize that there is no solution to the problem that will make the parallel jobs fit before today's date, as it will need to check all the combinations because there could be some resources that had a higher efficiency or a different calendar that might give a result. This means that if no timeout limit has been set it will run for a long time before changing the direction to forward.

This combinatorial logic also means that adding more applicable resources may make the engine run slower. If performance problems occur when having parallel operations and scheduling with infinite capacity, it can partly be fixed by having the route designer take a decision on which resource should be used and then assign the resource directly on the operation (because the engine in most cases will always end up picking the same resource, so the end result will be the same).

Hard links

Setting the link type between two jobs to hard, ensures that there is no time gap between the finish of one job and the start of the next one. This can be very useful in scenarios like when metal is heated in one job and then processed in the next job, where it is not desirable to have the metal cool down in between.

With standard soft links and forward scheduling, if the route forms a simple chain without any branches, a result can be achieved by finding a solution for the first job that satisfies its own constraints and then moving on through the chain propagating the end time from the previous job to the next job. If the current job can't find any capacity, the start time for it will be moved out further, without any consequence for the previous jobs potentially creating gaps between the jobs. However with hard links (especially in connection with finite capacity) for the same scenario, the fact that one job later in the chain cannot find capacity, will mean that all previous scheduled jobs will have to be "dragged" along one by one and thereby rescheduled a number of times. Especially in scenarios with high load for multiple resources, the hard links can cause a chain reaction where the jobs will affect each other and a number of iterations will have to be performed before the result stabilizes into a feasible schedule.

Running scheduling engines in parallel

When performing scheduling as part of a master planning run where helpers are used, each of the master planning helper threads can also pick up production order scheduling tasks. This means that multiple scheduling engines can be running at the same time. While multithreading in general is a highly significant performance benefit, there are also some functional downsides when it comes to scheduling.

In MRP, all production orders for a given bill of materials (BOM) level are scheduled in requirement date sequence, meaning that those orders with the earliest requirement date should be scheduled first and thereby have the highest chance of getting the available resource capacity. However, with multiple engines picking from the list of unscheduled orders the sequence is no longer ensured, as one might complete faster than the other.

Also, when scheduling using finite capacity and when multiple engine instances are trying to schedule orders that are potentially using the same resources at the same time interval, a race condition can occur. The number of such race conditions is recorded in the **Scheduling conflicts** field on the master plans history page. The conflict resolution logic is as follows:

- Schedule an order (lock-free) and get capacity reservations.
- Take the lock.
- Check if newer capacity reservations exist for the scheduled resources in the timespan.
 - If no, write the capacity and release the lock.

- If yes, release the lock and reschedule the order from the beginning.

So, when scheduling with multiple engine instances, the result is not fully deterministic because it will depend on the exact timing of each of the threads.

Operation scheduling performance

Even though operation scheduling is also known as rough-cut capacity planning, seen from an engine standpoint, it can be a harder problem to solve if finite capacity is used, as more data is needed to determine feasibility.

The capacity of a resource group depends on which and how many resources are members of the resource group. A resource group in itself does not have any capacity—only when resources are a member of the group will it have capacity. Because the resource group membership can vary over time, capacity must be evaluated per day.

In operations scheduling, the resource group's calendar is used to determine the start and end times for each operation. This means that the resource group's calendar places a limit on how much time can be operations scheduled for one operation on one day in one resource group. Opposite the calendar for the specific resources, the efficiency data of the calendar is ignored for the resource group as it simply denotes opening hours and not actual capacity.

For example, if the working time for a resource group on one specific date is from 8:00 to 16:00, one operation can't put more load on the resource group than what can be fit into 8 hours, no matter how much capacity that the resource group has available in total on that day. The available capacity can however limit the load further.

The load from job scheduling on all the resources included in the resource group on a given day is considered when the available capacity for the resource group on the same day is calculated. For each date, the calculation is:

Available resource group capacity = Capacity for resources in the group based on their calendar – Job scheduled load on the resources in the group – Operations scheduled load on the resources in the group – Operations scheduled load on the resource group

On the **Resource requirements** tab on the route operation, the resource requirements can be specified using either a specific resource (in which case the operation will be scheduled using that resource), for a resource group, for a resource type, or for one or more capabilities, skill, course, or certificate. While using all of these options gives a great flexibility on the route design, it also complicates the scheduling for the engine as the capacity must be accounted for per "property" (the abstract name used in the engine for capability, skills, and so on).

The resource group's capacity for a capability is the sum of the capacity for all resources in the resource group that has the capability in question. If a resource in the group has a capability, it will be considered no matter what level of the capacity is required.

In operations scheduling, the available capacity for a certain capability for a resource group will be reduced when it is loaded with an operation that requires the capability in question. If the operation requires more than one capability, the capacity will be reduced for all required capabilities.

For each date, the required calculation is:

Available capacity for a capability = Capacity for the capability – Job scheduled load on the resources with the specific capability, included in the resource group – Operations scheduled load on the resources with the specific capability, included in the resource group – Operations scheduled load on the resource group itself that require the specific capability

This means that if there is load on a specific resource, the load is considered in the calculation of the resource

group's available capacity per capability, because the load on a specific resource reduces its contribution to the resource group's capacity for a capability no matter if the load on the specific resource is for that specific capability. If there is load on the resource group level, it is considered in the calculation of the resource group's available capacity per capability only if the load is from an operation that requires the specific capability.

The above logic is complicated, as this is the same for each type of "property" so using operations scheduling with finite capacity requires a significant amount of data to be loaded.

Viewing scheduling engine input and output

To get specific details of the input and output of the scheduling process, enable logging by going to **Organization administration > Setup > Scheduling > Scheduling tracing cockpit**.

On this page, first select **Enable logging** on the Action Pane. Then run the scheduling for the production order. When complete, return to the **Scheduling tracing cockpit** page and select **Disable logging** on the Action Pane. Refresh the page and a new line will appear in the grid. Select the new line and select **Download** on the Action Pane. This will give you a .zip compressed folder containing the following files:

- **Log.txt** - This is the log file that describes the steps that the engine goes through. It is very elaborate and can be a bit overwhelming, but when used as part of experimenting with the route setup to resolve performance problems the first thing to look for is the difference in time between the first and the last line, as this will give you the exact time the scheduler has spent.
- **XmlModel.xml** - This contains the model that is built in X++ and that the engine operates on. The `JobId` used in the file correlates to the `RecId` from the source table containing the jobs (`ReqRouteJob` or `ProdRouteJob`). The typical thing to look for in this file is that the dates given in `ConstraintJobStartsAt` and `ConstraintJobEndsAt` are as expected, that the `JobGoal` property is set correctly, and that the jobs are related to each other through the `JobLink` constraints.
- **XmlSlots.xml** - This contains all the working times and capacity reservations that the engine has requested. The calendar working times and reservations will only be requested by the engine for the time periods where it tries to place the jobs (and an extra buffer), so if the file contains times very far in the future, it might be an indication of a problem with the setup. The `ResourceProperty` nodes will show for each resource which resource group and capabilities it is associated with for which periods.
- **Result.xml** - This contains the result of the scheduling run.

Note that the tracing functionality can add significant performance overhead, so only use it for investigating scheduling of specific orders in a controlled manner. If it is turned on during a master planning run it will quickly reach its size limit and stop.

Troubleshooting performance

As can be understood from all of the previous sections, there are some pitfalls when it comes to the setup and usage of the scheduling engine, which can lead to performance problems. The following check list can be used for troubleshooting such issues. It is important to look at all the points as it is most often a combination of multiple factors that leads to problems.

Performing scheduling as part of MRP when it is not needed

Even though routes are used for the production control purposes such as costing and reporting, it might not be necessary to consider them during MRP. In some cases, having a standard production lead time specified for the item will be sufficient for planning. To turn off route scheduling, set the capacity time fence to zero. If scheduling should be done, then the capacity time fence must be carefully set because it might not be necessary to consider routes for the full extent of the MRP's coverage time fence.

Note that if the order is not scheduled during MRP, then it will instead need to be scheduled when the planned order is firmed. This means that the firming process will take longer, so depending on how many of the

suggested planned orders get firmed the performance gain during MRP might be lost at firming.

Route with unnecessary operations

When designing the route, it is tempting to try to model the real world exactly with all the steps the production goes through. While this can be useful in some cases, it is not good for the performance as the model the engine needs to work on gets larger (both in terms of jobs and constraints) and more SQL statements will be executed for insertion and update of the jobs and capacity reservations. Also, there is the downstream effect of having to eventually report progress on the jobs, which can be mitigated with automatic postings. If the data is not used for anything, it creates unnecessary load.

We recommend that you only create operations that are strictly needed for scheduling (which will typically be the bottleneck resources) and/or costing purposes. Alternatively you should group many smaller distinct operations into one larger operation that represents a greater part of the process.

Many applicable resources for an operation

The number of applicable resources for an operation is determined by the resource requirements set on the operation relation. The requirement can either be for a specific (individual) resource or it can be based on the resource's membership of a resource group or capability.

If scheduling is not done using finite capacity and all the applicable resources have the same calendar and efficiency, then the scheduling engine will always end up picking the same resource for an operation, but only after trying all the applicable resources to check if there is one that is "better" than the others. In this case, the load of the scheduling can be greatly reduced simply by always assigning a specific resource to the operation at the route design time.

Route with parallel operations

While parallel operations (primary/secondary) are a powerful tool to model scenarios like when a machine and an operator are both needed to perform a specific task, it is also the source of many performance issues. If a requirement for a specific individual resource is assigned to both the primary and secondary operation, it is typically not a problem. But if there are many possible resources for each of the operations, then it adds significant computational complexity to the scheduling.

An alternative to using parallel operations is either to model the pairs as "virtual" resources (which will then represent the team that always goes together for the operation) or to simply not model one of the operations if it doesn't represent a bottleneck.

Route with quantity of resources higher than 1

If setting the quantity of resources needed for an operation higher than one, then it results effectively the same as using primary/secondary operations because multiple parallel jobs are sent to the engine. However, for this case there is not an option of using specific resource assignments, because a quantity higher than one requires that more than one resource is applicable for the operation.

Excessive use of finite capacity

Use of finite capacity requires the engine to load the capacity information from a database and can have a computational overhead because it will be harder to find a solution especially in environments where the resources are booked close to their maximum capacity. As a result, it is important to carefully evaluate if a resource really needs to use finite capacity or they can be overbooked. Because there might be a difference among finite capacity resources in how important they are not to overbook, we recommend using the bottleneck option on a resource in combination with a separate value on the plan in "Capacity time fence for bottleneck resources". Using the bottleneck concept can enable that the general finite capacity time fence can be lowered.

Setting hard links

The standard link type of the route is *soft*, which means that a time gap is allowed between the finishing time of one operation and the start of the next. Allowing this can have the unfortunate effect that, if materials or

capacity are not available for one of the operations for a very long time, the production could be idle for quite a while, meaning a possible increase of work in progress. This will not happen with hard links because the finish and start must align perfectly. But setting hard links makes the scheduling problem more difficult because working time and capacity intersections must be calculated for the two resources of the operations. If there are also parallel operations involved, this adds significant computational time. If the resources of the two operations have different calendars that don't overlap at all, the problem is unsolvable.

We recommend using hard links only when strictly necessary, and carefully consider if it is necessary for each operation of the route.

To reduce the work in progress without applying hard links, a trick is to schedule the order twice with changing to the opposite direction for the second pass. If the first schedule was done backwards from delivery date, then the second should be done forward from the scheduled start date. This will result in the jobs being compressed as much as possible so that the work in progress is minimized.

Separate calendar for each resource

One of the main sources of data for the scheduling engine is calendar information, which can be expensive to load from the database. Because calendars are generated based on templates, it would be tempting to generate a calendar for each resource and then adjust the information in this calendar when the resource has downtime and other issues. However, doing this will severely limit the engine's ability to cache the calendar data as it would need to request new data for each resource and can be a large source of performance problems. Instead, we recommend that you reuse the calendars as much as possible between the resources, and then control downtime changes by assigning a different calendar ID for a period.

High number of working time slots per calendar day

Because the engine works by examining time slots one-by-one for capacity, it is beneficial to minimize the number of time slots per calendar day. This could be done, for example, by considering whether it's important for the resulting schedule to reflect that workers have a 5-minute break every hour.

Large (or none) scheduling timeouts

Scheduling engine performance can be optimized using parameters found on the **Scheduling parameters** page. The **Scheduling timeout enabled** and **Scheduling optimization timeout enabled** settings should always be set to **Yes**. If set to **No**, the scheduling can potentially run infinitely if an unfeasible route with many options has been created.

The value for **Maximum scheduling time per sequence** controls how many seconds can, at most, be spent trying to find a solution for a single sequence (in most cases a sequence corresponds to a single order). The value to use here highly depends on the complexity of the route and settings like finite capacity, but a maximum of about 30 seconds is a good starting point.

The value for **Optimization attempts timeout** controls how many seconds can at most be used to find a better solution than the one originally found. This will only influence routes that are using parallel operations as these make it necessary to test different combinations.

NOTE

The values set for the timeouts will be applied both for scheduling of released production orders and of planned orders as part of MRP. As a result, setting very high values could significantly add to the run time of MRP when running for a plan with many planned production orders.

NOTE

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Master planning and multisite functionality overview

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Master planning takes the settings of the site and warehouse inventory dimensions into account.

The site dimension is mandatory, and you can set the warehouse dimension to be mandatory.

When a dimension is mandatory, a dimension value must be entered on all inventory transactions. Therefore, during master planning, the site and the warehouse for the initial demand are known. The site dimension is also consistent so that during the explosion of lower-level demand, the site value does not change.

When the warehouse is not set to mandatory, it may not be known from the initial demand. The planning engine must determine which warehouse to use based on the settings that are defined for the item, individual warehouses, and the details of the order line.

The following topics describe how the planning engine works, when different settings are defined, to determine the warehouse to use.

[Master planning for site and warehouse coverage, warehouse mandatory](#)

[Master planning for site coverage, mandatory warehouse](#)

[Master planning for site and warehouse coverage, warehouse not mandatory](#)

[Master planning for site coverage, warehouse not mandatory](#)

[Determine the BOM version](#)

NOTE

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Master planning for site coverage, mandatory warehouse

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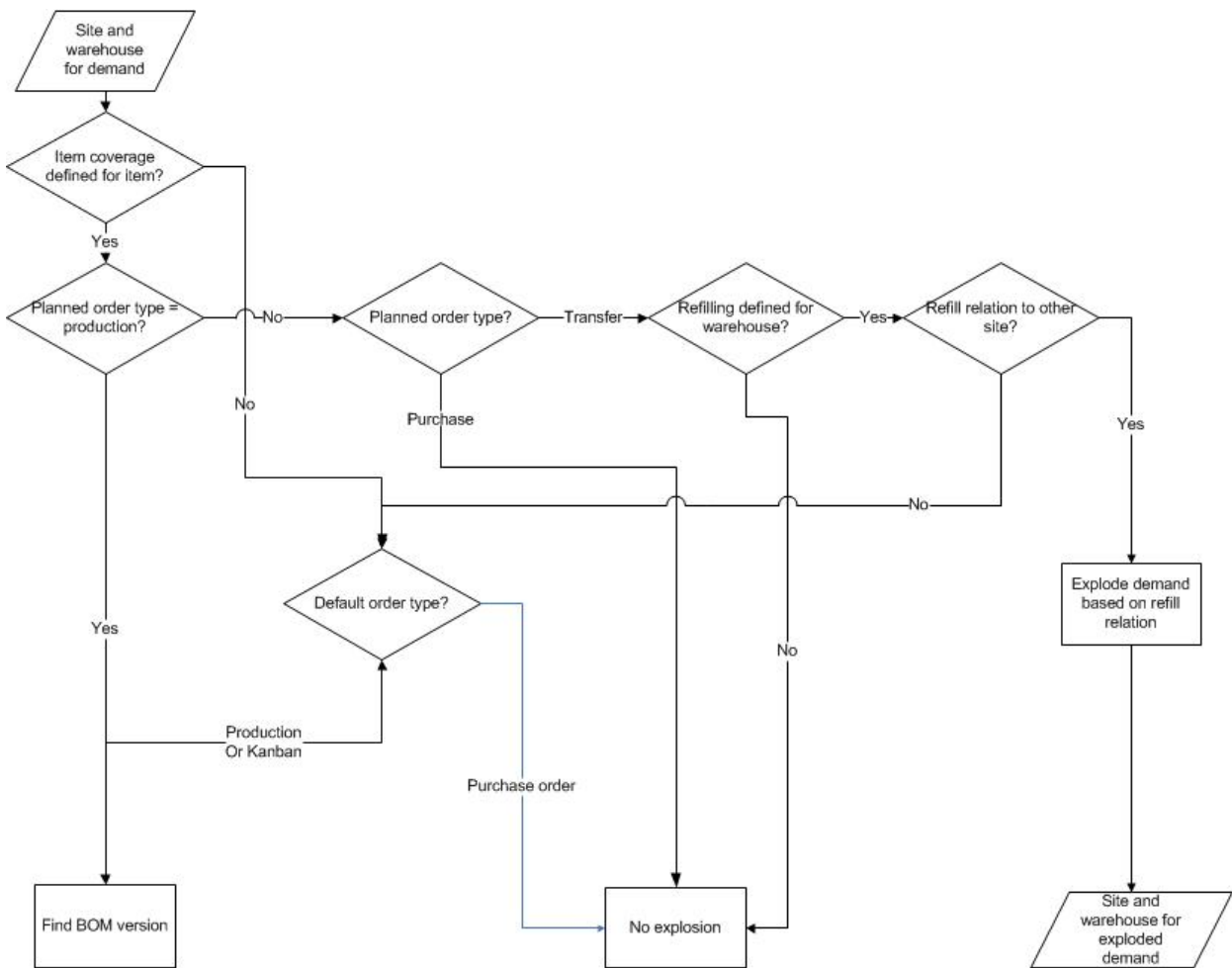
This topic describes how an item that has the site as coverage dimension is planned. Warehouse is a mandatory dimension.

This master planning scenario involves the following conditions:

- The site dimension is set to mandatory and must be entered on the demand transaction. This setting can't be modified.
- The warehouse dimension is set to mandatory and must be entered on the demand transaction.
- The site dimension is set for coverage planning. Other dimensions may be set for coverage planning also. However, they are not affected by the multisite functionality.
- The warehouse dimension is not set for coverage planning. Therefore, supply and demand are aggregated by site and, perhaps, other coverage-planned dimensions also.

The following graphic illustrates how master planning proceeds. The parameters that are referred to in the graphic, and their locations, are as follows:

- Item coverage is defined for the item. Click **Product information management > Products > Released products**. Select the item, and then click **Plan > Item coverage**.
- Refill relations are defined for the warehouse. Click **Inventory management > Setup > Inventory breakdown > Warehouses**. On the **Master planning** tab, see the **Main warehouse** field group.
- The default order type is set to Production, Purchase order, or Kanban. Click **Product information management > Products > Released products**. Select the item, and then click **Plan > Default order settings**. In the **Default order settings** form, see the **Default order type**.



Additional resources

[Master planning and multisite functionality overview](#)

[Master planning for site and warehouse coverage, warehouse mandatory](#)

[Master planning for site coverage, mandatory warehouse](#)

[Master planning for site and warehouse coverage, warehouse not mandatory](#)

[Determine the BOM version](#)

NOTE

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Master planning for site coverage, warehouse not mandatory

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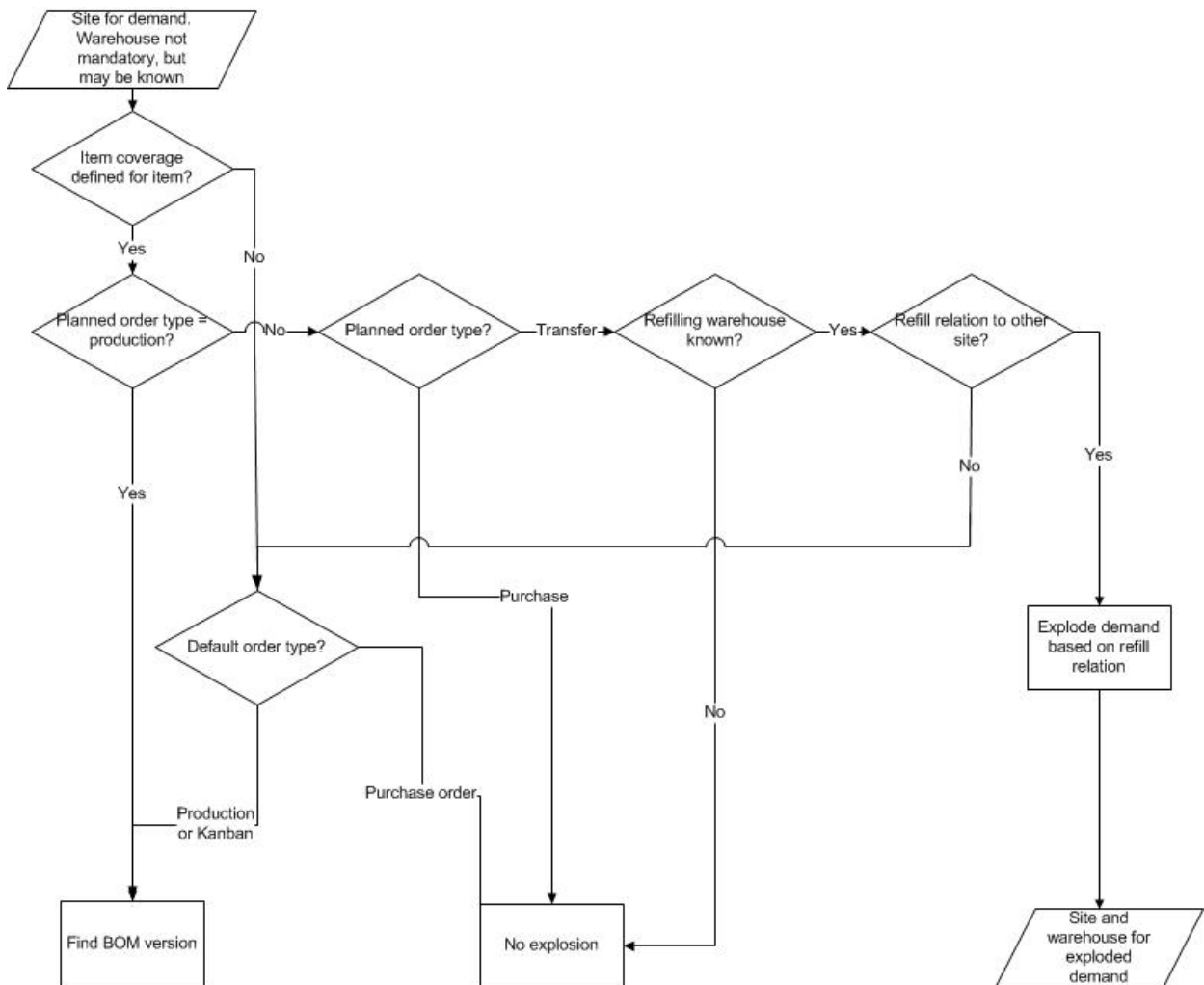
This topic describes how an item that has the site dimension set for coverage is planned.

This master planning scenario involves the following conditions:

- The site dimension is set to mandatory and must be entered on the demand transaction.
- The warehouse dimension is not set to mandatory. The warehouse may be known, but it is not used in the master planning calculation.
- The site dimension is set for coverage planning.
- The warehouse dimension is not set for coverage planning. Therefore, supply and demand are aggregated by site and, perhaps, other coverage-planned dimensions also.

The following graphic illustrates how master planning proceeds. The parameters that are referred to in the graphic, and their locations, are as follows:

- Item coverage is defined for the item. Click **Product information management > Products > Released products**. Select the item, and then click **Plan > Item coverage**.
- Refill relations are defined for the warehouse. Click **Inventory management > Setup > Inventory breakdown > Warehouses**. On the **Master planning** tab, see the **Main warehouse** field group.
- The default order type is set to Production, Purchase order or Kanban. Click **Product information management > Products > Released products**. Select the item, and then click **Plan > Default order settings**. In the **Default order settings** form, see the **Default order type** field.



Additional resources

[Master planning and multisite functionality overview](#)

[Master planning for site and warehouse coverage, warehouse mandatory](#)

[Master planning for site coverage, mandatory warehouse](#)

[Master planning for site coverage, warehouse not mandatory](#)

[Determine the BOM version](#)

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Master planning for site and warehouse coverage, warehouse mandatory

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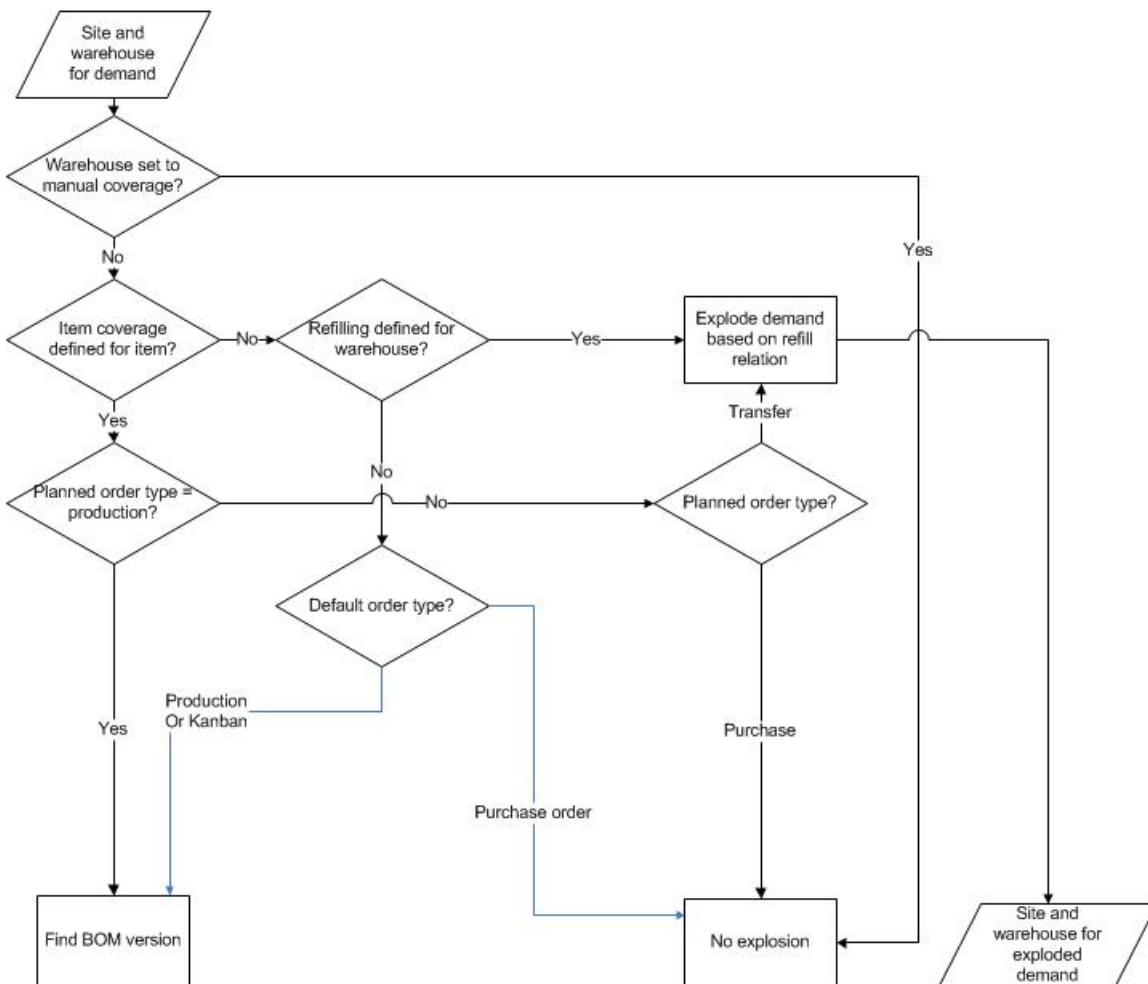
This topic describes how an item that has site and warehouse as coverage dimensions is planned. The warehouse dimension is mandatory.

This master planning scenario involves the following conditions:

- The site dimension is set to mandatory and must be entered on the demand transaction.
- The warehouse dimension is set to mandatory and must be entered on the demand transaction.
- The site and warehouse dimensions are set for coverage planning. Other dimensions may be set for coverage planning also. However, they are not affected by the multisite functionality.

The following graphic illustrates how master planning proceeds. The parameters that are referred to in the graphic, and their locations, are as follows:

- The warehouse is set to **Manual**. Click **Inventory management > Setup > Inventory breakdown > Warehouses**. On the **Master planning** FastTab, see the **Manual** field.
- Item coverage is defined for the item. Click **Product information management > Products > Released products**. Select the item, and then, on the Action Pane, on the **Plan** tab, click **Item coverage**.
- Refill relations are defined for the warehouse. Click **Inventory management > Setup > Inventory breakdown > Warehouses**. On the **Master planning** FastTab, see the **Main warehouse** field group.
- The default order type is set to Production, Purchase order, or Kanban. Click **Product information management > Products > Released products**. Select the item, and then, on the Action Pane, on the **Plan** tab, click **Default order settings**. In the **Default order settings** form, see the **Default order type**.



Additional resources

[Master planning and multisite functionality overview](#)

[Master planning for site coverage, mandatory warehouse](#)

[Master planning for site coverage, warehouse not mandatory](#)

[Master planning for site and warehouse coverage, warehouse not mandatory](#)

[Determine the BOM version](#)

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Master planning for site and warehouse coverage, warehouse not mandatory

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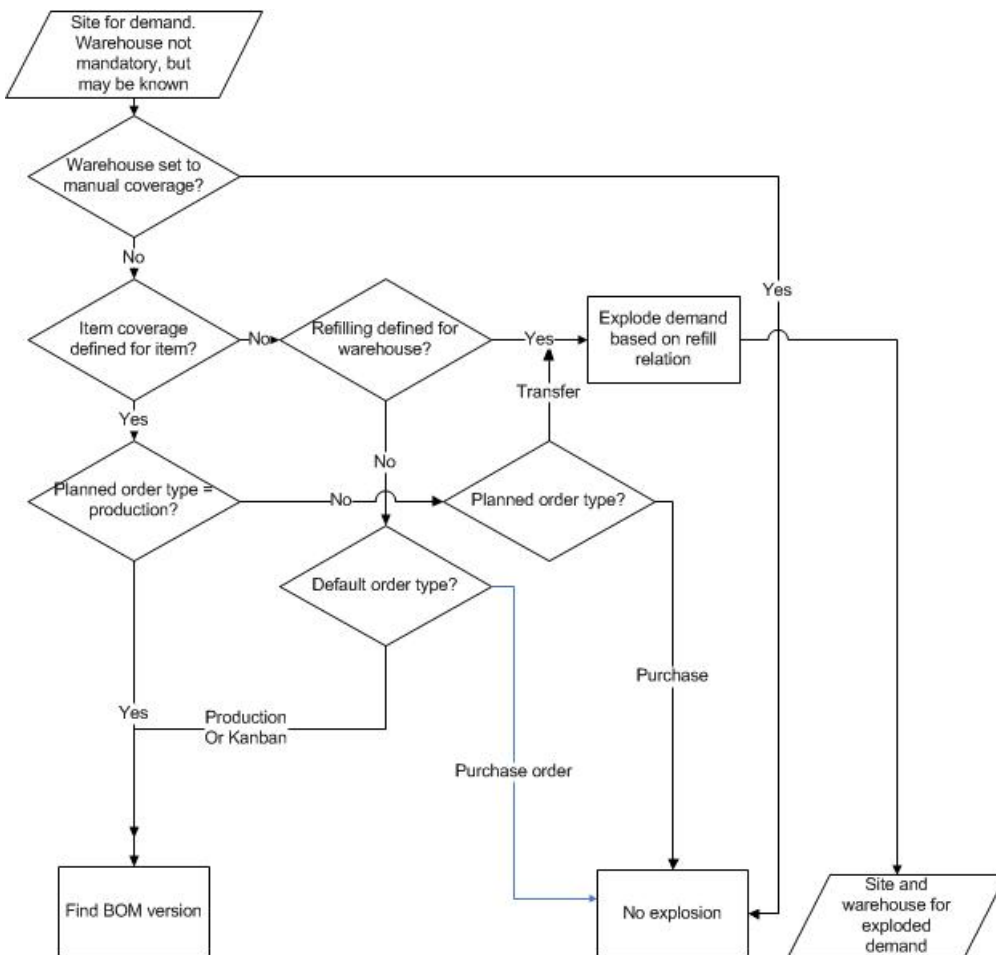
This topic describes how an item that has site and warehouse as coverage dimensions is planned. The warehouse dimension is not mandatory.

This master planning scenario involves the following conditions:

- The site dimension is set to mandatory and must be entered on the demand transaction. This setting can't be modified.
- The warehouse dimension is not set to mandatory. The warehouse may be known, but it is not used in the master planning calculation.
- The site and warehouse dimensions are set for coverage planning. Other dimensions may be set for coverage planning also. However, they are not affected by the multisite functionality.

The following graphic illustrates how master planning proceeds. The parameters that are referred to in the graphic, and their locations, are as follows:

- The warehouse is set to Manual. Click **Inventory management > Setup > Inventory breakdown > Warehouses**. On the **Master planning** FastTab, see the **Manual** field.
- Item coverage is defined for the item. Click **Product information management > Products > Released products**. Select the item, and then, on the Action Pane, on the **Plan** tab, click **Item coverage**.
- Refill relations are defined for the warehouse. Click **Inventory management > Setup > Inventory breakdown > Warehouses**. On the **Master planning** FastTab, see the **Main warehouse** field group.
- The default order type is set to Production, Purchase order, or Kanban. Click **Product information management > Products > Released products**. Select the item, and then, on the Action Pane, on the **Plan** tab, click **Default order settings**. In the **Default order settings** form, see the **Default order type**.



Additional resources

[Master planning and multisite functionality overview](#)

[Master planning for site coverage, mandatory warehouse](#)

[Master planning for site and warehouse coverage, warehouse mandatory](#)

[Master planning for site and warehouse coverage, warehouse not mandatory](#)

[Determine the BOM version](#)

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Determine the BOM version

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During a demand explosion, if an item has a default order type of Production, the planning engine finds a valid BOM version based on the site.

The site dimension is always known and is stated on the demand transaction. The following process is used to determine the BOM version to use:

- If there is a BOM version defined for the item at the demand site, the site-specific BOM is used.
- If there is no site-specific BOM version defined for an item at the demand site, a general BOM is used. A general BOM does not state a site, and it is valid for multiple sites. If there is a general BOM, it is used.
- If there is no general BOM version to use, the demand explosion stops at this point.

A valid BOM version, whether site-specific or general, must meet the required criteria for date and quantity.

NOTE

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Explosion of a BOM version

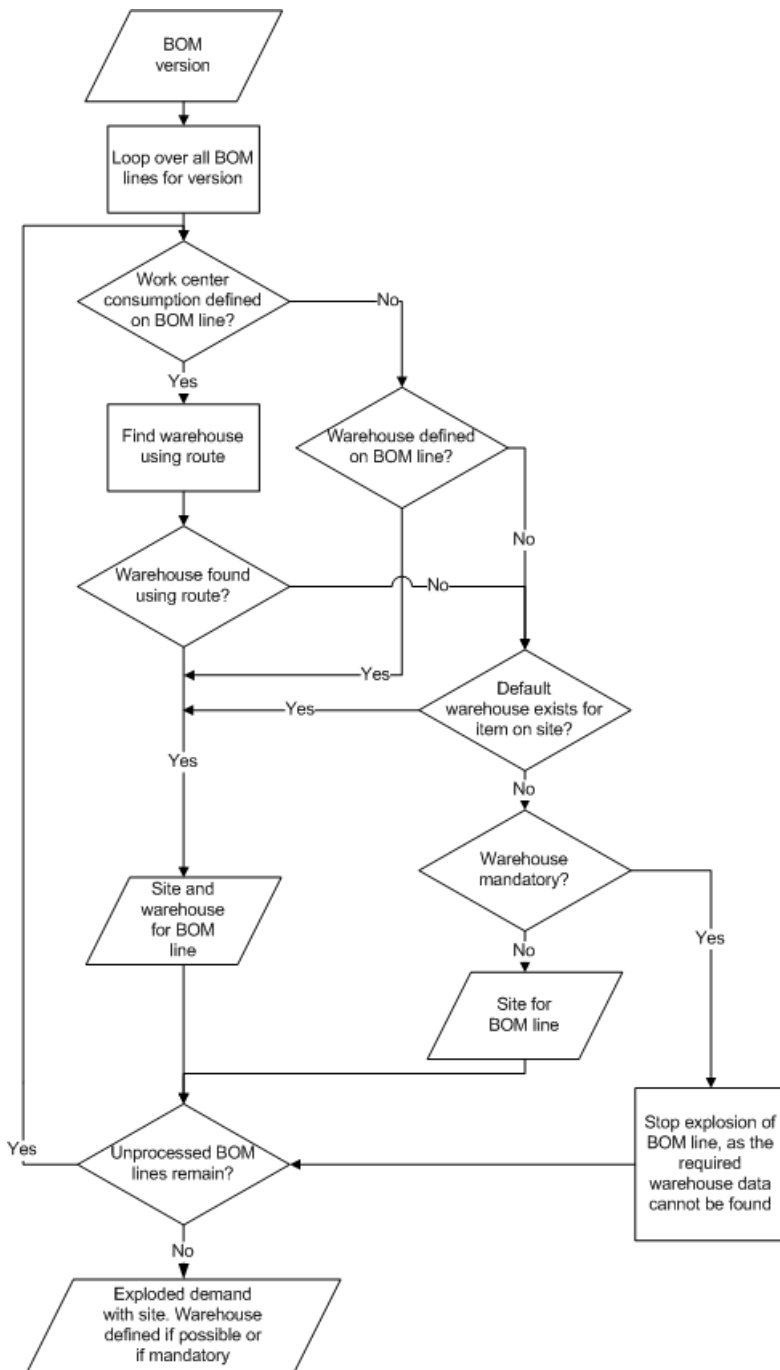
2/18/2021 • 2 minutes to read • [Edit Online](#)

This article explains a master planning scenario that involves explosion of a bill of materials (BOM) version.

A demand explosion of a bill of materials (BOM) version creates a demand for each BOM line item at a specific site and, possibly, at a specific warehouse. In a site-specific BOM, a specific warehouse can be defined for each BOM line. Additionally, for each BOM line, the item's dimension settings determine whether the warehouse is required. The resulting demand for each BOM line item then becomes the starting point for additional demand explosion. This master planning scenario involves the following conditions:

- The site dimension is mandatory and must be entered on the demand transaction.
- The site dimension is consistent. Therefore, the site for lower-level demand is the same as the site on the initial demand transaction.

The following illustration shows how the process for master planning demand explosion.



Additional resources

[Determine the BOM version](#)

[Master planning and multisite functionality overview](#)

NOTE

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Negative days and dynamic negative days

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This topic provides information about negative days and dynamic negative days, and how you can use them to help your business. The *negative days time fence* represents the number of days that you're willing to wait before you order new replenishment when you have negative inventory.

In this topic, you will learn the following information:

- How planned orders are created
- The correlation between the negative days time fence and the item's lead time
- How the dynamic negative days time fence is calculated, and how the item's lead time is factored into the calculation
- How to interpret the [suggestions for improving the running time for material requirements planning \(MRP\) \(master planning\)](#) that are related to negative days

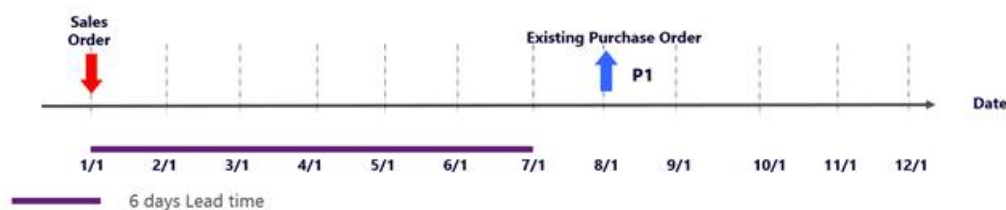
This topic uses three hypothetical scenarios to help you understand this information. The difference between the scenarios is the point at which you get demand: before, during, or after the item's lead time period.

Scenario 1: You get demand before the item's lead time period

You might get demand either relatively early in your item's lead time or just before the lead time period begins. Here is an example of this scenario:

- The DemoProduct item has a six-day purchase lead time.
- On day zero (January 1), the inventory level for the DemoProduct item is 0 (zero).
- On day zero (January 1), you get a sales order for a quantity of 10 of the DemoProduct item.
- On day seven (January 7), there is an existing purchase order for a quantity of 10 of the DemoProduct item.

The following illustration shows a graphical view of this scenario.



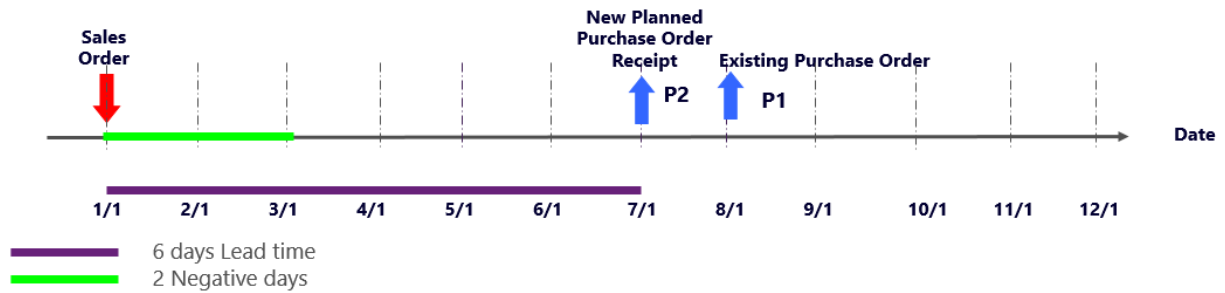
Case A: Negative days are less than the item's lead time

If you set the negative days to a number that is less than the item's lead time, MRP looks for receipts for the DemoProduct item inside the negative days time fence. Because it doesn't find any receipts, MRP creates a new planned purchase order. This planned order is immediately delayed by six days (the lead time). Therefore, it will arrive on January 7. The existing purchase order gets a **Cancel** action message, because the creation of the new planned purchase order has made it redundant.

The following illustration shows a screenshot of this case.

Overview													
General Action Futures Period													
Update Inquiries Sorting													
Referenc...	Reference	Item num...	Requirement ...	Expiration ...	CW req. ...	Req. qua...	Accumula...	CW accumul...	Action d...	Action quan...	Futures ...	Customer acc...	Customer gr...
	Sales order	_DemoProd...	01-01-2015			-10,00	-10,00				→	US-001	30
	Planned purchase orders	_DemoProd...	07-01-2015			10,00			☒		→		
	Purchase order	_DemoProd...	08-01-2015			10,00	10,00		☒	☒	☒		

The following illustration shows a graphical view of what occurs in this case.



If you consider MRP performance and plan nervousness, this case doesn't perform well. MRP must create a new planned order, and must calculate delays and actions. These tasks are time-consuming. This case also adds two more transactions to your plan. On the other hand, the sales order is delayed by only six days, not seven days.

Case B: Negative days are more than the item's lead time

To help improve MRP performance, you can set the negative days to a number that is more than the item's lead time. Because you can't get the supply inside the lead time in this scenario, you can search for receipts for as long as this search makes sense. Although the running time for MRP will be shorter, you should watch out for additional delays to the orders.

Case C: Automatically correlate the item's lead time to the negative days time fence

To automatically correlate the item's lead time to the negative days time fence, use dynamic negative days. To use dynamic negative days, go to **Master planning > Setup > Master planning parameters**, and then, on the **General** tab, in the **Coverage** section, set the **Use dynamic negative days** option to **Yes**. MRP then looks for receipts inside the dynamic negative days time fence. This time fence is calculated by using the following formula:

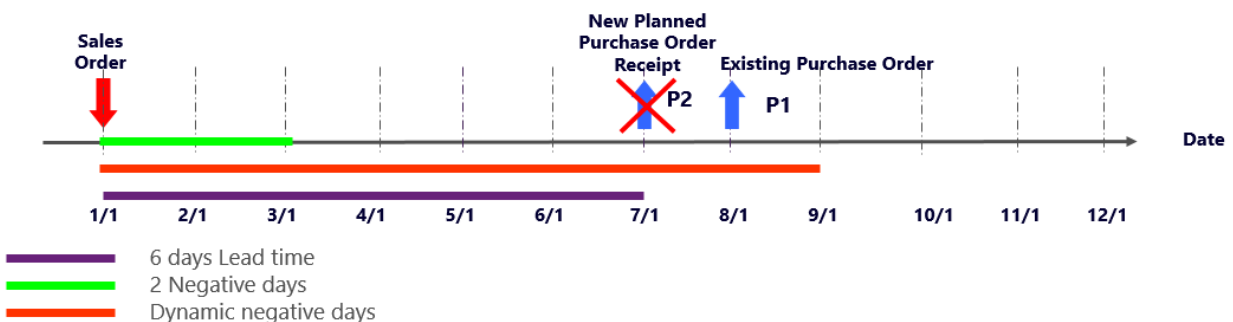
$$\text{Dynamic negative days time fence} = \text{Purchase lead time} + \text{Negative days time fence} + (\text{Current date} - \text{Requirement date})$$

(If the default order type of the DemoProduct item is **Production** or **Transfer**, the lead time is the **inventory** lead time.)

When dynamic negative days are used, the time fence that MRP looks at for receipts is now $6 + 2 + 0 = 8$ days. MRP finds the existing purchase order and pegs the sales order against it. No new planned orders are created. Therefore, the running time for MRP is shorter. The following illustration shows the net requirements for the DemoProduct item.

Reference	Reference	Number	Item number	Requireme...	Expiration date	CW req. qty	Req. quantity	Accumulated	CW accumulated	Action date	Action quantity	Futures date
	Sales order	000787	_DemoProd...	01-Jan-15			-10.00	-10.00				
	Purchase order	000044	_DemoProd...	08-Jan-15			10.00					

The following illustration shows a graphical view of what occurs in this case.



Case D: Use only dynamic negative days

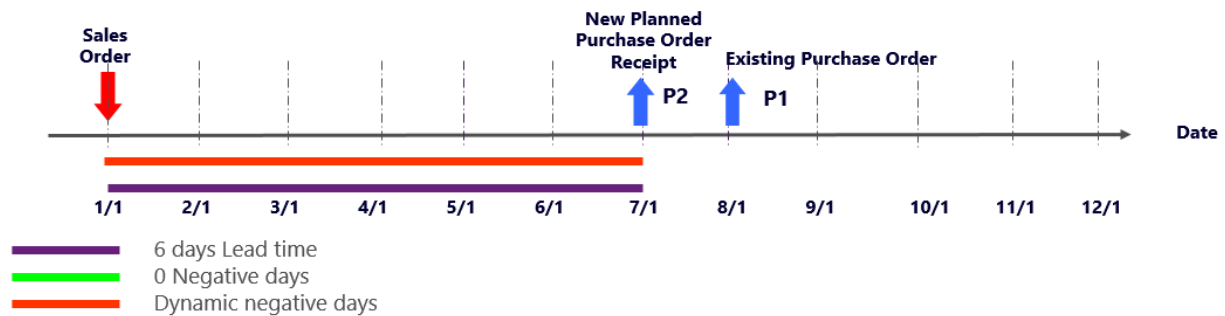
If you set the negative days to 0 (zero) and use only the dynamic negative days time fence, the dynamic negative days time fence is $6 + 0 + 0 = 6$ days. In this case, the result is the same as the result in case A for this scenario.

MRP must create a new planned order, and must calculate delays and actions. These tasks are time-consuming and can also be frustrating. You also have two more transactions to process. Because the demand can't be fulfilled on time for the item to arrive, this case adds unnecessary complications to your plan.

The following illustration shows a screenshot for this case.

Overview													
General Action Futures Period													
Update Inquiries Sorting													
Referenc...	Reference	Item num...	Requirement ...	Expiration ...	CW req. ...	Req. qua...	Accumula...	CW accumul...	Action d...	Action quan...	Futures ...	Customer acc...	Customer gr...
	Sales order	_DemoProd...	01-01-2015			-10,00	-10,00				⇒	US-001	30
	Planned purchase orders	_DemoProd...	07-01-2015			10,00			⇐	⇒			
	Purchase order	_DemoProd...	08-01-2015			10,00	10,00		✗	✗	✗		

The following illustration shows a graphical view of what occurs in this case.



Case E: Use both negative days that are more than the item's lead time and the dynamic negative days time fence

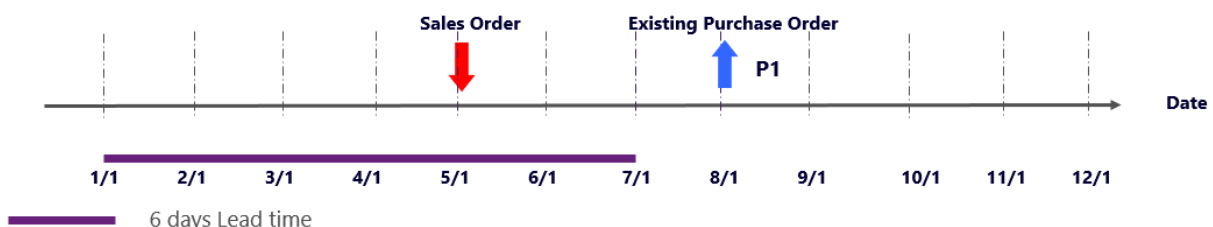
If you set the negative days to a number that is more than the item's lead time, and if you also use the dynamic negative days time fence, the dynamic negative days time fence is $6 + 6 + 0 = 12$ days. This approach might produce a very long time fence that MRP must search for results in. For information about how case E is related to a situation where you set the negative days to a long time fence, see the [Conclusion](#) section of this topic.

Scenario 2: You get demand during the item's lead time period

You might get demand sometime during your item's lead time. Here is an example of this scenario:

- The DemoProduct item has a six-day purchase lead time.
- On day zero (January 1), the inventory level for the DemoProduct item is 0 (zero).
- On day four (January 5), which is inside the item's lead time, you get a sales order for a quantity of 10 of the DemoProduct item.
- On day seven (January 8), there is a purchase order for a quantity of 10 of the DemoProduct item.

The following illustration shows a graphical view of this scenario.



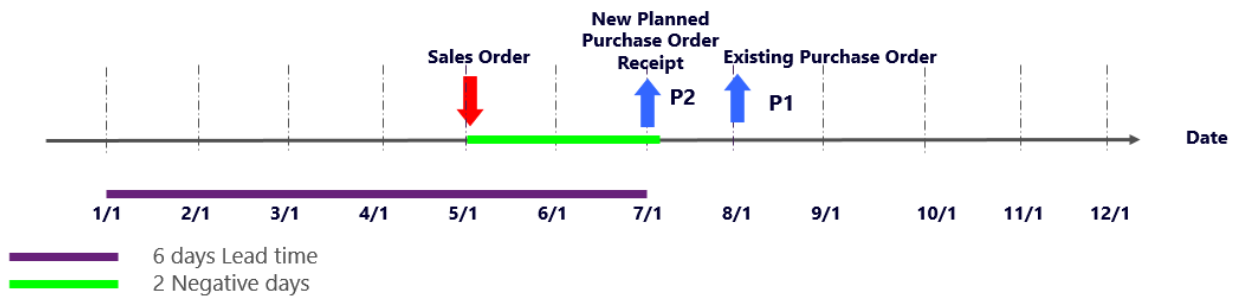
Case A: Negative days are less than the item's lead time

If you set the negative days to a number that is less than the item's lead time, MRP looks for receipts for the DemoProduct item inside the negative days time fence. Because it doesn't find any receipts, MRP creates a new planned purchase order that uses the current date as the order date. This planned order is immediately delayed by six days (the lead time). Therefore, it will arrive on January 7. The existing purchase order gets a **Cancel** action message, because the creation of the new planned purchase order has made it redundant.

The following illustration shows a screenshot for this case.

Reference	Reference	Number	Item number	Requirement ...	Expiration ...	CW req. qty	Req. quantity	Accumulated	CW accumulated	Action date	Action quantity	Futures ...
	Sales order	000787	_DemoProd...	05-Jan-15			-10.00	-10.00				→
	Planned purchase orders	013283	_DemoProd...	07-Jan-15			10.00					→
	Purchase order	000044	_DemoProd...	08-Jan-15			10.00	10.00		✗	✗	✗

The following illustration shows a graphical view of what occurs in this case.



Case B: Negative days are more than the item's lead time

This case resembles case B for scenario 1. If you set the negative days to a number that is more than the item's lead time, you don't get a new planned order. The sales order is attached to the existing purchase order.

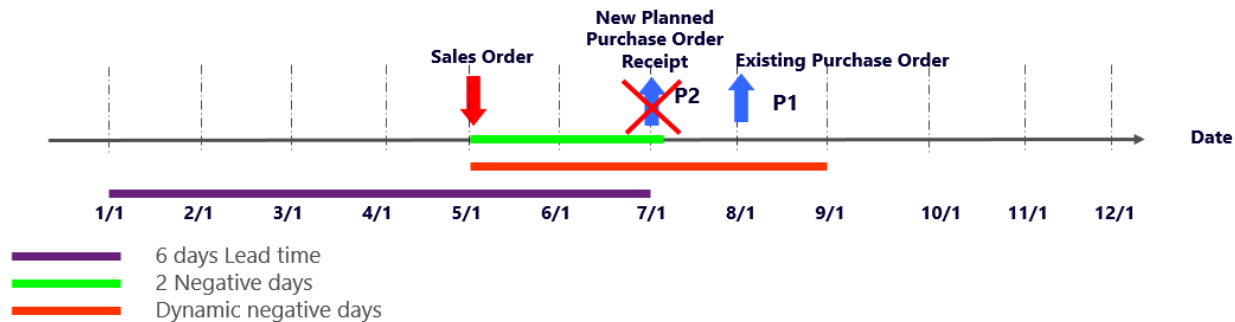
Case C: Automatically correlate the item's lead time to the negative days time fence

This case resembles case C for scenario 1, because dynamic negative days work just as well as they do in that case. The dynamic negative days time fence is now $6 + 2 - 4 = 4$ days. If you use this approach, MRP finds the existing purchase order and attaches the sales order to it. Because no new planned orders are created, the running time for MRP is shorter.

The following illustration shows a screenshot of this case.

Reference	Reference	Number	Item number	Requirement ...	Expiration date	CW req. qty	Req. quantity	Accumulated	CW accumulated	Action date	Action quantity	Futures date
	Sales order	000787	_DemoProd...	05-Jan-15			-10.00	-10.00				
	Purchase order	000044	_DemoProd...	08-Jan-15			10.00					

The following illustration shows a graphical view of what occurs in this case.



Case D: Use only dynamic negative days

If you set the negative days to 0 (zero) and use only the dynamic negative days time fence, the dynamic negative days time fence is now $6 + 0 - 4 = 2$ days. In this case, the result is the same as the result in case A for this scenario. For a graphical view of what occurs, see case A for this scenario.

Case E: Use both negative days that are more than the item's lead time and the dynamic negative days time fence

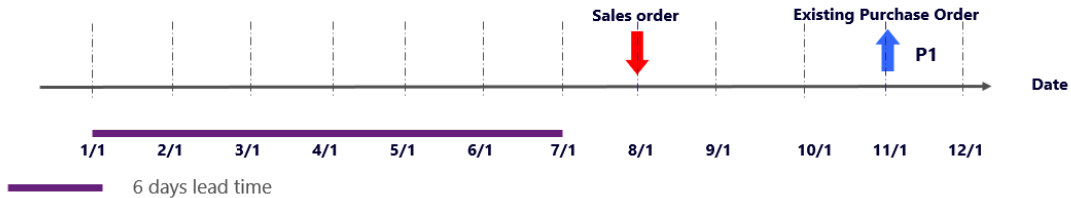
If you set the negative days to a number that is more than the item's lead time, and if you also use the dynamic negative days time fence, the dynamic negative days time fence is $6 + 6 - 4 = 8$ days. This approach might produce a very long time fence that MRP must search for results in. For information about how case E is related to a situation where you set the negative days to a long time fence, see the [Conclusion](#) section of this topic.

Scenario 3: You get demand after the item's lead time period

You might get demand after the item's lead time. Here is an example of this scenario:

- The DemoProduct item has a six-day purchase lead time.
- On day zero (January 1), the inventory for the DemoProduct item is 0 (zero).
- On day seven (January 8), which is outside the item's lead time, you get a sales order for a quantity of 10 of the DemoProduct item.
- On day 10 (January 11), there is a purchase order for a quantity of 10 of the DemoProduct item.

The following illustration shows a graphical view of this scenario.



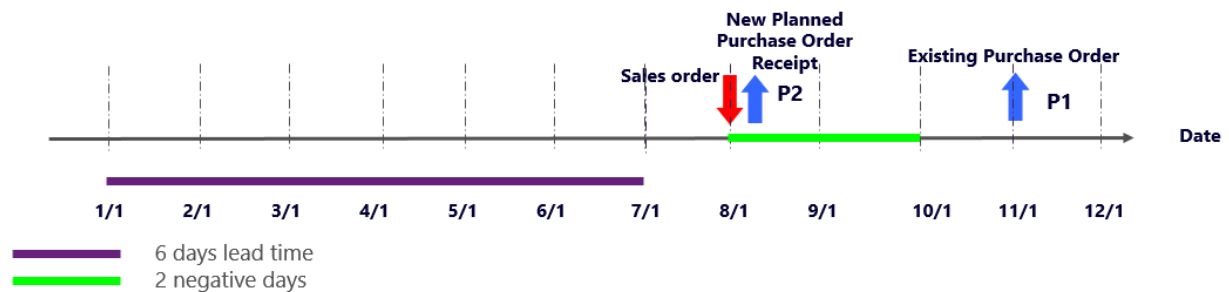
Case A: Negative days are less than the item's lead time

If you set the negative days to a number that is less than the item's lead time, MRP looks two days ahead of the sales order's requirement date. Because it doesn't find anything, MRP creates a planned purchase order on January 2. This planned purchase order will be shipped just in time to fulfill the sales order demand. The existing purchase order gets a Cancel action message, because it isn't required.

The following illustration shows a screenshot of this case.

Reference	Reference	Number	Item number	Requirement ...	Expiration date	CW req. qty	Req. quantity	Accumulated	CW accumulated	Action date	Action quantity	Futures date
	Planned purchase orders	013695	_DemoProd...	08-Jan-15			10.00	10.00				
	Sales order	000787	_DemoProd...	08-Jan-15			-10.00					
	Purchase order	000044	_DemoProd...	12-Jan-15			10.00	10.00		×	×	×

The following illustration shows a graphical view of what occurs in this case.



NOTE

In the preceding screenshot, the purchase order requirement date is January 12. Because that screenshot was taken in 2015, when January 11 was a Sunday, MRP moved the requirement date to the next working day, which was Monday, January 12. Nevertheless, the purchase order has a delivery date of January 11.

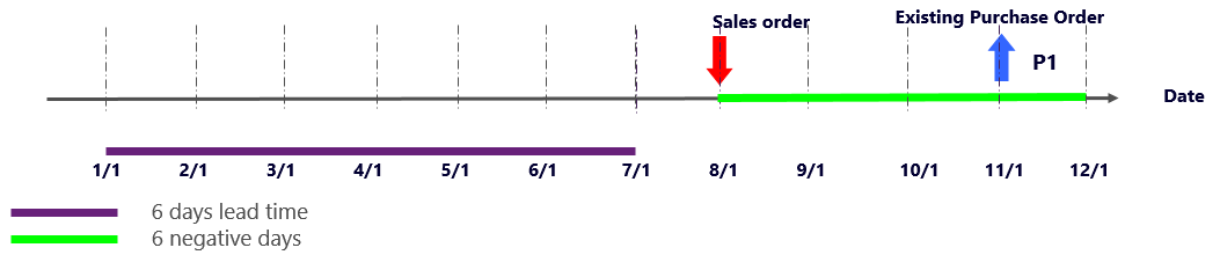
Case B: Negative days are more than the item's lead time

If you set the negative days to a number that is more than the item's lead time, you don't get a new planned order. The sales order is pegged against the existing purchase order. Therefore, the sales order is delayed. If you create a planned order, you can ship the sales order on time.

The following illustration shows a screenshot of this case.

Reference	Reference	Number	Item number	Requirement ...	Expiration date	CW req. qty	Req. quantity	Accumulated	CW accumulated	Action date	Action quantity	Futures date
	Sales order	000787	_DemoProd...	08-Jan-15			-10.00	-10.00				
	Purchase order	000044	_DemoProd...	12-Jan-15			10.00					

The following illustration shows a graphical view of what occurs in this case.

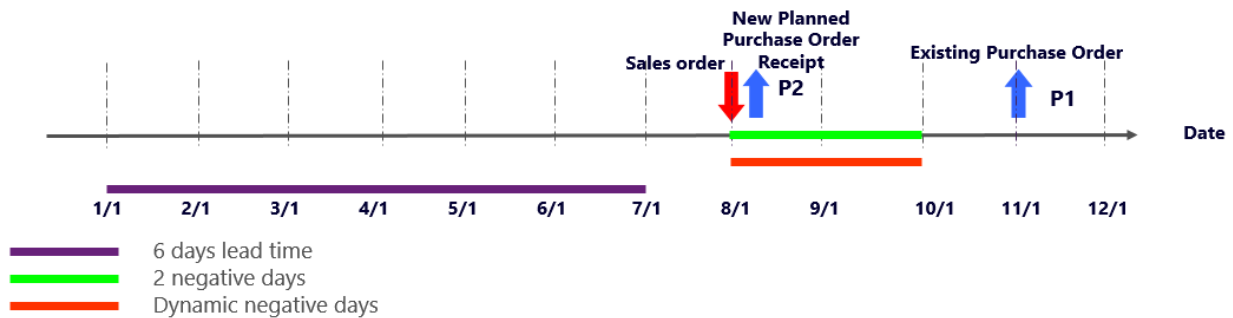


Case C: Automatically correlate the item's lead time to the negative days time fence

This case resembles case C for scenario 1, because dynamic negative days work just as well as, if not better than, they work in case B for this scenario.

The dynamic negative days time fence is $6 + 2 - 7 = 1$ day. However, in this case, the system still considers the negative days lead time (2), because MRP considers the maximum value between the negative days lead time and the dynamic negative days lead time. Therefore, the result in this case is the same as the result in case A for this scenario.

The following illustration shows a graphical view of what occurs in this case.



Case D: Use only dynamic negative days

If you set the negative days to 0 (zero) and use only the dynamic negative days time fence, the dynamic negative days time fence is now $6 + 0 - 7 = -1$ day. In this case, the system still considers the negative days lead time (2). Therefore, the result in this case is the same as the result in case A for this scenario and has all the same drawbacks. For a graphical view of what occurs, see case A for scenario 2.

Case E: Use both negative days that are more than the item's lead time and the dynamic negative days time fence

This case is the same as case E for scenarios 1 and 2. It has basically the same benefits and drawbacks.

Conclusion

As the three scenarios in this topic show, it's a good idea to set the negative days to a number that is more than the lead time of the items in the coverage group. It's also a good idea to use only dynamic negative days, and to set the negative days to the number of days that you're willing to wait before you order new replenishment when you have negative inventory (in other words, the number of days that you're willing to further delay demand). Additionally, items in the same coverage group should have similar lead times.

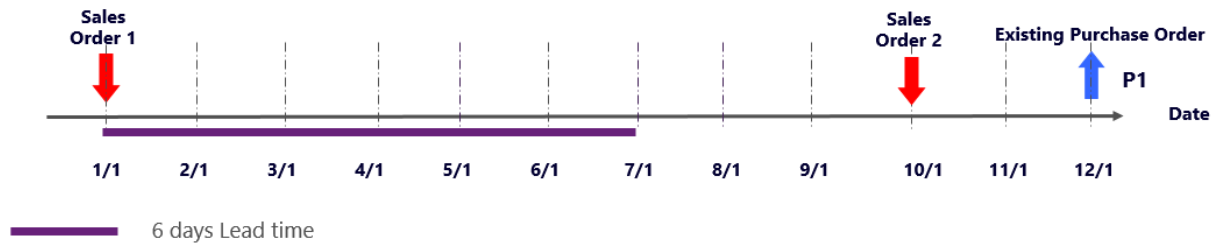
If you set the negative days to 0 (zero) and don't use dynamic negative days, MRP always creates a new planned order to fulfill demand. In this situation, it's important that you work with the action messages to make sure that you don't pile up inventory.

You might want to set the negative days to a long time fence and then work with the action messages. This approach produces good planning results, but it's also a bit slower. It might also be more difficult to analyze,

because you must analyze and apply the action messages. Here is an example:

- The DemoProduct item has a six-day purchase lead time.
- On day zero (January 1), the inventory for the DemoProduct item is 0 (zero).
- On day zero (January 1), you get a sales order for a quantity of 10 of the DemoProduct item.
- On day 10 (January 10), you get a sales order for a quantity of 10 of the DemoProduct item.
- On day 12 (January 12), there is a purchase order for a quantity of 10 of the DemoProduct item.
- Negative days are set to 20, which is much more than the item's lead time.

The following illustration shows a graphical view of what occurs.



MRP produces the following results.

Reference	Reference	Number	Item number	Requirement ...	Expiration date	CW req. qty	Req. quantity	Accumulated	CW accumulated	Action date	Action quantity	Futures date
	Sales order	000787	_DemoProd...	01-Jan-15			-10.00	-10.00				
	Planned purchase orders	012459	_DemoProd...	09-Jan-15			10.00			✗	✗	✗
	Sales order	000788	_DemoProd...	09-Jan-15			-10.00	-10.00				
	Purchase order	000044	_DemoProd...	12-Jan-15			10.00				⚡	

In the preceding screenshot, the sales order requirement date is January 9 instead of January 10. Because that screenshot was taken in 2015, when January 10 was a Saturday, the requirement date of the order should be the previous working day, which was Friday, January 9.

MRP creates a planned purchase order to fulfill the demand that is requested by the first sales order, but then it also recommends that you cancel the planned order, because you can advance the existing purchase order and increase the quantity on it.

The results aren't wrong, but the running time for MRP might be longer, because MRP must create all the delays and suggestions. Additionally, the planner might require more time to understand the MRP results. Most importantly, in this case, it's essential that the planner understand and use the action messages.

If you reduce the negative days to a number that's closer to the item's lead time, and you use dynamic negative days, MRP produces the following results.

Reference	Reference	Number	Item number	Requirement ...	Expiration date	CW req. qty	Req. quantity	Accumulated	CW accumulated	Action date	Action quantity	Futures date
	Sales order	000787	_DemoProd...	01-Jan-15			-10.00	-10.00				
	Planned purchase orders	013066	_DemoProd...	07-Jan-15			10.00			⚡		⇒
	Sales order	000788	_DemoProd...	09-Jan-15			-10.00	-10.00				⇒
	Purchase order	000044	_DemoProd...	12-Jan-15			10.00			⚡		

MRP creates a planned order that is attached to the first sales order. Then, as is expected, the second sales order is pegged against the existing purchase order, based on the negative days setting. This planning result is also correct, and the running time for MRP might be shorter. In this case, it isn't essential that you understand and know how to work with the action messages.

To help guarantee that the correct values are entered for your business, you must think in terms of both functionality and MRP running time. Therefore, it can take a little trial and error to determine the optimal values.

See also

For more discussion, see the original [More about \(dynamic\) negative days](#) blog post.

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Create an intercompany plan

2/18/2021 • 2 minutes to read • [Edit Online](#)

This procedure shows how to create an intercompany plan. The demo data company used to create this procedure is USMF.

Set up an intercompany planning group

1. In the **Navigation pane**, go to **Modules > Master planning > Setup > Intercompany planning groups**.
2. Use the Quick Filter to find records. For example, filter on the Name field with a value of '10'.
3. In the list, mark the selected row.
4. Click **Delete**. This step is necessary in order to shorten the intercompany planning run. Intercompany planning will run master planning in all the companies in a planning group, starting from the lowest scheduling sequence.
5. Click **Yes**.
6. Close the page.

Create an intercompany plan

1. In the **Navigation pane**, go to **Modules > Master planning > Workspaces > Master planning**.
2. Click **Intercompany master planning**.
3. In the **Intercompany planning group** field, click the drop-down button to open the lookup.
4. In the list, click the link in the selected row. Select intercompany planning group 10.
5. In the **Number of intercompany planning iterations** field, enter '2'. Intercompany planning group 10 has two members. In order to propagate the delays from the source company (USMF) to the customer company (DEMF), you will need to run intercompany in both companies two times. The first iteration will propagate the demand and identify the delays in the source company (USMF). The second iteration will propagate the delays from USMF to DEMF.
6. In the **First iteration** field, select 'Regeneration'.
7. In the **Subsequent iterations** field, select 'Regeneration'.
8. In the **Number of threads** field, enter a number. This represents the number of parallel threads used for planning.
9. Click **OK**.

View the result of the plan

1. In the **Plan** field, click the drop-down button to open the lookup.
2. In the list, click the link in the selected row. Click the link for StaticPlan. You need to be in company USMF.
3. Click **Planned orders**.

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View outbound planned intercompany demand

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This procedure shows how to view all the planned orders that will be fulfilled by an intercompany vendor. The demo data company used to create this procedure is DEMF.

1. Click Master planning.
2. In the Plan field, enter or select a value.
 - In the Plan field, select plan 10.
3. Click Run.
4. In the Number of threads field, enter a number.
 - This represents the number of parallel threads to be used for master planning.
5. Click OK.
 - This may take a while.
6. Click Planned intercompany demand.
7. Click Outbound planned intercompany demand.
 - This page provides an overview of all the planned demand that will be fulfilled by an internal supply chain vendor.
8. Expand the Upstream demand details section.
 - In this section, you can see the details about how the demand will be fulfilled. You may need to wait for master planning to be run in the supply company before you can see additional information here.

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Collaborate with internal supply chain customers

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This procedure shows how to view all the planned orders that will be fulfilled by an intercompany vendor. The demo data company used to create this procedure is DEMF.

1. Click Master planning.
2. In the Plan field, enter or select a value.
 - In the Plan field, select plan 10.
3. Click Run.
4. In the Number of threads field, enter a number.
 - This represents the number of parallel threads to be used for master planning.
5. Click OK.
 - This may take a while.
6. Click Planned intercompany demand.
7. Click Outbound planned intercompany demand.
 - This page provides an overview of all the planned demand that will be fulfilled by an internal supply chain vendor.
8. Expand the Upstream demand details section.
 - In this section, you can see the details about how the demand will be fulfilled. You may need to wait for master planning to be run in the supply company before you can see additional information here.

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Demand forecasting overview

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Demand forecasting is used to predict independent demand from sales orders and dependent demand at any decoupling point for customer orders. The enhanced demand forecast reduction rules provide an ideal solution for mass customization.

To generate the baseline forecast, a summary of historical transactions is passed to Microsoft Azure Machine Learning hosted on Azure. Because this service isn't shared among users, it can easily be customized to meet industry-specific requirements. You can use Supply Chain Management to visualize the forecast, adjust the forecast, and view key performance indicators (KPIs) about forecast accuracy.

NOTE

Microsoft Azure Machine Learning Studio (classic) is required for forecast generation with machine learning. As of January 2021, it is available in Japan East, South Central US, Southeast Asia, West Central US, and West Europe. For updated information about current availability, see [Azure Products by Region](#).

Key features of demand forecasting

Here are some of the main features of demand forecasting:

- Generate a statistical baseline forecast that is based on historical data.
- Use a dynamic set of forecast dimensions.
- Visualize demand trends, confidence intervals, and adjustments of the forecast.
- Authorize the adjusted forecast to be used in planning processes.
- Remove outliers.
- Create measurements of forecast accuracy.

Major themes in demand forecasting

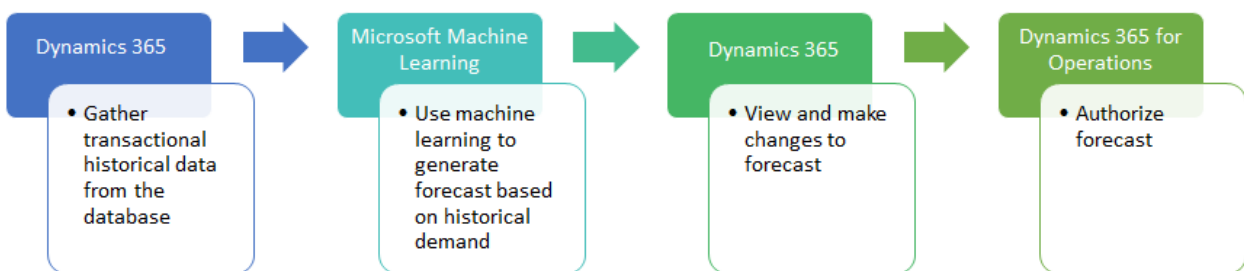
Three major themes are implemented in demand forecasting:

- **Modularity** – Demand forecasting is modular and easy to configure. You can turn the functionality on and off by changing the configuration key at **Trade > Inventory forecast > Demand forecasting**.
- **Reuse of the Microsoft stack** – Machine Learning, which is part of the Microsoft Cortana Analytics Suite, lets you quickly and easily create predictive analysis experiments, such as demand estimation experiments, by using algorithms R or Python programming languages and a simple drag-and-drop interface.
 - You can download the Demand forecasting experiments, change them to meet your business requirements, publish them as a web service on Azure, and use them to generate demand forecasts. The experiments are available for download if you've purchased a Supply Chain Management subscription for a production planner as enterprise-level user.
 - You can download any of the currently available demand prediction experiments from the [Cortana Analytics Gallery](#). Whereas the Demand forecasting experiments are automatically integrated with Supply Chain Management, customers and partners must handle the integration of experiments that they download from the [Cortana Analytics Gallery](#). Therefore, experiments from the [Cortana Analytics Gallery](#) aren't as straightforward to use as the Finance and Operations Demand forecasting experiments. You must modify the code of the experiments so that they use the Finance and Operations application programming interface (API).

- You can create your own experiments in Microsoft Azure Machine Learning Studio (classic), publish them as services on Azure, and use them to generate demand forecasts.
- If you don't require high performance, or if you don't require that a large amount of data be processed, you can use the Machine Learning free tier. We recommend that you always start from this tier, especially during implementation and testing phases. If you require higher performance and additional storage, you can use the Machine Learning standard tier. This tier requires an Azure subscription and involves additional costs. For details about Machine Learning pricing, see [Machine Learning Studio pricing](#).
- **Forecast reduction at any decoupling point** – Demand forecasting in builds on this functionality, which lets you forecast both dependent and independent demand at any decoupling point.

Basic flow in demand forecasting

The following diagram shows the basic flow in demand forecasting.



Demand forecast generation starts in Supply Chain Management. Historical transactional data from the Supply Chain Management transactional database is gathered and populates a staging table. This staging table is later fed to a Machine Learning service. By performing minimal customization, you can plug various data sources into the staging table. The data sources can include Microsoft Excel files, comma-separated value (CSV) files, and data from Microsoft Dynamics AX 2009 and Microsoft Dynamics AX 2012. Therefore, you can generate demand forecasts that consider historical data that is spread among multiple systems. However, the master data, such as item names and units of measure, must be the same across the various data sources.

If you use the Demand forecasting Machine Learning experiments, they look for a best fit among five time series forecasting methods to calculate a baseline forecast. The parameters for these forecasting methods are managed in Supply Chain Management.

The forecasts, historical data, and any changes that were made to the demand forecasts in previous iterations are then available in Supply Chain Management.

You can use Supply Chain Management to visualize and modify the baseline forecasts. Manual adjustments must be authorized before the forecasts can be used for planning.

Limitations

Demand forecasting is a tool that helps customers in the manufacturing industry create forecasting processes. It offers the core functionality of a demand forecasting solution and is designed so that it can easily be extended. Demand forecasting might not be the best fit for customers in industries such as commerce, wholesale, warehousing, transportation, or other professional services.

Demand forecast variant conversion limitation

Unit of measure (UOM) per variant conversion is not fully supported when generating demand forecast if inventory UOM is different than the demand forecast UOM.

Generating forecast (**Inventory UOM > Demand forecast UOM**) uses product UOM conversion. When loading historical data for the demand forecast generation, the product level UOM conversion will be always used when converting from inventory UOM to the demand forecast UOM, even if there are conversions defined on the variant level.

The first part of authorizing forecast (**Demand forecast UOM > Inventory UOM**) uses product UOM conversion. The second part of authorizing forecast (**Inventory UOM > Sales UOM**) uses the variant UOM conversion. When the generated demand forecast is authorized, the conversion to inventory UOM from demand forecast UOM will be done using product level UOM conversion. At the same time, conversion between the inventory unit and the sales UOM will respect the variant level defined conversions.

Note that the demand forecast UOM does not have to have any specific meaning. It can be defined as "Demand forecast unit". For each of the products, you can define the conversion to be 1:1 with the inventory UOM.

Additional resources

[Demand forecasting setup](#)

[Generate a statistical baseline forecast](#)

[Make manual adjustments to the baseline forecast](#)

[Authorize an adjusted forecast](#)

[Monitor forecast accuracy](#)

[Remove outliers from historical transaction data when calculating a demand forecast](#)

[Extend the demand forecasting functionality](#)

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Demand forecasting setup

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This topic describes the setup tasks that you must perform to prepare for demand forecasting.

The setup tasks include setting up the following data and parameters.

Item allocation key

A demand forecast is calculated for an item and its dimensions only if the item is part of an item allocation key. This rule is enforced to group large numbers of items, so that demand forecasts can be created more quickly. The item allocation key percentage is ignored when demand forecasts are generated. Forecasts are created based on historical data only.

An item and its dimensions must be part of only one item allocation key if the item allocation key is used during forecast creation.

To add a stock keeping unit (SKU) to an item allocation key, go to **Master planning > Setup > Demand forecasting > Item allocation keys**. Use the **Assign items** page to assign an item to an allocation key.

Intercompany planning groups

Demand forecasting generates cross-company forecasts. In Dynamics 365 Supply Chain Management, companies that are planned together are grouped into one intercompany planning group. To specify, per company, which item allocation keys should be considered for demand forecasting, associate an item allocation key with the intercompany planning group member by going to **Master planning > Setup > Intercompany planning groups**.

By default, if no item allocation keys are assigned to intercompany planning group members, a demand forecast is calculated for all items that are assigned to all item allocation keys from all companies. Additional filtering options for companies and item allocation keys are available on the **Generate statistical baseline forecast** page.

Review the number of items that are forecasted. Unnecessary items might cause increased costs when you use Microsoft Azure Machine Learning.

Demand forecasting parameters

To set up demand forecasting parameters, go to **Master planning > Setup > Demand forecasting parameters**. Because demand forecasting runs cross-company, the setup is global. In other words, the setup applies to all companies.

Demand forecasting generates the forecast in quantities. Therefore, the unit of measure that the quantity should be expressed in must be specified in the **Demand forecast unit** field. The unit of measure must be unique, to help guarantee that the aggregation and percentage distribution make sense. For more information about aggregation and percentage distribution, see [Make manual adjustments to the baseline forecast](#). For every unit of measure that is used for SKUs that are included in demand forecasting, make sure that there is a conversion rule for the unit of measure and the general forecasting unit of measure. When forecast generation is run, the list of items that don't have a unit of measure conversion is logged, so that you can easily correct the setup.

Demand forecasting can be used to forecast both dependent and independent demand. For example, if only the **Sales order** check box is selected, and if all the items that are considered for demand forecasting are items that

are sold, the system calculates independent demand. However, critical subcomponents can be added to item allocation keys and included in demand forecasting. In this case, if the **Production line** check box is selected, a dependent forecast is calculated.

There are two methods for creating a baseline forecast. You can use forecasting models on top of historical data, or you can just copy over the historical data to the forecast. The **Forecast generation strategy** field lets you select between these two methods. To use forecast models, select **Azure Machine Learning**.

By clicking **Forecast dimensions** in the left pane of the **Demand forecasting parameters** page, you can also select the set of forecast dimensions to use when the demand forecast is generated. A forecast dimension indicates the level of detail that the forecast is defined for. Company, site, and item allocation key are mandatory forecast dimensions, but you can also generate forecasts at the warehouse, inventory status, customer group, customer account, country/region, state, and item plus all item dimension levels.

At any point, you can add forecast dimensions to the list of dimensions that are used for demand forecasting. You can also remove forecast dimensions from the list. However, manual adjustments are lost if you add or remove a forecast dimension.

Not all items behave in the same manner from a demand forecasting perspective. Similar items can be grouped in one item allocation key, and parameters such as transaction types and forecast method settings can be set per item allocation key. Click **Item allocation keys** in the left pane of the **Demand forecasting parameters** page.

To generate the forecast, Supply Chain Management uses a Machine Learning web service. To connect to the service, you must provide the following information if you sign in to Microsoft Azure Machine Learning Studio (classic):

- Web service application programming interface (API) key
- Web service endpoint URL
- Azure storage account name
- Azure storage account key

NOTE

The Azure storage account name and key are required only if you use a custom storage account. If you deploy the on-premises version, you must have a custom storage account on Azure, so that Machine Learning can access the historical data.

To create demand predictions, you can deploy your own service by using Machine Learning Studio or the Supply Chain Management demand forecasting experiments. Instructions for deploying the demand forecasting experiments as a web service are available in Supply Chain Management. On the **Demand forecasting parameters** page, click the **Azure Machine Learning** tab.

Settings for the demand forecasting machine learning service

To view the parameters that can be configured for the demand forecasting service, go to **Master Planning > Setup > Demand forecasting > Forecasting algorithm parameters**. The **Forecasting algorithm parameters** page shows the default values for the parameters. You can overwrite these parameters on the **Demand forecasting parameters** page. Use the **General** tab to overwrite the parameters globally, or use the **Item allocation keys** tab to overwrite the parameters per item allocation key. Parameters that are overwritten for an item allocation key affect only the forecast of items that are associated with that item allocation key.

Forecast algorithm parameters

On the **Allocation keys** tab you can set the **Forecast algorithm parameters** for each item allocation key. The following options are available.

- **Confidence level percentage:** A confidence interval consists of a range of values that act as good estimates for the demand forecast. A 95% confidence level percentage indicates there is a 5% risk that the future demand falls outside the confidence interval range.
- **Force seasonality:** Specifies whether to force the model to use a certain type of seasonality. Applies to ARIMA and ETS only. Options: AUTO(default), NONE, ADDITIVE, MULTIPLICATIVE.
- **Forecasting model:** Options: ARIMA, ETS, STL, ETS+ARIMA, ETS+STL, ALL. To select best fit model, use ALL.
- **Maximum forecasted value:** Specifies the maximum value to use for predictions. Format: +1E[n] or numeric constant.
- **Minimum forecasted value:** Specifies the minimum value to use for predictions. Format: -1E[n] or numeric constant.
- **Missing value substitution:** Specifies how gaps in historical data are filled. Options: numeric value, MEAN, PREVIOUS, INTERPOLATE LINEAR, INTERPOLATE POLYNOMIAL.
- **Missing value substitution scope:** Specifies whether the value substitution applies only to the data range of each individual granularity attribute, or to the entire dataset. Options: GRANULARITY_ATTRIBUTE(default), GLOBAL.
- **Seasonality hint:** For seasonal data, provide a hint to the forecasting model to improve forecast accuracy. Format: integer number, representing the number of buckets a demand pattern repeats itself. For example, enter "6" for data that repeats itself every 6 months.
- **Test set size percentage:** Percentage of historical data to be used as a test set for forecast accuracy calculation.

Additional resources

[Demand forecasting overview](#)

[Generate a statistical baseline forecast](#)

[Make manual adjustments to the baseline forecast](#)

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Import historical data for demand forecasts

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To help guarantee the accuracy of demand forecasts, you must have as much historical demand data as you can get per item or item allocation key. If the historical demand data isn't already imported, use the **Historical external demand** (ReqDemPlanHistoricalExternalDemandEntity) data entity in Dynamics 365 Supply Chain Management to import it.

In the **Data management** workspace, you can see an overview of all the fields in the entity.

1. Open the **Data management** workspace.
2. Select the **Data entities** tile.
3. Search the entity list for **Historical external demand**.
4. Select **Target fields**. The following entity fields are mandatory: site (**DeliveringSiteId**), date (**DemandDate**), quantity (**DemandQuantity**), and either item number (**ItemNumber**) or item allocation key (**ProductAllocationKeyId**).

To use the data entity, you must have a Microsoft Excel file or comma-separated values (CSV) file that contains the historical demand data. The following example shows how to import the data from a CSV file.

For more information about how to import data, including how to clean up data after an import, see [Data import and export jobs overview](#) and its related topics.

Example

You can use the following file as an example. Download the [HistoricalDemandData](#). This file contains the historical demand data for item D0001. It contains only the following mandatory fields: site, quantity, and the demand date.

1. Select the company to import the historical demand data into.
2. Open the **Data management** workspace.
3. Select the **Import** tile.
4. Enter a name for the import project, such as **Import historical demand for item D0001**.
5. In the **Source data format** field, select the file format of the file that you're importing. To import the `HistoricalDemandData` file for this example, select **CSV**.
6. In the **Entity name** field, select **Historical external demand**.
7. Save the file to your computer, and then upload it.
8. Select **Import**.
9. The **Execution summary** page is opened automatically. Verify the imported data on the page.

After you've imported the historical demand data, you can generate a demand forecast.

Additional resources

[Generate a statistical baseline forecast](#)

[Data import and export jobs overview](#)

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Generate a statistical baseline forecast

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This topic provides information about the parameters and filters that are used in the calculation of demand forecasting.

When you create a baseline forecast, you must first specify the parameters and filters that are used in the calculation. For example, you can create a baseline forecast that estimates demand based on transaction data from the past year for a specific company, for the coming month, and for a selected group of items.

To generate a demand forecast, go to **Master planning > Forecasting > Demand forecasting > Generate statistical baseline forecast**.

The forecast bucket can be selected at forecast generation time. The available values are: Day, Week, and Month.

The number of buckets to generate a forecast for is set in the **Forecast horizon** field.

When the forecast strategy is set to **Copy over historical demand**, the end of the historical horizon is ignored. The system copies the number of buckets specified in the **Forecast horizon** field to the forecast demand, starting from the date set in the **From date** field under **Historical horizon**. By copying historical demand from a certain date forward, production planners can make the plan for the next quarter in two ways:

- By copying the demand from the same quarter last year.
- By copying the demand from the previous quarter.

To prevent confusion in the production plans, a certain number of forecast buckets can be frozen. This number is set in the **Freeze time fence** field. On the **Adjusted demand forecast** page, the cells for the frozen buckets are disabled, to give a visual indication that those values should not be changed.

The start date for the baseline demand forecast doesn't have to be the current date or a date in the future. To set a different start date, use the **Baseline forecast start date - From date** field. For example, in June, users can generate a forecast for the next year. Because the forecast buckets between the end of historical demand and the start of the baseline are missing, the predictions might not be accurate. If you are using the Demand forecasting service, there are four ways in which you can fill in the missing gaps. You can choose the method that you want by setting the `MISSING_VALUE_SUBSTITUTION` parameter on the **Demand forecasting parameters** page.

NOTE

Missing value substitution only works for the gaps in data in between the start and end dates for historical data. It will not fill in data before or after the last physical data point, it only acts as extrapolation between actual existing data points.

The **Baseline forecast start date - From date** field has to be set to the beginning of a forecast bucket, for example, in the United States, a Sunday if the forecasting bucket is the week. The system automatically adjusts the **Baseline forecast start date - From date** field to match the beginning of a forecast bucket.

The **Baseline forecast start date - From date** field can be set to a date in the past. In other words, it is possible to generate a demand forecast in the past. This is useful, because it lets users adjust the forecast service parameters so that the statistical forecast generated in the past matches the actual historical demand. Users can then continue using these parameter settings to generate a statistical baseline forecast for the future.

Manual adjustments made in previous demand forecasting iterations can be automatically applied to the new baseline forecast if the **Transfer manual adjustments to the demand forecast** check box is selected. If the check box is cleared, the manual adjustments are not added to the baseline forecast – but they are not deleted.

Manual adjustments made to a forecast can be deleted only at forecast import time, by clearing the **Save the manual adjustments made to the baseline demand forecast** check box. Manual adjustments are saved at authorization time. Therefore, if a user makes manual adjustments to the forecast, but doesn't authorize the forecast back to Supply Chain Management, the changes are lost. For more information about manual adjustments and how they work, see [Authorize an adjusted forecast](#).

A demand forecast generation can have a name and comments to help users identify the forecast that has been generated. These values are visible in forecast generation history on the **Statistical baseline forecast generation history** page.

The intercompany planning group, item allocation keys, and other filters can be applied at forecast generation time. These can be used to improve performance or to split the data into manageable chunks. However, note that a demand forecast is not generated for the members of any item allocation key that is not associated with an intercompany planning group, even if the item allocation key is selected in the query.

TIP

Sometimes users might receive errors while generating a demand forecast, or forecast generation is completed with no session log. This can happen because of leftover data in the query that was previously used for forecast generation. To resolve this issue, click **Select** to open the **Query** page, select **Reset**, and then regenerate the baseline forecast.

If the forecast is not generated for a big set of items, but, for example, for one item or one item allocation key at a time, then in order to get better performance, you can select the **Use request response mode** check box on the **Master planning - Setup - Demand forecasting - Demand forecasting parameters - Azure Machine Learning** tab.

NOTE

A potentially flat looking forecast can be due to the historical data that has to be of a longer historical timeframe (a minimum 3 of time periods in order to pick out patterns, such as 3 years with monthly forecast). To get a better result, you can try changing the granularity of the time range or increase the time range.

Additional resources

- [Demand forecasting setup](#)
- [Make manual adjustments to the baseline forecast](#)
- [Authorize an adjusted forecast](#)

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Make manual adjustments to the baseline forecast

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This topic explains how you can make manual adjustments to a baseline forecast and view details of the forecast.

Before you make manual adjustments, it's important that you understand a few concepts on various pages.

Grid on the Adjusted demand forecast page

The **Adjusted demand forecast** page includes a grid that has the following structure:

- The first column shows the items, item allocation keys, companies, and so on, that the forecast has been generated for. The subtitle of the page provides a description of the current forecast dimensions that are shown in the grid. For example, if the subtitle of the page is **Company / Site / Item allocation key**, and one of the row headers in the grid is **USMF / 1 / D_Alloc**, that row shows the forecast for the USMF company, site 1, and the **D_Alloc** item allocation key.
- Subsequent columns represent the forecast buckets that the forecast has been generated for. Each column header is the first date of the forecast bucket that the column shows.
- The values in the cells represent the forecast for one item, item allocation key, and so on, for that specific forecast bucket.

Forecast aggregation and de-aggregation

The subtitle of the page shows the level of forecast aggregation.

For example, if the subtitle of the page is **Company / Site / Allocation key / Item number / Color / Size / Configuration / Style**, there is no forecast aggregation, and the forecast is shown at the level of the item and its dimensions. To change the aggregation, use the **Change forecast dimensions** page, which you can open from the application menu.

To modify the forecast, click in any of the cells that are available, and type the adjusted forecast value. The edited cell immediately becomes bold to indicate that the forecast that it shows isn't the forecast that the demand forecasting service created, but has been manually adjusted.

If you change the aggregation to make the page show more aggregated data, you can use the **Demand forecast lines** page to see the individual forecast lines that make up the aggregated forecast.

For example, you've generated the forecast at the item level, but you know that the demand for this item will increase across all sites because of a promotion or another similar event. In this case, you can set the aggregation to **Company / Item allocation key / Item** on the **Change forecast dimensions** page. You can adjust the global forecast for the item across all sites in the **Adjusted demand forecast** grid. To see the effect of your change across all sites, open the **Demand forecast lines** page. On this page, you will see one line for the item for each site, the adjusted forecast quantity, and the original forecast quantity.

When the adjustment of the forecasted quantity is made at an aggregated level, the system uses weighted allocation to distribute the change among the lines that create the aggregation.

You can also make manual adjustments on the **Demand forecast lines** page, by modifying either the **Total quantity** value or the **Quantity** cells in the de-aggregation grid.

Viewing details of the forecast

You can open the **Demand forecast details** page to view more information about the forecast.

The **Demand forecast details** page shows the following information in graphical and tabular formats:

- The historical demand that the forecast predictions are based on.
- The current forecast that is used by Master planning.
- The new demand forecast values and the amounts they have been manually adjusted by.
- The confidence interval for the forecasted values.
- The forecast model that was used to generate the forecast. If you're viewing aggregated data, you will see the list of all the methods that were used for all the aggregated time series.
- The internal model accuracy (MAPE). For more information about forecast accuracy, see [Monitor forecast accuracy](#).

Notes:

- If you enable **Forecast model selection on Demand forecast details** from Feature management, you will be able to select the forecast models to be include, for the historical forecast, on the **Demand forecast details** page.
- The confidence interval that appears in the **Forecast** section of the page represents the difference between the confidence interval upper limit and the confidence interval lower limit. To see the values for the upper and lower limits, hover over the chart in the **Historical demand and forecast graphically** section.
- If you use the Demand forecasting Microsoft Azure Machine Learning, you can specify the confidence level percentage that the forecast that is generated should have. A confidence interval consists of a range of values that act as good estimates for the demand forecast. A 95-percent confidence level percentage indicates that there is a 5-percent risk that the demand forecast falls outside the confidence interval range.

You can also make manual adjustments to the forecast on the **Demand forecast details** page, by modifying the values in the **Forecast** row in the **Forecast** section.

Additional resources

[Monitor forecast accuracy](#)

[Generate a statistical baseline forecast](#)

NOTE

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Authorize an adjusted forecast

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Not all forecast data must be authorized immediately. This article explains how you can specify the period that a forecast is authorized for. It also explains how you can authorize the forecast for specific companies and forecast models.

Not all forecast data must be authorized immediately. You can specify the start and end dates of the period that the forecast is authorized for. This functionality lets you freeze specific buckets.

The start and end dates that you specify must correspond to the start and end dates of the bucket that the forecast is generated in. The system enforces this restriction and automatically adjusts the dates, if adjustment is required.

On the **Details** tab of the **Authorization** page, you can view details about the forecast that was most recently generated.

You can select the companies and the forecast models to authorize the forecast for use. By default, the grid includes all the companies that forecast demand has been created for. For each company, the forecast model that corresponds to the current forecast plan that is set up in the master planning parameters is prefilled. However, you can change this forecast model to any forecast model that belongs to that company. If no forecast demand data has been generated for a selected company, you receive a warning message at import time.

It's very important that you understand how the **Save the manual adjustments made to the baseline demand forecast** check box works. If you've made manual adjustments to the statistical baseline forecast, the adjusted values are authorized for use, even if this check box is cleared. However, the changes are discarded after the authorization. Therefore, the next time that a forecast is generated, that forecast is only a statistical forecast and doesn't have any manual overrides, even if **Transfer manual adjustments to the demand forecast** is selected. Therefore, you can consider the **Save the manual adjustments made to the baseline demand forecast** check box a mechanism that lets you keep or discard all manual changes.

Additional resources

[Make manual adjustments to the baseline forecast](#)

[Monitor forecast accuracy](#)

NOTE

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Monitor forecast accuracy

2/18/2021 • 2 minutes to read • [Edit Online](#)

This topic describes the types of forecast accuracy that Microsoft Dynamics 365 Supply Chain Management calculates, and explains how you can view the accuracy values.

Supply Chain Management calculates the following types of forecast accuracy:

- Historical forecast accuracy, by comparing the historical forecast that Master Planning uses with the historical demand. To view the values (both absolute values and percentage values) for historical forecast accuracy, click **Show accuracy** on the **Demand forecast details** page.
- The estimated accuracy of the forecasting model that is used to generate the predictions. You can view the accuracy percentage under **Model details - MAPE** on the **Demand forecast details** page.

NOTE

If you use the Demand forecasting Microsoft Azure Machine Learning, the calculation of internal model accuracy is based on the test data set. To specify the size of the test data set, set the **TEST_SET_SIZE_PERCENT** parameter on the **Demand forecasting parameters** page. For example, if you set the value to **20**, the last 20 percent of the historical data will be used to calculate the internal model accuracy.

Additional resources

[Authorize an adjusted forecast](#)

[Remove outliers from historical transaction data when calculating a demand forecast](#)

NOTE

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Remove outliers from historical transaction data when calculating a demand forecast

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This article describes how to exclude outliers from the historical data that is used to calculate a demand forecast. By excluding outliers, you can improve forecast accuracy.

You can exclude outliers to improve forecast accuracy. This is an optional task. Here is an overview of the process:

1. Click **Master planning** > **Setup** > **Demand forecasting** > **Outlier removal** to open the **Outlier removal** page, where you can use a query to select the transactions to exclude.
2. Select the company that the query applies to, and then enter a name and description. The **Query date** field is automatically set to the current date.
3. Select the **Active** check box to exclude the transactions that the query finds from the historical data. This setting will take effect when you create a baseline forecast.
4. On the **Outlier removal query** page, you can add, remove, and select the criteria that define which transactions will be excluded when the baseline forecast is calculated. For example, select a specific item or order transaction to exclude.
5. Click **Display transactions**. The **Outlier transactions** page lists the transactions that meet the criteria that you defined in the query, and that will be excluded from the historical data when the demand forecast is calculated.

Note: You can also create a query that is based on an existing query. Select the query to copy, and then click **Duplicate**. The **Query date** field identifies the version. You can use the query as it is, or you can click **Edit query** to modify the criteria. You can optionally modify the name and description of the new query.

Additional resources

[Demand forecasting overview](#)

[Monitor forecast accuracy](#)

NOTE

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Forecast reduction keys

2/18/2021 • 8 minutes to read • [Edit Online](#)

This topic provides information about the different methods that are used to reduce forecast requirements. It includes examples of the results of each method. It also explains how to create, set up, and use a forecast reduction key. Some methods use a forecast reduction key to reduce forecast requirements.

Methods that are used to reduce forecast requirements

When you include a forecast in a master plan, you can select how the forecast requirements are reduced when actual demand is included. Note that master planning excludes forecast requirements from the past, which means all forecast requirements before today's date.

To include a forecast in a master plan and select the method that is used to reduce forecast requirements, go to **Master planning > Setup > Plans > Master plans**. In the **Forecast model** field, select a forecast model. In the **Method used to reduce forecast requirements** field, select a method. The following options are available:

- None
- Percent – reduction key
- Transactions – reduction key
- Transactions – dynamic period

The following sections provide more information about each option.

None

If you select **None**, the forecast requirements aren't reduced during master scheduling. In this case, master planning creates planned orders to supply the forecasted demand (forecast requirements). These planned orders maintain the suggested quantity, regardless of other types of demand. For example, if sales orders are placed, master planning creates additional planned orders to supply the sales orders. The quantity of the forecast requirements isn't reduced.

Percent – reduction key

If you select **Percent - reduction key**, the forecast requirements are reduced according to the percentages and periods that are defined by the reduction key. In this case, master planning creates planned orders where the quantity is calculated as forecasted quantity \times reduction key in each period. If there are other types of demand, master planning also creates planned orders to supply that demand.

Example: Percent – reduction key

This example shows how a reduction key reduces demand forecast requirements according to the percentages and periods that are defined by the reduction key.

For this example, you include the following demand forecast in a master plan.

MONTH	DEMAND FORECAST
January	1,000
February	1,000
March	1,000

MONTH	DEMAND FORECAST
April	1,000

On the **Reduction keys** page, you set up the following lines.

CHANGE	UNIT	PERCENT
1	Month	100
2	Month	75
3	Month	50
4	Month	25

You assign the reduction key to the item's coverage group. Then, on the **Master plans** page, in the **Method used to reduce forecast requirements** field, you select **Percent - reduction key**.

In this case, if you run forecast scheduling on January 1, the demand forecast requirements are consumed according to the percentages that you set up on the **Reduction keys** page. The following requirement quantities are transferred to the master plan.

MONTH	PLANNED ORDER QUANTITY	CALCULATION
January	0	= 0% × 1,000
February	250	= 25% × 1,000
March	500	= 50% × 1,000
April	750	= 75% × 1,000
May through December	1,000	= 100% × 1,000

Transactions – reduction key

If you select **Transactions - reduction key**, the forecast requirements are reduced by the transactions that occur during the periods that are defined by the reduction key.

Example: Transactions – reduction key

This example shows how actual orders that occur during the periods that are defined by the reduction key reduce demand forecast requirements.

For this example, you select **Transactions - reduction key** in the **Method used to reduce forecast requirements** field on the **Master plans** page.

The following sales orders exist on January 1.

MONTH	NUMBER OF PIECES ORDERED
January	956
February	1,176

MONTH	NUMBER OF PIECES ORDERED
March	451
April	119

If you use the same demand forecast of 1,000 pieces per month that was used in the previous example, the following requirement quantities are transferred to the master plan.

MONTH	NUMBER OF PIECES REQUIRED
January	44
February	0
March	549
April	881
May through December	1,000

Transactions – dynamic period

If you select **Transactions - dynamic period**, the forecast requirements are reduced by the actual order transactions that occur during the dynamic period. The dynamic period covers the current forecast dates and ends at the start of the next forecast. In this case, master planning creates planned orders to supply the forecasted demand (forecast requirements). However, when actual order transactions are placed, the forecast requirements are reduced. The actual transactions consume part of the forecasted requirements.

When this option is used, the following behavior occurs:

- Reduction keys aren't required or used.
- If the forecast is completely reduced, the forecast requirements for the current forecast become 0 (zero).
- If there is no future forecast, forecast requirements from the last forecast that was entered are reduced.
- Time fences are included in the forecast reduction calculation.
- Positive days are included in the forecast reduction calculation.
- If actual order transactions exceed the forecasted requirements, the remaining transactions aren't forwarded to the next forecast period.

Example 1: Transactions – dynamic period

Here a simple example that shows how the **Transactions - dynamic period** method works.

For this example, you include the following demand forecast in a master plan.

DATE	DEMAND FORECAST
January 1	1,000
February 1	1,000

You also create the following sales orders.

DATE	SALES ORDER QUANTITY
January 15	200
February 15	400

In this case, the following planned orders are created.

DEMAND FORECAST DATE	QUANTITY	EXPLANATION
January 1	800	Forecast requirements (= 1,000 – 200)
January 15	200	Sales orders requirements
February 1	600	Forecast requirements (= 1,000 – 400)
February 15	400	Sales orders requirements

Example 2: Transactions – dynamic period

In most cases, systems are set up so that transactions reduce demand forecast in specific forecast periods: weeks, months, and so on. These periods are defined in the reduction key. However, the time between two demand forecast lines can also *imply* a period.

For this example, you create a demand forecast for the following dates and quantities.

DATE	DEMAND FORECAST
January 1	1,000
January 5	500
January 12	1,000

Notice that, in this forecast, there isn't a clear period between the forecast dates. Between the first and second dates there is a four-day span, and between the second and third dates there is a seven-day span. These spans are the dynamic periods.

You also create the following sales order lines.

DATE	SALES ORDER QUANTITY
December 15 in the previous year	500
January 3	100
January 10	200

In this case, the forecast is reduced in the following manner:

- Because the first sales order isn't in any period, it doesn't reduce any forecast.
- Because the second sales order is between January 1 and January 5, it reduces the forecast for January 1 by 100.
- Because the third sales order is between January 5 and January 12, it reduces the forecast for January 5 by 200.

Therefore, the following planned orders are created.

DEMAND FORECAST DATE	QUANTITY	EXPLANATION
December 15 in the previous year	500	Sales order requirements
January 1	900	Forecast requirements period January 1 to January 5 (= 1,000 – 100)
January 3	100	Sales order requirements
January 5	300	Forecast requirements period January 5 to January 10 (= 500 – 200)
January 12	1,000	Forecast requirements period January 12 to end

Create and set up a forecast reduction key

A forecast reduction key is used in the **Transactions - reduction key** and **Percent- reduction key** methods for reducing forecast requirements. Follow these steps to create and set up a reduction key.

1. Go to **Master planning > Setup > Coverage > Reduction keys**.
2. Select **New** to create a reduction key.
3. In the **Reduction key** field, enter a unique identifier for the forecast reduction key. Then, in the **Name** field, enter a name.
4. Define the periods and the reduction key percentage in each period:
 - The **Effective date** field indicates the date when creation of the periods starts. When the **Use the effective date** option is set to **Yes**, the periods start on the effective date. When it's set to **No**, the periods start on the date when master planning is run.
 - Define the periods that the forecast reduction should occur during.
 - For a specific period, specify the percentages that the forecast requirements should be reduced by. You can enter positive values to decrease requirements or negative values to increase requirements.

Use a reduction key

A forecast reduction key must be assigned to the coverage group of the item. Follow these steps to assign a reduction key to an item's coverage group.

1. Go to **Master planning > Setup > Coverage > Coverage groups**.
2. On the **Other** FastTab, in the **Reduction key** field, select the reduction key to assign to the coverage group. The reduction key then applies to all items that belong to the coverage group.
3. To use a reduction key to calculate forecast reduction during master scheduling, you must define this setting in the setup of the forecast plan or the master plan. Go to one of the following locations:
 - Master planning > Setup > Plans > Forecast plans
 - Master planning > Setup > Plans > Master plans
4. On the **Forecast plans** or **Master plans** page, on the **General** FastTab, in the **Method used to reduce forecast requirements** field, select either **Percent - reduction key** or **Transactions - reduction key**.

Reduce a forecast by transactions

When you select **Transactions - reduction key** or **Transactions - dynamic period** as the method for reducing forecast requirements, you can specify which transactions reduce the forecast. On the **Coverage groups** page, on the **Other** FastTab, in the **Reduce forecast by** field, select **All transactions** if all transactions should reduce the forecast or **Orders** if only sales orders should reduce the forecast.

Additional resources

[Master plans overview](#)

NOTE

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Create a baseline forecast

2/18/2021 • 2 minutes to read • [Edit Online](#)

A production planner can create a baseline forecast either by using time series forecast models or by copying the historical demand. This procedure shows how to copy the historical demand to create a baseline forecast for all products using one item allocation key.

Set up an item allocation key

1. Go to Master planning > Setup > Intercompany planning groups.
2. Use the Quick Filter to find records. For example, filter on the Name field with a value of '10'.
 - Demand forecasting runs across legal entities. That's why you need to set up all the companies for which you want to generate forecasts in one intercompany planning group.
3. In the list, find and select the desired record.
4. Click Item allocation keys.
 - Select all the item allocation keys for which you want to create forecasts.
5. In the list, mark the selected row.
 - Select D_Aloc item allocation key.
6. Click >.
7. Close the page.
8. Close the page.

Set up the demand forecasting parameters

1. Go to Master planning > Setup > Demand forecasting > Demand forecasting parameters.
2. Expand the Forecast algorithm parameters section.
3. In the Forecast generation strategy field, select 'Copy over historical demand'.
4. Click Save.

Create a baseline forecast

1. Go to Master planning > Forecasting > Demand forecasting > Generate statistical baseline forecast.
2. In the From date field, enter a date.
 - If you have sales orders starting from January 1, 2015, enter this date. If you don't, enter the earliest date of your sales orders.
3. In the To date field, enter a date.
 - Enter the last date of your sales orders, for example '2015-03-31'.
4. In the From date field, enter a date.
 - Enter '2015-04-01'. This date will be automatically calculated as the start date of the next forecasting bucket.
5. Expand the Records to include section.
6. Click Filter.
7. In the list, mark the selected row.
 - Mark the row where Field = Intercompany planning group.
8. In the Criteria field, type a value.
 - Type the intercompany planning group, for example, 10, that you used in the first task.

9. In the list, find and select the desired record.
 - Select the row where Field = Item allocation key.
10. In the Criteria field, type a value.
11. Click OK.
12. Expand the Advanced parameters section.
13. In the Forecast bucket field, select 'Month'.
14. In the Forecast horizon field, enter '3'.
15. In the Freeze time fence field, enter '1'.
16. Click OK.

Visualize the demand forecast

1. Go to Master planning > Forecasting > Demand forecasting > Adjusted demand forecast.
2. In the aggregated view table, select the cell in row 1, column 2. This is the second month for which you have created forecast.
3. Set QtyCell to '400'.
 - In the cell, enter a different number than the one that was forecasted, for example, 400.
4. You have made a manual adjustment to the forecast. Notice the graphical indication in the next step.
5. Click Forecast line details.
 - In this page, you can see the accuracy values, historical demand, and forecast. You can make changes to the forecast as well.

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Modify a demand forecast manually

2/18/2021 • 2 minutes to read • [Edit Online](#)

This procedure shows how to modify the forecast for an item. The demo data company used to create this procedure is USMF. This recording is intended for the production planner.

Modify the forecast for an item

1. In the **Navigation pane**, go to **Modules > Product information management > Products > Released products**.
2. In the list, find and select the desired record. Select the item for which you want to modify the forecast. For example, you can select item D0001.
3. On the **Action Pane**, click **Plan**.
4. Click **Demand forecast**.
5. In the list, mark the selected row. If there are no forecast lines, create a new line by clicking **New** on the app bar.
6. In the **Sales quantity** field, enter a number. This number represents the forecasted quantity for the item.
7. Click **Save**.

Modify the forecast in Excel

1. Click **Open** in Microsoft Office.
2. Click **Edit Demand forecast** in Excel. In Excel, you can add, delete and edit demand forecast lines. If you are not able to see the data in Excel, you need to sign in with the "Keep me signed in" option enabled and you need to trust the data connection app.

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Troubleshoot master planning

2/18/2021 • 3 minutes to read • [Edit Online](#)

This topic describes how to fix issues that you might encounter while you work with master planning.

Bill of materials explosion behaves differently for firmed production orders and for estimated production orders for manually created work.

Issue description

When a production order is firmed, the items aren't exploded when you explode the bill of materials (BOM). However, when you manually create a work order and then estimate the production order, the items are exploded.

Issue resolution

The system is working as expected. The explosion that occurs when the production order is firmed will point to the planned order, but it doesn't appear that the planned order is currently firmed in this case. However, if the production order has been estimated, the explosion is triggered from the released production order where no planned order exists.

The Delay value isn't updated when I reschedule a planned order.

To update the delay for planned orders, open the **Rescheduling** dialog box for the planned order. On the **Explosion** FastTab, make sure that the **Perform explosion after rescheduling** option is set to *Yes*.

Production scheduling doesn't consider the safety margins that are set on the item coverage for pegged supply.

Issue description

Master planning considers the safety margins. However, the safety margins are ignored when planned production orders are scheduled.

Issue resolution

Margins are considered only during master planning, not during manual scheduling. Margins are designed to act as a buffer during the planning phase, to give some "margin" for the actual process.

To get the desired result, you can remove the margin. The route must then be updated so that it includes the desired time (for example, as queue time). Both master planning and manual scheduling should then produce the same result.

Planned orders are generated even though we have items in stock and production orders already exist for them.

You might be able to fix this issue by increasing the **Positive days** value for the relevant groups on the **Coverage group** page. This change will cause the system to determine whether on-hand inventory can be used for the demand. Then a new planned order won't be generated for the items that are in stock.

Master planning doesn't seem to respect capacity limitations and is

scheduling more than the available capacity.

Issue description

When you use operation scheduling where there is finite capacity, and where the route specifies a mix of requirements for both a resource group and individual resources, there is a small chance of overbooking because of the way that the algorithm validates for capacity conflicts. This overbooking can occur when you use helpers to run master planning. It's most likely to occur if there are many jobs that have a relatively short runtime.

Issue resolution

If it's essential that no overbooking occur for operation scheduling, you can make the scheduling part of master planning single-threaded by turning on the **Accurate finite capacity for Operation Scheduling** option on the **Master planning parameters** page. This option isn't available by default. You must manually add it to the page by using personalization features. When you use this option, scheduling will run more slowly because of the lack of parallel processing.

Planned orders take a long time to update.

Issue description

When updating the requirement quantity and/or delivery date on a planned order, it typically takes at least 30 seconds per order to save the update.

Issue resolution

This is a known issue with the built-in master planning engine. It is caused by the underlying auto explosion through the BOM structure during edits. This issue is addressed in Planning Optimization, where a planner can update and approve the relevant orders and, when desired, trigger a planning run to update planned orders for the underlying BOM structure.

One way to improve performance with the built-in master planning engine is to do the following:

1. Go to **Master planning > Setup > Plans > Master plans**.
2. Select a plan.
3. Expand the **Time fence in days** FastTab.
4. Set **Explosion** to *Yes*, and set the field below this setting to 0 (zero).

NOTE

This will limit the period for explosions performed for this master plan to a single day.

NOTE

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Mobile app home page

2/18/2021 • 3 minutes to read • [Edit Online](#)

This topic describes the **Finance and Operations (Dynamics 365)** mobile app and provides links to resources that can help you implement it in your organization.

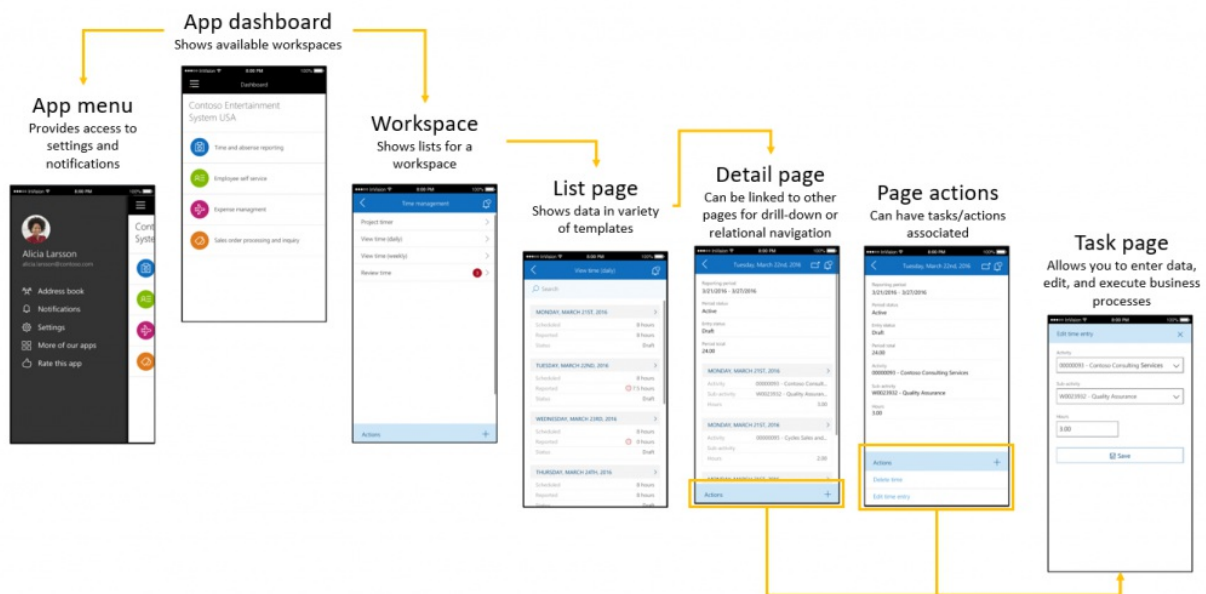
Overview

The mobile app enables your organization to make its business processes available on mobile devices. After your IT admin enables the mobile workspaces for your organization, users can sign in to the app and immediately begin to run business processes from their mobile devices. The mobile app includes the following features that can help increase productivity:

- Users can view, edit, and act on business data, even if they have intermittent network connectivity or their mobile devices are completely offline. When a device reestablishes a network connection, offline data operations are automatically synchronized.
- IT admins or developers can build and publish mobile workspaces that have been tailored to their organization. The app uses your existing code assets. Therefore, you don't have to re-implement your validation procedures, business logic, or security configuration.
- IT admins or developers can easily design mobile workspaces by using the point-and-click workspace designer that is included with the web client.
- IT admins or developers can optionally optimize the offline capabilities of workspaces by using the Business logic extensibility framework. Because data continues to be processed while a device is offline, your mobile scenarios remain rich and fluid, even if devices don't have constant network connectivity.

Elements of the mobile app

Navigation in the mobile app consists of four basic concepts: the dashboard, workspaces, pages, and actions.

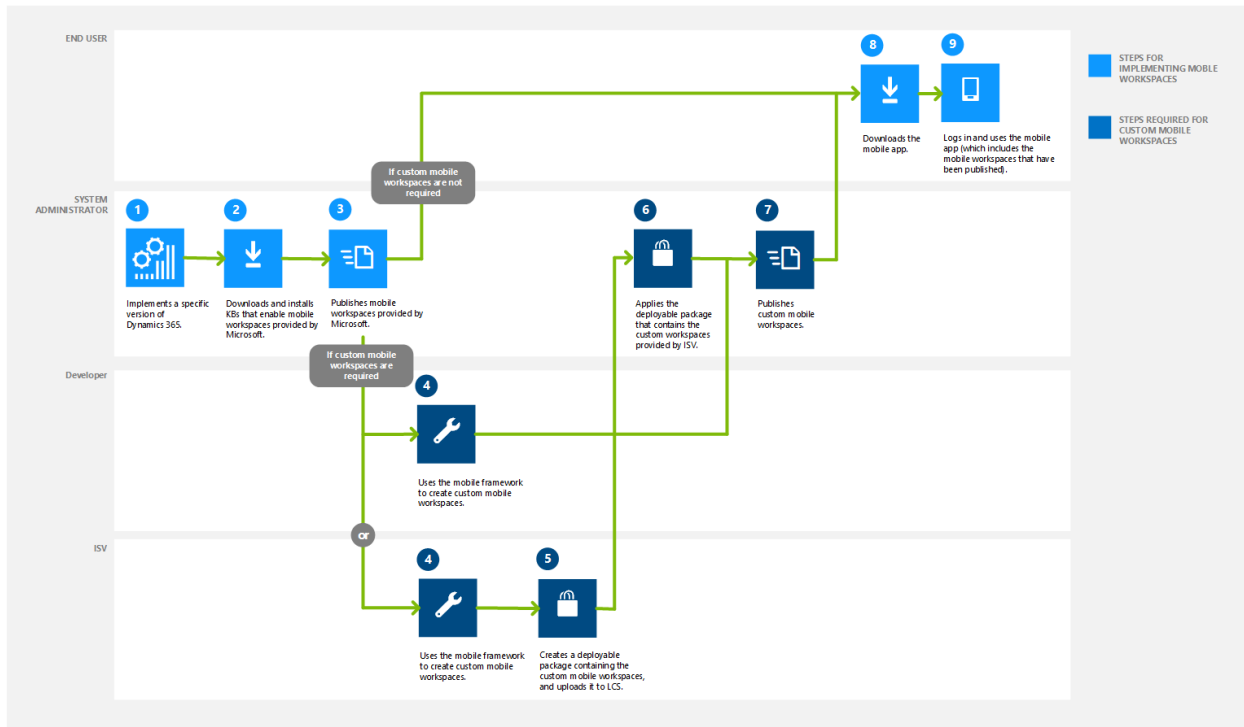


1. When you start the app, you go to the **dashboard**.
2. On the dashboard, you can see a list of **workspaces** that have been published.

3. In each workspace, you can see a list of **pages** that are available for that workspace.
4. After you're on a page, you can perform several actions. Here are some examples:
 - View detailed data.
 - Navigate to other pages for related data, such as entity details or lines.
 - See a list of actions that are available for that page. Actions let you create or edit existing data.

Implementation process

The following illustration shows the process for implementing both mobile workspaces that are provided by Microsoft and custom mobile workspaces.



The following table includes links to resources that can help you implement both mobile workspaces that are provided by Microsoft and custom mobile workspaces. The numbers in the first column correspond to the numbered steps in the previous illustration.

STEP	ROLE	ACTION	RESOURCES TO HELP YOU COMPLETE THE ACTION
1	System administrator	Implement the Finance and Operations app in your organization.	<ul style="list-style-type: none"> • If you haven't yet deployed a version of Microsoft Dynamics 365, see Deploy a demo environment. • To see a list of mobile workspaces that can be used, see Mobile workspaces recently released.

STEP	ROLE	ACTION	RESOURCES TO HELP YOU COMPLETE THE ACTION
2	System administrator	If you're using Microsoft Dynamics 365 for Operations version 1611: Download and install KBs that enable the mobile workspaces that are provided by Microsoft.	See the following topics for more information: <ul style="list-style-type: none"> • Cost controlling mobile workspace • Inventory on-hand mobile workspace • Sales orders mobile workspaces • Vendor collaboration mobile workspace • Project time entry mobile workspace • Expense management mobile workspace
3	System administrator	Publish the mobile workspaces that are provided by Microsoft.	Publish a mobile workspace
4	Developer or independent software vendor (ISV)	Use the mobile platform to create custom mobile workspaces.	Mobile platform
5	ISV	Create a deployable package that contains custom mobile workspaces, and upload the package to Microsoft Dynamics Lifecycle Services (LCS).	Create a deployable package
6	System administrator	Apply the deployable package that contains the custom workspaces that are provided by the independent software vendor (ISV).	Apply a deployable package
7	System administrator	Publish the custom mobile workspaces that are provided by the ISV.	Publish a mobile workspace
8	User	Download and install the mobile app.	Finance and Operations app for Android Finance and Operations app for iOS (Windows Phone unsupported)
9	User	Sign in, and use the mobile app. The app includes the mobile workspaces that have been published by the system administrator.	To see a list of mobile workspaces that are provided by Microsoft, see Mobile workspaces recently released .

Troubleshooting

[Mobile platform resources](#)

NOTE

Can you tell us about your documentation language preferences? [Take a short survey](#).

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Available mobile workspaces

2/18/2021 • 2 minutes to read • [Edit Online](#)

This topic lists the mobile workspaces that are available for use with the Dynamics 365 for Unified Operations mobile app.

MOBILE WORKSPACE	DESCRIPTION	AVAILABILITY
Company directory	Allows you to view and contact other employees in your organization.	June 2017
My team	You can view your direct reports and extended staff, as well as send praise for individuals in your reporting chain.	June 2017
Invoice approval	Provides a listing of invoices that have been assigned to you through the vendor invoice header workflow process.	June 2017
Expense management	You can capture and upload a receipt, so that you can attach it to an expense report later. The mobile workspace also lets you quickly create an expense line by using an attached receipt.	April 2017
Purchase order approval	View and respond to purchase orders with actions such as approve or reject.	April 2017
Project time entry	You can enter and save time against a project by using your mobile device.	March 2017
Cost controlling	Cost center managers can see the performance of the cost center.	January 2017
Inventory on-hand	Gain insights into reserved and available inventory.	January 2017
Sales orders	You can stay up to date on your sales orders.	January 2017
Vendor collaboration	Vendors can stay up to date on the purchase orders that have been sent to them for approval. They can also view information about new and updated purchase orders and contacts.	January 2017

MOBILE WORKSPACE	DESCRIPTION	AVAILABILITY
Asset management	This workspace lets users view and create maintenance requests and work orders. Users can also view the assigned work order jobs in a calendar or list view. Assets and functional locations can also be viewed and searched for.	October 2019

NOTE

Can you tell us about your documentation language preferences? [Take a short survey.](#)

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Use the Asset management mobile workspace

2/18/2021 • 6 minutes to read • [Edit Online](#)

This topic provides information about the **Asset management** mobile workspace. This workspace lets users view and create maintenance requests and work orders. Users can also view the assigned work order jobs in a calendar or list view. Assets and functional locations can also be viewed and searched for.

Overview

Asset Management is an advanced module for managing assets and work order jobs in Dynamics 365 Supply Chain Management. The **Asset management** mobile workspace lets users quickly view assigned work order jobs on the mobile device of their choice. Users can also create and manage maintenance requests, update lifecycle state, and view asset and functional location details by using their mobile device.

Specifically, the **Asset management** mobile workspace lets users perform these tasks:

- Create, view, and edit maintenance requests, take a photo or attach an existing image to the maintenance request, change the maintenance request lifecycle state.
- Create, view, and edit work orders, take a photo or attach an existing image to the work order, change the work order lifecycle state, view work order jobs.
- View assigned work order jobs in a calendar view.
- Create, view, and edit work order job, update asset counters, view maintenance checklist, view and edit work order job notes, view the tools required for the work order job.
- View or search for a specific asset or functional location.

Prerequisites

Before you can use the **Asset management** mobile workspace, your admin must set up the required user and worker accounts, and publish the workspace. For more information, see [Set up the Asset management mobile workspace](#).

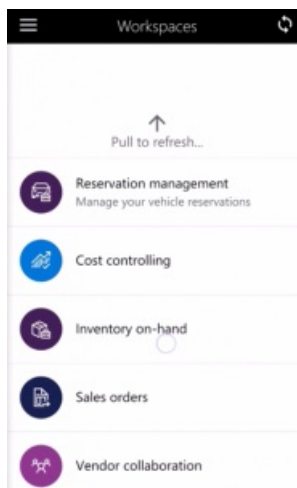
Download and install the mobile app

Download and install the Dynamics 365 for Unified Operations mobile app:

- [For Android phones](#)
- [For iPhones](#)

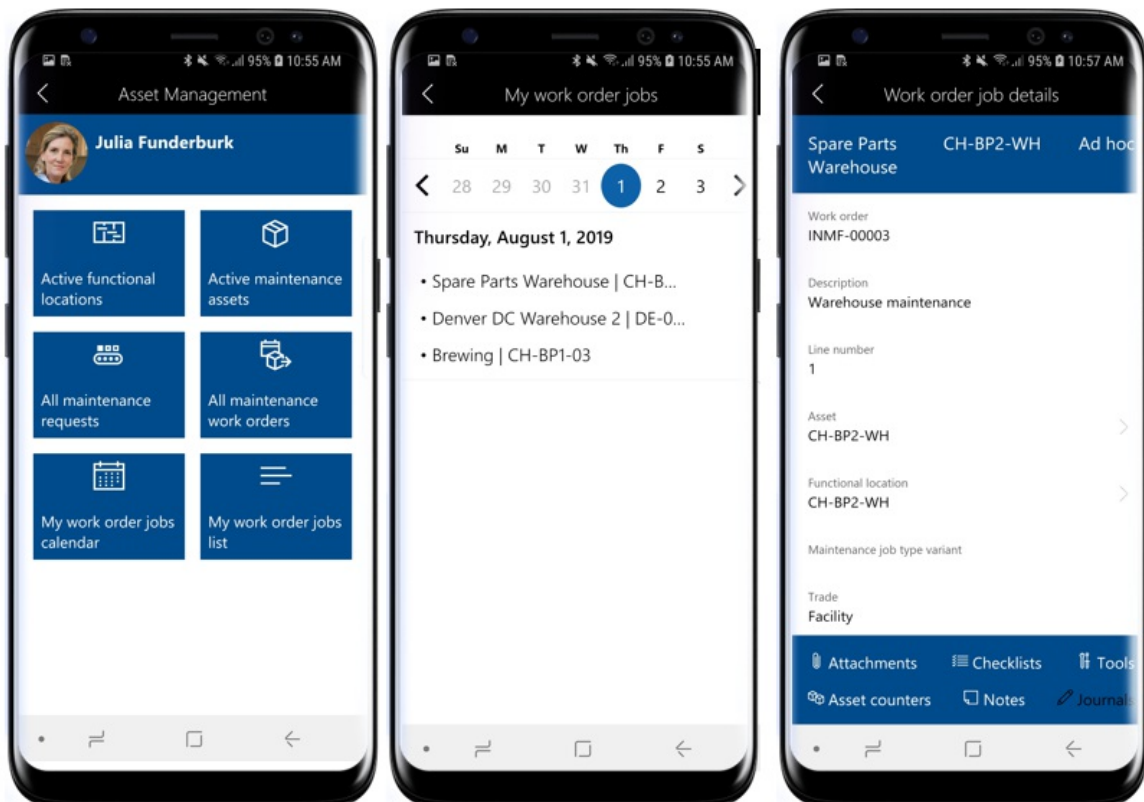
Sign in to the mobile app

1. Start the app on your mobile device.
2. Enter your Dynamics 365 URL.
3. The first time that you sign in, you're prompted for your user name and password. Enter your credentials.
4. After you sign in, the available workspaces for your company are shown. Note that if your system administrator publishes a new workspace later, you'll have to refresh the list of mobile workspaces.



View assigned work order jobs in calendar view

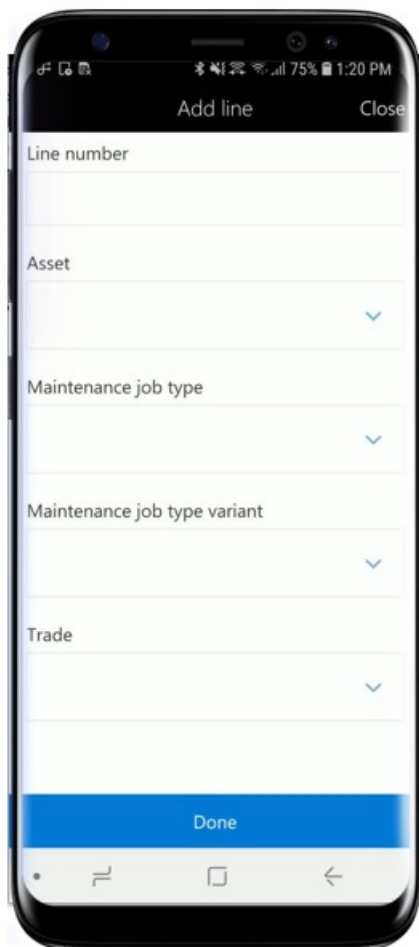
1. On your mobile device, open the **Asset management** workspace.
2. Select **My work order jobs calendar**.
3. Select the date you want to view work order jobs for. In the list, you'll see the asset ID and functional location ID for each work order job.
4. Select a work order job in the list to see job details: Asset and functional location details as well as other navigation links to view **Attachments**, **Checklists**, **Tools**, **Asset counters**, **Notes**, **Journals**.



Create a work order job

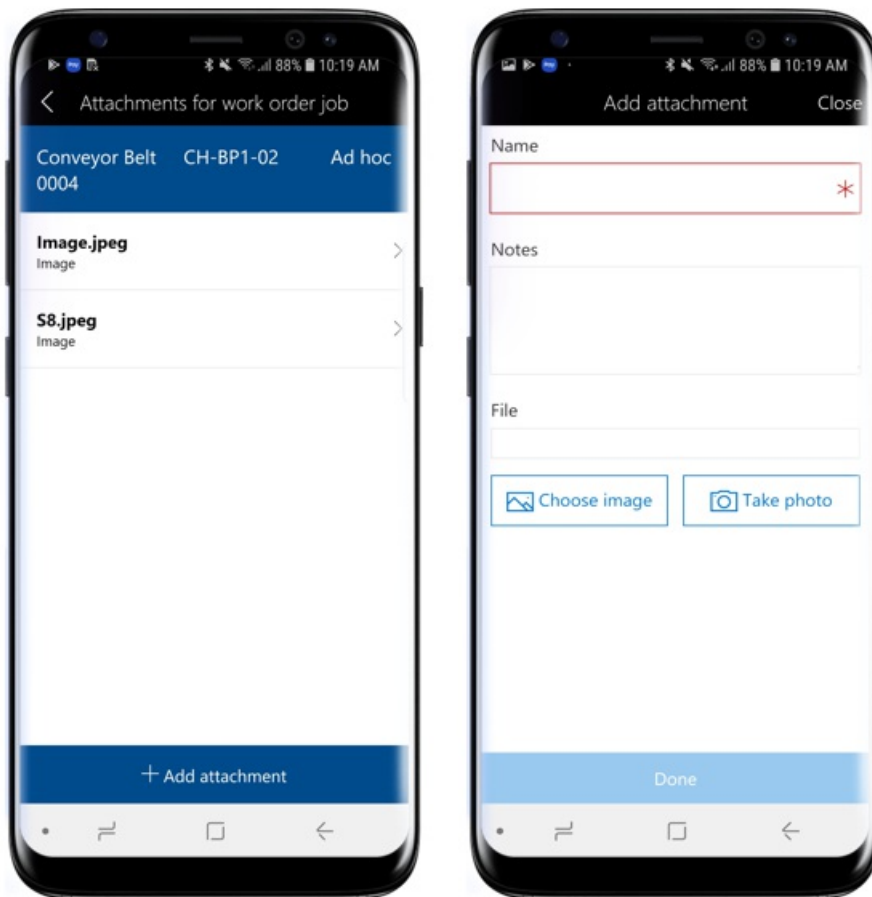
1. On your mobile device, open the **Asset management** workspace.
2. Select **All maintenance work orders**.
3. Select the work order you want to create a new work order job for.

4. Select the **Add line** button.
5. Select the **Asset** you want to create a work order job for.
6. Select **Maintenance job type**, **Maintenance job type variant** and **Trade**.
7. Select **Done**.



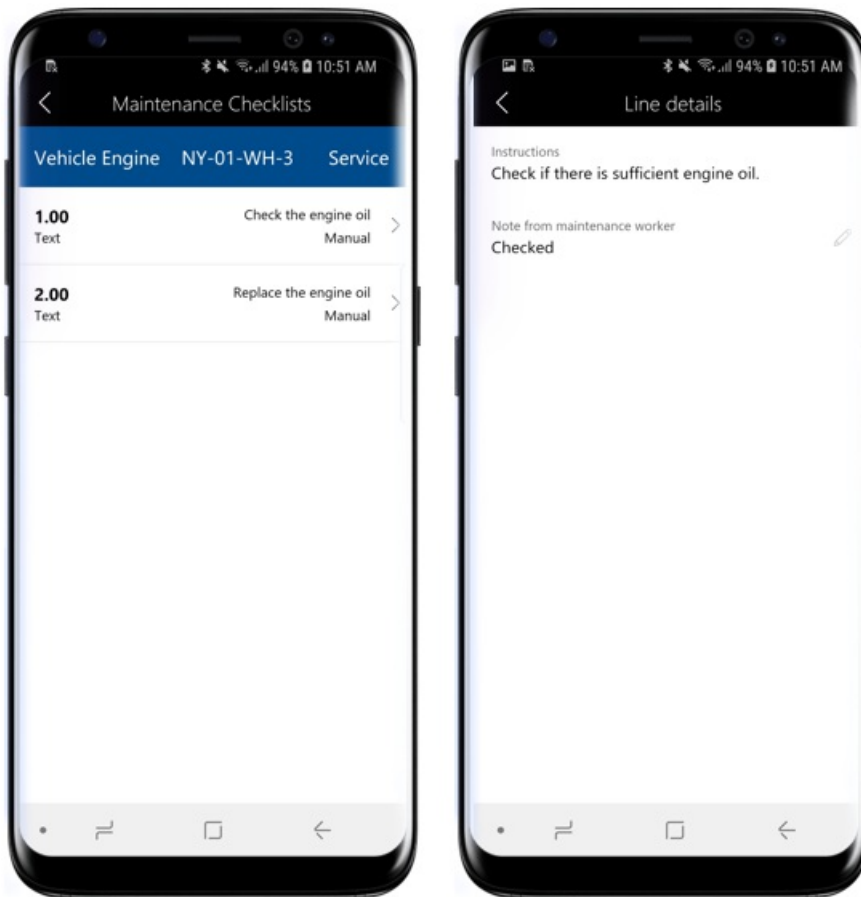
Add attachment to a work order job

1. On your mobile device, open the **Asset management** workspace.
2. Select **All maintenance work orders**.
3. Select the work order > work order job you want to add an attachment to.
 - Alternatively, you can also select **My work order jobs calendar** or **My work order jobs list** on the home page to navigate to the **Work order job details** page.
4. Select **Attachments** on the **Work order job details** page.
5. You'll see existing attachments on the work order job. Select **Add attachment**.
6. Enter **Name** and **Notes** for the attachment.
7. Select **Choose image** to select a photo from the mobile gallery, or **Take photo** to take a photo.
8. Select **Done**.



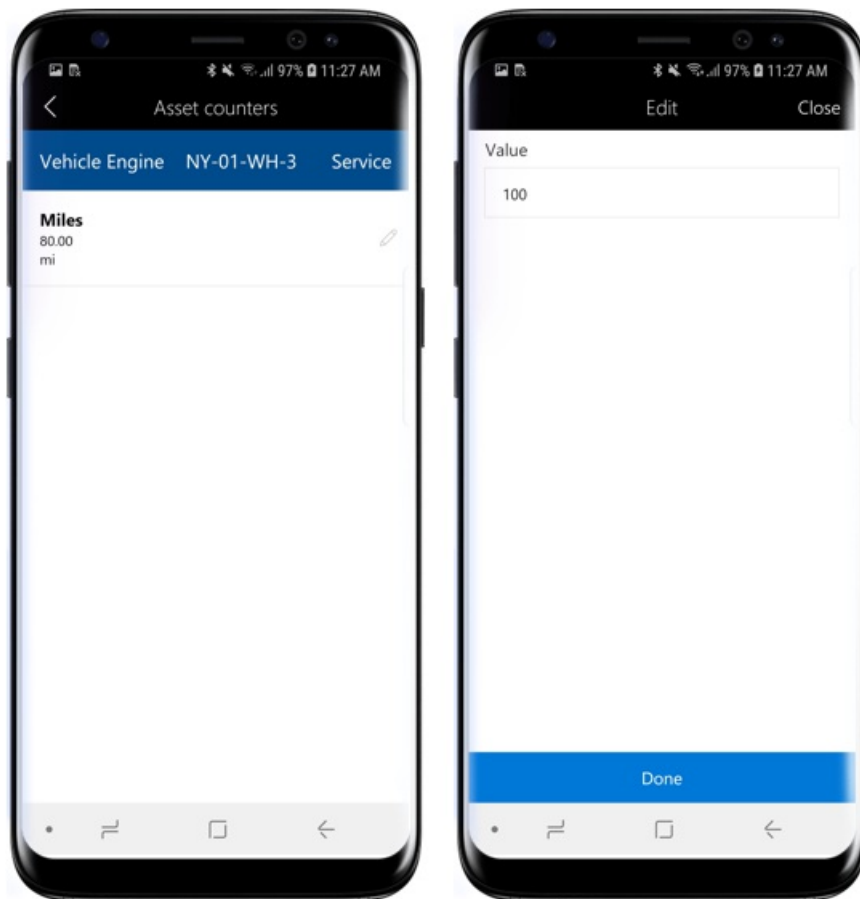
View maintenance checklist on a work order job

1. On your mobile device, open the **Asset management** workspace.
2. Select **All maintenance work orders**.
3. Select the work order > work order job you want to view checklists for.
 - Alternatively, you can also select **My work order jobs calendar** or **My work order jobs list** on the home page to navigate to the **work order job details** page.
4. Select **Checklists** on the **Work order job details** page.
5. You'll see a list of checklist lines related to the work order job. Select a checklist line to view **Instructions** and add **Notes**.
6. Select the back button (<) to return to the previous page.



View and update asset counters on a work order job

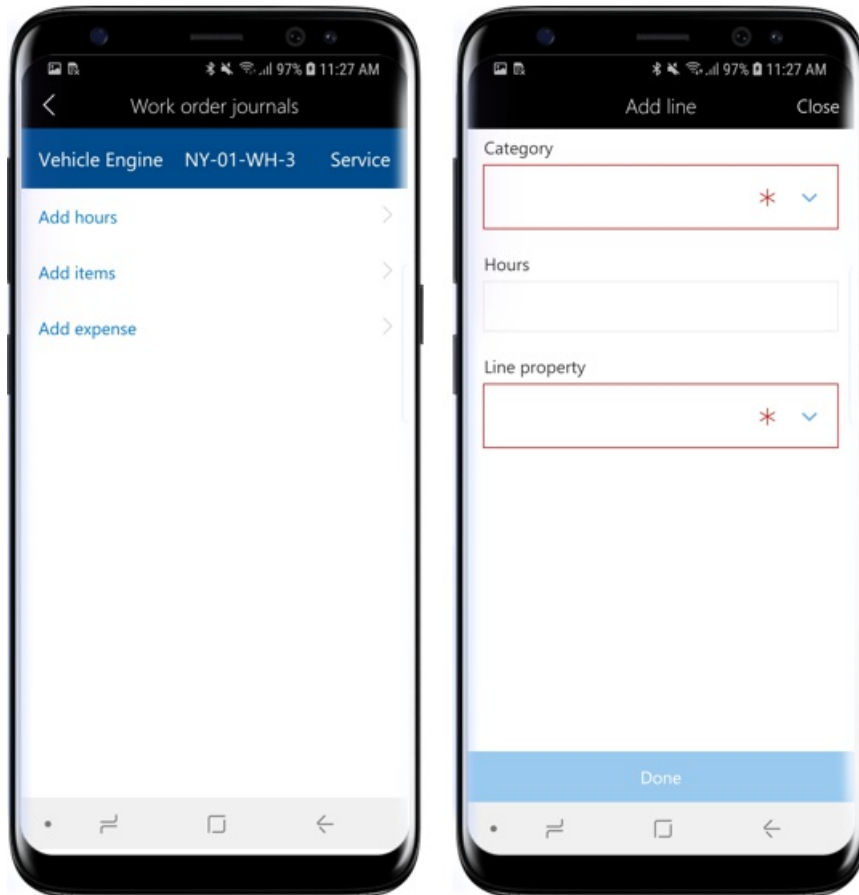
1. On your mobile device, open the **Asset management** workspace.
2. Select **All maintenance work orders**.
3. Select the work order > work order job you want to view asset counters for.
 - Alternatively, you can also select **My work order jobs calendar** or **My work order jobs list** on the home page to navigate to the **work order job details** page.
4. Select **Asset counters** on the **Work order job details** page.
5. You see a list of asset counters related to the work order job. Select the pencil icon on an asset counter line to update the counter value.
6. Enter a new counter value, and select **Done**.



Register consumption on a work order job

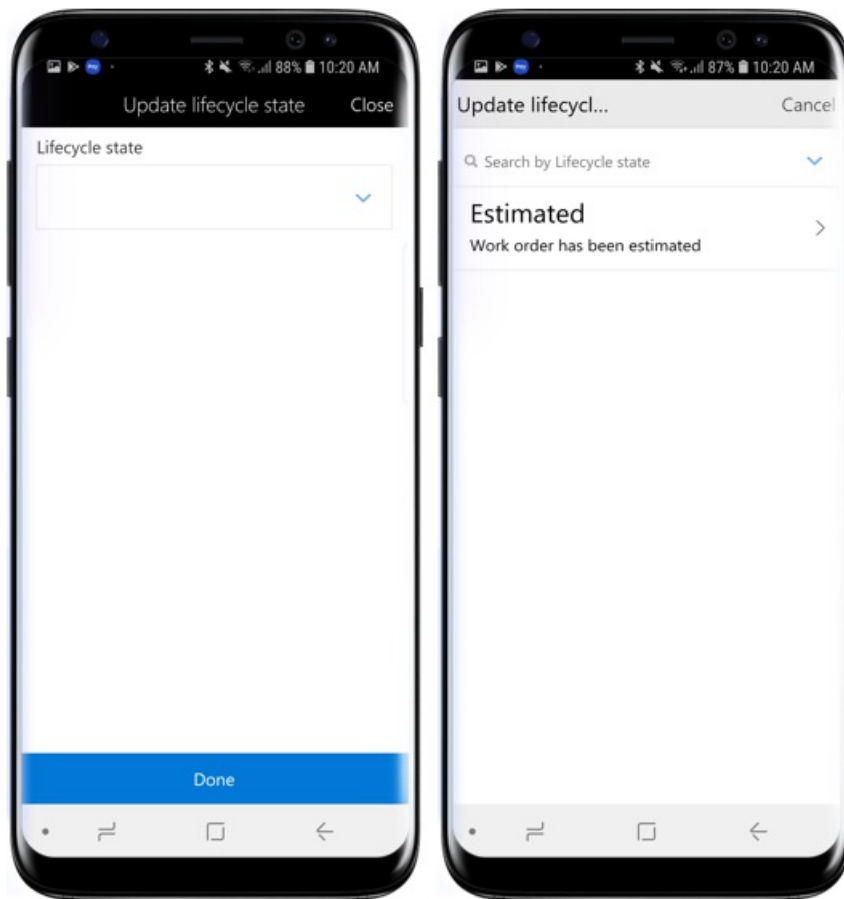
1. On your mobile device, open the **Asset management** workspace.
2. Select **All maintenance work orders**.
3. Select the work order > work order job you want to add consumption registrations for.
 - Alternatively, you can also select **My work order jobs calendar** or **My work order jobs list** on the home page to navigate to the **work order job details** page.
4. Select **Journals** on the **Work order job details** page.
5. Select **Add hours** to create work hour registrations.
 - a. Select the **Category** from the lookup.
 - b. In the **Hours** field, enter the number of work hours spent on the work order job.
 - c. Select the appropriate **Line property**.
 - d. Select **Done**.
6. Select **Add items** to create item registrations.
 - a. Select the **Item number** from the lookup.
 - b. Select the **Site** from the lookup.
 - c. Enter the **Quantity** of items consumed.
 - d. Select **Done**.
7. Select **Add expense** to create expense registrations.
 - a. Select the **Category** from the lookup.
 - b. Enter the quantity for the expense registration.
 - c. Select the **Sales currency** from the lookup.
 - d. Enter the **Cost price** for the expense registration.

e. Select Done.



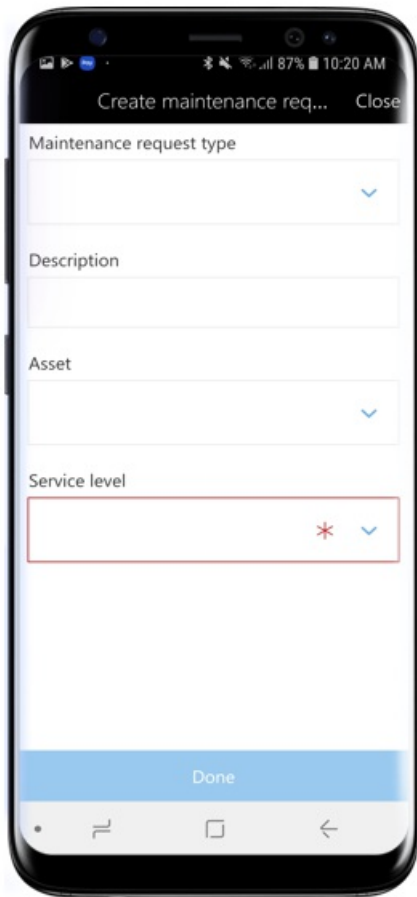
Update lifecycle state on a work order

1. On your mobile device, open the **Asset management** workspace.
2. Select **All maintenance work orders**.
3. Select the work order you want to update lifecycle state for.
4. Select the **Update state** button at the bottom of the screen.
5. Select a new lifecycle state from the list.
6. Select **Done**.



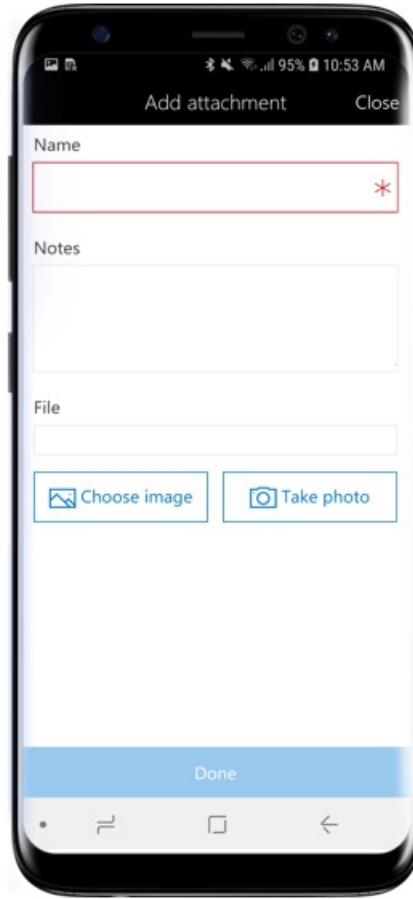
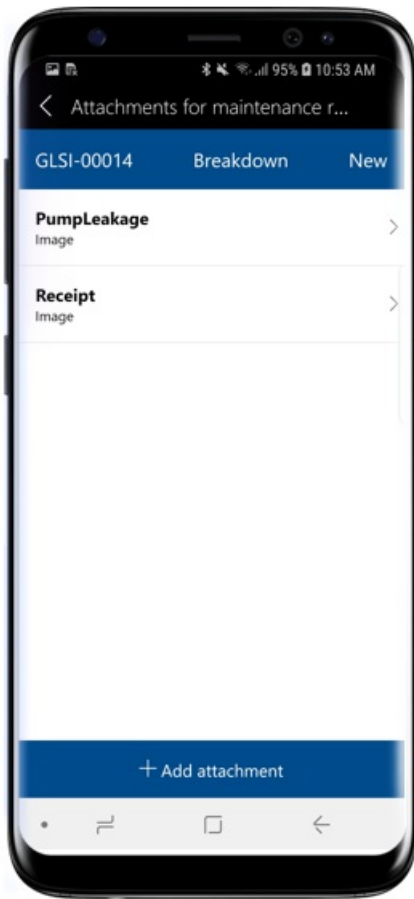
Create a maintenance request

1. On your mobile device, open the **Asset management** workspace.
2. Select **All maintenance requests**.
3. Select **Actions** at the bottom of the screen, and select **Create maintenance request**.
4. If number sequence is enabled for maintenance requests in **Asset management**, the **Maintenance request** field is hidden because it is automatically filled out. If the **Maintenance request** field is visible, enter a maintenance request ID.
5. Select a **Maintenance request type**.
6. Enter a **Description** for the maintenance request.
7. Select the **Asset** you want to create the request for.
8. Select the **Service level** for the maintenance request.
9. Select **Done**.



Add attachment to a maintenance request

1. On your mobile device, open the **Asset management** workspace.
2. Select **All maintenance requests**.
3. Select the maintenance request you want to add an attachment to.
4. Select **Attachments** at the bottom of the screen.
5. Select **Add attachments**.
6. Enter **Name** and **Notes** for the attachment.
7. Select **Choose image** to select a photo from the mobile gallery or **Take photo** to take a photo.
8. Select **Done**.



NOTE

Can you tell us about your documentation language preferences? [Take a short survey.](#)

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Company directory mobile workspace

2/18/2021 • 2 minutes to read • [Edit Online](#)

This topic provides information about the **Company directory** mobile workspace. This workspace lets users view and contact other employees in their organization.

This mobile workspace can be used with the Finance and Operations mobile app.

Overview

The **Company directory** mobile workspace lets users perform these tasks:

- View a list of employees in the organization.
- Search for employees in the organization.
- View contact information for employees.
- Contact employees from the profile information.

Prerequisites

Before you can use this mobile workspace, the following prerequisites must be met.

PREREQUISITE	ROLE	DESCRIPTION
One of the following products must be deployed in your organization: <ul style="list-style-type: none">• A Finance and Operations app• Microsoft Dynamics 365 Human Resources	System administrator	If you don't already have a Finance and Operations app deployed in your organization, see Deploy a demo environment . If you don't already have Human Resources deployed in your organization, the system administrator can access a trial version from the Human Resources webpage .
The Company directory mobile workspace must be published.	System administrator	See Publish a mobile workspace .

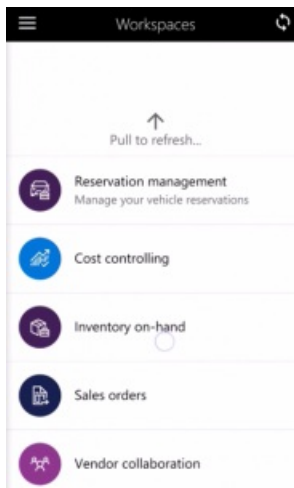
Download and install the mobile app

Download and install the Finance and Operations mobile app:

- [For Android phones](#)
- [For iPhones](#)

Sign in to the mobile app

1. Start the app on your mobile device.
2. Enter your Microsoft Dynamics 365 URL.
3. The first time that you sign in, you're prompted for your user name and password. Enter your credentials.
4. After you sign in, the available workspaces for your company are shown. Note that if your system administrator publishes a new workspace later, you will have to refresh the list of mobile workspaces.



View the company directory by using the mobile workspace

1. In the mobile app, select the **Company directory** workspace. A list of employees is shown.
2. Select an employee. The **Employee profile** page appears. The information on this page includes the employee's first name, last name, title, and department.

Search the company directory by using the mobile workspace

1. In the mobile app, select the **Company directory** workspace.
2. In the **Search** field, enter an employee's first name, last name, title, or department to start the search.
3. Select an employee. The **Employee profile** page appears. The information on this page includes the employee's first name, last name, title, and department.

NOTE

Can you tell us about your documentation language preferences? [Take a short survey.](#)

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Cost controlling mobile workspace

2/18/2021 • 3 minutes to read • [Edit Online](#)

This topic provides information about the **Cost controlling** mobile workspace. This workspace lets cost center managers view information about cost center performance anytime and anywhere.

This mobile workspace is intended to be used with the Finance and Operations mobile app.

Overview

The **Cost controlling** mobile workspace provides an instant view of the current performance of cost centers by comparing actual costs against the budgeted costs. You can drill down to the status of individual cost elements.

For example, an employee receives an invitation to an international conference, but the organization must cover all the travel expenses. The employee asks their manager whether they can attend the conference. The manager opens the **Cost controlling** mobile workspace on their mobile device to see whether there is budget for the employee to attend the conference.

Data security

The data in the **Cost controlling** mobile workspace is secured through user credentials. Cost center managers are allowed to see data only for their own cost center. The access-level security is managed in the **Cost accounting** module.

Cost accountants define the configuration of the **Cost controlling** mobile workspace in the **Cost accounting** module. After the workspace is published to the mobile app, it's available in the app. Therefore, all cost center managers in the organization can view data in the same format.

Actions, views, and links

The **Cost controlling** mobile workspace provides the following actions, views, and links:

- **Actions:**
 - Use **Select configuration** to select a layout.
 - Use **Select cost object** to select the cost centers to filter data on.

NOTE

The cost centers that appear in the list depend on the access that is granted in the **Cost accounting** module.

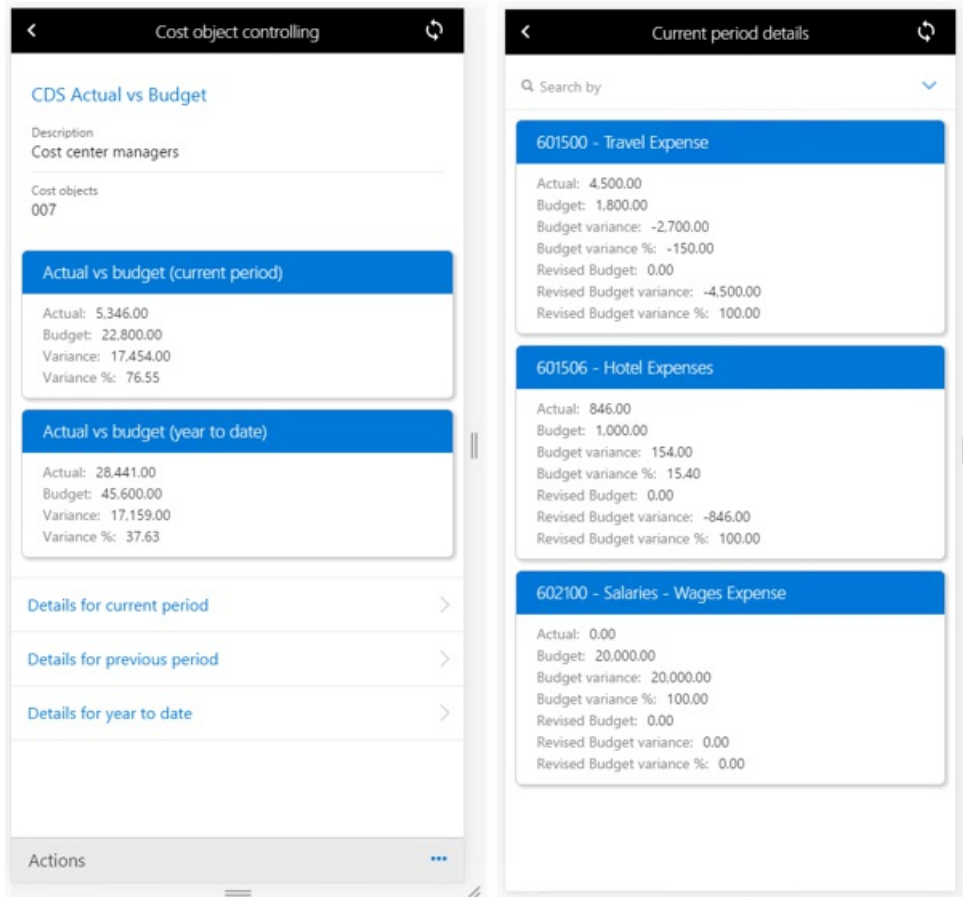
- **Views:** Based on the actions that are selected and the configuration in the **Cost accounting** module, you can view the following information on the cards:
 - Actual vs budget (current period)
 - Actual vs revised budget (current period)
 - Actual vs budget (previous period)
 - Actual vs revised budget (previous period)
 - Actual vs budget (year to date)
 - Actual vs revised budget (year to date)

The following amounts are shown on every card: Actual, Budget, Variance, and Variance %.

- **Links:**

- Details for current period
- Details for previous period
- Details for year to date

When you select a link, a card is shown for each cost element. The following amounts are shown on every card: Actual, Budget, Budget variance, Budget variance %, Revised budget, Revised budget variance, and Revised budget variance %.



Prerequisites

The prerequisites differ, based on the version of Microsoft Dynamics 365 that has been deployed for your organization.

Prerequisites if you use Microsoft Dynamics 365 Finance

If Finance has been deployed for your organization, the system administrator must publish the **Cost controlling** mobile workspace. For instructions, see [Publish a mobile workspace](#).

Prerequisites if you use version 1611 with Platform update 3 or later

If version 1611 with Platform update 3 or later has been deployed for your organization, the system administrator must complete the following prerequisites.

PREREQUISITE	ROLE	DESCRIPTION
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PREREQUISITE	ROLE	DESCRIPTION
Implement KB 4013633.	System administrator	KB 4013633 is an X++ update or metadata hotfix that contains the Cost controlling mobile workspace. To implement KB 4013633, your system administrator must follow these steps. <ol style="list-style-type: none"> 1. Download the metadata hotfix from Microsoft Dynamics Lifecycle Services (LCS). 2. Install the metadata hotfix. 3. Create a deployable package that contains the SCMMobile model, and then upload the deployable package to LCS. 4. Apply the deployable package.
Publish the Cost controlling mobile workspace.	System administrator	See Publish a mobile workspace .

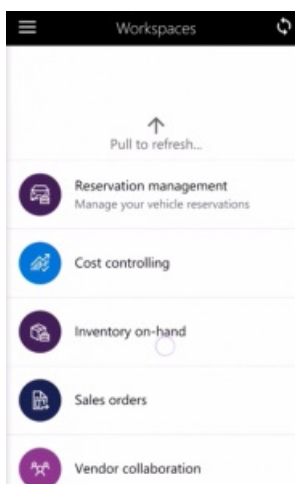
Download and install the mobile app

Download and install the Finance and Operations mobile app:

- [For Android phones](#)
- [For iPhones](#)

Sign in to the mobile app

1. Start the app on your mobile device.
2. Enter your Dynamics 365 URL.
3. The first time that you sign in, you're prompted for your user name and password. Enter your credentials.
4. After you sign in, the available workspaces for your company are shown. Note that if your system administrator publishes a new workspace later, you will have to refresh the list of mobile workspaces.



View the performance of your cost center by using the Cost controlling mobile workspace

1. On your mobile device, select the **Cost controlling** workspace.

2. Select **Cost object controlling**.
3. Select **Actions**.
4. Select **Select configuration** to select a cost controlling layout.
5. Select **Done**.
6. Select **Actions**.
7. Select **Select cost object** to select the cost centers that you've been granted access to.
8. Select **Done**.
9. View the overall performance of your cost center.
10. Select the **Details for current period** link.
11. View the performance of individual cost elements.
12. You can also search for specific cost elements.

NOTE

Can you tell us about your documentation language preferences? [Take a short survey](#).

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Inventory on-hand mobile workspace

2/18/2021 • 3 minutes to read • [Edit Online](#)

This topic provides information about the **Inventory on-hand** mobile workspace. This workspace helps you gain insights into reserved and available inventory anytime and anywhere.

This mobile workspace is intended to be used with the Finance and Operations mobile app.

Overview

Typically, companies have multiple shipments and multiple receipts of inventory every day. These movements constantly change the on-hand inventory status. The **Inventory on-hand** mobile workspace lets you see the cross-company on-hand inventory status, so that you can gain the latest insights into inventory data on the mobile device of your choice. Regardless of whether you work in the warehouse, purchasing, sales, manufacturing, or management, or have other roles, you can access on-hand inventory data anytime and anywhere.

The mobile workspace provides an instant view of the on-hand status across facilities. It lets you view on-hand inventory across facilities, current material reservations, and unreserved on-hand inventory. You can also enter item numbers to query on-hand inventory, and can do a filtered search for on-hand products or variants.

Specifically, the mobile workspace provides these features:

- You can search by product number or product name to find products to view the on-hand inventory status for.
- For the selected products, you can view the following information:
 - On-hand inventory per site
 - On-hand inventory per warehouse
 - On-hand inventory per location
 - On-hand inventory per batch (for batch-controlled products)
 - On-hand inventory per inventory status
- Product on-hand inventory is shown in the following ways:
 - By physical inventory (This view represents the total amount.)
 - By physical reserved (This view represents the reserved amount.)
 - By available physical (This view represents available amount that has no reservations.)

Prerequisites

The prerequisites differ, based on the version of Supply Chain Management that has been deployed for your organization.

Prerequisites if you use Supply Chain Management

If Supply Chain Management has been deployed for your organization, the system administrator must publish the **Inventory on-hand** mobile workspace. For instructions, see [Publish a mobile workspace](#).

Prerequisites if you use Platform update 3 or later

If Platform update 3 or later has been deployed for your organization, the system administrator must complete the following prerequisites.

PREREQUISITE	ROLE	DESCRIPTION
Implement KB 4013633.	System administrator	KB 4013633 is an X++ update or metadata hotfix that contains the Inventory on-hand mobile workspace. To implement KB 4013633, your system administrator must follow these steps. <ol style="list-style-type: none"> 1. Download the metadata hotfix from Microsoft Dynamics Lifecycle Services (LCS). 2. Install the metadata hotfix. 3. Create a deployable package that contains the SCMMobile model, and then upload the deployable package to LCS. 4. Apply the deployable package.
Publish the Inventory on-hand mobile workspace.	System administrator	See Publish a mobile workspace .

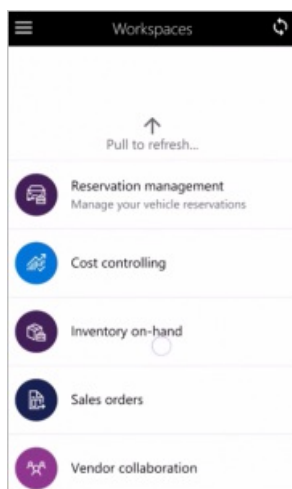
Download and install the mobile app

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Sign in to the mobile app

1. Start the app on your mobile device.
2. Enter your Dynamics 365 URL.
3. The first time that you sign in, you're prompted for your user name and password. Enter your credentials.
4. After you sign in, the available workspaces for your company are shown. Note that if your system administrator publishes a new workspace later, you will have to refresh the list of mobile workspaces.



View the on-hand inventory for a product by using the Inventory on-hand mobile workspace

1. On your mobile device, select the **Inventory on-hand** workspace.
2. Select **Check on-hand for an item**. You see a list of the products that are loaded into your app for offline use. By default, 50 items are loaded, but a developer can change this number. For more information, developers should see [Mobile platform](#).
3. If your item isn't in the list, select **Search more**. Search by product number, or switch to a search by product name.
4. Select a product. If the item has an image, the image is shown.
5. Select one of the following options to view the status of on-hand inventory:
 - View on-hand per site
 - View on-hand per warehouse
 - View on-hand per location
 - View on-hand per batch (for batch-controlled products)
 - View on-hand per inventory status

Product on-hand inventory is shown in the following ways:

- By physical inventory (This view represents the total amount.)
- By physical reserved (This view represents the reserved amount.)
- By available physical (This view represents the available amount that has no reservations.)

NOTE

Can you tell us about your documentation language preferences? [Take a short survey](#).

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Invoice approvals mobile workspace

2/18/2021 • 2 minutes to read • [Edit Online](#)

This topic provides information about the **Invoice approvals** mobile workspace. This workspace provides a list of invoices that have been assigned to you through the vendor invoice header workflow process.

This mobile workspace is intended to be used with the Finance and Operations mobile app.

Overview

The **Invoice approvals** mobile workspace lets Accounts payable clerks and managers view invoices that have been assigned to them as part of the vendor invoice header workflow process. You can view the invoice information, and even the line and distribution details, to help you make informed approval decisions. From the workspace, you can take action to move the invoice through the workflow process.

Prerequisites

Before you can use this mobile workspace, the following prerequisites must be met.

PREREQUISITE	ROLE	DESCRIPTION
Microsoft Dynamics 365 Finance must be deployed in your organization.	System administrator	See Deploy a demo environment .
The Invoice approvals mobile workspace must be published.	System administrator	See Publish a mobile workspace .

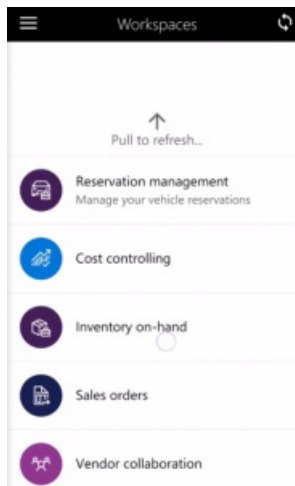
Download and install the mobile app

Download and install the Finance and Operations mobile app:

- [For Android phones](#)
- [For iPhones](#)

Sign in to the mobile app

1. Start the app on your mobile device.
2. Enter your Microsoft Dynamics 365 URL.
3. The first time that you sign in, you're prompted for your user name and password. Enter your credentials.
4. After you sign in, the available workspaces for your company are shown. Note that if your system administrator publishes a new workspace later, you will have to refresh the list of mobile workspaces.



Approve invoices by using the Invoice approvals mobile workspace

1. On your mobile device, select the **Invoice approvals** workspace.
2. Select the invoice that has been assigned to you by the vendor invoice header workflow process.
3. On the **Invoice details** page, review the invoice header information, such as the vendor and date information.
4. Select a line on the invoice to view more detailed information about it in the **Invoice line details** view.
5. In the **Invoice line details** view, select **Distributions** to show the line distributions. Here, you can view the accounting for the invoice line. The information that is shown includes the financial dimensions and the main account.
6. On the **Invoice details** page, select **Distributions** to show all distributions. Here, you can view the accounting for the whole invoice. The information that is shown includes the financial dimensions and the main accounts.
7. Select **Attachments** to view any notes or files that are attached to the invoice.
8. On the **Invoice details** page, select the appropriate workflow action to complete your review process.
9. Select **Done**.

NOTE

Can you tell us about your documentation language preferences? [Take a short survey](#).

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

My team mobile workspace

2/18/2021 • 2 minutes to read • [Edit Online](#)

This topic provides information about the **My team** mobile workspace. This workspace lets managers view their direct reports and extended staff. They can also send praise to individuals in their reporting chain.

This mobile workspace is intended to be used with the Finance and Operations mobile app.

Overview

The **My team** mobile workspace lets managers perform these tasks:

- View a list of the manager's direct reports.
- View a list of the manager's extended reporting team.
- View detailed information for each team member, such as birth date, seniority date, years of service, and compensation and performance information.
- Send praise to any individual in the manager's extended reporting team.

Prerequisites

Before you can use this mobile workspace, the following prerequisites must be met.

PREREQUISITE	ROLE	DESCRIPTION
One of the following products must be deployed in your organization: <ul style="list-style-type: none">• A Finance and Operations app• Microsoft Dynamics 365 Human Resources	System administrator	If you don't already have a Finance and Operations app deployed in your organization, see Deploy a demo environment . If you don't already have Human Resources deployed in your organization, the system administrator can access a trial version from the Human Resources webpage .
The My team mobile workspace must be published.	System administrator	See Publish a mobile workspace .

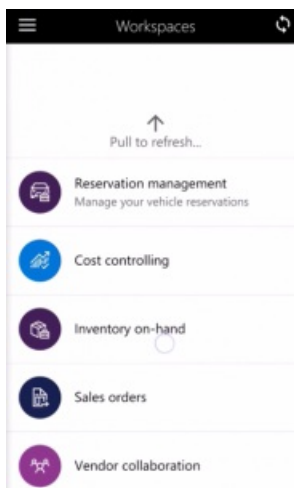
Download and install the mobile app

Download and install the Finance and Operations mobile app:

- [For Android phones](#)
- [For iPhones](#)

Sign in to the mobile app

1. Start the app on your mobile device.
2. Enter your Microsoft Dynamics 365 URL.
3. The first time that you sign in, you're prompted for your user name and password. Enter your credentials.
4. After you sign in, the available workspaces for your company are shown. Note that if your system administrator publishes a new workspace later, you will have to refresh the list of mobile workspaces.



View team members by using the My team mobile workspace

1. In the mobile app, select the **My team** workspace. A list of team members is shown. The list also shows each team member's title, and any direct reports that the member has.
2. Select a team member. The **Team member summary** page appears. The information on this page includes the team member's birth date, seniority date, years of service, years in the current position, and compensation information.

View extended team members by using the My team mobile workspace

1. In the mobile app, select the **My team** workspace. A list of team members is shown. The list also shows each team member's title, and any direct reports that the member has.
2. Select the **Direct reports** link. A list of your extended team is shown.
3. Select a team member. The **Team member summary** page appears. The information on this page includes the team member's birth date, seniority date, years of service, years in the current position, and compensation information.

Send praise about team members by using the My team mobile workspace

1. In the mobile app, select the **My team** workspace. A list of team members is shown. The list also shows each team member's title, and any direct reports that the member has.
2. Select a team member. The **Team member summary** page appears.
3. Select **Send praise**.
4. Enter the text of the praise that you want to send.
5. Select **Done**.

NOTE

Can you tell us about your documentation language preferences? [Take a short survey](#).

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Purchase order approval mobile workspace

2/18/2021 • 3 minutes to read • [Edit Online](#)

This topic provides information about the **Purchase order approval** mobile workspace. This workspace lets you view purchase orders and respond to them through actions. For example, you can approve or reject a purchase order.

Overview

Purchase orders that requires approval go through an approval workflow. The workflow can include various steps that require that one or more people take action. For example, a person might have to complete a task or approve the purchase order.

The **Purchase order approval** mobile workspace lets you easily view and respond to purchase orders from your mobile device. This workspace also lets you take the same workflow actions that you can take from the web client.

Prerequisites

The prerequisites vary, depending on the version of Supply Chain Management that has been deployed for your organization.

Prerequisites if you use Supply Chain Management

If Supply Chain Management has been deployed for your organization, the system administrator must publish the **Purchase order approval** mobile workspace. For instructions, see [Publish a mobile workspace](#).

Prerequisites if you use Microsoft Dynamics 365 for Operations version 1611 with Platform update 3 or later

If Microsoft Dynamics 365 for Operations version 1611 with Platform update 3 or later has been deployed for your organization, the system administrator must complete the following prerequisites.

PREREQUISITE	ROLE	DESCRIPTION
Implement KB 4017918.	System administrator	KB 4017918 is an X++ update or metadata hotfix that contains the Purchase order approval mobile workspace. To implement KB 4017918, your system administrator must follow these steps. <ol style="list-style-type: none">1. Download the metadata hotfix from Microsoft Dynamics Lifecycle Services (LCS).2. Install the metadata hotfix.3. Create a deployable package that contains the SCM Mobile model, and then upload the deployable package to LCS.4. Apply the deployable package.
Publish the Purchase order approval mobile workspace.	System administrator	See Publish a mobile workspace .

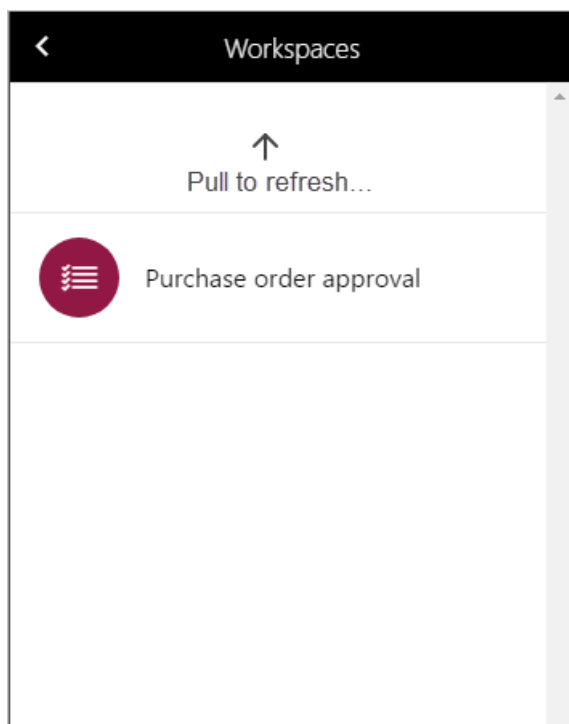
Download and install the mobile app

Download and install the Finance and Operations mobile app:

- [For Android phones](#)
- [For iPhones](#)

Sign in to the mobile app

1. Start the app on your mobile device.
2. Enter your Microsoft Dynamics 365 URL.
3. The first time that you sign in, you're prompted for your user name and password. Enter your credentials.
4. After you sign in, the available workspaces for your company are shown. Note that if your system administrator publishes a new workspace later, you will have to refresh the list of mobile workspaces.



View orders that are assigned to you

1. On your mobile device, select the **Purchase order approval** workspace.
2. Select **Orders assigned to me** to view all the purchase orders for which you've been asked to take action in the purchase order approval workflow.
3. Select an order. On the **Order details** page, you will see the order header information and lines. You can also find guidelines from the workflow task.
4. Select **Accounting distributions** to open the **Header accounting distributions** page.
5. Return to the **Order details** page, and select a line. From the order line details, you can also explore the line-specific accounting distributions.

Complete an action on the purchase order

After you've viewed the purchase order that is assigned to you and read the workflow instructions, you should be ready to take action.

1. On your mobile device, select the **Purchase order approval** workspace.
2. Select **Orders assigned to me** to view all the purchase orders for which you've been asked to take

action in the purchase order approval workflow.

3. Select an order, and view the details page.
4. Select **Actions** to show the available actions. The actions that are available depend on the task that has been assigned to you.

TASK ACTION	APPROVAL ACTION
Complete	Approve
Return	Reject
Request change	Request change
Delegate	Delegate

5. Select the appropriate action.
6. On the **Complete task** page, enter a comment. Note that if you select the **Delegate** action, you must select a user to delegate the task to.
7. Select **Done**. After you refresh your workspace, the purchase order will no longer be in your list.

NOTE

Can you tell us about your documentation language preferences? [Take a short survey.](#)

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Sales orders mobile workspace

2/18/2021 • 3 minutes to read • [Edit Online](#)

This topic provides information about the **Sales orders** mobile workspace. This workspace helps you stay up to date about your sales orders anywhere and anytime.

This mobile workspace is intended to be used with the Finance and Operations mobile app.

Overview

The **Sales orders** mobile workspace lets you view detailed information about each sales order. This information includes the status of the order, contact information for the customer, and contact information for the order taker. The **Sales orders** mobile workspace provides an instant view of sales orders. You can view all sales orders, view sales orders by customer, or view information about a specific sales order.

The mobile workspace provides two views to help you analyze sale orders in depth.

View all sales orders

This view lists all sales orders.

- Use one of the following filters to select the sales orders to view:
 - Search by sales order
 - Search by customer account
 - Search by customer name
 - Search by status
 - Search by release status
 - Search by created date and time
- After you select sales orders, you can view the details of specific orders. Specifically, you can view the following information:
 - Customer name and address information
 - Various dates for the sales order, such as the requested ship date and the confirmed ship date
 - Contact information for the order taker
 - Customer contact information
 - Order lines
 - Shipments that show how and when a sales order was shipped

View orders for a customer

This view lists sales orders by customer.

- Use one of the following filters to view orders for a customer:
 - Search by name
 - Search by account
- After you select a customer, you can view the following information:
 - Customer name and group
 - Customer contact information
 - Customer sales orders and details about those sales orders:

- Customer name and address information
- Various sales order dates
- Contact information for the order taker
- Customer contact information
- Order lines
- Shipments that show how and when a sales order was shipped

Prerequisites

The prerequisites differ, based on the version of Microsoft Dynamics 365 that has been deployed for your organization.

Prerequisites if you use Supply Chain Management

If Supply Chain Management has been deployed for your organization, the system administrator must publish the **Sales orders** mobile workspace. For instructions, see [Publish a mobile workspace](#).

Prerequisites if you use Dynamics 365 for Operations version 1611 with platform update 3 or later

If Dynamics 365 for Operations version 1611 with platform update 3 or later has been deployed for your organization, the system administrator must complete the following prerequisites.

PREREQUISITE	ROLE	DESCRIPTION
Implement KB 4013633.	System administrator	KB 4013633 is an X++ update or metadata hotfix that contains the Sales orders mobile workspace. To implement KB 4013633, your system administrator must follow these steps. <ol style="list-style-type: none"> 1. Download the metadata hotfix from Microsoft Dynamics Lifecycle Services (LCS). 2. Install the metadata hotfix. 3. Create a deployable package that contains the SCM Mobile model, and then upload the deployable package to LCS. 4. Apply the deployable package.
Publish the Sales orders mobile workspace.	System administrator	See Publish a mobile workspace .

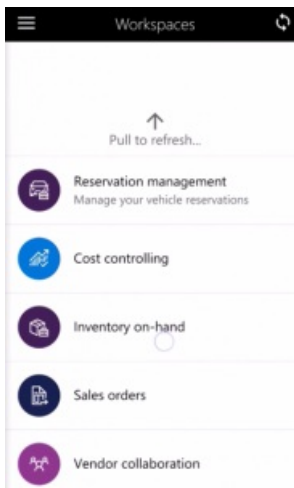
Download and install the mobile app

Download and install the Finance and Operations mobile app:

- [For Android phones](#)
- [For iPhones](#)

Sign in to the mobile app

1. Start the app on your mobile device.
2. Enter your Dynamics 365 URL.
3. The first time that you sign in, you're prompted for your user name and password. Enter your credentials.
4. After you sign in, the available workspaces for your company is shown. Note that if your system administrator publishes a new workspace later, you will have to refresh the list of mobile workspaces.



View information about sales orders for a customer by using the Sales order mobile workspace

1. On your mobile device, select the **Sales orders** workspace.
2. Select **View orders for a customer**.
3. Use account or customer name information to find the customer.
4. Select the customer.
5. Select **Contact information** or **Sales orders**. If you select **Sales orders**, a list of sales orders for the customer is shown.
6. Select **Sales order**. You can now view information about sales order lines, information about shipments, customer contact information, and contact information for the order taker.

NOTE

Can you tell us about your documentation language preferences? [Take a short survey](#).

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Vendor collaboration mobile workspace

2/18/2021 • 8 minutes to read • [Edit Online](#)

This topic provides information about the **Vendor collaboration** mobile workspace. This workspace helps your vendors stay up to date about the purchase orders that have been sent to them for approval. They can also view information about new and updated purchase orders and contacts.

This mobile workspace is intended to be used with the Finance and Operations mobile app.

Overview

The **Vendor collaboration** mobile workspace keeps vendors informed about new purchase orders, so that they can view purchase orders and then respond to them in the web client.

NOTE

The mobile workspace should be used as a supplement to the vendor collaboration web interface, not a replacement for it.

Your vendors can use the **Vendor collaboration** mobile workspace to view new purchase orders that are sent to them for approval. It shows purchase order information, such as products, quantities, and requested delivery dates. Price information is also available, depending on the configuration of each vendor.

A user who signs in as a vendor will see which purchase orders have been responded to, and which purchase orders are still awaiting customer action. For example, a purchase order might be awaiting customer action because the vendor suggested another delivery date, but the customer hasn't yet agreed to that date. The vendor will also see a list of purchase orders that have been confirmed but haven't yet been delivered.

To respond to a purchase order, the vendor must use the vendor collaboration web interface that is available in the web client. There, the vendor can also get more information about the order, such as document attachments, the delivery address per line, and charges that are associated with the vendor.

Vendors that have a special security role can see which contact persons are registered for a vendor account. The same security role lets a vendor view the status of any user request that has been submitted.

The vendor collaboration web interface in the web client must be used to create new contacts and submit new user requests.

The **Vendor collaboration** mobile workspace lets a vendor perform these tasks:

- View new purchase orders that are sent to the vendor.
- View purchase orders that the vendor has responded to, and that are awaiting customer action.
- View purchase orders that have been confirmed but haven't yet been fully received.
- View contact person information that is registered for the vendor account. (This task requires an additional security role.)
- View information about a user request that was submitted by the vendor, and follow the status of the request. (This task requires an additional security role.)

Prerequisites

The prerequisites vary, depending on the version of Microsoft Dynamics 365 that has been deployed for your

organization.

Prerequisites if you use Supply Chain Management

If Supply Chain Management has been deployed for your organization, the system administrator must publish the **Vendor collaboration** mobile workspace. For instructions, see [Publish a mobile workspace](#).

Prerequisites if you use Microsoft Dynamics 365 for Operations version 1611 with Platform update 3 or later

If Microsoft Dynamics 365 for Operations version 1611 with Platform update 3 or later has been deployed for your organization, the system administrator must complete the following prerequisites.

PREREQUISITE	ROLE	DESCRIPTION
KB 3216943 must be implemented if you're using Platform update 3.	System administrator	KB 3216943 is a binary update that is required if you're using Platform update 3. To implement this KB, the system administrator must follow these steps. <ol style="list-style-type: none">1. Download KB 3216943 from Microsoft Dynamics Lifecycle Services (LCS).2. Install the binary update, which is delivered as a deployable package. For information about how to apply a deployable package, see Apply a deployable package.
KB 4013633 must be implemented.	System administrator	KB 4013633 is an X++ update or metadata hotfix that contains the Inventory on-hand mobile workspace. To implement KB 4013633, your system administrator must follow these steps. <ol style="list-style-type: none">1. Download the metadata hotfix from LCS.2. Install the metadata hotfix.3. Create a deployable package that contains the SCM Mobile model, and then upload the deployable package to LCS.4. Apply the deployable package.
The Vendor collaboration mobile workspace must be published.	System administrator	See Publish a mobile workspace .
The vendor user must have access to the vendor collaboration web interface in the web client and must set up a vendor collaboration user.	Purchasing professionals and the system administrator	Follow the steps in the following topics to set up and work with the vendor collaboration web interface. <ul style="list-style-type: none">• Use vendor collaboration to work with external vendors• Manage vendor collaboration users• Set up and maintain vendor collaboration• Use vendor collaboration to work with customers in Supply Chain Managements

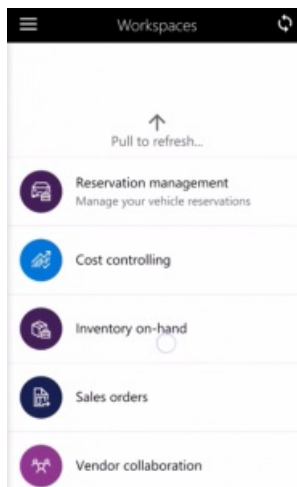
Download and install the mobile app

Download and install the Finance and Operations mobile app:

- [For Android phones](#)
- [For iPhones](#)

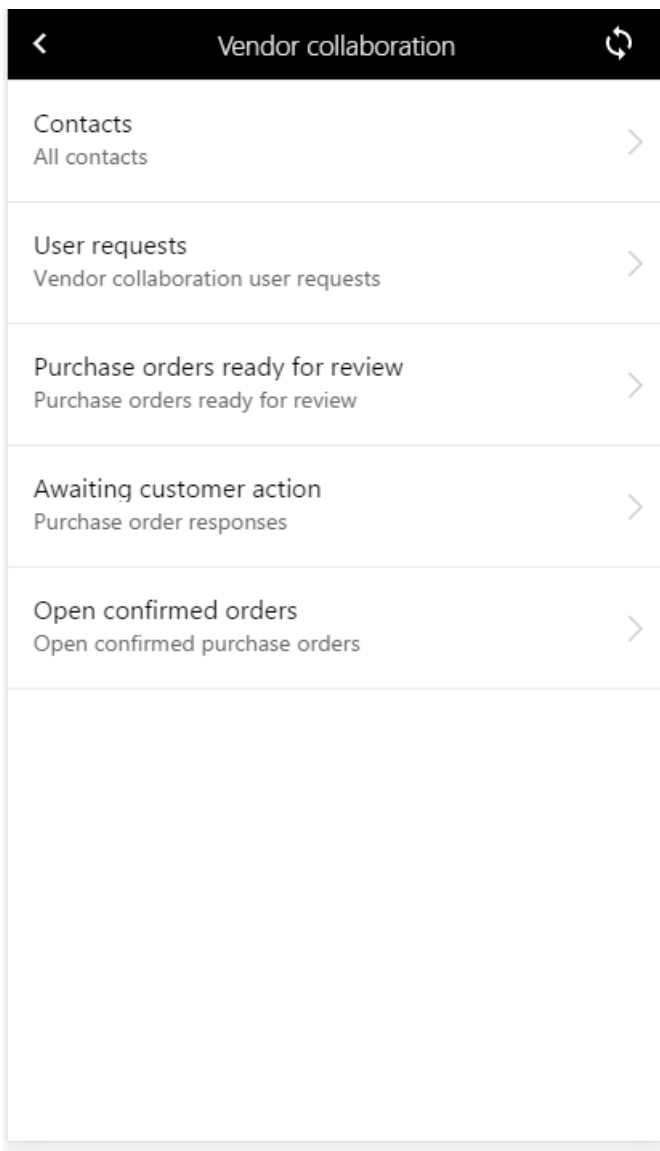
Sign in to the mobile app

1. Start the app on your mobile device.
2. Enter your Microsoft Dynamics 365 URL.
3. The first time that you sign in, you're prompted for your user name and password. Enter your credentials.
4. After you sign in, the available workspaces for your company are shown. Note that if your system administrator publishes a new workspace later, you will have to refresh the list of mobile workspaces.



Use the Vendor collaboration mobile workspace

When you select the **Vendor collaboration** workspace, you'll see the following options.



The **Vendor collaboration** workspace includes the following pages.

Contacts

The **Contacts** page lets you see all the contacts that have been set up for the vendor account. It shows the contact person's name, primary email address, and user alias, if the contact person has an alias. This page also shows whether the contact person's user account is active. When you select a contact, you see contact details, such as the legal entities that the person is a contact for. You also see contact information, such as a telephone number or an alternative email address.

User requests

The **User requests** page lets you see all the user requests that you've submitted via the vendor collaboration web interface. You can also follow the status of those requests. When you select a user request, you can see what was requested, add or inactivate a user, change security, and see which security roles were requested for the user.

Purchase orders ready for review

The **Purchase orders ready for review** page lets you see all the purchase orders that the customer has sent, but that haven't yet been responded to. You can view selected information about the order, such as which products were requested and when those products should be delivered. Price information is also available, depending on the configuration of the vendor.

You can also see whether the purchase order has notes or attachments. However, to open notes and attachments, you must use vendor collaboration web interface in the web client. Select **Purchase order line** to see all the lines together with their details. For each line, an indicator will show whether there are notes or

attachments, or whether the delivery address differs from the delivery address that is shown on the header.

To respond to the purchase order, you must use the vendor collaboration web interface in the web client.

Awaiting customer action

The **Awaiting customer action** page lets you find purchase orders that you or another person in your company who has access to vendor collaboration has responded to. The purchase orders are visible in this list only if the customer must take one of the following actions on the purchase order:

- If the purchase order was rejected, the customer must either update or cancel the original order, and then send it again. When the purchase order is sent again, it no longer appears on the **Awaiting customer action** page.
- If the purchase order was accepted with changes, the customer must either update the original order and then send it again for review, or update the order per the requested changes and then confirm it immediately. In both cases, the purchase order no longer appears on the **Awaiting customer action** page.
- If the purchase order was accepted but still appears on the **Awaiting customer action** page, the purchase order wasn't automatically confirmed when it was accepted. It's now waiting for a purchasing agent to change the order status to **Confirmed**. Typically, a purchase order is considered an agreement between the customer and the vendor as soon as the vendor accepts the order. Therefore, the update to **Confirmed** status is usually just a formality.

When you select a purchase order, additional details appear about the response. You can see the line details and response for every line. The line status shows which of the following responses has been given:

- Accepted
- Rejected
- Accepted with changes
- Substituted/Substitute
- Split into schedule/Schedule line

Note that the **Delivering** field is set to either **Yes** or **No** to indicate whether the lines will be delivered. A line might not be delivered because for the following reasons:

- The line was rejected.
- A substitution was made, and the original line isn't expected to be delivered as requested in the received order.
- The line was split into multiple schedule lines, and the original line isn't expected to be delivered as requested in the received order.

Any changes that have been made to the order line response are shown. However, uploaded notes and attachments aren't shown. To view notes and attachments, you must use the vendor collaboration web interface in the web client.

Open confirmed orders

When the purchase order is confirmed by the customer (that is, the status of the purchase order is changed to **Confirmed**), it appears in the open confirmed order. It will remain in the list until it's registered as received by the customer.

NOTE

Can you tell us about your documentation language preferences? [Take a short survey.](#)

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Publish mobile workspaces

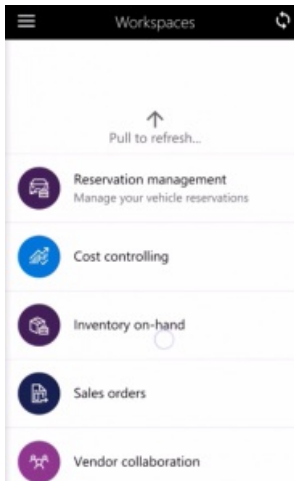
2/18/2021 • 2 minutes to read • [Edit Online](#)

This topic describes the steps that system administrators must follow to publish a mobile workspace. A mobile workspace must be published so that users can access it in the mobile app.

Publish a mobile workspace

1. In your browser, start your web client.
2. Click **Settings** > **Mobile app**.
3. Select the mobile workspace to publish.
4. Click **Publish**.

After a new workspace is published, users must pull to refresh the list of mobile workspaces.



NOTE

Can you tell us about your documentation language preferences? [Take a short survey](#).

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Office integration overview

2/18/2021 • 6 minutes to read • [Edit Online](#)

Applies to these Dynamics 365 apps:

Commerce, Finance, Supply Chain Management

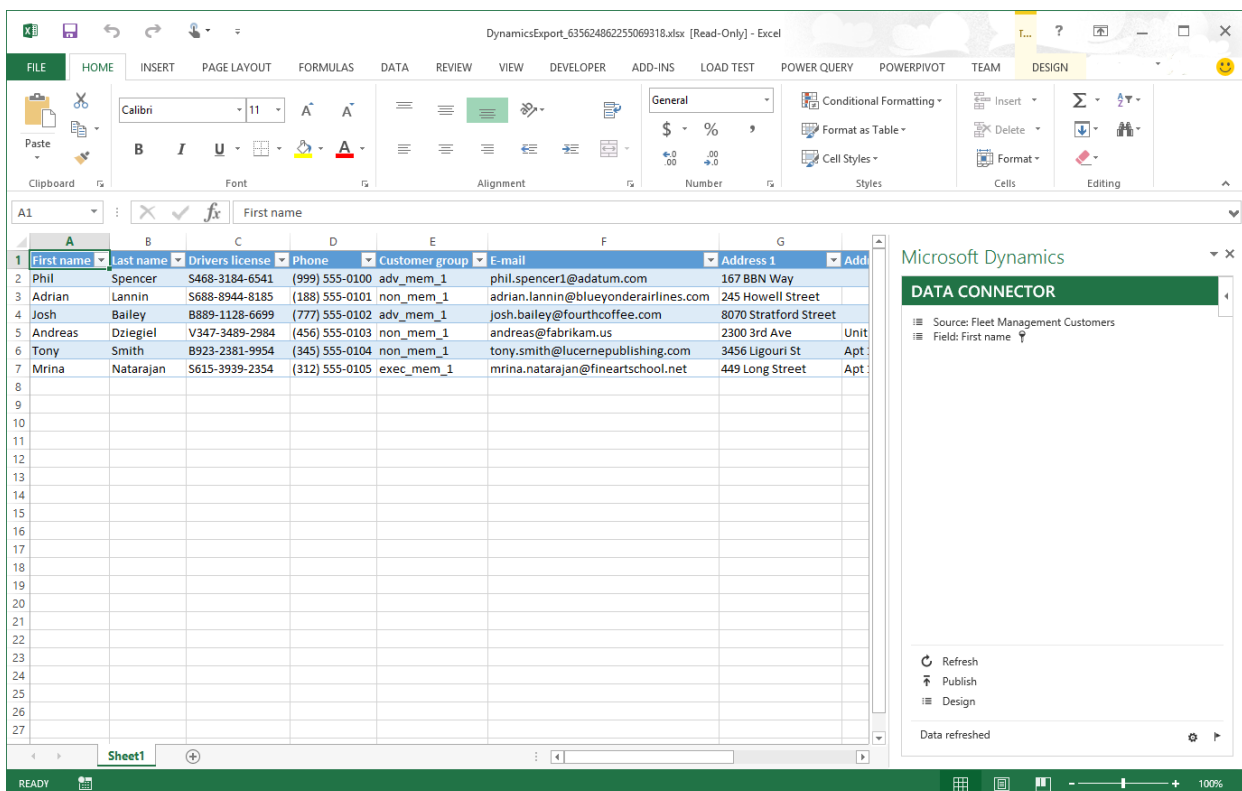
This topic reviews Microsoft Office integration concepts and features. The integration depends on several technologies:

- Working in Microsoft Azure
- Working with Azure Active Directory (Azure AD)
- Running a web client in multiple browsers

The Microsoft Office integration capabilities provide users with a productive environment that helps them get the job done by using Office products.

Excel Data Connector add-in

Microsoft Excel can change and quickly analyze data. The Excel Data Connector app interacts with Excel workbooks and OData services that are created for publicly exposed data entities. The Excel Data Connector add-in enables Excel to become a seamless part of the user experience. The Excel Data Connector add-in is built by using the Office Web add-ins framework. The add-in runs in a task pane. Office Web Add-ins are web applications that run inside an embedded Internet Explorer browser window.



1	First name	Last name	Drivers license	Phone	Customer group	E-mail	Address 1	Add.
2	Phil	Spencer	S468-3184-6541	(999) 555-0100	adv_mem_1	phil.spencer1@adatum.com	167 BBN Way	
3	Adrian	Lannin	S688-8944-8185	(188) 555-0101	non_mem_1	adrian.lannin@blueyonderairlines.com	245 Howell Street	
4	Josh	Bailey	B889-1128-6699	(777) 555-0102	adv_mem_1	josh.bailey@fourthcoffee.com	8070 Stratford Street	
5	Andreas	Dziewiel	V347-3489-2984	(456) 555-0103	non_mem_1	andreas@fabrikam.us	2300 3rd Ave	Unit
6	Tony	Smith	B923-2381-9954	(345) 555-0104	non_mem_1	tony.smith@lucernepublishing.com	3456 Ligouri St	Apt.
7	Mrina	Natarajan	S615-3939-2354	(312) 555-0105	exec_mem_1	mrina.natarajan@fineartschool.net	449 Long Street	

Dynamics AX 2012 architecture vs. Finance and Operations architecture

There are several differences between versions. For both, we built lightweight add-ins that run in Excel and use services to connect to the application.

Dynamics AX 2012

Excel > VSTO (.NET) Add-in > Windows Communication foundation (WCF) > Authentication through Active

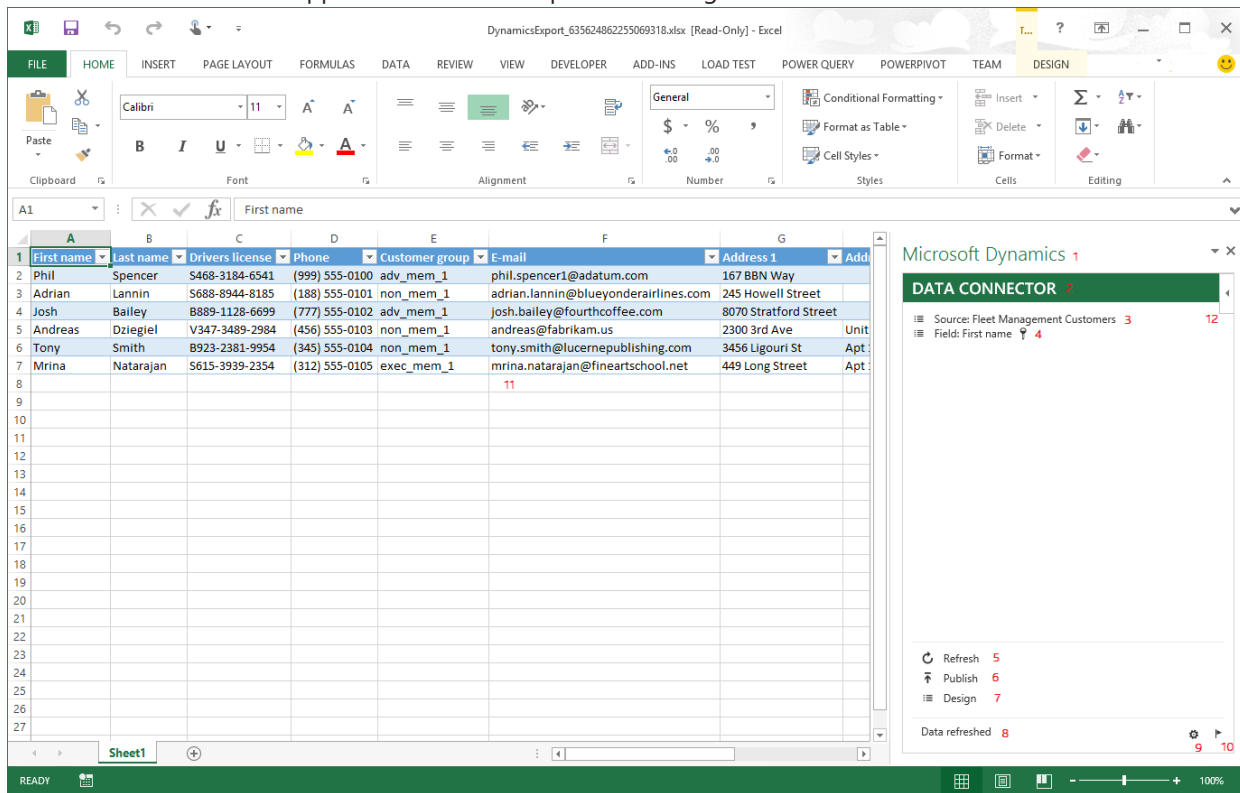
Directory (AD) > AIF SOAP services on the AOS > AX Services and Tables > AX query engine > Database

Finance and Operations

Excel > Office Web Add-in (JS + HTML) > JavaScript OData API (Olingo) > Authentication through Azure Active Directory (AAD) > AX OData services on the AOS > AX Entities > AX LINQ provider > AX Database

Office Add-in explained

The Excel Data Connector app is located in a task pane on the right side of a workbook.



The following table describes the parts of the add-in. The numbers correspond to the numbers in the preceding screen shot.

NUMBER	NAME	DESCRIPTION
1	Add-in primary title	The title of the add-in that is provided to the Office Web Add-ins framework.
2	Add-in secondary title	The title of the add-in that is provided by the add-in.
3	Source name	The label of the entity that provides data for the selected data table. You can hover over the label to see the corresponding name.
4	Field name	The label of the field that provides data for the selected data table column. You can hover over the label to see the corresponding name and type.
5	Refresh button	Refresh the data in the workbook.
6	Publish button	Publish the data changes in the workbook.
7	Design button	Open the design-time experience.

NUMBER	NAME	DESCRIPTION
8	Status bar	The status bar provides brief temporary information alerts. Information that is appears in the status bar also appears in the Messages dialog box.
9	Options button	Open the Options dialog box.
10	Messages button	Open the Messages dialog box, which displays the information messages, warnings, and errors that the program provides to the user. A number sometimes appears next to the Messages button to provide a count of the warnings or errors that the user might be interested in.
11	Excel data table containing data	The filter and sort controls in the columns headers can be used on this data. The filters must be removed before data changes are published.
12	Office Web Add-ins menu	The Office Web Add-ins menu button provides several standard links. The most important of the links is used to reload the add-in. When the add-in is reloaded, it updates all the data for the workbook that is contained in tables that are associated with the add-in.

Authentication

OData sits on the same authentication stack as the server. The add-in uses OAuth to facilitate authentication.

Lookups and drop-down lists

When you click in a table cell, any lookup, enumeration drop-down list, or date picker that is associated with that cell will be shown inside the add-in, underneath the source and field information. Any value that you select inside the add-in is put into the currently selected table cell.

Adding and deleting records

To add a record, either start typing in a row directly below a table, or use the Tab key to tab away from the last cell of the last row in the table. To delete a record, select the row by clicking the row label (1, 2, 3, and so on), and delete all the cells in that row. To publish the changes, click **Publish**. The **Messages** dialog box shows how many records were added, edited, and deleted.

Workbook Designer

You can use the **Workbook Designer** page to design an editable custom export workbook that contains an entity and a set of fields. To open the **Workbook Designer (ExportToExcelWorkbookDesigner)** page, click **Common > Common > Office Integration > Excel workbook designer**. Before you can publish data edits, all the key fields of the entity must be in the Excel table. Key fields have a key symbol next to them. To successfully create or update a record, it must have all the mandatory fields in the Excel table. Mandatory fields have an asterisk (*) next to them.

AVAILABLE FIELDS

🔑	Vehicle rental ID
*	Drivers license
*	First name
*	Last name
*	Start date

To retrieve the resulting workbook, click **Create workbook** in the app bar.

Click **View related form** to see the data that the entity exposes. This button is only enabled for entities that have a **FormRef** property value.

Document management

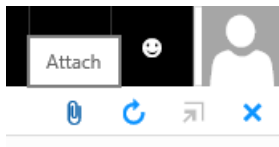
Document management supports saving record attachments in Azure Blob storage and SharePoint Online. Database storage is deprecated. Azure Blob storage is equivalent to storage in the database since documents can only be accessed through the application and it provides the added benefit of providing storage that doesn't negatively affect the performance of the database. Azure blob storage is the default and works immediately. SharePoint storage will work immediately if you have an O365 license since we auto-discover the SharePoint tenant e.g. a user on the TenantA.onmicrosoft.com O365/AAD tenant gets TenantA.sharepoint.com as the SharePoint site. If document management has been turned off by the user, turn it on by clicking **Options > General > Miscellaneous** and setting **Document handling active** to **Yes**.

DOCUMENT HANDLING

Document handling active

Yes

On any page that has data, an **Attach** button will be available in the upper-right corner.



The **Attachments** page provides a view of the attachments (documents) that are associated with the record that was selected on the previous page. You can add new attachments to the record by clicking the **New** button (+) in the app bar. For the **File** and **Image** document types, you will be prompted to provide the associated file.

Document preview

A preview for supported file types is provided on the **Preview** FastTab. Basic document types, such as PNG images and text files, are supported by default. Office document types, such as Microsoft Word, Excel, and PowerPoint files, must use a production Office Web Apps Server, which might not be available in a OneBox configuration.

Frequently asked questions

Office Licensing

What Microsoft 365 licenses are available?

There are lots of [Microsoft 365 license options](#). You should select the license that makes sense for your organization.

After purchasing a Microsoft 365 license, what needs to be done to set up SharePoint storage for attachments?

Open the Document Parameters form and ensure that the SharePoint server has been automatically discovered

and set. Now open or create a Document Type, set the Document Type's location to "SharePoint" and select the folder that the files should be stored in.

Additional resources

[Office integration tutorial](#)

[Troubleshoot the Office integration](#)

[Application stack and server architecture](#)

NOTE

Can you tell us about your documentation language preferences? [Take a short survey](#).

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Office integration tutorial

2/18/2021 • 27 minutes to read • [Edit Online](#)

Applies to these Dynamics 365 apps:

Commerce, Finance, Human Resources, Supply Chain Management

In this tutorial, you will use and build Office integration experiences that involve Excel, Word, Document Management, and email.

Overview

In this tutorial, you will use and build Microsoft Office integration experiences that involve Microsoft Excel, Microsoft Word, the Document Management subsystem, and email. You will see how Excel and Word use data entities as an entry point into the system, how Excel can become a core part of the user experience, and how Excel and Word can be used for ad-hoc lightweight reporting. You will also see how files can be stored and shared by using the Document Management and email capabilities.

Prerequisites

For this tutorial, you must access the environment by using Remote Desktop, and you must be provisioned as an administrator on the instance. For more information, see [Deploy and access development environments](#). If you're running Internet Explorer on the virtual machine (VM), you must enable font and file downloads at **Internet Options > Security > Custom Level**. Microsoft Visual Studio 2015 runs on the VM, and it must run as an administrator so that metadata and compilation files can be overwritten. To make sure that Visual Studio runs as an administrator, search for the program, and pin it to the taskbar. Then right-click the shortcut on the taskbar, right-click **Visual Studio 2015**, click **Properties > Advanced**, and select the **Run as administrator** check box. Visual Studio will now run as an administrator via a single left click of the taskbar shortcut.

Key concepts

- **Entities and OData** – You will use the Microsoft Dynamics Excel Data Connector App (Excel App) to create, read, update, and delete. The connector uses OData services that are created for any entity that is left in the default state of "public" (**DataEntity.Public=Yes**).
- **Apps for Office** – The Excel App is built by using the Apps for Office framework (which is also known as the Office Web API). The Excel App is web-based, and therefore shares technology with the client and will run inside both on-premises Excel instances and Microsoft Excel Online (Microsoft 365). The app runs inside Excel in a task pane.
- **Microsoft Office 2016** – The Excel and Word Apps use advances in the Apps for Office framework that were introduced in Office 2016. Therefore, Office 2016 is required in order to run the Excel and Word Apps.
- **Authentication** – The Excel and Word Apps run in an Internet Explorer window inside Excel and Word. Even if the user is running the client in an InPrivate Browsing session in Internet Explorer, or in a different browser, such as Chrome, Internet Explorer is still used to run the app inside Excel or Word. Authentication is facilitated by OAuth, and the user can select accounts and sign in within the app. Internet Explorer will first try to automatically sign the user in. Therefore, if you aren't signed in as the correct user, or if you have trouble signing in, you might have to force a sign-out from the app by using the sign-out link on the user menu in the lower-right corner of the app. After sign-out, right-click in the app, and try to sign in again.
- **Excel App** – In addition to facilitating refresh and publish data operations, the Excel App also provides source and field information, lookups, filtering, error messaging, and a design experience for adding or removing fields, table columns, or labels from entity data sources.

Setup

Load the Fleet data set

During this tutorial, we will mainly use forms, entities, and data in the Fleet Management model. Therefore, we must first load the Fleet data set.

1. Navigate to **Fleet Management > Setup > Fleet setup**.
2. Click **Create**.

Static Export to Excel experiences

Static Export to Excel

Static Export to Excel provides a quick mechanism for getting data into grids on a page. The standard mechanism for triggering Export to Excel is the **Open in Microsoft Office** menu. Static Export to Excel is also available via a shortcut menu on the grid.

1. In Internet Explorer, navigate to **Fleet Management > Customers > Customer**.
2. Click **Open in Microsoft Office > Export to Excel > Customers**.
3. Download and open the workbook that is generated. Note that the columns in the workbook match the columns in the grid.
4. Select ("mark") the first two rows by clicking in the left edge of the row, below the "Select all" check mark.
5. Right-click the grid header to open the shortcut menu. Note that both **Export all rows** and **Export marked rows** are available as commands.
6. Click **Export marked rows**. Note that the columns in the workbook match the columns in the grid, and that the rows that are exported match the rows that you marked.

Modify the static Export to Excel experience

You can suppress the static Export to Excel mechanism for a grid or change the label that appears on the **Open in Microsoft Office** menu.

1. Start Visual Studio 2015. Make sure that it's running as an administrator.
2. Click **View > Application Explorer** (or press Ctrl+E, Ctrl+E).
3. Navigate to **AOT > User Interface > Forms > FMCustomer**.
4. Right-click **FMCustomer**, and then click **Add to new project**.
5. In Solution Explorer, double-click the **FMCustomer** form to open the designer view.
6. Select **FMCustomerDesignTab(Tab)TabPageGrid(TabPage)MainGrid(Grid)**.
7. In the **Properties** window, find the **Export Label** property.
8. Set the **Export Label** property to **Fleet Customers**.
9. Save the form. If you're asked whether you want to overwrite the existing form or save it as a new form, click **Overwrite**.
10. Build the solution (press Ctrl+Shift+B).
11. In Internet Explorer, navigate to **Fleet Management > Customers > Customer**.
12. Click **Open in Microsoft Office**. Note that the **Customers** option has changed to **Fleet Customers**.

Generated Open in Excel experiences

Generated Open in Excel

Generated Open in Excel options are automatically added to forms when the system finds data entities that have the same root data source as the form. The workbook that is generated will contain a single table data source where the data from that entity is loaded. The Open in Excel experiences are listed on the **Open in Microsoft Office** menu. (When an entity has the same root data source as a form, it's added as an option in the **Open in**

Excel section of the **Open in Microsoft Office** menu. This option is referred to as a “generated” option.)

1. In Internet Explorer, navigate to **Fleet Management > Customers > Customer**.
2. Click **Open in Microsoft Office > Open in Excel > Fleet Management Customers (unfiltered)**.
3. Download and open the workbook that is generated. This workbook contains the Excel Data Connector App, a binding to the **Fleet Management Customer** entity, and a pointer to the server that the workbook was generated from.
4. Click **Enable editing** to enable the Excel Data Connector App to load. Customer data is read from the OData service on the server and added to the table.
5. In Internet Explorer, on the **Customer** page, click **Edit** (or press F2), and change the email address of one of the customers.
6. In the Excel App, click **Refresh**. Note that the new email address is shown in Excel.
7. In Excel, change the email address of one of the customers.
8. In the Excel App, click **Publish**.
9. In Internet Explorer, click **Refresh** in the upper right of the page (or press Shift+F5). Note that the new email address is shown on the **Customer** page.
10. In Excel, click the **Settings** (gear) button in the lower-right corner of the Excel App. You can use the dialog box that appears to adjust the settings in the current workbook. Note that the **Server URL** value matches the start of the URL that is shown in Internet Explorer. Also note that the data refresh and data publish operations are listed.
11. Click **Cancel** to close the **Settings** dialog box.
12. Click the **Message Center** (flag) button in the lower-right corner of the Excel App. The message center dialog box that appears provides information about what is occurring in the Excel App.

Add and remove table columns from an existing table data source in the Excel App

The Excel App has a design experience that lets users add and edit bindings to entity data sources and labels. To add and remove fields from an existing binding, you use the edit experience that is outlined in the following steps.

1. Get a workbook that has an existing table data source:
 - a. In Internet Explorer, navigate to **Fleet Management > Customers > Customer**.
 - b. Click **Open in Microsoft Office > Open in Excel > Fleet Management Customers (unfiltered)**.
 - c. Download and open the workbook that is generated. This workbook contains the Excel Data Connector App, a binding to the Fleet Management Customer entity, and a pointer to the server that the workbook was generated from.
 - d. Click **Enable editing** to enable the Excel Data Connector App to load. Customer data is read from the OData service on the server and added to the table.
2. Open the data source for editing:
 - a. In Excel, in the Excel App, click **Design**. A list of table and field data sources appears.
 - b. Click the **Edit** (pencil) button next to the existing table data source. The data source details are shown.
3. Remove fields. In the **Selected** list, double-click a field. Alternatively, click a field, and then click **Remove**. To select multiple fields, keep the Ctrl key held down while you click them. To select all fields, press Ctrl+A.
4. Add fields. In the **Available** list, double-click a field. Alternatively, click a field, and then click **Add**. To select multiple fields, keep the Ctrl key held down while you click them. To select all fields, press Ctrl+A.
5. Change the field order. In the **Selected** list, click a field, and then click **Up** or **Down**.
6. Change a field label. In the **Selected** list, click a field, and then click in the **Column label** field below the list. You can change the label to either a static string or a label identifier that will be translated to the active language (for example, @SYS129977).

7. Apply the changes that you made to data source fields:
 - a. Click **Update** to return to the data source list.
 - b. Click **Refresh** to make sure that any new fields are filled with data.

Change an automatically generated Open in Excel experience

The automatically generated Open in Excel experiences that are created for entities have a single table binding. The list of fields that are added to that table binding is defined by the **AutoReport** field group if the table binding contains fields. Otherwise, the key and mandatory fields for the entity are automatically added. The order of fields in the **AutoReport** group determines the order of fields in the table binding.

1. Start Visual Studio 2015. Make sure that it's running as an administrator.
2. Click **View** > **Application Explorer** (or press Ctrl+E, Ctrl+E).
3. Navigate to **AOT** > **Data Model** > **Data Entities** > **FMCustomerEntity**.
4. Right-click **FMCustomerEntity**, and then click **Add to project**.
5. Expand **FMCustomerEntity** > **Field Groups** > **AutoReport**.
6. Reverse the order of the **First name** and **Last name** fields by clicking the **Last name** field and moving it up (press Alt+Up arrow key).
7. Save the entity. If you're asked whether you want to overwrite the existing entity or save it as a new entity, click **Overwrite**.
8. Build the solution (press Ctrl+Shift+B).
9. In Internet Explorer, navigate to **Fleet Management** > **Customers** > **Customer**.
10. Click **Open in Microsoft Office** > **Open in Excel** > **Fleet Management Customers**.
11. Open the workbook that is generated.
12. Click **Enable editing** to enable the Excel Data Connector App to load. Note that the **Last name** column appears before the **First name** column.

Open in Excel Online

The Excel App is built by using a new Apps for Office framework. This framework provides a JavaScript-based web application programming interface (API) that enables apps to communicate with Office applications. The biggest advantage of this new framework is that apps can run in on-premises Excel instances (Win32), Excel Online (Microsoft 365), and Excel on the Apple iPad. They will also be able to run in other Excel apps in the future.

1. Navigate to **Fleet Management** > **Customers** > **Customer**.
2. Click **Open in Microsoft Office** > **Open in Excel** > **Fleet Management Customers**.
3. Click **SharePoint**.
4. Browse to the desired Microsoft SharePoint folder.
5. Click **Save**. The default behavior is to open the file after it's saved. Note that the workbook opens in Excel Online. In Excel Online, capabilities of the Excel App, such as refresh and publish, and the design experience, should work just as they work in on-premises Excel instances.

Template Open in Excel experiences

Template Open in Excel

Template options resemble the generated Open in Excel options. They are automatically added to forms when the system finds templates that have the same first data source as the root data source in the form. A workbook template can have multiple data sources. It can also have unbound content. The Open in Excel experiences are listed on the **Open in Microsoft Office** menu. The **Excel workbook designer** page provides an easy way to get a generated Open in Excel experience for an entity. It also provides a mechanism getting a blank workbook that contains just the Excel App and a pointer to the server.

1. In Internet Explorer, navigate to **Common > Common > Office integration > Excel workbook designer**.
2. Select the **FleetCustomer** entity.
3. Add all fields in the list of available fields to the list of selected fields.
4. Click **Create workbook**.
5. Open the workbook that is generated. This workbook contains the Excel Data Connector App, a binding to the **Fleet Management Customer** entity, and a pointer to the server that the workbook was generated from.
6. Click **Enable editing** to enable the Excel Data Connector App to load. Customer data is read from the OData service on the server and added to the table.
7. Insert a blank row above the table, and enter **Fleet Customers** as the title.
8. Rename the worksheet **FleetCustomers**.
9. Rearrange some of the fields in the table. Click **Design** to open the design experience.
10. Next to the **FleetCustomer** data source, there are buttons for editing and deleting the data source. Click **Edit** to see the field list.
11. Select fields, and move them as you require. Set the order for the first three fields to **FirstName**, **LastName**, and **DriverLicense**.
12. Click **Update**. Note that the field order is changed.
13. Click **Done**.
14. Click the **Settings** (gear) button.
15. Click **Clear binding data** so that the workbook contains no bound data.
16. Click **OK**.
17. Save the workbook as **FleetCustomersBasic.xlsx**.
18. In Internet Explorer, navigate to **Common > Common > Office integration > Document templates**.
19. Click **New**.
20. Browse to the file that you just saved.
21. Click **OK**. The template is added as a line in the templates table.
22. In the **FleetCustomersBasic** row, clear the **Apply current record filter** check box, so that an unfiltered list of customers will be loaded after the template is opened.
23. Change the **Template display name** value to **Fleet Customers Basic**.
24. Navigate to **Fleet Management > Customers > Customer**.
25. Click **Open in Microsoft Office**. Note that **Fleet Customers Basic** is now an option in the **Open in Excel** section. Click that option.
26. Open the workbook that is generated.
27. Click **Enable editing** to enable the Excel Data Connector App to load. Customer data is read from the OData service on the server and added to the table binding that you created.

Register a template as a system-defined template

Templates that are registered as system-defined templates are loaded at deployment. This behavior is useful for independent software vendors (ISVs) and partners that want to package templates together with other model artifacts.

1. Start Visual Studio 2015 by opening the previously created project where the model is set to **Fleet Management**, or create a new project.
2. Right-click the project, and then click **Add > New item**.
3. Select the **Resource** item type.
4. Set the name to **FleetCustomersBasicTemplate**.
5. Make sure that the **FleetCustomersBasic.xlsx** file is closed.

6. Click **Add**.
7. Select the **FleetCustomersBasic.xlsx** file. Note that the resource is added to the project.
8. Click **View** > **Application Explorer** (or press Ctrl+E, Ctrl+E).
9. Navigate to **AOT** > **Classes** > **Code** > **FMTemplateRegistrations**.
10. Right-click **FMTemplateRegistrations**, and then click **Add to project**.
11. Open **FMTemplateRegistrations**. The **FMTemplateRegistrations.xpp** code file should be shown.
12. Copy one of the existing lines, and change it by providing the template name, resource name, description, display name, and **Apply current record filter** and **List in Open in Office menu** values. The display name is the text that appears as an Open in Excel option. The description appears when the user holds the pointer over that item. The display name and description can be either labels or static strings. The code should resemble the following example.

```
this.addTemplate(  
    OfficeAppApplicationType::Excel,  
    resourceStr(FleetCustomersBasicTemplate),  
    resourceStr(FleetCustomersBasicTemplate),  
    "Template for fleet customers", "Fleet customers basic", NoYes::No, NoYes::Yes);
```

13. Save the code. If you're asked whether you want to overwrite the existing code or save it as a new file, click **Overwrite**.
14. Build the solution (press Ctrl+Shift+B).
15. Verify that the change was successful. In Internet Explorer, navigate to **Common** > **Common** > **Office integration** > **Document templates**.
16. Click **Reload system templates**.
17. Click **Yes** to confirm that you want to reload the system templates.
18. Verify that the new system-defined template is loaded, and that the template name is **FleetCustomersBasicTemplate**.

Journal Entry in Excel experience powered by a template

1. In Internet Explorer, navigate to **General ledger** > **Journal entries** > **General journals**.
2. Make sure that you're in company **USMF**.
3. Create a new journal by clicking **New**.
4. Set the name to **GenJrn**.
5. Click **Open lines in Excel**.
6. Open the workbook that is generated, and enable editing as required. Note that header fields are filled with data.
7. Enter a new line, and set the **MainAccount** field to **110110**. Enter a description, a currency, and a debit amount. Note that lookups are provided for the company and currency fields, because those relationships are defined for this entity.
8. Click **Publish**. Note that the line is updated with the current date and a debit amount of 0 (zero).
9. In Internet Explorer, click **Lines**. Note that line that you entered in Excel is shown.

Lookups in Excel experiences

Lookups in the Excel App

To facilitate data entry, the Excel App provides lookups and data assistance. Date fields provide a date picker,

enumeration (enum) fields provide an enum list, and relationships provide a relationship lookup.

1. In Internet Explorer, navigate to **Fleet Management > Rentals > Rental**.
2. Click **Open in Microsoft Office > Open in Excel > Fleet Management Rentals**.
3. Open the workbook that is generated.
4. Click **Enable editing** to enable the Excel Data Connector App to load and read in data.
5. Click a **Drivers license** value. Note that a relationship lookup now appears in the Excel App and shows a list of customers. Because relationship lookups are in their first generation, no filtering or sorting is currently supported.
6. Click another customer in the lookup, and note that the **Drivers license** value changes. Because this field is part of the key, click the original **Drivers license** value to reset it. Note that the **Drivers license**, **First name**, and **Last name** fields form a multi-part key, but the Excel App doesn't immediately change all parts of the multi-part key.
7. Click a **Start date** value. Note that a date picker now appears in the Excel App.
8. Click another date to change the **Start date** value.
9. Click **Design**, and edit the FleetRental data source by adding the **Status** field as a column in the table binding.
10. When you've finished adding the **Status** column, click a **Status** value. Note that an enum list now appears in the Excel App.
11. While focus is in the **Status** column, move up and down the list of rentals to see how quickly the enum list changes to reflect the current value. The whole enum list is shown, so that the user can quickly see all the available values.
12. Click a different **Status** value to see how an enum value can be changed by using a single click.

Create a relationship lookup

When relationships exist between entities, a relationship lookup is shown.

1. Start Visual Studio 2015 by opening the previously created project where the model is set to **Fleet Management**, or create a new project.
2. Click **View > Application Explorer** (or press Ctrl+E, Ctrl+E).
3. Navigate to **AOT > Data Model > Tables > FMCustGroup**.
4. Right-click, and then click **Open designer**.
5. In the designer, right-click **FMCustGroup**, and then click **Add-ins > Create data entity**. Artifacts are added to the project.
6. Open the designer view for **FMCustGroupEntity**.
7. In the property sheet for **FMCustGroupEntity**, set **Public Collection Name** to **FleetCustomerGroups** and **Public Entity Name** to **FleetCustomerGroup**.
8. Add the **CustGroup** and **Description** fields to the **AutoLookup** field group.
9. If **FMCustomerEntity** isn't already in the project, add it.
10. Open the designer view for **FMCustomerEntity**.
11. Right-click **Relations**, and then click **New > Relation**.
12. On the new relation, set **Name** to **CustomerGroup**, **Cardinality** to **ZeroMore**, **RelatedDataEntity** to **FMCustGroupEntity**, **RelatedDataEntityCardinality** to **ZeroOne**, **RelationshipType** to **Association**, **Role** to **CustomerGroupSource**, and **RelatedDataEntityRole** to **CustomerGroupTarget**.
13. Build the solution (press Ctrl+Shift+B).
14. Verify that the change was successful. In Internet Explorer, navigate to **Fleet Management > Customers > Customer**.
15. Click **Open in Microsoft Office > Open in Excel > Fleet Management Customers**.
16. Open the workbook that is generated.
17. Click a **Customer group** value.

18. Change the **Customer group** value for a customer.
19. Publish the change.
20. Change the value back, and publish that change.

Create a custom lookup

You can create custom lookups to show data options when an enum or relationship isn't sufficient. The main use case is when data must be retrieved from an external service and presented in real time.

1. Start Visual Studio 2015 by opening the previously created project where the model is set to **Fleet Management**, or create a new project.
2. Open the designer view for **FMCustomerEntity**.
3. Right-click **Methods**, and then click **New Method**.
4. Add the **lookup_Country** code from the following example.

```
public class FMCustomerEntity extends common
{
    [SysODataActionAttribute("FMCustomerEntityCountryCustomLookup", false), //Name in $metadata
    SysODataCollectionAttribute("_fields", Types::String), //Types in context
    SysODataFieldLookupAttribute("Country")] //Name of field
    public static str lookup_Country(Array _fields)
    {
        OfficeAppCustomLookupListResult result = new OfficeAppCustomLookupListResult();

        result.items().value(1, "US");
        result.items().value(2, "AU");
        result.items().value(3, "FR");
        result.items().value(4, "GR");
        result.items().value(5, "NZ");

        return result.serialize();
    }
}
```

5. Save the code. If you're asked whether you want to overwrite the existing code or save it as a new file, click **Overwrite**.
6. Build the solution (press Ctrl+Shift+B).
7. Verify that the change was successful. In Internet Explorer, navigate to **Fleet Management > Customers > Customer**.
8. Click **Open in Microsoft Office > Open in Excel > Fleet Management Customers**.
9. Open the workbook that is generated.
10. Click a **Country** value.
11. Change the **Country** value for a customer.
12. Publish the change.
13. Change the value back, and publish that change.

Export to Word experiences

Export to Word

Export to Word experiences can be used for lightweight reporting. They are powered by pre-built templates. The Export to Word experiences are listed on the **Open in Microsoft Office** menu. Let's look at an example

experience that has been created for Fleet Management Customers.

1. In Internet Explorer, navigate to **Fleet Management > Customers > Customer**.
2. Click **Open in Microsoft Office > Export to Word > Customer information Fleet Management Customers (unfiltered)**.
3. Download and open the document that is generated. The document contains data from the record that is currently selected.

Create a Word template

The Microsoft Dynamics App for Office can be run in Word to enable the creation of templates that can then be used for document generation.

1. Add a trusted catalog that points to the file share that contains the Microsoft Dynamics App manifest:
 - a. In Word, click **File > Options**.
 - b. Click **Trust Center > Trust Center Settings**.
 - c. Click **Trusted Add-in Catalogs**.
 - d. In the **Catalog URL** field, enter the file share location of the manifest.
 - e. Click **Add catalog**.
 - f. Click **OK**.
 - g. Click **OK**.
 - h. Restart Word.
2. Add the Microsoft Dynamics App to a document:
 - a. In Word, click **Insert > My Add-ins > Shared Folder > Microsoft Dynamics**.
 - b. Click **Insert**.
 - c. In the app, click **Add server information**.
 - d. In the **Server URL** field, enter the start of the URL (protocol + hostname). For example, enter `https://topo00dfa4stbobaos.cloudax.test.dynamics.com`.
 - e. Click **OK**.
 - f. Click **Yes** to apply the settings change and reload the app.
3. Sign in to the app:
 - a. Click **Sign In**. The Azure Active Directory sign-in screen should provide a list of credentials. If you encounter an error, force a sign-out (by using the sign-out link in the lower-right corner of the app), and then sign in again.
 - b. Select the appropriate account, or click **Use another account**.
 - c. Enter the credentials for that environment, and then click **Sign in**.
4. Load the template designer applet:
 - a. After sign-in, click **Load applets**.
 - b. Select **Template Designer**.
 - c. Click **OK**.
 - d. Click **Yes** to confirm.
 - e. Click **OK** to close the settings page. The latest OData metadata is loaded.
5. Follow one of these steps:
 - Add a fields data source:
 - a. In the app, click **Design**.
 - b. Click **Add fields**.
 - c. Select **FleetCustomer**.
 - d. Click **Next** to go to the field selection page.

- e. In the document, add a title and/or some blank lines at the top of the document.
 - f. In the app, in the **Available** list, select the **FirstName** field.
 - g. Click **Add label** to add a content control that references the "First name" label.
 - h. In the document, click to put focus into the document, click again to put focus at the end of the label, and then press the Right arrow key until the cursor is outside the content control (the control box will disappear).
 - i. Add a separator, such as space+hyphen+space (" - ") or space+colon+space (" : ").
 - j. In the app, click **Add value** to add a content control that references the **FirstName** field.
 - k. Repeat the process for the **LastName** field label and value.
 - l. Continue to add fields as desired.
- Add a table data source:
 - a. In the app, click **Design**.
 - b. Click **Add table**.
 - c. Select **FleetCustomer**.
 - d. Click **Next** to go to the field selection page.
 - e. In the document, add a title and/or some blank lines at the top of the document.
 - f. In the app, in the **Available fields** list, add the **FirstName**, **LastName**, and **City** fields.
 - g. Click **Done**.
6. In Word, save the template document.

Create a Word template and use it for document generation

After you've built a Word template, you can upload it to create an Export to Word experience.

1. Upload a template:
 - a. Navigate to **Common > Common > Office integration > Document templates**. Alternatively, search for the page.
 - b. Click **New**.
 - c. Click **Browse**.
 - d. In the dialog box, select a previously created template, and then click **Open**. Note that the Root data entity is obtained from the template and appears near the bottom of the dialog box.
 - e. Click **OK**.
 - f. Scroll down the list of templates to confirm that the template was added.
 - g. Optional: If the template should not be filtered to the user's current record, clear the **Apply current record filter** check box.
 - h. Optional: If the template should not be filtered to the user's current company, clear the **Apply company filter** check box.
2. Use the uploaded template for document generation:
 - a. Navigate to a page that shares the same root data source as the template's root data entity. For **FleetCustomer (FMCustomerEntity)**, that page is **Fleet Management > Customers > Customer**.
 - b. Click **Open** in **Microsoft Office > Export to Word**, and click the template.
 - c. Download and open the document that is generated.

Document Management and SharePoint experiences

Add a SharePoint document type

The Document Management subsystem can be used to attach files to records. Most non-executable file types are supported as attachments. A document preview is provided for Office document files and PDFs. Administrators

create document types to indicate where attachments should be stored. When administrators use SharePoint as the storage location, they must provide a specific folder that the files should be put in. Security of that SharePoint folder is a separate administration responsibility.

1. In Internet Explorer, navigate to **Organization administration > Document management > Document management parameters**.
2. Click **SharePoint**.
3. Make sure that the **Default SharePoint server** field is set to a default value for the tenant, such as **contosoax7.sharepoint.com**.
4. Click **Test SharePoint connection**. Note a successful connection.
5. Click **Save**.
6. Navigate to **Organization administration > Document management > Document types**.
7. Click **New**.
8. Set **Type** to **SharePointDoc**.
9. Set **Name** to **SharePointDoc**.
10. Set **Location** to **SharePoint**.
11. Click the **Edit** (pencil) button next to the **SharePoint Address** field.
12. On the left side of the dialog box, select a site. For the contosoax7 tenant, select **ContosoAX Team Site**.
13. On the right side of the dialog box, select a folder. For the contosoax7 tenant, select **ContosoAX Team Site > Documents > OfficeIntegration > Attachments**.
14. Click **OK**.
15. Click **Save**.
16. Click the **Browse** (globe) button next to the **SharePoint Address** field. Note that a new browser tab that shows the selected folder appears.
17. Use Windows Explorer to create a Word document in the Documents folder, and enter a few words in the document.
18. In Internet Explorer, navigate to **Fleet Management > Customers > Customer**.
19. Put focus on the first customer, and then click the **Attach** (paperclip) button in the upper-right corner of the page.
20. Click **New > SharePointDoc**.
21. Click **Browse**, and select the Word document that you created.
22. Expand the **Preview** FastTab to see a preview of the Word document.
23. Expand the **Attachment** FastTab to see the file location of the Word document.
24. In Internet Explorer, use the previously opened tab that shows the SharePoint folder to double-check that the file has been placed appropriately.

Email experiences

Send mail via a local mail client

Email workflows that are enabled via the SysEmail framework can generate email messages (.eml files) that contain attachments. You can then send these messages via Microsoft Outlook or another email client.

1. In Internet Explorer, navigate to **Accounts receivable > Customers > All customers**.
2. Select **US-008 Sparrow Retail**.
3. Click **Collect > Customer balances > Collections** to open the **Collections** page.
4. Click **Communicate > Email > Statements to contact**.
5. Click **OK** to accept the default values in the dialog box.
6. If you're prompted for the mail option to use, clear the **Do not ask again** check box (you can change this option from the user options page), select **Use an email app, such as Outlook**, and then click **OK**.

7. If you're running Internet Explorer on your laptop, open the email (.eml) file that is generated. If you're running Internet Explorer on the VM, copy the file to your laptop, and open it there.
8. Note the email address in the **To** field and the generated workbook attachment.

Send mail via SMTP

Email workflows that are enabled via the SysEmail framework can also be created in a simple email dialog box and then sent via Simple Mail Transfer Protocol (SMTP).

1. In Internet Explorer, navigate to **System administration > Setup > Email > Email parameters**.
2. Click **SMTP settings**.
3. Set the **Outgoing mail server** to the desired SMTP server:
 - For [Microsoft 365 production](#) (including *.onmicrosoft.com accounts): smtp.office365.com (Find this setting via outlook.office.com, at **Settings > Mail > POP and IMAP**.)
 - For Outlook/Hotmail: smtp-mail.outlook.com
4. Set the user name and password to an appropriate email account and password.
5. Leave **SSLRequired** turned on, and leave **SMTP port number** set to **587**.
6. Click **Save**.
7. In Internet Explorer, navigate to **Accounts receivable > Customers > All customers**.
8. Select **US-008 Sparrow Retail**.
9. Click **Collect > Customer balances > Collections** to open the **Collections** page.
10. Click **Communicate > Email > Statements to contact**.
11. Click **OK** to accept the default values in the dialog box.
12. If you're prompted for the mail option to use, select **Use the Microsoft Dynamics 365 for Finance and Operations email client**, and then click **OK**.
13. To receive the test message, change the **To** address to your email address.
14. Enter a subject and body for the message.
15. Click **Send**. The message should be delivered in one to five minutes. Note that the message will appear to be sent from the email account that is set on the **Email parameters** page. If that email account is given "Send As" (or "Send email from this mailbox") permissions for the From address that is used in the **Send email** dialog box, messages will appear to come from that address.
 - You can configure "Send As" permissions in the Microsoft 365 admin center (portal.office.com/Admin), at **Users > Active users > User > Edit mailbox permissions > Send email from this mailbox**. For more information, see [Enable sending email from another user's mailbox in Microsoft 365](#).
 - Before users can send email messages, "Send As" permissions for each user email account in the client must be given to the email account that is set on the **Email parameters** page. For more information, see [How to set up a multifunction device or application to send email using Microsoft 365](#).
16. Email that is sent directly from the server, without user interaction, is sent via a batch process and requires that the **Email distributor batch** process be started. Follow these steps to start the process:
 - a. Navigate to **System administration > Periodic tasks > Email processing > Batch**.
 - b. Turn on **Batch processing**.

Additional resources

[Office integration overview](#)

[Troubleshoot the Office integration](#)

NOTE

Can you tell us about your documentation language preferences? [Take a short survey](#).

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

View and update entity data with Excel

2/18/2021 • 9 minutes to read • [Edit Online](#)

Applies to these Dynamics 365 apps:

Commerce, Finance, Supply Chain Management

IMPORTANT

Some or all of the functionality noted in this topic is available as part of a preview release. The content and the functionality are subject to change. For more information about preview releases, see [Service update availability](#).

This topic explains how to open entity data in Microsoft Excel, and then view, update, and edit the data by using the Microsoft Dynamics Excel add-in. To open entity data, you can start from either Excel or Finance and Operations apps.

By opening entity data in Excel, you can quickly and easily view and edit the data by using the Excel add-in. This add-in requires Microsoft Excel 2016 or later.

NOTE

If your Microsoft Azure Active Directory (Azure AD) tenant is configured to use Active Directory Federation Services (AD FS), you must make sure that the May 2016 update for Office has been applied, so that the Excel add-in can correctly sign you in.

To learn more about how to use the Excel add-in, watch the short [Create an Excel template for header and line patterns](#) video.

Open entity data in Excel when you start from a Finance and Operations app

1. On a page in a Finance and Operations app, select **Open in Microsoft Office**.

If the root data source (table) for the page is the same as the root data source for any entities, default **Open in Excel** options are generated for the page. **Open in Excel** options can be found on frequently used pages, such as **All vendors** and **All customers**.

2. Select an **Open in Excel** option, and open the workbook that is generated. This workbook has binding information for the entity, a pointer to your environment, and a pointer to the Excel add-in.
3. In Excel, select **Enable editing** to enable the Excel add-in to run. The Excel add-in runs in a pane on the right side of the Excel window.
4. If you're running the Excel add-in for the first time, select **Trust this Add-in**.
5. If you're prompted to sign in, select **Sign in**, and then sign in by using the same credentials that you used to sign in to the Finance and Operations app. The Excel add-in will use a previous sign-in context from the browser and automatically sign you in, if it can. (For information about the browser that is used based on the operating system, see [Browsers used by Office add-ins](#)) To ensure that sign-in was successful, verify the user name in the upper-right corner of the Excel add-in.

The Excel add-in automatically reads the data for the entity that you selected. Note that there will be no data in

the workbook until the Excel add-in reads it in.

Open entity data in Excel when you start from Excel

1. In Excel, on the **Insert** tab, in the **Add-ins** group, select **Store** to open the Office Store.
2. In the Office Store, search on the keyword **Dynamics**, and then select **Add** next to **Microsoft Dynamics Office Add-in** (the Excel add-in).
3. If you're running the Excel add-in for the first time, select **Trust this Add-in** to enable the Excel add-in to run. The Excel add-in runs in a pane on the right side of the Excel window.
4. Select **Add server information** to open the **Options** pane.
5. In your browser, copy the URL of your target Finance and Operations app instance, paste it into the **Server URL** field, and then delete everything after the host name. The resulting URL should have only the host name.

For example, if the URL is `https://xxx.dynamics.com/?cmp=usmf&mi=CustTableListPage`, delete everything except `https://xxx.dynamics.com`.

6. Select **OK**, and then select **Yes** to confirm the change. The Excel add-in is restarted and loads metadata.

The **Design** button is now available. If the Excel add-in has a **Load applets** button, you probably aren't signed in as the correct user. For more information, see "The Load applets button is shown" in the [Troubleshooting](#) section of this topic.
7. Select **Design**. The Excel add-in retrieves entity metadata.
8. Select **Add table**. A list of entities appears. The entities are listed in "Name - Label" format.
9. Select an entity in the list, such as **Customer - Customers**, and then select **Next**.
10. To add a field from the **Available fields** list to the **Selected fields** list, select the field, and then select **Add**. Alternatively, double-click the field in the **Available fields** list.
11. After you've finished adding fields to the **Selected fields** list, make sure that the cursor is in the correct place in the worksheet (for example, cell A1), and then select **Done**. Then select **Done** to exit the designer.
12. Select **Refresh** to pull in a set of data.

View and update entity data in Excel

After the Excel add-in reads entity data into the workbook, you can update the data at any time by selecting **Refresh** in the Excel add-in.

Edit entity data in Excel

You can change entity data as you require and then publish it back to Finance and Operations apps by selecting **Publish** in the Excel add-in. To edit a record, select a cell in the worksheet, and then change the cell value. To add a new record, follow one of these steps:

- Click anywhere in the data sources table, and then select **New** in the Excel add-in.
- Click anywhere in the last row of the data sources table, and then press the Tab key until the cursor moves out of the last column of that row and a new row is created.
- Click anywhere in the row immediately below the data sources table, and start to enter data in a cell. When you move the focus out of that cell, the table expands to include the new row.
- For field bindings of header records, select one of the fields, and then select **New** in the Excel add-in.

Note that a new record can be created only if all the key and mandatory fields are bound in the worksheet, or if default values were filled in by using the filter condition.

To delete a record, follow one of these steps:

- Right-click the row number next to the worksheet row that should be deleted, and then select **Delete**.
- Right-click anywhere in the worksheet row that should be deleted, and then select **Delete > Table Rows**.

If data sources have been added as related data sources, the header is published before the lines. If there are dependencies between other data sources, you might have to change the default publishing order. To change the publishing order, in the Excel add-in, select the **Options** button (the gear symbol), and then, on the **Data Connector** FastTab, select **Configure publish order**.

Add or remove columns

You can use the designer to adjust the columns that are automatically added to the worksheet.

NOTE

If the **Design** button doesn't appear below the **Filter** button in the Excel add-in, you must enable the data source designer. Select the **Options** button (the gear symbol), and then select the **Enable design** check box.

1. In the Excel add-in, select **Design**. All the data sources are listed.
2. Next to the data source, select the **Edit** button (the pencil symbol).
3. In the **Selected fields** list, adjust the list of fields as you require:
 - To add a field from the **Available fields** list to the **Selected fields** list, select the field, and then select **Add**. Alternatively, double-click the field in the **Available fields** list.
 - To remove a field from the **Selected fields** list, select the field, and then select **Remove**. Alternatively, double-click the field.
 - To change the order of fields in the **Selected fields** list, select a field, and then select **Up** or **Down**.
4. To apply your changes to the data source, select **Update**. Then select **Done** to exit the designer.
5. If you added a field (column), select **Refresh** to pull in an updated set of data.

Change the publish batch size

When users publish changes to data records by using the Excel add-in, the updates are submitted in batches. The default publish batch size is 100 rows. In version 10.0.17 and later, the **Allow configuration of the publish batch size in the Excel add-in** feature gives you flexible control over the publish batch size.

System administrators can specify a system-wide limit on the publish batch size for "Open in Excel" workbooks by setting the **Publish batch limit** field in the **App parameters** section of the **Office app parameters** page.

The publish batch size can also be changed for an individual workbook by using the Excel add-in.

1. Open the workbook in Excel.
2. Select the **Option** (gear) button in the upper right of the Excel add-in.
3. Set the **Publish batch size** field as desired. The value that you set must be less than the system-wide publish batch limit.
4. Select **OK**.
5. Save the workbook. If you don't save the workbook after you make changes to the add-in settings, those changes won't persist when the workbook is reopened.

Excel workbook template authors can use the same procedure to set the publish batch size for templates before they upload them into the system.

Copy environment data

The data that is read into the workbook from one environment can be copied to another environment. However, you can't just change the connection URL, because the data cache in the workbook will continue to treat the data as existing data. Instead, you must use the Copy Environment Data functionality to publish the data to a new environment as new data.

1. Select the **Options** button (the gear symbol), and then, on the **Data Connector** FastTab, select **Copy Environment Data**.
2. Enter the server URL for the new environment.
3. Select **OK**, and then select **Yes** to confirm the action. The Excel add-in is restarted and connects to the new environment. Any existing data in the workbook is treated as new data.

After the Excel add-in is restarted, a message box states that the workbook is in Environment copy mode.

4. To copy the data into the new environment as new data, select **Publish**. To cancel the environment copy operation and review the existing data in the new environment, select **Refresh**.

Troubleshooting

There are a few issues that can be resolved through some easy steps.

- **The Load applets button is shown** – If the Excel add-in has a **Load applets** button after sign-in, you probably aren't signed in as the correct user. To resolve this issue, verify that the correct user name appears in the upper-right corner of the Excel add-in. If an incorrect user name appears, select it, sign out, and then sign back in.
- **You receive a "Forbidden" message** – If you receive a "Forbidden" message while the Excel add-in is loading metadata, the account that is signed in to the Excel add-in doesn't have permission to use the targeted service, instance, or database. To resolve this issue, verify that the correct user name appears in the upper-right corner of the Excel add-in. If an incorrect user name appears, select it, sign out, and then sign back in.
- **A blank webpage is shown over Excel** – If a blank webpage is opened during the sign-in process, the account requires AD FS, but the version of Excel that is running the Excel add-in isn't recent enough to load the sign-in dialog box. To resolve this issue, update the version of Excel that you're using. To update the version of Excel when you're in an enterprise that is on the deferred channel, use the [Office deployment tool to move from the deferred channel to the current channel](#).
- **You receive a time-out while you publish data changes** – If you receive time-out messages while you're trying to publish data changes to an entity, consider reducing the publish batch size for the affected workbook. Entities that trigger larger amounts of logic on record changes might require updates to be sent in smaller batches to help prevent time-outs.

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Create Open in Excel experiences

2/18/2021 • 18 minutes to read • [Edit Online](#)

Applies to these Dynamics 365 apps:

Commerce, Finance, Human Resources, Supply Chain Management

Learn about creating Open in Office experiences for Excel and Word.

What are Open in Excel experiences?

Open in Excel experiences are:

- Based on entities and the OData services that they create.
- Dynamically-generated or based on a pre-defined template.
- Editable and refreshable via the Excel Add-in.

The following image shows the **Excel Add-in** being used for Journal entry.

The screenshot displays an Excel spreadsheet titled "LedgerJournalLineEntryTemplate_635702638412497567(1) [Read-Only] - Excel". The spreadsheet is titled "General Ledger Journal Entry" and contains a table of journal entries. The table has columns for Date, Account type, MainAccount, BusinessUnit, Department, Description, Currency, Debit, and Credit. The data shows various entries for "Benefits" and "Payroll Tax" for the date 1/20/2011. A summary row at the bottom shows Totals with a Debit of 3,575,931.49 and a Credit of 710,016.87. On the right side of the spreadsheet, there is a "Microsoft Dynamics DATA CONNECTOR" panel with options for Refresh, Publish, Filter, and Design.

Date	Account type	MainAccount	BusinessUnit	Department	Description	Currency	Debit	Credit
1/20/2011	Ledger	602180	002	026	Benefits	USD	2,808.00	\$ -
1/20/2011	Ledger	602180	002	025	Benefits	USD	312.00	\$ -
1/20/2011	Ledger	602180	002	024	Benefits	USD	4,992.00	\$ -
1/20/2011	Ledger	602180	002	023	Benefits	USD	19,656.00	\$ -
1/20/2011	Ledger	602180	002	022	Benefits	USD	3,432.00	\$ -
1/20/2011	Ledger	602180	001	026	Benefits	USD	4,212.00	\$ -
1/20/2011	Ledger	602180	001	025	Benefits	USD	468.00	\$ -
1/20/2011	Ledger	602180	001	024	Benefits	USD	7,488.00	\$ -
1/20/2011	Ledger	602180	001	023	Benefits	USD	29,484.00	\$ -
1/20/2011	Ledger	602180	001	022	Benefits	USD	5,148.00	\$ -
1/20/2011	Ledger	602120	002	026	Payroll Tax	USD	2,246.40	\$ -
1/20/2011	Ledger	602120	002	025	Payroll Tax	USD	249.60	\$ -
1/20/2011	Ledger	602120	002	024	Payroll Tax	USD	3,993.60	\$ -
1/20/2011	Ledger	602120	002	023	Payroll Tax	USD	15,724.80	\$ -

Where are the Open in Excel experiences?

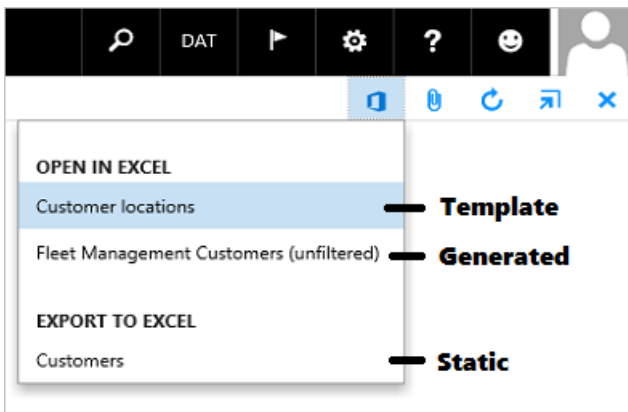
Open in Excel experiences are usually found under in the Open in Excel section of the Open in Microsoft Office menu, but an explicit button can be added for these experiences.

What's the difference between Export to Excel and Open in Excel?

The Export to Excel options and experiences are both found in the Open in Microsoft Office menu:

- The Export to Excel options are static exports of grid data. Each one corresponds to a visible grid. All the grid data for the current filter is placed into a workbook.
- The Open in Excel experiences utilize the Excel Add-in to facilitate refresh and publish.

The following image shows the **Open in Microsoft Office** menu on the **Fleet Customers** form with a template **Open in Excel** option, a generated **Open in Excel** option, and a static **Export to Excel** option.

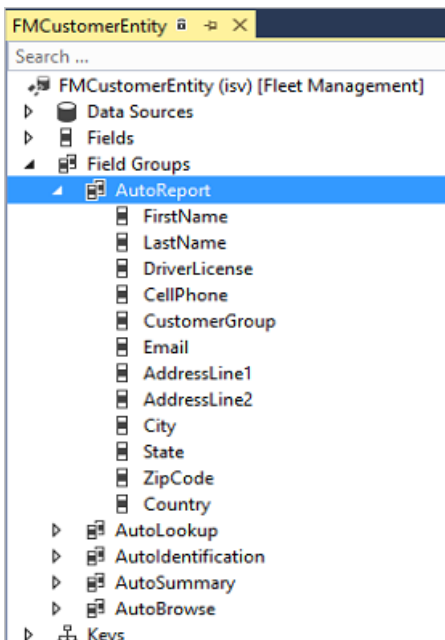


When will an entity show as an Open in Excel option?

When an entity has the same root datasource (table) as a form, it will be added as an option in the Open in Excel section of the Open in Microsoft Office menu. This is referred to as a "generated" option.

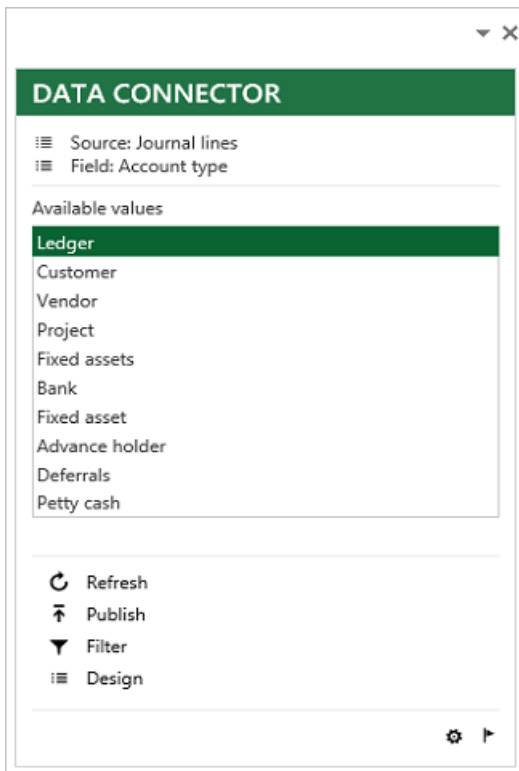
What fields will be shown in the workbook?

The default fields that will be added into the workbook are the key and mandatory fields of the entity. If a different set of fields should be provided by default, then those fields can be added into the **AutoReport field group** on the entity. The following image shows the Visual Studio view of the AutoReport field group for the FMCustomerEntity.



What fields will be shown when an entity is the target of a lookup?

When a relationship is defined between two entities, if the identifier for one entity is shown on the other entity, then the fields that will be shown in that lookup are either the key fields, or the fields in the **AutoLookup field group** if it is not empty. Relationship lookups are not currently supported, but they will eventually be displayed in the app in a similar way to the enumeration lookups. The Excel Add-in with an enumeration lookup is shown below.



What should be done to make an entity ready for use in Excel?

Define the AutoReport and AutoLookup field groups and test them using the Excel App design experience.

Why does an automatically added entity option have "(unfiltered)" after the entity name?

Currently, a filter is not added to these options, hence the term "(unfiltered)". In the future, an attempt will be made to apply the filter from the form to these options. For example, if a list of Customers was filtered to just Customers in the state of California, then, in the future, the entity will be scanned for the state field and if it is found then a filter would be added automatically.

How can an entity be added as an Open in Excel option on a form that doesn't share the same root datasource?

A generated Open in Excel option can be added on any form by implementing the `OfficeGeneratedWorkbookCustomExporter` interface. When adding a generated option programmatically, the set of fields can be explicitly specified. For more information, see [Modifying the Open in Office menu through interfaces](#).

What are the region-specific considerations for defining entities?

The Open in Excel generated experiences can be made region-specific by adding region-specific fields into the AutoLookup group. These region-specific fields will then be included in the generated workbook.

How can I create a custom lookup for an entity field in Excel?

A custom lookup can be shown for an Entity field.

- Name - The method needs to have a name that is "lookup_<fieldname>" e.g. a field "MyField" could have a lookup method "lookup_MyField".
- Attributes – Attributes need to be added to the method:

- SysODataActionAttribute(str <name>, Boolean <isInstanceMethod>)
- SysODataCollectionAttribute(str <name>, Types <type>, "Value")
- Return – The method should return a list of strings.

Example

```
public class ExportToExcel_SimpleEntity extends common
{
    [SysODataActionAttribute("Lookup_StringLookupField", true),
    SysODataCollectionAttribute("return", Types::String, "Value")]
    public List lookup_StringLookupField()
    {
        List lookupList = new List(Types::String);
        const int items = 5;

        for (int item = 0; item < items; item++)
        {
            lookupList.addEnd(strfmt('%1 - %2 (%3)', this.StringField, this.IntField, item));
        }

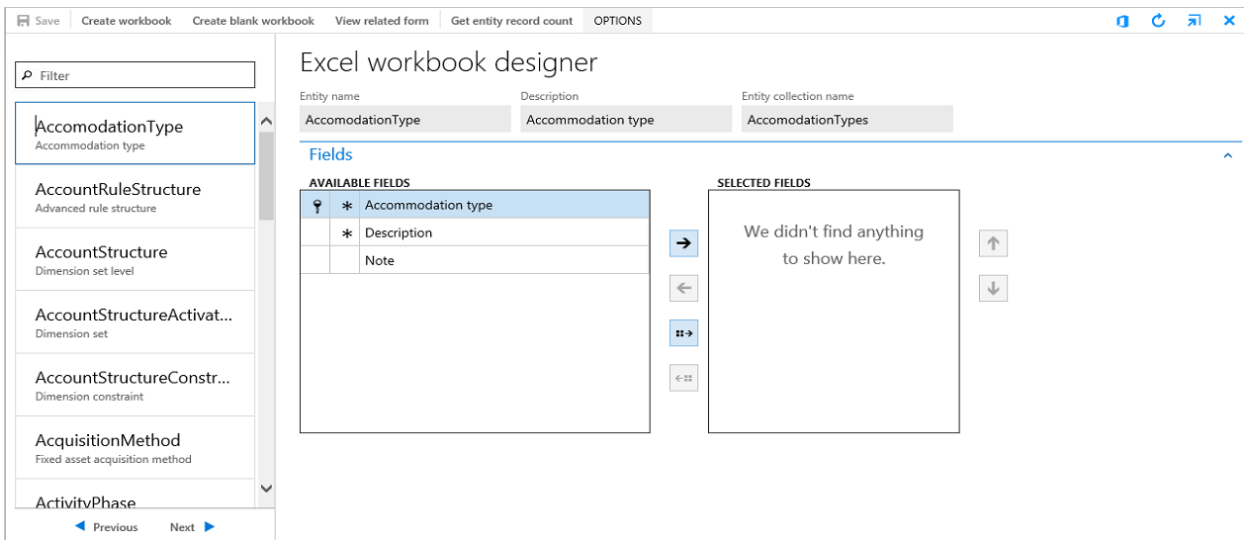
        return lookupList;
    }
}
```

How does the app get injected into a workbook to start building a template?

The Excel Add-in is injected into a workbook when a generated Open in Excel experience is triggered or when a workbook is created using the **Common > Common > Office integration > Excel workbook designer** form.

- The **Create workbook** button will add the selected entity and fields, a pointer to the server, and the app into a workbook.
- The **Create blank workbook** button will simply add a pointer to the server and the app into a workbook.
- The **View related** form will navigate to the form relating to the currently selected entity to more easily review the effect of data changes made in Excel.
- The **Get entity record count** button will show the record count for the currently selected entity. The Excel Add-in will handle large sets of data within the memory limits of a user's machine. By default, the Excel Add-in has a data governor that restricts the data size to one million cells but, depending on the performance abilities of the user's machine, this can usually be extended to around 2.5 million cells.

The following image shows the **Excel workbook designer** form.



After obtaining a workbook containing the Excel Add-in, additional datasources can be added using the **Design** button. Currently, datasources cannot be removed.

When will a template show as an Open in Excel option?

When a template listed in the **Common > Common > Office integration > Document templates** form (DocuTemplate) has `ShowInOpenInOfficeMenu` set to `Yes` and has the same root datasource (table) as the current form, it will be added as an option in the **Open in Excel** section of the **Open in Microsoft Office** menu. The following image shows the **Document templates** form.

TEMPLATE TYPE	TEMPLATE NAME	COMPANY	LANGUAGE	ROOT DATA ENTITY	TEMPLATE DISPLAY NAME	DESCRIPTION
Excel	FMTemplateCustomersWithLocati			FMCustomerEntity	Customer locations	Template provides a map of custo
Excel	FMTemplateRentalsByStatus			FMRentalEntity	Rentals by status	Template provides rental status cc
Excel	LedgerJournalLineEntryTemplate			LedgerJournalHeaderEntity	LedgerJournalLineEntryTemplate	General journal line entry using an
Word	DocuGenerationTestStringKeyTem			ExportToExcel_StringKeyEntity	DocuGenerationTestStringKeyTem	This is a test description

Will a filter be added to the template?

In the **Document Templates** form, the standard filter for "current record" can be turned on and off. If the filter is on, when the template is invoked as an **Open in Excel** option, then a filter for the current record will be added to the workbook. The filter will be the key fields and their values.

How can templates be defined in metadata and code and loaded automatically?

When adding a template into the **Document Templates** form, it is added for that instance and is referred to as a "user-defined" template. Templates can also be defined in metadata and code and loaded automatically, thus making them "system-defined" templates. To create a system-defined template using metadata and code, you need to do the following:

- Define the template.
- Create a new resource in a project.
- Define a new class that extends the `DocuTemplateRegistrationBase` class and add an implementation of the `registerTemplates` method.

The `LedgerJournalLineEntryTemplateRegistration` and `FMTemplateRegistrations` classes are good examples of

template registrations defined in code. The `LedgerJournalLineEntryTemplate` and `FMTemplateCustomersWithLocations` resources are the corresponding templates stored in metadata as resources. When a template has a registration class, it will be loaded when the **Reload system templates** button is clicked in the **Document Templates** form.

How do templates get loaded into a fresh deployment?

To load system defined templates, click the **Reload system templates** button in the **Common > Common > Office integration > Document templates** form, as shown below.



In the future, we will do the equivalent of clicking that button during deployment.

How do I decide if I should create a template?

A template is an artifact that needs to be maintained and versioned. If you can avoid defining a template without sacrificing much from the user experience, then you probably should use a template. Create a template if:

- You need additional content or formatting in the template.
- You want to combine multiple entities/datasources in the same workbook.

Don't create a template if:

- You can just specify a set of fields to show in a table binding.

What are the region-specific considerations for templates?

When creating a template for an entity that has region-specific fields, you should leave those region-specific fields out of the template, otherwise all users will see the region-specific fields. Templates should cater to the majority of users by default and region-specific users can add those fields using the easy-to-use design experience of the Excel Add-in. The region-specific fields and columns can be added by users as needed. That template can be either saved to local computer for reuse by a single user or uploaded via the Document Templates form for reuse by any user of that instance. A couple of other considerations:

- If a region has a region-specific entity, then a region-specific template could be created.
- If a region is important enough, then you could define a region-specific template as well as a region-generic template.

How do I add an explicit button for a template Open in Excel option?

An explicit button can be added for Open in Excel experiences. The label shown on the button should usually be "Open target in Excel" where target is the name of the target data like "lines" or "catalog". The code behind such a button will:

- Obtain the template to be used.
- Add a filter.
- Pass the template to the user.

An example of this code can be found on the `LedgerJournalTable` form (**General ledger > Journals > General journal**) in the `Clicked` method on the `OpenLinesInExcel` button.

```

[Control("Button")]
class OpenLinesInExcel
{
    /// <summary>
    /// Opens the current journal in Excel for line entry and editing
    /// </summary>
    public void clicked()
    {
        super();

        const str templateName = resourceStr(LedgerJournalLineEntryTemplate);
        DocuTemplate template = DocuTemplate::findTemplate(OfficeAppApplicationType::Excel,
templateName);

        // Ensure the template was present
        if (template && template.TemplateID == templateName)
        {
            Map filtersToApply = new Map(Types::String, Types::String);

            // Create lines filter
            ExportToExcelFilterBuilder filterBuilder = new
ExportToExcelFilterBuilder(tablestr(LedgerJournalLineEntity));
            str filterString = filterBuilder.areEqual(fieldstr(LedgerJournalLineEntity, JournalBatchNumber),
LedgerJournalTable.JournalNum);
            filtersToApply.insert(tablestr(LedgerJournalLineEntity), filterString);

            // Create header filter
            filterBuilder = new ExportToExcelFilterBuilder(tablestr(LedgerJournalHeaderEntity));
            filterString = filterBuilder.areEqual(fieldstr(LedgerJournalHeaderEntity, JournalBatchNumber),
LedgerJournalTable.JournalNum);
            filtersToApply.insert(tablestr(LedgerJournalHeaderEntity), filterString);

            // Generate the workbook using the template and filters
            DocuTemplateRender renderer = new DocuTemplateRender();
            str documentUrl = renderer.renderTemplateToStorage(template, filtersToApply);

            // Pass the workbook to the user
            if (documentUrl)
            {
                Browser b = new Browser();
                b.navigate(documentUrl, false, false);
            }
            else
            {
                error(strFmt("@ApplicationFoundation:DocuTemplateGenerationFailed", templateName));
            }
        }
        else
        {
            warning(strFmt("@ApplicationFoundation:DocuTemplateNotFound", templateName));
        }
    }
}

```

The following image shows the **General ledger > Journals > General journal** form with the **Open lines in Excel** button highlighted.

General journal

Show: All Show user-created only

LIST GENERAL SETUP BLOCKING FINANCIAL DIMENSIONS HISTORY

✓	NAME	JOURNAL BAT... ↑	DESCRIPTION	POSTED	LOG	I...	REVERSING ENTRY	REVERSING DATE
	GenJrn	00001	Payroll - Jan	<input checked="" type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	
	GenJrn	00002	Payroll - Feb	<input checked="" type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	
	GenJrn	00342	Payroll - Mar	<input checked="" type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	
	GenJrn	00343	Payroll - Apr	<input checked="" type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	
	GenJrn	00344	Payroll - May	<input checked="" type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	
	GenJrn	00345	Payroll - Jun	<input checked="" type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	
	GenJrn	00346	Payroll - Jly	<input checked="" type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	
	GenJrn	00347	Payroll - Aug	<input checked="" type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	

◀ Previous Next ▶

To programmatically add generated and template Open in Excel options, Open in Excel options can be added by implementing the `ExportToExcelGeneratedCustomExport` and `ExportToExcelTemplateCustomExport` interfaces. This allows the addition of options to forms where the entity or template doesn't have the same table as the root datasource. An example of when you would use this capability is on forms without a datasource, potentially containing only a collection of form parts. The following example adds generated and template Open in Excel options programmatically to the **FM Rental** form.

```

[Form]
public class FMRental extends FormRun implements ExportToExcelGeneratedCustomExport,
ExportToExcelITemplateCustomExport
{
...

    public List getExportOptions()
    {
        List exportOptions = new List(Types::Class);

        ExportToExcelExportOption exportOption =
ExportToExcelExportOption::construct(ExportToExcelExportType::CustomGenerated, int2str(1));
        exportOption.setDisplayNameWithDataEntity(tablestr(FMRentalEntity));
        exportOptions.addEnd(exportOption);

        ExportToExcelExportOption exportOption2 =
ExportToExcelExportOption::construct(ExportToExcelExportType::CustomTemplate, int2str(2));
        exportOption2.displayName("Analyze rentals");
        exportOptions.addEnd(exportOption2);

        return exportOptions;
    }

    public ExportToExcelDataEntityContext getDataEntityContext(ExportToExcelExportOption _exportOption)
    {
        ExportToExcelDataEntityContext context = null;

        if (_exportOption.id() == int2str(1))
        {
            context = ExportToExcelDataEntityContext::construct(tablestr(FMRentalEntity),
tablefieldgroupstr(FMRentalEntity, AutoReport));
        }

        return context;
    }

    public System.IO.Stream getTemplate(ExportToExcelExportOption _exportOption)
    {
        System.IO.Stream stream = null;

        if (_exportOption.id() == int2str(2))
        {
            stream =
Microsoft.Dynamics.Ax.Xpp.MetadataSupport::GetResourceContentStream(resourcestr(FMRentalEditableExportTempla
te));
        }

        return stream;
    }

    public void updateTemplateSettings(ExportToExcelExportOption _exportOption,
Microsoft.Dynamics.Platform.Integration.Office.ExportToExcelHelper.SettingsEditor _settingsEditor)
    {
    }
...

```

How do I add a filter for a programmatically-added template Open in Excel option?

A template Open in Excel option can be programmatically added by implementing the `ExportToExcelITemplateCustomExport` interface and providing a template in the `getTemplate` method. A filter for that option can be programmatically added by using the `ExportToExcelFilterBuilder` API in the `updateTemplateSettings` method.

```

public void updateTemplateSettings(ExportToExcelExportOption _exportOption,
Microsoft.Dynamics.Platform.Integration.Office.ExportToExcelHelper.SettingsEditor _settingsEditor)

{

_settingsEditor.SetFilterExpression(tableStr(RetailTmpBulkProductAttributeValueEntity),
element.getExportToExcelFilterExpression());

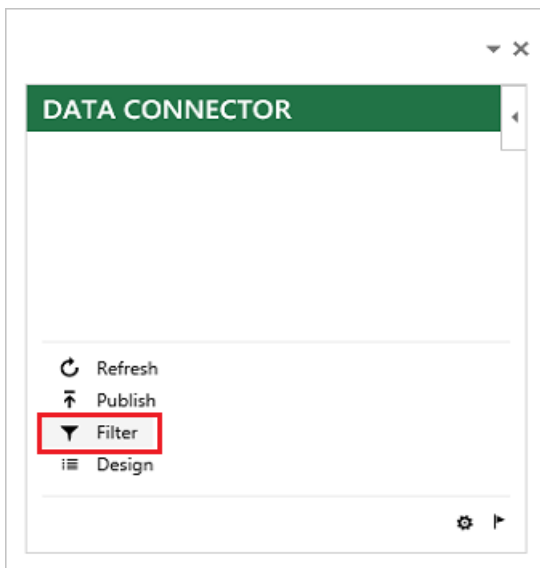
DictDataEntity dictDataEntity = new DictDataEntity(tableNum(RetailTmpBulkProductAttributeValueEntity));

_settingsEditor.SetFilterExpressionByPublicName(dictDataEntity.publicEntityName(),
element.getExportToExcelFilterExpression());

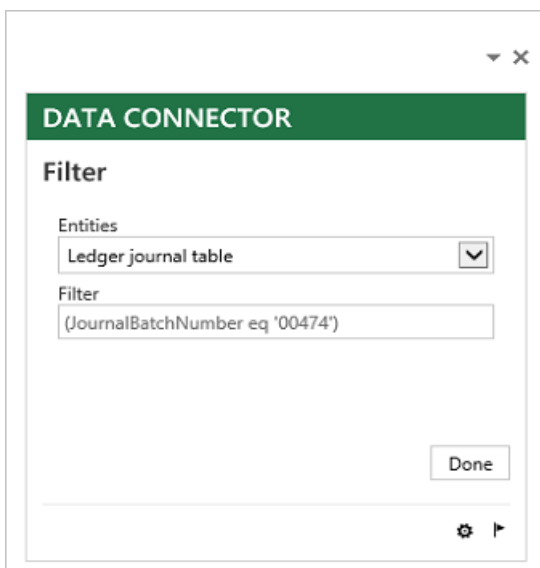
}

```

After a filter has been added programmatically, the resulting filter can be viewed in the Excel Add-in using the **Filter** button. The following image shows the Excel Add-in with the **Filter** button highlighted.



The following image shows the Excel Add-in with the **Filter** dialog box opened.



How do I enable relationship lookups in Excel?

To enable relationship lookups in the Excel Data Connector, you must ensure that the following metadata is set.

- The Role and Related Data Entity Role defined on the relationship need to be unique among all

relationships on both the source and target entity. Also, the relation role properties must be unique across all entities. This is particularly important for relationships involving entities with many relationships, such as DimensionCombinationEntity. If you're not seeing an expected lookup, try changing the role names to the following format:

- **Role:** [this entity's public name] + [target entity's public name] + [target entity field] + "Source"
- **Related Data Entity Role:** [this entity's public name] + [target entity's public name] + [target entity field] + "Target"
- The Cardinality and Related Data Entity Cardinality need to be set appropriately.
- At least one constraint must be added to the relationship. With the exception of dimension relationships, which are a special case, the properties constrained must both be public.

How can I enable users to create new header records as well as lines in a workbook?

To enable creation of header records and related lines, the header data source must be added as a set of "fields" and the lines data source must be added as a related table. This pattern can work well for document data entry scenarios such as Journal entry.

To learn more about header records and related lines, watch the short [Create an Excel template for header and line patterns in Dynamics 365 for Finance and Operations](#) video.

To design a workbook with header fields and a lines table that enables header creation:

1. In the Excel Add-in, click **Design** to open the Designer. Select **Add fields** to add a header data source.
2. Select the header fields that you want to use. Be sure to include all the key fields or the **New** button won't be enabled.
3. For all of the string header value fields, manually apply "Text" format for that cell using **Excel ribbon > Home tab > Number group > set "Number"** in the format drop-down menu. If the Text format isn't manually set on a string field and there's a string value with leading zeros like "00045", then Excel will automatically change it to "45" and an error will be shown like: *"Unable to change the value of PurchaseOrderHeader's PurchaseOrderNumber field as it is a key field"*. Currently, the API doesn't allow for automatically applying the text formatting on individual cells (versus table columns).
4. In the Designer, on the header data source, click the **Add related table** button represented by a double plus icon.
5. Select the line fields that you want to use.

Here's an example of a header data source with a related table data source.

- PurchaseOrderHeader (Fields)
 - dataAreald
 - PurchaseOrderNumber
 - PurchaseOrderName
 - OrderVendorAccountNumber
- PurchaseOrderLine (Table - related)
 - LineNumber
 - ItemNumber
 - LineDescription
 - OrderedPurchaseQuantity
 - LineAmount

To use a header and lines workbook to create a new header and lines, follow these steps:

1. In the workbook, move the focus to a cell with a header value.
2. In the Excel Add-in, click **New**.
3. Enter header values and lines as needed.
4. Select **Publish**.

How can fields be added, removed, or moved within an existing template workbook?

Fields can be added into an existing template workbook by editing the workbook stored in **Document Templates**.

1. Get the original template workbook.
 - a. Open the **Document Templates** form.
 - b. Find the existing template workbook.
 - c. Download the workbook.
 - d. Open the workbook and enable editing so that the Excel Add-in runs.
2. Make changes to the template.
 - a. In the Excel Add-in, select **Design**.
 - b. Click the **Edit** button (pencil icon) next to the datasource that you want to add a field into.
 - c. Add fields by moving them from the **Available fields** list into the **Selected fields** list. Double-clicking a field will move it. Remove fields by moving them from the **Selected fields** list into the **Available fields** list. Move fields using the **Up** and **Down** buttons.
 - d. After changes are complete, select **Update**, select **Yes** to confirm, and then select **Done** to exit the Designer (if appropriate, select **Refresh** to verify that the data is correctly populated).
 - e. Clear the data from the template before upload by clicking **Options** (gear icon), expand the **Data Connector** section, then click the **Clear binding data** button.
 - f. Use **Save As** to store the template somewhere temporarily.
3. Upload the changed template.
 - a. Return to the **Document Templates** form and upload the changed template.
 - b. Click **New** and browse to find the changed template.
 - c. Select the saved template file and click **Open**.
 - d. In the **Upload template** dialog box, remove the underscore and trailing random number from the name. For example, "CustInvoiceJournalTemplate_636564840743000567" becomes "CustInvoiceJournalTemplate".
 - e. A confirmation dialog box should show that "A template with this name already exists...", click **Yes** to confirm replacement of the previous template. Note that if this confirmation is not shown, then the template name is different and it is being uploaded as a new template.
4. Open the form that the template is used on and use the changed template.

Troubleshooting

If you are not seeing an expected lookup, validate relationship metadata by checking the metadata feed available at [YourSiteURL]/data/\$metadata. Search the \$metadat feed for the public name of your entity to find its EntityType element, then make sure there is a child NavigationProperty element with a name equal to the Role value of the relationship. If the navigation property exists, it will be used by the Excel Data Connector to show a relationship lookup. Lookups are not shown under the following conditions:

- All of the entity's key fields are included as constraints in the relationship.
- The selected field is a key and the selected record is not new.

- The authenticated user does not have permission to access the entity targeted by the lookup.

How do dimensions work?

The easiest way to set up dimension metadata on data entities is to use the data entity creation wizard, which will automatically create the private relationships and public display value fields exactly as the dimensions framework needs them. If you want to customize your dimensions setup, see [Add dimensions to Excel templates](#). Lookups, are only generated automatically for non-ledger dimensions. Custom dimensions are not supported currently. If you want to enable lookups for ledger dimensions (MainAccount, Department, CostCenter, etc.), see [Add dimensions to Excel templates](#) for guidance on creating relationships on DimensionCombationEntity and DimensionSetEntity fields. When those relationships are present, relationship lookups will be displayed in the Excel Data Connector. The Excel Data Connector supports two types of dimension data entry: editing the display value directly or editing each attribute of the display value in a separate column. If both the display value column and the individual attribute columns are bound, they can both be edited and published separately. If both the display value and an individual attribute are edited in the same row, the individual attribute change overrides the display value change.

How do I create formula table columns?

If a formula is needed in a table, then add a formula column. When in the field selection page for a table binding, click the **Formula** button above the Selected fields list to add a new formula column. The label and value for the formula are entered in the fields immediately below the Selected fields list. After adding a new formula column, leave the value empty and click **Update**. After the field has been added to the table, use standard Excel capabilities to create a formula, then copy the formula and paste it into the formula column value field. When defining a formula, make sure there is more than one row in the table, otherwise the formula that Excel provides may be for ALL rows instead of THAT row. To specify just the current row, the at sign (@) is needed. For example, sum of four columns for all rows `"=SUM(Table1[[ColumnA]:[ColumnD]])"` versus sum of four columns for the current row `"=SUM(Table1[@[ColumnA]:[ColumnD]])"`.

Known issues

Refresh doesn't automatically occur in old templates

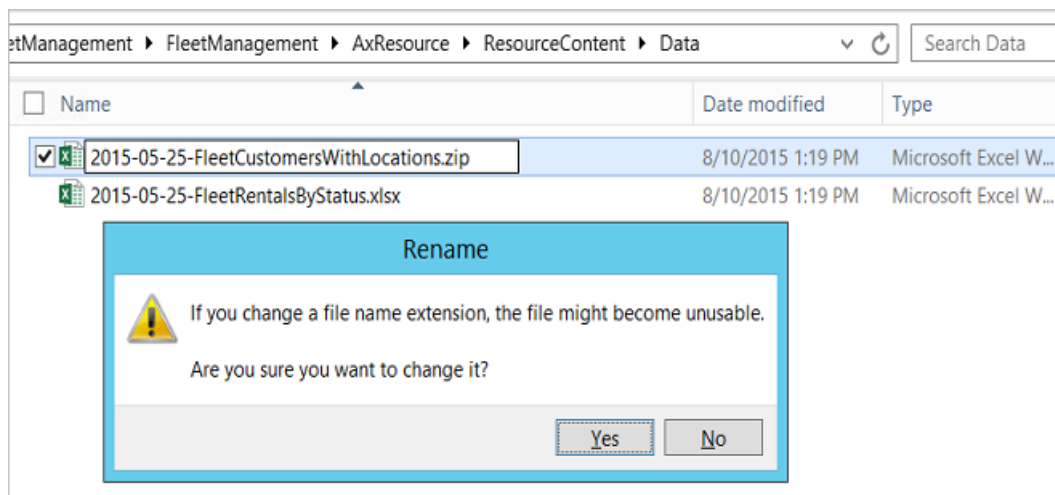
The ability to control "refresh on open" was added as a setting. To add this to the default behavior, existing templates and workbooks need to have the **Refresh on open** check box selected in **Options > Data Connector > Refresh Options**.

Error finding entity

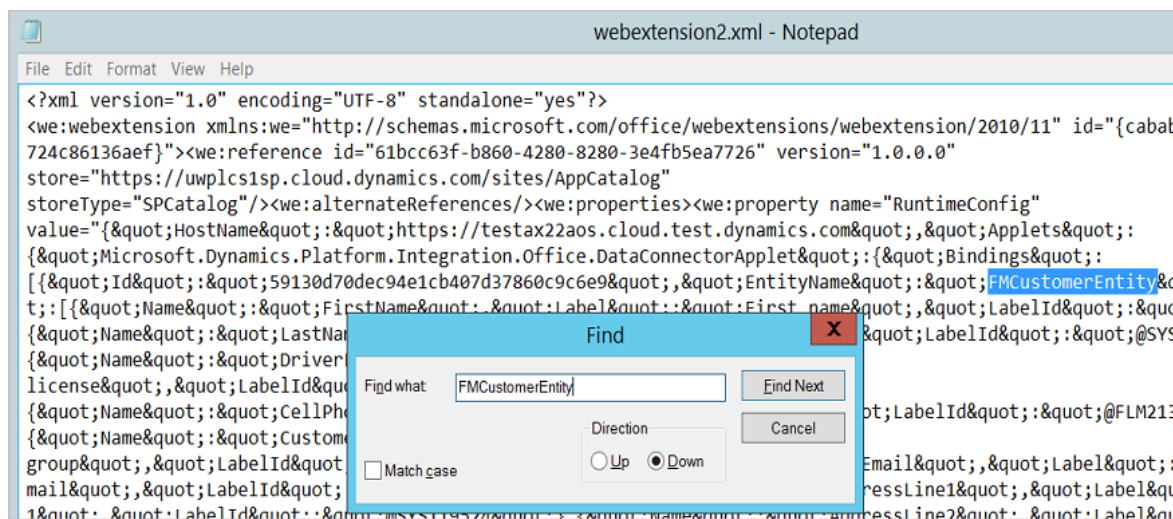
The reference to entities changed from using the Private Entity Name (DataEntity.Name) to Public Entity Name (DataEntity.PublicEntityName). If the public and private names for an entity were different and that entity was used in an Excel template or workbook, then this will cause the following error to be displayed in the Excel App: "Error Finding Entity. Details: Entity "<DataEntity.Name>" not found".

To resolve this, change the binding information in the affected template so that it points to DataEntity.PublicEntityName instead of DataEntity.Name.

1. For the DataEntity.Name that needs to be replaced, determine the DataEntity.PublicEntityName, for example replace FMCustomerEntity with FleetCustomer.
2. Find the affected template.
3. Change the file extension on the template from .xlsx to .zip.



4. The file to be changed will be one of the webextension*.xml files in the xlwebextensions directory, such as 2015-05-25-FleetCustomersWithLocations.zipxlwebextensionswebextension2.xml.
5. Open the file to ensure that you have the correct location.
6. Find the DataEntity.Name, such as FMCustomerEntity.



7. Extract the zip file.
8. Open the webextension xml file.
9. Replace the DataEntity.Name with the corresponding DataEntity.PublicEntityName.
10. Save the webextension .xml file changes.
11. Rename the old zip file, for example, add ".old" to the name.
12. Create a new zip file of all the previously extracted content. This usually involves highlighting the content inside the archive/zip folder and creating a zipped folder using that content.
13. Verify that the zip file has the "_rels", "docProps", and "xl" folders in the root of the zip file.
14. Rename the zip file as needed, for example rename the file 2015-05-25-FleetCustomersWithLocations.zip.
15. Change the zip file extension to .xlsx.
16. Re-publish the workbook .xlsx file, if needed.

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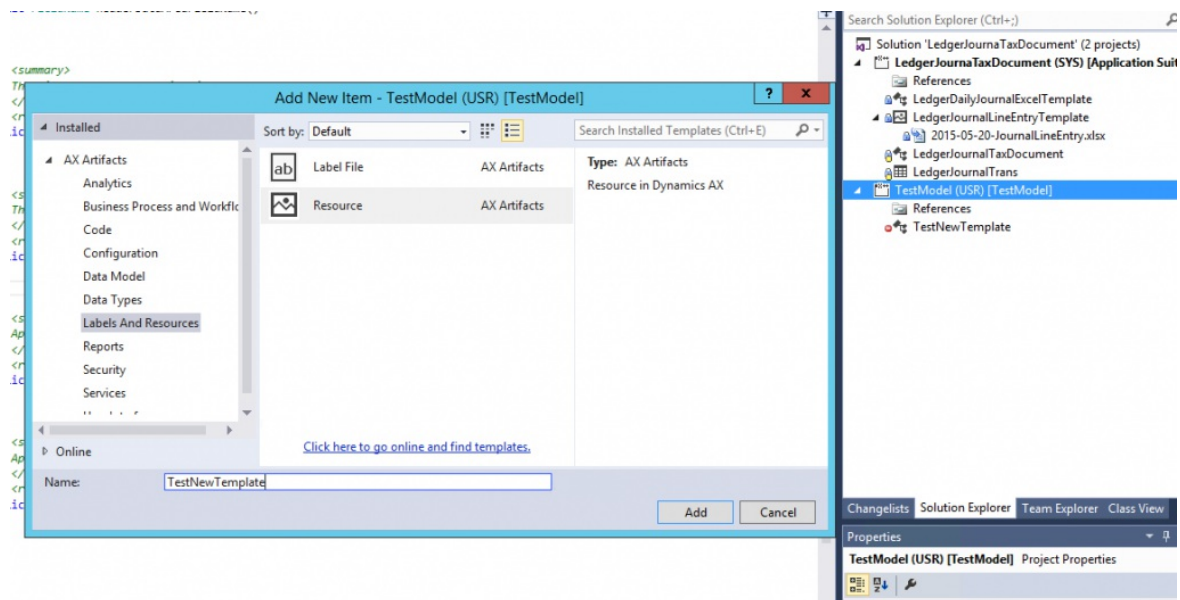
Add templates to the Open lines in Excel menu

2/18/2021 • 4 minutes to read • [Edit Online](#)

This topic describes how you can promote a template to the Open lines in the Excel menu that is available on journal pages.

Some of the most frequently used templates are the journal templates. Some of these journal templates have been promoted so that they appear on the **Open lines in Excel** menu by default. However, when you add a new template to the system, it's available on the **Open in Office** menu by default. To promote the template so that it's available on the **Open lines in Excel** menu, follow these steps.

1. Create a Microsoft Excel template, and save it locally. For more information, see the "Create Open in Excel experiences" article.
2. In Microsoft Visual Studio, create a new project for a model that has a reference to the ApplicationSuite model.



3. Create a new class, implement the **LedgerJournalExcelTemplate** interface, and extend **DocuTemplateRegistrationBase**. Your implementation (supported journal type, and so on) defines the context that your template will be available as an option for in the Open in Excel experience. This example uses **LedgerJournalHeaderEntity** and **LedgerJournalLineEntity**, but you aren't limited to these entities. You can define your own entities, provided that they entities follow the journal header/line entity pattern. Here is an example from the **LedgerDailyJournalExcelTemplate** class.

```
using Microsoft.Dynamics.Platform.Integration.Office;
public class TestNewTemplate extends DocuTemplateRegistrationBase implements
LedgerJournalExcelTemplate
{
    private const DocuTemplateName ExcelTemplateName = resourceStr(TestNewTemplate);
    private const EntityName LineEntityName = tableStr(LedgerJournalLineEntity);
    private const FieldName LineEntityJournalNum = fieldStr(LedgerJournalLineEntity,
JournalBatchNumber);
    private const FieldName LineEntityDataAreaId = fieldStr(LedgerJournalLineEntity, dataAreaId);
    private const FieldName HeaderEntityName = tableStr(LedgerJournalHeaderEntity);
    private const FieldName HeaderEntityJournalNum = fieldStr(LedgerJournalHeaderEntity,
JournalBatchNumber);
    private const FieldName HeaderEntityDataAreaId = fieldStr(LedgerJournalHeaderEntity, dataAreaId);
    /// <summary>
```

```

/// A boolean value which indicates whether the journal type is supported for the Excel template.
/// </summary>
/// <param name = "_ledgerJournalType">The ledger journal type.</param>
/// <returns>True if the journal type is supported; otherwise, false.</returns>
public boolean isJournalTypeSupported(LedgerJournalType _ledgerJournalType)
{
    return _ledgerJournalType == LedgerJournalType::Daily;
}
/// <summary>
/// Gets the document template name.
/// </summary>
/// <returns>The document template name</returns>
public DocuTemplateName documentTemplateName()
{
    return ExcelTemplateName;
}
/// <summary>
/// Gets a collection of the supported account types for the entity.
/// </summary>
/// <returns>A collection of <c>LedgerJournalACType</c> values.</returns>
public Set supportedAccountTypes()
{
    Set accountTypeSet = new Set(Types::Integer);
    accountTypeSet.add(LedgerJournalACType::Ledger);
    return accountTypeSet;
}
/// <summary>
/// Gets a collection of the supported offset account types for the entity.
/// </summary>
/// <returns>A collection of <c>LedgerJournalACType</c> values.</returns>
public Set supportedOffsetAccountTypes()
{
    Set offsetAccountTypeSet = new Set(Types::Integer);
    offsetAccountTypeSet.add(LedgerJournalACType::Ledger);
    return offsetAccountTypeSet;
}
/// <summary>
/// Validates the journal is valid for the template.
/// </summary>
/// <param name = "_ledgerJournalTable">The <c>LedgerJournalTable</c> record.</param>
/// <returns>True if the journal is valid for the template; otherwise, false.</returns>
public boolean validateJournalForTemplate(LedgerJournalTable _ledgerJournalTable)
{
    return LedgerJournalExcelTemplate::validateJournalForTemplate(_ledgerJournalTable, this);
}
public void registerTemplates()
{
    this.addTemplate(
        OfficeAppApplicationType::Excel,
        ExcelTemplateName,
        ExcelTemplateName,
        'Test new template',
        'Test new template',
        NoYes::No,
        NoYes::No,
        NoYes::No);
}
/// <summary>
/// The resource name of the header entity.
/// </summary>
/// <returns>The resource name of the header entity.</returns>
public EntityName headerEntityName()
{
    return HeaderEntityName;
}
/// <summary>
/// The resource name of the line entity.
/// </summary>
/// <returns>The resource name of the line entity.</returns>

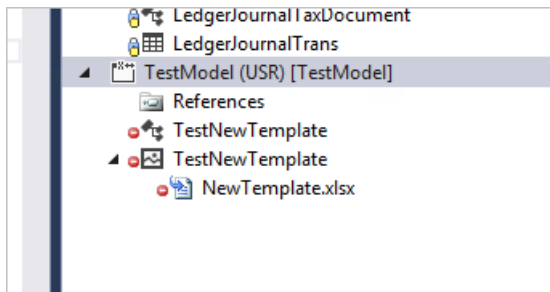
```

```

public EntityName lineEntityName()
{
    return LineEntityName;
}
/// <summary>
/// The field name for the header journal batch number.
/// </summary>
/// <returns>The field name for the header journal batch number.</returns>
public FieldName headerJournalBatchNumberFieldName()
{
    return HeaderEntityJournalNum;
}
/// <summary>
/// The field name for the header data area.
/// </summary>
/// <returns>The field name for the header data area.</returns>
public FieldName headerDataAreaFieldName()
{
    return HeaderEntityDataAreaId;
}
/// <summary>
/// The field name for the line journal batch number.
/// </summary>
/// <returns>The field name for the line journal batch number.</returns>
public FieldName lineJournalBatchNumberFieldName()
{
    return LineEntityJournalNum;
}
/// <summary>
/// The field name for the line data area.
/// </summary>
/// <returns>The field name for the line data area.</returns>
public FieldName lineDataAreaFieldName()
{
    return LineEntityDataAreaId;
}
/// <summary>
/// Append additional filter to the default filtering behavior.
/// </summary>
/// <returns>The original filter with new filter(s) appended; Otherwise, the original
filter</returns>
public FilterCollectionNode appendHeaderEntityFilters(FilterCollectionNode _headerFilter,
ExportToExcelFilterTreeBuilder _headerFilterBuilder)
{
    return _headerFilter;
}
/// <summary>
/// Append additional filter to the default filtering behavior.
/// </summary>
/// <returns>The original filter with new filter(s) appended; Otherwise, the original
filter</returns>
public FilterCollectionNode appendLineEntityFilters(FilterCollectionNode _lineFilter,
ExportToExcelFilterTreeBuilder _lineFilterBuilder)
{
    FilterCollectionNode lineFilter = _lineFilterBuilder.and(
        _lineFilterBuilder.areEqual(fieldStr(LedgerJournalLineEntity, AccountType),
LedgerJournalACType::Ledger),
        _lineFilterBuilder.areEqual(fieldStr(LedgerJournalLineEntity, OffsetAccountType),
LedgerJournalACType::Ledger));
    return _lineFilterBuilder.and(_lineFilter, lineFilter);
}
}

```

4. Build the project/model that has the new resources. You should have one new resource and one new class.



5. In the client, go to **Common > Common > Office integration > Document templates > Reload system templates**. You will see the new template in the list, and if you open the journal page that you added the template to, you will also see that template on the **Open lines in Excel** menu.

Additional resources

[Create Open in Excel experiences](#)

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Customize the Open in Microsoft Office menu

2/18/2021 • 10 minutes to read • [Edit Online](#)

Applies to these Dynamics 365 apps:

Commerce, Finance, Supply Chain Management

Most pages include an Open in Microsoft Office menu. This topic provides information about the Open in Office menu, and explains how to customize it by adding, removing, and changing options.

Overview

The **Open in Microsoft Office** menu button (**Open in Office** menu) is a system-defined button that appears on pages. The **Open in Office** menu contains menu items that let you export data to various Office products, such as Microsoft Excel and Microsoft Word. The following table describes the menu items on the **Open in Office** menu.

MENU ITEM	DESCRIPTION
Export to Excel	The data is exported to an Excel workbook. The workbook contains no references back to Finance and Operations, and the data can't be refreshed.
Export to Word	The data is exported to a Word document. The document contains no references back to Finance and Operations, and the data can't be refreshed.
Open in Excel	A workbook is created that contains the Microsoft Dynamics Office add-in. The workbook contains a reference back to Finance and Operations, and the data can be refreshed, updated, and published from the Data Connector that is hosted in the add-in.

How menu items are added to the Open in Office menu

The export options are added to the **Open in Office** menu in the following manner:

1. In the **Export to Excel** group, a menu item is added for each visible grid.
2. For each root data source on the page, the set of data entities that have the same root data source is determined. For each of these data entities, the following menu items are added:
 - In the **Open in Excel** group, a menu item is added for a default export of the data entity.
 - In the **Open in Excel** group, a menu item is added for each Document Template record of the **Excel** type that has the same root data entity and is marked for inclusion on the **Open in Office** menu.
 - In the **Export to Word** group, a menu item is added for each Document Template record of the **Word** type that has the same root data entity and is marked for inclusion on the **Open in Office** menu.

Default exports

The **Open in Office** menu provides a default export for each data entity. This export includes all the fields in the **AutoReport** group on the data entity. If **SaveDataPerCompany** is set to **Yes** for the data entity, a filter is applied to limit the data to the current company.

Document templates

Document templates can be added from the **Document templates** page. Several fields that are associated with each Document Template record control the behavior of that template on the **Open in Office** menu.

FIELD	DESCRIPTION
Root data entity	The root data entity of the template. The root data entity is used to determine which pages the template can be included on.
List in Office menu	If this field is selected, the template will be included on the Open in Office menu on applicable pages. (The applicable pages depend on the root data entity).
Apply record filter	If this field is selected, the data will be filtered, based on the record that is currently selected on the page.
Apply company filter	If this field is selected, the data will be filtered, based on the current company.

Trimmed template columns and fields

For Excel templates that are included on the **Open in Office** menu, columns and fields will be trimmed from the workbook, based on the configuration keys that are applied to the system and the applicable country/region context. If a configuration key is associated with a column or field in the workbook, the column or field will be removed if the configuration key is disabled. If a set of country/region codes is associated with the column or field in the workbook, the column or field will be removed if the country/region code isn't in scope.

Open in Office menu customization

There are several methods for customizing the content that appears on the **Open in Office** menu on a given page. For example, you can customize the content statically through metadata properties on model element and code attributes. However, customization via code gives you the finest level of control. In code, you can either implement one or more interfaces on a page, or use extensions and event subscriptions. The following sections describe the customization scenarios that are most often used.

Modifying the Open in Office menu through interfaces

If you must modify a page that you own, interfaces are the most appropriate customization method, because they give access to all private members of the page and allow for deeper customization. You can apply the following interfaces to the code for a page.

INTERFACE	DESCRIPTION
OfficeMenuCustomizer	Use this interface to modify the set of data entities that is considered for a page and add custom menu items.
OfficeGeneratedWorkbookCustomExporter	Use this interface to do a custom export of a workbook that is generated at run time.
OfficeTemplateCustomExporter	Use this interface to do a custom export that is based on a Document Template record.

Modifying the Open in Office menu through extensions and event subscriptions

If you must modify a page that you don't own, you should avoid using interfaces, because that approach will

require over-layering. Instead, you should do the customization through extensions and event subscriptions. To use this approach, implement an extension class that subscribes to the **OnInitializing** event of the page that you're customizing. From this event handler, get the **OfficeFormRunHelper** for the page, and subscribe to its **OfficeMenuInitializing** event. The following example shows sample code for this approach.

```
public static class MyForm_Extension
{
    [FormEventHandler(formStr(MyForm), FormEventType::Initializing)]
    public static void ExportToExcel_DataEntityCustom_OnInitializing(xFormRun sender, FormEventArgs e)
    {
        FormRun formRun = sender as FormRun;
        if (formRun)
        {
            OfficeFormRunHelper officeHelper = formRun.officeHelper();
            if (officeHelper)
            {
                officeHelper.OfficeMenuInitializing +=
                eventhandler(MyForm_Extension::officeMenuInitializingHandler);
            }
        }
    }
    private static void officeMenuInitializingHandler(FormRun _formRun, OfficeMenuEventArgs _eventArgs)
    {
        // Modify the OfficeMenuOptions available on the OfficeMenuEventArgs.menuOptions() as necessary.
    }
}
```

Typical customization scenarios

The following examples assume that the `_menuOptions` variable contains the **OfficeMenuOptions** instance that you're customizing.

Modifying the set of data entities that is considered for a page

Many of the menu items on the **Open in Office** menu are added automatically, based on the data entities that are considered for the page. However, in some cases, the algorithm that is used to determine the set of data entities might not determine the correct set. To modify the set of data entities that is considered for the page, you can use the **OfficeMenuOptions** that is available from either the **OfficeMenuCustomizer.customizeMenuOptions** method or the **OfficeFormRunHelper.OfficeMenuInitializing** delegate.

```
// Add an entity to the list
OfficeMenuDataEntityOptions entityOptions = OfficeMenuDataEntityOptions::construct(tableStr(MyEntity));
_menuOptions.dataEntityOptions().addEnd(entityOptions);
// Remove an entity from the list
ListIterator dataEntityOptionsIterator = new ListIterator(_menuOptions.dataEntityOptions());
while (dataEntityOptionsIterator.more())
{
    OfficeMenuDataEntityOptions dataEntityOptions = dataEntityOptionsIterator.value();
    if (dataEntityOptions.dataEntityName() == tableStr(MyOtherEntity))
    {
        dataEntityOptionsIterator.delete();
    }
    else
    {
        dataEntityOptionsIterator.next();
    }
}
```

Specifying the default data entity–related options that are included

The **OfficeMenuDataEntityOptions** class lets you specify whether to include a menu item for a default export or a menu item that is related to a document template.

```
// Find the entity options if they were included by default.
OfficeMenuDataEntityOptions entityOptions = _menuOptions.getOptionsForEntity(tableStr(MyEntity));
if (!entityOptions)
{
    // The entity options were not included. Add them.
    entityOptions = OfficeMenuDataEntityOptions::construct(tableStr(MyEntity);
    _menuOptions.dataEntityOptions().addEnd(entityOptions);
}
entityOptions.includeDefault(false); // Don't include the default export menu item.
entityOptions.includeTemplates(false); // Don't include Document Template related menu items.
```

Adding a custom export menu item – Generating a workbook

To explicitly add a menu item, you must add it to the **OfficeMenuOptions.customMenuItems()** list. To add a menu item that corresponds to a workbook that is generated at run time, use an

OfficeGeneratedExportMenuItem.

```
OfficeGeneratedExportMenuItem menuItem = OfficeGeneratedExportMenuItem::construct(tableStr(MyEntity),
"MyCustomGeneratedExportId");
menuItem.setDisplayNameWithDataEntity();
_menuOptions.customMenuItems().addEnd(menuItem);
```

To define what is actually exported, use an **ExportToExcelDataEntityContext**. The method for specifying the **ExportToExcelDataEntityContext** depends on whether you're using interfaces or extensions and event subscriptions to customize the **Open in Office** menu.

Using interfaces

If you're using interfaces, you must implement the

OfficeGeneratedWorkbookCustomExporter.getDataEntityContext() method.

```
public ExportToExcelDataEntityContext getDataEntityContext(OfficeGeneratedExportMenuItem _menuItem)
{
    ExportToExcelDataEntityContext context = null;
    if (_menuItem.id() == "MyCustomGeneratedExportId")
    {
        context = ExportToExcelDataEntityContext::construct(tableStr(MyEntity), tableFieldGroupStr(MyEntity,
MyFieldGroup));
    }
    return context;
}
```

Using extensions and event subscriptions

If you're using extensions and event subscriptions, the

OfficeGeneratedExportMenuItem.getDataEntityContext delegate should be subscribed to before you add the menu item to the **OfficeMenuOptions.customMenuItems()** list. The code for the event handler should resemble the preceding code for the interface. The following example shows how to do the event subscription.

```
menuItem.getDataEntityContext += eventhandler(MyForm_Extension::getDataEntityContextHandler);
```

Adding a custom export menu item – Specifying a document template

To explicitly add a menu item, you must add it to the **OfficeMenuOptions.customMenuItems()** list. To add a menu item that corresponds to a Document Template record, use an **OfficeTemplateExportMenuItem**.

```
OfficeTemplateExportMenuItem menuItem =
OfficeTemplateExportMenuItem::construct(OfficeAppApplicationType::Excel, "MyTemplateId",
"MyCustomTemplateExportId");
_menuOptions.customMenuItems().addEnd(menuItem);
```

To modify the template at run time, you can supply a set of initial filters. These filters will replace any filters in the template for the specified data entities. Additionally, you can modify filters and specify many settings by using **WorkbookSettingsManager**. The following sections show examples.

Using interfaces

If you're using interfaces, you must implement the

OfficeTemplateCustomExporter.getInitialTemplateFilters() and **OfficeTemplateCustomExporter.updateTemplateSettings()** methods.

```
public Map getInitialTemplateFilters(OfficeTemplateExportMenuItem _menuItem)
{
    Map initialFilters = new Map(Types::String, Types::Class);
    if (_menuItem.id() == "MyCustomTemplateExportId")
    {
        // Add an initial filter.
        ExportToExcelFilterTreeBuilder bldr = new ExportToExcelFilterTreeBuilder(_menuItem.dataEntityName());
        FilterNode filter = // create the filter..
        initialFilters.insert(_menuItem.dataEntityName(), filter);
    }
    return initialFilters;
}
public void updateTemplateSettings(OfficeTemplateExportMenuItem _menuItem,
Microsoft.Dynamics.Platform.Integration.Office.SettingsManager _settingsManager)
{
    if (_menuItem.id() == "MyCustomTemplateExportId")
    {
        // Set a new filter.
        ExportToExcelFilterTreeBuilder bldr = new ExportToExcelFilterTreeBuilder(_menuItem.dataEntityName());
        FilterNode filter = // create the filter..
        Excel.WorkbookSettingsManager workbookSettingsManager = _settingsManager as Excel.WorkbookSettingsManager;
        workbookSettingsManager.SetEntityFilter(entityMetadata.PublicEntityName, filter);
        // Adjust settings.
        DataConnectorAppletSettings settings = settingsManager.DataConnectorSettings;
        DataConnectorAppletUserOptions options = settings.DataOptions;
        options.RefreshOnOpen = true;
        options.EnableDesign = false;
        workbookSettingsManager.DataConnectorSettings = settings;
    }
}
```

Using extensions and event subscriptions

If you're using extensions and event subscriptions, the

OfficeTemplateExportMenuItem.getInitialTemplateFilters and **OfficeTemplateExportMenuItem.updateTemplateSettings** delegates should be subscribed to before you add the menu item to the **OfficeMenuOptions.customMenuItems()** list. The code for the event handlers should resemble the preceding code for the interface. The following example shows how to do the event subscription.

```
menuItem.getInitialTemplateFilters += eventhandler(MyForm_Extension::getInitialTemplateFiltersHandler);
menuItem.updateTemplateSettings += eventhandler(MyForm_Extension::updateTemplateSettingsHandler);
```

Additional customizations

The following customizations let you modify the contents of the **Open in Office** menu for a page without using

interfaces or extensions and event handlers.

Removing an Export to Excel menu item for a grid

On the **Open in Office** menu, the **Export to Excel** group will contain a menu item for each visible grid. To remove a grid from the **Open in Office** menu, set the **ExportAllowed** metadata property on the grid to **No**. After you make this change, users won't be able to export the grid by using the shortcut menu for the grid.

Renaming an Export to Excel menu item for a grid

To rename the **Export to Excel** menu item that is related to a grid, set the **ExportLabel** metadata property on the grid to the appropriate label.

Removing all menu items for a data entity from all pages

Integration scenarios require that some data entities be publicly available via the OData Service. However, it isn't always appropriate that these data entities appear on the **Open in Office** menu by default. In this scenario, you can add the **OfficeMenuOmit** code attribute to the entity declaration.

```
[OfficeMenuOmit]
public class MyEntity extends common
{
    // Entity code...
}
```

After you make this change, by default, the entity won't appear on the **Open in Office** menu on pages that have a matching root data source. However, if the entity should be added to a specific page, you can use other customization mechanisms to add it.

Adding a menu item button to a page that corresponds to an Open in Office menu entry

Sometimes, it's appropriate that the Action Pane of a page have a menu item button that corresponds to a custom menu item on the **Open in Office** menu. In this case, you can model a menu item button that has the following properties:

- **Menu Item Type:** Action
- **Menu Item Name:** ExportToExcelExportForm
- **Parameters:** The ID of the menu item

Then, a mouse click of this menu item button is equivalent to a mouse click of the corresponding menu item on the **Open in Office** menu.

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Configure and send email

2/18/2021 • 13 minutes to read • [Edit Online](#)

The behavior of the email subsystem is influenced by a combination of administrator configuration, user configuration, and user choices. This topic is divided into sections for administrators and users to make it easy to find relevant information.

Both administrators and users set the behavior of the email subsystem.

[Administrator] Email parameters page

Configuration tab

On the **Email parameters** page, note the following settings on the **Configuration** tab.

FIELD	DESCRIPTION
Batch email provider	Specifies which email provider will be used to send emails that are sent by processes in a batch or non-interactive manner. The Exchange provider will use the account associated with the batch process.
Attachment size limit	Specifies the maximum size of a single email that can be sent via the email subsystem.

In Platform update 32, an **Email history** page was added to allow administrators to review all sent emails, including any errors that might have prevented an email from being sent. By default, the last 30 days of email history is retained. This can be configured by changing the **Number of days to retain email history** to a non-zero amount. Zero provides the default amount and behavior.

In version 10.0.16/Platform 40, an **Email throttling** section is visible, if your environment has enabled the **Email throttling** feature in Feature management. This feature allows non-interactive email providers (such as the batch email provider) to adhere to a per-minute sending limit. This can prevent errors from the system attempting to send more emails than the provider allows. The sending limits for Microsoft 365 email providers are set automatically according to [Exchange Online sending limits](#). Manual configuration is required for all other email providers. The per-minute sending limit can be removed from a provider by resetting the **per-minute email sending limit** field to 0.

SMTP settings tab

On the **Email parameters** page, note the following settings on the **SMTP settings** tab.

FIELD	DESCRIPTION
Outgoing mail server	The host name of the desired SMTP server. <ul style="list-style-type: none">For Microsoft 365 production (including *.onmicrosoft.com accounts) use smtp.office365.com. (You can find this setting at outlook.office.com at Settings > Mail > POP and IMAP.)For Outlook/Hotmail use smtp-mail.outlook.com.
SMTP port number	Typically, the port number should be set to 587 for secure transport.

FIELD	DESCRIPTION
User name and Password	Specify, as needed, to send the email via the appropriate mail account. All users need to provide the SMTP account Send As and Send On Behalf Of permissions to enable the ability to send Simple Mail Transfer Protocol (SMTP) mail. You can configure Send As permissions in the Microsoft 365 admin center (portal.office.com/Admin), at Users > Active users > User > Edit mailbox permissions > Send email from this mailbox . For more information, see Enable sending email from another user's mailbox in Microsoft 365 .
Specify if SSL is required	Determines whether secure transport is used. Typically, this is Yes , except for internal or troubleshooting scenarios.

[Administrator] Email distributor batch process

Email that is sent directly from the server, without user interaction, via SMTP is sent by the **Email distributor batch** process. That batch process must be started to process the email queue. To start the process, open the **Email distributor batch** pane (**System administration > Periodic tasks > Email processing > Batch**) and turn on **Batch processing**.

If the Exchange provider is used, then the user account associated with the batch process (usually admin) will be sender.

[Administrator] User email

The default **send from** address for each user is pulled from the **Email** field on the **Users** page (**System administration > Users > Users**). Administrators can override this **send from** default if needed using the **Sender email** field on the **Options** page.

[User] Email provider selection section on the Options page

The **Options** page can be opened via **Settings > User options**. The **Email provider selection** section is on the **Account** tab.

FIELD	DESCRIPTION
Email provider ID	Allows the user to select the email provider that should be used when sending an email. Selecting an option here is the equivalent of selecting Do not ask again in the How would you like to send email dialog box. Selecting the blank option Prompt for which email provider to use will cause the How would you like to send email dialog box to display when an email is going to be sent.

FIELD	DESCRIPTION
Sender email	<p>Allows the administrator to provide an email address override for the user in the From field of the email. By default, the email alias that is associated with the user account is used as the From field in new emails, but this user option email address will override that. When sending email via SMTP, the user needs to have appropriate Send As and Send On Behalf Of permissions configured in Exchange or on the SMTP server.</p> <div style="border: 1px solid #ccc; padding: 5px; margin-top: 10px;"> <p>[!NOTE] You can configure Send As and Send On Behalf Of permissions in the Microsoft 365 admin center (portal.office.com/Admin) at Users > Active users > User > Edit mailbox permissions > Send email from this mailbox. For more information, see Enable sending email from another user's mailbox in Microsoft 365.</p> </div>

[User] How would you like to send email dialog box (optional)

When an email is going to be sent, the user will see the **How would you like to send email** dialog box that will list the available options for sending email.

FIELD	DESCRIPTION
Use an email app, such as Outlook	Provides the user with a generated email (.eml) file.
Use Exchange email server	Uses the Exchange Online server associated with the tenant. On-premises Exchange servers are currently not supported for the Exchange mail provider.
Use the system email client	Opens the Send email composition dialog box and then sends the resulting email via SMTP.
Do not ask again	If this field is not selected, the next time an email is sent the most recently selected option will be used and the dialog box will not open.

[User] Send email dialog box (optional)

The **Send email** dialog box is opened to allow the user to edit the contents of the email that will be sent. Some of the following fields will be pre-populated in this window.

FIELD	DESCRIPTION
From	Populated from the Email field on the Options page.
To, Cc, Bcc, Subject, and Body	Populated with values specified by the process that initiated the sending of the email. These fields can be edited as needed by the user.
Attachments list	May be populated with attachments specified by the process that initiated the sending of the email. This list can be edited as needed by the user.

When the email is ready to be sent, the **Send** button will cause the email to be sent via SMTP.

Usage scenarios to verify if email is configured correctly

Send mail via a local mail client

Email workflows that are enabled via the SysEmail framework can generate email messages (.eml files) that contain attachments. You can then send these messages via Microsoft Outlook or another email client.

1. In Internet Explorer, navigate to **Accounts receivable > Customers > All customers**.
2. Select **US-008 Sparrow Retail**.
3. Click **Collect > Customer balances > Collections** to open the **Collections** page.
4. Click **Communicate > Email > Statements to contact**.
5. Click **OK** to accept the default values in the dialog box.
6. If you're prompted for the mail option to use, clear the **Do not ask again** check box (you can change this option from the **User options** page), select **Use an email app, such as Outlook**, and then click **OK**.
7. If you're using Internet Explorer on your computer, open the email (.eml) file that is generated. If you're using Internet Explorer on the VM, copy the file to your computer, and open it there.
8. Note the email address in the **To** field and the generated workbook attachment.

Send mail via SMTP

Email workflows that are enabled via the SysEmail framework can also be created in a simple email dialog box and then sent via Simple Mail Transfer Protocol (SMTP).

1. Go to the **Email parameters** page.
2. Click **SMTP settings**.
3. Set the **Outgoing mail server** to the desired SMTP server:
 - For **Microsoft 365 production** (including *.onmicrosoft.com accounts) use smtp.office365.com. (Find this setting via outlook.office.com, at **Settings > Mail > POP and IMAP**.)
 - For Outlook/Hotmail use smtp-mail.outlook.com.
4. Set the user name and password to an appropriate email account and password.
5. Leave **SSLRequired** turned on, and leave **SMTP port number** set to **587**.
6. Click **Save**.
7. In Internet Explorer, navigate to **Accounts receivable > Customers > All customers**.
8. Select **US-008 Sparrow Retail**.
9. Click **Collect > Customer balances > Collections** to open the **Collections** page.
10. Click **Communicate > Email > Statements to contact**.
11. Click **OK** to accept the default values in the dialog box.
12. If you're prompted for the mail option to use, select **Use the Microsoft Dynamics 365 for Finance and Operations email client**, and then click **OK**.
13. To receive the test message, change the **To address** to your email address.

Ensure that the account specified in the SMTP settings is able to **Send As** and **Send On Behalf Of** your email account. The easiest way to ensure this is to use your email account in the SMTP settings.

14. Enter a subject and body for the message.

15. Click **Send**. The message should be delivered in one to five minutes.

[Administrator] Workflow email notifications

Workflow email configuration is a collection of related settings that work in conjunction.

Workflow email notification setup

1. Verify email settings:
 - a. Go to **System administration > Setup > Email > Email parameters**.
 - b. Verify that SMTP is enabled.
 - c. Set the SMTP mail server settings.
2. Verify that the email batch process is running:
 - a. Go to **System administration > Periodic tasks > Email processing > Email distributor batch**.
 - b. Enable the **Batch processing** option.
 - c. Optionally, adjust the recurrence of the email process:
 - a. Select **No end date** to adjust all recurrences of the email batch process.
 - b. Adjust the count.
 - c. Adjust to run every minute if needed.
3. Verify workflow notification system email templates:
 - a. Go to **System administration > Setup > Email > System email templates** (for system-wide templates).
 - b. Verify that the **Sender email** field is set and valid.
4. Verify workflow notification organization email templates:
 - a. Go to **Organization administration > Setup > Organization email templates** (for organization-specific templates).
 - b. Verify that the **Sender email** field is set and valid.
5. Verify that the user can receive email notifications:
 - a. Go to **Settings > User options**.
 - b. Go to the **Account** tab.
 - a. Set the **Email provider ID** (for example, SMTP).
 - b. Optionally, set a **Sender email** override if the default **send from** address should not be used for the current user.
 - c. Navigate to the **Workflow** tab. Set the option to send notifications in email to **Yes**.
6. Verify that the workflow system will send email notifications:

For each workflow that should have a notification, open the workflow properties in the workflow editor.

 - a. Click **Basic settings**. Adjust the email template for the workflow notifications.
 - b. Click **Notifications**.
 - a. Enable the events for which a user should be notified.
 - b. Set the recipient of the workflow notification for each event notification that is enabled.
 - c. On a workflow approval element for which a user should be notified:

- a. Go to **Properties**.
- b. Enable the events for which a user should be notified.
- c. Set the recipient of the workflow notification for each event notification that is enabled.

Workflow email notification testing

The testing for email notifications is to simply trigger the notification and then check for it.

1. Submit a workflow that has been set up for email notifications.
2. Check the workflow history to make sure that a workflow work item was assigned to the expected user.
3. Check the status of the pending email notification in **System administration > Periodic tasks > Email processing > Batch email sending status**.

If the email fails to send, make sure that the SMTP mail account can be opened.

4. Check for the email notification in the appropriate inbox.

Troubleshoot email

There are a few standard steps that can help you troubleshoot the configuration of email settings.

1. Verify email settings:
 - a. Go to **System administration > Setup > Email > Email parameters**.
 - b. Verify that SMTP is enabled.
 - c. Verify the settings of the SMTP mail server.
 - d. Sign in to the SMTP account in a separate window to make sure that the account and password are correct.
 - e. Send a test email using **System administration > Setup > Email > Email parameters > Test email**.
2. Verify that the email batch process is running:
 - a. Go to **System administration > Periodic tasks > Email processing > Batch**.
 - b. Make sure that the **Batch processing** option is set to **Yes**.
 - c. Review the recurrence of the email process:
 - a. Select **No end date** to adjust all recurrences of the email batch process.
 - b. Adjust the count as you require.
3. To review the contents and status of batch emails, go to **System administration > Periodic tasks > Email processing > Batch email sending status**.
 - a. If you're using a release that is earlier than Platform update 28, personalize the form to add the email sender for easy review. To do this, right-click the grid header, select **Add columns**, select **Email**, and then click **Insert**. If the **Email** field isn't added into the grid, you can view the sender by selecting **Show message**, and then selecting the **Email** field.
 - b. Verify that emails are being sent from the correct account. If the account is incorrect, you need to adjust settings such as user options, system templates, or organization templates, as needed.
 - c. Verify that all email user accounts have been granted permission to **Send As** for the configured SMTP account (see step 4 for details).
4. In Platform update 32, an **Email history** page was added to allow administrators to review all sent emails, including any errors that might have prevented an email from being sent. The **Email history** page will show interactive as well as non-interactive/batch emails. For any emails that have an **Email status** of **Failed**, review the error message on the **Failure details** tab and determine if corrective

actions should be taken.

5. In the Microsoft 365 admin center, verify that all user mail accounts that will be used to send emails have **Send As** and **Send On Behalf Of** permissions for the configured SMTP account. For more information, see [Enable sending email from another user's mailbox in Microsoft 365](#).
6. Sign in to all user mailboxes to verify that they are valid and can be accessed using sign in.
7. Send a test email using **System administration > Setup > Email > Email parameters > Test email**.
8. If the SMTP settings were migrated from another environment, clear the password field and re-enter the password to ensure that the field encryption hasn't negatively affected the stored value.
9. If you continue to experience issues when email is sent via SMTP, enter the SMTP account information in a tool such as [SMTPer.net](#) to verify that the SMTP server and account are valid and working correctly.

Troubleshoot the Exchange mail provider

The **Email parameters** page allows an administrator to select Exchange as an interactive email provider and as the Batch email provider. The Exchange mail provider will use the current user's Exchange Online account to send emails. When used as the Batch email provider, the batch account will be used. No additional configuration is needed. If troubleshooting is needed, ensure that the current user's account can be signed into and that emails can be sent from that account to the intended recipients.

Exchange mail provider not supported for external users

Users that are external to the primary tenant will not have exchange accounts on that tenant, so the Exchange mail provider is not supported for external users.

Other notes

The system communicates with Exchange or an SMTP server like a typical email client, so standard behavior and limits apply. For example, standard [Exchange Online receiving and sending limits](#) apply.

Troubleshooting

Where do workflow email templates come from?

The email templates will be sourced from either system email templates or organization email templates depending on whether the workflow is a system-level (not company specific) or organization-level (company specific) workflow.

Additional resources

[Troubleshoot the Office integration](#)

[Office integration tutorial](#)

[Configure email functionality in Microsoft Dynamics AX \[AX 2012\]](#)

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Develop email experiences by using the SysMailer framework

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Sending emails

The SysMailer framework is a new, extensible way to send email. It replaces all previous application programming interfaces (APIs) for mail, such as CDO.Messaging (SysMailer), MAPI (SysINetMail), and Outlook COM (SmmOutlookEmail). Those older mail APIs won't work correctly in Finance and Operations applications. By taking advantage of the SysPlugin framework and several .NET technologies, SysMailer provides a configurable experience for users and enables the application consumers to remain agnostic to the email option that users use to send email.

The SysMailer framework consists of a factory class that is used to retrieve an email provider, a set of email providers that send messages, a message builder that builds the messages, and the forms that are related to configuring and interacting with the email providers. To consume the SysMailer framework, an application developer primarily uses the **SysMailerFactory** and **SysMailerMessageBuilder** classes. The email provider factory is used to retrieve interactive or non-interactive email providers, so that multiple messages can be sent at the same time, or so that a message can be sent directly. The email providers expect the messages that they send to be encapsulated in .NET **System.Net.Mail.MailMessage** objects. The message builder class is used to build the .NET object that is passed to the email provider.

Scenarios

This topic describes three scenarios:

- Sending an interactive message
- Sending a non-interactive (batch) message
- Sending multiple non-interactive (batch) messages

Sending an interactive message

The following example is taken from the **CustCollectionsEmail** class. It demonstrates multiple features of the framework, such as the ability to chain message builder calls, conditionally set the sender address ("from" address), and add attachments.

```

using (System.IO.Stream attachmentStream = this.generateAttachment())
{
    var messageBuilder = new SysMailerMessageBuilder();
    messageBuilder.addTo(context.parmEmailAddress())
        .setSubject(emailSubject)
        .setBody(SysEmailMessage::stringExpand(emailBody,
            SysEmailTable::htmlEncodeParameters(templateTokens)));
    if (emailSenderAddr)
    {
        messageBuilder.setFrom(emailSenderAddr, emailSenderName);
    }
    else if (custParameters.CollectionsOMTeam)
    {
        var collectionsEmail = OMTeam::find(custParameters.CollectionsOMTeam).primaryEmail();
        if (strLen(collectionsEmail) > 0)
        {
            messageBuilder.setFrom(collectionsEmail);
        }
    }
    if (attachmentStream != null)
    {
        messageBuilder.addAttachment(
            attachmentStream,
            strFmt('%1%2', strReplace(DateTimeUtil::toStr(DateTimeUtil::utcNow()), ':', ''), '.xlsx'));
    }
    SysMailerFactory::sendInteractive(messageBuilder.getMessage());
}

```

Sending a non-interactive (batch) message

The following example is taken from the **VendRequestCompanyWorkflowManager** class. It shows how you can send a single message non-interactively.

```

// The vendor <vendor name> has been approved and has been added to the vendor master.
messageText = strFmt("@SYS134393", DirPartyTable::findRec(vendRequestCompany.VendParty).Name);
// Request
var messageBuilder = new SysMailerMessageBuilder();
messageBuilder.setFrom(senderEmail)
    .addTo(recipientEmail)
    .setSubject("@SYS130372")
    .setBody(messageText);
SysMailerFactory::sendNonInteractive(messageBuilder.getMessage());

```

Sending multiple non-interactive (batch) messages

The following example is taken from the **UserAdAddManager** class. It shows how you can get an instance of a batch email provider before you iterate over a list of emails to send.

```

var mail = SysMailerFactory::getNonInteractiveMailer();
var messageBuilder = new SysMailerMessageBuilder();
for (i = 1; i <= conLen(_notifyCon); i++)
{
    notifyEmailsStr = conPeek(_notifyCon, i);
    select firstonly RecId, Email from sysUser where sysUser.Id == notifyEmailsStr;
    if (sysUser.RecId && sysUser.Email != '')
    {
        messageBuilder.reset()
            .setFrom(_emailFrom)
            .addTo(sysUser.Email)
            .setSubject("@SYS129183")
            .setBody(errorStr);
        mail.sendNonInteractive(messageBuilder.getMessage());
        delete_from tmpUserErrorNotification;
    }
}
}

```

Important considerations

- A sender address ("from" address) is required when messages are sent to an email provider. A receiver address ("to" address) is required when messages are sent non-interactively. If these conditions aren't met, the framework throws an exception. If **getMessage** is called on the message builder before any call to **setFrom** is made, the builder tries to set the sender address to the current user's email address or network alias.
- When messages are sent, the way that the sender address ("from" address) is used depends on the provider:
 - **EML provider**: The sender address is removed from the message before the message is opened in the user's email client. Therefore, the email client can set the sender address to the default account that is configured for sending mail.
 - **SMTP provider**: The Simple Mail Transfer Protocol (SMTP) server must be configured to allow messages to be sent by using the sender address. In other words, the SMTP server must allow the impersonation of emails that are sent from it. Otherwise, the SMTP server might prevent the messages from being sent, flag them as spam, and so on.
- When messages are sent, the framework returns a Boolean value that indicates whether the operation to send the message was successful. However, it doesn't report any messages to the Action Center when the operation is successful. You decide whether messages are shown in the Action Center.
- By default, the body of all messages that are sent is in rich-text (HTML) format. If an application scenario requires that plain text be used to maintain newline spacing, you can pass **false** to the optional **_isHtml** parameter of the **setBody** method on the message builder.

Adding a new email provider

You can add email providers by using the pluggable framework. When you use the factory class and interfaces, new email providers immediately become available for use across all relevant application scenarios. Examples of email providers can be found in the existing provider implementations, `SysMailerEML` and `SysMailerSMTP`, and also in an existing tutorial implementation, `Tutorial_SysMailerMailTo`. The examples that follow are excerpts from the implementation of the `SysMailerEML` email provider.

To implement an email provider, you must create an implementation class that has the following properties:

- The class must have the appropriate **Export** attributes.
- The class must implement the base **SysIMailer** methods, **getId** and **getDescription**.
- The class must implement the **SysIMailerInteractive** interface, the **SysIMailerNonInteractive** interface, or both interfaces.

Specify attributes for the implementation class

The first step is to specify attributes for the implementation class. The class must have two attributes:

- **ExportAttribute** – The framework uses this attribute to discover the plug-in. The attribute specifies that the plug-in is an implementation of **SysIMailer** and therefore part of the SysMailer framework.
- **ExportMetadataAttribute** – The framework uses this attribute to find specific instances of a plug-in that have specific metadata. The attribute specifies the ID of the email provider, so that a single provider can be discovered quickly. **No two email providers should ever have the same ID.**

```
using System.IO;
using System.Net.Mail;
using System.Text.RegularExpressions;
#define SysMailerEML_ID('EML')
/// <summary>
/// The <c>SysMailerEML</c> class is an interactive email provider implementation that sends messages by
generating
/// an EML file, uploading it to Azure temporary blob storage, and then redirecting the user's browser to
/// the file to save or open for sending using their default email client.
/// </summary>
// This is a framework class. Customizing this class may cause problems with future upgrades to the
software.
[System.ComponentModel.Composition.ExportAttribute(IdentifierStr(Dynamics.AX.Application.SysIMailer)),
System.ComponentModel.Composition.ExportMetadataAttribute(extendedTypeStr(SysMailerId), #SysMailerEML_ID)]
public class SysMailerEML implements SysIMailerInteractive
{
```

Implement the SysIMailer interface

The **SysIMailer** interface includes identifiable information about an email provider, regardless of the capabilities of the email provider itself. To implement this interface, you must create two methods:

- **getId** – This method returns the same ID that is specified in the **ExportMetadataAttribute** attribute.
- **getDescription** – This method returns a non-technical description that indicates how the email will be sent.

```
public SysMailerId getId()
{
    return #SysMailerEML_ID;
}
public SysMailerDescription getDescription()
{
    // Use an email app, such as Outlook
    return "@ApplicationFoundation:EmailProviderEMLDescription";
}
```

Implement a combination of the SysIMailerInteractive and SysIMailerNonInteractive interfaces

The **SysIMailerInteractive** and **SysIMailerNonInteractive** interfaces are very simple. They implement the **sendInteractive** and **sendNonInteractive** methods, respectively. An email provider might implement one or both methods, depending on its capabilities. Each method that is implemented takes a **.NET System.Net.Mail.MailMessage** object that you use to construct and send the email.


```
public boolean sendInteractive(System.Net.Mail.MailMessage _message)
{
    using (var emlStream = this.generateEmIFile(_message))
    {
        Dynamics.AX.Application.File::SendFileToUser(emlStream, 'message.eml');
    }
    return true;
}
```

The **System.Net.Mail.MailMessage** object contains a large amount of advanced functionality that is related to MIME messages. You can build a relatively complex message object and pass it to an email provider. If there is specific functionality that an email provider doesn't support, the email provider is expected to handle the functionality actively (by modifying the message), passively (by making an internal call to another email provider), or not at all (by throwing an error).

Migration from Microsoft Dynamics AX 2012 to Finance and Operations applications

Migration involves using the **SysMailerMessageBuilder** object to build a message and then using the **SysMailerFactory** to send it, as outlined in the examples in this topic.

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Troubleshoot the Office integration

2/18/2021 • 16 minutes to read • [Edit Online](#)

Applies to these Dynamics 365 apps:

Commerce, Finance, Human Resources, Supply Chain Management

This topic provides answers to questions, tips, and troubleshooting information about the capabilities of the Microsoft Office integration. The questions and issues that are discussed range across user, administration, and development scenarios.

Frequently asked questions

What platforms do the Office Add-ins support?

The Microsoft Excel Add-in and Microsoft Word Add-in are built by using the Office Web/JavaScript Add-in framework. This framework was originally released for Microsoft Office 2013 but received significant updates in Microsoft Office 2016. For more information, see [Office Add-in host and platform availability](#). The Excel Add-in requires ExcelAPI 1.2. Therefore, use the [Office Add-in host and platform availability](#) matrix to determine which platforms support the Excel Add-in. For many users, the phrase "Excel 2016 with the latest updates" is sufficient.

Are the Office Add-ins safe?

In an age of malware, full connectivity, and compliance risks, nothing is completely secure. However, the web add-ins, like other websites, are basically a web application that interacts with the Office client products via a limited application programming interface (API). For more details, see [Office Add-ins platform overview](#)

Does the Excel Add-in support Office for Mac?

No. Support for Apple Mac and iOS is currently under development. The Office JavaScript (JS) APIs work differently in Apple Safari and Internet Explorer, especially in respect to authentication. For details about platform support for the Office JS APIs, see [Office Add-in host and platform availability](#).

What version of Office is required for the Excel Add-in to support AD FS?

For more information, see the "Troubleshooting issue" section later in this topic.

How can I force an update of Office?

If your Office build isn't updated, you might be on the deferred track ([Overview of update channels for Microsoft 365 Apps](#)). In this case, you can [use the Office Deployment Tool to move to the Current channel](#) or sign up for the [Office Insider program](#) to help guarantee that you have the latest updates. The easiest method is to use the Office Deployment Tool to switch to the Current channel. In this case, the latest updates will be installed immediately.

Why can't you tell me what version of Office or Excel a particular issue is fixed in?

Office has many releases. These releases receive updates at different times and have different version numbers that don't correspond. Some frequently used Office versions and update methods are Click to Run (C2R) Current channel, C2R Deferred, C2R First Update Deferred, Office Insider Fast, Office Insider Slow, and MSI/MSO (install from DVD). For more information about Office versions, see the [Release information for updates to Microsoft 365 Apps](#) page.

Why am I having trouble signing into the Excel Add-in?

The Excel Add-in runs inside an Internet Explorer window. By default, the Excel Add-in picks up stored credentials from Internet Explorer, and Internet Explorer provides the current Microsoft Windows credentials if there are no stored credentials. Make sure that you're using the correct credentials to sign in. In the Excel Add-in, explicitly

sign out, and then sign in to help guarantee that the correct credentials are used.

The Excel Add-in seems to be slow when it publishes records. How can I learn more about what is occurring?

Most of the work that the Excel Add-in does should occur on the server. To learn where the time is being spent, you can use [Fiddler \(a free download\)](#) to make sure that the Excel Add-in works as you expect.

The Excel Add-in sends the published records as a request. When those records are processed, the response is sent back from the server. The Excel Add-in then creates another message that contains the next set of records to publish, and sends that request. Five to ten seconds of processing time in the Excel Add-in should be required between the previous response from the server and the next request to the server.

To check processing time in the Excel Add-in versus the server/service, follow these steps.

1. Start [Fiddler](#).
2. Publish a few records to test the process.
3. Make sure that you can view that request and response in Fiddler ([make sure that HTTPS traffic is being decrypted](#)).
4. Publish a larger number of records.
5. In Fiddler, watch the time that is required from a request to its response, and from a response to the next request.
 - If the time from a request to its response is large, the bottleneck is the server/service.
 - If the time from a response to the next request is large, the bottleneck is the Excel Add-in (that is, the client).

Why is the Export to Excel functionality limited to 10,000 records (prior to Platform update 22)?

Prior to Platform update 22, the Export to Excel functionality is limited to 10,000 records. This limitation is in place because the export process uses the form from which data is being exported to provide the following records with fields and data that can't be obtained otherwise: formatted values, calculated values, and temporary table data. Because the form is used during the export, it occurs inside the client process that is shared by all the users on a given computer. During the export, those other users are blocked from interacting with the client.

With Platform update 22 and later, Export to Excel has a progress dialog box and is no longer a blocking process for other users, so larger datasets can be exported. Exporting data via Export to Excel will be slower than using the Excel Add-in or the Data Management framework, but it will return exactly the data shown in the grid. This is useful for filtered datasets. The user is presented with a dialog box that allows them to stop at any point. Because the export can take some time, it is recommended that the export is done with the Chrome or Edge browsers, with the automatic download option enabled. The automatic download option will ensure that the browser downloads the file as soon as the export is complete to ensure that the download link is used within the 15-minute time limit.

The ideal alternative to Export to Excel is to use Open in Excel and the Excel Add-in. The Excel Add-in retrieves data by using the OData service, and takes advantage of the security that the entities provide. The import and export capabilities in the Data management framework (DMF) and Data import/export framework (DIXF) can also be used. However, DMF/DIXF is often limited to administrators.

If you have concerns about giving users access to the data via the Excel Add-in, because they should not be able to update records, consider the following points:

- The entities should have all the validation and logic that the forms have. If they don't, it's a bug.
- The way that entities are secured resembles the way that forms are secured. Therefore, if a user should not have permission to update or write data by using a form that exposes that data, the user should not have permission to update or write data by using an entity that exposes that data.

Why is the Publish button in the Excel Add-in unavailable?

All key and mandatory fields must be present to publish data back to the entity. Try to edit the design to add more fields to the binding.

Why are the Excel Add-in, the Word Add-in, and the Open in Excel options only available when the Internet is available?

For all environments, including on-premises, the Excel and Word Add-ins, and the libraries they use, are loaded from multiple Internet locations and therefore will only run when the Internet is available. For on-premises environments, when the Internet is not available, the Open in Excel options are hidden because the Excel Add-in will not run without access to the Content Delivery Network (CDN) that houses the Excel Add-in.

Can the Excel Add-in and Word Add-in be made available to users using Centralized Deployment?

Yes, Centralized Deployment is supported. For more information, see [Centralized Deployment](#).

To use Centralized Deployment, on the **App parameters** tab on the **Office App Parameters** page change the **App ID**, **Store**, and **Store Type**:

- **App ID:** 61bcc63f-b860-4280-8280-3e4fb5ea7726
- **Store:** EXCatalog
- **Store Type:** Centralized Deployment

In case a change back to Office Store is needed, the standard values are:

- **App ID:** WA104379629
- **Store:** en-US
- **Store Type:** Office Store

NOTE

- **Name**, **Version**, and **Notes** are values that provide information but they are not needed to run the Excel Add-in.
- These same values are also used for the Word Add-in when it is run from the Document Templates form.

If you encounter issues with Centralized Deployment for some users, it could be one of these problems:

- One or more users are members in a group that is more restrictive than others
- The user referenced is on a different Microsoft 365 account (such as a personal account)

What is the cell limit for the Excel Add-in?

The default Excel Add-in cell limit is about half the limit of what the Excel Add-in can handle on a reasonably fast machine. The speed of the machine is the limitation. If problems are encountered, then the cell limit should be reduced and/or the filter should be adjusted to reduce the data set. A common workaround is to use a filter to manage the data in smaller pieces instead of all at once.

How do I make an entity available in the Excel Add-in and/or as an Open in Excel option?

If the entity is marked as "IsPublic=Yes" and has unique PublicEntityName and PublicCollectionName values, then it will be available via the OData service. Check that there aren't any existing entities with the same PublicEntityName and PublicCollectionName values by looking at the \$metadata feed for the environment (preferably in Google Chrome): [https://SomeFullEnvironmentURL.dynamics.com/data/\\$metadata](https://SomeFullEnvironmentURL.dynamics.com/data/$metadata)

Why are date and time values in UTC in the Excel Add-in?

The Excel Add-In, Data Management Framework, and Power BI reporting are all designed to interact with data directly on the database level. Because there is no client to adjust Date and Time data to the time zone of the user, all Date and Time values are in UTC.

Troubleshooting issues

[Fixed] Issue: During sign-in to the Excel Add-in, I receive the following error message: "AADSTS65001: The user or administrator has not consented to use the application with ID XYZ"

Issue: During sign in to the Excel Add-in, you receive the following error message: "AADSTS65001: The user or administrator has not consented to use the application with ID XYZ."

Explanation: Typically, this issue occurs because Microsoft Azure Active Directory (Azure AD) can't find the Azure AD application that represents the Excel Add-in. That issue occurs because, during the [configuration of Microsoft Power BI](#), an Azure AD application was added that has the App ID URI set to the environment URL.

Fix: Make sure that no Azure AD apps have the App ID URI set to the environment URL. App ID URIs should be fabricated, unique URIs, such as `https://contosoAXPowerBI`.

[Fixed] Issue: During sign-in to the Excel Add-in, I receive the following error message: "AADSTS50001: The application named ABC was not found in the tenant named XYZ"

Issue: During sign-in to the Excel Add-in, you receive the following error message: "AADSTS50001: The application named ABC was not found in the tenant named XYZ."

Explanation: This issue probably occurs because an error in the deployment system caused the environment to get a URL that wasn't added to the configured list of service principals for the tenant.

Fix: File a support issue for your environment, so that the problem can be investigated and the configuration can be adjusted.

[Fixed] Issue: After the Excel Add-in starts and updates data, I receive the following error message: "An error occurred while writing to the data cache"

Issue: After the Excel Add-in starts and updates data, you receive the following error message: "An error occurred while writing to the data cache." The details of the error state, "The argument is invalid or missing or has an incorrect format."

Explanation: You receive this error message if the client is open in Internet Explorer, and the user clicks **Open** immediately after selecting the **Open in Excel** option. The way that Internet Explorer handles temporary Internet files causes an issue in Excel. This issue, in turn, causes API calls to fail.

Workaround: In Internet Explorer, when you open a workbook, click **Save** first, and then click **Open**. The file will then be opened from your Downloads folder. Alternately, use the Edge or Google Chrome browser. By default, both these browsers save files to a Downloads folder. Therefore, the issue doesn't occur.

Long-term fix: We are working with the Office team to understand this issue so that it can be fixed in Excel.

Issue: When I send email by using SMTP, the server response is "5.7.60 SMTP; Client does not have permissions to send as this sender"

Issue: When you send email by using Simple Mail Transfer Protocol (SMTP), you might receive an error message that states that the server response was "5.7.60 SMTP; Client does not have permissions to send as this sender." Alternatively, the error message might state, "Something went wrong while generating the report."

Explanation: This issue is usually caused by incorrect setup of the Send As permissions for the email account.

Fix: You can configure Send As permissions in the Microsoft 365 admin center (portal.office.com/Admin). Click **Users > Active users > User > Edit mailbox permissions > Send email from this mailbox**. For more information, see [Give mailbox permissions to another user in Microsoft 365 - Admin Help](#).

The following illustration shows the setup of SMTP on the **Email parameters** page. Here, you must provide the outgoing mail server, port, user name, password, and Secure Sockets Layer (SSL) requirements.

Email parameters

Email providers

SMTP settings

SMTP settings

Outgoing mail server: smtp.office365.com
SMTP port number: 587
User name: serviceacct@d365forops.onmicro
Password: [REDACTED]
Specify if SSL is required: Yes

IMPORTANT

All users must give the SMTP account Send As permissions on their email setup in Microsoft 365. This configuration is done in the mailbox permissions in Microsoft Exchange or in the Microsoft 365 Admin portal. The following illustration shows the setup for the Test User account, where the SMTP service account is added in the **Send As** section.

Test User

- general
- mailbox usage
- contact information
- organization
- email address
- mailbox features
- member of
- MailTip
- ▶ mailbox delegation

Send As

The Send As permission allows a delegate to send email from this

+ -

USER PRINCIPAL NAME

SMTP AUTHORITY

serviceacct@d365forops.onmicrosoft.com

Send on Behalf

The Send on Behalf permission allows the delegate to send email

+ -

DISPLAY NAME

Full Access

The Full Access permission allows a delegate to open this mailbox

+ -

DISPLAY NAME

[Fixed] Issue: The Office Add-ins don't yet support AD FS

Affected versions: CTP8 and the February 2016 releases

Issue: When users from an Azure AD tenant that uses Active Directory Federation Services (AD FS) try to sign in to the Office Add-ins (in other words, when the users enter their account, and then press Tab or click in the field to enter their password), a separate browser window opens. This browser window usually has a URL that starts with `https://az689774.vo.msecnd.net/dynamicsofficeapp/v1.2.1.0/App/DynamicsApp.html?id_token=`. The user can't sign in.

Explanation: During sign-in to the Office add-ins (both the Excel Add-in and the Word Add-in), a redirect to the AD FS site for the tenant occurs. However, that site is an unknown and therefore disallowed application domain (AppDomain).

Long-term fix: The long-term fix for this issue was put in place on May 10, 2016. The Office Add-ins now use a new Dialog API that the Office team added.

Taking advantage of the add-in updates that support AD FS: All Office installations should be updated via **File > Account > Updates** (for click-to-run installations) or via Windows Update (for MSI installations). The AD FS Dialog API was included in the May update (16.0.6868.2060). For information about updates, see the [Microsoft 365 client update channel releases](#) page.

If your Office build isn't updated, you might be on the deferred track ([Overview of update channels for Microsoft 365 Apps](#)). In this case, you can [use the Office Deployment Tool to move to the Current channel](#) or sign up for the [Office Insider program](#) to help guarantee that you have the latest updates. Additionally, see [Install the latest version of Office](#) and [Office 2016 Deployment Guides for Admins](#).

If Office updates can't be installed, the following workaround can unblock users.

Workaround: Use Internet Explorer to sign in to the client before you use the Office Add-ins

This workaround requires user knowledge and extra steps. After users have been educated about this workaround, it should be straightforward for them.

User steps: Before users open Excel (or Word), they should sign in to the client by using Internet Explorer.

Explanation: The Excel or Word Add-in will use the sign-in context, and no redirect will be required. The earlier sign-in must occur in Internet Explorer, because the Office Add-ins run inside an Internet Explorer window in Excel and Word. The sign-in context lasts 6 to 24 hours, depending on policies. Therefore, a new sign-in through Internet Explorer is required only occasionally.

1. Exit Internet Explorer and Excel.
2. Start Internet Explorer, and sign in to the client.
3. Test the Excel Add-in by using an Open in Excel experience. (For example, click **Fleet Management > Customers > Customer > Open in Microsoft Office > Open in Excel > Fleet Management Customers**.)

[Fixed] Issue: The Excel Add-in doesn't correctly run or enable sign-in

Issue: When users try to sign into the Excel Add-in, a blank authentication dialog box appears, or an error message is shown instead of the authentication page. The user can't sign in.

Explanation: The Excel Add-in relies on the Office Web JS Add-in platform and uses Azure AD for authentication. If a proxy is used, several URLs must be accessible for users to run and sign in to the Excel Add-in. Additionally, if AD FS is used, the AD FS URL must use HTTPS.

Solution: Because this issue is a customer-specific network issue, it requires a customer-specific resolution. If AD FS is used, make sure that the AD FS URL uses HTTPS. Additionally, make sure that all the following URLs are accessible from the user's computer.

The following URLs are accessed for loading.

- `https://az689774.vo.msecnd.net:443`
- `https://az689774.vo.msecnd.net`
- `https://appsforoffice.microsoft.com:443`
- `https://appsforoffice.microsoft.com`
- `https://secure.aadcdn.microsoftonline-p.com:443`
- `https://secure.aadcdn.microsoftonline-p.com`
- `https://az416426.vo.msecnd.net:443`
- `https://az416426.vo.msecnd.net`
- `https://telemetryservice.firstpartyapps.oaspapps.com:443`

- <https://telemetryservice.firstpartyapps.oaspapps.com>
- <https://nexus.officeapps.live.com:443>
- <https://nexus.officeapps.live.com>
- <https://browser.pipe.aria.microsoft.com:443>
- <https://browser.pipe.aria.microsoft.com>
- <http://schemas.microsoft.com>

The following URLs are accessed for authentication.

- <https://login.windows.net:443>
- <https://login.windows.net>
- <https://login.microsoftonline.com:443>
- <https://login.microsoftonline.com>

Issue: The Excel Add-in needs an explicit sign out after encountering an AADSTS50058 "silent sign in failed" error

Issue: When users try to sign in to the Excel Add-in after some period of inactivity, the user encounters the AADSTS50058 "silent sign in failed" error and is forced to sign out before signing back in.

Explanation: The Excel Add-in uses Azure AD for authentication. When authentication occurs, a token is created for the user. That token has an expiration period. After the token has expired, an AADSTS50058 error will occur indicating that "silent sign in failed".

Solution: The user needs to sign out and sign back in. We will improve this behavior in the future by automatically signing the user out to enable faster sign in.

Issue: When trying to use a document template with Open in Excel a "Record for id GUID not found" error displays

Issue: The "Record for id GUID not found" error can display when copying a database from one environment to another.

Explanation: Copying the database is problematic for document templates, record attachments, and other files that are stored in Azure blob storage. When the database is copied from one environment to another, the files are not copied along with the records, so the files that the application tries to access are not found.

Solution: For document templates, the solution is to identify the templates that are needed and load a copy of those template files into the target environment.

Additional resources

[Office integration](#)

[Office integration tutorial](#)

[Configuring Power BI integration](#)

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Organization administration home page

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This topic points to content that will help power users and administrators configure the system to work smoothly and effectively for your organization and business.

Much of the content listed here applies to features in the **Organizational administration** module. However, there are a couple of tasks, such as creating and using a record template, that can be performed in any module to help your organization run more efficiently.

Number sequences

Number sequences are used to generate readable, unique identifiers for master data records and transaction records that require identifiers. A master data record or transaction record that requires an identifier is referred to as a *reference*. Before you can create new records for a reference, you must set up a number sequence and associate it with the reference.

- [Number sequences overview](#)
- [Set up number sequences using a wizard](#) (Task guide)
- [Set up number sequences on an individual basis](#) (Task guide)

Organizations

An organization is a group of people who are working together to carry out a business process or achieve a goal. Organizational hierarchies represent the relationships between the organizations that make up your business.

Before you set up organizations and organization hierarchies, make sure that you plan how your business will be modeled. The organization model has a significant effect on implementation and business processes.

- [Organizations and organizational hierarchies overview](#)
- [Plan your organizational hierarchy](#)
- [Create an organization hierarchy](#) (Task guide)
- [Create a legal entity](#) (Task guide)
- [Create an operating unit](#) (Task guide)

Address books

The global address book is a centralized repository for master data that must be stored for all internal and external persons and organizations that the company interacts with. The data that is associated with party records includes the party's name, address, and contact information.

After you create the global address book, you can create additional address books as you require, such as a separate address book for each company in your organization or for each line of business.

- [Global address book overview](#)
- [Plan for the global address book and other address books](#)
- [Configure the global address book](#)
- [Address books FAQ](#)

Workflow

Workflow is a system that you can use to create individual workflows, or business processes. When you create a workflow, you specify how a document flows, or moves, through the system by showing who must complete a task, make a decision, or approve a document.

- [Workflow system overview](#)
- [Workflow elements](#)
- [Actions in workflow approval processes](#)
- [Create workflows overview](#)

Electronic signatures

An electronic signature confirms the identity of a person who is about to start or approve a computing process. In some industries, an electronic signature is as legally binding as a handwritten signature. Electronic signatures are a regulations compliance requirement for several regulated industries, such as pharmaceuticals, food and beverage, and aerospace and defense.

You can use electronic signatures for critical business processes. Some processes have built-in electronic signature capabilities. You can also create custom signature requirements for any database table and field.

- [Electronic signatures overview](#)
- [Set up electronic signatures](#) (Task guide)

Case management

By planning, tracking, and analyzing cases, you can develop efficient resolutions that can be used for similar issues. For example, when customer service representatives or Human Resources generalists create cases, they can find information in knowledge articles to help them work with or resolve a case more efficiently.

- [Case management overview](#)
- [Plan case category security, case processes, and case categories](#)

Record templates

Record templates can help you to create records more quickly. You can create a record template so that field values that are used often do not have to be entered explicitly for each new record.

- [Record templates overview](#)
- [Create a record template to facilitate data entry](#) (Task guide)
- [Use record template to create a new record](#) (Task guide)

General organization administration

- [Change the banner or logo](#) (Task guide)
- [Configure document management](#)
- [Configure and send email](#)
- [Date/time data and time zones](#)

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Number sequences overview

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Number sequences are used to generate readable, unique identifiers for master data records and transaction records that require identifiers. A master data record or transaction record that requires an identifier is referred to as a *reference*.

Before you can create new records for a reference, you must set up a number sequence and associate it with the reference. We recommend that you use the pages in **Organization administration** to set up number sequences. If module-specific settings are required, you can use the parameters page in a module to specify number sequences for the references in that module. For example, in **Accounts receivable** and **Accounts payable**, you can set up number sequence groups to allocate specific number sequences to specific customers or vendors.

When you set up a number sequence, you must specify a scope, which defines which organization uses the number sequence. The scope can be **Shared**, **Company**, **Legal entity**, or **Operating unit**. **Legal entity** and **Company** scopes can be combined with **Fiscal calendar period** to create even more specific number sequences.

Number sequence formats consist of segments. Number sequences with a scope other than **Shared** can contain segments that correspond to the scope. For example, a number sequence with a scope of **Legal entity** can contain a legal entity segment. By including a scope segment in the number sequence format, you can identify the scope of a particular record by looking at its number.

In addition to segments that correspond to scopes, number sequence formats can contain **Constant** and **Alphanumeric segments**. A **Constant** segment contains a set of letters, numbers, or symbols that does not change. An **Alphanumeric** segment contains a set of letters or numbers that increment every time that a number is used. Use a number sign (#) to represent incrementing numbers and an ampersand (&) to represent incrementing letters. For example, the format #####_2017 creates the sequence 00001_2017, 00002_2017, and so on.

Number sequence examples

The following examples show how to use segments to create number sequence formats. In particular, the examples demonstrate the effects of using scope segments.

Expense report numbers

In the following example, expense report numbers are set up for the legal entity that is titled **CS**.

- **Area:** Travel and expense
- **Reference:** Expense report number
- **Scope:** Legal entity
- **Legal entity:** CS

SEGMENTS	SEGMENT TYPE	VALUE
Segment 1	Legal entity	CS
Segment 2	Constant	-EXPENSE-

SEGMENTS	SEGMENT TYPE	VALUE
Segment 3	Alphanumeric	####

Example of formatted number: CS-EXPENSE-0039

You can set up a similar number sequence format for other legal entities. For example, for a legal entity that is named **RW**, if you change only the value of the legal entity segment, the formatted number is RW-EXPENSE-0039. You can also change the whole number sequence format for other legal entities. For example, you can omit the legal entity scope segment to create a formatted number such as Exp-0001.

Sales order numbers

In the following example, sales order numbers are set up for the company ID **CEU**.

- **Area:** Sales
- **Reference:** Sales order
- **Scope:** Company
- **Company:** CEU

SEGMENTS	SEGMENT TYPE	VALUE
Segment 1	Constant	SO-
Segment 2	Alphanumeric	####

Example of formatted number: SO-0029

Even though a scope segment is not included in the format, numbering restarts for each company ID. If you use the same format for all company IDs, the same numbers are used in each company. For example, sales order number SO-0029 is used in each company. You can also change the whole number sequence format for other company IDs.

Purchase requisition numbers

In the following example, purchase requisition numbers are organization-wide.

- **Area:** Purchase
- **Reference:** Purchase requisition
- **Scope:** Shared

SEGMENTS	SEGMENT TYPE	VALUE
Segment 1	Constant	Req
Segment 2	Alphanumeric	####

Example of formatted number: Req0052

Because the scope is **Shared**, the number sequence format is used across the organization. You cannot set up different number sequence formats for different parts of the organization.

Performance considerations for number sequences

Consider the following information about how the configuration of number sequences can affect system performance before you set up number sequences.

Continuous and non-continuous number sequences

Number sequences can be continuous or non-continuous. A continuous number sequence does not skip any numbers, but numbers may not be used sequentially. Numbers from a non-continuous number sequence are used sequentially, but the number sequence may skip numbers. For example, if a user cancels a transaction, a number is generated, but not used. In a continuous number sequence, that number is recycled later. In a non-continuous number sequence, the number is not used.

Continuous number sequences are typically required for external documents, such as purchase orders, sales orders, and invoices. However, continuous number sequences can adversely affect system response times because the system must request a number from the database every time that a new document or record is created.

If you use a non-continuous number sequence, you can enable **Preallocation** on the **Performance** FastTab of the **Number sequences** page. When you specify a quantity of numbers to preallocate, the system selects those numbers and stores them in memory. New numbers are requested from the database only after the preallocated quantity has been used.

Unless there is a regulatory requirement that you use continuous number sequences, we recommend that you use non-continuous number sequences for better performance.

Automatic cleanup of number sequences

In case of a power failure, an application error, or other unexpected failure, the system cannot recycle numbers automatically for continuous number sequences. You can run the cleanup process manually or automatically to recover the lost numbers.

Carefully consider server usage when you plan the cleanup process. We recommend that you perform the cleanup as a batch job during non-peak hours.

NOTE

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Set up number sequences on an individual basis

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This topic explains how to set up number sequences on an individual basis. Number sequences are used to generate readable, unique identifiers for master data records and transaction records that require them. A master data or transaction record that requires an identifier is referred to as a reference. Before you can create new records for a reference, you must set up a number sequence and associate it with the reference. You can set up all required number sequences at the same time by using the **Set up number sequences** wizard, or you can create or modify individual number sequences by using the **Number sequences** page.

1. Go to **Navigation pane > Modules > Organization administration > Number sequences > Number sequences**.
2. Select **Number sequence**.
3. In the **Number sequence code** field, type a value.
4. In the **Name** field, type a value.
5. On the **Scope parameters** FastTab, select a scope for the number sequence and select scope values from the drop-down list. The scope defines which organizations use the number sequence. In addition, number sequences that have a scope other than **Shared** can have segments that correspond to their scope. For example, a number sequence with a scope of **Legal entity** can have a legal entity segment. For more information about scopes, see [Number sequence overview](#).
6. Expand the **Segments** section.
 - Define the format for the number sequence by adding, removing, and rearranging segments.
 - Number sequences of all scopes can contain *Constant segments* and *Alphanumeric segments*. Constant segments contain a set of alphanumeric characters that do not change. Use this segment type to add a hyphen or other separators between number sequence segments. Alphanumeric segments contain a combination of number signs (#) and ampersands (&). These characters represent letters and numbers that increment every time that a number from the sequence is used. Use a number sign (#) to indicate incrementing numbers and an ampersand (&) to indicate incrementing letters. For example, the format `#####_2014` creates the sequence `00001_2014`, `00002_2014`, and so on. At least one alphanumeric segment must be present. Scope segments, such as company or legal entity, are not required. However, if you do not include scope segments in the format, numbers for the selected reference are still generated per scope.
7. Expand the **References** section. Select the document type or record to assign this number sequence to. This step is optional for sequences that are defined for special application usage patterns. In these scenarios, a new number is generated by using the value of a number sequence code or ID, without using a reference. An example of a special application usage pattern is a voucher series that is used for specific journal names. However, we do not recommend that you use such patterns.
8. Expand the **General** section. On the General FastTab, specify whether the number sequence is manual, and continuous or non-continuous. In addition, enter the lowest and highest numbers that can be used in the number sequence. We do not recommend changing a non-continuous number sequence to a continuous number sequence. The number sequence will not be truly continuous. This change may also cause duplicate key violations in the database. In addition, continuous number sequences have a larger effect on performance.
9. Click **Save**.

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Set up number sequences using a wizard

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Number sequences are used to generate readable, unique identifiers for master data records and transaction records that require them. A master data or transaction record that requires an identifier is referred to as a reference. Before you can create new records for a reference, you must set up a number sequence and associate it with the reference. This topic explains how to set up all required number sequences at the same time by using a wizard. The demo data company used to create this procedure is USMF.

1. Go to **Navigation > Modules > Organization administration > Number sequences > Number sequences**.
2. Select **Generate**.
3. Select **Next**.
 - On this page, you can modify the identification code, the lowest value, and the highest value. In addition, you can indicate whether the number sequence must be continuous.
 - Do not select the **Continuous** option if you must preallocate numbers for the number sequence. To add a scope segment to the format of a number sequence, select the format in the list, and then select **Include scope in format**. To remove a scope segment from the format of a number sequence, select the format in the list, and then select **Remove scope from format**. To exclude a number sequence from automatic generation, select the number sequence in the list, and then select **Delete**.
4. Select **Next**.
5. Select **Finish**.

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Configure number sequences for warehouse flows

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The *Number sequence extensions* feature adds a new configuration page for setting up number sequences. It enables flexible configuration of GS1-regulated IDs, including GS1 prefixes and check digits (modulo 10), and enforces a length limit on existing number sequences.

Standard number sequence segments aren't suitable for GS1 implementation, because no check digit is calculated, and the company's GS1 prefix must be updated manually.

This feature adds the following functionality:

- Bill of lading (BOL) IDs can be generated in advance.
- A unique number sequence can be generated for serial shipping container code (SSCC) numbers.
- GS1-compliant number sequences can be created for BOL and SSCC numbers. The feature adds out-of-box support for license plate IDs, container IDs, wave label IDs, and BOL IDs.
- Configuration of license plate ID numbers is flexible. For example, you can include or exclude application identifiers (AI), such as leading zeros (00).

This functionality makes it more efficient to support labeling of cartons and to adjust new numbers that are generated by the system.

Turn on the Number sequence extensions feature

Before you can use the feature, it must be turned on in your system. Admins can use the [Feature management](#) workspace to check the status of the feature and turn it on if it's required. There, the feature is listed in the following way:

- **Module:** *Warehouse management*
- **Feature name:** *Number sequence extensions*

Set up the feature

To set up number sequence extensions in your system, follow these steps.

1. Go to **Warehouse management > Setup > Warehouse management parameters**.
2. On the **General** tab, in the **GS1 company prefix** field, and enter your company's GS1 prefix. This value will affect all number sequences where the GS1 prefix is included as a segment.
3. If you want to generate BOL numbers for wave labels, on the **Reports** tab, select the **Generate BOL number when printing wave labels** check box.

NOTE

This check box is available only if the functionality for [wave label printing](#) is turned on.

4. Go to **Warehouse management > Setup > Number sequence extensions**
5. On the Action Pane, select **Create default setup**. A GS1-compliant BOL number sequence and three types of SSCC number sequences are created. All these number sequences take the length of your company's GS1 prefix into account.

For more information about how to customize these default number sequences and/or add new sequences, see the next section. You can also remove any of these sequences if you don't need them.

6. Go back to **Warehouse management > Setup > Warehouse management parameters**.
7. On the **Number sequences** tab, select a relevant number sequence extension to use to generate numbers for your license plate IDs, wave label IDs, container IDs (in this case, select the appropriate **SSCC-18 number** sequence), and/or BOL IDs (in this case, select the **BOL** sequence). By default, number sequence extensions are supported only for these four types of IDs.

The next time that a new number is generated for one of these number sequences, the new logic will be used.

NOTE

If you don't select a number sequence extension for license plate IDs, the current rules for generating license plate IDs will be used. Otherwise, your selected number sequence will be used. The other IDs will use a plain number sequence until you apply a number sequence extension for them.

Create and edit number sequences

In the previous section, you generated a default set of number sequences. This section explains how each number sequence is defined. It also explains how to create custom sequences, and how to edit the default or custom sequences.

To create and edit number sequences, follow these steps.

1. Go to **Warehouse management > Setup > Number sequence extensions**.
2. On the Action Pane, select **New**.
3. In the **Number sequence extension** field, enter a name for the new sequence. In the **Description** field, enter a description.
4. On the **Segments** FastTab, use the buttons on the toolbar to assemble your numbering format by adding, deleting, and arranging segments. In the **Segment** field for each row, assign a segment type to define the purpose and content of that segment. The following table describes the types of segments that are available.

SEGMENT TYPE	DESCRIPTION
Constant	This segment type adds the same constant text for each generated number in the sequence. In the Value field, enter the required text. The Length field is automatically updated to the length of the text that you entered in the Value field.
Number sequence	In the Value field, enter a number sign (#) for each character that should be shown in the generated sequence. The number sequence itself might generate longer numbers, but only the right-most characters will be shown. The Length field is automatically updated to the number of number signs that you entered in the Value field. To comply with GS1 requirements for SSCC-18 numbers, make sure that the length of this segment is 16 minus the length of your GS1 prefix.

SEGMENT TYPE	DESCRIPTION
GS1 prefix	This segment type adds the value that is set in the GS1 company prefix field on the Warehouse management parameters page. The Value field shows the value that is set on the Warehouse management parameters page, and the Length field shows the number of characters in the value. Both the Value field and the Length field are read-only.
Application identifier	In the Value field, enter an application identifier, as specified by the relevant GS1 policy for this type of number sequence. For example, enter <i>00</i> for SSCC or <i>420</i> for BOL. The Length field is automatically updated to the length of the identifier that you entered in the Value field.
Packing type	For items that can be clearly identified, this segment type adds a field value from the relevant unit sequence group (from the Unit sequence groups page). (This behavior matches the existing logic for license plate IDs.) For license plates that include multiple stock keeping units (SKUs), this segment type adds <i>0</i> (zero) by default. For this segment type, the Value field is always set to <i>P</i> , and the Length field is always set to <i>1</i> .
Check digit	This segment type adds a check digit, which is a modulo 10 calculation. (This behavior matches the existing logic for license plate IDs.) For this segment type, the Value field is always set to a caret (^), and the Length field is always set to <i>1</i> .

- To view an example of your final number format, inspect the **Format** field at the bottom of the **Segments** FastTab.

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Organizations and organizational hierarchies overview

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An organization is a group of people who are working together to carry out a business process or achieve a goal. Organizational hierarchies represent the relationships between the organizations that make up your business.

Organizations

You can define the following types of internal organizations: legal entities, operating units, and teams.

All internal organizations are types of the **Party** entity. Therefore, these organizations use the address book to store address and contact information. A party, which can be either a person or an organization, can belong to one or more address books.

Legal entities

A legal entity is an organization that has a registered or legislated legal structure. Legal entities can enter into legal contracts and are required to prepare statements that report on their performance.

A company is a type of legal entity. Currently, companies are the only kind of legal entity that you can create, and every legal entity is associated with a company ID. This association exists because some functional areas in the program use a company ID, or DataAreald, in their data models. In these functional areas, companies are used as a boundary for data security. Users can access data only for the company that they are currently logged on to.

Operating units

An operating unit is an organization that is used to divide the control of economic resources and operational processes in a business. People in an operating unit have a duty to maximize the use of scarce resources, improve processes, and account for their performance.

The types of operating units include cost centers, business units, value streams, departments, and commerce channels. The following table provides more information about each type of operating unit.

OPERATING UNIT TYPE	DESCRIPTION	PURPOSE
Cost center	An operating unit in which managers are accountable for budgeted and actual expenditures.	Used for the management and operational control of business processes that span legal entities.
Business unit	A semi-autonomous operating unit that is created to meet strategic business objectives.	Used for financial reporting that is based on industries or product lines that the organization serves independently of legal entities.
Value stream	An operating unit that controls one or more production flows.	Commonly used in lean manufacturing to control the activities and flows that are required to supply a product or service to consumers.

OPERATING UNIT TYPE	DESCRIPTION	PURPOSE
Department	An operating unit that represents a category or functional part of an organization that performs a specific task, such as sales or accounting.	Used to report on functional areas. A department may have profit and loss responsibility, and may consist of a group of cost centers.
Commerce channel	An operating unit that represents a brick and mortar store, an online store or an online marketplace.	Used for the management and operational control of one or more stores within or across legal entities.

Teams

A team is an organization in which the members share a common responsibility, interest, or objective. Teams cannot be used in organizational hierarchies.

Organizational hierarchies

Set up organizational hierarchies to view and report on your business from different perspectives. For example, you can set up a hierarchy of legal entities for tax, legal, or statutory reporting. Set up a hierarchy that is based on operating units to report financial information that is not legally required, but that is used for internal control. For example, you can create a purchasing hierarchy to control purchasing policies, rules, and business processes.

Each hierarchy is assigned a purpose. The purpose of a hierarchy determines the types of organizations that can be included in the hierarchy. The purpose also determines which application scenarios a hierarchy can be used in.

Organizations in a hierarchy can share parameters, policies, and transactions. An organization can inherit or override the parameters of its parent organization. However, shared master data, such as products and address books, applies to the whole organization and cannot be overridden for individual organizations. Creating organizations and hierarchies requires careful planning. For more information, see [Plan your organizational hierarchy](#).

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Plan your organizational hierarchy

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Before you set up organizations and organization hierarchies, make sure that you plan how your business will be modeled. The organization model has a significant effect on the implementation and business processes.

Organizational hierarchies represent the relationships between the organizations that make up a business. Therefore, the most important consideration when you model organizations is the structure of your business. We recommend that you define organization structures based on feedback from executives and senior managers from functional areas, such as finance and accounting, human resources, operations, purchasing, and sales and marketing.

When you are planning hierarchies, it is also important to consider the relationship between the organizational hierarchy and financial dimensions. You can set up multiple organizational hierarchies to represent different views of your business. By using financial dimensions, you can create reports based on these views. Work with your partner to create hierarchies that address both organizational and statutory reporting needs.

NOTE

Although you can use financial dimensions to represent legal entities without creating the legal entities, financial dimensions aren't designed to address the operational or business needs of legal entities. The interunit accounting functionality is designed to address only the accounting entries that are created by each transaction.

IMPORTANT

You shouldn't decide how to model organizations based only on the information in this article. This documentation is a guide. You can work with your Partner for additional guidance. Your Partner has gained experience in various industries and across the customer base.

Decide whether to model internal organizations as legal entities or operating units

You must have at least one legal entity to represent your business. A legal entity can enter legal contracts and is required to prepare financial statements that report on its performance.

Legal entities can be used for transactional business or for consolidation. This means that a legal entity in Finance and Operations does not necessarily represent a real entity in your business. For example, a company that participates in transactions can own subsidiary legal entities. In this scenario, a legal entity is required for transactions, and a virtual legal entity is required to consolidate the results and balances of the subsidiary legal entities.

Internal organizations in your business, such as regional offices, can be represented as additional legal entities, or as operating units of the main legal entity. An operating unit is not required to be a legally defined organization. Operating units are used to control economic resources and operational processes in the business. For example, departments and cost centers are operating units.

Some functionality works differently depending on whether the organization is a legal entity or an operating unit. Carefully consider the functionality described below as you make your decision.

Master data

If the organization is modeled as a legal entity

Some master data, such as customers, payment terms, tax authorities, and site-specific stock ordering, must be set up for each legal entity. Some master data, such as users, products, and most human resources data, is shared among all legal entities.

If the organization is modeled as an operating unit

Master data is shared among operating units.

Module parameters**If the organization is modeled as a legal entity**

Parameters for modules, such as Accounts receivable parameters, Accounts payable parameters, and Cash and bank management parameters, must be set per legal entity. Because the module setup for legal entities is separate, each subsidiary can comply with local statutory requirements and business practices. For example, a professional services legal entity and a manufacturing legal entity can have different module parameters even though they report to the same parent company.

If the organization is modeled as an operating unit

Module parameters are shared among operating units.

Data security**If the organization is modeled as a legal entity**

Most data is automatically secured by company ID. A company ID is a unique identifier for the data that is associated with a legal entity. A company can be associated with only one legal entity, and a legal entity can be associated with only one company. Users can access data only for the companies that they have access to. You do not need to customize to secure data by company ID.

If the organization is modeled as an operating unit

Data can be secured per operating unit by creating customized data security policies. Data security policies are used to limit access to data. For example, assume that a user is allowed to create purchase orders only in a particular operating unit. Data security policies can be created to prevent the user from accessing purchase order data from any other operating unit. The volume of transactions and the number of security policies can affect performance. When you design security policies, keep performance in mind.

Ledgers**If the organization is modeled as a legal entity**

Each legal entity requires a ledger that provides a chart of accounts, accounting currency, reporting currency, and fiscal calendar. A balance sheet can be created only for a legal entity. Main accounts, dimensions, account structures, charts of accounts, and account rules can be used by more than one legal entity.

If the organization is modeled as an operating unit

An operating unit can't have its own ledger information. If your internal organizations do not require unique ledgers, you can model them as operating units. Ledger information will be set up for the parent legal entity in the hierarchy. Income statements can be created for operating units within a legal entity or for the parent legal entity.

Fiscal calendars**If the organization is modeled as a legal entity**

Each legal entity has its own fiscal calendar. If your internal organizations use different fiscal years and fiscal calendars, you must model the organizations as legal entities.

If the organization is modeled as an operating unit

Operating units must share a fiscal calendar. If your internal organizations can use the same fiscal years and fiscal calendars, you can model the organizations as operating units.

Consolidation**If the organization is modeled as a legal entity**

You must consolidate the financial results for regional offices into a single, consolidated company in order to

prepare financial statements.

If the organization is modeled as an operating unit

Consolidation is not required, because data is already shared among operating units.

Centralized payments

If the organization is modeled as a legal entity

Centralized payments must be set up so that invoices for all child legal entities can be paid to or from a single parent legal entity.

If the organization is modeled as an operating unit

Centralized payments are not required because all invoices are recorded in a single legal entity.

Intercompany transactions

If the organization is modeled as a legal entity

Intercompany sales orders, purchase orders, payments, or receipts can be applied to one another. You are not required to use journal vouchers. You can view intercompany transactions at the sub-ledger level (Accounts receivable, Accounts payable). The following examples illustrate how intercompany transactions are handled.

Example 1: Headquarters provides services to regional offices and must charge the costs of those services to the regional offices

If you model the regional office as a legal entity, you have the following options:

- Headquarters creates a journal entry to cross-charge the regional office for the expense. The transactions cannot be aged.
- Headquarters sends a purchase order for the services to the regional office. A sales order is automatically created in the legal entity for the regional office, with intercompany sub-ledger transactions.

Example 2: Headquarters procures and pays for service that is delivered to a regional office

If you model the regional office as a legal entity, you have the following options:

- The invoice and payment follow the regulatory requirements of headquarters. Headquarters can create a journal entry to cross-charge the regional office for the expense. The transactions cannot be aged.
- The invoice and payment follow the regulatory requirements of headquarters. Headquarters can create an intercompany sub-ledger transaction.

If the organization is modeled as an operating unit

Intercompany transactions among operating units are supported only through journal vouchers. An operating unit cannot issue or receive a purchase order, sales order, or invoice from another operating unit in the same legal entity. You cannot view intercompany transactions at the sub-ledger level (Accounts receivable, Accounts payable). The following examples illustrate how intercompany transactions are handled.

Example 1: Headquarters provides services to regional offices and must charge the costs of those services to the regional offices

If you model the regional office as an operating unit, headquarters enters an expense transaction and codes it to the regional office.

Example 2: Headquarters procures and pays for service that is delivered to a regional office

If you model the regional office as an operating unit, the invoice and payment follow the regulatory requirements of headquarters. The invoice can be coded to the regional office. On the income statement, use a balancing financial dimension to report costs for the regional office.

Local tax requirements

If the organization is modeled as a legal entity

A legal entity is subject to the tax laws of the tax authority in the country/region where the legal entity is registered. For example, a legal entity that is registered in Denmark is subject to Danish tax laws and regulations. A legal entity can belong to only one country/region. The country/region that you select for the primary address of the legal entity controls the country/region-specific features that are available to that legal entity. For example, if the primary address of the legal entity is in Denmark, features that are related to Danish tax laws and regulations become available. Therefore, if your organizations are in different countries/regions and require

different local tax options, you must set up the organizations as separate legal entities.

If the organization is modeled as an operating unit

Operating units use the country context of the parent legal entity. Operating units in the same legal entity cannot have different country/region-specific requirements. If your organizations are in the same country/region and use the same tax options, you can set them up as operating units.

Statutory reporting for a country/region

If the organization is modeled as a legal entity

For countries/regions that are supported, most statutory reports can be created. For information about which reports are available for each country/region, see the [Microsoft Dynamics Localization Portal](#). (A CustomerSource logon is required.)

NOTE

A posting layer in the general ledger allows you to make adjusting entries to a parent company that uses a different accounting standard than the child company. For example, for a company that uses generally accepted accounting practices in the United Kingdom (UK GAAP), you can make adjusting entries in the posting layer. These entries can be consolidated into a parent company that uses generally accepted accounting principles (GAAP) in the United States. The adjusting entries do not affect UK GAAP reporting.

If the organization is modeled as an operating unit

Statutory reports must be created by using another application. You must ensure that data is captured in Finance and Operations apps to support the requirements of each operating unit, where they differ from the requirements of headquarters.

Currency

If the organization is modeled as a legal entity

If your organizations must use different functional currencies, you must model the organizations as legal entities. Functional currencies are set up per legal entity. However, you can enter transactions in multiple currencies.

If the organization is modeled as an operating unit

If your organizations can use a single functional currency, you can model the organizations as operating units. Operating units must share a functional currency. However, you can enter transactions and create reports in multiple currencies.

Year-end closing

If the organization is modeled as a legal entity

If laws and accounting practices differ among the countries/regions where your organizations are located, you may require different year-end procedures per organization. This means that you must model the organizations as legal entities. Each legal entity has its own year-end procedures.

If the organization is modeled as an operating unit

If laws and accounting practices are the same among the countries/regions where your organizations are located, you may use a single set of year-end procedures. This means that you can model the organizations as operating units. All operating units must use the same year-end closing procedure.

Number sequences

If the organization is modeled as a legal entity

Number sequences for some references can be set up per legal entity. Some number sequences can be shared.

If the organization is modeled as an operating unit

Number sequences for some references can be set up per operating unit. Some number sequences can be shared.

Products

If the organization is modeled as a legal entity

Product definitions are shared, and they must be released to individual legal entities before they can be included in transactions. Each legal entity has its own set of released products that can be included in transaction documents. If your internal organizations must use different sets of products, you must model the organizations as legal entities.

NOTE

Even though product definitions are shared, in each legal entity where a product has been released, you can specify different sales, purchase, and stocking parameters for the item at each inventory site.

If the organization is modeled as an operating unit

All operating units share the same set of products. If your internal organizations can share the same set of products, you can model the organizations as operating units.

Inquiry and reporting

If the organization is modeled as a legal entity

You must manually change companies to enter transactions and perform inquiries in multiple legal entities. Because of data security boundaries, consolidated inquiry and reporting can be resource intensive and time-consuming.

If the organization is modeled as an operating unit

You do not need to change companies to access data from multiple operating units. Consolidated inquiry and reporting and individual regional inquiry is easier and faster.

Best practices for modeling organizations and hierarchies

Consider the following best practices when you implement an organization hierarchy:

- Create a department to model the intersection between a legal entity and a business unit. You can then roll up data from a department to a legal entity for statutory reporting, and from a department to a business unit for internal reporting. Departments can serve as profit centers. If you use departments, you do not have to use legal entities and business units as dimensions in the account structure. You can use just departments as a dimension. However, you must use both cost centers and departments as dimensions in the account structure if cost centers are used only as cost accumulators, and departments are used for revenue recognition.
- Model multiple hierarchies for operating units if you have complex requirements for reporting profit and loss.
- In a single legal entity, do not model multiple hierarchies for the same hierarchy purpose.
- Do not create a hierarchy for every purpose. Usually, you can use one hierarchy for multiple purposes. For example, one hierarchy of operating units can be assigned to all policy-related purposes.
- Create balanced hierarchies. In a hierarchy, all nodes that are the same distance from the root node are defined as a level. In a balanced hierarchy, only one type of operating unit can occur at each level, and the distance from the root node to each level is consistent. If there are intermediate levels between a department and a legal entity or a business unit, placeholder organizations may be required to create a balanced hierarchy.
- Do not model a separate hierarchy of operating units if the structure for legal entities is also your operating structure. A mixed hierarchy of legal entities and operating units may serve both purposes.
- Before you model major restructuring scenarios, use the hierarchy's effective dates to perform an impact analysis and a validation test.
- Use draft mode to change a hierarchy before you publish a new version in a production environment.
- Limit the number of people who have permissions to add or remove organizations from a hierarchy in a

production environment. A smaller number reduces the chance that costly mistakes can occur and corrections must be made.

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Create an organization hierarchy

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Use the following procedure to create an organizational hierarchy. You can use organizational hierarchies to view and report on your business from various perspectives. For example, you can set up one hierarchy for tax, legal, or statutory reporting. You can then set up another hierarchy to report financial information that is not legally required, but that is used for internal reporting.

Before you create an organizational hierarchy, you must create organizations. For more information, see the "Create a legal entity" or "Create an operating unit" tasks. You can also create departments and teams.

The demo data company used to create this procedure is USMF.

Create a hierarchy

1. Go to **Navigation pane > Modules > Organization administration > Organizations > Organization hierarchies**.
2. On the **Action pane**, click **New**.
3. In the **Name** field, type a value.
4. In the **Purpose** section, click **Assign purpose**.
5. In the list, find and select the desired record. Select a purpose to assign to your organization hierarchy.
6. In the **Assigned hierarchies** section, click **Add**.
7. In the list, mark the selected row. Find the hierarchy you just created.
8. Click **OK**.

Add organizations to the hierarchy

1. In the list, find and select the desired record. Select your hierarchy.
2. In the **Assigned hierarchies** section, click **View hierarchy**.
 - Add organizations, as necessary.
 - To add an organization, click **Edit** and then **Insert** to add the organization. When you are done making changes you can **Save** a draft and/or **Publish** the changes.

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Create a legal entity

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A legal entity is an organization that is identified through registration with a legal authority. Legal entities can enter into contracts and are required to prepare statements that report on their performance. The following procedure explains how to create a legal entity. The demo data company used to create this procedure is USMF.

1. Go to **Navigation pane > Modules > Organization administration > Organizations > Legal entities**.
2. Click **New**.
3. In the **Name** field, type a value.
4. In the **Company** field, type a value.
5. In the **Country/region** field, enter or select a value.
6. Click **OK**. In the **General** section, provide the following general information about the legal entity: Enter a search name, if a search name is required. A search name is an alternate name that can be used to search for this legal entity. Select whether this legal entity is being used as a consolidation company. Select whether this legal entity is being used as an elimination company.
7. Expand the **Addresses** section. In the **Addresses** section, click **Edit** to enter address information, such as the street name and number, postal code, and city.
8. Expand the **Contact information** section. In the **Contact information** section, enter information about methods of communication, such as email addresses, URLs, and telephone numbers.
9. Expand the **Statutory reporting** section. In the **Statutory reporting** section, enter the registration numbers that are used for statutory reporting.
10. Expand the **Registration numbers** section. In the **Registration numbers** section, enter any information required by the legal entity.
11. Expand the **Bank account information** section. In the **Bank account information** section, enter bank accounts and routing numbers for the legal entity.
12. Expand the **Foreign trade and logistics** section. In the **Foreign trade and logistics** section, enter shipping information for the legal entity.
13. Expand the **Number sequences** section. In the **Number sequences** section, you can view the number sequences that are associated with the legal entity.
14. Expand the **Images** section. In the **Images** section, view or change the logo and/or dashboard image that are associated with the legal entity.
15. Expand the **Tax registration** section. In the **Tax registration** section, enter the registration numbers that are used to report to tax authorities.
16. Expand the **Tax 1099** section. In the **Tax 1099** section, enter 1099 information for the legal entity.
17. Click **Save**.

NOTE

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Create an operating unit

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An operating unit is an organization that is used to divide the control of economic resources and operational processes in a business. People in an operating unit have a duty to maximize the use of scarce resources, improve processes, and account for their performance. The types of operating units include cost centers, business units, departments, and value streams. Use the following procedure to create an operating unit. The demo data company used to create this procedure is USMF.

1. Go to **Navigation pane > Modules > Organization administration > Organizations > Operating units**.
2. Click **New** to open the drop dialog.
3. In the list, find and select the desired record. Select the type of operating unit you want to create.
4. In the list, click the link in the selected row.
5. In the **Name** field, type a value.
 - Expand the **General** section, if necessary.
 - Provide general information about the operating unit, such as an identification number, DUNS number, and manager.
 - Expand the **Addresses** section, if necessary.
 - Enter address information, such as the street name and number, postal code, and city. Click **Add** to enter a new address record, or click **Edit** to modify an existing address record.
 - Expand the **Contact information** section, if necessary.
 - Enter information about methods of communication, such as email addresses, URLs, and telephone numbers. To enter a new communication record, click **New**. To modify an existing communication record, click **More options > Advanced**.
6. Optionally, change the **Operating unit number** as needed. Note that this number is a unique identifier for the corresponding **Party** record and cannot be the same as any other operating unit.
7. Select **Save**.

NOTE

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Global address book overview

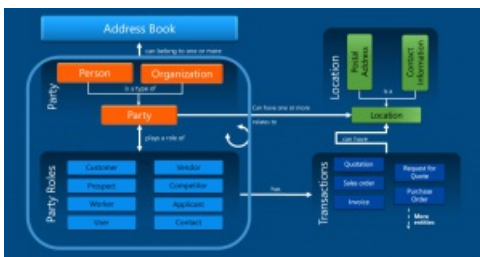
2/18/2021 • 4 minutes to read • [Edit Online](#)

The global address book is a centralized repository for master data that must be stored for all internal and external persons and organizations that the company interacts with. The data that is associated with party records includes the party's name, address, and contact information. Other details vary, depending on whether the party is a person or an organization. Each party record is assigned to a party, and each party can be associated with one or more party roles in a company. Party roles include customer, prospect, worker, user, vendor, competitor, applicant, and contact. For example, the organization party First Up Consultants, can be associated with customer, business relation, and vendor roles in the CEE company, and can also be associated with the vendor role in the CEU company. Here are some of the benefits of this shared data:

- The data shows the relationships that people and organizations have with other areas of the company. The relationship between two organizations changes when one organization has multiple roles, such as vendor and customer. Communication between the two organization also changes. There might be special agreements that can be negotiated to encourage a closer partnership with the other organization.
- Setup and maintenance are easier. For example, when an address changes, the update must be made in only one place. All the other associated records are updated automatically.

How the global address book works

The following illustration shows how party records, party roles, locations, and transactions interact and relate to an address book. As the illustration shows, a party record can belong to one or more address books. Each party record can store one or more locations, or addresses, and is assigned a party role. The role that is assigned to the party record can have specific transactions types associated with it. The following sections provide more information about party roles, locations, and transaction types. The following image is a graphical representation of the ways that parties, party roles, locations, and transactions interact in relation to the global address book.



Party roles

Roles that are associated with party records are referred to as party roles. There are several party roles, and they can be assigned to both party types, person and organization. Here are the definitions for each party role:

- **Customer** – Individuals, companies, or other entities who purchase goods and services that are produced by other individuals, companies, or entities.
- **Prospect** – A party that might provide a service or benefit to a legal entity.
- **Worker** – A person who assumes the role of an employee or a contractor, and who is paid in exchange for services.
- **User** – A person who is a user of the system.
- **Vendor** – A party that supplies products to one or more legal entities in exchange for payment.
- **Competitor** – A person or organization that provides goods or services that are similar to the goods or services that your business provides.

- **Applicant** – A person who makes a formal written or electronic request to work for or fill an open position in an organization.
- **Contact** – A person, either inside or outside your organization, that you have created an entry for. In this entry, you can save information such as the person's street and email addresses, telephone and fax numbers, and webpage URLs.

Creating new party records

There are two ways to enter party records in the global address book:

- **Creating a party record when you don't know the role** – When you create a party record and don't know the role type (for example, you don't know whether the party is a customer or an opportunity), you create the record in the global address book. You can select the role type later.
- **Creating a party record when you know the role** – If you know the role type for the party, you can create a record on the appropriate page for that type. For example, if the party is a customer, you create a record on the **Customer** page. When you create and save a record by using the page for the party's role type, the record is automatically created in the global address book.

Party roles and transactions

For transactions that are a part of the business processes, multiple parties might be associated with each transaction. An example is a customer that needs to be referenced on project quotations.

Parties locations, addresses, and contact information

Each party record's addresses, locations, and contact information are shared across all the party roles that are associated with that party. Therefore, when any of this information is changed, all other associated records are updated accordingly.

Locations and transactions

When a party role is included in a transaction, the location, address, or contact information of the party can be accessed when transaction details are entered.

NOTE

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Plan for the global address book and other address books

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This topic describes the considerations and decisions that you must make during the planning process, before you set up and configure the global address book and any additional address books. Some of the decisions will require that you confirm the decisions that have been made for other areas of the product, such as the organization hierarchy.

Global address book

Before you begin to work with the global address book, you must determine the default values for it. These default values are then used for any additional address books that you create.

Decisions

- What sequence should names be displayed in for party records of the **Person** type? For example, one sequence is last name, middle name, first name.
- Should party records be deleted from the address book when the role record is deleted? For example, if a customer record is deleted, should the party record also be deleted?
- When a new record is created, should users be notified if a duplicate record is found in the global address book?
- Should the Data Universal Numbering System (DUNS) number be included in a party record's information?
- If the DUNS number is included in a party record, should the uniqueness of the number be checked?
- When a party record is created in the global address book, do you want a default party type, person, or organization?
- Which user roles should have access to the private addresses and contact information of party records?

Additional address books

After you create the global address book, you can create additional address books as you require, such as a separate address book for each company in your organization or for each line of business. For example, Fabrikam is an international organization that has multiple companies and multiple lines of business. Fabrikam plans to create an address book for each line of business. For lines of business that occur in more than one location, such as the pneumatic tools business, Fabrikam plans to create an address book for each location. Chris, the IT manager at Fabrikam, has created the following list of address books that are required. This list also describes the party records that each address book must include.

- **Public Sector Contracts (PubSC)** – Party records for all parties that are involved in the public sector contracts that Fabrikam holds.
- **Private Sector Contracts (PriSC)** – Party records for all parties that are involved in the private sector contracts that Fabrikam holds.
- **Electronic Tools (ET)** – Party records for all parties that are involved in the purchase or sale of electronic tools, or that otherwise interact with the electronic tools that are provided by or purchased for Fabrikam in the Fabrikam-Japan company.
- **Pneumatic Tools (PTJPN)** – Party records for all parties that are involved in the purchase or sale of pneumatic tools, or that otherwise interact with the pneumatic tools that are provided by or purchased for Fabrikam in the Fabrikam-Japan company.

- **Pneumatic Tools (PTUSA)** – Party records for all parties that are involved in the purchase or sale of pneumatic tools, or that otherwise interact with the pneumatic tools that are provided by or purchased for Fabrikam in the Fabrikam-US company.

Decision:

- How many additional address books will you create?

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Configure the global address book

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Use this procedure to set the default values and security policies for the global address book.

The demo data company used to create this task is USMF. This task is intended for the Planning and configuration team.

1. In the Navigation pane, go to **Modules > Organization administration > Global address book > Global address book parameters**.
2. In the **Name sequence** field, select how names should be shown.
3. In **Delete parties with no roles**, select whether to delete parties with that have not been assigned a role.
4. In **Use duplicate check**, select whether to check for duplicate records.
5. In **Display DUNS number on addresses**, select whether to display the DUNS number on addresses.
6. In **Check for unique DUNS number**, select whether to check for unique DUNS numbers.
7. In the **Party** field, select an option.
8. In the **Customer** field, select an option.
9. In the **Vendor** field, select an option.
10. In the **Prospect** field, select an option.
11. In the **Competitor** field, select an option.
12. Click the **Private location security** tab.
13. In the list, find and select the desired record. Press the Shift key to select multiple roles to add to the **Selected roles** pane and then click the arrow to add the selected roles.
14. Click **Save**.

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Address books FAQ

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How do I check for duplicate records?

You can check for duplicate records directly from the **Global address book** list page. On the Action Pane, on the **Party** tab, in the **Maintain** group, click **Check for duplicates**. Then select the values to include in the check for duplicates.

Can I bulk add or delete party records from an address book?

Yes, you can add multiple party records to an address book and also remove multiple party records.

- To add multiple party records to an address book, on the **Global address book** list page, select the parties in the list. Then, on the Action Pane, on the **Party** tab, in the **Maintain** group, click **Assign parties**. Select the address books to add the selected party records to, and then click **OK**. All the selected party records are added to the address books that you selected.
- To remove multiple party records from an address book, on the **Global address book** list page, select the parties in the list. Then, on the Action Pane, on the **Party** tab, in the **Maintain** group, click **Remove parties**. Select the address books to remove the parties from, and then click **OK**. All the selected party records are removed from the address books that you selected.

Can I change the party type of a record, or do I have to delete the old record and create a new one?

Occasionally, you might have to change the party type of a record from person to organization or from organization to person. For example, Nancy is a member of the sales team for Fabrikam U.K. At a trade show in London, she meets six new prospects. Nancy creates a prospect party record for each prospect. When Nancy saves the records, each record is also created in the global address book. Fabrikam has set the default party type to organization, but two of the new prospects should have a record type of person. Therefore, when Nancy returns from the trade show, she must change the party type of the two prospect records. To change a party record from one party type to another, you must first create a new party record of the correct type in the global address book. You then associate the old party record with this new record. After you have made the new party association, delete the original party record that has the incorrect record type.

How do I change the name or address of a party record?

You can update the name of a party record, and the addresses that are associated with that record, at any time.

- To update the name of a party record, open the party record, and then, on the Action Pane, click **Edit**. On the **General** FastTab, enter the new name for the party, and then save the record.
- To update an address for a party record, open the party record, and then, on the **Addresses** FastTab, select the address to update. Click **Edit**, and then, on the **Edit address** page, make the required changes to the address or address parameters.

Can I merge two or more party records into one record?

Occasionally, you might want to merge two or more party records into a single record. This can occur if you create one or more duplicate party records, either on purpose or unintentionally. When you merge party records, you select one record to keep. The information from the other records is then merged into this record.

For example, you discover that information about Fabrikam is stored in three party records: A, B, and C. You decide to keep party record A. Therefore, the information that is stored in party records B and C will be merged into party record A. There are some situations where you can't merge party records:

- You can't merge party records that are associated with the same party role, such as customer or vendor, in the same legal entity. For example, party A is associated with a customer in legal entity 123, and party B is associated with a different customer in legal entity 123. These party records can't be merged, because if they were merged, the merged party record would be associated with multiple customers in the same legal entity, and this isn't allowed. However, the records can be merged if party B is associated with a vendor in legal entity 123 or with a customer in a different legal entity.
- You can't merge internal party organization records in the same legal entity, team, or operating unit.

Should I create a party record in the global address book or in another place, such as the Customer or Vendor page?

You can enter party records either in the global address book or on the appropriate entity page. When you add a record in one location, the same record is always added in the other location. For example, if you add a party record for a customer in the global address book, the record is also added on the **Customer** page. Likewise, if you add a party record for a customer on the **Customer** page, the record is also added in the global address book. Use the following guidelines to decide where you should enter new party records:

- **Creating a party record when you don't know the entity type** – If you must create a party record but don't know the entity type (for example, you don't know whether the entity is a customer or an opportunity), create the record in the global address book. You can select the entity type later.
- **Creating a party record when you know the entity type** – If you know the entity type for the party, you can create a record on the applicable page for that type. For example, create a record for a customer on the **Customer** page. When you create and save a record by using the appropriate entity page, the record is automatically created in the global address book.

Can I translate address information for party records?

You can set up translations of address information, so that the information appears in your user language (system language) in your program, but in another language on documents such as sales orders. You can enter translations for country/region names, address purposes, and name sequences. For example, your system language is Danish, and you create a sales order for a customer in France. In this case, you can view the customer record in Danish in the program but display the address information in French on the printed sales order. When you set up translations, you should enter a translation for every item in the list. Any item that you don't enter a translation for will appear in the system language. For example, your system language is Danish, and you send a document to a customer in Spain. If you haven't entered Spanish (ESP) translations for the address information, that information will appear in Danish both in the program and on the printed document.

NOTE

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Configure address books

2/18/2021 • 2 minutes to read • [Edit Online](#)

Use this procedure, and the decisions that you made in the Planning the configuration of the global address book and additional address books topic, to set up additional address books for your organization.

The demo data company used to create this task is USMF. This recording is intended for the Planning and configuration team members.

Configure address books

1. In the **Navigation** pane, go to **Modules > Organization administration > Global address book > Address books**.
2. Click **New**.
3. In the **Name** field, type a value.
4. In the **Description** field, type a value.
5. Click **Save**.
6. In the list, find and select the desired record.
7. Click the arrow to add the selected available teams to the address book.
8. Click **Save**.

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Workflow system overview

2/18/2021 • 2 minutes to read • [Edit Online](#)

This topic describes the workflow system.

What is workflow?

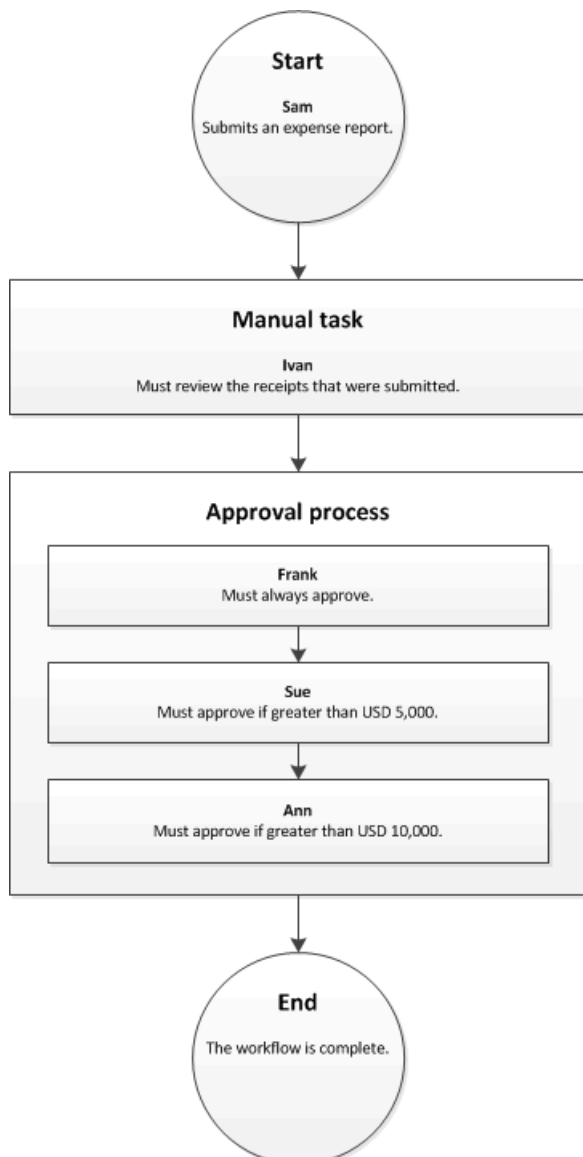
The term *workflow* can be defined in two ways: as a system and as a business process.

Workflow is a system

Workflow is a system that runs on the Application Object Server (AOS). The workflow system provides functionality that you can use to create individual workflows, or business processes.

Workflow is a business process

A workflow represents a business process. It defines how a document flows, or moves, through the system by showing who must complete a task, make a decision, or approve a document. For example, the following illustration shows a workflow for expense reports.



To better understand this workflow, suppose that Sam submits an expense report for USD 7,000. In this scenario, Ivan must review the receipts that Sam routes to him. Then Frank and Sue must approve the expense report.

Now suppose that Sam submits an expense report for USD 11,000. In this scenario, Ivan must review the receipts, and Frank, Sue, and Ann must approve the expense report.

Benefits of using the workflow system

There are several benefits of using the workflow system in your organization:

- **Consistent processes** – You can define how specific documents, such as purchase requisitions and expense reports, are processed. By using the workflow system, you ensure that documents are processed and approved in a consistent and efficient manner.
- **Process visibility** – You can track the status, history, and performance metrics of workflow instances. This helps you determine whether changes should be made to the workflow to improve efficiency.
- **Centralized work list** – Users can view a centralized work list that displays the workflow tasks and approvals that are assigned to them.

Workflow content

- [Workflow system architecture](#)
- [Workflow elements](#)
- [Actions in workflow approval processes](#)
- [Create workflows overview](#)
- [Configure workflow properties](#)
- [Configure manual tasks in a workflow](#)
- [Configure automated tasks in a workflow](#)
- [Configure approval processes in a workflow](#)
- [Configure approval steps in a workflow](#)
- [Configure manual decisions in a workflow](#)
- [Configure conditional decisions in a workflow](#)
- [Configure parallel activities in a workflow](#)
- [Configure parallel branches in a workflow](#)
- [Configure line-item workflows](#)
- [Workflow FAQ](#)

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Workflow system architecture

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This article describes the architecture of the workflow system.

The workflow infrastructure consists of two components that are hosted on Application Object Server (AOS): the X++ workflow runtime and the managed workflow runtime.

The X++ workflow runtime consists of the following components:

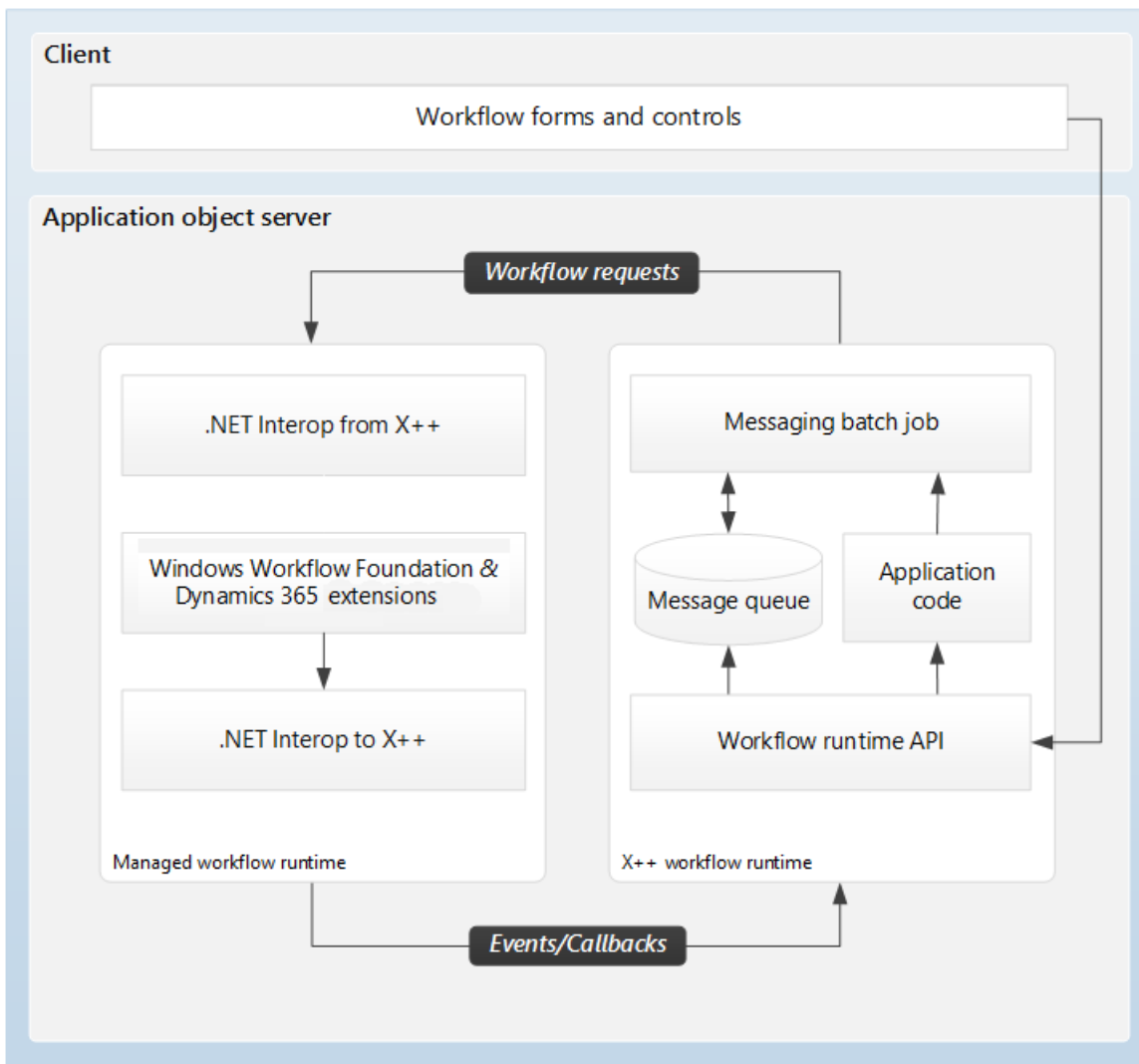
- Workflow runtime application programming interface (API)
- A messaging batch job
- A message queue

Either the messaging batch job or the workflow runtime API can invoke the application code, if it's required. The X++ workflow runtime is compiled into the Common Intermediate Language (CIL) of the Microsoft .NET Framework.

The managed workflow runtime consists of the Windows Workflow Foundation and Finance and Operations apps extensions.

Logically, the workflow infrastructure is an extension and is transparent to users. Physically, both the X++ workflow and the managed workflow runtimes are hosted on AOS. The workflow infrastructure uses batch processing on AOS and .NET Interop to integrate both subsystems, and to pass messages from one subsystem to the other. The X++ code that is run in the batch processor is compiled to .NET CIL. The batch processing runs in the .NET common language runtime (CLR).

The following figure shows the high-level architecture of the workflow infrastructure.



Users can use workflow pages and controls to participate in business processes.

Developers can create workflows for the objects that they have added. The following table describes the workflow steps that occur when a user submits an expense report to the workflow system for approval.

STEP	RUNTIME	ACTIVITY
1	X++ workflow runtime	<p>A user submits an expense report by clicking the Submit button on one of the workflow controls. This action causes X++ code to activate a workflow instance by calling the workflow runtime API. The workflow runtime API posts a message to the message queue. The messaging batch job reads the message and sends a workflow activation request to the managed workflow runtime.</p> <p>[!NOTE] The messaging batch job processes the message queue at one-minute intervals.</p>

STEP	RUNTIME	ACTIVITY
2	Managed workflow runtime	<p>.NET Interop from X++ receives the message and starts a new workflow instance via Windows Workflow Foundation. This workflow instance performs a callback to the X++ workflow runtime API via .NET Interop to X++ CIL and posts a message that the workflow has started.</p> <p>After the message is posted, the managed workflow runtime saves the idle workflow instance to the database. The runtime then removes the workflow instance from memory. When the managed workflow runtime receives another message from the X++ workflow runtime for this workflow instance, it restores the workflow instance to memory and resumes it.</p> <p>Each workflow instance is unique. If two users submit their expense reports for approval, two workflow instances are started.</p>
3	X++ workflow runtime	<p>The messaging batch job reads the workflow started message from the message queue and invokes the application event handler to process a workflow started event. The batch job then posts an acknowledgment message that the event was processed.</p>
4	Both	<p>This same messaging pattern is repeated, as required, throughout the lifecycle of the workflow instance.</p>

The workflow architecture helps provide a reliable and durable messaging system, and also helps guarantee that the state of the workflow is always synchronized with the state of the application. If an unexpected hardware or software failure occurs, the workflow instance state is returned to its last known saved point, and the message stays in the queue. Therefore, from an architecture perspective, the recovery model is to fix the problem and resume the workflow.

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Workflow elements

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This topic describes the various elements that make up a workflow.

A workflow consists of elements. The sections that follow describe each type of element.

Tasks

A *task* is a unit of work that must be performed. Two types of tasks can be added to a workflow: manual tasks and automated tasks.

Manual task

A *manual task* is a unit of work that must be performed by a user. For example, an expense report workflow can have manual tasks that require the assigned users to complete the following actions:

- Review the receipts that are submitted together with an expense report.
- Call an employee's manager.

Automated task

An *automated task* is a unit of work that must be performed by the system. No human interaction is required. For example, a sales order workflow can have automated tasks that require the system to complete the following actions:

- Perform a credit check.
- Create a customer record for the customer, if a record doesn't already exist.

Approval processes

An *approval process* is a process that consists of separate steps. At each approval step, the user can perform the following actions:

- Approve the document.
- Reject the document.
- Request a change to the document.
- Assign the document to another user for approval.

Line-item workflow elements

A workflow can be created to process either documents or the line items on a document. For example, you've created an approval workflow for timesheets. (We will refer to this workflow as the *document workflow*.) You can add a *line-item workflow* element to that document workflow. When the line-item element is run, each line item on the document is submitted for processing. You might want all the line items to be processed by the same line-item workflow, or you might want each line item to be processed by a different line-item workflow. Imagine that an employee has submitted a timesheet that resembles the following figure.

Timesheet: 1234
Employee: 5678
Submitted by: Mike

Your Organization's Name

Date	Project ID	Project Manager	Description of Work	Start Time	Stop Time
DD/MM/YY	1111	Mary	Work at site A	9:00	17:00
DD/MM/YY	1111	Mary	Work at site A	9:00	17:00
DD/MM/YY	2222	Hans	Work at site B	9:00	17:00
DD/MM/YY	3333	Jen	Work at site C	9:00	17:00
DD/MM/YY	3333	Jen	Work at site C	9:00	17:00

Document workflow
You can configure a workflow to process the whole document.

Line-item workflow
You can configure a workflow to process each line item on the document.

In this scenario, you might want to create the following line-item workflows:

- **Line-item workflow 1** – This workflow is used to process line items where the project ID is 1111.
- **Line-item workflow 2** – This workflow is used to process line items where the project ID is 2222.
- **Line-item workflow 3** – This workflow is used to process line items where the project ID is 3333.

Flow-control elements

The following elements let you design workflows that have alternate branches or branches that run at the same time.

Manual decision

A *manual decision* is a point where a workflow divides into two branches. A user must make a decision, and this decision determines which branch is used to process the document that was submitted.

Conditional decision

A *conditional decision* is also a point where a workflow divides into two branches. However, the system decides which branch is used to process the document that was submitted. To make this decision, the system evaluates the document to determine whether it meets specified conditions.

Parallel activity

A *parallel activity* is a workflow element that includes two or more workflow branches that run at the same time.

Subworkflow

A *subworkflow* is a workflow that runs in the context of another workflow.

NOTE

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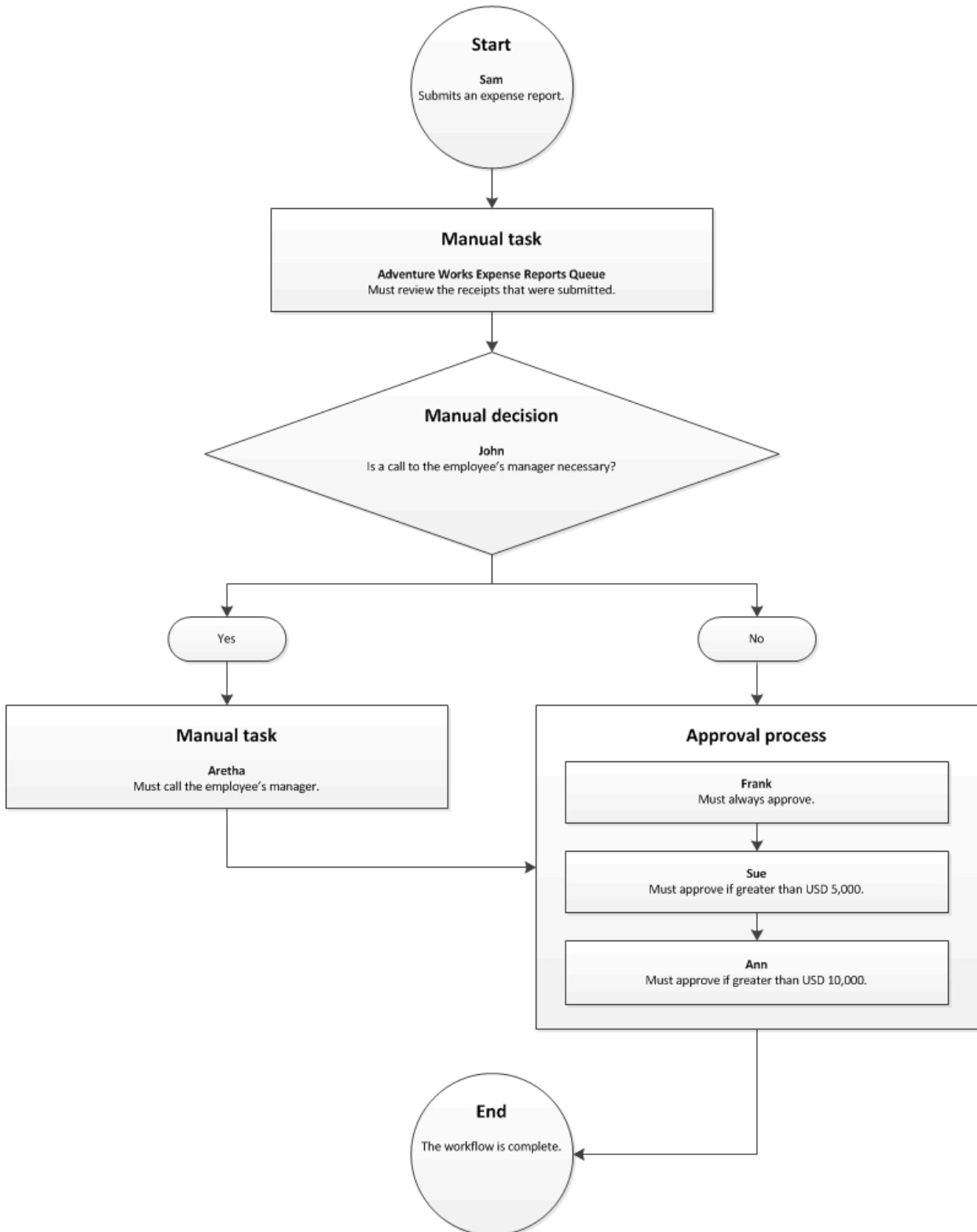
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Actions in workflow approval processes

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This article explains the actions that each participant in a workflow approval process can take.

A workflow can involve several groups of people: the originator, task assignees, decision makers, and approvers. For example, in the following expense report workflow, Sam is the originator, the members of the queue are task assignees, John is a decision maker, and Frank, Sue, and Ann are approvers.



The following sections explain the workflow actions that each group can perform.

Actions that an originator can perform

The originator starts a workflow instance by submitting a document for processing. For example, Sam must click the **Submit** button on the **Expense report** page to submit his expense report.

Actions that a task assignee can perform

A task can be assigned to multiple people or to a work item queue that is monitored by several people. However, only one person can complete a task. For example, Sam has submitted an expense report and has routed his receipts to his organization's Expense Reports department for review.

The members of the Adventure Works Expense Reports department monitor the queue. Julie, a member of that department, has accepted the task of reviewing Sam's expense report and receipts. She can now perform one of the following actions: complete, reject, delegate, request change, reassign, or release.

NOTE

The actions that are available vary, depending on how the software developer designed the task.

Complete

When a user completes a task, the document that was submitted for processing is assigned to the next user in the workflow, if there is a next user. If no additional processing is required, the workflow process ends.

For example, Julie, a member of the Adventure Works Expense Reports department, has accepted the task of reviewing Sam's expense report and receipts. After Julie completes her review, the document is assigned to John.

Reject

When a user rejects a document, the workflow process ends.

For example, Julie, a member of the Adventure Works Expense Reports department, has accepted the task of reviewing Sam's expense report and receipts. If Julie rejects the expense report, the workflow process ends.

Sam can then resubmit the expense report. He can make changes first, or he can resubmit the original version. If Sam resubmits the expense report, the workflow process starts at the manual review task.

Delegate

When a user delegates a task, the task is assigned to another user.

For example, Julie, a member of the Adventure Works Expense Reports department, has accepted the task of reviewing Sam's expense report and receipts. Julie delegates this task to Tim, who is her assistant.

Tim then acts on behalf of Julie. Therefore, when Tim completes his review, the expense report is assigned to John, just as if Julie had completed the task.

Request change

When a user requests a change to a document that was submitted, the document is sent back to the originator.

For example, Julie, a member of the Adventure Works Expense Reports department, has accepted the task of reviewing Sam's expense report and receipts. Julie notices some errors on the expense report and requests changes. The expense report is sent back to Sam.

Sam can resubmit the expense report. He can make the requested changes first, or he can resubmit the original version. If Sam resubmits the expense report, a member of the work item queue must review the expense report

and the receipts again.

Reassign

The members of a work item queue can reassign documents that are in that queue to another queue.

For example, Julie, a member of the Adventure Works Expense Reports department, is monitoring the queue. To help balance the workload, she can reassign the expense report, and the receipts that are included with it, to another queue.

Release

Occasionally, a member of a work item queue might accept a task, but then decide that he or she can't complete the task. In this case, the person who accepted the task can release the document back to the work item queue.

For example, Julie, a member of the Adventure Works Expense Reports department, has accepted the task of reviewing Sam's expense report and receipts. If Julie decides that she can't complete the task, she can release the document. The expense report is returned to the queue, so that other members of the Adventure Works Expense Reports department can complete the task.

Actions that a decision maker can perform

Typically, a document is assigned to a decision maker, because there is a question that the decision maker must answer. The answer to the question is typically **Yes** or **No**, or **True** or **False**. If the decision maker doesn't select one of those choices, he or she can delegate the decision.

[Choice 1] or [Choice 2]

A decision maker must answer a question that is related to the document. The answer to the question is typically **Yes** or **No**, or **True** or **False**. The answer that the decision maker selects determines the workflow branch that is used to process the document.

For example, Sam's expense report is assigned to John. John must decide whether the information in the document requires a call to Sam's manager. If John decides that a call is required, the expense report is assigned to Aretha, who must then call Sam's manager. If John decides that a call isn't required, the expense report is assigned to Frank for approval.

Delegate

When a decision maker delegates a decision, the document is assigned to another user who must make the decision.

For example, Sam's expense report is assigned to John. John delegates the decision to Maria, who is his assistant.

Maria then acts on behalf of John. If Maria decides that a call to Sam's manager is required, the expense report is assigned to Aretha, who must then call Sam's manager. If Maria decides that a call isn't required, the expense report is assigned to Frank for approval.

Actions that an approver can perform

When a document is assigned to an approver, the approver can perform one of the following actions: approve, reject, delegate, or request change.

Approve

When an approver approves a document, the document is assigned to the next user in the workflow, if there is a next user. If no additional processing is required, the workflow process ends.

For example, Sam has submitted an expense report for USD 6,000, and this document is assigned to Frank. When Frank approves the document, it's assigned to Sue for approval. When Sue approves the expense report,

the workflow process ends.

Reject

When an approver rejects a document, the workflow process ends.

For example, Sam has submitted an expense report for USD 12,000, and this document is assigned to Sue. If Sue rejects the expense report, the workflow process ends.

Sam can resubmit the expense report. He can make changes first, or he can resubmit the original version of the expense report. If Sam resubmits the expense report, the workflow process starts at the approval process.

Delegate

When an approver delegates a document, the document is assigned to another user for approval.

For example, Sam has submitted an expense report for USD 12,000, and this document is assigned to Frank. Frank delegates the expense report to Ann.

Ann then acts on behalf of Frank. Therefore, when Ann approves the document, it's assigned to Sue for approval, just as if Frank had approved it. After Sue approves the document, it's sent to Ann for approval.

Request change

When an approver requests a change to a document, the document is sent back to the originator.

For example, Sam has submitted an expense report for USD 12,000, and this document is assigned to Sue. If Sue requests a change, the expense report is sent back to Sam.

Sam can resubmit the expense report. He can make the requested changes first, or he can resubmit the original version of the expense report. If Sam resubmits the expense report, it's sent to Frank for approval, because Frank is the first approver in the approval process.

NOTE

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Create workflows overview

2/18/2021 • 2 minutes to read • [Edit Online](#)

This topic explains how to create a workflow.

Open the workflow editor

The module that you're working in determines the types of workflow that you can create. Follow these steps to select the type of workflow to create and open the workflow editor.

1. Open the module that you want to create a new workflow for. For example, to create a workflow for purchase requisitions, click **Procurement and sourcing**.
2. Click **Setup > [Module name] workflows**.
3. On the list page that appears, on the Action Pane, click **New**.
4. On the **Create workflow** page, select the type of workflow to create, and then click **Create workflow**. The workflow editor appears. You can now use the following procedures to design the workflow.

Drag workflow elements onto the canvas

The **Workflow elements** area of the workflow editor contains the elements that you can add to your workflow. To add elements to the workflow, drag them onto the canvas.

Connect the elements

To connect one workflow element to another, hold the pointer over an element until connection points appear. Click a connection point, and drag it to another element. Be sure to connect all the elements.

Configure the properties of the workflow

Follow these steps to configure the properties of the workflow.

1. Click the canvas to make sure that no workflow element is selected.
2. Click **Properties** to open the **Properties** page for the workflow.
3. Follow the procedures in the [Configure workflow properties](#) topic.

Configure the elements of the workflow

Configure each element that you dragged onto the canvas. For information about how to configure each workflow element, see the following topics:

- [Configure manual tasks in a workflow](#)
- [Configure automated tasks in a workflow](#)
- [Configure approval processes in a workflow](#)
- [Configure approval steps in a workflow](#)
- [Configure manual decisions in a workflow](#)
- [Configure conditional decisions in a workflow](#)
- [Configure parallel branches in a workflow](#)
- [Configure a parallel branch](#)
- [Configure line-item workflows](#)

Resolve any errors or warnings

The **Errors and warnings** pane at the bottom of the workflow editor shows messages that have been generated for the workflow. To find the element where an error or warning occurred, double-click the error or warning message. You must resolve all errors and warnings before you can make the workflow active.

Save and activate the workflow

When you're ready to save and activate the workflow, follow these steps.

1. Click **Save and close** to close the workflow editor and open the **Save workflow** page.
2. Enter comments about the changes that you've made to the workflow, and then click **OK**.
3. If all errors and warnings have been resolved, the **Activate workflow** page appears. Select one of the following options:
 - To activate this version of the workflow, click **Activate the new version**. When a workflow is active, users can submit documents to it for processing.
 - If you don't want to activate this version, click **Do not activate the new version**. You can activate the workflow later.

NOTE

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Configure workflow properties

2/18/2021 • 5 minutes to read • [Edit Online](#)

This topic explains how to configure the various properties of a workflow.

To configure the properties of a workflow, open the workflow in the workflow editor. Click the canvas of the workflow editor, and then click **Properties** to open the **Properties** page. You can then use the following procedures to configure the various properties of the workflow.

Name the workflow

Follow these steps to enter a name for the workflow.

1. In the left pane, click **Basic Settings**.
2. In the **Name** field, enter a unique name for the workflow. For example, if you create a purchase requisition workflow for each country/region that you operate in, you can name the purchase requisition workflow **Purchase Requisitions Denmark** or **Purchase Requisitions Spain**.

Specify the workflow owner

The workflow owner is the person who manages and maintains the workflow. Follow these steps to specify the workflow owner.

1. In the left pane, click **Basic Settings**.
2. In the **Owner** list, select the name of the person who will manage the workflow.

Select an email template

Follow these steps to select the email template that is used to generate notification messages about the workflow.

1. In the left pane, click **Basic Settings**.
2. In the **Email template for workflow notifications** list, select the template.

Enter instructions for users

You can provide instructions to users who submit documents for processing and approval. These users are also referred to as *originators*. For example, you're creating a purchase requisition workflow, and you enter instructions. Those instructions can then be viewed by users who enter purchase requisitions on the **Purchase requisitions** page. To view instructions, the originator clicks the icon in the workflow message bar. Follow these steps to enter instructions for users.

1. In the left pane, click **Basic Settings**.
2. In the **Submission instructions** field, enter the instructions.
3. To personalize the instructions, you can insert placeholders. Placeholders are replaced with the appropriate data when the instructions are shown to users. To insert a placeholder, follow these steps:
 - a. Click in the **Submission instructions** field to specify where the placeholder should appear.
 - b. Click **Insert placeholder**.
 - c. In the list that appears, select the placeholder to insert.

- d. Click **Insert**.
4. To add translations of the instructions, follow these steps:
 - a. Click **Translations**.
 - b. On the page that appears, click **Add**.
 - c. In the list that appears, select the language that you will enter the text in.
 - d. In the **Translated text** field, enter the text.
 - e. To personalize the text, you can insert placeholders. For instructions about how to enter a placeholder, see step 3.
 - f. Click **Close**.

NOTE

Placeholders cannot be added using copy and paste because the target information is not pasted in correctly. Use the interface to add placeholders.

Specify when this workflow is used through activation conditions

You can create multiple workflows that are based on the same workflow type. When you have multiple workflows that are based on the same type, you must specify when each workflow is used using activation conditions. If activation conditions are not met, then the default workflow is used. Similarly, if there is only one workflow configuration defined for a workflow type, then that workflow configuration will be used regardless of the activation conditions.

For example, you can create a purchase requisition workflow for each country/region that you operate in, such as Purchase Requisitions Denmark and Purchase Requisitions Spain, with the following conditions:

- Purchase Requisitions Denmark is used when: country/region = DK
- Purchase Requisitions Spain is used when: country/region = ES

Follow these steps to specify when the workflow that you're configuring is used.

1. In the left pane, click **Activation**.
2. Select the **Set the conditions for running this workflow** check box.
3. Click **Add condition**.
4. Enter a condition.
5. Enter any additional conditions that are required.
6. Run through the workflow with some target records to verify that the condition correctly includes and excludes records.

Specify when notifications are sent

When a document is submitted for processing, a workflow instance is created. You can send notifications to users when workflow instances that are based on the workflow are started, completed, terminated, or stopped because of an error. Follow these steps to specify when notifications are sent.

1. In the left pane, click **Notifications**.
2. Select the check box for each event that should trigger notifications:
 - **Started** – Send notifications when a workflow instance is started.
 - **Stopped** – Send notifications when a workflow instance is stopped because of an error.
 - **Completed** – Send notifications when a workflow instance is completed.

- **Unrecoverable** – Send notifications when a workflow instance is stopped because of an unrecoverable error.
 - **Terminated** – Send notifications when a workflow instance is terminated.
3. Select the row for an event that you selected in step 2.
 4. On the **Notification text** tab, enter the text of the notification.
 5. To personalize the text, you can insert placeholders. Placeholders are replaced with the appropriate data when the text is shown to users. To insert a placeholder, follow these steps:
 - a. Click in the field to specify where the placeholder should appear.
 - b. Click **Insert placeholder**.
 - c. In the list that appears, select the placeholder to insert.
 - d. Click **Insert**.
 - e. A common **Notification text** placeholder to include is "Last Notes: %Workflow.Last note%", which displays any comments from the previous step.
 6. To add translations of the text, follow these steps:
 - a. Click **Translations**.
 - b. On the page that appears, Click **Add**.
 - c. In the list that appears, select the language that you will enter the text in.
 - d. In the **Translated text** field, enter the text.
 - e. To personalize the text, you can insert placeholders. For instructions about how to enter a placeholder, see step 5.
 - f. Click **Close**.
 7. On the **Recipient** tab, use the following options to specify who should receive the notifications.

OPTION	NOTIFICATIONS ARE SENT TO THESE USERS	TO SEND NOTIFICATIONS, FOLLOW THESE STEPS
Participant	Users who are assigned to a specific group or role	<ol style="list-style-type: none"> 1. On the Recipient tab, click Participant. 2. On the Role based tab, in the Type of participant list, select the type of group or role to send notifications to. 3. In the Participant list, select the group or role to send notifications to.
Workflow user	Users who are participants in this workflow	<ol style="list-style-type: none"> 1. On the Recipient tab, click Workflow user. 2. On the Workflow user tab, in the Workflow user list, select a participant in this workflow.
User	Specific users	<ol style="list-style-type: none"> 1. On the Recipient tab, click User. 2. On the User tab, the Available users list includes all users. Select the users to send notifications to, and move those users into the Selected users list.

8. Repeat steps 3 through 7 for each event that you selected in step 2.

Enter comments about the changes that you made to the workflow

To enter comments about the changes that you made to the workflow, follow these steps.

1. In the left pane, click **Notes**.
2. In the **Enter comments about the workflow** field, enter your comments.
3. Review your comments. After you add comments, you can't modify them.
4. Click **Add** to add your comments to the **Comment history** area.

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Configure manual tasks in a workflow

2/18/2021 • 14 minutes to read • [Edit Online](#)

This topic explains how to configure the properties for a manual task.

To configure a manual task in the workflow editor, right-click the task, and then click **Properties** to open the **Properties** page. Then use the following procedures to configure the properties for the manual task.

Name the task

Follow these steps to enter a name for the manual task.

1. In the left pane, click **Basic Settings**.
2. In the **Name** field, enter a unique name for the task.

Enter a subject line and instructions

You must provide a subject line and instructions to users who are assigned to the task. For example, if you're configuring a task for purchase requisitions, the user who is assigned to the task sees the subject line and instructions on the **Purchase requisitions** page. The subject line appears in a message bar on the page. The user can then click the icon in the message bar to view the instructions. Follow these steps to enter a subject line and instructions.

1. In the left pane, click **Basic Settings**.
2. In the **Work item subject** field, enter the subject line.
3. To personalize the subject line, you can insert placeholders. Placeholders are replaced with appropriate data when the subject line is shown to users. Follow these steps to insert a placeholder:
 - a. In the text box, click where the placeholder should appear.
 - b. Click **Insert placeholder**.
 - c. In the list that appears, select the placeholder to insert.
 - d. Click **Insert**.
4. To add translations of the subject line, follow these steps:
 - a. Click **Translations**.
 - b. On the page that appears, click **Add**.
 - c. In the list that appears, select the language that you're entering the text in.
 - d. In the **Translated text** field, enter the text.
 - e. To personalize the text, you can insert placeholders as described in step 3.
 - f. Click **Close**.
5. In the **Work item instructions** field, enter the instructions.
6. To personalize the instructions, you can insert placeholders. Placeholders are replaced with appropriate data when the instructions are shown to users. Follow these steps to insert a placeholder:
 - a. In the text box, click where the placeholder should appear.
 - b. Click **Insert placeholder**.
 - c. In the list that appears, select the placeholder to insert.
 - d. Click **Insert**.

7. To add translations of the instructions, follow these steps:
 - a. Click **Translations**.
 - b. On the page that appears, click **Add**.
 - c. In the list that appears, select the language that you're entering the text in.
 - d. In the **Translated text** field, enter the text.
 - e. To personalize the text, you can insert placeholders as described in step 6.
 - f. Click **Close**.

Assign the task

Follow these steps to specify who the manual task should be assigned to.

1. In the left pane, click **Assignment**.
2. On the **Assignment type** tab, select one of the options in the following table, and then follow the additional steps for that option before you go to step 3.

OPTION	USERS THAT THE TASK IS ASSIGNED TO	ADDITIONAL STEPS
Participant	Users who are assigned to a specific group or role	<ol style="list-style-type: none"> 1. After you select Participant, on the Role based tab, in the Type of participant list, select the type of group or role to assign the task to. 2. In the Participant list, select the group or role to assign the task to.

OPTION	USERS THAT THE TASK IS ASSIGNED TO	ADDITIONAL STEPS
Hierarchy	Users in a specific organizational hierarchy	<ol style="list-style-type: none"> 1. After you select Hierarchy, on the Hierarchy selection tab, in the Hierarchy type list, select the type of hierarchy to assign the task to. 2. The system must retrieve a range of user names from the hierarchy. These names represent users that the task can be assigned to. Follow these steps to specify the starting point and ending point of the range of user names that the system retrieves: <ol style="list-style-type: none"> a. To specify the starting point, select a person in the Start from list. b. To specify the ending point, click Add condition. Then enter a condition that determines where in the hierarchy the system stops retrieving names. 3. On the Hierarchy options tab, specify which users in the range the task should be assigned to: <ul style="list-style-type: none"> • Assign to all users retrieved – The task is assigned to all users in the range. • Assign only to last user retrieved – The task is assigned to only the last user in the range. • Exclude users with the following condition – The task isn't assigned to users in the range who meet a specific condition. Click Add condition to specify the condition.
Workflow user	Users in the current workflow	<ul style="list-style-type: none"> • After you select Workflow user, on the Workflow user tab, in the Workflow user list, select a user who participates in the workflow.

OPTION	USERS THAT THE TASK IS ASSIGNED TO	ADDITIONAL STEPS
User	Specific users	<ol style="list-style-type: none"> 1. After you select User, click the User tab. 2. The Available users list includes all users. Select the users to assign the task to, and then move those users to the Selected users list.
Queue	A work item queue	<ol style="list-style-type: none"> 1. After you select Queue, click the Queue based tab. 2. To assign the task to a specific queue, follow these steps: <ol style="list-style-type: none"> a. In the Queue type list, select Work item queues. b. In the Queue name list, select the queue. 3. If a specific condition should determine which queue the task is assigned to, follow these steps: <ol style="list-style-type: none"> a. In the Queue type list, select Conditional work item queues. b. In the Queue name list, select Conditional queue. <div style="border: 1px solid gray; padding: 5px; margin-top: 10px;"> <p>[!NOTE] This option is used for only a few workflows, such as Case management.</p> </div>

3. On the **Time limit** tab, in the **Duration** field, specify how much time the user has to complete the task. Select one of the following options:

- **Hours** – Enter the number of hours that the user has to complete the task. Then select the calendar that your organization uses, and enter information about your organization's work week.
- **Days** – Enter the number of days that the user has to complete the task. Then select the calendar that your organization uses, and enter information about your organization's work week.
- **Weeks** – Enter the number of weeks that the user has to complete the task.
- **Months** – Select the day and week that the user must complete the task by. For example, you might want the user to complete the task by Friday of the third week of the month.
- **Years** – Select the day, week, and month that the user must complete the task by. For example, you might want the user to complete the task by Friday of the third week of December.

If the user doesn't complete the task in the allotted time, the task is overdue. A task that is overdue can be escalated, based on the options that you select in the **Escalation** area of the page.

Specify what happens when the task is overdue

If a user doesn't complete the manual task in the allotted time, the task is overdue. A task that is overdue can be escalated, or automatically assigned to another user. Follow these steps to escalate the task if it's overdue.

1. In the left pane, click **Escalation**.
2. Select the **Use escalation path** check box to create an escalation path. The system automatically assigns the task to the users who are listed in the escalation path. For example, the following table represents an escalation path.

SEQUENCE	ESCALATION PATH
1	Assign to: Donna
2	Assign to: Erin
3	Final action: Reject

In this example, the system assigns the overdue task to Donna. If Donna doesn't complete the task in the allotted time, the system assigns the task to Erin. If Erin doesn't complete the task in the allotted time, the system rejects the document that was submitted for processing.

3. To add a user to the escalation path, click **Add escalation**. On the **Assignment type** tab, select one of the options in the following table, and then follow the additional steps for that option before you go to step 4.

OPTION	USERS THAT THE TASK IS ESCALATED TO	ADDITIONAL STEPS
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OPTION	USERS THAT THE TASK IS ESCALATED TO	ADDITIONAL STEPS
Hierarchy	Users in a specific organizational hierarchy	<ol style="list-style-type: none"> 1. After you select Hierarchy, on the Hierarchy selection tab, in the Hierarchy type list, select the type of hierarchy to escalate the task to. 2. The system must retrieve a range of user names from the hierarchy. These names represent users that the task can be escalated to. Follow these steps to specify the starting point and ending point of the range of user names that the system retrieves: <ol style="list-style-type: none"> a. To specify the starting point, select a person in the Start from list. b. To specify the ending point, click Add condition. Then enter a condition that determines where in the hierarchy the system stops retrieving names. 3. On the Hierarchy options tab, specify which users in the range the task should be escalated to: <ul style="list-style-type: none"> • Assign to all users retrieved – The task is escalated to all users in the range. • Assign only to last user retrieved – The task is escalated to only the last user in the range. • Exclude users with the following condition – This task isn't escalated to users in the range who meet a specific condition. Click Add condition to specify the condition.
Workflow user	Users in the current workflow	<ul style="list-style-type: none"> • After you select Workflow user, on the Workflow user tab, in the Workflow user list, select a user who participates in the workflow.

OPTION	USERS THAT THE TASK IS ESCALATED TO	ADDITIONAL STEPS
User	Specific users	<ol style="list-style-type: none"> 1. After you select User, click the User tab. 2. The Available users list includes all users. Select the users to escalate the task to, and then move those users to the Selected users list.

4. On the **Time limit** tab, in the **Duration** field, specify how much time the user has to complete the task. Select one of the following options:

- **Hours** – Enter the number of hours that the user has to complete the task. Then select the calendar that your organization uses, and enter information about your organization's work week.
- **Days** – Enter the number of days that the user has to complete the task. Then select the calendar that your organization uses, and enter information about your organization's work week.
- **Weeks** – Enter the number of weeks that the user has to complete the task.
- **Months** – Select the day and week that the user must complete the task by. For example, you might want the user to complete the task by Friday of the third week of the month.
- **Years** – Select the day, week, and month that the user must complete the task by. For example, you might want the user to complete the task by Friday of the third week of December.

5. Repeat steps 3 through 4 for each user that should be added to the escalation path. You can change the order of the users.

6. If the users in the escalation path don't complete the task in the allotted time, the system takes action on the task. To specify the action that the system takes, select the **Action** row, and then, on the **End action** tab, select an action.

Specify when the system automatically acts on the task

You can configure the system to take action on the manual task if specific conditions are met. For example, a task requires that a member of the Expense reports department review the receipts that are submitted together with an expense report. According to company policy, this task must be performed if the total amount of the expense report is more than USD 100. In this scenario, you can configure the system to automatically mark the task as **Complete** when the total amount is less than 100. Follow these steps to specify when the system takes action on the manual task.

1. In the left pane, click **Automatic actions**.
2. Select the **Enable automatic actions** check box.
3. Click **Add condition**.
4. Enter a condition.
5. Enter any additional conditions that are required.
6. To verify that the conditions that you entered are configured correctly, follow these steps:
 - a. Click **Test**.
 - b. On the **Test workflow condition** page, in the **Validate condition** area, select a record.
 - c. Click **Test**. The system evaluates the record to determine whether it meets the conditions that you defined.
 - d. Click **OK** or **Cancel** to return to the **Properties** page.

7. In the **Auto complete action** list, select the action that the system should take on the task.

Specify when notifications are sent

You can send notifications to people when a manual task has been delegated, escalated, completed, or rejected, or when a change has been requested. Follow these steps to specify when notifications are sent, and who the notifications are sent to.

1. In the left pane, click **Notifications**.
2. Select the check box next to the events that notifications should be sent for:
 - **Delegate** – The task has been assigned to another user.
 - **Escalate** – The assigned user hasn't completed the task in the allotted time.
 - **Complete** – The assigned user has completed the task.
 - **Reject** – The assigned user has rejected the document that was submitted.
 - **Request change** – The assigned user has requested a change to the document that was submitted.
3. Select the row for an event that you selected in step 2.
4. On the **Notification text** tab, in the text box, enter the text of the notification.
5. To personalize the notification, you can insert placeholders. Placeholders are replaced with appropriate information when the notification is shown to users. Follow these steps to insert a placeholder:
 - a. In the text box, click where the placeholder should appear.
 - b. Click **Insert placeholder**.
 - c. In the list that appears, select the placeholder to insert.
 - d. Click **Insert**.
6. To add translations of the notification, follow these steps:
 - a. Click **Translations**.
 - b. On the page that appears, click **Add**.
 - c. In the list that appears, select the language that you're entering the text in.
 - d. In the **Translated text** field, enter the text.
 - e. To personalize the text, you can insert placeholders as described in step 5.
 - f. Click **Close**.
7. On the **Recipient** tab, specify who the notifications are sent to. Select one of the options in the following table, and then follow the additional steps for that option before you go to step 8.

OPTION	NOTIFICATION RECIPIENTS	ADDITIONAL STEPS
Participant	Users who are assigned to a specific group or role	<ol style="list-style-type: none">1. After you select Participant, on the Role based tab, in the Type of participant list, select the type of group or role to send notifications to.2. In the Participant list, select the group or role to send notifications to.

OPTION	NOTIFICATION RECIPIENTS	ADDITIONAL STEPS
Workflow user	Users in the current workflow	<ul style="list-style-type: none"> After you select Workflow user, on the Workflow user tab, in the Workflow user list, select a user who participates in the workflow.
User	Specific users	<ol style="list-style-type: none"> After you select User, click the User tab. The Available users list includes all users. Select the users to send notifications to, and then move those users to the Selected users list.

8. Repeat steps 3 through 7 for each event that you selected in step 2.

Set a time limit

Follow these steps if the manual task must be completed in a specific time.

NOTE

The options that you select in this procedure override the options that you selected in the **Assignment** and **Escalation** areas of the page.

- In the left pane, click **Advanced settings**.
- Select the **Set a time limit for the workflow element** check box.
- In the **Duration** field, specify when the task must be completed. Select one of the following options:
 - Hours** – Enter the number of hours that the task must be completed in. Then select the calendar that your organization uses, and enter information about your organization's work week.
 - Days** – Enter the number of days that the task must be completed in. Then select the calendar that your organization uses, and enter information about your organization's work week.
 - Weeks** – Enter the number of weeks that the task must be completed in.
 - Months** – Select the day and week that the task must be completed by. For example, you might want the task to be completed by Friday of the third week of the month.
 - Years** – Select the day, week, and month that the task must be completed by. For example, you might want the task to be completed by Friday of the third week of December.
- If the time limit is exceeded, the system takes action on the task. In the **Action** list, select the action that the system should take.

Specify which actions are available to the user

When the manual task is assigned to a user, the user must take action on the task. Follow these steps to specify which actions the user can take on the task.

NOTE

The actions that are available vary, depending on the design of the task.

1. In the left pane, click **Advanced settings**.
2. Select the **Complete** check box if the user should be able to mark the task as **Complete**.
3. Select the **Reject** check box if the user should be able to reject the document that was submitted.
4. Select the **Request change** check box if the user should be able to request changes to the document that was submitted.
5. Select the **Delegate** check box if the user should be able to assign the task to another user.
6. Select the **Reassign** check box if the user should be able to reassign the task to another user in the work item queue.
7. Select the **Release** check box if the user should be able to reassign the task to the work item queue. Another user can then complete the task.

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Configure automated tasks in a workflow

2/18/2021 • 2 minutes to read • [Edit Online](#)

This topic explains how to configure the properties for an automated task.

To configure an automated task in the workflow editor, right-click the task, and then click **Properties** to open the **Properties** page. Then use the following procedures to configure the properties for the automated task.

Name the task

Follow these steps to enter a name for the automated task.

1. In the left pane, click **Basic Settings**.
2. In the **Name** field, enter a unique name for the task.

Specify when notifications are sent

You can send notifications to people when an automated task has been run or canceled. Follow these steps to specify when notifications are sent, and who they are sent to.

1. In the left pane, click **Notifications**.
2. Select the check box next to the events to send notifications for:
 - **Execution** – Notifications are sent when the task has been run.
 - **Canceled** – Notifications are sent when the task has been canceled.
3. Select the row for an event that you selected in step 2.
4. On the **Notification text** tab, in the text box, enter the text of the notification.
5. To personalize the notification, you can insert placeholders. Placeholders are replaced with appropriate data when the notification is shown to users. Follow these steps to insert a placeholder:
 - a. In the text box, click where the placeholder should appear.
 - b. Click **Insert placeholder**.
 - c. In the list that appears, select the placeholder to insert.
 - d. Click **Insert**.
6. To add translations of the notification, follow these steps:
 - a. Click **Translations**.
 - b. On the page that appears, click **Add**.
 - c. In the list that appears, select the language that you're entering the text in.
 - d. In the **Translated text** field, enter the text.
 - e. To personalize the text, you can insert placeholders as described in step 5.
 - f. Click **Close**.
7. On the **Recipient** tab, specify who the notifications are sent to. Select one of the options in the following table, and then follow the additional steps for that option before you go to step 8.

OPTION	NOTIFICATION RECIPIENTS	ADDITIONAL STEPS
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OPTION	NOTIFICATION RECIPIENTS	ADDITIONAL STEPS
Participant	Users who are assigned to a specific group or role	<ol style="list-style-type: none"> 1. After you select Participant, on the Role based tab, in the Type of participant list, select the type of group or role to send notifications to. 2. In the Participant list, select the group or role to send notifications to.
Workflow user	Users who participate in the current workflow	<ul style="list-style-type: none"> • After you select Workflow user, on the Workflow user tab, in the Workflow user list, select a user who participates in the workflow.
User	Specific users	<ol style="list-style-type: none"> 1. After you select User, click the User tab. 2. The Available users list includes all users. Select the users to send notifications to, and then move those users to the Selected users list.

8. Repeat steps 3 through 7 for each event that you selected in step 2.

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Configure approval processes in a workflow

2/18/2021 • 6 minutes to read • [Edit Online](#)

Use the following procedure to configure the properties of the approval process.

To configure an approval process, in the workflow editor, right-click the approval element, and then click **Properties** to open the **Properties** form.

Name the approval process

Follow these steps to enter a name for the approval process.

1. In the left pane, click **Basic Settings**.
2. In the **Name** field, enter a unique name for the approval process.

Specify when the system automatically acts on the document

You can configure the system to automatically act on the document if specific conditions are met. For example, the system can approve expense reports that have total amounts that are less than USD 100. Follow these steps to specify when the system acts on the document.

1. In the left pane, click **Automatic actions**.
2. Select the **Enable automatic actions** check box.
3. Click **Add condition**.
4. Enter a condition.
5. Enter additional conditions, if necessary.
6. To verify that the conditions that you entered are configured correctly, complete the following steps:
 - a. Click **Test** to open the **Test workflow condition** form.
 - b. Select a record in the **Validate condition** area of the form.
 - c. Click **Test**. The system evaluates the record to determine whether it meets the conditions that you defined.
 - d. Click **OK** or **Cancel** to return to the **Properties** form.
7. In the **Auto complete action** list, select the action that the system should take on the document.

Specify when notifications are sent

You can send notifications to people when a document has been approved, rejected, delegated, or escalated, or when a change has been requested. Follow these steps to specify when notifications are sent, and who the notifications are sent to.

1. In the left pane, click **Notifications**.
2. Select the check box next to the events to send notifications for:
 - **Delegate** – When a document has been assigned to another user for approval.
 - **Escalate** – When the assigned user has not acted on a document in the allotted time.
 - **Approve** – When a document has been approved.

- **Reject** – When a document has been rejected.
 - **Request change** – When the assigned user has requested a change to a document that was submitted.
3. Select the row for an event that you selected in step 2.
 4. Click the **Notification text** tab.
 5. In the text box, enter the text for the notification.
 6. To personalize the text, you can insert placeholders, which are replaced with the appropriate data when they are displayed to users. To insert a placeholder, follow these steps:
 - a. Click in the text box at the location where the placeholder should appear.
 - b. Click **Insert placeholder**.
 - c. In the list that is displayed, select the placeholder to insert.
 - d. Click **Insert**.
 7. To add translations of the notification, click **Translations**. In the form that is displayed, follow these steps:
 - a. Click **Add**.
 - b. In the list that is displayed, select the language in which you will enter the text.
 - c. In the **Translated text** text box, enter the text.
 - d. To personalize the text, insert placeholders.
 - e. Click **Close**.
 8. Click the **Recipient** tab.
 9. Specify who the notifications are sent to. Select one of the options in the following table, and then follow the additional steps for the option before you go to step 10.

OPTION	NOTIFICATION RECIPIENTS	ADDITIONAL STEPS
Participant	Users who are assigned to a specific group or role	<ol style="list-style-type: none"> 1. After you select Participant, click the Role based tab. 2. In the Type of participant list, select the type of group or role to send notifications to. 3. In the Participant list, select the group or role to send notifications to.
Workflow user	Users who participate in the current workflow	<ol style="list-style-type: none"> 1. After you select Workflow user, click the Workflow user tab. 2. In the Workflow user list, select a user who participates in the workflow.
User	Specific users	<ol style="list-style-type: none"> 1. After you select User, click the User tab. 2. Select the users to send notifications to, and then move these users to the Selected users list.

10. Repeat steps 3 through 9 for each event that you selected in step 2.

Specify a final approver

You can designate a final approver for scenarios where the approver is the person who submitted the document for approval and the "disallow approval by submitter" is being used. Follow these steps to specify a final approver.

1. In the workflow editor, right-click the approval element, and then select **Properties** to open the **Properties** form.
2. In the left pane, click **Advanced settings**.
3. Select the **Use final approver** check box.
4. In the list, select a user to be the final approver.

Set a time limit

Follow these steps if the approval process must be completed in a specific time.

NOTE

The options that you select in these steps override the options that you selected in the **Assignment** and **Escalation** areas of each approval step.

1. In the left pane, click **Advanced settings**.
2. Select the **Set a time limit for the workflow element** check box.
3. In the **Duration** field, specify when the approval process must be completed. Select one of the following options:
 - **Hours** – Enter the number of hours in which the approval process must be completed. Then select the calendar that your organization uses, and enter information about your organization's work week.
 - **Days** – Enter the number of days in which the approval process must be completed. Then select the calendar that your organization uses, and enter information about your organization's work week.
 - **Weeks** – Enter the number of weeks in which the approval process must be completed.
 - **Months** – Select the day and week by which the approval process must be completed. For example, you may want the approval process to be completed by Friday of the third week of the month.
 - **Years** – Select the day, week, and month by which the approval process must be completed. For example, you may want the approval process to be completed by Friday of the third week of December.
4. If the time limit is exceeded, the system acts on the document. In the **Action** list, select the action that the system should take.

Specify which actions are available to the user

When a document is assigned to a user for approval, the user must act on the document. Follows these steps to specify which actions the user can take on the document that was submitted.

1. In the left pane, click **Advanced settings**.
2. Select the **Approve** check box if the user can approve the document.
3. Select the **Reject** check box the user can reject the document.
4. Select the **Request change** check box the user can request changes to the document.
5. Select the **Delegate** check box if the user can assign the document to another user for approval.

NOTE

The **Enable actions from the work list in Enterprise Portal** check box has been deprecated.

Configure the approval steps

An approval process consists of approval steps. Complete the following procedure to add steps the approval process and configure the steps.

1. In the workflow editor, double-click the approval process. The workflow editor displays the steps of the approval process.
2. To add an approval step, drag the step from the **Workflow elements** area to the canvas.
3. To configure an approval step, see [Configure approval steps in a workflow](#).

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Configure approval steps in a workflow

2/18/2021 • 11 minutes to read • [Edit Online](#)

This topic explains how to configure the properties of an approval step.

To configure an approval step in the workflow editor, right-click the approval step, and then click **Properties** to open the **Properties** page. Then use the following procedures to configure the properties of the approval step.

Name the step

Follow these steps to enter a name for the approval step.

1. In the left pane, click **Basic Settings**.
2. In the **Name** field, enter a unique name for the approval step.

Enter a subject line and instructions

You must provide a subject line and instructions to users who are assigned to the approval step. For example, if you're configuring an approval step for purchase requisitions, the user who is assigned to the step sees the subject line and instructions on the **Purchase requisitions** page. The subject line appears in a message bar on the page. The user can then click the icon in the message bar to see the instructions. Follow these steps to enter a subject line and instructions.

1. In the left pane, click **Basic Settings**.
2. In the **Work item subject** field, enter the subject line.
3. To personalize the subject line, you can insert placeholders. Placeholders are replaced with appropriate data when the subject line is shown to users. Follow these steps to insert a placeholder:
 - a. In the text box, click where the placeholder should appear.
 - b. Click **Insert placeholder**.
 - c. In the list that appears, select the placeholder to insert.
 - d. Click **Insert**.
4. To add translations of the subject line, follow these steps:
 - a. Click **Translations**.
 - b. On the page that appears, click **Add**.
 - c. In the list that appears, select the language that you're entering the text in.
 - d. In the **Translated text** field, enter the text.
 - e. To personalize the text, you can insert placeholders as described in step 3.
 - f. Click **Close**.
5. In the **Work item instructions** field, enter the instructions.
6. To personalize the instructions, you can insert placeholders. Placeholders are replaced with appropriate data when the instructions are shown to users. Follow these steps to insert a placeholder:
 - a. In the text box, click where the placeholder should appear.
 - b. Click **Insert placeholder**.
 - c. In the list that appears, select the placeholder to insert.
 - d. Click **Insert**.

7. To add translations of the instructions, follow these steps:
 - a. Click **Translations**.
 - b. On the page that appears, click **Add**.
 - c. In the list that appears, select the language that you're entering the text in.
 - d. In the **Translated text** field, enter the text.
 - e. To personalize the text, you can insert placeholders as described in step 6.
 - f. Click **Close**.

Assign the approval step

Follow these steps to specify who the approval step should be assigned to.

1. In the left pane, click **Assignment**.
2. On the **Assignment type** tab, select one of the options in the following table, and then follow the additional steps for that option before you go to step 3.

OPTION	USERS THAT THE APPROVAL STEP IS ASSIGNED TO	ADDITIONAL STEPS
Participant	Users who are assigned to a specific group or role	<ol style="list-style-type: none"> 1. After you select Participant, on the Role based tab, in the Type of participant list, select the type of group or role to assign the step to. 2. In the Participant list, select the group or role to assign the step to.

OPTION	USERS THAT THE APPROVAL STEP IS ASSIGNED TO	ADDITIONAL STEPS
Hierarchy	Users in a specific organizational hierarchy	<ol style="list-style-type: none"> 1. After you select Hierarchy, on the Hierarchy selection tab, in the Hierarchy type list, select the type of hierarchy to assign the step to. 2. The system must retrieve a range of user names from the hierarchy. These names represent users that the step can be assigned to. Follow these steps to specify the starting point and ending point of the range of user names that the system retrieves: <ol style="list-style-type: none"> a. To specify the starting point, select a person in the Start from list. b. To specify the ending point, click Add condition. Then enter a condition that determines where in the hierarchy the system stops retrieving names. 3. On the Hierarchy options tab, specify which users in the range the step should be assigned to: <ul style="list-style-type: none"> • Assign to all users retrieved – The step is assigned to all users in the range. • Assign only to last user retrieved – The step is assigned to only the last user in the range. • Exclude users with the following condition – The step isn't assigned to any users in the range who meet a specific condition. Click Add condition to specify the condition.
Workflow user	Users in the current workflow	<ul style="list-style-type: none"> • After you select Workflow user, on the Workflow user tab, in the Workflow user list, select a user who participates in the workflow.

OPTION	USERS THAT THE APPROVAL STEP IS ASSIGNED TO	ADDITIONAL STEPS
User	Specific users	<ol style="list-style-type: none"> 1. After you select User, click the User tab. 2. The Available users list includes all system users. Select the users to assign the step to, and then move those users to the Selected users list.

3. On the **Time limit** tab, in the **Duration** field, specify how much time the user has to take action on, or respond to, documents that reach the approval step. Select one of the following options:

- **Hours** – Enter the number of hours that the user has to respond. Then select the calendar that your organization uses, and enter information about your organization's work week.
- **Days** – Enter the number of days that the user has to respond. Then select the calendar that your organization uses, and enter information about your organization's work week.
- **Weeks** – Enter the number of weeks that the user has to respond.
- **Months** – Select the day and week that the user must respond by. For example, you might want the user to respond by Friday of the third week of the month.
- **Years** – Select the day, week, and month that the user must respond by. For example, you might want the user to respond by Friday of the third week of December.

If the user doesn't take action on the document in the allotted time, the document is overdue. A document that is overdue is escalated, based on the options that you select in the **Escalation** area of the page.

4. If you assigned the approval step to multiple users or a group of users, on the **Completion policy** tab, select one of the following options:

- **Single approver** – The action that is applied to the document is determined by the first person who responds. For example, Sam has submitted an expense report for USD 15,000. The expense report is currently assigned to Sue, Jo, and Bill. If Sue is the first person who responds to the document, the action that she takes is applied to the document. If Sue rejects the document, it's rejected and sent back to Sam. If Sue approves the document, it's sent to Ann for approval.



- **Majority of approvers** – The action that is applied to the document is determined when most of the approvers respond. For example, Sam has submitted an expense report for USD 15,000. The expense report is currently assigned to Sue, Jo, and Bill. If Sue and Jo are the first two approvers who respond, the action that they take is applied to the document.
 - If Sue approves the document, but Jo rejects it, the document is rejected and sent back to Sam.
 - If both Sue and Jo approve the document, it's sent to Ann for approval.
- **Percentage of approvers** – The action that is applied to the document is determined when a specific percentage of the approvers respond. For example, Sam has submitted an expense report for USD 15,000. The expense report is currently assigned to Sue, Jo, and Bill, and you entered 50 as the percentage. If Sue and Jo are the first two approvers who respond, the action that they take is applied to the document, because they meet the requirement for 50 percent of approvers.
 - If Sue approves the document, but Jo rejects it, the document is rejected and sent back to Sam.
 - If both Sue and Jo approve the document, it's sent to Ann for approval.
- **All approvers** – All the approvers must approve the document. Otherwise, the workflow can't continue. For example, Sam has submitted an expense report for USD 15,000. The expense report is currently assigned to Sue, Jo, and Bill. If Sue and Joe approve the document, but Bill rejects it, the document is rejected and sent back to Sam. If Sue, Jo, and Bill all approve the document, it's sent to Ann for approval.

Specify when the approval step is required

You can specify when the approval step is required. The approval step can always be required, or it can be required only if specific conditions are met.

The approval step is always required

Follow these steps if the approval step is always required.

1. In the left pane, click **Condition**.
2. Select the **Always run this step** option.

The approval step is required in specific conditions

The approval step that you're configuring might be required only if specific conditions are met. For example, if you're configuring an approval step for a purchase requisition workflow, you might want the approval step to occur only if the amount of the purchase requisition is more than USD 10,000. Follow these steps to specify when the approval step is required.

1. In the left pane, click **Condition**.
2. Select the **Run this step only when the following condition is met** option.
3. Enter a condition.
4. Enter any additional conditions that are required.
5. To verify that the conditions that you entered are configured correctly, follow these steps:
 - a. Click **Test**.
 - b. On the **Test workflow condition** page, in the **Validate condition** area, select a record.
 - c. Click **Test**. The system evaluates the record to determine whether it meets the conditions that you defined.
 - d. Click **OK** or **Cancel** to return to the **Properties** page.

Specify what happens when the document is overdue

If a user doesn't take action on a document in the allotted time, the document is overdue. A document that is overdue can be escalated, or automatically assigned to another user for approval. Follow these steps to escalate the document if it's overdue.

1. In the left pane, click **Escalation**.
2. Select the **Use escalation path** check box to create an escalation path. The system automatically assigns the document to the users who are listed in the escalation path. For example, the following table represents an escalation path.

SEQUENCE	ESCALATION PATH
1	Assign to: Donna
2	Assign to: Erin
3	Final action: Reject

In this example, the system assigns the overdue document to Donna. If Donna doesn't respond in the allotted time, the system assigns the document to Erin. If Erin doesn't respond in the allotted time, the system rejects the document.

3. To add a user to the escalation path, click **Add escalation**. On the **Assignment type** tab, select one of the options in the following table, and then follow the additional steps for that option before you go to

step 4.

OPTION	USERS THAT THE DOCUMENT IS ESCALATED TO	ADDITIONAL STEPS
Hierarchy	Users in a specific organizational hierarchy	<ol style="list-style-type: none">1. After you select Hierarchy, on the Hierarchy selection tab, in the Hierarchy type list, select the type of hierarchy to escalate the document to.2. The system must retrieve a range of user names from the hierarchy. These names represent users that the document can be escalated to. Follow these steps to specify the starting point and ending point of the range of user names that the system retrieves:<ol style="list-style-type: none">a. To specify the starting point, select a person in the Start from list.b. To specify the ending point, click Add condition. Then enter a condition that determines where in the hierarchy the system stops retrieving names.3. On the Hierarchy options tab, specify which users in the range the document should be escalated to:<ul style="list-style-type: none">• Assign to all users retrieved – The document is escalated to all users in the range.• Assign only to last user retrieved – The document is escalated to only the last user in the range.• Exclude users with the following condition – The document isn't escalated to any users in the range who meet a specific condition. Click Add condition to specify the condition.

OPTION	USERS THAT THE DOCUMENT IS ESCALATED TO	ADDITIONAL STEPS
Workflow user	Users in the current workflow	<ul style="list-style-type: none"> After you select Workflow user, on the Workflow user tab, in the Workflow user list, select a user who participates in the workflow.
User	Specific users	<ol style="list-style-type: none"> After you select User, click the User tab. The Available users list includes all users. Select the users to escalate the document to, and then move those users to the Selected users list.

- On the **Time limit** tab, in the **Duration** field, specify how much time the user has to take action on, or respond to, documents. Select one of the following options:
 - Hours** – Enter the number of hours that the user has to respond. Then select the calendar that your organization uses, and enter information about your organization's work week.
 - Days** – Enter the number of days that the user has to respond. Then select the calendar that your organization uses, and enter information about your organization's work week.
 - Weeks** – Enter the number of weeks that the user has to respond.
 - Months** – Select the day and week that the user must respond by. For example, you might want the user to respond by Friday of the third week of the month.
 - Years** – Select the day, week, and month that the user must respond by. For example, you might want the user to respond by Friday of the third week of December.
- Repeat steps 3 through 4 for each user that should be added to the escalation path. You can change the order of the users.
- If the users in the escalation path don't respond in the allotted time, the system automatically take action on the document. To specify the action that the system takes, select the **Action** row, and then, on the **End action** tab, select an action.

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Configure manual decisions in a workflow

2/18/2021 • 12 minutes to read • [Edit Online](#)

This topic explains how to configure the properties of a manual decision.

To configure a manual decision in the workflow editor, right-click the manual decision, and then click **Properties** to open the **Properties** page. Then use the following procedures to configure the properties of the manual decision.

Name the decision

Follow these steps to enter a name for the manual decision.

1. In the left pane, click **Basic Settings**.
2. In the **Name** field, enter a unique name for the manual decision.

Enter a subject line and instructions

You must provide a subject line and instructions to users who are assigned to the manual decision. For example, if you're configuring a decision for purchase requisitions, the user who is assigned to the decision sees the subject line and instructions on the **Purchase requisitions** page. The subject line appears in a message bar on the page. The user can then click the icon in the message bar to view the instructions. Follow these steps to enter a subject line and instructions.

1. In the left pane, click **Basic Settings**.
2. On the **Instructions** tab, in the **Work item subject** field, enter the subject line.
3. To personalize the subject line, you can insert placeholders. Placeholders are replaced with appropriate data when the subject line is shown to users. Follow these steps to insert a placeholder:
 - a. In the text box, click where the placeholder should appear.
 - b. Click **Insert placeholder**.
 - c. In the list that appears, select the placeholder to insert.
 - d. Click **Insert**.
4. To add translations of the subject line, follow these steps:
 - a. Click **Translations**.
 - b. On the page that appears, click **Add**.
 - c. In the list that appears, select the language that you're entering the text in.
 - d. In the **Translated text** field, enter the text.
 - e. To personalize the text, you can insert placeholders as described in step 3.
 - f. Click **Close**.
5. In the **Work item instructions** field, enter the instructions.
6. To personalize the instructions, you can insert placeholders. Placeholders are replaced with appropriate data when the instructions are shown to users. Follow these steps to insert a placeholder:
 - a. In the text box, click where the placeholder should appear.
 - b. Click **Insert placeholder**.
 - c. In the list that appears, select the placeholder to insert.

- d. Click **Insert**.
7. To add translations of the instructions, follow these steps:
 - a. Click **Translations**.
 - b. On the page that appears, click **Add**.
 - c. In the list that appears, select the language that you're entering the text in.
 - d. In the **Translated text** field, enter the text.
 - e. To personalize the text, you can insert placeholders as described in step 6.
 - f. Click **Close**.

Specify the possible outcomes of a decision

Typically, when a document is assigned to a decision maker, the decision maker is asked a question. The answer to this question is usually **Yes** or **No**, or **True** or **False**. Follow these steps to specify the possible outcomes of the manual decision.

1. In the left pane, click **Basic Settings**.
2. On the **Outcomes** tab, in the **Outcome 1** field, enter the name of the outcome, or the option.
3. To add translations of the outcome, follow these steps:
 - a. Click **Translations**.
 - b. On the page that appears, click **Add**.
 - c. In the list that appears, select the language that you're entering the text in.
 - d. In the **Translated text** field, enter the text.
 - e. Click **Close**.
4. In the **Outcome 2** field, enter the name of the outcome, or the option.
5. To add translations of the outcome, follow these steps:
 - a. Click **Translations**.
 - b. On the page that appears, click **Add**.
 - c. In the list that appears, select the language that you're entering the text in.
 - d. In the **Translated text** field, enter the text.
 - e. Click **Close**.

Specify when notifications are sent

You can send notifications to people when a decision has been made, delegated, or escalated. Follow these steps to specify when notifications are sent, and who the notifications are sent to.

1. In the left pane, click **Notifications**.
2. Select the check box next to the events that notifications should be sent for:
 - **[Choice 1]** – The assigned user has selected **[Choice 1]**.
 - **[Choice 2]** – The assigned user has selected **[Choice 2]**.
 - **Delegate** – The assigned user has assigned the decision to another user.
 - **Escalate** – The assigned user hasn't made the decision in the allotted time.
3. Select the row for an event that you selected in step 2.
4. On the **Notification text** tab, in the text box, enter the text of the notification.
5. To personalize the notification, you can insert placeholders. Placeholders are replaced with appropriate

data when the notification is show to users. Follow these steps to insert a placeholder:

- a. In the text box, click where the placeholder should appear.
 - b. Click **Insert placeholder**.
 - c. In the list that appears, select the placeholder to insert.
 - d. Click **Insert**.
6. To add translations of the notification, follow these steps:
- a. Click **Translations**.
 - b. On the page that appears, click **Add**.
 - c. In the list that appears, select the language that you're entering the text in.
 - d. In the **Translated text** field, enter the text.
 - e. To personalize the text, you can insert placeholders as described in step 5.
 - f. Click **Close**.
7. On the **Recipient** tab, specify who the notifications are sent to. Select one of the options in the following table, and then follow the additional steps for that option before you go to step 8.

OPTION	NOTIFICATION RECIPIENTS	ADDITIONAL STEPS
Participant	Users who are assigned to a specific group or role	<ol style="list-style-type: none"> 1. After you select Participant, on the Role based tab, in the Type of participant list, select the type of group or role to send notifications to. 2. In the Participant list, select the group or to send notifications to.
Workflow user	Users in the current workflow	<ul style="list-style-type: none"> • After you select Workflow user, on the Workflow user tab, in the Workflow user list, select a user who participates in the workflow.
User	Specific users	<ol style="list-style-type: none"> 1. After you select User, click the User tab. 2. The Available users list includes all users. Select the users to send notifications to, and then move those users to the Selected users list.

8. Repeat steps 3 through 7 for each event that you selected in step 2.

Assign a decision

Follow these steps to specify who a manual decision should be assigned to.

1. In the left pane, click **Assignment**.
2. On the **Assignment type** tab, select one of the options in the following table, and then follow the additional steps for that option before you go to step 3.

OPTION	USERS THAT THE DECISION IS ASSIGNED TO	ADDITIONAL STEPS
Participant	Users who are assigned to a specific group or role	<ol style="list-style-type: none"><li>1. After you select Participant, on the Role based tab, in the Type of participant list, select the type of group or role to assign the decision to.<li>2. In the Participant list, select the group or role to assign the decision to.

OPTION	USERS THAT THE DECISION IS ASSIGNED TO	ADDITIONAL STEPS
Hierarchy	Users in a specific organizational hierarchy	<ol style="list-style-type: none"> 1. After you select Hierarchy, on the Hierarchy selection tab, in the Hierarchy type list, select the type of hierarchy to assign the decision to. 2. The system must retrieve a range of user names from the hierarchy. These names represent users that the decision can be assigned to. Follow these steps to specify the starting point and ending point of the range of user names that the system retrieves: <ol style="list-style-type: none"> a. To specify the starting point, select a person in the Start from list. b. To specify the ending point, click Add condition. Then enter a condition that determines where in the hierarchy the system stops retrieving names. 3. On the Hierarchy options tab, specify which users in the range the decision should be assigned to: <ul style="list-style-type: none"> • Assign to all users retrieved – The decision is assigned to all users in the range. • Assign only to last user retrieved – The decision is assigned to only the last user in the range. • Exclude users with the following condition – The decision isn't assigned to any users in the range who meet a specific condition. Click Add condition to specify the condition.
Workflow user	Users in the current workflow	<ul style="list-style-type: none"> • After you select Workflow user, on the Workflow user tab, in the Workflow user list, select a user who participates in the workflow.

OPTION	USERS THAT THE DECISION IS ASSIGNED TO	ADDITIONAL STEPS
User	Specific users	1. After you select User , click the User tab. 2. The Available users list includes all users. Select the users to assign the decision to, and then move those users to the Selected users list.

3. On the **Time limit** tab, in the **Duration** field, specify how much time the user has to make the decision. Select one of the following options:

- **Hours** – Enter the number of hours that the user has to make the decision. Then select the calendar that your organization uses, and enter information about your organization's work week.
- **Days** – Enter the number of days that the user has to make the decision. Then select the calendar that your organization uses, and enter information about your organization's work week.
- **Weeks** – Enter the number of weeks that the user has to make the decision.
- **Months** – Select the day and week that the user must make the decision by. For example, you might want the user to make the decision by Friday of the third week of the month.
- **Years** – Select the day, week, and month that the user must make the decision by. For example, you might want the user to make the decision by Friday of the third week of December.

If the user doesn't make the decision in the allotted time, the decision is overdue. A decision that is overdue is escalated, based on the options that you select in the **Escalation** area of the page.

Specify what happens when a decision is overdue

If a user doesn't make the decision in the allotted time, the decision is overdue. A decision that is overdue can be escalated, or automatically assigned to another user. Follow these steps to escalate the decision if it's overdue.

1. In the left pane, click **Escalation**.
2. Select the **Use escalation path** check box to create an escalation path. The system automatically assigns the decision to the users who are listed in the escalation path. For example, the following table represents an escalation path.

SEQUENCE	ESCALATION PATH
1	Assign to: Donna
2	Assign to: Erin
3	Final action: [Choice 1]

In this example, the system assigns the overdue decision to Donna. If Donna doesn't make the decision in the allotted time, the system assigns the decision to Erin. If Erin doesn't make the decision in the allotted time, the system selects **[Choice 1]** as the decision.

3. To add a user to the escalation path, click **Add escalation**. Select one of the options in the following table, and then follow the additional steps for that option before you go to step 4.

OPTION	USERS THAT THE DECISION IS ESCALATED TO	ADDITIONAL STEPS
Hierarchy	Users in a specific organizational hierarchy	<ol style="list-style-type: none"> 1. After you select Hierarchy, on the Hierarchy selection tab, in the Hierarchy type list, select the type of hierarchy to escalate the decision to. 2. The system must retrieve a range of user names from the hierarchy. These names represent users that the decision can be escalated to. Follow these steps to specify the starting point and ending point of the range of user names that the system retrieves: <ol style="list-style-type: none"> a. To specify the starting point, select a person in the Start from list. b. To specify the ending point, click Add condition. Then enter a condition that determines where in the hierarchy the system stops retrieving names. 3. On the Hierarchy options tab, specify which users in the range the decision should be escalated to: <ul style="list-style-type: none"> • Assign to all users retrieved – The decision is escalated to all users in the range. • Assign only to last user retrieved – The decision is escalated to only the last user in the range. • Exclude users with the following condition: – The decision isn't escalated to any users in the range who meet a specific condition. Click Add condition to specify the condition.
Workflow user	Users in the current workflow	<ul style="list-style-type: none"> • After you select Workflow user, on the Workflow user tab, in the Workflow user list, select a user who participates in the workflow.

OPTION	USERS THAT THE DECISION IS ESCALATED TO	ADDITIONAL STEPS
User	Specific users	<ol style="list-style-type: none"> 1. After you select User, click the User tab. 2. The Available users list includes all users. Select the users to escalate the decision to, and then move those users to the Selected users list.

4. On the **Time limit** tab, in the **Duration** field, specify how much time the user has to make the decision. Select one of the following options:
 - **Hours** – Enter the number of hours that the user has to make the decision. Then select the calendar that your organization uses, and enter information about your organization's work week.
 - **Days** – Enter the number of days that the user has to make the decision. Then select the calendar that your organization uses, and enter information about your organization's work week.
 - **Weeks** – Enter the number of weeks that the user has to make the decision.
 - **Months** – Select the day and week that the user must make the decision by. For example, you might want the user to make the decision by Friday of the third week of the month.
 - **Years** – Select the day, week, and month that the user must make the decision by. For example, you might want the user to make the decision by Friday of the third week of December.
5. Repeat steps 3 through 4 for each user that should be added to the escalation path. You can change the order of the users.
6. If the users in the escalation path don't make the decision in the allotted time, the system makes the decision. To specify the option that the system selects, select the **Action** row, and then, on the **End action** tab, select an option.

Set a time limit

Follow these steps if the decision must be made in a specific time.

NOTE

The options that you select in this procedure override the options that you selected in the **Assignment** and **Escalation** areas of the page.

1. In the left pane, click **Advanced settings**.
2. Select the **Set a time limit for the workflow element** check box.
3. In the **Duration** field, specify when the decision must be made. Select one of the following options:
 - **Hours** – Enter the number of hours. Then select the calendar that your organization uses, and enter information about your organization's work week.
 - **Days** – Enter the number of days. Then select the calendar that your organization uses, and enter information about your organization's work week.
 - **Weeks** – Enter the number of weeks.
 - **Months** – Select the day and week that the decision must be made by. For example, you might want the decision to be made by Friday of the third week of the month.
 - **Years** – Select the day, week, and month that the decision must be made by. For example, you might

want the decision to be made by Friday of the third week of December.

4. If the time limit is exceeded, the system makes the decision. In the **Action** list, select the option that the system should select.

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Configure conditional decisions in a workflow

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Use the following procedure to configure the properties of a conditional decision.

A conditional decision is a point at which a workflow divides into two branches. To configure a conditional decision, in the workflow editor, right-click the conditional decision, and then click **Properties** to open the **Properties** form.

Name a decision

Follow these steps to enter a name for a conditional decision.

1. In the left pane, click **Basic Settings**.
2. In the **Name** field, enter a unique name for the conditional decision.

Set conditions

The system determines which branch is used by evaluating the submitted document to determine whether it meets specific conditions.

1. In the left pane, click **Basic Settings**.
2. Click **Add condition**.
3. Enter a condition.
4. Enter additional conditions, if they are required.
5. To verify that the conditions that you entered are configured correctly, complete the following steps:
 - a. Click **Test** to open the **Test workflow condition** form.
 - b. Select a record in the **Validate condition** area of the form.
 - c. Click **Test**. The system evaluates the record to determine whether it meets the conditions that you defined.
 - d. Click **OK** or **Cancel** to return to the **Properties** form.

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Configure parallel activities in a workflow

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To configure a parallel activity, complete the following procedures in the workflow editor.

A parallel activity consists of workflow branches that run at the same time.

Name a parallel activity

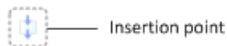
Follow these steps to enter a name for a parallel activity.

1. Right-click the parallel activity, and then click **Properties** to open the **Properties** form.
2. In the left pane, click **Basic Settings**.
3. In the **Name** field, enter a unique name for the parallel activity.
4. Click **Close**.

Configure the branches of a parallel activity

Follow these steps to add and configure the branches of this parallel activity.

1. Double-click the parallel activity to display the branches of the parallel activity.
2. To add a branch, drag the **Branch** element from the **Workflow elements** area to an insertion point on the canvas. The following figure shows an insertion point.



NOTE

The order of the branches is not important because all the branches of a parallel activity run at the same time.

3. To configure each branch, see [Configure parallel branches in a workflow](#).

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Configure parallel branches in a workflow

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To configure a parallel branch, complete the following procedures in the workflow editor.

A parallel branch is essentially a workflow that runs in the context of a parent workflow.

Name a branch

Follow these steps to enter a name for a parallel branch.

1. Right-click the parallel branch, and then click **Properties**. The **Properties** form is displayed.
2. In the left pane, click **Basic Settings**.
3. In the **Name** field, enter a unique name for the parallel branch.
4. Click **Close**.

Design and configure the elements of a branch

Follow these steps to design and configure the elements of a parallel branch.

1. Double-click the parallel branch.
2. Drag workflow elements onto the canvas, and then configure the elements, just as you would to create any other workflow. For more information, see [Create workflows overview](#).

Additional resources

[Create workflows overview](#)

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Configure line-item workflows

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This topic explains how to configure a line-item workflow element.

To configure a line-item workflow element, in the workflow editor, right-click the element, and then click **Properties** to open the **Properties** page. Then use the following procedures to configure the properties of the line-item workflow element.

Name the line-item workflow element

Follow these steps to enter a name for the line-item workflow element.

1. In the left pane, click **Basic Settings**.
2. In the **Name** field, enter a unique name for the line-item workflow element.

Specify whether the same workflow is used to process all line items

Follow these steps to specify whether the same workflow is used to process all the line items on a document.

1. In the left pane, click **Basic Settings**.
2. If the same workflow should process all the line items on a document, click **Invoke a single workflow for all line-items**. Then select the workflow to use to process the line items.
3. If a specific workflow should process line items that meet a specific set of conditions, click **Invoke a workflow for each line-item**. Then follow these steps to define the set of conditions:
 - a. Click **Add**.
 - b. Select the condition in the table.
 - c. On the **Condition name** tab, enter a name for the set of conditions that you're defining.
 - d. Click **Add condition** to enter a condition.
 - e. Enter any additional conditions that are required.
 - f. To verify that the set of conditions that you entered is configured correctly, click **Test**. On the **Test workflow condition** page, in the **Validate condition** area, select a record, and then click **Test**. The system evaluates the record to determine whether it meets the conditions that you defined. Click **OK** or **Cancel** to return to the **Properties** page.

On the **Workflow** tab, select the workflow select the workflow to use to process line items that meet the set of conditions that you defined.

NOTE

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Configure the Workflow message processing batch job as critical

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The workflow system uses various batch jobs. **Workflow message processing** is an important batch job used to process workflow messages. If workflow is a key component of your organization, you should consider configuring the **Workflow message processing** batch job as critical.

Configuring the **Workflow message processing** batch job as critical ensures that the system actively tracks its status. When a critical batch job fails, the support team can better monitor failures and take action to resolve any issues that may have caused the failure.

Follow these steps to configure the **Workflow message processing** batch job as critical.

1. Navigate to the **Batch jobs** page.
2. Search for **Workflow message processing** using the quick filter.
3. Select the **Workflow message processing** batch job.
4. Click **Edit** in the action pane.
5. Select the **Critical Job** check box.
6. Click **Save** in the action pane.

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Delegate work items in a workflow

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Manually delegate a work item

To delegate an individual work item, select the **Delegate** option in the **Workflow** menu and then enter the user to be delegated to along with a comment. This will reassign the work item to that user so they can complete it.

Manually delegate multiple work items

Multiple work items can be delegated together from the **Work items assigned to me** page. The following workflow types are eligible for mass delegation: Purchase agreement approval workflow, Purchase order workflow, Purchase requisition review, and Vendor invoice workflow. The **Delegate multiple work items** feature is disabled by default and can be enabled in **Workspaces > Feature management**. Contact your system administrator for help with enabling this feature.

1. Go to **Common > Common > Work items > Work items assigned to me**.
2. Select the work items that will be delegated.
3. Click the **Delegate work items** menu.
4. In the **User** field, select the user to delegate the work items to.
5. In the **Comment** field, enter a comment that explains why you're delegating the work items.
6. Click the **Delegate work items** button to complete the work item delegation.

Automatically delegate work items

If you plan to be out of the office or otherwise unavailable to act on work items for a period of time, you can automatically delegate new work items to other users using the **User options** page.

Set up automatic delegation

1. Go to **Common > Setup > User options**.
2. Click the **Workflow** tab. Make sure the Delegation section is expanded. To configure the system to automatically delegate your work items to other users, you must create delegation rules, which specify when certain types of work items are delegated. Follow these steps to create a delegation rule.
3. Click **Add**.
4. In the **Scope** field, select an option:
 - All – Delegate all work items that are assigned to you.
 - Module – Delegate only the work items that are related to a specific type of workflow. If you select this option, you must select the type of workflow in the **Name** field.
 - Workflow – Delegate only the work items that are related to a specific workflow. If you select this option, you must select the workflow in the **Name** field.
5. In the **Name** field:
 - For **Module** scope, select the target module.
 - For **Workflow** scope, select the target workflow.
6. In the **Delegate** field, select the user to delegate the work items to. Use the **Start date/time** and **End date/time** fields to specify when you want the work items to be automatically delegated.
7. In the **Start date/time** field, enter a date and time.
8. In the **End date/time** field, enter a date and time.

9. Select the **Enabled** check box to activate the delegation rule.
10. In the **Comment** field, enter a comment that explains why you're delegating the work items.

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View workflow history

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This topic describes the steps to view the status of a document that was submitted to the workflow system for processing and approval. The demo data company used to create this procedure is USMF.

1. Go to **Navigation pane > Modules > Common > Inquiries > Workflow > Workflow history**.

- Use this form to view the status of a document that was submitted to the workflow system for processing and approval.
- The **Instance ID** is the identification code of the workflow instance that is processing, or has processed the document.
- The **Status** is the workflow status of the document.
- The **Workflow ID** is the identification code of the workflow that is processing, or has processed the document.
- The **Document** is the identification code of the document.
- The **Document type** is the type of document that was submitted for processing.
- The **Workflow** is the name of the workflow that is processing, or has processed the document.
- The **Version** is the version number of the workflow that is processing, or has processed the document.
- The **Created date and time** is the date and time that the document was submitted.
- The **Elapsed time** is the time that has passed since the document was submitted.
- The **Resume** button allows you to resume the workflow process for the selected document.
- The **Recall** button allows you to recall the selected document so that it is not processed.

2. In the list, select the link in the desired row.

- Make sure the **Work items** section is expanded. In this section you can view the work items that are associated with the selected document. For example, a task may have to be completed, or the document may have to be approved.
- The **Reassign** button will open a dialog box where you can reassign a work item to another user.
- Make sure the **Tracking details** section is expanded. In this section you can view the workflow history of the selected document.

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Enable users to receive workflow-related email messages

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You can configure the system to send email messages to users when workflow-related events occur. For example, email messages can be sent to users when documents are assigned to them for approval. The demo data company used to create this procedure is USMF.

1. Go to **Navigation pane > Modules > System administration > Users > Users**.
2. In the list, find and select the desired record.
3. On the **Action pane**, click **User options**.
4. Click the **Workflow** tab. Make sure that the **Notifications** section is expanded. In the **Notifications** section, you can specify how you want the user to be notified about workflow-related events.
5. In the **Line-item workflow notification type** field, select an option.
 - Grouped – Notifications for line items are grouped into a single email message.
 - Individual – An email message is sent for each line item.
 - If you want the user to receive notifications in the client, select the **Send notifications in email** check box.
6. Click **Save**.
7. Close the page.

NOTE

The workflow email templates will be sourced from either system email templates or organization email templates depending on whether the workflow is a system-level (not company specific) or organization-level (company specific) workflow.

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Create a workflow type

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To add workflow support for a document, you must create a workflow type. After you create a workflow type, it can be used to create workflow configurations for the document. This topic provides links to the procedures for creating a workflow type.

You create workflow types to define the following elements:

- The workflow document to assign the workflow to
- A category that defines the module that the workflow type is available in
- Tasks, automated tasks, and approvals that are supported for the workflow
- The workflow started, completed, configuration data change, and canceled event handlers
- A `SubmitToWorkflowMenuItem` menu item

In this section

- [Workflow type checklist](#)
- [Create a workflow category](#)
- [Create a query for a workflow type](#)
- [Create a new workflow type](#)
- [Create a workflow document class](#)
- [Create a `SubmitToWorkflow` class](#)
- [Associate a workflow document class with a workflow type](#)

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Workflow type checklist

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This topic describes the steps that are required to create a new workflow type. Workflow types are used to create configurations for a workflow.

Workflow type checklist

1. If an existing category isn't appropriate, create a new workflow category to use for the workflow type. For more information, see [Create a workflow category](#).
2. Create a query that accesses the document that the new workflow type is being created for. For more information, see [Create a query for a workflow type](#).
3. Create a workflow type in Application Explorer. Typically, you complete this step by using the **Workflow** wizard. For more information, see [Create a new workflow type](#).

We recommend that you use the **Workflow** wizard to create a workflow type. The wizard performs the following tasks. In some cases, you must add more code for your workflow type. Links are provided so that you can see the details of the actions that the wizard performs and the additional steps that you must perform to complete your workflow type.

1. Create a workflow document class, and then bind the query that is used for the workflow to the class. For more information, see [Create a workflow document class](#).
2. Bind the workflow document class to the workflow type. For more information, see [Associate a workflow document class with a workflow type](#).
3. Create workflow event handlers for started, completed, configuration change, and canceled events, and then bind event handlers to the workflow type. For more information, see [Create a workflow event handler](#).
4. Create a class for **SubmitToWorkflowMenuItem**. Optionally create a class for **CancelMenuItem**. Bind the classes to the action menu items that you will create in the next step. For more information, see [Classes and methods](#).
5. Create an action menu item for the **SubmitToWorkflowMenuItem** workflow property. Optionally create an action menu item for the **CancelMenuItem** property. Bind the actions to the workflow type. For more information, see [Create a new workflow type](#).

Next steps

After you create a workflow type, you can add tasks, automated tasks, and approvals.

See also

[Configure workflow properties](#)

[Configure manual tasks in a workflow](#)

[Configure automated tasks in a workflow](#)

[Configure approval processes in a workflow](#)

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Create a workflow category

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When you create a workflow type, you must assign it to a workflow category. The workflow category determines whether the workflow type is available in a specific module. If an appropriate workflow category doesn't already exist, you must create it.

For example, a workflow type for a customer invoice should not be available in the **Master planning** module. To make the workflow type available only in the **Customer** module, select the **Customer** module when you create a workflow category.

This topic describes how to create a workflow category.

Create a workflow category

1. In Application Explorer, expand the **Business Process and Workflow** node.
2. Follow one of these steps to create the workflow category:
 - Right-click the **Workflow Categories** node, and then select **New Workflow Category**. A new workflow category group appears under the **Workflow Categories** node. Right-click the new workflow category, and then select **Properties**.
 - On the **Project** menu, select **Add new item**. In the **Add new item** dialog box, select **Workflow category**. Enter a name for the category, and then select **Create**.
3. On the **Properties** sheet, set the following properties, as required.

PROPERTY	VALUE
Name	Specify the name that is used to reference the workflow category.
Label	Specify the label that is used for the workflow category in the user interface (UI).
Help Text	Specify the description that is shown for the workflow category in the workflow configuration UI.
Module	Specify the module that the workflow will be available in. The default module is Ledger .

After you create a workflow category, a workflow type can be bound to it. Typically, the **Workflow** wizard completes this step. However, the following procedure explains how to manually bind a workflow type to a workflow category.

Bind a workflow type to a workflow category

1. In Application Explorer, expand the **Business Process and Workflow** node, and then expand the **Workflow Types** node.
2. Right-click the workflow type that you want to bind to a workflow category, and then select **Properties**.
3. On the **Properties** sheet, set the **Category** property to the workflow category that you created in the previous procedure.

See also

[Create a workflow type](#)

[Create a new workflow type](#)

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Create a query for a workflow type

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Before you create a workflow type, you must create a query that will access the table fields for the workflow document. This topic describes how to create a query for a workflow type.

Create a query for a workflow type

1. Follow one of these steps to create a new query:
 - In Application Explorer, right-click the **Queries** node, and then select **New Query**. A query group appears under the **Queries** node. Right-click the new query, and then select **Rename**. Enter a name for the query.
 - On the **Project** menu, select **Add new item**. In the **Add new item** dialog box, select **Query**. Enter a name for the query, and then select **Create**.
2. Expand the new query, right-click the **Data Sources** node, and then select **New Data Source**. A data source group appears under the **Data Sources** node.
3. Right-click the new data source group, and then select **Properties**.
4. On the **Properties** sheet, set the **Table** property to the main table for the document type that you're defining a workflow for.
5. In the Application Object Tree (AOT), right-click the new query, and then select **Save**.

For more information about how to create queries, see [Create queries by using the AOT](#).

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Create a new workflow type

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To make the workflow process available for a workflow document, you must create the workflow types that are used in the workflow configuration user interface (UI). This topic describes how to create a workflow type in Application Explorer.

A workflow type defines the following information:

- The document that the workflow is used for
- Workflow categories, which are used to assign a workflow type to a specific module
- Tasks, automated tasks, approvals, and line item workflows that the user can configure
- Menu items and event handlers

Create a new workflow type

1. Follow one of these steps to open the **Workflow** wizard. The wizard will help you create a new workflow type.
 - In Application Explorer, right-click the **Business Process and Workflow** node, and then select **Add-Ins > Workflow type wizard**.
 - On the **Project** menu, select **Add new item**. In the **Add new item** dialog box, select **Workflow type**. Enter a name for the query, and then select **Create**.
2. Set the following values for the wizard.

VALUE	DESCRIPTION
Name	Specify the name that will be used for the workflow type.
Category	Select the workflow category that will be used for the workflow type. The category determines the module that the workflow type is available in. You can use an existing category or a new category that you create. For more information, see Create a workflow category .
Query	Select the query that will access the table fields for the workflow document. For more information, see Create a query for a workflow type .
Document menu item	Select the menu item that points to the main page that shows the document that you're creating the workflow type for.
Document web menu item	Select the web menu item that points to the Enterprise Portal page that shows the document that you're creating the workflow type for.

3. Specify the types of menu items that you want to create. You can create menu items, web menu items, or both.
4. Select **Next**. A list of all the resources that will be created for the workflow type is shown.
5. Select **Finish** to create the resources. The wizard creates classes, menu items, web menu items, the

workflow type, and a project that contains all the items.

6. When dialog box appears that indicates the status, select **OK**. The project that contains the workflow type resources is shown.

After you create a workflow type, the next step is to create a workflow document class to expose document data for conditions. For more information, see [Create a workflow document class](#).

See also

[Create a workflow type](#)

[Create a workflow category](#)

NOTE

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Create a workflow document class

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You define table fields in a query to create workflow conditions. In a typical scenario, calculated fields are used to determine the behavior of a workflow. For example, a dynamic sales total of all records in a table can be used as a workflow condition to determine whether the step should be used. However, a limitation of queries is that you can't define calculated fields in the queries themselves. To overcome this query limitation, you must use a workflow document class. This topic describes how to create a workflow document class.

The workflow document class that you create defines table fields for conditions in two ways: the Application Explorer query and parameter methods. You must override the `getQueryName` method of the [WorkflowDocument class](#) to return the name of the query. You can optionally add calculated fields by adding parameter methods that have a specific signature on the class. For more information about workflow conditions, see [Configure workflow properties](#) and [Configure conditional decisions in a workflow](#).

The following procedures explain how to create a workflow document class that includes a parameter method for a calculated field. Before you begin, you must create a query that specifies the data that will be accessed. For more information about workflow queries, see [Create a query for a workflow type](#).

NOTE

If you used the **Workflow** wizard to create the workflow type, the wizard has already created the workflow document class.

Create a workflow document class

1. Follow one of these steps to create a new query:
 - In Application Explorer, expand the **Classes** node. Right-click the **Classes** node, and then select **New Class**. A class group appears under the **Classes** node. Right-click the new class, select **Rename**, and then enter a name for the workflow document class.
 - On the **Project** menu, select **Add new item**. In the **Add new item** dialog box, select **Class**. Enter a name for the class, and then select **Create**.
2. Expand the new class, select **classDeclaration**, right-click the class declaration, and then select **Edit**.
3. Enter the following code in the class declaration.

```
class <MyWorkflowDocumentClassName> extends WorkflowDocument
{
}
```

4. Close the **Editor** window, and select **Yes** to save your changes.
5. Right-click the new class, point to **Override Method**, and then select **getQueryName**. A method node that is named `getQueryName` appears under the workflow document class node, and the **Editor** window appears.

NOTE

Be sure to select `getQueryName` as the method to override. The `WorkflowDocument.getQuery` method is used only internally to retrieve the actual query, based on the string that is returned by the `WorkflowDocument.getQueryName` method.

6. In the **Editor** window, enter the following code for the query method.

```
QueryName getQueryName()
{
    return querystr(<MyWorkflowDocumentQueryName>);
}
```

After you create the workflow document class, you can bind it to the workflow type. For more information, see [Associate a workflow document class with a workflow type](#).

You can add a calculated field to the workflow document class only if it meets these conditions:

- It must be named `parm <name>`.
- It must define the `CompanyId`, `TableId`, and `RecId` parameters.
- It must return an extended data type (EDT) that will be included in the list of fields that define conditions or notification messages. The label for the EDT must uniquely identify the value.

Add a calculated field to the workflow document class

1. In the workflow document class that you want to add a calculated field to, right-click the class, and then select **New Method**. A new method node appears under the **Classes** node.
2. Right-click the new method node, and then select **Edit**.
3. Enter code in the format that is shown in the following example. This example shows how to add a calculated field to determine the total credit amount for a journal.

```
public TotalJournalCreditAmount parmTotalJournalCreditAmount(CompanyId _companyId, TableId _tableId,
RecId _recId)
{
    // The calculateAmounts method contains business and validation logic
    this.calculateAmounts(_companyId, _tableId, _recId);
    return totalJournalCreditAmount;
}
```

See also

[Associate a workflow document class with a workflow type](#)

NOTE

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Create a SubmitToWorkflow class

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A workflow is started when the user selects the **Submit** button on the workflow toolbar. The **Submit** button is bound to an action menu item that calls the **main** method of a class that you create to activate a workflow. This topic describes how to create a **SubmitToWorkflow** class and use the name of the workflow type to activate the workflow.

You can also activate a workflow by using the workflow configuration ID or the workflow sequence number. The basic procedure is the same. For more information, see [Activating a workflow](#).

NOTE

If you used the **Workflow** wizard to create the workflow type, the wizard has already created a workflow submission manager class. You just have to add code to it.

Create a SubmitToWorkflow class

1. In Application Explorer, expand the **Classes** node.
2. Right-click the **Classes** node, and then select **New Class**. A class group appears under the **Classes** node.
3. Right-click the new class, and then select **New Method**. A new method node appears under the **Classes** node.
4. Right-click the new method, and then select **Edit**.
5. Enter the following code for the **main** method to use the name of the workflow type to activate the workflow.

NOTE

This example applies to workflow submissions. For an example that also works with Enterprise Portal, see [Adding enterprise portal support for workflow submission](#).

```

public static void main(Args args)
{
    // Variable declaration.
    recId _recId = args.record().RecId;
    WorkflowCorrelationId _workflowCorrelationId;
    // Hardcoded workflow type name.
    WorkflowTypeName _workflowTypeName = workflowtypestr("MyWorkflowType");
    // Initial note is the information that users enter when they
    // submit the document for workflow.
    WorkflowComment _initialNote = "";
    WorkflowSubmitDialog workflowSubmitDialog;
    // Opens the submit to workflow dialog box for user comments.
    workflowSubmitDialog =
WorkflowSubmitDialog::construct(args.caller().getActiveWorkflowConfiguration());
    workflowSubmitDialog.run();
    if (workflowSubmitDialog.parmIsClosedOK())
    {
        _recId = args.record().RecId;
        // Get user comments from the submit to workflow dialog box.
        _initialNote = workflowSubmitDialog.parmWorkflowComment();
        try
        {
            ttsbegin;
            // Activate the workflow from a template.
            _workflowCorrelationId = Workflow::activateFromWorkflowType(_workflowTypeName, _recId,
_initialNote, NoYes::No);
            ttscommit;
            // Updates the workflow button to display Actions instead of Submit.
            args.caller().updateWorkflowControls();
        }
        catch(exception::Error)
        {
            // ToDo Insert your error code here.
        }
    }
}
}

```

6. Close the Editor window, and select **Yes** to save your changes.

NOTE

When you save this code, you will receive an "Empty compound statement" warning message in the **Compiler Output** window unless you add valid code in the `catch(exception::Error)` block.

See also

[Activating a workflow](#)

[Create a new workflow type](#)

[Workflow::activateFromWorkflowType method](#)

[Workflow::activateFromWorkflowSequenceNumber method](#)

[Workflow::activateFromWorkflowConfigurationId method](#)

NOTE

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Associate a workflow document class with a workflow type

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To create a workflow, you must bind a workflow document class to the workflow type. The workflow document class contains references to the table data fields that the workflow uses. This topic describes how to bind a workflow document class to a workflow type.

NOTE

If you used the **Workflow** wizard to create the workflow type, the wizard has already bound the workflow document class to the workflow type.

Before you begin the following procedure, you must create a workflow document class to expose the table fields that are used for conditions in the configuration user interface (UI). For more information, see [Create a workflow document class](#).

Bind a workflow document class to a workflow type

1. In Application Explorer, expand the **Workflow** node.
2. In the **Workflow Types** node, right-click the workflow type that you want to bind a workflow document class to, and then select **Properties**.
3. On the **Properties** sheet, set the **Document** property to the workflow document class that defines the workflow document.

See also

[Create a new workflow type](#)

[Create a workflow document class](#)

NOTE

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Workflow types report

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This topic points you to a report that lists the available workflow types.

To create a workflow, you must first select the *type* of workflow that you want to create. For example, you may want to create a **Purchase requisition line review** workflow to define who must approve line items on purchase requisitions. For more information about creating a workflow, see [Create workflows overview](#).

View the report

The **Workflow types report**, included with the [Technical reference reports](#), lists each type of workflow that is available. The report also describes what each type of workflow is used for and indicates whether the workflows of each type are associated with a specific company in the organization or with the whole organization.

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Workflow FAQ

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This topic answers frequently asked questions about the workflow system.

Why are multiple notifications received when a work item is rejected?

When a work item is rejected, that work item is completed as rejected. Another work item is created and assigned to the originator. This means that there is a notification to the originator for the rejected work item, and a separate notification to the user assigned to the new "change requested" work item.

Each notification is for a different work item, but the similarity can cause confusion. We are looking at ways to improve this in a future release.

Why are my workflow exports failing?

There is currently a limitation in the workflow export feature that prevents workflow names from exceeding 48 characters. Using a name that is longer than 48 characters can result in a "Server failed to authenticate the request" error and/or prevent a file to be exported without a file type. The following blog post provides more details, [Workflow export troubleshooting](#).

Can the submitter of a workflow also approve the workflow?

Yes, a submitter of a workflow can also approve the workflow if it is configured that way. To prevent this behavior, set **System administration > Workflow > Workflow parameters > General > Approver > Disallow approval by submitter** to Yes.

Can I add alerts to workflows to provide notifications to users?

Here are a few key areas to note about adding alerts to workflows to provide notifications:

- Alerts versus workflow notification mechanisms
 - Alerts can be set up for record changes. Workflows change records, so it's possible to set up an alert related to a record change caused by a workflow. However, because workflows have different built-in notification options, using alerts isn't ideal.
- Standard notifications from workflows
 - Workflows have built in email notifications. A customer can configure the notifications so that the users are sent emails. Those notifications don't result in Action Center messages for users.
 - In a future update we will be adding an Action Center message so a user is assigned a workflow work item.
- Adding notifications to workflows
 - Action Center messages can be created for specific users, such as a message created from a workflow in X++.
 - [Workflows have business events](#) that the customer could use to trigger Flows have the notifications that they are looking for.

In summary, if a user does not get the proper notification from the Action Center when they are assigned a workflow work item, then leverage [Workflow business events](#) with Microsoft Power Automate to provide additional or different notifications.

Why is workflow editor not able to start under AD FS?

When running under Active Directory Federation Services (AD FS) in an upgraded environment, the workflow editor may have trouble starting. If it does, make sure that the URL "https://dynamicsaxworkflweditor/" is added to the property **Microsoft Dynamics 365 for Operations On-premises - Workflow - Native application** in the ADFS settings.

Why am I getting SQL deadlocks on workflow processing?

The default field value for the **Number of workflow items per batch** on the **Workflow parameters** page is 0. A value of 0 causes the default to change to 20 items per batch. Be careful when adjusting this value because a high number of items per batch (> 40) can cause SQL deadlocks.

What is the Workflow Enhanced Error feature?

The Workflow Enhanced Error feature in version 10.0.13 adds error codes to differentiate different classes of workflow errors. The error messages reported will be mostly similar with minor differences to make them clearer.

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Alerts overview

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About alerts

Alerts form a notification system for critical events in the system. You can use alerts to stay informed about events that you want to track during the workday. You can easily create your own set of alert rules so that you're alerted about deliveries that are overdue, orders that are deleted, prices that change, or other events that you must respond to.

In enterprise resource planning (ERP), there are several typical scenarios where the alerts feature can be used. Here are some examples.

Scenario 1: Create an alert rule for new sales orders

1. Open the **All sales orders** page.
2. On the Action Pane, on the **Options** tab, in the **Share** group, select **Create a custom alert**.
3. In the **Create alert rule** dialog box, on the **Alert me when** FastTab, in the **Event** field, select **Record has been created**.

Scenario 2: Create an alert rule for postponement of a delivery date

1. Open the **All purchase orders** page.
2. Select a purchase order ID to access the purchase order details.
3. Expand the **Purchase order header** FastTab.
4. On the Action Pane, on the **Options** tab, in the **Share** group, select **Create a custom alert**.
5. In the **Create alert rule** dialog box, on the **Alert me when** FastTab, in the **Field** field, select **Delivery date**.
6. In the **Event** field, select **has been postponed**.

After you close the **Create alert rule** dialog box, your rule appears on the **Manage alert rules** page. You can use the **Manage alert rules** page to update your existing alert rules. For example, you can modify event triggers, update event notifications, and update expiration dates. To open the **Manage alert rules** page, use the **Alert me** button on the **Options** tab of the Action Pane.

What occurs when an alert rule is created?

When you create alert rules, you can associate a predefined event with a specific field. For example, the date that is specified in the field arrives, or the contents of the field change. Alternatively, you can associate an event with the records on a specific page. For example, a record is created, or a record is deleted.

When the selected event occurs for the field or for a record on the page, an alert is sent to you. For example, you create a rule where you associate the **Delivery date** field on a specific purchase order line with the **was due this amount of time ago** event. You set the time frame to five days. In this case, an alert is sent five days after the delivery date of that purchase order line.

Additionally, you can refine alert rules by setting conditions. For example, you can be alerted about new purchase orders that are created for specific vendor accounts.

Preparing for an alert

Before you set up an alert rule, decide when or in what situations you want to receive alerts. When you know which event you want to be notified about, find the page where the data that causes that event appears. The

event can be a date that arrives or a specific change that occurs. Therefore, you must find the page where the date is specified, or where the field that changes or the new record that is created appears. After you have this information, you can create the alert rule.

Components of an alert rule

An alert rule has five components:

- **Event** – The event that triggers an alert rule can be a date that arrives or a specific change that occurs. You define events on the **Send email alerts for job status changes** FastTab of the **Create alert rule** dialog box.
- **Condition** – On the **Alert me for** FastTab of the **Create alert rule** dialog box, you can select the scope of the condition, to control when you're alerted about events. You can apply the rule either to the current record only or to all visible records on the page. If the rule applies across legal entities, you can set the **Organization-wide** option to **Yes**.
- **Expiry of rule** – On the **Alert me until** FastTab of the **Create alert rule** dialog box, you can specify how long the alert rule should be active.
- **Contents** – On the **Alert me with** FastTab of the **Create alert rule** dialog box, you can specify the subject text and message text that the alert messages should use.
- **User** – On the **Alert who** FastTab of the **Create alert rule** dialog box, you can specify which user should receive the alert messages. By default, your user ID is selected.

NOTE

This option is restricted to organization administrators.

Videos

How to use alerts to monitor filtered data

The [How to use alerts to monitor filtered data](#) video (shown above) is included in the [Finance and Operations playlist](#) available on YouTube.

Alert rule options

The [Alert rule options](#) video (shown above) is included in the [Finance and Operations playlist](#) available on YouTube.

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Create alert rules

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Getting started

Before you set up an alert rule, decide when or in what situations you want to receive alerts. When you know which event you want to be notified about, find the page where the data that causes that event appears. The event can be a date that arrives or a specific change that occurs. Therefore, you must find the page where the date is specified, or where the field that changes or the new record that is created appears. After you have this information, you can create the alert rule.

When you create an alert rule, you define the criteria that must be met before an alert is triggered. Criteria is basically the match between the occurrence of an event and the fulfillment of specific conditions. When an event occurs, the system starts to perform a check according to the conditions that are set up.

Ensure the alert batch jobs are running

The batch jobs for data change and due date alerts need to be running for the alert conditions to be processed and the notifications to be sent. To run batch jobs, go to **System administration > Periodic tasks > Alerts** and add a new batch job for **Change based alerts** and/or **Due date alerts**. If a long and frequently running batch job is needed, select **Recurrence** and set **No end date** with a **Recurrence pattern** of **Minutes** and a **Count** of 1.

Events

The event that triggers an alert rule can be a date that arrives or a specific change that occurs. Triggers for events are defined on the **Alert me when** FastTab of the **Create alert rule** dialog box. The events that are available for a particular field depend on the trigger that is selected.

For example, if you're setting up an alert rule for the **Start date** field, due date events are appropriate. Therefore, the **is due in** event type is available for that field. However, for a field such as **Cost center**, a due date event isn't appropriate. Therefore, the **is due in** event type isn't available. Instead, the **has changed** event type is available.

Event types

Three types of events can occur:

- **Create-type and delete-type events** – These events trigger an alert when a record is created or deleted.
- **Update-type events** – These events trigger an alert when the data in a specific field changes.
- **Due date-type events** – These events trigger an alert when a date arrives.

Changes that occur can be initiated by a user. For example, a user changes the delivery date of a purchase order. Alternatively, changes can occur as part of a process. For example, the **Status** field on a page changes to reflect the life cycle of various processes in the system.

Conditions

On the **Alert me for** FastTab in the **Create alert rule** dialog box, you can use conditions to control when you're alerted about events.

For example, you can specify that the system should alert you when the status of purchase orders changes, but only if the status matches a specific set of conditions. Specifically, you want to be alerted when the status of a purchase order is set to **Received**. This change in status is the event that triggers the alert.

Next, you must decide which purchase orders you want to be alerted about. For example, you can select one of the following options. These options define the conditions for the alert rule.

- **Current selected record** – You receive an alert when the status of a specific purchase order changes to **Received**.
- **All records** – You receive an alert when the status of a purchase order is changed for an item in the active page view. You can use the advanced filtering that is available on the page to create rules for a specific set of records. For example, you can create an alert that is triggered for all purchase orders for the customers in a specific customer group.

Expiry of rule

On the **Alert me until** FastTab of the **Create alert rule** dialog box, you can specify how long the alert rule should be active.

Alert contents

On the **Alert me with** FastTab of the **Create alert rule** dialog box, you can specify the subject text and message text that the alert messages should use.

User ID

On the **Alert me with** FastTab of the **Create alert rule** dialog box, you can specify which user should receive the alert messages. By default, your user ID is selected. The ability to change the user receiving the alert is restricted to organization administrators.

Alerts as business events

You can send alerts externally using the business events framework. When creating an alert, set **Organization-wide** to **No** and set **Send externally** to **Yes**. After you have the alert triggering the business event, you can trigger a flow built in Power Automate using the **When a business event occurs** trigger on the Finance and Operations connector, or explicitly send the event to a business events endpoint via the **Business events catalog**.

Create an alert rule

0. Ensure the alert batch jobs are running (see above).
1. Open the page that contains the data to monitor.
2. On the Action Pane, on the **Options** tab, in the **Share** group, select **Create alert rule**.
3. In the **Create alert rule** dialog box, in the **Field** field, select the field to monitor.
4. In the **Event** field, select the type of event.
5. On the **Alert me for** FastTab, select the desired option. If you want to send the alert as a business event, set the **Organization-wide** value to **No**.
6. If the alert rule should become inactive on a specific date, on the **Alert me until** FastTab, select an end date.
7. On the **Alert me with** FastTab, in the **Subject** field, accept the default subject heading for the email message, or enter a new subject. The text becomes the subject heading for the email message that you receive when an alert is triggered. If you want to send the alert as a business event, set **Send externally** to **Yes**.
8. In the **Message** field, enter an optional message. The text becomes the message that you receive when an

alert is triggered.

9. Select **OK** to save the settings and create the alert rule.

Limitations and workarounds

Workaround for creating alerts for the secondary data sources of a form

You can't create alerts for some secondary data sources on forms. For example, when creating alerts on the customer or vendor posting profiles form, only the fields on the header (CustLedger or VendLedger) are available and not the dimension accounts. The workaround for this limitation is to use **SysTableBrowser** to open that table as primary data source.

1. Open the table in the **SysTableBrowser** form.

```
https://<EnvironmentURL>/?cmp=USMF&mi=SysTableBrowser&TableName=<TableName>
```

2. Create an alert from the **SysTableBrowser** form.

NOTE

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Batch processing of alerts

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Alerts are processed by the batch processing functionality. You must set up batch processing before the process and deliver alerts.

Batch processing functionality supports two types of events:

- Events triggered by change-based events. These events are also referred to as create/delete and update events.
- Events triggered by due dates.

You can set up batch processes for each type of event.

Batch processing for change-based events

The system reads all change-based events that have occurred since batch processing was last run. Change-based events include updates to fields, the deletion of records, and the creation of records. These events are compared with the conditions that you set up in alert rules. When an event matches the conditions in a rule, the batch process generates an alert.

Frequency for change-based events

For change-based events, you can set up a batch job that triggers the processing of an event soon after the system logs the event. If you set up the batch job to recur more often, users receive their alerts sooner after changes occur. However, a high frequency for batch processing might adversely affect system performance.

On the other hand, a batch job that recurs less often, and that you schedule for times when the system load is low, might help improve system performance. However, a low frequency for batch processing might not meet the users' demands for timely alerts.

Therefore, when you set up the frequency of batch processing for change-based events, consider the balance between the timeliness of alerts and the performance of the whole system. These considerations become more relevant as the number of users who create alert rules increases. The frequency doesn't affect the number of events that the system processes. However, if more users create rules, the process runs more checks. This type of data exchange might affect system performance.

The risks of low batch frequency

If you set up a low frequency for batch processing for change-based events, data that is relevant to the conditions in alert rules might change before processing. Therefore, you might lose alerts.

For example, you create an alert to trigger when the event is **customer contact changes** and the condition is **customer = BB**. In other words, when the customer contact for customer BB changes, the process logs the event. However, the batch processing system is set up so that batch processing occurs less often than data entry. If the customer name changes from **BB** to **AA** before the event is processed, the data in the database no longer matches the condition in the rule, **customer = BB**. Therefore, when the event is finally processed, no alert is generated.

Set up processing for change-based alerts

1. Go to **System administration > Periodic tasks > Alerts > Change based alerts**.
2. In the **Change based alerts** dialog box, enter the appropriate information.

Batch processing for due-date events

The system detects all events that are caused by due dates, and these events are compared with the conditions that are set up in alert rules. The batch process generates an alert when an event matches the conditions in a rule.

Frequency for due-date events

For due-date events, you might want to set up batch jobs that are run during the night or at specific times of the day, to balance the system load. We recommend that you set up the batch job so that it's run at least one time per day. If alerts should be sent as early as possible, set up the batch processing to occur immediately after the system date changes. If you want to generate alerts for due-date events that occur after a batch job has already processed alerts, you can run the batch job again on the same day.

For example, a batch job has been run on a particular day. You then create a purchase order that has a due date that should trigger an alert on that same day. To receive the alert on that day, you must run the batch job again after the purchase order is created. However, if you don't run the batch job again on that day, the next day's batch job detects any due-date events that weren't processed on previous days.

NOTE

Even when the batch process is run more than one time per day, alerts aren't duplicated for the same due-date event and conditions. Alerts are generated only for dates that have become due because of changes that occurred in the system after the last batch job was run.

Batch processing window

The processing of alert rules in a company can be stopped for several reasons. These reasons include vacations, system errors, or other issues that prevent the batch jobs from being run for some time.

To prevent due-date alerts from becoming obsolete because the batch job hasn't been run for several days, you can set up a batch processing window. A batch processing window can be used to prevent a batch job from being run for a specified number of days.

If you set up a batch processing window, an alert is sent when the alert rule is processed, even if the alert exceeds the time limit that is defined in the due-date criteria. An alert continues to be sent for as long as the period that is defined by this time limit plus the batch processing window isn't exceeded. However, when the period exceeds the value defined by the time limit plus the batch processing window, an alert is no longer sent.

Set up processing for due-date alerts

1. Go to **System administration > Periodic tasks > Alerts > Due date alerts**.
2. In the **Due date alerts** dialog box, enter the appropriate information.

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Client alert notifications by email

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You can define custom alert rules that monitor filtered views of data and automatically send email notifications when predefined events occur. The option to send email notifications is available for all supported alert types and you can also turn them on for existing alert rules.

You can use built-in controls to create alert rules that monitor the filtered views of system batch jobs. By monitoring the value of the **Status** field, you can also configure alert rules that send email when a batch job fails. After you create these alert rules, you no longer have to check reports for changes to business data. Instead, you can let the intelligent change detection service do the monitoring for you.

Client alerts depend on the email subsystem that is provided through integration with Microsoft Office. We recommend that you use the Simple Mail Transfer Protocol (SMTP) provider, so that email distribution doesn't have to rely on a local mail client.

To send notifications by email, customers must configure integrated email services. Email notifications are sent to recipients on behalf of alert owners.

For more information about how to configure email, see [Configure and send email](#).

The following image shows the **Create alert rule** dialog box, which now includes a **Send email** option.

The screenshot displays the 'Create alert rule' dialog box in Dynamics 365. The dialog is titled 'Create alert rule' and is for a 'Customers' table. It shows the following fields and options:

- Rule ID:** 000311
- Table name:** Customers
- Alert me for:** Customers
- Alert me until:** (empty)
- Alert me with:** (empty)
- Subject:** Record has been created in Custo
- User ID:** Admin
- Message:** (empty text area)
- Send email:** Yes (checked)
- Email recipients:** karif@contoso.com

The background shows a table of customers with columns for Account, Name, and Invoice. The table is filtered to show all customers.




NOTE

When the **Send email** option is set to **Yes**, alert notifications will continue to be delivered from the Action Center.

Alert notification email templates

The service sends email notifications by using predefined email templates that deliver the basic details of the alert notification.

The following image shows the structure of the alert notifications when they are received by email.

<p>From: owner@domain.com Sent: Thursday, November 29, 2018 To: target@domain.com Subject: Alert Notification – Record has been created in Customers</p> <p> Microsoft Dynamics 365</p> <p>Message: Custom alert messages entered by the Alert owner goes here</p> <p>Details: View customer account: Test Cust 02, Test Account 02</p>	<p>From: owner@domain.com Sent: Thursday, November 29, 2018 To: target@domain.com Subject: Alert Notification – Field Customer group in table Customers has changed</p> <p> Microsoft Dynamics 365</p> <p>Message: Custom alert messages entered by the Alert owner goes here</p> <p>Details: View Customer account: DE-001, Contoso Europe</p>	<p>From: owner@domain.com Sent: Thursday, November 29, 2018 To: target@domain.com Subject: Alert Notification – Record has been deleted in Customers</p> <p> Microsoft Dynamics 365</p> <p>Message: Custom alert messages entered by the Alert owner goes here</p> <p>Details: Go to Customers</p>
RECORD CREATED	FIELD CHANGED	RECORD DELETED

NOTE

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Electronic signatures overview

2/18/2021 • 4 minutes to read • [Edit Online](#)

This article provides an overview of electronic signatures and describes how they can be used.

What is an electronic signature?

An electronic signature confirms the identity of a person who is about to start or approve a computing process. In some industries, an electronic signature is as legally binding as a handwritten signature.

Electronic signatures are a regulations compliance requirement for several regulated industries, such as pharmaceuticals, food and beverage, and aerospace and defense. They are also required for compliance with regulations in 21 CFR Part 11 that was issued by the Food and Drug Administration (FDA) in the United States.

NOTE

An electronic signature by itself isn't the same as a digital signature. An electronic signature is just a substitute for a handwritten signature, whereas a digital signature provides additional security measures. A digital signature can help identify whether another user or process has tampered with the data. A digital signature can also be verified, and this verification can't be refuted by the owner of the certificate that was used to sign the data. As described below, electronic signatures have built-in digital signature functionality.

Electronic signatures

You can use electronic signatures for critical business processes. Some processes have built-in electronic signature capabilities. You can also create custom signature requirements for any database table and field.

Electronic signatures have built-in digital signature functionality. Every user who signs documents must obtain a valid cryptographic certificate. When a document is signed, the private key that is associated with that certificate is validated. Electronic signature information is recorded in a log to provide an audit trail. To set up electronic signatures, see [Set up electronic signatures](#).

Users who require access to electronic signatures

Three kinds of users typically require security access to electronic signatures: electronic signature administrators, signers, and electronic signature auditors.

Electronic signature administrator

The electronic signature administrator sets up signature requirements, general parameters, and approvers, and receives alerts when signatures can't be verified. By default, a user who belongs to the **Information technology manager** security role has permission to administer electronic signatures.

Signer

A signer provides electronic signatures for documents and processes that require signatures. By default, a user who belongs to the **System user** security role has permission to sign documents electronically.

NOTE

The signer might require additional permissions before access is granted to data that is related to the document or process that is being signed. A user who changes data and must then sign for those changes must have permission to change the data. A user who signs on behalf of another user might not require access to the data. An example of this kind of user is a supervisor who signs for an employee's changes.

Electronic signature auditor

The electronic signature auditor reviews the database log and the signature review log that is available from the database log. By default, a user who belongs to the **Information technology manager** security role has permission to audit electronic signatures.

If you use a role other than **Information technology manager**, make sure that the role is assigned the following privileges:

- View electronic signature failures
- View database log

Signing documents electronically

Get a certificate

Before you sign documents electronically, you must request a certificate.

NOTE

Microsoft SQL Server features are used to create certificates and enable electronic signing. No additional certificate or public key infrastructure (PKI) is required.

When you request a certificate, a public key and a private key are created for you. The private key is encrypted by using a password that is known only to you. When you sign a document electronically, your identity is verified when you enter the password.

To request a certificate, on the **Options** page, on the **Accounts** tab, click **Get certificate**.

You must enter and confirm the password that you will use for signing. The password is used to protect your private key and authorize the use of your certificate. This password isn't stored in the database, and it isn't available to anyone else, not even to the administrator.

If you forget the password that is connected with your certificate, that certificate must be reset. If you reset the certificate, you don't affect documents that you signed by using the previous certificate. To reset the certificate, on the **Options** page, click **Reset certificate**.

Sign a document electronically

The **Sign document** page is displayed when you make a change that requires an electronic signature.

1. On the **Sign document** page, click the **Document** tab to review the changes to the document.
2. On the **Signature** tab, select a reason code.
3. Enter a comment, if a comment is required.
4. If your user ID doesn't appear in the **Signer** field, select it in the list.
5. Enter your location, if this information is required.
6. Click **OK**.

Sign for another user's changes

Occasionally, you might want a user to sign for another user's changes. For example, a supervisor might be

required to sign for changes that an employee makes to a bill of materials (BOM). Use this procedure to designate a user as a signer for another user.

NOTE

When one user signs for another user's change, the signature must be provided at the workstation of the user who made the change. The user can't save the change until the signature has been provided.

To designate approvers, follow these steps.

1. On the **Options** page, on the **Accounts** tab, click **Designate approver**.
2. In the **Approver user ID** field, select the ID of the user who must sign for another user's changes.
3. In the **Sign for user ID** field, select the ID of the user whose changes must be signed for.

NOTE

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Set up electronic signatures

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Use this procedure to set up electronic signatures. An electronic signature confirms the identity of a person who is about to start or approve a computing process. The demo data company used to create this procedure is DAT.

Enable the Electronic signature configuration key

1. Go to System administration > Setup > License configuration.
2. In the tree, expand 'Administration'.
 - Verify that the Electronic signature check box is selected.
 - If the Electronic signature check box is not selected, you must enable maintenance mode. Maintenance mode can be enabled in this environment by running a maintenance job from Lifecycle Services, or by using the Deployment.Setup tool locally.
3. Close the page.

Set up electronic signature parameters

1. Go to Organization administration > Setup > Electronic signature > Electronic signature parameters.
2. Click Edit.
3. In the Notice field, type a value.
 - Enter the notice that signers will receive when a signature is requested. You can enter any text. Typically, this text tells the user what it means to sign a document electronically.
 - If you want to enter the Notice text in additional languages, click the Translations button.
4. Click Save.
5. Close the page.

Set up reason codes for electronic signatures

1. Go to Organization administration > Setup > Electronic signature > Electronic signature reason codes.
2. Click New.
 - You must set up reason codes before using electronic signatures. A valid reason code is required when signing a document. A signer selects a reason code to indicate the purpose of an electronic signature. For example, a reason code could be used to indicate legal approval.
3. In the Reason code field, type a value.
4. In the Description field, type a value.
 - Enter additional reason codes, if needed.
5. Click Save.
6. Close the page.

Require electronic signatures for existing processes

1. Go to Organization administration > Setup > Electronic signature > Electronic signature requirements.
2. In the list, find and select the desired record.
 - Select a process that requires electronic signatures.
3. Select or clear the Signature required check box.
 - Repeat these steps for each process that requires electronic signatures.

4. Click Save.

Create a custom requirement for electronic signatures

1. Click New.

2. Select or clear the Signature required check box.

3. In the Name field, enter a name for the process that requires electronic signatures.

4. In the Table name field, click the drop-down button to open the lookup.

5. In the list, find and select the table where the data that must be signed is stored.

6. In the list, click the link in the selected row.

7. In the Field name field, click the drop-down button to open the lookup.

8. In the list, find and select the field in the table that you want to monitor.

9. In the list, click the link in the selected row.

- Specify when a signature is required. Select Always if a signature is required when the data in the field changes. Select Only if a signature is required only under certain conditions. If you select Only, you must also select one of the following options: When a record is inserted, When a record is updated, or When a record is deleted.

10. Click Save.

11. Close the page.

NOTE

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Case management overview

2/18/2021 • 6 minutes to read • [Edit Online](#)

By planning, tracking, and analyzing cases, you can develop efficient resolutions that can be used for similar issues. For example, when customer service representatives or Human Resources generalists create cases, they can find information in knowledge articles to help them work more efficiently. The following examples show how cases can be used for different situations in an organization.

Example: How Fabrikam uses cases for customers in the private sector

Lisa, a customer service representative at Fabrikam, receives a telephone call from Lionel, a Fabrikam customer. Lionel is having trouble setting the correct volume level on the new sound system that Fabrikam installed in his music store. Lisa creates a case for Lionel and assigns the **Volume** category to the case. Lisa then elevates the priority and assigns a one-day service level agreement (SLA) to the case.

Lisa also enters the case details in the case log. Lisa notices that several knowledge articles are associated with the **Volume** category, and that three of them are marked as helpful for resolving cases. Lisa opens each article and discusses the resolution steps with Lionel, but none of the solutions solve the issue that Lionel is having with the new sound system. Lisa tells Lionel that an audio technician will call him within 24 hours and work to solve the issue.

Lisa activates the case, and a set of activities is created. She assigns the activities to Terrence, a member of the audio engineering team. Terrence sees that new activities are assigned to him. He opens the case and reads the case log to learn more about the case. Terrence encountered the same issue the day before, and he developed a solution. Terrence contacts Lionel and offers this solution for the issue. Terrence also enters it in the case details.

Because his solution is successful, Terrence decides to document it, so that other people can use it if they encounter the same issue. Terrence adds the document to the **Knowledge article** page, assigns the document to the **Volume** category, and manually elevates the ranking, so that other Fabrikam employees will know that it's a successful solution. Terrence then elevates the case to the next level. By elevating the case, he creates a new activity for Marie, who is a quality assurance representative in the customer service department.

Marie sees that a new activity is assigned to her, and opens the case that is associated with the activity. Marie reviews the case and the case details to make sure that the correct process was followed for the case. Marie verifies that the actual case time did not exceed the time frame that was estimated in the SLA. Marie notes that Terrence contacted the customer, and that the issue was resolved. Marie is satisfied with the treatment that the customer received and the results of the case. She resolves the case as closed. When Marie closes the case, the open activity that is assigned to her is also closed.

Example: How City Power & Light uses cases for customers in the public sector

Annie, a customer service representative with City Power & Light, receives a telephone call from a resident of the city that City Power & Light serves. Annie records the call as an activity and takes notes of the conversation. The resident tells Annie that his house has no power. Annie informs the resident that City Power & Light will investigate, find, and resolve the issue as quickly as possible.

Annie then creates a case, associates the telephone call with the case, and creates a service order. Annie knows that other residents are likely to call to report a power outage. Therefore, to avoid overwhelming the customer service center, and to save time, Annie sends a group instant message (IM) to inform the other representatives about the issue, and to tell them that a case and service order have been created. Annie includes the case

number and service order number in her IM. Then, if City Power & Light receives more telephone calls about the power outage, the customer service representatives can create an activity for each telephone call and assign it to the existing case.

Example: How Fabrikam uses cases for employees

The following scenarios show how Fabrikam Human Resources generalists in different locations can use case management when they address issues for employees.

In Great Britain

Christine, the Human Resources generalist for the Great Britain division of Fabrikam, receives a telephone call from Peter, a Fabrikam employee. Peter informs Christine that nine weeks ago, immediately after the birth of his son, he changed the number of dependents on his tax withholdings. Peter wants to know why the changes haven't become effective. Christine creates a case for Peter. She reviews Peter's tax information and learns that, although Peter entered new dependent information, he didn't select a start date for the new tax withholdings. Christine sends an email message to inform Peter that he must select a start date and resubmit his changes. Peter replies to Christine's message to tell her that he has now selected a start date and resubmitted his changes. Christine attaches the email message from Peter to the case record, verifies that the correct changes were made and submitted, and closes the case.

In the United States

Luke, the Human Resources generalist for the United States division of Fabrikam, receives an email message from Shannon, a Fabrikam employee. Shannon is a machine operator who was injured on the job six months ago. Since then, she has been working with Humongous Insurance to have her medical expenses paid. Because Shannon contacted Luke about this issue four weeks ago, a case has already been created. Shannon's new email message explains that Humongous Insurance is still not returning her telephone calls. Luke opens the existing case, adds Shannon's email message as a document, and reviews the case log. When Luke created this case, he assigned the **Insurance** category to it. He now sees that there is a new knowledge article that is associated with the **Insurance** category. Luke reads the knowledge article and learns that all phones at Humongous Insurance are down while the company's telephone system is being updated. The article states that the insurance company sent an email message to all its customers, but that several customers did not receive the message because of a problem with the company's email system. All customers who have active insurance claims are asked to send their inquiries to Humongous Insurance by email or paper mail. Luke sends Shannon an email message that explains what she must do to have her insurance claim settled. He also ranks the knowledge article that he read as a helpful source of information. Luke creates another activity for himself, so that he can follow up with both Shannon and Humongous Insurance in four weeks to make sure that the claim has been resolved. After four weeks, Luke contacts Shannon. He learns that Humongous Insurance has paid her claims, and that she is happy with the resolution. Luke changes the status of the case to **Closed**.

NOTE

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Plan case category security, case processes, and case categories

2/18/2021 • 2 minutes to read • [Edit Online](#)

This article describes the considerations and decisions that you must make during the planning process, before you begin to configure cases.

You can use the case functionality to resolve both issues that are external to your organization and internal issues.

Case category security by role

Only appropriate employees in an organization should have access to cases and related information. To control which employees have access to view, create, and update different types of cases, you can assign security roles to case category types. You must determine which security roles should have access to the various case category types.

Decision: Determine which security roles should have access to the following case category types. Your organization might not use all these category types, so make decisions only for those categories that are appropriate.

- General
- Sales
- Purchase
- Service
- Project
- Production
- Collections
- Audit
- Web
- Human Resources
- Product change
- FMLA

Case processes

You should set up processes that employees must follow for the cases that are opened in your organization. Processes help guarantee consistency for the people who are involved in cases, and also help employees resolve cases faster and more efficiently. You can set up a process for each case category that cases are assigned to. Although planning a separate process for each case type takes time, case resolution will go much more smoothly if the processes are planned out.

Decisions: For each case process, you must make the following decisions:

- What are the name and description of the process?
- Is the process active, and should employees use it when they handle a case that the process is assigned to?
- Who in the organization will be responsible for applying the process to a case? For example, Cost accounting or Human resources might be responsible for some case processes. Note that multiple areas can be responsible for completing one process.

Case categories

The Case category hierarchy provides a list of categories that you can assign cases to (see the "Case category security by role" section). Each top-level category includes subcategories, so that you can create more specific categories for the cases that your organization works with. Review the list of existing categories and subcategories to determine whether you must create more. If you must create more categories and subcategories, you must make the following decisions for each addition.

Decisions:

- Are you creating a new top-level category?
 - What is the name of the category
- Are you creating a new subcategory?
 - What is the parent category of the subcategory?
 - What is the name of the subcategory?
 - Which worker will own the subcategory?
 - What department is the subcategory assigned to?
 - What case process will be assigned to this subcategory?
 - What is the default service level agreement (SLA) that is assigned to this subcategory?
 - Should an activity be created when a case that this subcategory is assigned to is opened?
 - If so, what are the activity category, type, purpose, and phase?
 - Should a follow-up activity for the case be created?
 - If so, what are the follow-up activity category, type, purpose, and phase?

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Record templates overview

2/18/2021 • 2 minutes to read • [Edit Online](#)

This article introduces the concept of record templates and explains how they can be used to create records that share information.

Record templates can help you to create records more quickly, however you can only create record templates for some record types.

For example, imagine you are entering rental information for a car rental business that is located in San Francisco. Since most of the customers are likely to be from the San Francisco area, it would be nice if you could automatically fill in the values for the **State**, **Country**, and **City** fields on the rental form.

NOTE

You can apply templates only in areas that you have access to. However all template titles are visible to you when you create a new record, and to other users as well, if you are creating templates that will be available for all users. Be sure to consider this when naming templates. For example, avoid using names that include words, such as "commission," if is confidential that some employees in the company have commission-based salaries.

When one or more templates that you have access to exist for a specific form and you attempt to create a new record in the form, the **Select a template for** page is displayed. When you select a template from the list, the new record is created and contains default information that is based on the template that you selected. If you do not want to use templates when you create new records, select the **Do not ask again** check box in the **Select a template for** page. To display the template selection dialog box again, right-click any record, click **Record info**, and then click **Show template selection**.

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Create a record template to facilitate data entry

2/18/2021 • 2 minutes to read • [Edit Online](#)

This topic demonstrates how to create a record template so that field values that are used often do not have to be entered explicitly for each new record. In this procedure, you'll create a new record for new laptops that should be added to your fixed assets. This procedure uses the USMF sample company.

1. In the navigation pane, go to **Modules > Fixed assets > Fixed assets > Fixed assets**.
2. Select **New**.
3. In the **Fixed asset group** field, enter or select a value.
4. In the **Name** field, type a value. For example, enter **Corporate lead laptop**.
5. In the **Search name** field, type a value. For example, enter **laptop**.
6. Expand the **Technical information** section.
7. In the **Make**, **Model**, and **Model year** fields, type values.
8. On the Action Pane, select **Options**.
9. Select **Record info**.
10. Select **User template**.
11. In the **Name** field, type a value.
12. In the **Description** field, type a value.
13. Select **OK**.
14. Select **Close**.

NOTE

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Use record template to create a new record

2/18/2021 • 2 minutes to read • [Edit Online](#)

This procedure shows how to use a previously defined record template to create a new record. To complete this procedure, you must first complete the "Create a record template to facilitate data entry" procedure.

This procedure uses the USMF company.

1. In the **Navigation pane**, go to **Fixed assets > Fixed assets > Fixed assets**.
2. Click **New**. You will be prompted to select a template. Select the one that corresponds to your business need.
3. In the list, find and select the desired record.
4. Click **OK**.

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Configure document management

2/18/2021 • 15 minutes to read • [Edit Online](#)

This topic explains how to configure document management (document handling) so that it stores file attachments and notes for records. It includes information about the concepts and features that are involved in this functionality.

To learn more about document management, watch the short [Document Management](#) video.

Configure document types

Document types are used to categorize the documents that you attach to records or the templates that you create. Each document type can be stored in a unique location.

A default set of document types is provided. You can use these document types to categorize an attachment as a file, image, note, or URL. The **File** and **Image** default document types are configured to use **Azure storage** as the location.

To create a new document type, follow these steps.

1. Go to the **Document types** page.
2. Click **New**.
3. In the **Type** field, enter a short name for the new document type, such as **SharePoint** or **HR Docs**.
4. In the **Name** field, enter a longer name, such as **SharePoint files** or **HR Docs**.
5. In the **Class** field, specify a class to define the behavior for the document type:
 - **Attach file** – The user is prompted for a file.
 - **Attach URL** – The user can enter a URL in the **Notes** field, such as `https://www.microsoft.com`. The **Open** button on the **Attachments** page will open the URL on a browser tab.
 - **Simple note** – The user can add a simple note in the **Notes** field.
6. If you specified **Attach file** in the **Class** field, in the **Location** field, specify the storage mechanism to use.
7. If you specified **SharePoint** in the **Location** field, specify the Microsoft SharePoint address in the **SharePoint Address** field. To do this, click the **Edit** button (pencil symbol) and use the **Folder selection** dialog box.

Configure SharePoint storage

Microsoft SharePoint Online is one of the storage locations that are supported natively. Currently, only SharePoint Online is supported. Support for on-premises SharePoint (a local SharePoint server) may be added in the future.

To use SharePoint storage, set the **Location** field for a document type to **SharePoint**. Then, in the **SharePoint Address** field, enter a valid SharePoint address.

To configure SharePoint storage, follow these steps.

1. Go to the **Document management parameters** page.
2. On the **SharePoint** tab, in the **Default SharePoint server** field, review the host name that was

automatically detected for the SharePoint site, such as contosoax7.sharepoint.com. Typically, the SharePoint host name is in the form tenantname.sharepoint.com, and accounts on that tenant are in the form `user1@tenantname.onmicrosoft.com`.

Typically, if no default SharePoint server is specified, either there is no SharePoint site for the tenant, or a valid Microsoft 365 license isn't associated with the current user (the admin).

3. Optional: Click **Test SharePoint connection** to test the specified SharePoint host name. This verifies that the security and license are working correctly.
4. Optional: Click **Open SharePoint** to open the specified SharePoint host name in a browser. Note that this does not verify security, it just opens the SharePoint path in a browser tab for easy exploration.

Troubleshooting SharePoint communication

SharePoint communication works for the current user only if the following conditions are met:

- A Microsoft 365 license is associated with the user's account.
- The user is a typical user on the tenant, not an external user (for example, a user from another tenant).
- There is a SharePoint site for the tenant (for example, Contoso.SharePoint.com).
- The user has access to the folder that the document is stored in.

If documents stored in SharePoint don't open or don't display in preview, follow these steps to troubleshoot the issue:

1. Verify the Admin account has an associated email account (verify or change this in the **User** page). If this isn't set up, you need to add the email and provider via the OData Excel add-in. By default, the email address isn't present in the Excel design. The user needs to edit the Excel design, add all fields, apply, and refresh. Once complete, you can update the Admin account.
2. After the Admin account has an associated email account, sign in to Dynamics as the admin.
3. Open an attachment that is stored in SharePoint.
4. Sign in with another user account that has read access to the attachments page and the configured SharePoint folder. Verify that they can also open and preview the attachment.

Configure file types

By modifying the list of file extensions that are allowed, you can control the types of files that users can attach to records.

To specify file types, follow these steps.

1. Go to the **Document management parameters** page.
2. On the **File types** tab, review the default file types.
3. Remove any file types that users should not be able to attach to records, and add any file types that users should be able to attach to records.

Configure document preview

The attachments preview uses the Web app Open Platform Interface (WOPI) that is provided by Microsoft Office Online Server. On the **Document management parameters** page, on the **General** tab, in the **Office Web Apps Server** field, specify the Office Online Server instance to use for attachment previews. The default value is `https://onenote.officeapps.live.com`. This value points to the cloud-based WOPI server.

For a Microsoft Dynamics 365 Finance + Operations (on-premises) environment

The default cloud-based WOPI server in Finance + Operations can't read the attachment file to provide a

preview. If previews are required, you must [install an on-premises Office Online Server instance](#) and configure it inside the environment. Set the **Office Web Apps Server** field to the host name of the installed Office Online Server instance, and then click **Save**.

If previews aren't required, set the **Office Web Apps Server** field to `https://localhost`. The preview will then show the message "No preview available" instead of an error message.

Document preview (WOPI) will not work in environments with an IP safe list enabled

Document preview (WOPI) will not work in environments with an IP safe list enabled, because the WOPI service that provides the preview will not be able to connect back to the file service to retrieve the file for rendering.

Other configuration

Here are some other configuration options to consider, although these options are rarely used:

- On the **Document management parameters** page, on the **General** tab, you can use the **Use Document Tables** option to enable the **Active document tables** allow list. If you set this option to **Yes**, you disable attachments on all other tables. Therefore, turn on this option only when it's required.
- On the **Document management parameters** page, on the **General** tab, you can use the **Maximum file size in megabytes** field to set the maximum file size for attachments. Note that the ability of users to provide files is also constrained by the file size limit that is set for the environment in configuration files. These configuration files can't be changed via a client page.
- On the **Options** page (**Settings** > **User options**), on the **Preferences** tab, you can use the **Enable document handling** option to disable document handling (document management).

Accessing document management attachments

Document management appears to users as the **Attach** button at the top of most pages that contain data. When you select the **Attach** button (or when you use the corresponding keyboard shortcut, **Ctrl+Shift+A**), the **Attachments** page is opened in the context of the data source of the control that is currently selected on the page. This page shows all the attachments that are related to the corresponding data source.

The **Attach** button also shows a count of the attachments for the currently selected record. Therefore, you can determine whether there are attachments for the current record without having to open the **Attachments** page. The button shows exact counts for zero through nine attachments. If there are more than nine attachments, the button shows **9+** as the count. In this way, the performance impact and visual noise that exact larger counts might cause are reduced.

In version 10.0.12, the **Show related document attachments** feature changes the document attachment experience in two ways. First, when the feature is enabled, the **Attachments** page doesn't show only attachments that are related to a single data source. Instead, it shows attachments from all data sources on the page that are related to the active record. The count of attachments on the **Attach** button also reflects this change. Second, users can move and copy attachments between the related data sources on the **Attachments** page.

Document attachment history

Starting in version 10.0.16/Platform update 40, a history mechanism has been made available for record attachments. This allows your organization to maintain an audit of actions related to individual attachments. In particular, you can see when an attachment was created, marked for pending deletion, restored, deleted, or moved and who performed that action. Note that attachment history is not maintained until 10.0.16/Platform update 40, so any actions on attachments prior to that version will not be available.

Configuration of document attachment history

Document attachment history can be enabled (or disabled) by going to **Document management parameters**

> **General** > **History** > **Enable document history**. The default history retention period is 180 days, but this value can be modified as needed using the **Number of days to retain history** field.

Viewing an attachment's history

There are two entry points for viewing the history of a record attachment:

- When you are looking at the attachments for a specific record (see the [Accessing document management attachments](#) section for more details), you can view the history for the current set of attachments on the **Attachments** page by selecting the **Document history** button in the Action pane.
- Administrators can select the **Document history** button in the **History** section of the **Document management parameters** page. This action opens the **Document history** page, which shows a list of all attachments in the system. You can then drill into any record to see the detailed history for the selected attachment.

Attachment recovery

In Platform update 29, an attachment recovery feature has been added that provides a recycle bin for record attachments to be recovered within a configured period of time.

Configuration of attachment recovery

Attachment recovery can be enabled by going to **Document management parameters** > **General** > **Deferred deletion** > **Deferred deletion enabled**. The default for **Number of days to defer deletion** is 30 days but can be changed as needed. If the **Number of days to defer deletion** value is zero, this means that the deleted attachments will be recoverable for an indefinite period.

After attachment recovery is enabled, a batch job with this name will be created, "Scans for deleted references which have reached the end of their retention period". This batch job will use the **Number of days to defer deletion** to determine how long to retain a deleted attachment based on the **Deleted data and time**.

Deleting attachments when attachment recovery is active

When a user deletes an attachment, a notification will be added to the Message Center to provide confirmation of the deletion and an option to undo to the action if the deletion was unintended.

Table extension support has been built-in, so that any extension or custom field values on the **DocuRef** or **DocuValue** tables will be retained to enable their recovery.

Recovering attachments

When attachment recovery is enabled, attachments can be recovered in one of three ways:

1. Immediately after deletion, the user can use the undo link in the **Attachment deleted** notification.
2. On the **Attachments** page, a **Deleted attachments** button provides access to the list of deleted attachments that can be recovered for a particular record. The deleted attachments can be opened for review, permanently deleted, or restored.
3. In **System administration** > **Inquiries**, the **Deleted attachments** page provides access to the list of deleted attachments that can be recovered for any record. The deleted attachments can be opened for review, permanently deleted, or restored.

Scanning attachments for viruses and malicious code

When you work with attachments, you might want to scan the files for viruses and malicious code. Therefore, in version 10.0.12 and later, extension points are available so that customers can integrate with the file scanning software of their choice when they work with attachments. A similar extension point is also available for file upload. For more information, see [File upload control](#).

IMPORTANT

Out of the box, Finance and Operations apps don't scan files for viruses and malicious code, and we don't recommend specific software for file scanning. Instead, customers are responsible for choosing their own file scanning software, and for adding the appropriate code to the delegate handlers so that they can use the software or service of their choice to scan files.

The **Docu** class exposes the following two delegates. Handlers can be implemented for these delegates for document scanning purposes:

- **Docu.delegateScanDocument()** – This delegate applies the file scanning logic when a new document attachment is uploaded, or when a user tries to preview or download an existing attachment. The corresponding action will fail if the scanning service determines that the file is malicious.
- **Docu.delegateScanDeletedDocument()** – This delegate applies the file scanning logic to documents in the attachments recycle bin when a user tries to preview or download a file. The corresponding action will fail if the scanning service determines that the file is malicious.

Implementation details

The following example of the **ScanDocuments** class shows boilerplate code for the two handlers. For general information about how to implement handlers for delegates, see [EventHandlerResult classes in request or response scenarios](#).

```

public final class ScanDocuments
{
    [SubscribesTo(classStr(Docu), staticDelegateStr(Docu, delegateScanDocument))]
    public static void Docu_delegateScanDocument(DocuRef _docuRef, EventHandlerRejectResult
_validationResult)
    {
        if (!ScanDocuments::scanDocument(_docuRef))
        {
            _validationResult.reject();
        }
    }

    [SubscribesTo(classStr(Docu), staticDelegateStr(Docu, delegateScanDeletedDocument))]
    public static void Docu_delegateScanDeletedDocument(DocuDeletedRef _docuDeletedRef,
EventHandlerRejectResult _validationResult)
    {
        if (!ScanDocuments::scanDeletedDocument(_docuDeletedRef))
        {
            _validationResult.reject();
        }
    }

    private static boolean scanDocument(DocuRef _docuRef)
    {
        /*
        Custom implementation required for connecting to a scanning service
        If document scanning process found an issue, return false; otherwise, return true;
        */
        return true;
    }

    private static boolean scanDeletedDocument(DocuDeletedRef _docuDeletedRef)
    {
        /*
        Custom implementation required for connecting to a scanning service
        If document scanning process found an issue, return false; otherwise, return true;
        */
        return true;
    }
}

```

Frequently asked questions

What is the difference between document handling and document management?

There is no difference between document handling and document management. Both terms refer to the same functionality. Different terms are used in different versions of the product.

What is the difference between document management and print management?

Document management lets you add notes, documents, and other files to records.

Print management lets you control print settings for selected reports. Print settings include the number of copies, the printer destination, and the multilanguage text that can be included on the report. For more information, see [Document Reporting Services](#).

What is the difference between document types and file types?

Document types are used to categorize the documents that you attach to records or the templates that you create. Each document type can be stored in a unique location. The table for document types is named DocuType.

File types include Microsoft Word documents and images. A file type is denoted by the extension of the file, such

as .txt, .png, .doc, .xlsx, or .pdf.

Does document management integrate with Microsoft 365?

Yes. SharePoint storage is supported natively and can be selected as the storage location for a document type. In addition, any URL addressable file can be made an attachment via the URL document type.

How does the default storage location for Document Management change in Finance + Operations environments?

For Finance + Operations, the Azure Blob storage provider for attachments is replaced by a file folder storage provider so that attachments are kept on-premises instead of being stored in the cloud. Therefore, the default storage location for attachments is a file folder.

If I accidentally delete an attachment stored in Azure Blob storage, can it be restored?

If an attachment stored in Azure Blob storage is accidentally deleted, it cannot be restored or recovered because it has been permanently deleted and the reference to it has also been deleted.

Is the database information about attachments stored separately from the attachments themselves?

Record attachment information is stored in the DocuRef and DocuView tables. The DocuRef table is the record that represents the attachment. The DocuRef record points to the record being attached to and to a DocuView record. The DocuView record points to the file that is the attachment. Files are stored outside the database, therefore any database operations, like restoring from backup, will only affect the database information about the attachment, not the attachment file itself.

Can attachments be stored in the database?

No. By default, attachments are stored in Azure Blob storage.

What are the main differences between Azure Blob storage and database storage?

Database storage is Azure SQL Database. File storage is Azure Blob storage. Azure Blob storage is simpler and much less expensive.

How much storage do we get for Azure Blob storage?

That information is in the [licensing guide](#). Currently, you get 40 gigabytes (GB) of storage.

What is the cost for additional storage?

The cost for additional storage varies, but it's similar to the [standard Azure costs for storage](#). In other words, the cost is about \$0.05 per GB.

How can we learn how much storage we've already used?

There will be proactive communications when you're approaching your database and file storage limits. However, Microsoft Dynamics Lifecycle Services (LCS) provides some information, and you can log support requests for additional information.

Is there an option to export all document attachments from the system?

Although attachments can be exported, that capability isn't a standard capability, because there isn't a standard attachment entity. Entities that provide attachments for a specific business document or record must be built.

How can attachments be extracted from the system?

To extract attachments, an Attachments entity must be built for a specific business document or record. There isn't a standard attachment entity because the identity for each record type is different. To learn how to build an Attachments entity, you can find examples in the Application explorer by searching for "Attachment" under the AOT > Data Model > Data Entities node.

How does the document preview work for attachments stored in SharePoint?

The files are retrieved from SharePoint using the current user permissions by the WOPI service. Those files are then rendered in HTML to provide a document preview. This means that the current user needs access to the

files to be able to preview them or open them.

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Configure and send email

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The behavior of the email subsystem is influenced by a combination of administrator configuration, user configuration, and user choices. This topic is divided into sections for administrators and users to make it easy to find relevant information.

Both administrators and users set the behavior of the email subsystem.

[Administrator] Email parameters page

Configuration tab

On the **Email parameters** page, note the following settings on the **Configuration** tab.

FIELD	DESCRIPTION
Batch email provider	Specifies which email provider will be used to send emails that are sent by processes in a batch or non-interactive manner. The Exchange provider will use the account associated with the batch process.
Attachment size limit	Specifies the maximum size of a single email that can be sent via the email subsystem.

In Platform update 32, an **Email history** page was added to allow administrators to review all sent emails, including any errors that might have prevented an email from being sent. By default, the last 30 days of email history is retained. This can be configured by changing the **Number of days to retain email history** to a non-zero amount. Zero provides the default amount and behavior.

In version 10.0.16/Platform 40, an **Email throttling** section is visible, if your environment has enabled the **Email throttling** feature in Feature management. This feature allows non-interactive email providers (such as the batch email provider) to adhere to a per-minute sending limit. This can prevent errors from the system attempting to send more emails than the provider allows. The sending limits for Microsoft 365 email providers are set automatically according to [Exchange Online sending limits](#). Manual configuration is required for all other email providers. The per-minute sending limit can be removed from a provider by resetting the **per-minute email sending limit** field to 0.

SMTP settings tab

On the **Email parameters** page, note the following settings on the **SMTP settings** tab.

FIELD	DESCRIPTION
Outgoing mail server	The host name of the desired SMTP server. <ul style="list-style-type: none">For Microsoft 365 production (including *.onmicrosoft.com accounts) use smtp.office365.com. (You can find this setting at outlook.office.com at Settings > Mail > POP and IMAP.)For Outlook/Hotmail use smtp-mail.outlook.com.
SMTP port number	Typically, the port number should be set to 587 for secure transport.

FIELD	DESCRIPTION
User name and Password	Specify, as needed, to send the email via the appropriate mail account. All users need to provide the SMTP account Send As and Send On Behalf Of permissions to enable the ability to send Simple Mail Transfer Protocol (SMTP) mail. You can configure Send As permissions in the Microsoft 365 admin center (portal.office.com/Admin), at Users > Active users > User > Edit mailbox permissions > Send email from this mailbox . For more information, see Enable sending email from another user's mailbox in Microsoft 365 .
Specify if SSL is required	Determines whether secure transport is used. Typically, this is Yes , except for internal or troubleshooting scenarios.

[Administrator] Email distributor batch process

Email that is sent directly from the server, without user interaction, via SMTP is sent by the **Email distributor batch** process. That batch process must be started to process the email queue. To start the process, open the **Email distributor batch** pane (**System administration > Periodic tasks > Email processing > Batch**) and turn on **Batch processing**.

If the Exchange provider is used, then the user account associated with the batch process (usually admin) will be sender.

[Administrator] User email

The default **send from** address for each user is pulled from the **Email** field on the **Users** page (**System administration > Users > Users**). Administrators can override this **send from** default if needed using the **Sender email** field on the **Options** page.

[User] Email provider selection section on the Options page

The **Options** page can be opened via **Settings > User options**. The **Email provider selection** section is on the **Account** tab.

FIELD	DESCRIPTION
Email provider ID	Allows the user to select the email provider that should be used when sending an email. Selecting an option here is the equivalent of selecting Do not ask again in the How would you like to send email dialog box. Selecting the blank option Prompt for which email provider to use will cause the How would you like to send email dialog box to display when an email is going to be sent.

FIELD	DESCRIPTION
Sender email	<p>Allows the administrator to provide an email address override for the user in the From field of the email. By default, the email alias that is associated with the user account is used as the From field in new emails, but this user option email address will override that. When sending email via SMTP, the user needs to have appropriate Send As and Send On Behalf Of permissions configured in Exchange or on the SMTP server.</p> <div style="border: 1px solid #ccc; padding: 5px; margin-top: 10px;"> <p>[!NOTE] You can configure Send As and Send On Behalf Of permissions in the Microsoft 365 admin center (portal.office.com/Admin) at Users > Active users > User > Edit mailbox permissions > Send email from this mailbox. For more information, see Enable sending email from another user's mailbox in Microsoft 365.</p> </div>

[User] How would you like to send email dialog box (optional)

When an email is going to be sent, the user will see the **How would you like to send email** dialog box that will list the available options for sending email.

FIELD	DESCRIPTION
Use an email app, such as Outlook	Provides the user with a generated email (.eml) file.
Use Exchange email server	Uses the Exchange Online server associated with the tenant. On-premises Exchange servers are currently not supported for the Exchange mail provider.
Use the system email client	Opens the Send email composition dialog box and then sends the resulting email via SMTP.
Do not ask again	If this field is not selected, the next time an email is sent the most recently selected option will be used and the dialog box will not open.

[User] Send email dialog box (optional)

The **Send email** dialog box is opened to allow the user to edit the contents of the email that will be sent. Some of the following fields will be pre-populated in this window.

FIELD	DESCRIPTION
From	Populated from the Email field on the Options page.
To, Cc, Bcc, Subject, and Body	Populated with values specified by the process that initiated the sending of the email. These fields can be edited as needed by the user.
Attachments list	May be populated with attachments specified by the process that initiated the sending of the email. This list can be edited as needed by the user.

When the email is ready to be sent, the **Send** button will cause the email to be sent via SMTP.

Usage scenarios to verify if email is configured correctly

Send mail via a local mail client

Email workflows that are enabled via the SysEmail framework can generate email messages (.eml files) that contain attachments. You can then send these messages via Microsoft Outlook or another email client.

1. In Internet Explorer, navigate to **Accounts receivable > Customers > All customers**.
2. Select **US-008 Sparrow Retail**.
3. Click **Collect > Customer balances > Collections** to open the **Collections** page.
4. Click **Communicate > Email > Statements to contact**.
5. Click **OK** to accept the default values in the dialog box.
6. If you're prompted for the mail option to use, clear the **Do not ask again** check box (you can change this option from the **User options** page), select **Use an email app, such as Outlook**, and then click **OK**.
7. If you're using Internet Explorer on your computer, open the email (.eml) file that is generated. If you're using Internet Explorer on the VM, copy the file to your computer, and open it there.
8. Note the email address in the **To** field and the generated workbook attachment.

Send mail via SMTP

Email workflows that are enabled via the SysEmail framework can also be created in a simple email dialog box and then sent via Simple Mail Transfer Protocol (SMTP).

1. Go to the **Email parameters** page.
2. Click **SMTP settings**.
3. Set the **Outgoing mail server** to the desired SMTP server:
 - For **Microsoft 365 production** (including *.onmicrosoft.com accounts) use smtp.office365.com. (Find this setting via outlook.office.com, at **Settings > Mail > POP and IMAP**.)
 - For Outlook/Hotmail use smtp-mail.outlook.com.
4. Set the user name and password to an appropriate email account and password.
5. Leave **SSLRequired** turned on, and leave **SMTP port number** set to **587**.
6. Click **Save**.
7. In Internet Explorer, navigate to **Accounts receivable > Customers > All customers**.
8. Select **US-008 Sparrow Retail**.
9. Click **Collect > Customer balances > Collections** to open the **Collections** page.
10. Click **Communicate > Email > Statements to contact**.
11. Click **OK** to accept the default values in the dialog box.
12. If you're prompted for the mail option to use, select **Use the Microsoft Dynamics 365 for Finance and Operations email client**, and then click **OK**.
13. To receive the test message, change the **To address** to your email address.

Ensure that the account specified in the SMTP settings is able to **Send As** and **Send On Behalf Of** your email account. The easiest way to ensure this is to use your email account in the SMTP settings.
14. Enter a subject and body for the message.

15. Click **Send**. The message should be delivered in one to five minutes.

[Administrator] Workflow email notifications

Workflow email configuration is a collection of related settings that work in conjunction.

Workflow email notification setup

1. Verify email settings:
 - a. Go to **System administration > Setup > Email > Email parameters**.
 - b. Verify that SMTP is enabled.
 - c. Set the SMTP mail server settings.
2. Verify that the email batch process is running:
 - a. Go to **System administration > Periodic tasks > Email processing > Email distributor batch**.
 - b. Enable the **Batch processing** option.
 - c. Optionally, adjust the recurrence of the email process:
 - a. Select **No end date** to adjust all recurrences of the email batch process.
 - b. Adjust the count.
 - c. Adjust to run every minute if needed.
3. Verify workflow notification system email templates:
 - a. Go to **System administration > Setup > Email > System email templates** (for system-wide templates).
 - b. Verify that the **Sender email** field is set and valid.
4. Verify workflow notification organization email templates:
 - a. Go to **Organization administration > Setup > Organization email templates** (for organization-specific templates).
 - b. Verify that the **Sender email** field is set and valid.
5. Verify that the user can receive email notifications:
 - a. Go to **Settings > User options**.
 - b. Go to the **Account** tab.
 - a. Set the **Email provider ID** (for example, SMTP).
 - b. Optionally, set a **Sender email** override if the default **send from** address should not be used for the current user.
 - c. Navigate to the **Workflow** tab. Set the option to send notifications in email to **Yes**.
6. Verify that the workflow system will send email notifications:

For each workflow that should have a notification, open the workflow properties in the workflow editor.

 - a. Click **Basic settings**. Adjust the email template for the workflow notifications.
 - b. Click **Notifications**.
 - a. Enable the events for which a user should be notified.
 - b. Set the recipient of the workflow notification for each event notification that is enabled.
 - c. On a workflow approval element for which a user should be notified:

- a. Go to **Properties**.
- b. Enable the events for which a user should be notified.
- c. Set the recipient of the workflow notification for each event notification that is enabled.

Workflow email notification testing

The testing for email notifications is to simply trigger the notification and then check for it.

1. Submit a workflow that has been set up for email notifications.
2. Check the workflow history to make sure that a workflow work item was assigned to the expected user.
3. Check the status of the pending email notification in **System administration > Periodic tasks > Email processing > Batch email sending status**.

If the email fails to send, make sure that the SMTP mail account can be opened.

4. Check for the email notification in the appropriate inbox.

Troubleshoot email

There are a few standard steps that can help you troubleshoot the configuration of email settings.

1. Verify email settings:
 - a. Go to **System administration > Setup > Email > Email parameters**.
 - b. Verify that SMTP is enabled.
 - c. Verify the settings of the SMTP mail server.
 - d. Sign in to the SMTP account in a separate window to make sure that the account and password are correct.
 - e. Send a test email using **System administration > Setup > Email > Email parameters > Test email**.
2. Verify that the email batch process is running:
 - a. Go to **System administration > Periodic tasks > Email processing > Batch**.
 - b. Make sure that the **Batch processing** option is set to **Yes**.
 - c. Review the recurrence of the email process:
 - a. Select **No end date** to adjust all recurrences of the email batch process.
 - b. Adjust the count as you require.
3. To review the contents and status of batch emails, go to **System administration > Periodic tasks > Email processing > Batch email sending status**.
 - a. If you're using a release that is earlier than Platform update 28, personalize the form to add the email sender for easy review. To do this, right-click the grid header, select **Add columns**, select **Email**, and then click **Insert**. If the **Email** field isn't added into the grid, you can view the sender by selecting **Show message**, and then selecting the **Email** field.
 - b. Verify that emails are being sent from the correct account. If the account is incorrect, you need to adjust settings such as user options, system templates, or organization templates, as needed.
 - c. Verify that all email user accounts have been granted permission to **Send As** for the configured SMTP account (see step 4 for details).
4. In Platform update 32, an **Email history** page was added to allow administrators to review all sent emails, including any errors that might have prevented an email from being sent. The **Email history** page will show interactive as well as non-interactive/batch emails. For any emails that have an **Email status** of **Failed**, review the error message on the **Failure details** tab and determine if corrective

actions should be taken.

5. In the Microsoft 365 admin center, verify that all user mail accounts that will be used to send emails have **Send As** and **Send On Behalf Of** permissions for the configured SMTP account. For more information, see [Enable sending email from another user's mailbox in Microsoft 365](#).
6. Sign in to all user mailboxes to verify that they are valid and can be accessed using sign in.
7. Send a test email using **System administration > Setup > Email > Email parameters > Test email**.
8. If the SMTP settings were migrated from another environment, clear the password field and re-enter the password to ensure that the field encryption hasn't negatively affected the stored value.
9. If you continue to experience issues when email is sent via SMTP, enter the SMTP account information in a tool such as [SMTPer.net](#) to verify that the SMTP server and account are valid and working correctly.

Troubleshoot the Exchange mail provider

The **Email parameters** page allows an administrator to select Exchange as an interactive email provider and as the Batch email provider. The Exchange mail provider will use the current user's Exchange Online account to send emails. When used as the Batch email provider, the batch account will be used. No additional configuration is needed. If troubleshooting is needed, ensure that the current user's account can be signed into and that emails can be sent from that account to the intended recipients.

Exchange mail provider not supported for external users

Users that are external to the primary tenant will not have exchange accounts on that tenant, so the Exchange mail provider is not supported for external users.

Other notes

The system communicates with Exchange or an SMTP server like a typical email client, so standard behavior and limits apply. For example, standard [Exchange Online receiving and sending limits](#) apply.

Troubleshooting

Where do workflow email templates come from?

The email templates will be sourced from either system email templates or organization email templates depending on whether the workflow is a system-level (not company specific) or organization-level (company specific) workflow.

Additional resources

[Troubleshoot the Office integration](#)

[Office integration tutorial](#)

[Configure email functionality in Microsoft Dynamics AX \[AX 2012\]](#)

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Date/time data and time zones

2/18/2021 • 2 minutes to read • [Edit Online](#)

This article provides information about date and time fields, and time zones.

Date and time fields

There are three types of date and time fields that correspond to different data types in the database:

- **Combined date/time fields** – These fields are the preferred method of entering date and time data. The **utcdatetime** data type stores time and date data in a single field in Coordinated Universal Time (UTC). UTC is the primary time standard by which the world regulates clocks and time. It is, within about 1 second, mean solar time at 0° longitude; it does not observe daylight saving time. Time zones around the world are expressed using positive or negative offsets from UTC. For most purposes, UTC is considered interchangeable with Greenwich Mean Time (GMT). The current version of UTC is defined by International Telecommunications Union Recommendation (ITU-R TF.460-6).
- **Date fields** – These fields are used to enter dates only. The **date** data type stores a day, month, and year. However, these values are not stored in UTC and cannot be associated with a time zone.
- **Time fields** – These fields are used to display the number of seconds that have elapsed since midnight on the current date. The **timeofday** data type stores an integer value. Time values are not stored in UTC.

Time zones

To express UTC times in the local time, you must provide a time zone. The time zone controls the offset from UTC that is the equivalent of the local time. For example, the offset for Moscow is UTC+3. Your preferred time zone is first set according to the Windows locale of your computer, although it might have been changed by an administrator. Your preferred time zone is used only when displaying combined dates and times. To set the preferred time zone for a user, go to **Users** page. The page will show the list of users of the system. Select the user that you want to set the preferred time zone for, and click **User options**. On the **Language and region** tab, select the preferred time zone.

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Procurement and sourcing overview

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This article gives an overview of the functionality that's available in the Procurement and sourcing module.

Procurement and sourcing covers all the steps from identifying a need for product and services through procuring the product, receipt, invoicing, and processing of payment with vendors. Procurement processes can be configured toward specific business needs by defining purchasing policies and workflows.

Identifying a need for product and services

The need for products or services may arise from *requisitions*, for example, when an employee requires a product. *Product catalogs* can be set up to guide the selection of available products to select from, or requests can be made for products that are not yet made available in a catalog, allowing the purchasing department to consider how the product can be supplied.

Spending limits can be used to constrain requisition spending, and the *purchasing workflow* adds the option of requiring approval before ordering happens. It's also possible to specify budget fund allocation, if required.

The procurement department identifies suppliers for required products and services, and this can involve a *request for quotation* being sent out to multiple potential suppliers. It's possible to share the specifications of the product that's being requested and potential vendors can view these to see if they can deliver a product that conforms with them. Vendors return their bids which are then reviewed by the procurement department before they select the supplier that they want to procure from.

Purchase orders include an option to send out a *purchase inquiry* to the vendor as an alternative to a more comprehensive request for quotation process. The purchase inquiry can be used to help establish terms like prices, discounts, and delivery date for the order. If vendors are set up to use the **Vendor** portal, purchase inquiry functionality is disabled. Instead the order is shared on the **Vendor** portal, and when a *confirmation request* is sent the vendor can directly confirm the order.

Vendor catalogs can be used to collect information on the product assortment that vendors can supply. Vendors can publish their own catalog, so it's easier to keep the catalog up to date. It's possible to attach an *approved vendor list* to a product, and this can help guide vendor selection when new purchase orders are opened, and prevent the use of unintended vendors.

Procurement

Purchase orders can be created in a number of different ways including:

- As an outcome of master planning which has identified a demand that requires a purchase. This process generates planned purchase orders, and when these are released, purchase orders are generated.
- Through the processing of purchase requisitions that result in procurement.
- Through the processing of purchase agreements, where purchase orders are created as released orders from the agreements. This is commonly used when purchase agreements are used to represent blanket orders.
- Manually, when the purchase order that's created is not based on another document.

Purchase orders that are configured with *purchase approval workflows* require approval before they are recorded as approved, and this is required before the order can be processed further.

Purchase orders are *confirmed* to represent that an agreement has been established with the vendor. The purchase order will then gradually progress through different states until ultimately being invoiced or canceled.

When you create a purchase order, many of the fields are pre-populated with values that default from the information stored about the vendor in the **Vendors** page. This means that there are a limited number of fields that you need to fill in on the purchase order, although you can choose to override the default values.

Prices and discounts

Prices and discounts includes information about the prices, discounts, and rebate terms that they offer. Prices and discounts can be represented as *trade agreements*. Trade agreements represent vendor price lists with prices or discounts, and have a specific set of dates for which the agreement is valid. Prices and discounts can be negotiated and represented through *purchase agreements* with conditions like commitments to buy certain volumes or monetary amounts as a precondition for the negotiated terms. *Rebate agreements* can be created with vendors where the procurement of specific products or groups of products may trigger a rebate from the vendor depending on the purchase amount or volume.

Delivery options

There are different options for the delivery process associated with a purchase order. Ordered products can be split into *delivery* schedules, where parts of the ordered quantity can be planned for delivery on different dates. Delivery can also include *direct delivery* initiated from a sales order, which automates the generation of the packing slip on the sales order at the same time as the product receipt is recorded on the purchase order. Purchase orders can also be part an *intercompany order* chain, also referred to as intercompany purchase orders, where products are ordered from a matching intercompany sales order. In this situation, some steps are automated across the two related intercompany orders.

Supplementary items

Products can be set up to include *supplementary items*. This is to propose products that are related to the product that's being ordered. The additional products may be required, or may be optional. In some cases, supplementary items may be added as free products that accompany the purchase of other products.

Purchase order charges

Charges can be assigned to the purchase order. This can happen automatically through setup of automatic charges or by adding the charges manually. Charges can be assigned to the order at the header level, or at the order line level. Accounting of charges can be set up in different ways. For example, you can set up a charge to be accounted as a product cost. If you do this, the charges must be assigned at the order line level before the order can be confirmed. There is an option that can help allocate charges from the order header to the lines.

Product receipt and invoicing

Purchase orders that include physical products commonly require *arrival registration* to happen within a warehouse, and after this a *product receipt* is registered for the order. Purchase orders with products that fulfill requisitions may be configured so that the employee who has requested the products also needs to provide a *confirmation of receipt*.

Some purchase orders include products that are services or other non-physical products where receipt in a warehouse is not needed. Products can be created as services or *procurement categories* can be used directly on the purchase order for such orders. With these orders, accounting of product receipt is sometimes skipped and the order is invoiced directly, or alternatively product receipt registration is done on the purchase order without any prior arrival registration.

Receipt of products may result in automatic consumption for a specific purpose. This includes implied consumption with direct delivery, consumption towards a project, or accounting the product as a fixed asset.

When *vendor invoices* arrive from the vendor they may first be recorded in the *invoice register* independent of the purchase order, and then later approved as a record against the purchase order. Recording the vendor invoice with the purchase order includes matching of the product receipt toward the invoice.

Accounting distributions can be specified on the purchase order to describe how accounting should be done

within the ledger, and can also define how budget fund allocation is obtained when this is included in your configuration.

Invoiced purchase orders will record the liability into the vendor account within accounts payable, from where the *vendor payment* can be processed.

Vendor performance

Performance and review of purchasing is supported through *procurement and account payable reports*, which include spend analysis and vendor performance analysis.

NOTE

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Procurement and sourcing workflows

2/18/2021 • 2 minutes to read • [Edit Online](#)

Some organizations require that purchase requisitions and purchase orders are approved by a user other than the person who entered the transaction. To set up an approval process, you can create a workflow.

A workflow represents a business process. It defines how a document flows through the system and indicates who must complete a task or approve a document. There are several benefits of using the workflow system in your organization:

- **Consistent processes** — You can define the approval process for specific documents, such as purchase requisitions and expense reports. Using the workflow system helps to ensure that documents are processed and approved in a consistent and efficient manner.
- **Process visibility** — You can track the status, history, and performance metrics of a specific workflow instance. This helps you determine whether changes should be made to the workflow to improve efficiency.
- **Centralized work list** — Users can view a centralized work list to view the workflow tasks and approvals assigned to them across all workflows they participate in. This is available in the Work items page.

The types of workflows that you can create

The following workflow types are available for Procurement and sourcing.

TYPE	USE THIS TYPE TO
Purchase requisition review	Create review and approval workflows for purchase requisitions.
Purchase requisition line review	Create review and approval workflows for purchase requisition lines.
Purchase order workflow	Create review and approval workflows for purchase orders.
Purchase order line workflow	Create review and approve workflows for purchase order lines.
Vendor add application workflow	Create review and approval workflows for adding new vendors via vendor requests.

IMPORTANT

When you are adding a new workflow, you might also see the following obsolete workflows listed in the **Create workflow** dialog box. These are related to the *confirmation of receipt* functionality that was available in [Dynamics AX 2012](#), but which has now been deprecated. These workflows are currently unsupported.

- Delivery due date notification workflow
- Invoice received notification workflow
- Product receipt failed notification workflow
- Unconfirmed product receipt rejection notification workflow

Creating a workflow

To create a workflow, go to Procurement and sourcing > Setup > Procurement and sourcing workflows and create a new workflow by selecting the type of workflow you want to create.

In the workflow canvas you can drag workflow elements into the designer and link the elements into a flow. The workflow elements should be configured. For approval and task workflow elements you can configure which participant should take action.

Types of participants

You can assign an approval step to the following groups of participants.

USER GROUP	DESCRIPTION
Participant	Assign the approval step to members of a group or role.
Hierarchy	Assign the approval step to users in a specific organizational hierarchy.
Workflow user	Assign the approval step to users of this workflow.
Queue	Assign the approval step to a work item queue.
User	Assign the approval step to specific users.

Additional resources

- [Defining business process workflows for purchase requisitions](#)
- [Purchase requisition workflow](#)
- [Onboard vendors](#)

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Troubleshoot procurement and sourcing workflows

2/18/2021 • 2 minutes to read • [Edit Online](#)

This topic describes how to fix issues that you might encounter while you work with procurement and sourcing workflows.

Error when re-submitting a purchase order to the workflow after a change: "Changes to purchase order X are allowed only in a Draft state when change management is activated"

This issue occurs only if the purchase order was in a *Confirmed* state before you requested changes. If you request changes while the purchase order is in an *Approved* state, the workflow can be processed successfully.

Error description

The following error occurs in the workflow when a purchase order is resubmitted after a change:

```
Stopped (error): X++ Exception: Changes to purchase order PO0000569 are only allowed in state Draft when change management is activated at  
SysWorkflowParticipantProvider-resolve  
SysWorkflowParticipantProvider-resolveParticipants  
SysWorkflowServiceProvider-resolveParticipant  
SysWorkflowQueue-resume
```

Issue resolution

This issue can occur because of inconsistency in purchase order distributions.

To unblock this issue and reset the purchase order to a *Draft* state, go to **Procurement and sourcing > Periodic tasks > Clean up > Purchase order distribution reset**. For more information, see the following blog post: [Resolve PO distribution errors in Dynamics 365 Supply Chain Management](#).

The issue will be fixed through [this Microsoft Knowledge Base \(KB\) article](#).

One or more accounting distributions are either over-distributed or under-distributed.

This issue can occur because of inconsistency in purchase order distributions.

To unblock this issue and reset the purchase order to a *Draft* state, go to **Procurement and sourcing > Periodic tasks > Clean up > Purchase order distribution reset**. For more information, see the following blog post: [Resolve PO distribution errors in Dynamics 365 Supply Chain Management](#).

If a delivery remainder is canceled on a purchase order where change management is turned on, the purchase order goes to a *Confirmed* state.

Issue description

For a purchase order that is subject to change management, if the only change that is requested is the cancellation of a delivery remainder on one or more of the lines, the purchase order will go directly to a *Confirmed* state when it's approved, and no journal will be created.

Issue resolution

Cancellation of a delivery remainder doesn't affect the contents of the confirmation journal. This functionality should be used when the line has been partially received, and the remainder quality should be canceled in the process step after the purchase order has been confirmed with the vendor.

If this should be reflected on the purchase order confirmation, the quantity should be adjusted on the purchase order line so that the confirmation will be required. Alternatively, if nothing has been received on the line, the quantity can be removed. In this case, reconfirmation will be required.

Canceled purchase orders appear in the draft list in the Purchase order preparation workspace.

Issue description

After you cancel purchase orders that were in a *Confirmed* state, the canceled purchase orders still appear in the list of draft purchase orders in the **Purchase order preparation** workspace.

Issue resolution

This issue occurs only for purchase orders that are subject to change management. It occurs because the cancellation is considered a change that must be approved. The approval can be done automatically by the system. Therefore, the process is to submit the canceled purchase order to the approval workflow so that it can go to an *Approved* state. At that point, the purchase order will no longer appear in the list of draft purchase orders in the **Purchase order preparation** workspace.

NOTE

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Procurement catalogs overview

2/18/2021 • 4 minutes to read • [Edit Online](#)

This article describes, at a high level, how purchasing professionals can set up and maintain procurement catalogs. Procurement catalogs define the items and services that company employees can order for internal use.

Purchasing professionals can create and maintain catalogs of the items and services that can be purchased for internal use in an organization. After catalogs are set up, company employees can create purchase requisitions to order from them. The catalogs can be used to enforce purchasing policies, so that employees can order only the items and services that are allowed for their buying legal entity. When you create a procurement catalog, you should consider the following tasks:

- Configure your procurement category hierarchy before you create the catalog.
- Determine which products you want your employees to be able to order. You can show or hide specific products in a catalog node, or you can show or hide all the products in a node.
- Determine how many procurement catalogs you require. Access to a procurement catalog is determined by the catalog policy rule that you configure for the legal entity and operating unit that an employee is assigned to.

Several factors determine the products that employees can order and the procurement categories that they can use when they create purchase requisitions:

- The category access policy rule in the purchasing policy determines which procurement categories are available in the purchase requisition. If no rule is defined, all procurement categories are available.
- Employees can order a product only if it's in the active procurement catalog for your organization, and if it's in an enabled node and not hidden. The product must also be in a category that a particular employee has access to according to the category access policy rule.
- The catalog policy rule specifies the catalog that is used. If no catalog policy rule is defined, the category access rule alone determines the products that an employee can order on the requisition.

Prerequisites

The following table describes the tasks that must be completed before a purchasing professional can create a procurement catalog.

TASK	ROLE	DESCRIPTION
------	------	-------------

TASK	ROLE	DESCRIPTION
Set up a procurement category hierarchy.	Purchasing manager	Procurement category hierarchies classify items or transactions for reporting and analysis. By using a procurement category hierarchy, companies can strategically manage categories, products, vendors, and other procurement factors from a central location. One procurement category hierarchy is defined for a whole organization. The catalog is based on the procurement category hierarchy: the categories in the hierarchy become nodes in the catalog. The vendors and products are included in your catalog.
Add vendors and products to procurement categories.	Purchasing manager	When the procurement category hierarchy is created for your organization, each procurement category can be associated with specific vendors, products, and so on. These associations are copied automatically to the catalog.

Setting up a catalog

After the prerequisites have been met, you can set up catalogs. You can create either one catalog that your whole organization uses or multiple catalogs that the various divisions in your organization use. If you create one catalog for the whole organization, access to the catalog is controlled by your purchasing policy rules.

The catalog defines which products are available when purchase requisitions are created, but you can use category access policies rules to apply additional restrictions. Because the nodes in a catalog are procurement categories, they can be suppressed by a category access policy rule. In this case, the products in that category are not available for employees to use on requisitions. You define category access policy rules on the **Purchasing policies** page. The following table describes the tasks that must be completed to set up a catalog.

TASK	ROLE	DESCRIPTION
Create a new catalog.	Purchasing agent	When you create a catalog, you specify a name and description for the catalog. You also define whether the catalog is updated manually or automatically, and specify the catalog owner.
Control whether products are available in the catalog.	Purchasing agent	Because the products are inherited from the procurement categories, they all appear in the appropriate catalog nodes. You can control whether all products in a node are hidden or shown when the catalog is used in a purchase requisition. You can also control whether individual products in a node are hidden or shown.

TASK	ROLE	DESCRIPTION
Publish the catalog.	Purchasing agent	Before a catalog is available for employees to use in a requisition, you must define a catalog policy rule for the catalog, set the catalog's status to Active , and publish the catalog. You can inactivate catalogs that you no longer want to be available to your users.

Updates are published either automatically or manually, depending on the option that you select for the catalog in the **Default update type** field on the **Catalogs** page. The following default update types are available for catalogs:

- **Dynamic** – The catalog is automatically updated whenever it's changed.
- **Static** – The catalogs must be manually updated.
- **Both** – If the catalog includes product categories that have a default update type of **Static**, it must be manually updated when these categories are updated. If the catalog includes product categories that have a default update type of **Dynamic**, it is automatically updated whenever it's changed.

Additional resources

[Set up a procurement category hierarchy](#)

NOTE

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Create a procurement catalog

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This topic explains how to create a procurement catalog. This task would typically be carried out by a procurement professional. You will also learn how employees can use the catalog when they create a requisition. Before you can create a catalog, there must be a procurement category hierarchy in your system. The hierarchy is inherited by the new catalog, along with all the products that are in the hierarchy. You can use this guide in demo data company USMF where the procurement category hierarchy is available, as well as the examples used in the procedure steps.

Ensure that a procurement category hierarchy exists

1. Go to **navigation pane > Modules > Procurement and sourcing > Procurement categories**. A procurement category hierarchy is available in the USMF demo data company and products have been added to the **Office machines/Computers** category. If you're running this procedure as a task guide, you'll need to unlock the guide if you want to browse through the category. If a hierarchy was not available, you'd create it by clicking **New**. This can only be done once.
2. Close the page.

Create a catalog

1. Go to **navigation pane > Modules > Procurement and sourcing > Catalogs > Procurement catalogs**.
2. Select **New procurement catalog** to open the drop dialog.
3. In the **Name** field, type a value.
4. Select **OK**.
5. In the tree, expand **CORP PROCUREMENT CATEGORIES**.
6. In the tree, expand **OFFICE MACHINES**.
7. In the tree, select **Computers**.
 - The products from the procurement category are displayed in the list. If you want to add a product to the category you need to do this on the **Procurement category hierarchy** page or on the **Item details** page.
 - The **Default** update type determines whether new products that have been added to the procurement category hierarchy are immediately visible in the catalog. If the update type is set to **Dynamic**, changes are visible immediately. If the update type is **Static**, new products are only visible to people using the catalog after the catalog has been re-published. The **Publish** action is available on the Action Pane at the top of the page. If products are removed from the procurement category hierarchy, the change is immediately visible, regardless of the value in the **Default** update type field.
8. On the Action Pane, select **Category navigation** and ensure that **Enable** is selected.
9. Select **Activate catalog**.
10. Close the page.

Make the catalog visible

1. Go to **navigation pane > Modules > Procurement and sourcing > Setup > Policies > Purchasing policies**.
2. Select **Procurement Policy USMF**. You need to select the purchasing policy for the legal entity that the

worker connected to your user profile is allowed to order products in. In the USMF demo data, the Admin user is connected to the worker called **Julia Funderburk**, and she orders products in USMF by default.

3. Select the catalog that you've just created.
4. Select **OK**.

Use the catalog

1. Go to navigation pane > **Modules > Procurement and sourcing > Purchase requisitions > All purchase requisitions**.
2. Select **New**.
3. In the **Name** field, type a value.
4. Select **OK**.
5. Select **Add products**.
6. In the list, find and select the desired record. You can use the category hierarchy on the left or the filter at the top of the list to filter the products.
7. Select **Add to lines**.
8. Select **OK**.

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Set up a procurement category hierarchy

2/18/2021 • 2 minutes to read • [Edit Online](#)

This procedure shows you how to create new nodes in a procurement category hierarchy and how to configure a procurement category to be used in a procurement process. These tasks would typically be carried out by a Purchasing manager. Before you can start this procedure, there must be a category hierarchy of type Procurement. If you're using a demo data company, you can run this procedure in the USMF company.

Add a new procurement category

1. Go to **Navigation pane > Modules > Procurement and sourcing > Consignment > Procurement categories**.
2. On the Action Pane, select **Edit category hierarchy**. The current procurement category hierarchy is displayed in the left side of the page. You are about to modify the hierarchy.
3. On the Action Pane, select **New category node**. The system selects the top node by default. If you are running this procedure as a task guide, you can click the Unlock button and select another parent node to insert your new node into. Once that is done, lock the task guide again and then click New category node.
4. In the **Name** field, type a value.
5. In the **Description** field, type a value.
6. In the **Friendly name** field, type a value. The friendly name is optional. It will be displayed in category lookups together with the category name.
7. Select **Save**.

Add products to your new procurement category

1. Go to **Procurement and sourcing > Consignment > Procurement categories**. Select the node you just added. If you're running this procedure as a task guide you might need to unlock the task guide to select the node.
2. Toggle the expansion of the **Products** section.
3. Select **Add** to associate products with the procurement category.
4. Select the products you want to add to the procurement category.
5. Select the arrow to add the products to the **Selected** table.
6. Select **OK**.

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Purchase requisition overview

2/18/2021 • 10 minutes to read • [Edit Online](#)

This topic describes the purchase requisition workflow and the different statuses that a purchase requisition can have.

Depending on the setup of your organization, you can create purchase requisitions for products that your organization uses. A purchase requisition is an internal document that authorizes the Purchasing department to buy items or services.

After a purchase requisition is approved, it can be used to generate a purchase order. Purchase orders are the external documents that the Purchasing department submits to vendors.

Creating purchase requisitions

You can create a purchase requisition on the **My purchase requisitions** page, and select the items and services that you require. You can select items from a procurement catalog that your organization has created, or you can request items that aren't found in a catalog by selecting a procurement category and entering the product details.

Before you can submit a purchase requisition for review, workflows must be configured. You use a workflow to move a purchase requisition through the review process, from an initial status of **Draft** to a final status of **Approved**.

Purchase requisition statuses

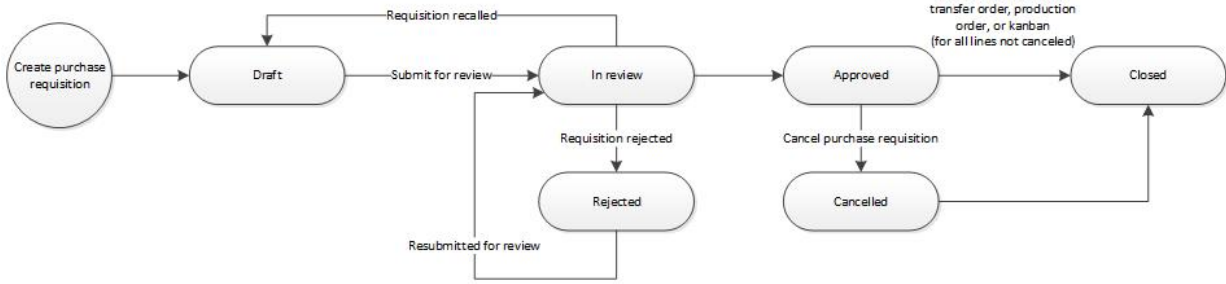
When you create a purchase requisition, a status is assigned to it. A status is also assigned to every line that you add to a purchase requisition. When you submit a purchase requisition to a workflow for review, the status of the purchase requisition and the status of each line are updated as the lines move through the workflow process.

You can configure the purchase requisition workflow process to route a purchase requisition through the review process as a single document. Alternatively, the lines on a purchase requisition can be routed individually to the appropriate reviewers. If the purchase requisition lines are reviewed individually, the status of each purchase requisition line can be updated as the line moves through the review process. When all lines have completed the review process and no review steps remain for the purchase requisition, the status of the whole purchase requisition is updated.

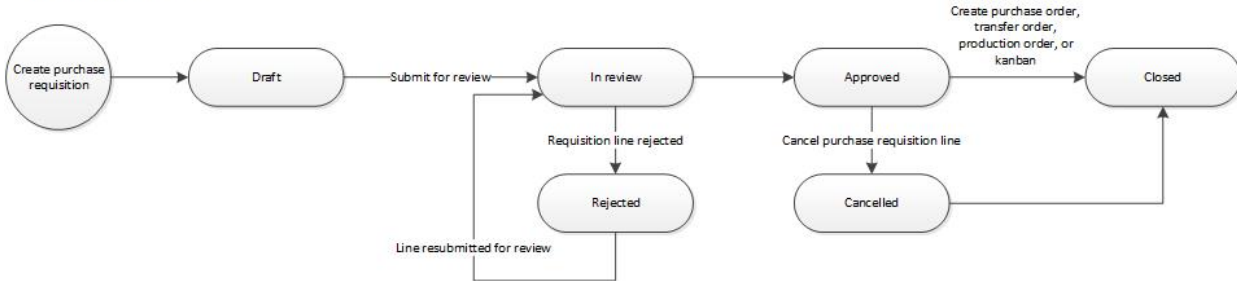
Purchase requisition workflow

The following diagram shows the statuses that are assigned to a purchase requisition and a purchase requisition line as they move through the workflow process.

Purchase requisition header statuses



Purchase requisition line statuses



Purchase requisition header and line status relationships

The overall status of a purchase requisition is determined by the status of the purchase requisition lines. Therefore, the review process must be completed for all purchase requisition lines before the review process for the whole purchase requisition can be completed. The following table describes the statuses that are assigned to a purchase requisition header and lines as the purchase requisition moves through the workflow process.

PURCHASE REQUISITION STATUS	PURCHASE REQUISITION LINE STATUS	DESCRIPTION
Draft	Draft	The purchase requisition and purchase requisition line have been created, but they haven't been submitted for review. Purchase requisitions and purchase requisition lines that have a status of Draft can be modified. A purchase requisition or purchase requisition line also has a status of Draft if it has been recalled but hasn't been resubmitted for review. Note: You can submit or recall a purchase requisition at the document level. However, you can't submit or recall a single purchase requisition line.

PURCHASE REQUISITION STATUS	PURCHASE REQUISITION LINE STATUS	DESCRIPTION
In review	<ul style="list-style-type: none"> • In review • Rejected 	<p>If the workflow has been configured to route purchase requisition lines to individual reviewers, each line can have a status of In review or Rejected. The purchase requisition status is updated when the review process is completed for all purchase requisition lines and no review steps remain for the purchase requisition.</p> <ul style="list-style-type: none"> • In review – The purchase requisition lines have been submitted for review. When the workflow process is completed for a purchase requisition line, the status of that line remains In review until all remaining purchase requisition lines have been reviewed. • Rejected – A purchase requisition line has been rejected. Purchase requisition lines that are rejected can be modified and resubmitted. <p>If you resubmit a purchase requisition line that has been rejected, the review process starts over for all lines in the purchase requisition that are still in review.</p> <p>Note: You can recall a purchase requisition that has already been submitted. When you recall a purchase requisition, all other purchase requisition lines are also recalled. Purchase requisition lines that have been recalled can be deleted.</p>
Rejected	Rejected	The purchase requisition and all purchase requisition lines have been rejected. Purchase requisitions and purchase requisition lines that have been rejected can be resubmitted.

PURCHASE REQUISITION STATUS	PURCHASE REQUISITION LINE STATUS	DESCRIPTION
Approved	<ul style="list-style-type: none"> • Approved • Cancelled • Closed 	<p>All purchase requisition lines have completed the review process, and there are no more review steps for the purchase requisition.</p> <ul style="list-style-type: none"> • Approved – The review process for a purchase requisition line has been completed, and the line is approved. • Cancelled – The purchase requisition line was approved, but it has been canceled because it's no longer required. Only purchase requisition lines that have been approved can be canceled. • Closed – The purchase requisition line was approved, and documents have been generated, depending on the requisition purpose. <ul style="list-style-type: none"> ◦ If the requisition purpose is consumption, a purchase order has been generated for the purchase requisition line. ◦ If the requisition purpose is replenishment, one or more fulfillment documents have been generated.
Cancelled	Cancelled	<p>The purchase requisition and all purchase requisition lines have been canceled.</p> <p>Note: If you no longer require an item that is on a purchase requisition line, you must cancel the purchase requisition line if it has already been approved. Only purchase requisition lines that have been approved can be canceled. If any purchase requisition lines are in review, the purchase requisition will have a status of In review. In this case, you can recall the purchase requisition and delete the appropriate purchase requisition line.</p>

PURCHASE REQUISITION STATUS	PURCHASE REQUISITION LINE STATUS	DESCRIPTION
Closed	<ul style="list-style-type: none"> • Closed • Cancelled 	<p>The purchase requisition is closed, and one or more fulfillment documents have been generated.</p> <ul style="list-style-type: none"> • Closed – The purchase requisition line was approved, and documents have been generated, depending on the requisition purpose. <ul style="list-style-type: none"> ◦ If the requisition purpose is consumption, a purchase order has been generated for the purchase requisition line. ◦ If the requisition purpose is replenishment, one or more fulfillment documents have been generated. • Cancelled – The purchase requisition line was approved, but it has been canceled because it's no longer required. Only purchase requisition lines that have been approved can be canceled. <p>Note: If you no longer require an item on a purchase requisition line that has been closed, you must cancel the line on the fulfillment document that was generated for the purchase requisition line.</p>

Distributing costs to multiple financial accounts

You can distribute the cost of a product that is included in a purchase requisition to multiple financial accounts. If your organization uses dimensions, such as cost centers and departments, you can distribute the cost of a product to dimensions for financial accounts.

Requisition purposes

Requisition purposes make the process of fulfilling requisition demand more flexible. When you create a requisition, you can assign one of two purposes to it: consumption or replenishment. Depending on the requisition purpose and the setup of your organization, requisition demand can be fulfilled by a purchase order, transfer order, production order, or kanban.

In the procurement policies, you can control the requisition purposes that are available when a requisition is created for your organization.

Requisitions that have a purpose of consumption

A requisition that has a purpose of consumption represents demand for items or services that will be used internally by your organization. The demand that is created by this kind of requisition is always fulfilled by a purchase order. If Supply Chain Management is set up to automatically generate purchase orders, purchase orders are created after the purchase requisition is approved.

Requisitions that have a purpose of replenishment

A requisition that has a purpose of replenishment represents demand to replenish inventory. For example, you create a requisition to replenish items so that they can be sold at a specific retail location at a specific time. The demand that is created by this kind of requisition can be fulfilled by a purchase order, transfer order, production order, or kanban.

When the requisition purpose is replenishment, demand is expressed as a quantity instead of a monetary amount. Therefore, encumbrance accounting, budgetary control, business rules for fixed asset determination (BRAD), project accounting, and any related rules don't apply. Only products that are stocked and released to the specified legal entity can fulfill replenishment requisition demand. To define the products that are available when the requisition purpose is replenishment, use the **Replenishment category access policy rule** page.

To use purchase requisitions that have a purpose of replenishment, you must set up master scheduling to include requisition demand. The fulfillment method for the demand that is created by this kind of requisition is then determined automatically, based on the supply policies that have been set up for the items in your organization and planned by using master scheduling.

Purchase requisitions and requests for quotation

In some cases, you must start a request for quotation (RFQ) process to identify the vendor and price for products that are requested in a purchase requisition. An RFQ can be generated when the purchase requisition is in review. When you accept a bid, information about the vendor, price, and so on, is transferred to the requisition.

You can put a purchase requisition on hold by selecting the **On hold** check box on the **Purchase requisition details** page. Processing of the purchase requisition can continue only after you remove the hold by clearing the check box.

NOTE

In e-procurement, the RFQ for your purchase requisition might allow vendors to add alternate lines. In this case, your purchase requisition will reflect approved alternates.

Demand consolidation

By consolidating purchase requisition lines from multiple purchase requisitions, you can increase your negotiating power with your vendors to achieve better pricing, lower shipping and handling costs, and reduced overhead costs.

Purchase requisition lines are eligible for demand consolidation only if the following statements are true:

- The purchase requisition has been approved.
- The purchase requisition meets the purchasing policy rule criteria for manual processing and demand consolidation.

Approved purchase requisition lines that meet the criteria for manual processing are listed on the **Release approved purchase requisitions** page. If a purchase requisition line also meets the criteria for demand consolidation, the line can be added to a consolidation opportunity.

A consolidation opportunity is a set of purchase requisition lines that are grouped together, so that the purchasing professional can negotiate the best deal with vendors. Purchase requisition lines that you select for a consolidation opportunity appear on the **Purchase requisition consolidation** page. You can modify the lines on this page, if changes are required. You can also add new lines to the consolidation opportunity or remove existing lines.

After you add requisition lines to a consolidation opportunity and make any changes that you require, you can create a purchase order for the consolidated purchase requisition lines.

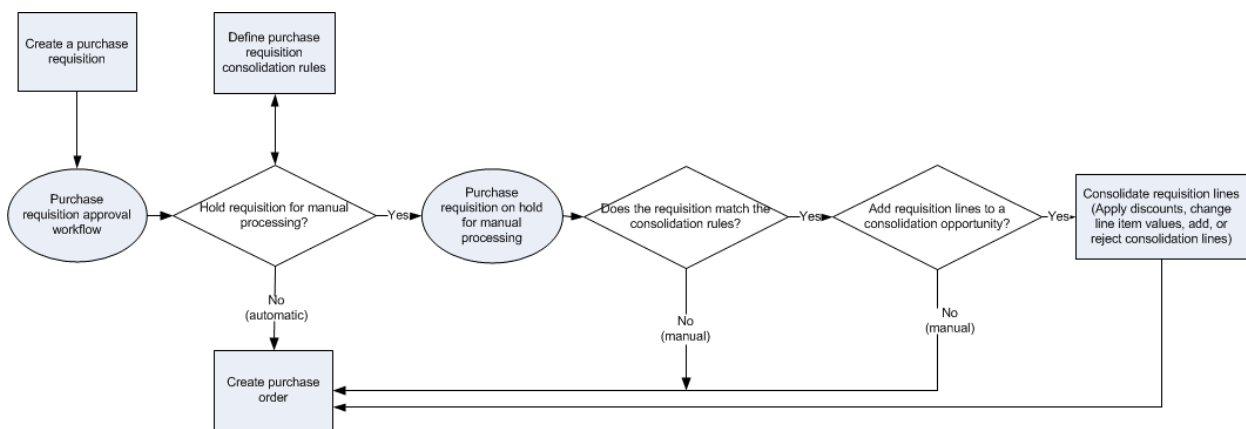
NOTE

Changes that you make to a purchase requisition line on the **Purchase requisition consolidation** page are reflected on the purchase order that you create. However, the line remains unchanged in the purchase requisition, so that its history is preserved.

To create a purchase order for purchase requisition lines that aren't eligible for demand consolidation or aren't selected for a consolidation opportunity, you must process the lines manually.

Consolidating purchase requisition lines

The process for demand consolidation starts when a purchase requisition is approved in a workflow and, if budget control is configured for your organization, when the budget reservations and pre-encumbrances have been recorded. The following diagram shows the process flow for demand consolidation.



To consolidate approved purchase requisition lines, follow these steps:

1. Review approved requisition lines that have been held for manual processing, and that are eligible for demand consolidation.
2. Select lines to add to a consolidation opportunity.
3. Create a new consolidation opportunity, or add requisition lines to an existing consolidation opportunity.
4. Make any required changes to the requisition lines, and remove requisition line items that you no longer want to include in the consolidation opportunity.
5. Create purchase orders for consolidated requisition lines or for purchase requisition lines in a consolidation opportunity.

Additional resources

[Create a requisition for consumption](#)

[Purchase requisition workflow](#)

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Purchase requisition workflow

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The workflow process moves purchase requisitions through the review process, from an initial status of Draft to a final status of Approved. When a purchase requisition is submitted for review, the workflow process is started. After a purchase requisition is approved, a purchase order can be generated for the purchase requisition lines and submitted to the vendor for order fulfillment.

Before a purchase requisition can be submitted for review, you must configure a workflow. The workflow process can include one or more review steps, in any order. The workflow process can also be configured to skip the review tasks and automatically approve the purchase requisition. You can configure the workflow to route the purchase requisition as a single document, or you can route individual purchase requisition lines to the appropriate reviewers. You can also create a scenario where the purchase requisition is routed as a single document to some reviewers and selected purchase requisition lines are routed to other reviewers.

If purchase requisition lines are reviewed individually, the review process must be completed for all purchase requisition lines before the workflow process can move to the next step, and before the review process for the purchase requisition as a whole can be completed. When the review process has been completed for the purchase requisition and all its lines, the overall status of the purchase requisition is updated to **Approved**.

You can configure your workflow to represent the business process for purchase requisitions in your organization. When you configure your purchase requisition workflow process, consider the following questions:

- What expenditures must be reviewed?
- What expenditures can be automatically approved?
- Who is required to review and approve expenditure requests? What role are these users assigned to?
- What process must be followed if a reviewer is not available?

The following examples illustrate two ways that you can configure a workflow for purchase requisitions.

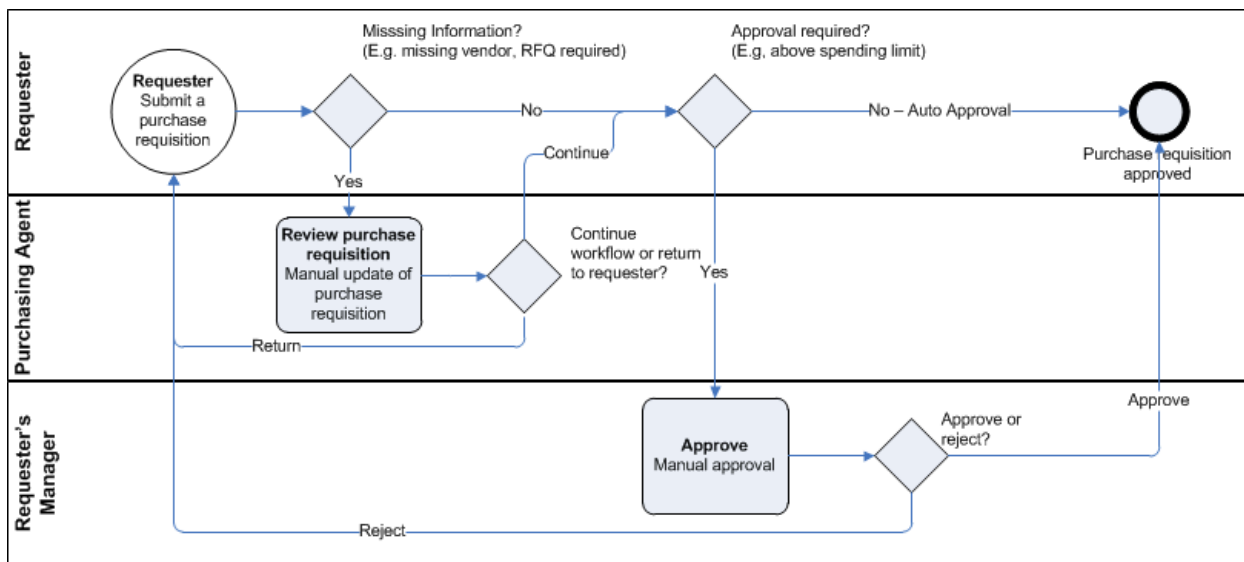
Example 1: Route a purchase requisition as a single document for review

The following illustration shows how a purchase requisition can flow through the workflow review process as a single document. The lines on the purchase requisition aren't routed individually. The following roles are included in the workflow process for this example:

- **Requester** – The user who requests the items or services. The requester can prepare the purchase requisition, or another worker can prepare the purchase requisition on the requester's behalf. This worker is the preparer. The preparer is responsible for managing the purchase requisition throughout the review process. Only the preparer of the purchase requisition can modify it.

Note: A worker must be granted the appropriate permissions to create a purchase requisition on behalf of someone else. Use the **Purchase requisition permission** page to set up these permissions.

- **Purchasing agent** – The user who performs a procurement review and can approve the document.
- **The requester's manager** – The user who performs a managerial review and can approve the document.



In this example, the workflow process for the purchase requisition includes the following steps:

1. The preparer submits a purchase requisition for review.
2. The purchasing agent receives a notification. The notification requests that the purchasing agent verify the information in the purchase requisition. If required information is missing, the purchasing agent can either add it or return the purchase requisition to the preparer to add it. When all the required information has been filled in, the purchase requisition can move to the next step in the review process.
3. The requester's manager reviews the purchase requisition. The purchase requisition might be routed to the requester's manager if, for example, the amount of the purchase requisition exceeds the requester's spending limit for purchase requisitions. The requester's manager can approve or reject the purchase requisition, or return it to the preparer for changes.

Example 2: Route the individual purchase requisition lines for review

The following illustration shows how the individual purchase requisition lines can be routed through a workflow. In general, the process for each line is the same as the process for a purchase requisition that is reviewed as a single document. However, each line must complete the workflow process individually before the workflow can be completed for the whole purchase requisition.

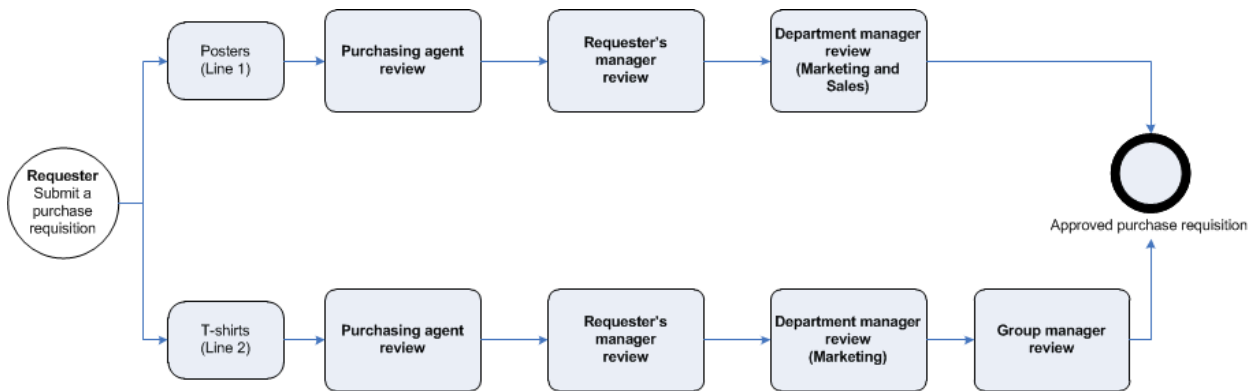
In this example, a worker enters a request for posters and T-shirts for a marketing campaign. The cost of the posters is split between the Marketing department and the Sales department. If the cost of the posters or T-shirts exceeds the signing limit authority for department managers, the purchase requisition must also be reviewed by the group manager.

The following roles are included in the workflow process for this example:

- **Requester** – The user who requests the items or services. The requester can prepare the purchase requisition, or another worker can prepare the purchase requisition on the requester's behalf. This worker is the preparer. The preparer is responsible for managing the purchase requisition throughout the review process. Only the preparer of the purchase requisition can modify it.

Note: A worker must be granted the appropriate permissions to create a purchase requisition on behalf of someone else. Use the **Purchase requisition permission** page to set up these permissions.

- **Purchasing agent** – The user who performs a procurement review and can approve the document.
- **The requester's manager** – The user who performs a managerial review and can approve the document.
- **Department manager** – The user who performs an expenditure review and can approve the document.
- **Group manager** – The user who performs a signature authority review and can approve the document.



In this example, the workflow process for the purchase requisition lines includes the following steps:

1. The preparer submits a purchase requisition for review. Each line is routed to the reviewer who is configured to receive it in the workflow process.
2. The purchasing agent receives a notification. The notification requests that the purchasing agent verify the information in the purchase requisition and on the purchase requisition lines. When the purchase requisition is opened by the purchasing agent all the lines are visible, but a visual indicator shows which lines have been sent to the purchasing agent for review. If required information is missing, the purchasing agent can either add it or return a purchase requisition line to the preparer to add it. When all the required information has been filled in, the purchase requisition line can move to the next step in the review process. Purchase requisition lines can continue through the review process independently of each other.
3. The requester's line manager reviews and approves the purchase requisition lines. The approval might be routed to the requester's manager if, for example, the amount on a purchase requisition line exceeds the requester's spending limit for purchase requisition lines. The manager can approve or reject one or both of the purchase requisition lines.
4. The department manager for the Marketing department reviews the purchase requisition lines for both the posters and the T-shirts. The Sales department manager reviews the purchase requisition line only for the posters, because that is the only cost that is being charged to the Sales department.
5. The group manager reviews and approves the purchase requisition line for the T-shirts only if group manager approval is required because, for example, the amount on the purchase requisition line exceeds the department manager's approval limit. The group manager does not have to approve the purchase requisition line for the posters.

NOTE

The system currency must be set if the header workflow for a purchase requisition requires approvals related to signing limits.

Configuring a workflow for purchase requisitions

To route a purchase requisition for review, you must configure the purchase requisition workflow processes. The workflow process that you define controls the interaction between the user who requested the items (the requester) and the reviewer and approver in the workflow. The routing of the purchase requisition depends on the conditions that are specified in the workflow configuration. For example, these conditions determine when the purchase requisition should be routed, the user or role that it should be routed to, and the actions that users can take.

The examples in this topic show how a purchase requisition can be routed through a workflow as a single document or as individual purchase requisition lines. You can also configure a workflow for purchase requisitions that reflects the internal control review of purchase requisitions that is defined for your organization.

The participants or the reviewers that a task is assigned to in a workflow can be members of a particular user

group, users who have a particular security role, users who are associated with the submitter in a managerial hierarchy, or named users or users who have specific expenditure responsibilities.

Purchase requisition expenditure reviewers

Expenditure reviewer configurations let you dynamically route expenditures for review, based on the user who is assigned to a project role or a financial dimension where the expenditure is being charged. The workflow process uses the specified project role or financial dimension owner to determine who the expenditure should be routed to.

You can define one or more expenditure reviewer configurations and then select a configuration when you create a workflow. You can configure the expenditure reviewer values for every legal entity in your organization. After you define the expenditure reviewer configurations, you assign a configuration to your workflow task.

You don't have to define expenditure reviewer configurations. Instead, you can assign specific users or user groups as reviewers when you define your workflow. However, if you have a complex organization, expenditure reviewers can increase the efficiency of your approval process. In addition, if you set up expenditure reviewers, you don't have to update workflow reviewer assignments every time that a reviewer changes job roles.

You can set up the expenditure reviewers on the **Purchase requisition expenditure reviewers** page. Create an expenditure reviewer configuration, and enter values for each legal entity in your organization. For requisitions that are assigned to a project, you can specify the role that is responsible for reviewing the requisitions: Project manager, Project controller, or Project sales manager. Expenditures will be routed to the user who is assigned to the specified role. You can also route the expenditure to the financial dimension owner by selecting the appropriate financial dimension option on the **Organization distributions** tab.

To use one of the expenditure reviewers that you set up in a workflow, you must set the **Type of participant** option to **Expenditure participants** in the **Assignment** properties for the relevant workflow element.

Additional resources

[Create a requisition for consumption](#)

[Defining business process workflows for purchase requisitions](#)

[Procurement and sourcing workflows](#)

[Purchase requisition overview](#)

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Requests for quotation (RFQs) overview

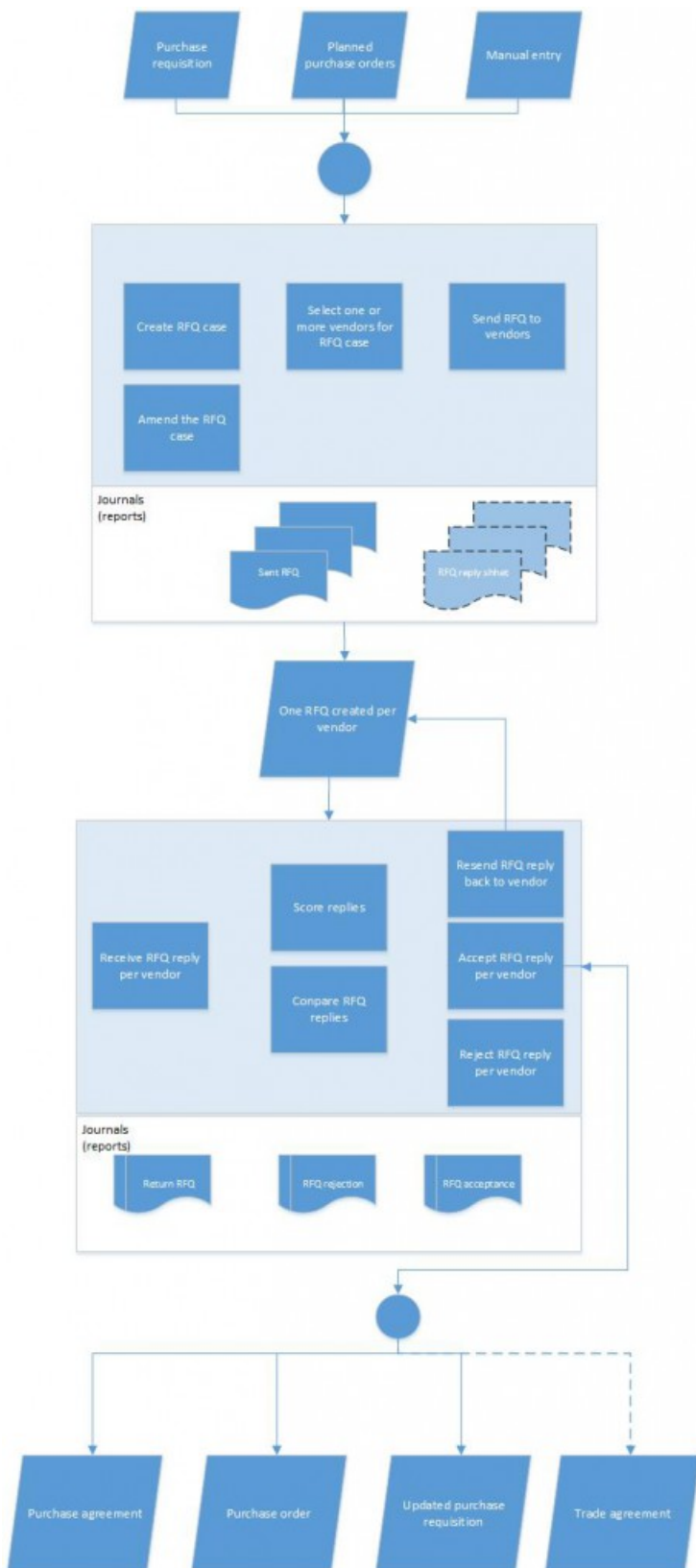
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This topic provides an overview of requests for quotation (RFQs). Organizations issue RFQs when they want to receive competitive offers from several vendors for the items or services that they must purchase. In an RFQ, you ask vendors to provide the prices and delivery times for the item quantities that you specify. You can also ask vendors to specify whether there are any incidental charges, such as shipping costs, or any discounts for large orders or early payment of the vendor invoice.

The RFQ process consists of the following tasks:

1. Create and send an RFQ to one or more vendors.
2. Receive and register bids (RFQ replies).
3. Transfer bids that you accept to a purchase order, purchase agreement, or purchase requisition.

The following illustration shows an overview of the RFQ process.



You can create an RFQ case from planned orders, from a purchase requisition, or by manual entry. The RFQ case is the base document that you use to issue an RFQ to each vendor.

After you prepare the RFQ case and add vendors, select **Send** (**Send and publish** for public sector) on the RFQ case. An RFQ journal is generated for each vendor that you sent the RFQ to. You can configure the Printing options for the Send action so that it either prints a report for each vendor to an archive or sends a report to each vendor's email address. In addition, you can use the RFQ journal for each vendor to generate a report that you can send or resend to the vendor later. You can also configure the Send action so that it generates a reply sheet that the vendor can fill in.

This topic covers the process for handling RFQs when vendor collaboration isn't used. If your system is set up

for vendor collaboration, vendors can enter bids directly in Supply Chain Management. For more information, see [Vendor collaboration with customers](#) and [Vendor collaboration with external vendors](#).

If you must amend an RFQ after you send it, you can resend the RFQ to vendors when you've finished by using the two amendment actions: Create and Finalize.

When you receive bids by email, you can handle these bids from the **Request for quotations** page.

If a second iteration of a reply from a vendor is required, select **Return** on the **Request for quotation** page. The Return action generates a new journal and a report that will be printed, archived, and sent according to your Printing settings.

If you added scoring criteria to your RFQ case, the RFQ will have a scoring panel where you can enter the scores. The total scores will appear on the RFQ and when you compare the replies on the **Compare replies** page. On the **Compare replies** page, you can also compare other reply data, such as the line price, delivery date, and total price.

After you choose a bid or a number of lines in a bid, you can accept all or some lines and reject the rest. Acceptance journals, rejection journals, and corresponding reports are generated, and will be printed, archived, and sent according to your Printing settings. When you accept a bid or specific lines in a bid, either a purchase agreement or a purchase order is generated, or a purchase requisition is updated, depending on the purchase type of the RFQ. You can create a trade agreement that you can use later for any of the replies, regardless of whether you accepted or rejected them.

An RFQ case has two statuses: lowest and highest, you can view the status on the list page for **All request for quotations**. The lowest status is the least advanced stage of any line in the RFQ case, and the highest status is the most advanced stage of any line in the RFQ case. For example, say that an RFQ case with three lines is sent to two vendors, so there are two RFQs each with three lines. All lines are **Sent**. Now a bid is entered from one of the vendors and the RFQ lines get the status **Received**. This means that out of the three lines on the RFQ case, all of them are **Sent** for one RFQ and **Received** for another RFQ. The lowest status will then be **Sent**, and the highest status is **Received**.

These statuses will be described in more detail later in this topic.

Setting up RFQ functionality

Before you can create an RFQ case, you must set up RFQ information on the **Procurement and sourcing parameters** page. When you create an RFQ case, you can specify default values that are copied to the RFQ. You can specify the following default values:

- The purchase type of new RFQs: **Purchase order** or **Purchase agreement**
- The expiration date and time offset from the day the RFQ case is created.
- Solicitation type, which may default a specific scoring method to the RFQ case.
- Delivery information and payment terms.

You can override these values for a specific RFQ case.

You should also configure the amendment process. As part of this configuration, you can turn on field locking. When field locking is turned on, a procurement professional who wants to amend an RFQ must first select **Create** in the **Amendment** section of the **Quotation** tab on the RFQ case. Then, after the RFQ case has been updated with the amendment, the procurement professional must complete the process by selecting **Finalize**. The Finalize action generates an email that notifies the vendors about the amended RFQ.

On the **Procurement and sourcing parameters** page, you select the template to use for the email notification that is sent to vendors. When a template is created in **Email templates**, it can contain the following replacement tokens:

- %RFQ case%
- %Reason for bid return%
- %Reason for amendment%
- %Amendment prepared by%
- %Company%
- %RFQ case name%
- %Expiry Date Time%
- %Date%

The %Reason for bid return% and %Reason for amendment% tokens are replaced by text that the procurement professional can enter when he or she completes the amendment in the **Amendment** wizard. The values for the %Amendment prepared by% and %Company% tokens are automatically taken from the RFQ. The %Date% token is replaced by the current date.

If you want to cancel an RFQ after it's been sent, you can do that from the RFQ case. For the cancellation, an email template is required to send the cancellation notification to the vendor's contact persons. The template must be selected on the **Procurement and sourcing parameters** page. When the template is created, it can contain the following replacements tokens:

- %Reason for cancellation%
- %RFQ case%
- %RFQ cancelled by%
- %Company%
- %RFQ case name%
- %Date%

The %Reason for cancellation% token is replaced by text that the procurement professional can enter in the **Cancellation** wizard. The %Date% token is replaced by the current date.

If you want to use reason codes on a bid to indicate why it was rejected or accepted, you must set up reason codes on the **Vendor reasons** page.

On the **Form setup** page in Procurement and sourcing, you can configure the appearance of your printed or stored RFQ documents.

NOTE

For a public-sector configuration, you must use the amendment process to change an RFQ that has already been sent. When an RFQ is sent, fields are locked. Therefore, to make changes to the RFQ, you must select **Create** to start the amendment process, as described earlier. The locking behavior is controlled by the **Lock RFQ when they are sent** option on the **Procurement and sourcing parameters** page. By default, this parameter is set to **Yes**, and for a public-sector configuration, the default setting can't be changed. Therefore, although the amendment process can be handled manually in a non-public-sector configuration, it must be used for a public-sector configuration.

When you create an RFQ case of the type Purchase order and add an inventory item to the RFQ, an inventory transaction is generated that has a receipt status of **Quotation receipt**. Only RFQ case lines that have this status are considered when you use a master plan to calculate supplies. If you want the master plan to include RFQ case lines as an expected receipt, you must configure this behavior in the setup of master planning.

A purchasing manager or agent can create and maintain solicitation types to suit the organization's procurement requirements. Each solicitation type can be associated with a scoring method. Scoring methods consist of a set of criteria that can be used when you score bids. You must set up solicitation types, scoring methods, and scoring criteria on the **Solicitation type** and **Scoring method** pages.

Choose default fields to include in vendor RFQ reply forms

You can specify specific types of information that you want to receive from vendors when they reply to (bid on) a request for quotation (RFQ). Fields that you mark as default are included on the online form provided for vendor collaboration. To make these settings:

1. If you haven't already done so, use the [Feature management](#) page to enable the *Select RFQ fields to include in vendor RFQ reply forms* feature.
2. Go to **Procurement and sourcing > Setup > Procurement and sourcing parameters**.
3. Open the **Request for quotation** tab.
4. Select the **Default requests for quotation** reply fields link under the **Set up default values for requests for quotations** heading.
5. The **Default request for quotation reply fields** dialog box opens.
6. The **RFQ fields included in vendor RFQ reply forms** section includes a slider for each field that is available for use in RFQ reply forms. Fields set to *Yes* in this section will be included (together with their values) in RFQ reply forms. Set the slider to *No* for each field where you want to prevent vendors from seeing data when reviewing bids. This allows you to enter estimated or expected values during RFQ entry for internal purposes without the vendor seeing what has been entered.

You can override these settings for individual RFQ cases as needed.

Creating and sending an RFQ

You create an RFQ case, select the vendors that you want to bid on the RFQ case, and then send RFQs to the vendors. You can use Printing settings to route the RFQ report and reply sheet reports to your preferred destination.

You can manually create an RFQ case of either the **Purchase order** purchase type or the **Purchase agreement** purchase type.

If the RFQ case is of the **Purchase order** type, the following behavior occurs that deviates from other types of RFQ cases:

- When RFQ case lines are created, inventory transactions are generated that have a receipt status of **Quotation receipt**.
- When you accept a bid, a purchase order is generated.

If the RFQ is of the **Purchase agreement** type, the following behavior occurs that deviates from other RFQ cases:

- The RFQ case is used for an agreement to purchase a specific quantity or value of product over time. You must select the date range that applies to the purchase agreement and the name of the person who manages the purchase agreement.
- When you accept a bid, a purchase agreement is generated.

If the RFQ case is generated from a purchase requisition, the **Purchase requisition** type is automatically assigned. You can't manually create an RFQ case of the **Purchase requisition** type.

You can create an RFQ case from a purchase requisition only if the status of the purchase requisition is **In review** and you're assigned to do the next workflow task. The lines in the purchase requisition are automatically updated as you accept lines from bids (RFQ replies) that you received from vendors. You can't complete, reject, approve, or perform any other actions on the purchase requisition until the requisition line is updated with an accepted RFQ line or the RFQ case is cancelled.

When you create an RFQ case, you can select a solicitation type. The solicitation type determines the set of scoring criteria that is used to score RFQ replies to the RFQ case.

You can add a questionnaire to an RFQ case. This questionnaire then appears on all RFQ replies after you send the RFQ. The completion of the questionnaire is a mandatory task before the bid can be submitted.

Although defaults are provided, you can change the **RFQ fields included in vendor RFQ reply forms** settings for each individual RFQ case as needed. To do so, create or open an RFQ case. Then, on the Action Pane, open the **Quotation** tab and, from the **Replies** section, select **Set RFQ reply defaults**. The **Default request for quotation reply fields** dialog box opens, which works the same as it does when setting the defaults for vendor RFQ reply forms, except your changes here will only affect the current RFQ case. For details about how to enable this functionality and how it works, see [Choose default fields to include in vendor RFQ reply forms](#).

There are three ways to select the vendors to add to an RFQ case:

- Add the vendors one by one.
- Search for all vendors that meet specific criteria.
- Automatically add all vendors that are approved for the procurement categories that are used on the RFQ case lines.

When the RFQ case is ready, select **Send**. The Send action generates journals and reports that will be printed, archived, and sent according to your printing settings.

If you set **Use vendor for recalculating prices** and **Use vendor specific item information** to **Yes** on the **Sending request for quotation** page when you sent the RFQ to a vendor, some vendor-specific information is automatically entered in the RFQ for that vendor.

Amending an RFQ case

Occasionally, you must change an RFQ case after you send it. You might have to change an RFQ case if, for example, the delivery dates have changed, or you want additional products or different quantities of products. You can configure the amendment process so that it's either more restrictive or less restrictive.

If you configure the amendment process so that it's more restrictive, before you can modify the fields on an RFQ case that has already been sent, you must select **Create** on the RFQ case to start an amendment. After you've completed your changes, you must select **Finalize**. You're then guided through the process of adding information for the email that is sent to notify vendors about the amendment. The updated RFQ report, which includes an amendment note, is automatically attached to the email.

If you configure the amendment process so that it's less restrictive, you don't have to select **Create** before you can modify the fields on an RFQ case that has already been sent. However, you must manually add an amendment note on the RFQ and send the case again. Be aware that this approach can be used only if none of the replies (bids) have been edited. If you've entered a reply and it's in a **Received** state, the **Send** button is unavailable. In this case, you must select **Create** and then **Finalize**, as you must do in the more restrictive process. The reply is then reset to reflect the changes to the RFQ case.

If vendors use the vendor collaboration interface to enter bids, you must always use the amendment process to notify vendors about changes to the RFQ case. This process helps prevent the situation where vendors bid on an outdated RFQ case while their bid is in progress. For more information about vendor collaboration, see [Vendor collaboration with external vendors](#).

If you want to invite additional vendors to bid, and no changes have been made to the RFQ case, you can use the **Send** button. The vendors that you added will appear on the **Send** page and will receive the email invitation.

Receiving and registering RFQ replies

When you send an RFQ, a reply sheet is automatically generated. As you receive bids on an RFQ, you must enter them via the **Request for quotation** page by clicking the action **Edit RFQ reply**. This will allow you to enter the bid information in a dedicated bid form. Initially, the **Reply progress** will be **Not started**. When you click

Edit RFQ reply, the progress status is **Purchaser is updating** until the bid is submitted. Click **Submit** when you have entered the bid information. The Reply progress status will change to **Submitted by purchaser**. Similarly, with vendor collaboration enabled, the **Reply progress** will update as the vendor interacts with the bid. The status then changes from **Vendor is updating** to **Submitted by vendor**. When the bid is submitted, a journal is created as **Received**. The reply (bid) has to be submitted in order to be registered as received, and only then it can be further processed as accepted or rejected.

If you need to update the bid, you should go through the same process as above and submit again.

Note that editing the **Request for quotation** form is only allowed for information that relates to processing the bid, not for entering the bid. To enter or modify the bid, click **Edit RFQ reply**.

When you enter the bid information, and if the RFQ case allows for alternate lines, you can add alternate lines for lines that only have a procurement category and no catalog item specified,. Click **Add alternate** to add alternate lines.

If you've entered a reply but require a new offer from the vendor, you can return the RFQ. A new journal and a report are generated, that can be sent to the vendor.

You can see an overview of all RFQs and their statuses: **Sent, Received, Accepted, Rejected, Cancelled, Declined** on the **Request for quotation follow-up** page.

Accepting and rejecting bids, and transferring accepted bids to downstream documents

After you've identified the best bid, such as the bid that offers the best total price, you accept the bid. You can accept some lines in a bid and reject others. You can also accept lines from different vendors. Be aware that if you accept some lines, you're prompted to reject all the other lines. Therefore, if you want to accept other lines, you must select **Cancel** when you're prompted. The status of the RFQ reply for each vendor that you accept bids or lines from is updated to **Accepted**.

If you, while you prepare the purchase order or purchase agreement, need to add an additional line to the RFQ, you can do so by clicking **Add line** on the **Request for quotation** page line grid. You can only view and edit this line in **Request for quotation** page. It will be visible on the bid page when it is accepted.

When you accept a bid or one or more lines in a bid, a purchase order or a purchase agreement is automatically generated. You can then reject the bids from all the other vendors.

On the reply, you can add a reason code to explain why you accepted or rejected a bid.

When you accept a bid of the **Purchase requisition** type, the purchase requisition lines will be updated with the following information that reflects the information of the accepted bid:

- Unit price
- Discount percentage
- Discount amount
- Purchase charges
- Line charges
- Vendor
- External number
- External description

The following table shows how the RFQ status changes as you accept and reject bids from vendors.

Statuses – highest and lowest

On the Vendor tab of the RFQ case, you can see the lines with the highest and the lowest status for a particular vendor. When the vendor is added, and no lines have yet been sent, both the lowest and the highest status is

Created. When the RFQ is sent to the vendor with all lines, the status of the two lines will be **Sent**. If some lines in a bid from a vendor are accepted and others are rejected, the rejected lines will get the lowest status which is **Rejected**, and the accepted lines will get the highest status which is **Accepted**.

On the RFQ case lines, you can see the highest and the lowest status per line across all vendors. If you have sent a line to all the vendors in the RFQ case and no one have responded yet both the lowest and the highest status is **Sent**. When at least one vendor responds, the highest state will change to **Received**. If you add a new vendor to the case, the lowest status will change to **Created**

The highest and the lowest status on the RFQ case is an aggregation of the status on the <Vendor tab and the Lines tab.

The statuses are ranked in the following way from lowest to highest: Created, Sent, Received, Rejected, Accepted, Declined, Canceled.

The following table shows how the RFQ case status changes when you create an RFQ case with lines and then send it to vendors.

ACTION	LOWEST RFQ CASE STATUS	HIGHEST RFQ CASE STATUS	LOWEST RFQ CASE LINE STATUS	HIGHEST RFQ CASE LINE STATUS
Create the RFQ case header and line.	Created	Created	Created	Created
Send RFQs to all vendors in the RFQ case.	Sent	Sent	Sent	Sent
Add another vendor.	Created	Sent	Created	Sent
Send the RFQ to the second vendor.	Sent	Sent	Sent	Sent

All the lines on the RFQ's that are related to the RFQ case will be in **Sent** state.

The following table shows how the RFQ status changes as you receive bids and register the information on the RFQ reply sheet.

ACTION	LOWEST STATUS ACROSS ALL LINES OF ALL RFQS	HIGHEST STATUS ACROSS ALL LINES OF ALL RFQS	LOWEST RFQ CASE HEADER STATUS	HIGHEST RFQ CASE HEADER STATUS	LOWEST RFQ CASE LINE STATUS	HIGHEST RFQ CASE LINE STATUS
Register one vendor's bid to an RFQ, and save it.	Sent	Received	Sent	Received	Sent	Received
Register the second vendor's bid to an RFQ, and save it.	Received	Received	Received	Received	Received	Received

In the example below you can see the highest and lowest status on the RFQ case where one bid has been received and the other bid has been accepted. When a received bid is rejected, the lowest status will change from received to rejected on the RFQ case header and line.

ACTION	LOWEST STATUS ACROSS ALL LINES OF ALL RFQS	HIGHEST STATUS ACROSS ALL LINES OF ALL RFQS	LOWEST RFQ CASE HEADER STATUS	HIGHEST RFQ CASE HEADER STATUS	LOWEST RFQ CASE LINE STATUS	HIGHEST RFQ CASE LINE STATUS
Accept one of the bids. (or at least one line)	Received	Accepted	Received	Accepted	Received	Accepted
Reject all the other bids.	Rejected	Accepted	Rejected	Accepted	Rejected	Accepted

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Create a request for quotation

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This procedure shows you how to create a request for quotation. This would typically be done by a purchasing agent. You can use this procedure in demo data company USMF or on your own data. You need to have set up solicitation types before you start. Once you've completed this task and you've created and sent an RFQ you can then enter the replies per vendor, compare them, and award the contract.

Prepare a new RFQ

1. Go to **Navigation pane > Modules > Procurement and sourcing > Requests for quotations > All requests for quotations**.
2. Click **New**. The following purchase types are available: Purchase order (this is the default): a document that confirms the offer to buy products, or the acceptance of an offer to sell products in exchange for payment. Purchase requisition: this type is automatically selected if you create an RFQ directly from a purchase requisition. If you manually select this option, you'll get an error. Purchase agreement: an agreement to purchase a specific quantity or value of product over time. If you select this option, you must select the date range that applies to the purchase agreement.
3. In the **Document title** field, type a value.
4. In the **Solicitation type** field, enter or select a value.
 - If a scoring method is associated with the solicitation type, this will be the default scoring method for the RFQ that you're creating. It is possible to change the scoring method later.
 - In the **Delivery date** field, enter a date.
 - Select the date by which you want to receive the items.
 - In the **Expiration date and time** field, enter a date and time.
 - Specify the date and time by which vendors must respond to the RFQ.
5. In the **Warehouse field**, enter or select a value. The delivery address will default to the warehouse address.
6. Click **OK**.

Add lines

After you've specified the basic information about your RFQ, you specify the goods or services that you want vendors to bid on. Item is the default line type.

1. In the **Item number** field, enter or select a value. If you're using USMF, you can select T0020.
2. In the **Quantity** field, enter a number.
3. Click **Add line**.
4. In the **Line type** field, select 'Category'. You can use the Category line type to create RFQs for non-inventory goods or services. You then need to select the type of goods or services from a hierarchy of procurement categories.
5. In the **Procurement category** field, enter or select a value.
6. In the **Product name** field, type a value.
7. In the **Quantity** field, enter a number.
8. In the **Unit** field, enter or select a value.

Add vendors

1. Click **Header** to change from the Lines view to the Header view.
2. Expand the **Vendor** section.
3. Click **Auto-add vendors**. You can add vendors to the RFQ automatically, based on the procurement category of the items requested. If there are no vendors approved for the categories included in the lines you can add vendors manually.
4. Click **Add**.
5. In the **Vendor account** field, enter or select a value.
6. Click **Add**.
7. In the **Vendor account** field, enter or select a value. Once you've selected a vendor, the status is Created. This means that the vendor information has been saved in the RFQ, but you have not sent the RFQ to the vendor. You can add a vendor to an RFQ regardless of the vendor status.

Send the RFQ to vendors

1. On the **Action Pane**, click **Send**. In the Sending request for quotation page, check that the vendors in the list are the ones that you want to receive the RFQ.
2. Click **Print**. This dialog allows you to print the RFQ. If you choose to print a reply sheet, the contents of this are defined in Procurement and Sourcing parameters. To choose how to print reply sheets, once you've opened the Print dialog, click Advanced printing options. One RFQ will be printed for each vendor containing the lines that have the status of Created or Sent. Canceled lines and lines with registered replies will not be printed.
3. Click **Cancel**.
4. Click **OK**.
5. Close the page.
6. Close the page.

View the RFQ journal

1. Go to **Procurement and sourcing > Requests for quotations > Request for quotations follow-up > Request for quotation journals**.
2. Click **Preview/Print**.
3. Click **Original preview**.
4. Close the page.
5. Close the page.

NOTE

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Create a requisition that uses an RFQ

2/18/2021 • 2 minutes to read • [Edit Online](#)

This topic explains how to add price and vendor information to a purchase requisition from an RFQ process. The example shown in this guide can be used in the USMF demo data company, and you must be logged in as an Admin to complete all the steps. The tasks in this guide would typically be done by procurement professionals.

Create a requisition

1. In the navigation pane, go to **Modules > Procurement and sourcing > Purchase requisitions > Purchase requisitions prepared by me**.
2. Select **New**.
3. In the **Name** field, type a value.
4. In the **Requested date** field, enter a date.
5. In the **Accounting date** field, enter a date.
6. Select **OK**.
7. In the **Reason** field, enter or select a value.
8. Select **Add line**.
9. In the **Procurement category** field, select a category in the tree, and then select **OK**.
10. In the **Product name** field, type a value.
11. In the **Quantity** field, enter a number.
12. In the **Unit** field, enter or select a value.
13. Select **Save**.
14. Select **Workflow** to open the drop dialog.
15. Select **Submit**.
16. Close the page.
17. Select **Submit**.

Reassign a workflow task

The next task is to create an RFQ to get bids from vendors for the product. In USMF demo data, the requisition workflow is set up with a rule so that if a vendor is not selected, or the unit price is 0 for a line, a task is assigned to a specific worker to create an RFQ. To continue with this guide, you need to re-assign that task to another user (yourself). You can only do this if you are logged in as an Admin.

1. Select **Workflow** to open the drop dialog.
2. Select **View history**.
3. Refresh the page.
4. Expand the **Tracking details** section.
5. In the tree, select the line that starts with "Line workflow activated on".
6. Select **View workflow details**.
7. Expand the **Work items** section.
8. Select **Reassign**.
9. In the **User** field, select **Admin**.
10. Select **Reassign**.
11. Close the two pages.

Create an RFQ

1. Refresh the page.
2. Select **Request for quotation**.
3. In the **Buying legal entity** field, select **USMF**. You must select the same legal entity that's on the requisition line.
4. In the list, mark the selected row. If you had multiple lines on your purchase requisition, select all the lines that you want to add to the RFQ.
5. Select **OK**.
6. Refresh the page.
7. Ensure that the FactBox is open, then expand the **Related documents** section.
8. Select the link in the **Request for quotation** field to open the RFQ that was just created.
9. Select **Header**.
10. Select **Add**.
11. In the **Vendor account** field, enter or select a value.
12. Select **Add**.
13. In the **Vendor account** field, enter or select a value.
14. Select **Send**.
15. Select **OK**.
16. Select **Enter reply**.
17. On the Action Pane, select **Reply**.
18. Select **Copy data to reply**. This copies data, such as the quantity and dates, from the RFQ to the reply.
19. In the **Unit price** field, enter a number. This is the price that you've received from the vendor. You might also want to enter additional information from the vendor.
20. Select **Accept**.
21. Select **OK**.

Verify that vendor and price have been transferred to the requisition

1. Close the page.
2. Select **Lines**.
3. Select **Related information**.
4. Select **Purchase requisition**.
5. Select the line that was transferred to the RFQ. Verify that the price and vendor have been copied to the requisition.
6. Select **Workflow** to open the drop dialog.
7. Select **Complete**.
8. Select the page.
9. Select **Complete**.

NOTE

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Create a scoring method for RFQs

2/18/2021 • 2 minutes to read • [Edit Online](#)

This procedure shows you how to create a scoring method. A scoring method is a set of criteria that can be used to compare bids that are sent in reply to a request for quotation (RFQ). For example, you might want to rate a vendor on past performance, or rate whether the company is environmentally friendly or a good collaborator, or you might want to compare bids based on price. The scoring method can be associated with a solicitation type as the default scoring method for RFQs of that type. These tasks would typically be carried out by a purchasing manager. You can use this procedure in demo data company USMF or on your own data.

1. Go to Procurement and sourcing > Setup > Request for quotation > Scoring method.
2. Click New.
3. In the Name field, type a value.
4. In the Description field, type a value.
5. Click Save.
6. Click New.
7. In the Name field, type a value.
8. In the Description field, type a value.
 - This description is shown along with the scoring method name when a scoring method is selected for an RFQ.
9. In the Range from field, enter a number.
 - The range limits what the procurement professional can enter as a score. When there are multiple scoring criteria on an RFQ, the scores that have been entered are added to each other and the sum is made available to allow the bids to be compared.
10. In the Range to field, enter a number.
11. Click New.
12. In the Name field, type a value.
13. In the Description field, type a value.
14. In the Range from field, enter a number.
15. In the Range to field, enter a number.

NOTE

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Create solicitation types and scoring criteria for RFQs

2/18/2021 • 2 minutes to read • [Edit Online](#)

This guide shows you how to create a solicitation type and associate this with a scoring method. It also shows how to use the solicitation type on a request for quotation (RFQ) which then sets the default scoring method. These tasks would typically be carried out by a purchasing manager. You can use this procedure in demo data company USMF or on your own data. You need to have a scoring method available before you start.

Create a solicitation type

1. Go to Procurement and sourcing > Setup > Request for quotation > Solicitation type.
2. Click New.
3. In the Name field, type a value.
4. In the Description field, type a value.
5. In the Scoring method field, select the scoring method that you want to use for this solicitation type.
6. Click Save.
7. Close the page.

Use the solicitation type

1. Go to Procurement and sourcing > Requests for quotations > All requests for quotations.
2. Click New.
3. In the Solicitation type field, select the solicitation type that you have just created. *
4. Click OK.
5. Click Scoring criteria.
 - The scoring criteria that are shown are the ones from the scoring method that you associated with the solicitation type. You can choose to add or delete criteria on this page. It's also possible to add new criteria by copying them from other scoring methods.
6. Click Copy criteria.
7. In the Scoring method field, enter or select a value.
8. Click OK.
9. Close the page.

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Responding to vendor questions on Request for quotations

2/18/2021 • 4 minutes to read • [Edit Online](#)

When your agency has sent a request for quotation (RFQ), vendors sometimes have questions that pertain to the request. Vendors that have questions related to an RFP can submit their questions and read the answers on **Vendor collaboration** page, when you make that page available to them. When vendor questions are accepted, **Questions and answers** is available on the **Request for quotation bid** page on **Vendor collaboration**, and for your agency through the **Request for quotation** page, **Questions and answers**.

Users can publish answers to vendor questions more than once. Vendors can't no longer post questions after a vendor is selected and the RFQ is awarded, or after the cutoff date for questions is reached.

Turn on the feature

Before you can use this feature, it must be turned on in your system. Admins can use the [feature management](#) settings to check the status of the feature and turn it on. In the **Feature management** workspace, the feature is listed in the following way:

- **Module:** *Procurement and sourcing*
- **Feature name:** *RFQ questions and answers*

Allow questions and answers to be used in RFQs

1. Go to **Procurement and sourcing > Setup > Procurement and sourcing parameters**.
2. Open the **Request for quotation** tab.
3. Set the following options as needed:
 - **Allow vendor questions:** Enables or disables vendor questions for RFQ cases. You must set this to *Yes* to use the features described in this topic.
 - **Default direct response:** When you reply to a question, you can choose to reply to all vendors who received the RFQ or to reply only to the specific vendor who submitted the question. You can make choose this option each time you reply, but this setting controls the default. If you usually reply to all vendors, set this to *No*. If you usually reply to individual vendors, set this to *Yes*.

Setting up for vendor questions

When creating a request for quotation, you determine whether vendors can ask questions about the RFQ.

1. Navigate to **Procurement and sourcing > Requests for quotations** then click **New > Request for quotation**
2. In the **New request for quotation** page, **Header** to set the **Vendor question options** fields to allow questions before a certain date.
3. Set the **Allow vendor question** option to **Yes** so the vendors can enter questions. Users can enter and answer questions and designate commonly asked questions to publish for vendors when the RFQ is sent to vendors.
4. Optional: In the **Cutoff date** field, define the final date by which questions must be submitted. If no cutoff date is entered, questions are accepted as long as the RFQ is open and accepting bids.
5. Click **Save** to save the RFQ.

6. Click **Send** to send the RFQ to the vendors for bidding.

Entering and replying to vendor questions

Vendors enter questions in the **Vendor Collaboration > Request for quotations bid page, Vendor questions** FastTab. The question is visible only to the vendor and users.

Entering a vendor question

1. In Vendor collaboration, in the **Request for quotation bid** page, click **Questions and answers**, and then click **+ Ask a question**.

NOTE

Alternately, a user can enter questions for a vendor on the **Request for quotation** page, by clicking **Manage replies**, **Edit RFQ reply** then clicking **Questions and answers**.

2. On the **Question** field, enter the question text.
3. Click the **Submit**. Repeat steps 1-3 to add a question.
4. When done, click **Save** to save your questions.

Replying to a single vendor

The question and answer are visible only to the vendor and users.

1. On the **Request for quotations** page, click the **Questions and answers** to display the **Questions and answers** page.
2. Click **Edit**.
3. Enter text in the **Answer** field to respond to the vendor's question.
4. Check the **Direct response** box.
5. Click **Save** to save your replies.
6. Click **Send answers** to send the answers to the vendor.

Replying to all vendors

If you receive the same question from multiple vendors, you can group the questions and respond with one answer. All vendors receive notification when the commonly asked questions and answers are published. The vendors and anyone with access to the request for quotation can view the summary of questions and answers.

1. On the **Request for quotations** page, click the **Questions and answers** to display the **Questions and answers** page.
2. Click **Edit**.
3. Choose a code for the common question, such as the letter 'a.'
4. For each line that asks a similar question, enter the code in the **Group code** field. For example, for each line asking about item color, enter 'a.'
5. Choose one of the lines with the code value, and enter the question and answer the way you want them to read in the summary that will be available when the questions and answers are published (**Group question**, **Group answer** fields).
6. Optional: You can mark the **Direct response** check box to send the answers only to the selected vendors.
7. Click **Save** to save your answers.
8. Optional: You can revert the questions and answers to the previously published values if you want to undo

your changes.

9. Click **Send answers** to send your answers to the vendors.

Changing RFQ to allow or disallow questions

You can make changes to allow or disallow questions to RFQs until the RFQ is awarded. You can also extend or shorten the time frame in which vendors can submit questions. For published RFQs, you must modify a request for quotation to allow or disallow vendor questions or adjust the time frame for questions.

IMPORTANT

If you amend an existing RFQ for the purpose of allowing vendor questions, the system will clear all existing responses when you resend the RFQ.

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Enter and compare RFQ bids and award contracts

2/18/2021 • 6 minutes to read • [Edit Online](#)

This topic explains how to enter replies to a request for quotation (RFQ), score and compare bids, and then award the contract to one of the vendors. You can use this procedure in the **USMF** demo data company.

Before you start this procedure, you must have an RFQ that has two lines, and that has been sent to at least two vendors. To create this RFQ, complete the [Create a request for quotation](#) procedure. Scoring criteria must also be set up before you can complete this procedure.

You can enter the bid as either a vendor or a procurement professional. For more information, see [Set up and maintain vendor collaboration](#).

Enter a reply as a vendor

1. On the dashboard, select **Vendor bidding**.
2. In the **New bid invitations** list, find an RFQ that was just sent. Select the RFQ to review what was requested.
3. Select **RFQ attachments** to review any attachments that have been added.
4. Select **Bid** to make the fields editable. Notice that the **Bid progress** field is set to **Vendor is updating**.
5. On the header and lines, enter the values from the bid reply.
6. If any attachments should be added to the bid, select **Bid attachments**.
7. Select the **Bidding guiding items** FastTab to view whether any documents are required.
8. Select the **Amendments** FastTab to view whether the RFQ has been amended.
9. Select the **Questionnaire** FastTab. Any questionnaires that appear here must be answered.
10. Select the **Line details** FastTab to view extended information about the line.
11. Select **Reset from RFQ** only if you must reset the values that have been entered to the original RFQ values.
12. You can save the bid at any time and do additional processing later, provided that the expiration date and time haven't passed. In this case, you can find the bid in the **Bids in progress** list in the **Vendor bidding** workspace.
13. When the bid is ready to be sent, select **Submit**. If you don't want to bid, select **Decline**. Submitted bids are available in the **Submitted bids** list in the **Vendor bidding** workspace.
14. After the bid is submitted, you can recall it at any time before the expiration date and time. Note that when a bid is recalled, it isn't treated as submitted. When the bid is accepted or rejected by the procurement department, it appears in either the **Awarded bids** or **Lost bids** list in the **Vendor bidding** workspace.

Enter a reply from a vendor as a procurement professional

1. Make sure that the permission to edit vendor bids is set up. Go to **Procurement and sourcing > Setup > Procurement and sourcing parameters**. On the **Request for quotations** tab, set the **Purchaser can edit vendors bid** option to **Yes**.
2. Go to **Procurement and sourcing > Requests for quotations > All requests for quotations**.
3. Select an RFQ that has a status of **Sent**, and then select the link in the **Request for quotation case** field.
4. Select **Manage replies**. The page that appears shows an RFQ for each vendor that was invited to bid.
5. Select an RFQ that hasn't been replied to. (The **Reply progress** field should be set to **Not started**.)
6. Select **Edit > Edit RFQ reply**. The **RFQ reply** page appears. As a procurement professional, you can now enter the reply on behalf of the vendor. Notice that the **Bid progress** field is set to **Purchaser is updating**.

7. Enter the bid data. When you've finished, select **Submit**.

Score the bids

1. On the **All requests for quotations** page, select the RFQ case that you want to score replies for.
2. Select **Manage replies**.
3. Select the reply to score.
4. Select **Header** so that you can view the scoring for the bid.
5. On the **Bid scoring** FastTab, enter a number in the **Score** field for one of the scoring criteria. If you hover over a scoring criterion, a tooltip shows the range that the score must be within. In this demo, you can enter a number between 1 and 5 for any of the scoring criteria.
6. Repeat step 5 for another scoring criterion.
7. If the RFQ case has a questionnaire that was sent to the vendors, you can enter the vendor responses on the **Questionnaires** FastTab.
8. Close the page.
9. Repeat steps 1 through 8 for all the other bids.

Compare the replies

1. On the Action Pane, on the **General** tab, select **Compare replies**.
2. In the **Rank** field, enter a number.
 - This page shows the bids, together with the header and line information, and also the total score at the header level. You can compare the lines by sorting the grid so that comparable lines are next to each other. The following information is also included:
 - **Quantity** – The quantity that the vendor quoted. This quantity might not equal the quantity that is specified in the RFQ.
 - **Net amount** – The price that the vendor quoted for the items on the line, minus any discounts.
 - **Deviation** – The number of days by which the delivery date on the bid header or line differs from the requested delivery date on the RFQ header or line. You can enter a rank for each bid.
3. Select the header line for the other bid that you want to rank.
4. In the **Rank** field, enter a number.
5. Select **Save**.

Reject a bid

1. Select the header line for the bid that you want to reject. You can accept, reject, or return only one bid or the lines on only one bid at a time.
2. Select the **Mark** check box.
 - If you select the **Mark** check box on the header of the bid, all the lines are also marked. To reject or accept only some of the lines on the bid, you can mark just those lines. Additionally, you can accept one vendor's bid for some lines of an RFQ and then award other RFQ lines to a different vendor. However, you must do one bid at a time.
 - If alternate lines are present, you can accept either the original bid line or its alternate, but not both.
3. Select **Reject**.
4. Select **Parameters**, and then, in the **Reason reject** field, enter or select your reason for rejecting the bid. The reason is stored in the reply.
5. Select **OK**.
6. Select **OK**.

Accept a bid

1. Select the bid to accept, and then select the link in the **Request for quotation** field. If you're on the **Compare request for quotation replies** page, the highlighted bid that has focus is the bid that the system will consider during the Accept action. You can accept lines from only one bid at a time.
2. On the Action Pane, select **Reply**.
3. Select **Accept**. If you marked only specific lines, the Accept action will include only those lines. If you want to accept all the lines on the bid, you don't have to mark the lines.
4. Select **Parameters**, and then, in the **Reason accept** field, enter or select your reason for accepting the bid. The reason is stored in the bid.
5. Select **OK**.
6. Select **OK**. When you select **OK**, a purchase order is generated based on the lines that are included in the RFQ acceptance. If there are other bids that haven't been processed (accepted, rejected, or returned), the system prompts you to reject them.

View the purchase order that is generated

On the Action Pane, on the **General** tab, select **Purchase order**. The page that appears shows the purchase order that was generated when you accepted the bid.

NOTE

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Purchase order overview

2/18/2021 • 5 minutes to read • [Edit Online](#)

This article provides general information about purchase orders (POs) and links to additional articles that are related to the various stages that a PO goes through.

A purchase order (PO) is a document that represents an agreement with a vendor to buy goods or services. The document also helps keep track of product receipts that are made toward the order and, later, the accounting of vendor invoices that the vendor bills toward the order.

The **Purchase orders** page contains an overview of the available orders and lets you modify those orders. When you open a PO, you can select the **Header** view, which contains information that is specified only one time for each PO, such as the vendor details. Alternatively, you can select the **Lines** view, where you can modify order lines. Typically, you will switch between these two views as you modify POs. Charges aren't listed directly on the **Purchase orders** page, but are accessed via menus on the order header and lines.

There are many reports where you can view information about POs, product receipts, and vendor invoices. These reports are found in the **Procurement and sourcing** and **Accounts payable** modules.

The **Purchase order preparation** and **Purchase order receipt and follow-up** workspaces let you view lists of POs in the various states that they have progressed to. They also provide a summary of the actions that must be taken. The **Purchase order preparation** workspace is focused on PO creation and review, processing of the order through approval, and confirmation with the vendor. The **Purchase order receipt and follow-up** workspace is focused on processing the receipt of goods or services against POs. It includes lists that give insight into receipts that are overdue, or that will soon be due for delivery by the supplier. These workspaces aren't used to perform the related receipt activities that are done in the warehouse. Those activities are performed by using pages in the **Inventory management** and **Warehouse management** modules. Processing of vendor invoices should be done by using the **Vendor invoice entry** workspace, and payments should be done by using the **Vendor payments** workspace.

The following articles provide an overview of the various stages that a PO goes through:

- [Create purchase orders](#)
- [Approve and confirm purchase orders](#)
- [Product receipt against purchase orders](#)
- [Overview of vendor invoices](#)

Types of purchase orders

There are three types of POs. When you create a PO, you must specify the type. You can set up a default order type for new orders on the **Procurement and sourcing parameters** page.

PO TYPE	DESCRIPTION
Journal	Use this type to create a draft order. This type doesn't affect stock quantities or generate inventory transactions. The PO journal lines aren't included in master scheduling.
Purchase order	Use this type to create POs when orders are confirmed with a vendor, and as the orders are processed through receipt and invoicing before payment is made to the vendor. This type of PO is the most common.

PO TYPE	DESCRIPTION
Returned order	Use this type when you return goods to the vendor. This type of order requires that you specify the return material authorization (RMA) number that the vendor gives you. You specify the RMA number on the General tab of the PO. The order lines must have negative quantities.

Purchase order statuses

POs include several status fields that indicate the progress of the order. All these fields are visible in the **Header** view of the order, and a few of them are also visible in the grid overview of all orders. The **Status** field shows the status for quantities on the order. The following values are available:

- **Open order** – Orders have been created, and quantities are on order.
- **Received** – Some of the quantities have been received, but they haven't been invoiced yet.
- **Invoiced** – The full quantity on the order has been invoiced. **Note:** If an order has been *partially* invoiced, neither **Received** status nor **Invoiced** status is appropriate. Therefore, the order will still have a status of **Open order**.
- **Canceled** – An order was confirmed but later canceled. Therefore, this status indicates that there are no longer any open quantities on order.

The **Document status** field helps you quickly review the order's progress in terms of documents that have been processed. It shows the status of the most recent document that has been completed for the order. The following values are available:

- **None** – No document has been processed for the order yet.
- **Purchase inquiry** – A purchase inquiry has been generated, and the order is awaiting feedback from the vendor.
- **Purchase order** – Confirmation has been processed on the order.
- **Product receipt** – Product receipt has been processed on the order.
- **Invoice** – An invoice has been accounted with the order.

The **Approval status** field is used when a PO goes through a review process or workflow. The following values are available:

- **Draft, In review, and Rejected** – These statuses are used only when an approval workflow is used for the PO.
- **Approved** – This status is assigned to orders that have completed workflow approval. Orders that are created without using an approval workflow receive a status of **Approved** immediately.
- **In external review** – This status is used in scenarios where a purchase inquiry is sent to the vendor, so that the vendor can confirm terms of the PO. This status is also used in the process that is initiated by the **Confirmation request** action. For this process, the vendor is asked to confirm terms of the PO by connecting to your system and registering whether it confirms or rejects the order.
- **Confirmed** – This status is assigned after the order has been confirmed. Typically, this status is the last approval status that is assigned to an order.

Additional resources

[Create purchase orders](#)

[Approve and confirm purchase orders](#)

[Product receipt against purchase orders](#)

Overview of vendor invoices

NOTE

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Approve and confirm purchase orders

2/18/2021 • 6 minutes to read • [Edit Online](#)

This topic describes the statuses that a purchase order (PO) goes through after it has been created, and the effect of enabling change management on POs.

After a purchase order (PO) has been created, it might have to go through an approval process. After the vendor has agreed to the order, the PO is set to a status of **Confirmed**.

Approval of purchase orders

POs that don't use change management have a status of **Approved** as soon as they are created, whereas POs that use change management have a status of **Draft** when they are first created. A PO that has been created by firming a planned order from master planning is always set to a status of **Approved**, regardless of the change management settings. A PO creates inventory transactions only when it reaches the **Approved** status. Therefore, that inventory doesn't appear as available for reservation or marking until the order is accepted.

You enable change management for POs by setting the **Activate change management** option on the **Procurement and sourcing parameters** page. When change management is enabled, POs must go through an approval workflow after they have been completed. Supply Chain Management has a workflow process editor where you can define a workflow to represent your approval process. This workflow can include rules for automatic approval, rules that determine who will be assigned to approve particular POs, and rules for escalating a workflow that has been waiting for approval for a long time. You can enable the change management process for all vendors or for specific vendors. You can also set up the process so that it can be overridden for individual POs.

When change management is enabled, POs move through six approval statuses, from **Draft** to **Finalized**. After an order has been approved, users who want to modify it must use the **Request change** action.

APPROVAL STATUS	DESCRIPTION	REQUEST CHANGE IS ENABLED
Draft	The PO is a draft and hasn't been submitted for approval in the PO workflow.	No
In review	The PO was submitted for approval in the PO workflow. Approval is pending.	No
Rejected	The PO was rejected during the approval process.	No
Approved	The PO was approved.	Yes
Confirmed	The PO was confirmed. A PO can't be confirmed until it has been approved.	Yes
Finalized	The PO was made final. It's now financially closed and can no longer be changed.	No

Confirming purchase orders

POs that have an approval status of **Approved** can go through additional steps before they are confirmed. For example, you might have to send a purchase inquiry to the vendor to inquire about prices, discounts, or delivery dates. In this case, you can set the PO to the **In external review** status by using the **Purchase inquiry** action.

Vendors that are set up to use the Vendor portal can review orders on the portal, and approve or reject them. During this review process, the PO has a status of **In external review**. The Vendor portal can be configured so that a confirmation from the vendor automatically confirms the order in Supply Chain Management. Alternatively, you can manually confirm a PO after you receive confirmation from the vendor. If a vendor rejects a PO, the rejection is received together with the reason for the rejection and suggestions for changes. In this case, the status of the PO remains **In external review**.

There is also an option to generate a pro-forma confirmation for an order before the actual confirmation has been processed. This option just creates a report that you can share with the vendor. It doesn't create any journal information.

After the vendor has agreed to the order, the next step is to record the PO as committed. You can complete this step by using either the **Confirmation** action or the **Confirm** action. Both these actions set the approval status of the order to **Confirmed**. Confirmation of an order initiates two additional processes:

- A journal is created to store an exact copy of what was confirmed in the system. Sometimes, orders require changes, and additional journals are created after the updated order is confirmed. These journals let you view the history of the various versions of the order that were confirmed.
- Accounting distributions are created, and order checks and budget checks occur if this functionality has been enabled. If either check fails, you receive an error message that states that changes must be made to the PO before it can be confirmed again.

A vendor might request some type of assurance that payment will be provided for a purchase. There are various methods for providing this guarantee within accounts payable processes. For example, the **Prepayment** action reserves funds for the PO, and this prepayment is recorded on the PO.

Changing purchase orders

In some situations, you might have to change a PO after it has reached an approval status of **Approved** or **Confirmed**.

If the PO was created by using a change management process, you can make changes by recalling the order or, if the order has already been approved, by using the **Request change** action. In this case, the approval status is changed back to **Draft**, and you can then modify the order. After you've finished making changes, you might have to submit the PO for re-approval. You can configure the types of changes that require re-approval by using a **Re-approval rule for purchase orders** policy rule on the **Purchasing policies** page.

If part of the ordered quantity for a PO line has been delivered, you can't change the ordered quantity when the purchase order is in **Draft**. However, you can change the **Deliver remainder** quantity on the line for the purchase order that is in **Draft** status.

After an order has been confirmed, you can no longer delete it. However, you can cancel the total quantity or any remaining quantity on an order, provided that the quantity hasn't been received or invoiced. You can then use the **Finalize** action to prevent further processing.

Canceling purchase orders

A PO can be canceled by using the **Cancel** action on the header.

If the quantity has been partially registered, received, or invoiced, you can cancel only the remaining quantity that hasn't been registered, received, or invoiced. The order quantity is then reduced accordingly. When the quantity on the line is updated, the line status is also updated. For example, the original quantity on the line is 5,

and a quantity of 3 is received. In this case, only two can be canceled. The line is then updated to **Received** status.

If a delivery remainder is added to the order line, and it exceeds the quantity on the order line, the **Cancel** action doesn't cancel the excess quantity. Instead, the line remains in **Open order** status, because it has a remaining quantity. For example, the original quantity on the line is 5, and the delivery remainder is 7. If the order is canceled, five are canceled, and a quantity of 2 remains, as you can see in the inventory transactions.

To cancel the whole quantity on a PO line, you should cancel the delivery remainder quantity on the line. The line will then be updated to **Canceled** status.

If a PO is under change management, any change, such as cancellation of the order or the delivery remainder, must be submitted to the workflow system and approved before the process can be completed and the inventory transactions can be updated as canceled.

Additional resources

[Purchase order overview](#)

[Create purchase orders](#)

[Product receipt against purchase orders](#)

[Vendor invoices overview](#)

NOTE

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Purchase order approval mobile workspace

2/18/2021 • 3 minutes to read • [Edit Online](#)

This topic provides information about the **Purchase order approval** mobile workspace. This workspace lets you view purchase orders and respond to them through actions. For example, you can approve or reject a purchase order.

Overview

Purchase orders that requires approval go through an approval workflow. The workflow can include various steps that require that one or more people take action. For example, a person might have to complete a task or approve the purchase order.

The **Purchase order approval** mobile workspace lets you easily view and respond to purchase orders from your mobile device. This workspace also lets you take the same workflow actions that you can take from the web client.

Prerequisites

The prerequisites vary, depending on the version of Supply Chain Management that has been deployed for your organization.

Prerequisites if you use Supply Chain Management

If Supply Chain Management has been deployed for your organization, the system administrator must publish the **Purchase order approval** mobile workspace. For instructions, see [Publish a mobile workspace](#).

Prerequisites if you use Microsoft Dynamics 365 for Operations version 1611 with Platform update 3 or later

If Microsoft Dynamics 365 for Operations version 1611 with Platform update 3 or later has been deployed for your organization, the system administrator must complete the following prerequisites.

PREREQUISITE	ROLE	DESCRIPTION
Implement KB 4017918.	System administrator	KB 4017918 is an X++ update or metadata hotfix that contains the Purchase order approval mobile workspace. To implement KB 4017918, your system administrator must follow these steps. <ol style="list-style-type: none">1. Download the metadata hotfix from Microsoft Dynamics Lifecycle Services (LCS).2. Install the metadata hotfix.3. Create a deployable package that contains the SCMMobile model, and then upload the deployable package to LCS.4. Apply the deployable package.
Publish the Purchase order approval mobile workspace.	System administrator	See Publish a mobile workspace .

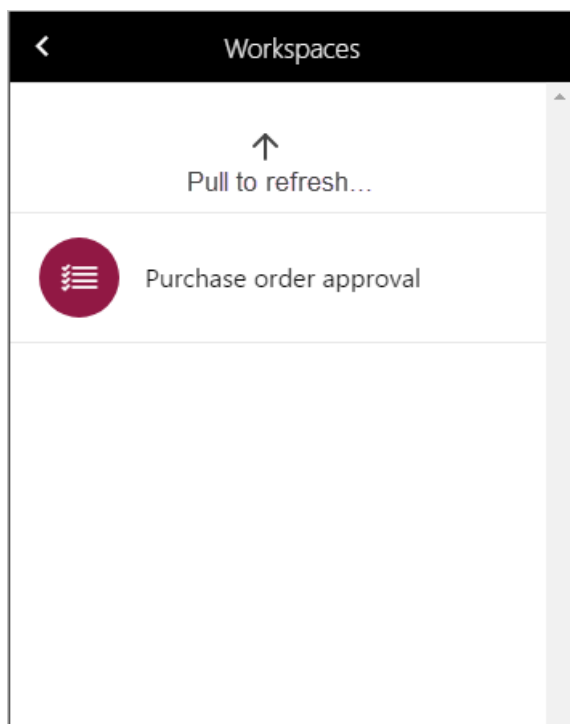
Download and install the mobile app

Download and install the Finance and Operations mobile app:

- [For Android phones](#)
- [For iPhones](#)

Sign in to the mobile app

1. Start the app on your mobile device.
2. Enter your Microsoft Dynamics 365 URL.
3. The first time that you sign in, you're prompted for your user name and password. Enter your credentials.
4. After you sign in, the available workspaces for your company are shown. Note that if your system administrator publishes a new workspace later, you will have to refresh the list of mobile workspaces.



View orders that are assigned to you

1. On your mobile device, select the **Purchase order approval** workspace.
2. Select **Orders assigned to me** to view all the purchase orders for which you've been asked to take action in the purchase order approval workflow.
3. Select an order. On the **Order details** page, you will see the order header information and lines. You can also find guidelines from the workflow task.
4. Select **Accounting distributions** to open the **Header accounting distributions** page.
5. Return to the **Order details** page, and select a line. From the order line details, you can also explore the line-specific accounting distributions.

Complete an action on the purchase order

After you've viewed the purchase order that is assigned to you and read the workflow instructions, you should be ready to take action.

1. On your mobile device, select the **Purchase order approval** workspace.
2. Select **Orders assigned to me** to view all the purchase orders for which you've been asked to take

action in the purchase order approval workflow.

3. Select an order, and view the details page.
4. Select **Actions** to show the available actions. The actions that are available depend on the task that has been assigned to you.

TASK ACTION	APPROVAL ACTION
Complete	Approve
Return	Reject
Request change	Request change
Delegate	Delegate

5. Select the appropriate action.
6. On the **Complete task** page, enter a comment. Note that if you select the **Delegate** action, you must select a user to delegate the task to.
7. Select **Done**. After you refresh your workspace, the purchase order will no longer be in your list.

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Record the receipt of goods on the purchase order

2/18/2021 • 2 minutes to read • [Edit Online](#)

This topic explains how to record receipt of goods directly on a purchase order. It's also possible to register product receipt in the warehouse, and then later record it on the purchase order. This task is typically done by a purchasing agent or an accounts payable coordinator. The example shown in this guide can be used in the USMF demo data company. The example includes steps to create a simple purchase order so that you can play the procedure as a task guide. If you were using the procedure on your own data, you would start at the **Record receipt of goods** subtask.

Prepare a new purchase order for receipt of goods

1. Go to **Navigation pane > Modules > Procurement and sourcing > Purchase orders > All purchase orders**.
2. Select **New**.
3. In the **Vendor account** field, enter .
4. Select **OK**.
5. In the **Item number** field, enter .
6. In the **Quantity** field, enter .
7. On the Action Pane, select **Purchase**.
8. Select **Confirm**.

Record receipt of goods

1. On the Action Pane, select **Receive**.
2. Select **Product receipt**. The **Quantity** field allows you to select different options for the quantity that you want to receive. For example, if a quantity has previously been registered in the warehouse, you can select **Registered quantity**. For this example, use the value **Ordered quantity**.
3. Expand the **Overview** section.
4. In the **Product receipt** field, type any value. This field is used to enter a reference that will be used as voucher for the product receipt journal.
5. Expand the **Lines** section.
6. Set **Quantity** to '4'. Here you are able to manually specify the quantity that is being received for each line on the order.
7. Select **OK**. The goods have now been recorded as received on the purchase order, and a product receipt journal has been created as document to reflect this. You can use the Product receipt action to review the journals created with the purchase order, and see what was received, and when.

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Troubleshoot purchase orders

2/18/2021 • 6 minutes to read • [Edit Online](#)

This topic describes how to fix issues that you might encounter while you work with purchase orders.

An action can be completed only after the line number is fully distributed.

This issue can occur because of inconsistency in purchase order distributions.

To unblock this issue and reset the purchase order to a *Draft* state, go to **Procurement and sourcing > Periodic tasks > Clean up > Purchase order distribution reset**. For more information, see the following blog post: [Resolve PO distribution errors in Dynamics 365 Supply Chain Management](#).

When purchase orders are imported through data management, purchase order line numbers don't follow the increment that defined in system parameters.

Issue description

By default, automatically generated line numbers for purchase order lines that are imported through the *Purchase order lines V2* data entity don't use the system line number increment that is specified in system parameters. If you manually create a purchase order and add lines through the user interface (UI), the line numbers are incremented correctly. However, if you use the Data management framework (DMF), they aren't incremented correctly.

This issue occurs because, when you import lines via DMF, if line numbers aren't already assigned in the imported entity, the system uses DMF's method for assigning them. That method always increments line numbers by one.

Issue workaround

Make sure that the desired line numbers are already given in the data entity line number fields when you import the purchase order lines. In this case, DMF won't overwrite the line numbers.

A default tax group and a default cash discount aren't filled in from the invoice account.

If you're using an invoice account that differs from the customer account, a default tax group and a default cash discount aren't filled in from the invoice account when a purchase order is created.

This behavior is by design. The default values for the tax group, cash discounts, and other price information are based on the customer account, not the invoice account.

I receive an "Object reference not set" error during purchase order confirmation, or an "Exception has been thrown by the target of an invocation" exception occurs during vendor invoice posting.

This issue can occur because of inconsistency in purchase order distributions.

To unblock this issue and reset the purchase order to a *Draft* state, go to **Procurement and sourcing >**

Periodic tasks > Clean up > Purchase order distribution reset. For more information, see the following blog post: [Resolve PO distribution errors in Dynamics 365 Supply Chain Management](#).

One or more accounting distributions are either over-distributed or under-distributed.

Issue description

You receive the following error: "One or more accounting distributions is either over-distributed or under-distributed."

Issue resolution

This issue can occur because of inconsistency in purchase order distributions.

To unblock this issue and reset the purchase order to a *Draft* state, go to **Procurement and sourcing > Periodic tasks > Clean up > Purchase order distribution reset**. For more information, see the following blog post: [Resolve PO distribution errors in Dynamics 365 Supply Chain Management](#).

Can I show only purchase orders that I created?

This functionality isn't currently available.

Can I reserve inventory and create transactions against registered inventory on a purchase order?

Issue description

Even when items are in a *Registered* state on a purchase order, you can still reserve the inventory. In other words, you can create transactions against the registered inventory.

Reproduce the issue

The following procedure shows one way to reproduce the issue.

1. Create a purchase order.
2. Register the purchase order line.
3. Notice that you can generate reservations or transactions against the registered inventory.

Issue resolution

This behavior is by design. The expectation is that the registered items have physically arrived in the warehouse or inventory, and that they are therefore available for reservation.

Purchase orders don't reflect the language settings of the legal entity.

Issue description

The product name on a purchase order is shown in the system language instead of the language that is set for the legal entity where the purchase order was created.

Reproduce the issue

The following procedure shows one way to reproduce the issue.

1. Set the system language to *EN-US* (US English).
2. Make sure that there is a product where the *EN-US* and *DE* (German) languages are maintained for translations of the product name.
3. Change the language of a legal entity to *DE*.
4. In the legal entity where *DE* is set as the language, create a purchase order that includes the product.

5. Notice that the product name is still shown in US English (the system language).

Issue resolution

This behavior is by design. On purchase orders, the product is always shown in the system language. The purchase order language is used when a confirmation journal is created.

The Approved vendor list by product entity doesn't allow the effective date to be changed.

Issue description

A product has an approved vendor that has, for example, an effective date of January 11, 2018 (*01/11/2018*), and an expiration date of *Never*. If you try to change the effective date to January 10, 2018 (*01/10/2018*), or January 12, 2018 (*01/12/2018*), you receive the following error:

Cannot create a record in Approved supplier list (PdsApproveVendorList). The 'Expiration' value needs to be greater than or equal to the 'Effective' value.

Issue resolution

You can only extend the period that the vendor is approved for. The following rules apply:

- To change the effective date so that it's earlier than any of the existing records (periods) for the item vendor, the expiration date of the new period must be before all the expiration dates in the existing records.
- To change the expiration date so that it's later than any of the existing periods, the effective date must be after the latest expiration date in any existing record.
- To reduce the overall period that the vendor is approved for, you must delete or modify existing records. Alternatively, you can use the **truncate** switch during import. This switch deletes all existing records in the table for approved vendors by item.

For the example scenario that is described in the issue description, where a record has an effective date of *01/11/2018* and an expiration date of *Never*, you can import a new record that has an effective date of *01/10/2018* and an expiration date of *Never*. However, you can't reduce the period so that the effective date is updated to *01/12/2018* via data management. You must make this change through the UI.

After I change the delivery address on a purchase order header, the delivery name isn't synced.

Issue description

The address on the header of a purchase order is updated to an address that isn't a delivery address. Although the address is updated on the purchase order, the delivery name isn't updated based on the updated address.

Issue resolution

This behavior is by design. The selected address must be classified as a delivery address. Otherwise, the delivery name isn't updated based on the selected address.

Can I find the user who canceled a purchase order?

This information is tracked only if the purchase order is subject to change management. If you use change management, you can see who submitted the change (the cancellation), and who approved it.

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Create purchase orders

2/18/2021 • 9 minutes to read • [Edit Online](#)

This article describes the process and options when you manually create a purchase order.

When you create a purchase order (PO), general information about the whole order is specified in the PO header, and you then add one or more PO lines. This article describes some of the most frequently used options that are available.

You can also create POs by copying lines from another PO document or a sales order. In this case, you can reverse the sign on the inventory, as you would reverse the sign on an invoice to indicate credit.

Although you can manually create POs, they are more typically generated from other processes. Orders can be automatically created based on other documents, such as requisitions. Alternatively, they can be created as part of the master planning process through planned POs. If you use purchase agreements, POs can be created by the **Release order** action. There are also more advanced methods for automatically creating a PO. For example, orders can be created when you use direct delivery or intercompany order chains.

Creating a purchase order header

When you create a new PO, a dialog box appears, where you can enter the most common information for the PO header. When you click **OK** to close the dialog box, the order is created, and you can then specify additional information in the header.

The first detail that you must consider when you create a PO is the type of order. The **Purchase order** type is used most often. However, if a credit invoice is required, you can use the **Returned order** type.

You must specify the supplier in the **Vendor account** field. For this field, you can search on either the account or the vendor name. If a vendor delivers from multiple locations but uses a single invoice account, you can select that invoice account in the **Invoice account** field and then use it with different vendor accounts. If you must create a PO for products that won't be ordered repeatedly, you can use the **One-time supplier** option. This option automatically creates a new vendor account that is marked as a one-time account, to support a later clean-up process for one-time accounts in the **Accounts payable** module. When you select a vendor account, many fields in the PO header inherit default values from the information that is associated with the vendor account. For example, the default delivery site and warehouse are copied from the vendor information. However, you can override these default values if the purchase is intended for another location.

If the supplier has provided a reference number for the order, you can record this information in the **Vendor reference** field. For returned orders, you must specify a value in the **RMA** field to reference the supplier's authorization for processing the return.

If a purchase agreement is associated with the order, you must specify this information in the **Purchase agreement** field.

The PO header also contains information about charges that apply to the whole order instead of individual lines. Charges can be automatically added to the order if automatic charges have been set up for the vendor or the vendor's charge group. You can also manually add charges to the order header by clicking **Maintain charges** on the Action Pane.

Adding purchase order lines

POs can be for physical products or for services. A setting on the inventory model group determines whether a

particular item number applies to a product or a service. Usually, the item that is purchased is specified by an item number. However, if the order is for products or services that are directly consumed, you can also specify the item by using a procurement category.

PO lines contain lots of fields, but many of these fields have a default value or a value that is inherited from the order header. Additional fields are set when you select a product or service. The fields that are most often set manually include the fields for the item number, quantity, and requested delivery date. Information about unit price and discounts is also very important, but the values of those fields are often determined by trade agreements or purchase agreements.

When you select a product, you can search on all or part of the product name instead of using the item number. If the product has several variants, such as different sizes, you can see an overview of the available variants by using the **Add lines** function or by using the lookup that is available in the **Variant number** field.

Often, you will have to specify several dimensions for the item that is selected on each PO line. The dimensions that must be specified depend on the dimension groups that have been assigned to the product master definition. For example, you will often have to specify a site and warehouse to indicate the location that the product should be delivered to. You identify product variants by specifying a variant number, or by entering values for one or more product dimensions, such as color, size, configuration, or style. Tracking dimensions, such as batch and serial number, let you uniquely identify each inventory lot. After you've created an order, you can capture dimension values on the order by using the **Registration** action. For example, you have ordered a quantity of five pieces of an item. Later, you register that three of those pieces will be black, and two of them will be blue. This approach is an alternative to capturing the dimension information during arrival registration.

You can check the details of the inventory transaction status for stocked products. For example, you might want to check the on-hand inventory to help you decide how much to order. Alternatively, you might want to review the inventory status of an ordered quantity to see whether inbound arrival registration has occurred.

A PO line that is being used to return a product to the vendor will have a negative quantity. You can select a specific lot to return by using the **Reservation** action.

Sometimes, you might want to divide the quantity that you've ordered, so that different parts of it are delivered on different dates. You can set up these deliveries by using the **Delivery schedule** action, which is available on the **Purchase order line** menu in the **Lines** view.

Charges can be automatically added to PO lines, if automatic charges have been set up for the vendor or vendor charge group, and for the item or item charge group. However, more typically, charges are added manually at the order line level. To add a charge, open the **Maintain charges** page by using the **Maintain charges** action on the **Financials** menu in the **Lines** view. The advantage of adding charges directly at the order line level is that the charge can be allocated as an inventory cost. To set up charge codes to account product cost, use the **Item** debit option. These types of charges must be allocated from the PO header to the lines before the order can be confirmed. For example, you might want to allocate charges based on the quantity on each line. The charge category also affects how charges are accounted. For example, fixed charges specify a fixed amount, and percent charges are calculated as a percentage of the net amount for the order line. POs can be assigned to a load, and the load might include an estimate of the expected expense for the transportation cost. You can allocate this expense from the load back to the PO lines.

Purchase order actions

After you've added the header and lines to the PO, you must often complete additional steps before the order is ready to be confirmed. Because so many options are available, you might find it helpful to use [Action search](#) to find the relevant menu item.

You can configure products on the order so that they have supplementary items. Supplementary items are products that must or can be bought together with other products. Supplementary products might be added free of charge as accompanying products, or you may be able to decide whether to add them to the order or

not. You can review the supplementary items after each order line that is added. However, you will probably find it more convenient to review and add relevant supplementary items for all the order lines by using the **Supplementary items** page, which you can open from the Action Pane.

Discounts are usually added to lines as they are created. However, a few discounts apply to the whole order:

- The **Total discount** action calculates a total discount percentage that is applied to the full order. Don't confuse this discount with the cash discount percentage. Cash discounts are applied when the invoice is paid, and they depend on payment settlement by a specific date.
- If a multi-line discount applies, you must use the **Multiline discount** action to calculate and assign it to the order. Multi-line discounts are discounts that can be offered if a mix of products on the order exceeds a joint threshold. Only a few companies use this type of discount.

Charges that have a charge code that uses the **Item** debit type must be assigned to the line level before the order can be confirmed. You might find it convenient to assign these charges at the order header level, so that you can specify the total amount of the charge. However, in this case, the charge must then be allocated down to each line before the order can be confirmed. You can use the **Allocate charges** action to split amounts from charges that are assigned at the header level down to the order lines. Charges can be split according to the net amount of each line, according to the quantity that has been ordered, or evenly across the order lines. After you've allocated charges to the lines, the charge is removed from the order header.

POs can be configured to require that budget funds be allocated to the order before it can be processed. In this case, you can use the **Budget checking** action to allocate the budget.

You might have to delay the completion of a PO. For example, you might require additional information about products or services, or you might have to get authorization for the spend. There are several ways to hold back an order. For example, you can wait to confirm the order. Alternatively, if a change management workflow is being used, don't submit the order for approval. If you must block all orders for a particular vendor, you can also mark the vendor as **On hold** for processing on the vendor master. There are also circumstances that might prevent the order from being processed. For example, processing might be prevented if credit limits have been exceeded, or if required budget funds aren't available.

Additional resources

[Purchase order overview](#)

[Approve and confirm purchase orders](#)

[Product receipt against purchase orders](#)

[Vendor invoices overview](#)

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Create a purchase order

2/18/2021 • 5 minutes to read • [Edit Online](#)

This topic shows you how to create a purchase order manually. It's more typical for purchase orders to be created automatically as result of master planning, direct delivery, and other processes. Purchase orders are typically created by a purchasing agent. The example shown here can be used in the USMF demo data company using the values that are suggested in the notes for various steps.

Create the purchase order header

1. Go to **Navigation pane > Modules > Procurement and sourcing > Purchase orders > All purchase orders**.
2. Select **New**.
3. Select vendor account **US-101**. When you select a vendor, details from the vendor record such as address, invoice account, delivery terms, and delivery mode will be copied as default values into the order header. You can change these values at any time.
4. Expand the **General** section.
 - The **Site** field together with the **Warehouse** field specifies where the procured goods or services must be delivered to. The default delivery address is the site. Both fields can be populated with values set up for the selected vendor, or you can specify them manually.
 - The **Delivery date** field is used to specify when procured goods and services need to be delivered. You can specify a single delivery date for the order, or the individual order lines can be given unique delivery dates. If the delivery date specified here cannot be met for specific products or services because they have longer lead times, then those lines will be created with a later delivery date to accommodate for this.
5. Expand the **Administration** section. The **Orderer** field can be used to specify who is placing the order. This may be convenient to share with the vendor in case they need to contact that person. The field may be assigned a value automatically if the current user account is associated with a name on the **Users** page.
6. Select **OK**. The order header has now been created. When you work with purchase order lines, only a summary of the header information is shown. If you need to view the rest of the information, select **Header**.

Add a purchase order line

1. Select **Purchase order line**.
2. Select **Dimensions**. Products can be in variants that are differentiated by dimensions, such as color, size, or style. Products can also be set up to use storage dimensions, such as site and warehouse. There are also optional tracking dimensions, such as batch and serial numbers. To improve the efficiency of order entry, you can add the dimension fields that you commonly use directly to the order grid.
3. Select the **Color** check box. Optional: If you select the **Save setup** field, the dimensions you have chosen will also be shown on the order line grid the next time you open the purchase order page.
4. Select **OK**.

5. In the **Item number** field, select **T0004**.

- Order lines are created for products and services by specifying an item number, or as expenses by specifying a procurement category.
- The **Procurement** category field is used for adding lines where procured items are expensed directly, rather than going into inventory. This means that if you need to expense a purchase you can do this by creating a purchase order line that specifies a procurement category, rather than creating a line with an item number. Items can also be associated with a procurement category and in this case, the procurement category is shown as informational only.

6. In the **Color** field, enter or select a value. The **Site** and **Warehouse** fields are typically populated with values from the order header, but it is possible to override the fields if some lines need to be delivered to different locations.

7. In the **Quantity** field, enter a number.

- Select the quantity that you want to purchase. The **Quantity** field is automatically populated with the minimum order quantity for the product if this is set up, or with the value of 1.
- The **Unit** field indicates the unit of measure for the ordered quantity. Typically, the unit is automatically provided from the purchasing unit on the product master data, but you can change this.
- The **Unit price** field typically contains a value from either a purchase agreement or a trade agreement. It's possible to change the unit price on individual order lines, for example if a unique price is negotiated with the vendor.
- The **Discount** field represents a discount amount per unit. This discount therefore reduces the unit price by the discount. This discount is commonly supplied automatically from purchase agreements or trade agreements, but it is possible to override on individual lines if unique discounts have been negotiated with the vendor.
- A discount percentage can be entered that reduces the net amount for the line accordingly. The discount percent is often supplied automatically from purchase agreements or trade agreements, but it is possible to override on individual lines if a unique discount percentage has been negotiated with the vendor.
- The value in the **Net Amount** field is calculated from other fields on the line including quantity, unit price, discount, and discount percent. It's possible to change the Net amount, but then the **Unit Price**, **Discount**, and **Discount percent** fields will be blank and when you post toward the line, the amount posted will be proportional to the net amount. Typically the **Net Amount** field is only used for displaying the net amount of the line.

8. Expand the **Line details** section.

9. Select the **Delivery** tab. A unique delivery date can be assigned to each order line. The date is inherited from the field on the purchase order header, but you can change this.

Review order totals

1. Select **Totals**.

- If you don't see the **Totals** action, select the **Purchase Order** tab on the Action Pane.
- This dialog box shows totals for the whole order.
- The **Selection** field allows you to change the basis of how totals are calculated. For example, you could choose **Product receipt quantity** to show totals that relate to the amount of the product(s) that have been received, or **Ordered quantity** to show the amount of product that was ordered.

2. Select **OK**.

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Create a purchase order with a delivery schedule

2/18/2021 • 3 minutes to read • [Edit Online](#)

This topic demonstrates how to create a delivery schedule for a purchase order. A delivery schedule is used when a quantity on an order or a journal is requested to be delivered in multiple shipments. The example shown in this guide can be used in the USMF demo data company. This procedure would typically be done by a purchasing agent.

Create a delivery schedule

1. In the navigation pane, go to **Modules > Procurement and sourcing > Purchase orders > All purchase orders**.
2. On the Action Pane, select **New**.
3. In the **Vendor account** field, enter .
4. Select **OK**.
5. In the **Item number** field, enter .
6. In the **Quantity** field, enter .
7. Select **Purchase order line**.
8. Select **Delivery schedule**.
 - The **Delivery schedule** page allows you to specify the number of shipments in which the total quantity of the order line will be delivered from the vendor.
 - By default, the system copies the total quantity and other delivery details of the original purchase line into the first delivery schedule line. In this example, we'll create a schedule for two shipments, with the second shipment's date offset by a week from the first shipment.
9. In the **Quantity** field, change the quantity to .
10. Select **New**.
11. In the **Quantity** field, enter as the remaining quantity.
 - In the delivery date field, select a date that's one week after the date on the first delivery line.
 - You can keep track of the total quantity that's allocated to the delivery schedule lines by looking at the **Total** and **Remaining** fields. When the remaining quantity is zero, the full quantity from the original line has been allocated to the schedule.
12. Expand the **Charges conversion** section.
 - The options here allow you to control how you want charges to be distributed across the delivery schedule lines. If you select **Copy gross amounts**, the charge amount on the original order line is copied to each delivery line. The **Allocate to delivery lines** option divides the original line charge according to the quantity on each delivery line.
13. Collapse the **Charges conversion** section.
14. Select **OK**.
 - The delivery schedule has now been applied to the order.
 - The original order line, now referred to as a Commercial line, has been converted to an Order line with multiple deliveries. It is marked with a distinct icon and acts as a header for the delivery lines.
15. Select the second order line, which is the first of the two delivery lines.

- The two new lines, referred to as Delivery lines, make up one delivery schedule. The order will be processed against these lines and not the original line. If documents such as confirmations, product receipt journals, or invoices are printed, only the delivery lines are shown.

Change the delivery schedule

You can change the quantity on delivery lines. If you do this, the commercial line is automatically updated to the total quantity in the delivery lines.

1. In the **Quantity** field of the first delivery line, change the quantity from to .
2. Select the first order line (the commercial line).

- The quantity on the commercial line has been changed to 11.

Process product receipt using delivery schedules

The purchase order must be confirmed before the product receipt can be processed. In this example, receipt is recorded directly on the purchase order. The receipt could also have been recorded when the goods arrived in the warehouse.

1. On the Action Pane, select **Purchase**.
2. Select **Confirm**.
3. On the Action Pane, select **Receive**.
4. Select **Product receipt**. In the **Product receipt** field, type any value.
 - This field is used to enter a reference that will be used as voucher for the product receipt journal.
 - In the **Quantity** field, select **Ordered quantity**. This option means that the receipt will process for the quantity that the order lines were created with.
 - Make sure that the **Print product receipt** field is set to **No**. Printing isn't needed in this example.
5. Expand the **Lines** section.
 - Notice how the product receipt is created for the two delivery lines and not the original order line. If the receipt had been recorded in the warehouse, it would also have been recorded on the delivery schedule lines.
6. Collapse the **Lines** section.
7. Select **OK** to post the receipt.

NOTE

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Create a purchase order for a one-time supplier

2/18/2021 • 2 minutes to read • [Edit Online](#)

This procedure shows you how to create a purchase order for a one-time supplier. The supplier is created automatically with the purchase order, rather than having to create the vendor account manually. Purchase orders are typically created by a purchasing agent. The example shown in this guide can be used in the USMF demo data company. It is a prerequisite that a one-time vendor account has been set up in the Account payable parameters page.

Create a purchase order for a one-time supplier

1. Go to Procurement and sourcing > Purchase orders > All purchase orders.
2. Click New.
3. Select Yes in the One-time supplier field.
 - A vendor account is automatically created and assigned to the purchase order. The vendor account is created based on the template that is specified on the General tab in the Accounts payable parameters page.
4. In the Name field, type a name for the supplier.
5. Click OK.
 - The purchase order can now be completed and processed like any other order. There are no special characteristics related to how this is done. The invoice will account a due transaction on the vendor account that was created with the order, and payment will then be processed.

NOTE

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Create a purchase release order when creating the purchase order

2/18/2021 • 2 minutes to read • [Edit Online](#)

This procedure shows how to use a purchase agreement when you create a purchase order. The purchase agreement has to be applied when you create the purchase order because there are general terms that should be copied to the purchase order header. Typically this task would be carried out by a purchasing agent. As a prerequisite for this guide, you must have an effective purchase agreement with a product quantity commitment for a vendor and items. The same procedure can be used if you have a purchase agreement with other types of commitments. You can run this guide in demo data company USMF. If you're using USMF, you can run the "Create a purchase agreement" guide first to set up the necessary preconditions for this guide.

Create a purchase order

1. Open the purchase order preparation workspace.
2. Click New purchase order.
3. In the Vendor account field, click the drop-down button to open the lookup.
4. In the list, find and select the desired record.
5. In the list, click the link in the selected row.
6. Toggle the expansion of the General section.
7. In the Purchase agreement field, click the drop-down button to open the lookup.
 - All available agreements for the vendor are listed here. Find the effective agreement that you want to use.
8. In the list, click the link in the selected row.
9. Click Yes.
10. Click OK.

Add a line

1. In the Item number field, type a value.
 - If there are specific inventory or location dimensions on the commitment you must enter the same values on the purchase order line to make use of the agreement.
2. In the Site field, click the drop-down button to open the lookup.
 - The site may already be populated with the default value from the order, or from the vendor. If this is the case, skip this step.
3. In the list, find and select the desired record.
4. In the list, click the link in the selected row.
5. In the Quantity field, enter a number.
 - Validate that the price is copied from the commitment.

Look up the commitment

1. Click Update line.
2. Click Attached.
 - Here you can get details for the purchase agreement. For example, you can see the price and whether the price and discount are fixed, which means that if you change price or discount on the purchase

order to a different value than on the commitment, the system will remove the link so the purchase order line does not fulfill the commitment. You can also see if the Max is enforced option is selected, which means that the quantity on the commitment cannot be exceeded by summing all of the purchases that fulfill the commitment.

3. Close the page.

Look up the purchase agreement

1. On the Action Pane, click General.

2. Click Purchase agreement.

3. Close the page.

4. Close the page.

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Create a purchase release order from a purchase agreement

2/18/2021 • 2 minutes to read • [Edit Online](#)

This procedure shows how to use a purchase agreement when you create a purchase order. The purchase agreement has to be applied when you create the purchase order because there are general terms that should be copied to the purchase order header. Typically this task would be carried out by a purchasing agent. As a prerequisite for this guide, you must have an effective purchase agreement with a product quantity commitment for a vendor and items. The same procedure can be used if you have a purchase agreement with other types of commitments. You can run this guide in demo data company USMF. If you're using USMF, you can run the "Create a purchase agreement" guide first to set up the necessary preconditions for this guide.

Create a purchase order

1. In the **Navigation pane**, go to **Workspaces > Purchase order preparation**.
2. Click **New purchase order**.
3. In the **Vendor account** field, click the drop-down button to open the lookup.
4. In the list, find and select the desired record.
5. In the list, click the link in the selected row.
6. Expand the **General** fastTab.
7. In the **Purchase agreement** field, click the drop-down button to open the lookup. All available agreements for the vendor are listed here. Find the effective agreement that you want to use.
8. In the list, click the link in the selected row.
9. Click **Yes**.
10. Click **OK**.

Add a line

1. In the **Item number** field, type a value. If there are specific inventory or location dimensions on the commitment you must enter the same values on the purchase order line to make use of the agreement.
2. In the **Site** field, click the drop-down button to open the lookup. The site may already be populated with the default value from the order, or from the vendor. If this is the case, skip this step.
3. In the list, find and select the desired record.
4. In the list, click the link in the selected row.
5. In the **Quantity** field, enter a number. Validate that the price is copied from the commitment.

Look up the commitment

1. Click **Update line**.
2. Click **Attached**. Here you can get details for the purchase agreement. For example, you can see the price and whether the price and discount are fixed, which means that if you change price or discount on the purchase order to a different value than on the commitment, the system will remove the link so the purchase order line does not fulfill the commitment. You can also see if the Max is enforced option is selected, which means that the quantity on the commitment cannot be exceeded by summing all of the purchases that fulfill the commitment.
3. Close the page.

Look up the purchase agreement

1. On the **Action Pane**, click **General**.
2. Click **Purchase agreement**.
3. Close the page.
4. Close the page.

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Create a purchase return order

2/18/2021 • 4 minutes to read • [Edit Online](#)

This procedure shows you how to create a purchase return order by using the Credit note action to copy lines from a vendor invoice document to a new PO. It also shows you how to confirm the order and process shipment of the goods back to the vendor. The example shown in this procedure can be used in the USMF demo data company. This task would typically be carried out by a purchasing agent.

Create a new purchase return order

1. Go to **Navigation pane > Modules > Procurement and sourcing > Purchase orders > All purchase orders**. The first step is to create a new purchase order to be used as the purchase return order.
2. Click **New**.
3. In the **Vendor account** field, enter "US-102".
4. Click **OK**.
5. On the **Action Pane**, click **Purchase**.
6. Click **Credit note**. This is the page from which you can copy from an existing vendor invoice to your return order. This is the same page that's used for other copy actions. But because we've opened it from the Credit note action, the page is configured to support the creation of a return order that offsets vendor invoices.
7. Expand the **Parameters** section.
 - The **Invert sign** option is automatically selected, and cannot be changed. This ensures that the sign is changed for the quantities, and that order lines that are added will offset the vendor invoice.
 - The **Copy charges** option is automatically selected, and cannot be changed. This means that charges from the vendor invoice are added to the purchase return order to offset the original charge. It's possible to modify the changes on the order header and lines later.
 - The **Copy precisely** option is automatically selected, and cannot be changed. This ensures that an exact copy is made of the values in all the fields on the vendor invoice header and lines. This means that a purchase return order is created with values that match all terms used with the vendor invoice document.
 - The **Delete purchase lines** option deletes any purchase order lines that already exist on the purchase order before adding the new lines. In this example we have not yet added any lines to the purchase return order, so there wouldn't be any effect. Use this option with caution, as it deletes all existing lines without further warning.
 - The **Copy order header** option is automatically selected, and cannot be changed. This ensures that information is copied from the vendor invoice and applied to the purchase return order header. This is useful because it helps to ensure that the purchase return order offsets the invoice by using similar terms.
8. Collapse the **Parameters** section.
9. Expand the **Invoices** section. The page has been opened from the Credit note action, so the only option available is to copy information from vendor invoices. This tab shows all the available invoices for the vendor account that's specified on the purchase return order that you created earlier. The invoices are

identified by the invoice voucher or the purchase order IDs.

10. Locate the vendor invoice identified by invoice number AP-0006, and highlight that line by clicking on any field in that line.
11. Select the line by clicking in the check box for the line. Notice that the lines available on the vendor invoice are automatically selected together with the order. This particular vendor invoice has 2 order lines. For this example, we'll return part of the quantity from the second line.
12. Highlight the second line (the one with item M0006) by clicking on any field in that line.
13. In the **Quantity** field, change the quantity to 10. This is the quantity that we'll return to the vendor.
14. Highlight the first line (the one with item M0005) by clicking on any field in that line.
15. Clear the check box for the line. Only the lines that you've selected will be copied to your order.
16. Collapse the **Invoices** section.
17. Expand the **Selected lines or header to be copied** section. This view shows a summary of all the documents and lines that you've selected to be copied to your order.
18. Collapse the **Selected lines or header to be copied** section.
19. Click **OK**. The line that you selected has now been copied to your purchase return order. The **Quantity** field shows -10.
20. In the **Purchase order line** section, click **Inventory**.
21. Click **Marking**. The order line that was created is marked against the inventory transaction from the vendor invoice. This ensures that the inventory that's returned to the vendor is the same as the inventory that was received from them earlier. There are some situations where marking does not occur, for example, if the inventory has already been marked as Consumed, or if the product is one that doesn't use marking.
22. Click **OK**.

Confirm and record the shipment of goods

1. Click **Actions > Confirm**.
2. On the **Action Pane**, click **Receive**.
3. Click **Product receipt**.
 - This page is used to record product receipt for purchase orders and also to process the return of goods back to the vendor. Order lines with a negative quantity mean that goods are to be returned to the vendor, and the document that can be generated from this page can be used as packing slip for this use.
 - In the **Quantity** field, select **Ordered quantity** for this example. This ensures that the shipment will be processed for the full ordered quantity that the order lines were created with.
4. In the **Product receipt** field, type a value. This field is used to enter a reference that will be used as a voucher for the product receipt journal.
5. Click **OK**. The goods have now been recorded as shipped on the purchase return order, and a product receipt journal has been created. You can use the **Product receipt** action to review the journals created with the purchase order, and see what was received or returned, and when.

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Create project purchase order

2/18/2021 • 2 minutes to read • [Edit Online](#)

This procedure shows you how to create a project purchase order. This task uses the USSI data set.

1. Go to Project management and accounting > Projects > All projects.
2. In the list, click the link in the selected row.
3. On the Action Pane, click Manage.
4. Click Item task.
5. Click Purchase order.
6. In the Vendor account field, enter or select a value.
7. In the Site field, enter or select a value.
 - These steps aren't required, but they do simplify the purchase order by setting up a default site and warehouse for the purchase order lines.
8. In the Warehouse field, enter or select a value.
9. Click OK.
10. In the list, mark the selected row.
11. In the Item number field, enter or select a value.
 - This can be the item number or a procurement category.
12. Expand the Line details section.
13. Click the Project tab.
 - Verify that the sales and cost prices are available. If they are not available but needed, enter the information.
14. Click Save.

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Create a repeat purchase order

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This topic shows you how to create a repeat purchase order (PO) by copying lines from an earlier purchase order document to a new PO or to an existing PO. There are two methods for creating repeat orders. You can use the actions available at the document level from the Action Pane, or you can use the line detail actions. The document level actions are mainly intended for creating a new purchase order by adding lines and header information from another order, while the line details action is mainly for adding lines to an existing order. The example shown in this guide can be used in the USMF demo data company. This task would typically be carried out by a purchasing agent.

Create a new repeat purchase order

1. In the navigation pane, go to **Modules > Procurement and sourcing > Purchase orders > All purchase orders**. First we'll try the option for copying information to a new order.
2. Select **New**.
3. In the **Vendor account** field, enter .
4. Select **OK**.
5. On the Action Pane, select **Purchase order**.
6. Select **From all**. This is the page from which you can copy from existing orders to your order. There are different options for how the lines are copied, and different kinds of documents that you can copy from. We'll look at the options for how lines are copied first.
7. Expand the **Parameters** section.
 - The **Quantity factor** field is useful if you need to use a quantity that is different than the one that's on the order that you're copying from. For instance, if you want to order twice the quantity that's in the lines that you're copying from, you'd type '2' in this field and then the system will add lines where the original quantity has been doubled.
 - The **Invert sign** field also supports changing the ordered quantity by changing the sign of the quantity for order lines that are added. This may be useful if you need to reverse a transaction, by creating order lines that negate the transaction. This option is automatically selected when the page is opened from the **Create credit note** action.
 - The **Copy charges** option allows you to copy charges to your new order from the document that you're copying the order lines from.
 - The **Recalculate prices** option uses the current prices and discounts rather than copying these from the document that you're copying other information from.
 - The **Copy precisely** option creates an exact copy of the values in all the fields on the order document header and lines. If this option is not selected, default values are used for many of the fields relating to the vendor and products just as if you were creating the new order manually. For example, if the order that you're copying from had overridden the default Invoice account for the vendor, that same Invoice account would be copied to your order. If you didn't select the **Copy precisely** option, the default Invoice account for the vendor would be used on your order instead.
 - The **Delete purchase lines** option deletes all purchase order lines that already exist on the purchase order that you're copying to, before applying the new lines. Use this option with caution, as it deletes all existing lines without further warning.

- If you use the **Copy order header** option, you don't need to manually create the header information on your new order. Note that this option will result in default values being used for the fields associated with the vendor. If the document that you're copying from has non-default values that you want to copy, use the **Copy precisely** option as well.
 - There are different document sources that you can copy from, and each has a separate section on this page. For example, the **Purchase orders** section allows you to copy from existing purchase orders.
8. In the **Purchase orders** section, select the lines you'd like to be copied to your clipboard. It's possible to select additional purchase orders lines from other purchase orders and copy them to your order as well. It's also possible to add lines from other kinds of purchase documents. The next few steps review the different options.
 9. Expand the **Confirmation** section. Here you can select purchase order confirmations to copy from. The purchase order confirmations are identified by the associated purchase journal ID or the purchase order ID.
 10. Expand the **Product receipts** section. Here you can select product receipt journals to copy from. The product receipt journals are identified by the product receipt voucher or the purchase order ID.
 11. Expand the **Invoices** section. Here you can select vendor invoices to copy from. The invoices are identified by the invoice voucher or the purchase order ID.
 12. Expand the **Selected lines or header to be copied** section. This view shows a summary of all documents and lines that have been selected to be copied to your order.
 13. Select **OK**. The lines that you selected have been copied to your new purchase order.

Copy lines to an existing purchase order

Instead of copying an entire order, it's more common to create a new PO and complete information on the PO header, and then copy individual lines from existing orders.

1. Select **Purchase order line**.
2. Select **From all**. The page that opens is identical to the one shown before, but different options are selected when it's opened from the order lines view. Let's review the parameters.
3. Expand the **Parameters** section.
 - The **Delete purchase lines** option is not selected. This means that you can copy new lines to your order without removing existing lines.
 - The **Copy order header** option is also not selected, as we're only adding additional lines to the order.
 - For this example, we'll copy lines from an existing purchase order.
4. Select the line for the desired purchase order. Notice that the single order line that's on this PO is also selected.
5. Select **OK**. The additional order line has been added to your purchase order.

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Create a requisition for consumption

2/18/2021 • 4 minutes to read • [Edit Online](#)

This topic describes the process of creating a requisition. It shows you different ways to search for products in your procurement catalog and how to add a product that isn't in your catalog. Before you start this procedure, you must have a purchasing policy set up with Consumption as the default type of requisition. You can walk through this procedure in demo data company USMF, or using your own data. The procedure can only be carried out by a user profile that is set up as worker. This task would normally be carried out by an employee. The **Employee** employ security role will allow you to carry out the tasks, or if you're using USMF, you can log in as **Alicia**.

Create a new requisition

1. Go to **Navigation pane > Modules > Procurement and sourcing > Purchase requisitions > Purchase requisitions prepared by me**.
2. Select **New**.
3. In the **Name** field, give the requisition a name.
4. In the **Requested date** field, enter a date. By default, the requested date and accounting date are copied to the purchase requisition lines. They can be changed at the line level. The requested date is the requested delivery date.
5. In the **Accounting date** field, enter a date. The accounting date is used to record the accounting entry in the general ledger, and to validate whether budget funds are available.
6. Select **OK**.
7. In the **Reason** field, select an option from the drop-down menu. By default, the business justification reason that you select appears for the purchase requisition lines, but you can change it at the line level.
8. Select the reason.
9. In the **details** field enter a more descriptive justification for the requisition.

Add a line to the requisition

1. Select **Add line**. There are two ways of adding lines to the purchase requisition. If you already know the product number or you already know that you are requesting a product that is not in the product catalog, then you can add the line directly with **Add line**. The other way is to use **Add products** where you can use searching and filtering to find items in the product catalog.
2. Select the row you just created.
 - The requester is the worker that has requested the requisition.
 - By default the person preparing the requisition is the worker who has requested it. You have to be given permission to prepare a requisition line on behalf of another worker. If you have such permissions then the other workers will show up in this lookup.
3. In the **Item number** field, type a value. The items that are available for you to choose are limited by the category access policy and the procurement catalog for the buying legal entity.
4. In the **Quantity** field, enter a number.

Add more products to the requisition

1. Select **Add products**. This is the option where you can search for products in the product catalog.
2. In the **Find procurement category node** field, enter the first part of the name of the category that you are

looking for, and then select **Enter**. For example, enter .

3. Use the **InvokeDefaultButton** shortcut.
4. Use the **Filter** to filter the list of products in the selected category.
5. Select the product card that you want to add to the requisition.
6. Select **Add to lines**.
7. In the **Quantity** field, enter a number.
8. In the **Find procurement category node** field, type the first part of the name of the category that you are looking for, and then select **Enter**. For example, enter (highlighters).
9. Use the **InvokeDefaultButton** shortcut.
10. Select **Add unlisted product to lines** to add a product that's not listed in the procurement catalog.
11. In the **Product name** field, type a value.
12. In the **Unit** field, type a value.
13. Select **OK**.
14. In the **Item description** field, add a description of the product.
15. In the **Quantity** field, enter a number.
16. In the **Unit price** field, enter a number. If you know the price for a particular vendor (that you select in the vendor account field) then that price can be entered.
17. In the **Vendor account** field, open the drop-down list to select an option. The vendors that are available in this field depend on the purchasing policies and the status that the vendor has for the current procurement category. As an alternative to selecting a vendor here, you can select **Suggest vendor**.
18. In the list, select the vendor you want to use.
19. In the **External item number** field, type a value. This is a reference number for the product that is known by the vendor. For example, this could be the item number of the product in the vendor's own catalog.
20. Select **OK**.

Distribute amounts

1. Select **Financials**.
2. Select **Distribute amounts**. This process shows you how to distribute the cost for the first line between 2 accounts. This can also be done later when the requisition is in review.
3. Select **Split** to create a new distribution line.
4. In the **Ledger account** field select the first cost center that should take part of the cost.
5. Select the other distribution line.
6. In the **Ledger account** field specify the other cost center.
7. Select **Distribute equally**.
8. Close the page.

View line details

1. Toggle the expansion of the **Line details** section.

Submit the requisition

1. Select **Workflow** to open the drop dialog.
2. Select **Submit**.
3. Close the page.
4. In the **Comment** field, type a note for the approver of the requisition.
5. Select **Submit**.
6. Close the page.

7. Refresh the page.

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Purchase agreements

2/18/2021 • 7 minutes to read • [Edit Online](#)

This article provides information about purchase agreements. A purchase agreement is a contract that commits an organization to buy a specified quantity or amount by using multiple purchase orders over time. In exchange for this commitment, the buyer receives special prices and discounts.

Purchase agreements can apply to a specific quantity of a product, a specific currency amount of a product, or a specific currency amount of the products in a procurement category. The prices and discounts of the purchase agreement override the prices and discounts that are specified in any trade agreements that exist.

On the **Purchase agreements** page, you can create, apply, and follow up on purchase agreements that exist between your organization and your vendors. For example, after you create a purchase agreement, you can order directly from it. Each purchase agreement has a validity period that is defined by the person who creates the purchase agreement. The delivery date of a purchase must be within the effective dates of this validity period.

After you create a purchase agreement, you must activate it before it becomes effective. To activate a purchase agreement, set the **Mark agreement as effective** option to **Yes**.

To prevent your purchase agreement from being used and confirmed, mark the agreement status as **Closed**. You can still update the status to **Effective** any time after making this change.

Responsible workers on purchase agreements

You can identify a primary responsible worker and secondary responsible worker on the purchase agreement classification. These values will be inherited by the resulting purchase agreement. You're not required to add responsible workers to the purchase agreement, and they can be modified directly on a per case basis on the purchase agreement itself. You can't specify a secondary responsible worker without a primary responsible worker, although you don't have to have a secondary responsible worker. You can't specify the same worker as both the primary and secondary responsible worker.

IMPORTANT

Before you can use the responsible party feature, it must be turned on in your system. Admins can use the [feature management](#) settings to check the status of the feature and turn it on. In the **Feature management** workspace, the feature is listed in the following way:

- **Module:** *Procurement and sourcing*
- **Feature name:** *Purchase agreement responsible party*

Commitment types

Each line in a purchase agreement is a commitment to buy something. You can use lines from multiple purchase orders (POs) to fulfill the commitment. There are four types of commitments:

- **Product quantity commitment** – You purchase a specific quantity of a product.
- **Product value commitment** – You purchase a specific currency amount of a product.
- **Product category value commitment** – You purchase a specific currency amount in a procurement category. The amount can be for a catalog item or a non-catalog item.
- **Value commitment** – You purchase a specific currency amount of any product or products in any

procurement category.

Pricing terms for purchase agreements

Pricing terms can vary, depending on the type of commitment. The pricing terms from purchase agreements override any other pricing terms that are set up for trade agreements. The following table describes the price-related fields that are affected by each commitment type. Fields that contain **Yes** can be updated on an order line.

COMMITMENT TYPE	UNIT PRICE	PRICE UNIT	DISCOUNT PERCENT	CASH DISCOUNT AMOUNT
Product quantity commitment	Yes	Yes	Yes	Yes
Product value commitment			Yes	
Product category value commitment			Yes	
Value commitment			Yes	

Policies for purchase agreements

The following policies affect the way that the link between a purchase agreement commitment and the corresponding PO lines works:

- **Max is enforced** – The total quantity or amount for all order lines can't exceed the quantity or amount that is specified on the related commitment.
- **Price and discount is fixed** – The price on an order line and the price on the related commitment must be the same. If the price is changed on the order line, the link to the commitment is broken. If the link is broken, the order line doesn't contribute to the fulfillment of the commitment.
- **Minimum release amount and Maximum release amount** – If an amount is specified, you receive a message if you make any change to an order line that causes the order line to differ from the related commitment.

Fulfillment calculations for purchase agreements

Fulfillment quantities and amounts are shown on the **Fulfillment** tab on the **Line details** FastTab of the **Purchase agreements** page.

The **Fulfillment** area shows the remaining amount or quantity that is required to fulfill the commitment.

The **Agreement** area shows the total quantity or the total amount that the sales agreement line is valid for.

You can access the PO lines and the invoice lines that contribute to the fulfillment calculation by selecting the **Related information** action on the lines or on the header of a purchase agreement.

Confirmations and version history for purchase agreements

When you confirm a purchase agreement, the current version of the purchase agreement is stored in a history table. If you change the purchase agreement, you can confirm it again to store another version of the purchase agreement in the history. If you don't confirm a purchase agreement, you can still use it to create POs. However, the history information for the purchase agreement isn't stored. You can preview or print all versions of the

agreement. You can then share the revisions with your vendor to obtain approval.

Applying purchase agreements in the ordering process

When you create a PO, you can apply a purchase agreement to it. Information from the terms for the agreement, such as the payment terms, delivery terms, and delivery address, is then copied to the header of the PO. If the PO contains one or more lines for products or categories that are covered by the agreement, the prices and discounts from the purchase agreement are used for those lines. The amount or quantity on the order line contributes to the fulfillment of the commitment in the purchase agreement. The same PO can include both lines that aren't related to a purchase agreement and lines that have a commitment for a purchase agreement.

You can select a purchase agreement only when you're creating a PO. You can't select a purchase agreement after the PO has been created.

In some situations where POs are created indirectly, you can control whether Supply Chain Management automatically searches for applicable purchase agreements. For example, you might do this when you're automatically firming planned POs or creating POs that are based on sales orders.

Matching policy on purchase agreements

You can define a line matching policy on the header of the purchase agreement. This line matching policy will respect the accounts payable parameters line matching policy when the **Allow matching policy override** field on the **Accounts payable parameters** page (on the **Price and quantity matching** FastTab) is set to **Higher than company policy**. Documents that reference the purchase agreement will use the line matching policy that's defined on the purchase agreement header unless otherwise defined on the corresponding item, item and vendor, or category purchasing policy.

Purchase agreements and intercompany trade

Intercompany trading relationships can be created between vendor accounts and customer accounts that are in different legal entities. When a sales order or PO is created for one of the parties, an intercompany order chain is created. In the order chain, the sales order and PO are created in the appropriate legal entities.

You can create a purchase agreement or sales agreement for one of the intercompany trading parties. You can then generate the corresponding sales agreement or purchase agreement for the other intercompany trading party in the other legal entity.

If you create an intercompany PO that uses the intercompany purchase agreement in one legal entity, the corresponding intercompany sales order uses the corresponding intercompany sales agreement in the other legal entity. The fulfillment of the sales agreement commitments and the fulfillment of the purchase agreements are synchronized, just as the intercompany sales order and the intercompany PO are synchronized.

Financial dimensions on purchase agreements

You can copy financial dimensions to document headers or to individual lines of a purchase agreement. If you change the dimensions in the agreement header or on the agreement line, the change doesn't affect any released orders, but it will be reflected on any new orders.

Additional resources

[Create a purchase agreement](#)

[Create a purchase release order from a purchase agreement](#)

NOTE

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Create a purchase agreement

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This topic guides you through the creation of a purchase agreement. This would typically be done by a purchasing manager. You can use this procedure in demo data company USMF or on your own data. You need to have set up purchase agreement classifications before you start. Once you've created an agreement you can use it when you create a PO, and this will copy the purchase agreement conditions to the header and to any lines in the order that are affected by the agreement.

Create a new purchase agreement

1. Go to **Navigation pane > Modules > Procurement and sourcing > Purchase agreements > Purchase agreements**.
2. Click **New**.
3. In the **Vendor account** field, select the drop-down menu and select the row of the desired record.
4. In the **Purchase agreement classification** field, select the drop-down menu and select the row of the desired record.
5. Expand the **General** FastTab.
6. In the **Expiration date** field, enter a date.
 - This expiration date will be the default for all commitment lines and will determine how long each specific commitment is valid.
7. In the **Document title** field, type a name for your purchase agreement.
 - Leave the **Default commitment** field set to **Product quantity commitment** (or change it if it's not set to this).
 - The default commitment value determines your options on the agreement lines. If you need a new commitment type when you're creating the agreement lines, you need to change the default commitment on the header. There are 4 types of commitments: **Product quantity commitment** - for a specific quantity of a product; **Product value commitment** - for a specific currency amount of a product; **Product category value commitment** - for a specific currency amount in a procurement category where the amount can be for a catalog item or a non-catalog item; **Value commitment** - for a specific currency amount which can be fulfilled by any product or by any procurement category.
8. Select **OK**.

Add a commitment

1. Select **Add line**.
2. In the **Item number** field, select the desired record from the drop-down menu.
3. In the **Quantity** field, enter a number. This is the total quantity that you have agreed to buy from your vendor.
4. In the **Unit price** field, enter a number.
5. Expand the **Line details** section.
6. Set the **Max is enforced** option to **Yes**. The **Max is enforced** option limits the use of the commitment. You can only purchase up to the quantity that's specified in the **Quantity** field for the line.

Add header conditions

1. On the Action Pane, select **Options**.
2. Select **Change view**.
3. Select **Header view**.
4. Expand the **Terms** section.
5. In the **Method of payment** field, select the desired record in the drop-down menu. The payment terms from the vendor account are shown here by default.
6. In the **Mode of delivery** field, select the desired record in the drop-down menu.
7. In the **Delivery terms** field, select the drop-down button to open the lookup.

Confirm and activate the agreement

1. On the Action Pane, select **Purchase agreement**.
2. Select **Confirmation**. Set the **Mark agreement as effective** option to **Yes**.
3. Select **OK**.
4. On the Action Pane, select **Purchase agreement**.
5. Select **Purchase agreement confirmations**. The **Preview/Print** option allows you to generate a document for the purchase agreement which you can then print or send to the vendor. If you update the agreement later on and re-confirm it, both versions will be shown here.
6. Close the page.

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Automatic allocation of charges

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Based on the customer that you're working with or the item that you're selling, you might want to apply specific additional charges. The *charges* feature in Microsoft Dynamics 365 Supply Chain Management helps you automatically allocate charges to purchase orders or sales orders.

Automatic charges, or auto charges, are automatically applied when you create a sales order or a purchase order. You can define auto charges for specific vendors, customers, groups of vendors, or items. You can also define auto charges that apply to all vendors, customers, or items.

Set up charges codes

To allocate charges, you must first define charges codes.

1. Follow one of these steps:
 - For purchase orders: Go to **Accounts payable** > **Charges setup** > **Charges code**.
 - For sales orders: Go to **Accounts receivable** > **Charges setup** > **Charges code**.
2. On the Action Pane, select **New** to create a charges code.
3. In the header of the new record, set the following fields:
 - **Charges code** – Enter a code for the charges.
 - **Description** – Enter a description of the charges.
 - **Item sales tax group** – Select an item sales tax group, if applicable.
 - **Prorate** – Set this option to *Yes* if you want to prorate your charges. This option is available only for sales orders.
 - **Maximum amount** – Enter the maximum amount that is allowed for the charges code. This field is used to validate charges for vendor invoices. It's available only for purchase orders.

NOTE

To turn on the functionality for validating charges for purchase orders, go to **Accounts payable** > **Setup** > **Accounts payable parameters**. On the **Invoice validation** FastTab, in the **Invoice validation** section, set the **Enable invoice matching validation** option to *Yes*.

4. The **Posting** FastTab includes **Debit** and **Credit** sections. Set the following fields, depending on the ledger that you want to post the charges to:
 - **Type** – Select the type of account that you're posting to (*Ledger, Customer, or Item*).
 - **Posting** – Select the type of postings to create (such as *Broker fee* or *Customer settlement*).
 - **Account** – Select the account to post the charge for.
5. On the Action Pane, select **Save**.

Create charge groups

Charge groups automatically allocate specific charges to a group of customers or vendors. The following subsections describe how to create and assign these charge groups.

Charge groups for purchase orders

To create charge groups for purchase orders, follow these steps.

1. Go to **Accounts payable > Charges setup > Vendor charges group**.
2. On the Action Pane, select **New** to add a row to the grid, and then set the following fields:
 - **Charges group** – Enter the name of the charge group.
 - **Description** – Enter a description of the charge group.
3. On the Action Pane, select **Save**.
4. Go to **Accounts payable > Vendors > All vendors**, and either open an existing vendor or create a new vendor.
5. On the **Purchase order defaults** FastTab, in the **Purchase order** section, set the **Charges group** field to the charge group that you just created.

Charge groups for sales orders

To create charge groups for sales orders, follow these steps.

1. Go to **Accounts receivable > Charges setup > Customer charge groups**.
2. On the Action Pane, select **New** to add a row to the grid, and then set the following fields:
 - **Charges group** – Enter the name of the charge group.
 - **Description** – Enter a description of the charge group.
3. On the Action Pane, select **Save**.
4. Go to **Accounts receivable > Customers > All customers**, and either open an existing customer or create a new customer.
5. On the **Purchase order defaults** FastTab, in the **Sales order** section, set the **Charges group** field to the charge group that you just created.

Define auto charges

After your charges codes are set up, follow these steps to define the auto charges.

1. Follow one of these steps:
 - For purchase orders: Go to **Procurement and sourcing > Setup > Charges > Automatic charges**.
 - For sales orders: Go to **Accounts receivable > Setup > Charges setup > Auto charges**.
2. In the list pane, in the **Level** field, select the level where your auto charge applies:
 - *Main* – Apply charges to the order header.
 - *Line* – Apply charges to the order lines.
3. Select an existing auto charge to edit it, or select **New** to define a new auto charge.
4. In the **Account code** list, select one of the following values to specify the scope of accounts that will be affected:
 - *Table* – Assign charges to a specific customer or vendor.
 - *Group* – Assign charges to a miscellaneous charges group.
 - *All* – Assign charges to all customers or vendors.
5. In the **Customer relation** or **Vendor relation** field, select a specific customer or vendor if you set the **Account code** field to *Table*. If you set the **Account code** field to *Group*, select a customer or vendor

charges group.

6. In the **Item code** field, select one of the following values to specify the scope of items that will be affected. You can select an item code only when you define auto charges at the line level.
 - *Table* – Assign charges to a specific item.
 - *Group* – Assign charges to an item charges group.
 - *All* – Assign charges to all items.
7. In the **Item relation** field, select a specific item if you set the **Item code** field to *Table*. If you set the **Item code** field to *Group*, select an item charges group.
8. **For sales orders only:** In the **Mode of delivery code** field, select one of the following values to specify the scope of delivery modes that will be affected:
 - *Table* – Assign charges to a specific mode of delivery.
 - *Group* – Assign charges to a mode of delivery group.
 - *All* – Assign charges to all modes of delivery.
9. **For sales orders only:** In the **Mode of delivery relation** field, select a specific mode of delivery if you set the **Mode of delivery code** field to *Table*. If you set the **Mode of delivery code** field to *Group*, select a mode of delivery group.
10. On the **Lines** FastTab, define the charges and the charges rates that will be used when the current auto charge is applied. You can use the toolbar on this FastTab to add as many lines as you require. For each line, set the following fields:
 - **Currency** – Select the currency that should be used to calculate the charge.
 - **Charges code** – Select the code for the charge.
 - **Category** – Select one of the following values:
 - *Fixed* – The charge is entered as a fixed amount on the line. Fixed charges can be used on charges both in the order header and on the order lines.
 - *Pcs* – The charge is based on the unit. These charges can be used only on order lines. They will appear when you calculate the order total.
 - *Percent* – The charge is entered as a percentage on the line. Percentage charges can be used on charges both in the order header and on the order lines.
 - *Intercompany percent* – The charge is entered as a percentage on the line for intercompany orders. Intercompany percentage charges can be used only on order lines.
 - *External* – The charge is calculated by a third-party service that is associated with one or more shipping carriers.
 - **Charges value** – Enter the charge value, based on the category that you selected.
 - **Charges currency code** – Specify a currency for the charge if you want to use a currency other than the currency that you specified in the **Currency** field. You can use a different currency only if the **Debit type** or **Credit type** field is set to either *Ledger account* or *Item* for the selected charges code.
 - **From amount** – Specify a starting amount to apply the auto charge to. In this context, the amount refers to the order total.
 - **To amount** – Specify the ending amount to apply the auto charge to. In this context, the amount refers to the order total.
 - **Sales tax group** – Specify a sales tax group.
 - **Site and Warehouse** – Specify a site and warehouse if charges should be applied only for a

specific site and warehouse.

- **Keep** – Select this check box to keep the charges transactions after invoicing is completed, so that the charge will be applied every time that you create a new invoice for the selected customer account.

11. **For sales orders only:** If you want to calculate tiered charges, see [Tiered charges on sales orders](#) for information.

Allocate charges from the header to a line

The following procedure shows how to allocate header-level charges to a line. Before you start this procedure, you should already have a header-level charge of the *fixed amount* type and an order where that charge is applied. Additionally, the order should already include at least one line item.

1. Open the purchase order or charge order.
2. On the Action Pane, follow one of these steps:
 - For purchase orders: On the **Purchase** tab, in the **Charges** group, select **Allocate charges**.
 - For sales orders: On the **Sell** tab, in the **Charges** group, select **Allocate charges**.
3. In the **Allocate charges to order lines** dialog box, set the following fields:
 - **Charges allocation** – Select one of the following values to specify how the charges should be allocated:
 - *Net amount* – Allocate charges according to each line amount relative to the total net amount.
 - *Quantity* – Allocate charges according to the number of units for each line relative to the total number of units.
 - *Per line* – Allocate charges equally among the total number of lines.
 - **Allocate charges to lines** – Select a value to specify whether charges should be allocated to all lines, to positive lines only, or to negative lines only.
 - **Allocate all** – Select this check box to allocate charges to order lines even if the charges code has a debit type other than *Item*.
 - **Received** – Select this check box to allocate charges only to received order lines.
 - **Stocked** – Select this check box to allocate charges to only inventoried order lines.
 - **Show selections and clear specific lines** – Select this check box to exclude specific lines from this allocation. When you select this check box, the **Choose lines to exclude from allocation** grid is opened. This grid includes only lines that match the criteria that are defined by the **Allocate charges to lines** and **Stocked** settings. For example, if you set the **Allocate charges to lines** field to *Positive lines* and select the **Stocked** check box, the grid shows only lines that are both positive and inventoried. In addition, the grid automatically filters out any lines that the full quantity has already been received for. While the grid is open, clear the **Include** check box for each line that should be excluded from allocation.

IMPORTANT

When you work with the **Choose lines to exclude from allocation** grid, be sure to leave the grid open until you select **Allocate**. If you close the grid before you select **Allocate**, your settings in the grid will be lost. Therefore, charges will be allocated based on the criteria that you previously defined.

4. Select **Allocate** to apply your settings and close the dialog box.

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Vendor rebates

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Vendor rebates help companies better manage their supplier rebate programs by automating tasks that are required in order to administer, track, and claim rebates that are earned.

This topic provides an overview of the most common tasks that you might want to perform when you work with vendor rebates. The overview covers the following tasks:

- Review details of a rebate agreement.
- Identify orders that qualify for rebates, and generate rebate claims.
- Review and approve claims.

Audience and purpose

The information in this topic is intended for business decision makers in enterprise companies, in positions such as purchase manager, chief financial officer (CFO), and accounting manager, who have the following responsibilities:

- Negotiate vendor price, discount, and rebate agreements.
- Manage staff that processes rebate claims and collects payments.
- Order inventory at the best possible prices.

People in these positions are looking for ways to achieve various goals. Here are some examples:

- Flexibly accommodate different types of vendor promotion programs and rebate conditions.
- Reduce the administrative burden and errors that are associated with monitoring promotion performance and processing claims.
- Improve cash flow forecasts by accruing for future receivables.
- Have a quantified basis for ongoing and future negotiations with vendors about rebates.

Review details of a vendor rebate agreement

A vendor rebate agreement is a record of a contract with a vendor that specifies the negotiated terms and conditions under which the company qualifies for a monetary reward in return for achieving preset purchase targets. Vendor rebate agreements are recorded on the **Rebate agreements** page.

To open the **Vendor rebate agreements** page, select **Procurement and sourcing > Vendor rebates > Rebate agreements**.

Vendor rebate agreements

OVERVIEW GENERAL NOTE DIMENSIONS

Workflow approval status	Rebate program ID	Vendor code	Vendor selection	Item code	Item selection	Unit	Unit type	Minimum qua...	Minimum amo...	Start date	Expiry date
Approved	Promo	Table	US-101	Table	T0020	ea	Inventory unit	10	0,00	2/1/2014	Never

CUMULATE: Cumulate purchases by: Month
 PRICE: Taken from: Gross
 ACCOUNTS: Rebate program accrual account: 130701
 CURRENCY: Currency: USD
 APPROVAL: Approval required: Yes
 LINE BREAKS: Rebate line break type: Quantity
 VALIDATION: Validated: Yes
 Period type:
 Rebate program expense account: 520202
 Validated by: 000020

LINES

Vendor code	Vendor selection	Item code	Item selection	Currency	Unit	Rebate line br...	From value	To value	Value	Amount type
Table	US-101	Table	T0020	USD	ea	Quantity	10,00	20,00	15,0000	Amount per unit
Table	US-101	Table	T0020	USD	ea	Quantity	20,00	0,00	30,0000	Amount per unit

On the **Vendor rebate agreements** page, you can view details about the negotiated conditions of a vendor agreement.

The agreement's header specifies the general conditions that qualify a company for rebates. In effect, the header information specifies that a vendor grants a rebate when a specific product is bought in a specific quantity. On the header, you also specify the unit of measure rebate option and the calculation date type.

- On the **Overview** tab, if you have lines with **Item code** set to *table* to specify the item, then the agreement is for that specific item. If you have lines with **Item code** set to *Group* or *All* to specify the items, then the vendor rebate agreement will be individually processed per item qualifying for the item code, not across all items qualifying for the item code.
- On the **General** tab, in the **Unit of measure rebate option** field, you can define whether a unit of measure should be a condition for the purchase order line to qualify for a rebate claim.
 - **Convert** – A purchase order line qualifies for a vendor rebate per the rebate agreement. You will receive a rebate regardless of the unit of measure that is applied on the line.
 - **Exact match** – To qualify for a rebate, a purchase line must have the same unit of measure that is specified on the agreement.
- On the **General** tab, in the **Calculation date type** field, select the date that is used to determine whether the purchase occurs in the validity period of the rebate agreement.
 - **Created** – Use the creation date of the purchase order.
 - **Requested delivery** – Use the requested delivery date.

On the agreement lines, you can specify the vendor rebate agreement in more detail.

- In the **Cumulate purchase by** field, you can set the calculation of the rebate claim. The amount can be set to depend on a period (of week, month, year, lifetime or a customized period). The **Invoice** value indicates that a rebate claim will be determined every time that a purchase order line is invoiced.
- In the **Taken from** field, you can specify the basis for the rebate calculation.
 - **Gross** – The rebate is calculated based on the gross price of the item.
 - **Net** – The rebate is calculated based on the net price of the item (that is, the price after other discounts have been applied).
- The **Rebate program accrual account** and **Rebate program expense account** fields specify account numbers that will receive accrued rebate amounts during the intermediate stage between approval and processing.
- When the **Approval required** option is set to **Yes**, the rebate claim must be approved before it can be

accrued or paid out.

- The **Rebate line break type** field specifies the basis for the rebates.
 - **Quantity** – The rebates are volume-based.
 - **Amount** – The rebates are amount-based.
- On the **Lines** FastTab, you can see how different quantity tiers can be set up to grant different rebates. For example, in the previous illustration, the **From value** and **To value** fields indicate that a product quantity between 10 and 19 units will qualify for a rebate of USD 15 per unit.

NOTE

The **From value** value is inclusive, whereas the **To value** value is exclusive. For example, the **Rebate line break type** field is set to **Quantity**, and you enter 1 in the **From value** field and 3 in the **To value** field. In this case, the rebate amount applies when you purchase one or two items, but not when you purchase three items.

- In the **Workflow approval status** field, the **Approved** value indicates that the agreement can be applied to purchase orders that meet the agreement's conditions.

Identify orders that qualify for rebates, and generate rebate claims

When purchase orders are placed with a vendor that the company has a rebate agreement with, the program identifies any future vendor credit payments. If the purchase orders qualify for a rebate, a rebate claim is generated for every order line as soon as a purchase invoice has been posted. This process is automatic. Later, you can review the expected rebates and see the impact of those rebates on the product's cost and profit margin.

View details of rebates that are applied to a purchase order line per the vendor rebate agreement

1. On the **Purchase order** page, select an order line, and then select **Purchase order line > View > Price details**.
2. On the **Price details** page, select the **Rebates** FastTab.

The rebate information is also shown in the **Vendor rebate** field in the **Margin estimation** section of the **Price details** page.

NOTE

On the **Procurement and sourcing parameters** page, on the **Prices** tab, verify that the **Enable price details** option is set to **Yes**. If the option is set to **No**, you won't be able to view the rebates.

Review and approve claims

Rebate claims that are generated represent the future payments that can be expected from the vendor. Before a credit note is issued to the vendor, the agreement owner typically wants to review the claims and approve them. However, note that the status of a claim determines whether the claim is ready to go through the approval process.

The status of claims and the effect on the approval process

When a claim is generated, its status is set to **To be calculated** if the rebate is granted on a cumulative basis or **Calculated** if the rebate is granted per invoice. If the status of a claim is **To be calculated**, the claim must go through a calculation process that is handled by the **Cumulate** function. Only claims that have a status of **Calculated** can be included in the approval process.

NOTE

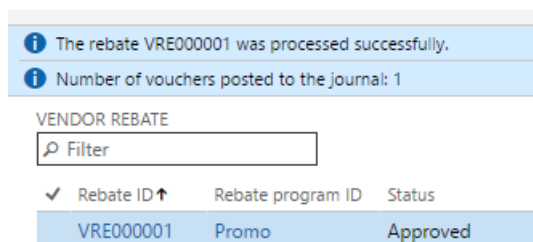
If the **Approval required** option on a vendor rebate agreement is set to **No**, any claims that are generated will have a status of **Approved**. The approval is mandatory for claims that are granted on a cumulative basis.

Approve claims, and view postings and invoice details

When claims have been approved, they can be processed by Accounts payable (A/P). A credit memo (vendor invoice) for the rebate claim amount is automatically generated. The credit can then be added to the vendor balance, and the A/P team can include it in the regular settlement process.

1. Select **Procurement and sourcing > Vendor Rebates > Rebate claims** to open a rebate claim.
2. Close the rebate claim.
3. Mark the claim, and then, on the Action Pane, select **Approve**.
4. On the request page, in the **Vendor** field, select the vendor that you're authorized to receive a rebate from, and then select **OK**.

A Rebate accrual journal is posted for the claim amount. This posting debits the Accrued Vendor Rebates Receivable account for the expected vendor credit and credits the interim Accrued Vendor Rebates Received account for the expected gain.



5. In the rebate list, select the line, and then, on the Action Pane, select **Rebate transactions** to see and navigate to the journal batch number for this rebate accrual posting.

To move the claims to the regular A/P process, the A/P clerk must now complete the rebate claim handling by running the Process function.

6. On the Action Pane, select **Process**, and then select **Filter**. In the **Criteria** field for the **Vendor account** field, select the vendor to process rebate claims for, select other relevant filters, and then select **OK**.

The message bars and the fact that the status is changed to **Completed** indicate that the following events have occurred:

- A Rebate accrual journal posting has reversed the previous interim amounts on the accrual receivable and expense accounts.
- A vendor invoice (credit note) for the rebate amount has been created.

NOTE

The setting of the **Manual invoice posting** option on the **Rebate program** tab of the **Procurement and sourcing parameters** page determines whether a vendor invoice is posted manually or automatically as part of claim processing.

- When the vendor invoice is posted, either automatically or manually, the vendor's Payable account has been debited, and the Discounts and Allowances Received account has been credited.

NOTE

The Discounts and Allowances Received account number is specified for the procurement category that is used on the purchase invoice line for the rebate. The procurement category, in turn, is set on the **Rebate program** tab of the **Procurement and sourcing parameters** page.

7. In the rebate list, select the line, and then, on the Action Pane, select **Rebate transactions** to see and navigate to the journal batch number for this rebate accrual posting and also the vendor invoice number.
8. Select the line for the vendor invoice transaction, and then, on the Action Pane, select **Vendor invoice**. If the vendor invoice has been posted, you will see the Invoice journal. Otherwise, you will see the vendor invoice as a pending vendor invoice that requires manual posting.

The invoice line specifies the details of the vendor invoice for the **Commissions and Rebates** procurement category.

9. On the **All vendors** page, select the vendor that you receive a rebate from, and then, on the Action Pane, select **Transactions**. Find the line for the invoice. The rebate amount has now been added to the vendor balance.

Summary

The process for handling vendor rebates involves multiple manual tracking tasks that are often tedious. By automating these tasks, the vendor rebate management feature can help you move through the following processes:

- Generating accurate rebate claims
- Accruing the expected receivable and interim gain in the general ledger
- Updating the vendor balance and the income statement with the allowance that is due

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Troubleshoot prices, discounts, agreements, and rebates

2/18/2021 • 5 minutes to read • [Edit Online](#)

This topic describes how to fix issues that you might encounter while you work with prices, discounts, agreements, and rebates.

I can't link a purchase agreement to a purchase order line after the purchase order is created.

A purchase agreement must be associated with a purchase order when the purchase order is created. Otherwise, purchase order lines can't be associated with purchase agreement lines.

What check triggers the "Update prices and discounts entered manually or external document" message?

When you change the shipping date, you might receive a message that states, "Update prices and discounts entered manually or external document." You receive this message because, if the shipping date is changed, a different trade or sales agreement might be triggered and cause a price change. A change to the shipping date can also affect warehouse schedules and other related information.

The message is triggered whenever any of the dates or some other parameters are changed. The purpose of the message is to make sure that you're aware of price changes that can occur because of those changes.

The message is the trade agreement evaluation (TAE) prompt. For a full description, see [Trade agreement evaluation policies](#).

A purchase order receipt doesn't include all charges.

Reproduce the issue

The following procedure shows one way to reproduce the issue.

1. On the **Procurement and sourcing parameters** page, on the **Delivery** tab, make sure that the **Generate charges on product receipt** option is set to *Yes*.
2. Create a purchase order that includes charges.
3. Confirm the purchase order.
4. Receive the purchase order.
5. Look at the receipt total, and compare it to the expected total.
6. Notice that not all the charges are included on the purchase order receipt.

Issue resolution

The resolution depends on the way that the miscellaneous charges have been set up. For information about how to set up miscellaneous charges to meet your requirements, see the following blog post: [Post misc. charges at time of product receipt](#).

Trade agreement prices and discounts aren't applied on sales or purchase order lines that are imported through data management.

Issue description

Trade agreements that are applicable to sales or purchase order lines aren't applied on lines that are imported through data management. However, the same trade agreements are applied on sales or purchase order lines that are manually created.

Reason for the issue

If purchase order lines that are imported via data management already include price information, the trade agreement won't be reevaluated for those lines. For example, if **Line discount percentage** or any of the price and discount values is set for a line, then trade agreements will not be looked up for that line.

Issue workaround

This behavior is expected, and is similar for both sales orders and purchase orders.

As a workaround, import the purchase order lines without setting any price information. The trade agreements will then be applied, and the purchase order lines will be updated based on the defined trade agreements.

A vendor rebate isn't cumulated based on invoices.

Issue description

If invoices that are posted have different due dates, those invoices aren't reflected in vendor rebates that are generated from them.

Issue resolution

By design, the due date isn't considered when the vendor rebate is calculated. Consider customizing the system so that the due date and the relation to the invoice are more apparent with respect to the actual vendor rebate.

Unit prices on purchase orders aren't calculated based on the unit conversion.

Issue description

When a unit is changed on a purchase order, trade agreement prices aren't recalculated according to unit conversion definitions.

Issue resolution

Prices are always obtained from trade agreements (or other price settings in the system, such as sales agreements or item prices), and they are set for a unit.

If the unit is changed on an order line, the system looks for a price for the new unit and applies that price. If no price is found for the unit, the system doesn't apply a price. The unit conversion can't be used to recalculate the price into another unit. Theoretically, the price for one box of ten might not equal ten times the price of one box.

Issue workaround

One way to work around this issue is to make sure that there are trade agreements for the units that you expect will be used on order lines for the item.

Currency conversion issues occur with trade agreements.

Trade agreement prices aren't recalculated according to the currency when the currency differs on a purchase order.

The *Generic currency* feature lets you define prices and discounts in only one currency. You can then convert to other currencies as you require. Furthermore, after the conversion is done, the feature can automatically apply smart rounding.

When I open the Purchase agreement page in a line view mode, I can't personalize the page by adding the Price unit field in the overview of the line.

Some shared fields in the agreement framework can't be included in personalizations. This limitation occurs because of the data model that is implemented. Therefore, you can't personalize the Price unit field.

The maximum limit from a purchase agreement isn't effective on a purchase requisition.

Issue description

When a purchase requisition is linked to a purchase agreement, the maximum limit from the purchase agreement isn't effective on the purchase requisition. The default price information is correctly entered, but more than the maximum limit from the purchase agreement can be ordered in the purchase requisition.

Issue resolution

This behavior is expected. Because requisitions aren't always approved, a quantity or amount should not be reserved on the purchase agreement. Therefore, you won't meet the maximum limit from the purchase agreement.

Trade agreements can be created from rejected RFQs. Therefore, the system doesn't prevent trade agreement journals from being created if the RFQ line hasn't been accepted.

You can create trade agreements for any replies for a request for quotation (RFQ), regardless of whether they were accepted or rejected. For more information, see [Requests for quotation \(RFQs\) overview](#).

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Purchasing policies overview

2/18/2021 • 12 minutes to read • [Edit Online](#)

This article provides information about purchasing policies. A purchasing policy is a collection of rules that control the requisition process. Purchasing policies help procurement administrators implement their procurement strategy by creating a policy structure that is aligned with the organization's strategic purchasing requirements.

A purchasing policy consists of a set of policy rules. When you define a policy rule, you first select a rule type. You then create a rule for the rule type by defining the settings, the start date, and the end date for the rule.

For example, an administrator creates a policy, selects the **Catalog policy** rule type, and then adds a catalog policy rule to the policy. This catalog policy rule specifies that the Adventure catalog must be used for internal procurement. After the purchasing policy is associated with a particular organization, employees of that organization see the Adventure catalog when they create requisitions.

Assigning policies to organizations

Before a policy can take effect, it must be associated with an organization. Purchasing policies are associated with the **Procurement internal control** hierarchy purpose. Therefore, purchasing policies apply only to organizations in hierarchies that have a hierarchy purpose of **Procurement internal control**. You can also select organizations from the flat list of legal entities in the CompanyInfo table. These legal entities are designated in the policy framework as "Companies."

Determining which rule to apply

Depending on how you configure your purchasing policies, multiple rules can affect the users in an organization. The following examples illustrate different ways that you can configure purchasing policies and specify how policies are applied when a transaction occurs.

Example 1: Simple purchasing policy configuration

Organizations that are small and less complex can set up purchasing policies by legal entity, and can use only the Companies organization hierarchy.

For Fabrikam, a small business, purchasing requirements vary little across the organization. Purchasing rules vary only among the organization's legal entities. For example, employees of Fabrikam Canada and employees of Fabrikam U.S. purchase goods and services from different catalogs and different vendors. Therefore, Fabrikam sets up its purchasing policies at the legal-entity level.

Fabrikam creates two purchasing policies. Policy A applies to its U.S. legal entity, 1111. Policy B applies to its Canadian legal entity, 2222. When an employee in legal entity 1111 creates a purchase requisition, the policy rules are derived from policy A. For example, the product catalog that the employee sees is specified in the catalog policy rule for policy A.

When an employee in legal entity 2222 creates a purchase requisition, the policy rules are derived from policy B.

Note: If an employee of legal entity 1111 purchases an item on behalf of an employee of legal entity 2222, the policy rules that are specified for legal entity 2222 (that is, the policy rules from policy B) are applied.

Example 2: Complex purchasing policy configuration

In the previous example, all purchasing rules were defined in a single organization hierarchy, the Companies organization hierarchy. However, a complex organization might define policies for multiple organization

hierarchies.

Contoso is a large company that requires complex purchasing rules to control the requisition process. Contoso has defined rules for two different organization hierarchies: Department and Global purchasing control.

Policy 123 is defined for the Department organization hierarchy for the Sales UK – Sales department. In policy 123, the purchase requisition control rule specifies that restrictions must be enforced for minimum order quantities. In this rule, the **Enforce minimum order quantity restrictions** option is selected.

Policy 456 is defined for the Global purchasing control organization hierarchy for the Sales and Marketing department. In policy 456, the purchase requisition control rule doesn't specify that restrictions must be enforced for minimum order quantities. In this rule, the **Enforce minimum order quantity restrictions** option is de-selected.

Sam works in the Sales UK – Sales department in Contoso's United Kingdom office. The policies for both the Department and Global purchasing control organization hierarchies apply to his department. When Sam creates a purchase requisition, the system must determine which policy to apply. The system administrator set up the purchasing policy parameters to specify that purchasing policies must be applied in the following order of precedence:

1. Global purchasing control
2. Department
3. Companies

Therefore, policy 456 is applied to the purchase requisition that Sam creates, and no minimum order quantity is required for the purchase requisition.

Policy rules

Catalog policy rule

The catalog policy rule determines which procurement catalog users see when they create purchase requisitions. If a user has been granted permission to order products on behalf of another user, the requisition uses the catalog policy rule that is defined for the requester's legal entity and operating unit to determine which catalog to display. Before you can define a catalog policy rule, you must create and publish a procurement catalog.

Category access policy rule

The category access policy rule determines which categories users have access to when they create purchase requisitions. If no rule is specified, all the procurement categories can be added to the purchase requisition.

1. Select the **Include parent rule** option to apply the category access policy rule of the parent organization to the category.
2. In the **Available categories** pane, select the categories that the rule applies to. When you select a category, all categories that are higher in the hierarchy are also added to the **Selected categories** list.
3. Select the **Include subcategories** option to apply the rule to all subcategories of the selected category.

Category policy rule

The category policy rule defines how users can select vendors for each category. It also defines requirements for the receiving and invoicing processes.

Re-approval rule for purchase orders

The re-approval rule is an optional rule that defines the criteria for requiring re-approval when a purchase order is changed. The selected fields are evaluated in the purchase order workflow when the "Requires purchase order re-approval" condition is set up in the workflow.

NOTE

Accounting distribution will always be reset when an approved purchase order with change management enabled is changed. So you should be aware that if you want to avoid a re-approval of a purchase order when certain fields are changed, the field Accounting distribution.changed should NOT be included as a selected field for re-approval.

Purchase requisition RFQ rule

The purchase requisition RFQ rule defines criteria for requiring a request for quotation (RFQ) for a purchase requisition line. If a line meets the conditions, the "informal RFQ" or "formal RFQ" stamp appears on the requisition line.

Purchase requisition control rule

The purchase requisition control rule for requisitions of type **consumption** is an optional rule. When you create rules of this type, you can set options on various tabs:

- On the **Workflow submission** tab, you can configure the fields that must be entered on the requisition line for the requisition to be submitted for approval.
- On the **Order quantities** tab, you can configure the fields that are required on the purchase requisition under certain conditions. You can also enforce order quantities.
- On the **Dates** tab, you can configure whether the accounting date is the same as the requested date
- On the **Address** tab, you can define whether the user is allowed to create new addresses in the system to apply to the purchase requisition.

Requisition purpose rule

The requisition purpose rule is an optional rule that determines the type of requisition purpose that is allowed for a specific legal entity. Unless another purpose is indicated in this rule, requisitions automatically have a purpose of **Consumption** when they are created.

Replenishment category access policy rule

The replenishment category access policy rule is an optional rule that determines the products that are available to fulfill requisition demand for a specific legal entity when the requisition purpose is **Replenishment**.

Replenishment control rule

The replenishment control rule is an optional rule that defines the fields that must be entered on the requisition line for the requisition to be submitted for approval when the requisition purpose is **Replenishment**.

Purchase order creation and demand consolidation rule

The purchase order creation and demand consolidation rule defines the policy rules to use when a purchase order is generated from an approved purchase requisition. When you create rules of this type, you can set options on various tabs:

- On the **Purchase order split** tab, you can define criteria for splitting purchase requisition lines onto separate purchase orders.
- On the **Price/discount transfer** tab, you can define when to recalculate the price agreement when a purchase order is created:
 - **Only if no trade agreement** – Prices and discounts are transferred from the purchase requisition only if there is no applicable trade agreement or base price. If a trade agreement or base price exists for the item or vendor, the prices and discounts are recalculated based on the trade agreement or the base price, and are applied to the purchase order. Unless otherwise specified, this is the default behavior.
 - **Always** – Prices and discounts are always transferred from the purchase requisition.

You can also allow the requester to change the method of price and discount transfer for individual

purchase requisition lines, regardless of the price/discount transfer rule that is defined. Select the **Allow manual override per purchase requisition line** option to enable this capability.

- On the **Item description transfer** tab, you can transfer the item description from the requisition when it originates from an RFQ.
- On the **Price Tolerance** tab, you can define rules to route approved purchase requisitions back through the review process when the price of a procurement catalog item increases. Set the maximum amount that the net amount on a line item on a purchase requisition can increase between the time when the purchase requisition is approved and the time when the purchase order is created. The net amount is calculated by using the following formula: $[(\text{Quantity} \times (\text{Unit price} - \text{Discount}) \div \text{Price unit}) + \text{Purchase miscellaneous charges}] \times (100 - \text{Discount percent}) \div 100$ Purchase requisition lines that exceed the price tolerance that you set are held for manual processing. The rules that you configure on the **Error processing** tab determine how the purchase requisition lines are processed.
- On the **Error processing** tab, you can configure the processing rule that is applied to a purchase requisition if it fails validation during purchase order creation because of a vendor error or a price tolerance error. Select one of the following options:
 - **No action** – The purchase requisition lines remain on the **Release approved purchase requisitions** page. The status of the purchase requisition lines remains **Approved**. However, the errors must be resolved before a purchase order can be generated for the purchase requisition lines.
 - **Cancel the purchase requisition line** – The purchase requisition lines are canceled. The requester can create a new purchase requisition for the canceled lines if he or she still wants to request the line items.
 - **Create a new purchase requisition line** – The purchase requisition lines are canceled. New purchase requisitions are then generated that contain only the purchase requisition lines that failed validation. The new purchase requisitions that are generated have a status of **Draft**. These purchase requisitions can be resubmitted for review after the validation errors have been resolved. The preparer of the purchase requisition lines is notified that the lines were canceled, and that new purchase requisitions were generated for the purchase requisition lines that failed.
- On the **Manual purchase order creation** tab, you can define the parameters that determine whether a purchase requisition must be manually processed, or whether it can be automatically converted to a purchase order. The parameters can apply to internal catalog items, external catalog items, or non-catalog items. Select one of the following options:
 - **Manually create purchase orders** – Manually create purchase orders for all purchase requisitions.
 - **Automatically create purchase orders** – Automatically create purchase orders for all approved purchase requisitions. No purchase requisitions are held for manual purchase order creation.
 - **Automatically create purchase orders except under these conditions** – Manually create purchase orders for purchase requisitions that match the criteria that you define. All other purchase requisitions that are approved are automatically converted to purchase orders. If you select **Automatically create purchase orders except under these conditions**, you can add procurement categories and vendors to specify which approved purchase requisition lines are held for manual processing. This option can apply to internal catalog items, external catalog items, and non-catalog items. When you select a procurement category, any subcategories for that procurement category are also selected. Select the **All** option for a specific type of purchase requisition line to hold all lines of that line type for manual processing.

If you want purchase orders to be generated automatically from approved purchase requisitions when the batch job for purchase order generation runs, select the **Run automatic purchase order creation as a batch job** option. This option applies only to purchase requisitions that don't require manual processing. By running automatic purchase order generation as a batch job, you can schedule this activity at a time when resources are less constrained. If the **Prepayment required** option is selected on the

purchase requisition lines, select the **When the requisition is set up for prepayment** option to hold approved purchase requisitions for manual processing. Purchase requisitions that are held for manual processing can be filtered so that you can view only those purchase requisition lines that require prepayment.

- On the **Demand consolidation** tab, you can define the parameters that determine whether purchase requisitions that are manually processed can be considered for purchase requisition consolidation. The parameters can apply to internal catalog items, external catalog items, or non-catalog items. Select one of the following options:
 - **Do not allow demand consolidation** – No approved purchase requisition lines are eligible for demand consolidation. This option is selected by default and applies only to purchase requisition lines that require manual processing for purchase order creation.
 - **Always allow demand consolidation** – All approved purchase requisition lines are eligible for demand consolidation. **Note:** If you select the **Always allow demand consolidation** option on the **Demand consolidation** tab, but you select the **Automatically create purchase orders** option on the **Manual purchase order creation** tab, all purchase requisitions are held for manual processing.
 - **Allow demand consolidation under these conditions** – Define the criteria that determine whether approved purchase requisition lines are eligible for demand consolidation. For each type of purchase requisition line, you can set the criteria by procurement category and vendor. If you select **Allow demand consolidation under these conditions**, you can set the criteria by procurement category and vendor for each type of purchase requisition line. When you select a procurement category, any subcategories for that procurement category are also selected. If you select the **All** option for a specific line type, all purchase requisition lines of that line type are eligible for demand consolidation.

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Create purchasing policies

2/18/2021 • 2 minutes to read • [Edit Online](#)

This topic shows you how to create purchasing policies to align with your business processes for purchasing. Before you can create purchasing policies, you must set up the purchasing policy parameters. It's possible to create, modify, and retire a purchasing policy, but you can't delete a purchasing policy. This procedure would typically be carried out by a purchasing manager. You can use this procedure in demo data company USMF or on your own data.

Set up policy parameters

1. In the navigation pane, go to **Modules > Procurement and sourcing > Setup > Policies > Purchasing policies**.
2. On the Action Pane, select **Parameters**.
 - Policy precedence rules apply to different levels in your organization. The organizational units that are shown depend on your organizational hierarchy, and on which levels in the hierarchy have been assigned the purpose of Procurement internal control. For example, your organization might have legal entities, cost centers, regions, and departments, but it may be that only some of these have a hierarchy purpose of Procurement internal control. As a default, the organization of type Company is available.
3. Select the **Policy rule type parameters** tab.
4. In the tree, go to **Purchasing policy > Purchase requisition control rule**.
 - You define the order of precedence for policy resolution at the policy level. However, for some policy types, you can override the order of precedence for individual policy rule types. For example, you might define the order of precedence for purchasing policies to be: cost center, department, company. For the catalog policy rule, you might want the order of precedence to be: department, cost center, company. You can change the order of precedence for the Catalog policy rule. When a worker creates a requisition, the catalog that is displayed is determined by the policies that are associated with the worker's department, then their cost center, and then their company.
 - If there's more than one organizational level listed, you can use the Up/Down arrows to set the order of precedence for the Purchase requisition control rule.
5. Close the page.

Create a new policy

1. Select **New**.
2. In the **Name** field, type a value.
3. In the **Description** field, type a value.
 - A single purchasing policy can only apply to one organization hierarchy. For example, you could have one hierarchy called "Geographic" and one called "Department", and have a different purchasing policy for each.
 - Select an organization that the policy should apply to.
4. Select the arrow to add the selected organization.
 - You can repeat this process to add more organizations.

Add a policy rule

1. In the **Policy rule type** list, select **Requisition purpose rule**.
 - You'll create a rule that sets the default requisition purpose to type Consumption but allows the Replenishment type to be selected instead.
2. Select **Create policy rule**.
3. Select **Yes** in the **Allow manual override** field.
4. Select **Close**.
 - Now you can set up other policy rules for the purchasing policy. Note that a Policy rule type cannot have overlapping rules that are active at the same time within a single procurement policy.

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Set up policies for procurement category hierarchies

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Use this procedure to set up rules for ordering products in a category. The rules are defined for a specific purchasing policy. The category access rule controls which procurement categories employees have access to when they create a requisition. When a requisition is being created, the purchasing policy and category access rule that should be applied are determined by the legal entity and the operational unit that the employee belongs to. You can use this procedure in demo data company USMF. This task would typically be carried out by a purchasing manager.

Find the procurement policy

1. In the Navigation pane, go to **Modules > Procurement and sourcing > Setup > Policies > Purchasing policies**.
2. Click the link on the 'Procurement Policy USMF' policy. This is the policy that you'll add a rule to. It must be an Active policy.

Create a category access rule

1. Expand the **Policy rules** fastTab.
2. In the **Policy rule type** list, select the **Category access policy rule**. If the **Create policy rule** button is dimmed, it's because there's already an active policy rule for Category access. Check the **Effective** and **Expiration** fields to determine which it is, then select it, and click **Retire policy rule**. If the **Create policy rule** button is available, you don't need to do anything.
3. Click **Create policy rule**.
4. In the **Effective date** field, enter a date and time. The time must not overlap with another rule that's already active.
5. Select a category that the rule will apply to. Make a note of which category this is – you'll need it later. When you select a category, its parent category or categories will also be added to the Selected categories list. If you want the rule to apply to all subcategories of the selected category, select the **Include subcategories** check box.
6. Click the right arrow to add to the **Selected categories** list.
7. Click **OK**. If you set the **Include parent rule** option to Yes, the policy rule that you define for a parent category is also assigned to its child categories, if no policy rule has been defined for the child categories.

Create a category policy rule

1. In the **Policy rule type** list, select the **Category policy rule**. If the **Create policy rule** button is dimmed, select the active policy rule, and then click **Retire policy rule**.
2. Click **Create policy rule**.
3. In the **Effective date** field, enter a date and time.
4. Click **Add**.
5. In the **Category** field, select the same category that you used for the **Category access rule**.
6. In the **Vendor selection** field, select an option. Select a rule to control which kind of vendors can be selected for the category when requisitions are created.
7. Click **Close**. The policy rules that you have defined have been for requisitions of type Consumption. If you wanted to define policies for requisitions of type Replenishment, you would create a rule for the Policy rule

type called "Replenishment category access policy rule".

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Product receipt against purchase orders

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This topic describes the various options for registering products as received.

Product receipt is the process of recording that products that were ordered have been received, so that the purchase order (PO) lines can then be processed for invoicing. In some cases, products go through preregistration, where additional information from the supplier is recorded before the products are received. When products arrive, they are first marked as **Registered**. The products might then go through additional processes, such as quality management, before they are finally marked as **Received**.

Preregistration (ASN)

Suppliers might share information about products that will be shipped. In this case, you can preregister the products to record this information before the products are received. By preregistering products, you reduce the amount of work that is required during item registration and receipt. Suppliers can provide product information electronically through an Advance Shipment Notice (ASN) that is then automatically recorded in the system. The information in the ASN includes the quantity of products that will be shipped and the date when they will be shipped. The ASN might also include information such as batch or serial numbers. Registration of the ASN occurs in the **Transportation management** module.

Registration

Product receipt registration often occurs at the inbound docks in a warehouse. It's performed either by using a hand-held device or through arrival journals. Alternatively, you can manually register product receipt by using the **Registration** action on the **Purchase order** page. In both cases, the products are marked as **Registered**. Note that the products aren't yet marked as **Received**.

Products that are received in a warehouse might go through quality inspection before they are put away into inventory. Either quality orders or quarantine orders can be used to perform quality inspection. If quality orders are used, you can configure the process to temporarily block products through a reservation while they are inspected. If quarantine orders are used, products are moved to another warehouse for inspection. This warehouse is known as the quarantine warehouse. In both quality inspection processes, some of the goods might be scrapped, either because they don't conform to the quality expectations or because the quality inspection involves destructive testing of a sample of the product.

Product receipt

Most often, the **Product receipt** action on the **Purchase orders** page is used to mark products as **Received** on the PO. The **Posting product receipt** page has various options for the quantity that is accounted as received. For example, you can set the **Quantity** field to **Ordered quantity** or **Receive now quantity**. Alternatively, if a warehouse arrival process has been used, you will often set this field to **Registered quantity**. You can modify the quantities on each order line that will be marked as **Received**, to account for any discrepancies, such as under-delivery and over-delivery. During product receipt, you must specify a product receipt identifier, which is typically a reference to the packing slip from the supplier. This identifier is required for accounting, because it enables checks or audits of supplier packing slips against what has been received, and the accounted inventory or expense.

POs can be created for products that aren't intended as inventory but are considered an expense. This category includes order lines where the products are marked as **Not stocked** by their inventory model group, and also

lines that use procurement categories. In this case, the items might not go through arrival registration and receipt in the warehouse. Instead, the **Product receipt** action is used to record the receipt directly on the PO, and the receipt is based on the ordered quantity, not a registered quantity.

You can create PO lines where the **New fixed asset** option is enabled. This option indicates that the purchase should be considered a fixed asset instead of inventory. In this case, the fixed asset determination rules that have been configured determine whether the purchase of the product or category exceeds specific thresholds, and must therefore be accounted for as an asset and go through fixed asset management. Purchases can also be made toward an existing fixed asset. In this case, the amount is adjusted as appropriate.

You can select multiple orders and process receipt on all those orders together. This approach isn't used very often, but you might want to use it if a supplier has consolidated shipments for you into a single load. During product receipt on the purchase, there is a function for doing summary updates. Summary updates let you post a single packing slip from the supplier for more than one PO.

POs might be created from a sales order where the **Direct delivery** option was selected. When direct delivery is used, the products never arrive in your warehouse but are shipped directly from the supplier to the customer. In this case, the receipt is usually recorded directly on the PO. The receipt can be done automatically, such as through electronic data interchange (EDI) integration with the supplier. Alternatively, if the PO is an intercompany PO, Supply Chain Management automates the receipt on the intercompany sales order when shipment occurs. When direct delivery is used, products are still accounted as inventory, even though they don't physically arrive at the warehouse. Therefore, when product receipt is registered on the PO, the sales order is automatically updated with a packing slip, so that the overall change to inventory is 0 (zero). In direct delivery scenarios, you should not require preregistration. If you're using warehouses that are enabled for warehouse management, you can get around the requirement for license plate registration by specifying a virtual warehouse instead. You specify this warehouse in the **Direct delivery warehouse** field on the product.

After the product receipt has been processed on the PO, the PO status is set to **Received** to indicate that the invoice can be processed for the order. You can review details about products that have already been received by using the **Product receipt journals** page.

You can access this page from the **Receipt** action group on the **Purchase order** page. The information in the journals includes details about the quantities, dates, and dimensions.

Additional resources

[Purchase order overview](#)

[Create purchase orders](#)

[Approve and confirm purchase orders](#)

[Overview of vendor invoices](#)

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Vendor invoices overview

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This topic provides general information about vendor invoices. Vendor invoices are requests for received payment for products and services. Vendor invoices might represent a bill for ongoing services, or they can be based on purchase orders for specific items and services.

Vendor invoices

A vendor invoice from a purchase order is produced when products or services are received according to a purchase order placed with a vendor. The vendor invoice contains a header, and one or more lines for items or services. A vendor invoice completes the cycle from purchase order to product receipt to vendor invoice.

Although some vendor invoices connect to a purchase order, vendor invoices can also contain lines that don't correspond to purchase order lines. You can also create vendor invoices that aren't associated with any purchase order. These vendor invoices might represent ongoing services, such as a utility bill. You don't have to reference a purchase order when you add an ongoing service.

There are several ways to enter a vendor invoice:

- The vendor invoice register lets you quickly enter invoices that don't reference a purchase order, so that you can accrue the expense. By using the vendor invoice approval journal, you can select those invoices and post them to the vendor balance to reverse the accrual.
- The vendor invoice journal lets you quickly enter invoices that don't reference a purchase order, in a single step.
- Together with the vendor invoice pool, the vendor invoice register lets you quickly enter invoices to accrue the expense. You can open the associated purchase orders later to post the invoice against the expense account.
- The **Open vendor invoices** and **Pending vendor invoices** pages let you create vendor invoices from confirmed purchase orders.

The following discussion provides more information about how to use the **Open vendor invoices** or **Pending vendor invoices** page to create a vendor invoice from a purchase order.

Understanding invoice line quantities

When you open a vendor invoice from a related purchase order, the system creates invoice lines from the purchase order. By default, the system takes the quantities from the product receipt. However, you can use any of the following default behaviors:

- **Receive now quantity** – Use this option for partial shipments. The system sets the default value in the **Quantity** from the quantity specified in the **Receive now** field on the purchase order.
- **Ordered quantity** – Use this option for complete shipments. The system sets the default value in the **Quantity** from the quantity specified in the **Ordered** field on the purchase order.
- **Registered quantity** – Use this option if the item requires registration, as specified on the **Item model groups** page. The default value in the **Quantity** field is the physical update quantity that has been registered.
- **Product receipt quantity** – Use this option if a product receipt has already been received for the order. The system takes the default value in the **Quantity** field from the total quantity of available product receipts.
- **Registered quantity and services** – Use this option if quantities have been registered in arrival journals

for stocked items or items that aren't stocked. This option also includes services, regardless of whether they are registered.

If your legal entity uses invoice matching, you can view the results of the quantity matching in the **Product receipt quantity match** column. You can also use the **Matching details** button on the **Review** tab of the Action Pane to view the results of the quantity matching.

Adding a line that wasn't on the purchase order

You can add a line that wasn't on the purchase order to the vendor invoice. You must select an item number or procurement category. You can then add quantities, prices, and amounts to the line. The line will be included only in matching policies for invoice totals.

Submitting a vendor invoice for review

Your organization might use workflows to manage the review process for vendor invoices. Workflow review can be required for the invoice header, the invoice line, or both. The workflow controls apply to the header or the line, depending on where the focus is when you select the control. Instead of the **Post** button, a **Submit** button displays send the vendor invoice through the review process.

Preventing invoice from being submitted to workflow

Following are several ways you can prevent an invoice from being submitted to a workflow.

- **Invoice total and the registered total are not equal.** The person who submitted the invoice will receive an alert that the totals aren't equal. The alert provides an opportunity to correct the balances before resubmitting the invoice to workflow. This feature is available if the **Prohibit submission to workflow when the invoice total and registered invoice total are not equal** parameter on the **Feature management** page is turned on.
- **Invoice contains unallocated charges.** The person who submitted the invoice will receive an alert that the invoice has unallocated charges so they can correct the invoice before resubmitting it to workflow. This feature is available if the **Prohibit submission to workflow when there are unallocated charges on a vendor invoice** parameter on the **Feature management** page is turned on.
- **Invoice contains the same invoice number as another posted invoice.** The person who submitted the invoice will receive an alert that an invoice with a duplicate number was found, and they can correct it before resubmitting to workflow. This alert will be displayed when the **Check the invoice number used** parameter in Accounts payable is set to **Reject duplicate**. This feature is available if the **Prohibit submission to workflow when the invoice number already exists on a posted invoice, and your system is not set up to accept duplicate invoice numbers** parameter on the **Feature management** page is turned on.

Matching vendor invoices to product receipts

You can enter and save information for vendor invoices, and you can match invoice lines to product receipt lines. You can also match partial quantities for a line.

You can create a vendor invoice that is based on the product receipt line items that have been received through the current date, even if all the items for a particular purchase order haven't yet been received. For example, you might use this option if a vendor sends one invoice per month to cover all the deliveries that it shipped during that month. Each product receipt represents a partial or complete delivery of the items on the purchase order.

When an invoice is in workflow, the approver can update invoice quantities so that they match the value in the **Product-receipt-quantity-to-match** field. To do so, select the **Update the invoice quantities to match**

product receipt quantities in workflow feature in the **Feature management** workspace and select **Enable**. If an approver in the workflow process has removed all the matches from all the product receipts from the invoice line, the invoice line will be deleted. When this feature isn't enabled, invoice quantities are not updated for invoices in workflow.

When you post the invoice, the **Invoice remainder** quantity for each item is updated with the total of the received quantities from the selected product receipts. If both the **Invoice remainder** quantity and the **Deliver remainder** quantity for all items on the purchase order are 0 (zero), the status of the purchase order is changed to **Invoiced**. If the **Invoice remainder** quantity isn't 0, the status of the purchase order remains unchanged, and additional invoices can be entered for it.

This option assumes that at least one product receipt has been posted for the purchase order. The vendor invoice is based on these product receipts and reflects the quantities from them. The financial information for the invoice is based on the information that is entered when you post the invoice.

For more information, see [Record vendor invoice and match against received quantity](#).

Configure an automated task for vendor invoice workflow to post the vendor invoice using a batch job

You can add an automated posting task to the Vendor invoice workflow so that invoices are processed in a batch. Posting invoices in a batch lets the workflow process continue without having to wait for the posting to finish, which improves the overall performance of all the tasks submitted to the workflow.

To post a vendor invoice in a batch, on the **Feature management** page, turn on the **Vendor invoice batch posting** parameter. Vendor invoice workflows are configured by going to **Accounts payable > Setup > Accounts payable workflows**.

You can see the **Post the vendor invoice using a batch** task in the workflow editor, regardless of whether the feature parameter, **Vendor invoice batch posting**, is enabled. When the feature parameter is not enabled, an invoice that contains the **Post the vendor invoice using a batch** task won't process in workflow until the parameter is enabled. The **Post the vendor invoice using a batch** task must not be used in the same workflow as the **Post vendor invoices** automated task. Also, the **Post the vendor invoice using a batch** task should be the last element in the workflow configuration.

You can specify the number of invoices to include in the batch, and the number of hours to wait before rescheduling a batch, by going to **Accounts payable > Setup > Accounts payable parameters > Invoice > Invoice workflow**.

Working with multiple invoices

You can work with multiple invoices at the same time and post all of them at the same time. If you need to create multiple invoices, use the **Pending vendor invoices** page. If you must post and print multiple vendor invoices, use the invoice approval journal. If you're using the invoice approval journal, at least one product receipt must be posted for the purchase order, and an invoice for the purchase order must be posted in an invoice register. The financial information for the invoice comes from the invoice that was posted in the register.

Recovering vendor invoices that are being used

While a vendor invoice is being used, it can't be edited by another user. However, the state of an invoice might sometimes indicate that the invoice is being used, even though it isn't being actively edited. For example, the application might have stopped responding while the invoice was being edited, or a user might have inadvertently left the invoice open in the application.

You can use the **Recover vendor invoices** page to recover or release vendor invoices that have been in use for

more than four hours, so that they can be edited. You can open this page from the **Periodic task** navigation or a tile on the **Vendor invoice entry** workspace. After an invoice is recovered, it will be available for editing on the **Vendor invoice** page.

You can access the **Recover vendor invoices** page only if the **Recover vendor invoices in use** security duty and privilege are assigned to you. Additionally, the **Allow vendor invoice recovery** parameter on the **Accounts payable parameters** page must be turned on.

Resetting the workflow status for vendor invoices from Unrecoverable to Draft

A workflow instance that has stopped because of an unrecoverable error will have a workflow status of **Unrecoverable**. When the status of a vendor invoice workflow is **Unrecoverable**, you can reset it to **Draft** by selecting **Recall**. You can then edit the vendor invoice. This feature is available if the **Resetting the workflow status for vendor invoices from Unrecoverable to Draft** parameter on the **Feature management** page is turned on.

You can use the **Workflow history** page to reset the workflow status to **Draft**. You can open this page from **Vendor invoice** or from the **Common > Inquires > Workflow** navigation. To reset the workflow status to **Draft**, select **Recall**. You can also reset the workflow status to **Draft** by selecting the **Recall** action on the **Vendor invoice** or **Pending vendor invoices** page. After the workflow status is reset to **Draft**, it becomes available for editing on the **Vendor invoice** page.

Viewing the invoice total on the Pending vendor invoices page

You can view the invoice total on the **Pending vendor invoices** page by enabling the **Display invoice total on pending vendor invoices list** parameter on the **Accounts payable parameters** page.

Additional resources

- [Set up vendor invoice policies](#)
- [Key invoice data in AP system using vendor invoice](#)
- [Key invoice data into accounts payable using an approval journal](#)
- [Key invoice data into the AP system using invoice pool](#)
- [Record a vendor invoice in the invoice journal](#)

NOTE

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Troubleshoot product receipts and invoicing

2/18/2021 • 4 minutes to read • [Edit Online](#)

This topic describes how to fix issues that you might encounter while you work with product receipts and invoicing.

I can't post more than one invoice for a purchase order line that has category-based items.

A quantity is mandatory if you want to post invoices. Therefore, if the full quantity of a line has been invoiced for only a partial amount, you won't be able to invoice the remaining amount on another invoice.

I receive an "Object reference not set" error during purchase order confirmation, or an "Exception has been thrown by the target of an invocation" exception occurs during vendor invoice posting.

This issue can occur because of inconsistency in purchase order distributions.

To unblock this issue and reset the purchase order to a *Draft* state, go to **Procurement and sourcing** > **Periodic tasks** > **Clean up** > **Purchase order distribution reset**. For more information, see the following blog post: [Resolve PO distribution errors in Dynamics 365 Supply Chain Management](#).

I can't consolidate multiple product receipts into a single purchase order.

You can't consolidate multiple product receipts into a single purchase order if the different product receipt lines have different accounting dates.

In earlier versions of Microsoft Dynamics 365 Supply Chain Management, consolidation was allowed in this situation. However, the practice is prone to error. The accounting date on the purchase order lines that are created should not differ from the accounting date on the product receipt lines that those purchase order lines were created from. (The accounting date on the purchase order lines matches the accounting date on the purchase order header.) Therefore, the consolidation of multiple product receipts into a single purchase orders is no longer allowed.

The accounting date is used, for example, for budget reservations and encumbrance. Therefore, it should be kept during the transition from product receipt to purchase order.

When product receipts are canceled, transactions can be posted to a suspended ledger account.

Issue description

If a product receipt is canceled, the system allows transactions to be posted to suspended ledger accounts, even though the main accounts are suspended.

Reproduce the issue

The following procedure shows one way to reproduce the issue.

1. On the **Accounts payable parameters** page, on the **General** tab, make sure that the **Post product**

receipt in ledger option is set to *Yes*.

2. Create a purchase order, and add an order line that has a quantity of *1,000* for a product.
3. Confirm the purchase order.
4. Post the product receipt, and check the vouchers.
5. Suspend the relevant main accounts, *200140* and *140200*.
6. Cancel the posted product receipt.
7. Notice that transactions can be posted to the suspended ledger accounts.

Issue resolution

Transactions can be posted to the suspended ledger accounts when product receipts are canceled, because this behavior allows for correct postings.

A product receipt voucher number is consumed even if no financial voucher is generated during product receipt.

If the **Accrue liability on product receipt** option is set to *No* for the item model group, no postings to the general ledger will occur. However, a physical event will be recorded for the purpose of accounting in a subledger, and that event requires a voucher number. This voucher number is the voucher number that is referenced in the inventory transactions.

We recommend that you set the **Accrue liability on product receipt** option to *Yes*, as described in the following blog post: [Post Misc. charges at time of product receipt](#).

The Post to charge account in ledger setting isn't turned on.

Issue description

This issue occurs when a purchase order is invoiced, if the **Post to charge account in ledger** option is set to *Yes* on the **Invoice** tab of the **Accounts payable parameters** page.

Reproduce the issue

The following procedure shows one way to reproduce the issue.

1. Go to **Accounts payable > Setup > Accounts payable parameters**.
2. On the **Invoice** tab, set the **Post to charge account in ledger** option to *Yes*.
3. Go to **Inventory management > Setup > Posting > Posting**.
4. On the **Purchase order** tab, make sure that you've deleted all the lines in the purchase expenditure for the product.
5. Go to **Accounts payable > Purchase orders > All purchase orders**.
6. Create a purchase order. In the **Vendor account** field, select *1001 Acme Office Supplies*.
7. Add a purchase order line that has the following settings:
 - **Item number:** *D0011 Laser Projector*
 - **Site:** *1*
 - **Warehouse:** *11*
 - **Quantity:** *4*
8. On the Action Pane, on the **Purchase** tab, in the **Action** group, select **Confirm**.
9. On the Action Pane, on the **Receive** tab, in the **Generate** group, select **Product receipt**.
10. In the **Posting product receipt** dialog box, in the **Product receipt** field, enter an arbitrary number, and

then select **OK**.

11. On the Action Pane, on the **Invoice** tab, in the **Generate** group, select **Invoice**.
12. In the **Number** field, enter an arbitrary number as the invoice number.
13. Update the match status, and post.
14. Notice that you now receive the following error when you generate an invoice from a purchase order:
"Account number for transaction type Purchase expenditure for product does not exist."

Issue resolution

This depends on the parameter settings for invoices and invoice groups. For more information, see the following blog post: [Accounting for Purchase charge and Stock variation](#).

NOTE

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Set up and maintain vendor collaboration

2/18/2021 • 8 minutes to read • [Edit Online](#)

The vendor collaboration interface exposes a limited set of information about purchase orders, invoices, and consignment stock to external vendor users. From this interface, a vendor can also reply to requests for quotation (RFQs), and view and edit basic company information.

This topic explains how to set up vendor collaboration in Dynamics 365 Supply Chain Management. It also explains how to set up a workflow to provision new vendor collaboration users, and how to manage the security roles for those users.

NOTE

The information about the setup of security roles for vendor collaboration applies only to the current version of Finance and Operations. In Microsoft Dynamics AX 7.0 (February 2016) and Microsoft Dynamics AX application version 7.0.1 (May 2016), you collaborate with vendors by using the **Vendor portal** module. For information about user permissions for the Vendor portal in Microsoft Dynamics AX, see [Vendor portal user security](#).

Set up vendor collaboration security roles

A procurement professional or a vendor that has enough permissions can request that a contact person be provisioned as a user by enabling **Provision vendor user** on the contact person record. During the provisioning process, user permissions are selected for the new external user, and the new vendor user request is submitted. It's important that you correctly set up the user permissions that are available for selection in the vendor user request. Otherwise, vendors might be granted access to information that they should not have access to in Supply Chain Management.

Set up the security roles that are available for selection when a new user request is used for a contact person

1. Select **System administration > Security > External roles**.
2. Select **New**, and then select a security role and the **Vendor** party role.

You might want to add the **Vendor admin (external)** and **Vendor (external)** roles that are provided in Supply Chain Management. Alternatively, you can use security roles that your company has created.

You should make the **Vendor admin (external)** role available only if vendors should be able to create new contacts, submit vendor collaboration user requests for new users and changes to user information, and handle those requests via a workflow.

If you plan to manually set up vendor contacts and users, you can make just the **Vendor (external) role** available. This role will then be the only role that can be requested through a vendor user request.

NOTE

The **SystemUser** role is automatically granted when you manually create a new user account. Therefore, you must remove that role and assign the **SystemExternalUser** role. If new user accounts are created via the workflow that is initiated by a vendor user request to provision a new user, one or more of the roles that you've set up for vendor collaboration and the **SystemExternalUser** role will be assigned.

Vendor admin (external) security role

The **Vendor admin (external)** role can be used for external vendors that maintain vendor contact information

and make requests to provision new vendor collaboration users. External users who have this security role can perform the following tasks:

- View and modify contact person information, such as the person's title, email address, and telephone number.
- Add a new or existing contact person to the vendor accounts that they are a contact for.
- Delete any contact person that they have created.
- Activate or inactivate the association between a contact person and a vendor account. After the association between a contact person and a vendor account is inactivated, the contact person can't be referred to on new purchase orders or other documents.
- Deny or allow a contact person's access to documents on the vendor collaboration interface that are specific to the vendor account. After the association between a contact person and a vendor account is inactivated, access to documents that are specific to the vendor account is always denied.
- Request a new user account for a contact person by using the **Provision user** action.
- Request that a contact person's user account be inactivated.
- Request that a contact person's user account be modified to add or remove security roles.
- View RFQs.

Vendor (external) security role

The **Vendor (external) role** can be used for external vendors that will work with purchase orders. External users who have this security role can perform the following tasks:

- Respond to and view information about purchase orders.
- Maintain vendor collaboration invoices.
- View consignment inventory.
- View and respond to RFQs.
- View vendor information.

Set up security roles that are used when prospective vendors are onboarded

To onboard vendors that are initiated via a prospective vendor registration request, you must set up an external security role. This role will be assigned to new users during the provisioning process that is controlled by the workflow of the **User request workflow (platform)** type. For more information, see the [Set up workflows to process vendor collaboration user requests](#) section later in this topic.

For information about how to onboard prospective vendors, see [Onboard vendors](#).

Set up a security role that is used when a new prospective vendor user request is submitted

1. Select **System administration > Security > External roles**.
2. Select **New**, and then select a security role and the **Prospective vendor** party role.

You should add the **Vendor prospect (external)** role that is provided in Supply Chain Management.

The security role will grant access only to the new vendor registration wizard.

Set up workflows to process vendor collaboration user requests

To help guarantee that all the relevant tasks are completed, and that the appropriate approvals are given, you must set up workflows to handle vendor collaboration user requests.

Vendor collaboration user requests are submitted either by external vendors that have the **Vendor admin (external)** security role or similar permissions, or by procurement professionals in your company. They can also be generated from prospective vendor registration requests during the vendor onboarding process.

There are three types of requests:

- Requests to provision a new user
- Requests to inactivate an existing user
- Requests to modify the security roles of an existing user

For more information about vendor collaboration user requests, see [Manage vendor collaboration users](#).

You must create two or more workflows to process all three types of vendor collaboration user requests. New workflows are created on the **User workflows** page.

Example of a workflow for provisioning new users and modifying security roles

To handle vendor user requests to create new users and modify security roles, you can put a branching condition at the beginning of the workflow. In this way, a different branch of the workflow is used, depending on whether the request is to create a new user or modify an existing user.

To set up this branching, create a new workflow of the **User Request Workflow (Platform)** type. The branches of this workflow might contain the following elements.

Branch to provision new users

1. Assign an approval task to the person who is responsible for approving that new users should be granted access to vendor collaboration information.
2. Assign a task to the person who is responsible for requesting new Microsoft Azure Active Directory (Azure AD) user accounts in Azure portal. Use the predefined **Send Azure B2B user invitation** task for this step. B2B users can be automatically exported to Azure AD. Use the predefined **Provision Azure AD B2B user**. For more information, see [Export B2B users to Azure AD](#).
3. Assign an approval task to the person who uploads to Azure. If an account isn't successfully created, this person rejects the task and ends the workflow. This approval task can be skipped if you've included the step that automatically exports new user accounts to Azure via the B2B application programming interface (API).
4. Add an automated task that provisions a new user. Use the predefined **Automated provision user** task for this step.
5. Add a task that notifies the new user. You might want to send the new user a welcome email that includes a URL for Supply Chain Management. This email can use a template that you create on the **Email messages** page and then select on the **User workflow parameters** page. The template can include the **%portal URL%** tag. When the welcome email is generated, this tag which will be replaced by the URL of the Supply Chain Management tenant.

NOTE

This workflow can be used in multiple scenarios that involve user onboarding. For example, it can be used when prospective vendors or contact persons require a vendor collaboration account. Therefore, you should phrase the email as a general statement that can be used for multiple purposes.

Branch to modify security roles

1. Assign an approval task to the person who is responsible for approving changes to security roles.
2. Add an automated task that adds or removes the relevant security roles. Use the **Automated provision user** task for this step.

Example of a workflow for inactivating a user

Create a workflow of the **Inactivate user request workflow platform** type, and then add the following tasks.

1. Assign an approval task to the person who is responsible for accepting requests to inactivate users. You can

add conditions to automate this approval step.

2. Add an automated task that inactivates the user. Use the **Automated user inactivation** task for this step.
3. Add any clean-up tasks that are required. For example, you can add a task that removes the account from your directory in Azure portal.

Enable vendor collaboration for a specific vendor

Before you create a user account for someone who will use vendor collaboration, you must set up the vendor so that it can use vendor collaboration. On the **Vendors** page, on the **General** tab, set the **Collaboration activation** field. The following options are available:

- **Active (PO is auto-confirmed)** – Purchase orders are automatically confirmed if the vendor accepts them without requesting changes.
- **Active (PO is not auto-confirmed)** – Your organization must manually confirm purchase orders after the vendor has accepted them.

NOTE

Procurement professionals in your company can also complete this task.

Troubleshoot the provisioning of new vendor collaboration users

New vendor collaboration users are provisioned via the workflow that you set up to process vendor collaboration user requests of the **Provision vendor user** type.

If the email address of a new vendor collaboration user belongs to a domain that is registered with Azure as a tenant (that is, if it's a managed domain account), the email address must be an existing Azure AD account. Otherwise, the provisioning process can't be completed.

For more information about the process that is used in the **Send Azure B2B user invitation** task in the workflow for Azure AD account management, see [Azure Active Directory B2B collaboration](#).

Additional resources

[Vendor collaboration with external vendors](#)

Watch a short video on the vendor onboarding process: [Onboard a new vendor](#)

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Manage vendor collaboration users

2/18/2021 • 4 minutes to read • [Edit Online](#)

This topic describes how you can request the provisioning of new vendor collaboration users, and how to add new vendor collaboration contacts.

The vendor collaboration interface in Dynamics 365 Supply Chain Management exposes information about purchase orders, invoices, and consignment stock to external vendors. You can create new vendor collaboration contacts and request that new users are provisioned if you're working as an external vendor with the **Vendor admin (external)** security role, or similar permissions. You can also perform these tasks if you're working as a procurement professional. In this topic, this role refers to a procurement professional who is working within the company that owns the instance of Supply Chain Management. For more information about how to use vendor collaboration if you're an external vendor, see [Vendor collaboration with customers](#).

For more information about how to use vendor collaboration if you're a procurement professional, see [Vendor collaboration with external vendors](#).

Add new vendor collaboration contacts

If you want someone to have access to vendor collaboration they first have to be added as a vendor collaboration contact. You may also want to add contacts for employees in your company who won't use vendor collaboration. For example, they could be the point of contact for other kinds of procurement information. New contacts are added on the **All contacts** page, which is accessed from the **Vendor collaboration > Contacts** menu. To add a new contact:

1. Click **New**.
2. Enter the contact person details.
3. Choose which legal entity they're representing in your company, and which legal entity they'll work with in the company that they'll collaborate with. You do this by selecting a **Legal entity in my company/Legal entity in customer company** pair.
4. Click **Create**.

If you want to delete a contact, it's only possible to delete the ones that you've created.

Vendor collaboration user requests

Vendor collaboration user requests can be raised by a procurement professional, or by an external vendor administrator.

- If you're an external vendor, you submit requests from the **All contacts** page within the **Vendor collaboration** module.
- If you're a procurement professional, you submit requests from the **View contacts** page. To do this, on the vendor record, in the **Setup** section on the Action Pane, select **Contacts > View contacts**.

You can make a request to provision a user, to inactivate a user, or to modify security roles. If you're an external vendor administrator, you must be registered as a contact person for the vendor accounts that you want to make user requests for, and you must have access to the vendor collaboration interface for those vendor accounts.

When a request is submitted it is added to the **Vendor collaboration user requests** list in the **Vendor collaboration** module, and to the **Vendor collaboration user request** list in the **Procurement and**

sourcing module (the Procurement and sourcing module is not accessible to external users).

Provision a user

Before you can request that a new user is provisioned, that person must be set up as a contact for one or more vendor accounts. To create a request for a new vendor collaboration user:

1. On the **All contacts** page, click **Provision vendor user**.
2. Enter an email address for the user. This address will be used by the user to sign in to Supply Chain Management. If the email address belongs to a domain registered as a tenant with Microsoft Azure, then the email address has to be an existing Azure Active Directory (AAD) account in order for the provisioning process to complete successfully. If the email address does not belong to a domain registered with Microsoft Azure, an AAD account will be created as part of the provisioning process and the new user will receive an invitation mail. Consumer email addresses with domains such as @hotmail.com, @gmail.com, or @comcast.net cannot be used to register a user.
3. Set the **Vendor collaboration access allowed** option to **Yes** for all the legal entities that the user needs access to.
4. In the **Assign user roles** section, select the **Assign** check box for the security roles that the new user should have.
5. Click **Submit**.

When the vendor user request is submitted, the **Vendor collaboration access allowed** field is set to **Yes** for the selected vendor account and a user request workflow is started. As part of the workflow, a new user is created, and security roles are assigned. In addition, an Azure B2B service is activated which initiates interaction with Azure portal and associates a new or existing AAD account with the Supply Chain Management user account. For more information, see [What is Azure AD B2B collaboration?](#)

Inactivate a user

There are two ways to remove access to vendor collaboration for a user:

- On the **Contacts** page for the vendor, set the **Vendor collaboration access allowed** option to **No** for the contact. This can be done individually per legal entity that the person is a contact for. This option can only be used by procurement professionals.
- Inactivate the entire user account, by submitting an **Inactivate vendor user** request.

To request that a user is inactivated:

1. On the **All contacts** page, click **Inactivate vendor user**.
2. Write a comment in the **Business justification** field.
3. Click **Submit**.

Modify security roles

The **Maintain vendor user roles** page is the same as the **Provision vendor user** page except that the list of security roles can be edited.

To request that the security roles are modified for a user:

1. On the **All contacts** page, click **Maintain vendor user roles**.
2. Write a comment in the **Business justification** field.
3. In the **Maintain user roles** section, select the security roles that you want to assign, or clear the ones that you want to remove.
4. Click **Submit**.

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Set up vendor accounts

2/18/2021 • 8 minutes to read • [Edit Online](#)

This topic describes the types of information that you must specify when you create a new vendor account.

When you create a vendor account, you enter information about the vendor. This information is used to automatically enter data in documents and to track activity that involves the vendor. For example, you can configure the following information for a vendor:

- Assign a vendor group. Every vendor must be assigned to a vendor group. The vendors in a vendor group have parameters that they share. For example, they might have the same terms of payment.
- Configure the vendor for catalog import. Vendors can provide a file that contains the catalog of their items and services. This file can be uploaded so that your workers can order from the vendor.
- Assign the vendor to procurement categories.
- Allow an existing vendor to do business with another legal entity in your organization.
- Put a vendor on hold for specific types of transactions.
- Set up banking information for the vendor, so that you can send payments electronically.
- Set up tax, delivery, invoice, and payment information for the vendor. By default, these settings are copied to new documents that you create for the vendor.
- Set up default financial dimensions that are used to automatically post transactions with the vendor to financial accounts.

To speed up the process of creating vendor accounts, you can create templates. To create a template, on the **Vendor** page, on the Action Pane, click **Options > Record info**. Then click **Company accounts template**. Company account templates are shared with other users.

You can also create a user template for your own use. You can't delete a vendor that is associated with other records, such as contacts or products.

Vendor account numbers

The account number is a unique identifier for a vendor. You can set up account numbers so that they're generated automatically when you create a vendor. You can also configure the number sequence so that account numbers are entered manually. For example, you might want to use the vendor's telephone number as the identifier.

Vendor organizations and individual vendors

When you create a new vendor account, you must select whether the vendor is an organization or a person. Your selection affects the information that you must fill in for the vendor. For a person, this information includes the first name, last name, and title. For an organization, this information includes the organization number and the number of employees.

Addresses

For each vendor, you can define multiple addresses, each of which is used for a different purpose. For example, you can create an address that has a purpose of **Invoice**. Or, if you will pay the vendor by using checks, you can set up an address that has a purpose of **Remit-to**. If you must specify an address to use for money transfers to foreign banks, the purpose will be **SWIFT**.

Vendor contacts

You can store contacts for a vendor. These contacts can then be used on documents such as purchase orders or requests for quotation (RFQs).

To add contacts for a vendor, on the **All vendors** page, on the **Vendor** tab, in the **Set up** group, click **Contacts > Add contacts**.

You can create vendor contacts from scratch. Alternatively, you can copy details from another person who is already registered in Supply Chain Management, and edit the information as you require.

Note: Adding a contact for a vendor isn't the same as adding contact information for that vendor. Although you might add general contact information for a vendor, you might also have several specific people who are contacts at that company, and who all have their own contact information.

You can't delete a contact person record if the contact is referenced on a document. Instead, you can inactivate the contact.

You can add vendor contacts to your personal contacts in Microsoft 365. However, you must first set up synchronization between Supply Chain Management and Microsoft 365 in both Microsoft Exchange Server synchronization and the Microsoft Outlook setup wizard.

Vendors in different legal entities

If a vendor is registered for only one legal entity in your organization, and other legal entities must register the same vendor, you can use the **Add vendor to another legal entity** page to configure the vendor to do business with another legal entity. You must select a vendor group, currency, and hold status for the vendor in the selected legal entity.

If multiple legal entities in your organization do business with the same vendor, and each legal entity maintains a separate vendor account for that vendor, you can merge the party IDs for the vendor accounts. In this way, information such as the address and the number of employees can be shared, so that you must update it in only one place.

To merge party IDs, follow these steps.

1. On the **Global address book** page, select the address book records that represent the vendor in each legal entity that should be included in the mapping.
2. On the Action Pane, click **Merge records**.

Agreements

When you set up a vendor account, you might also want to register the agreements that you have with the vendor. You can set up price and discount agreements by using the actions on the vendor record. You can also set up a purchase agreement on the **Purchase agreements** page.

Putting a vendor on hold

You can put a vendor on hold for various transaction types. The following options are available:

- **No** – No holds have been put on the vendor.
- **Invoice** – No invoices can be posted for the vendor.
- **All** – The vendor is on hold for all transaction types. These transaction types include purchase requisitions, invoices, and payments.
- **Payment** – No payments can be generated for the vendor.
- **Requisition** – Purchase requisitions can't be created for the vendor, and requisition lines already created

before the vendor was set on hold can't be converted to a purchase order. Requisition lines for the vendor will be canceled if your policy is set to create purchase orders automatically.

- **Never** – The vendor is never put on hold for inactivity.

When you put a vendor on hold, you can also specify a reason and a date when the on-hold status will end. If you don't enter an end date, the vendor's on-hold status lasts indefinitely.

You can bulk update the on-hold status to **All** for vendors based on the selected criteria on the **Vendor inactivation** page, and assign a reason for why the vendor is on-hold.

The following criteria are used to include vendors that have been inactive in a period, include or exclude vendors that are employees, and exclude vendors that are under a grace time before the next hold.

- Based on the number of days that you enter in the **In activity period** field on the **Vendor inactivation** page, the application calculates the latest date where the vendor can have any activity to be considered inactive. That is, the current date minus the number of days that you enter. If one or more invoices exist for the vendor where the date is later than the calculated latest date, the vendor will be excluded from the inactivation. This is also validated if the vendor has payments after that date, open purchase requisitions, open purchase orders, requests for quotations, or replies.
- The number of days in the **Grace time before next hold** field is used to calculate the latest grace date. That is, the current date minus the days that you enter. This only applies to vendors who have previously been inactivated. In the case of a previous inactivation, the application verifies the history of other occurrences of inactivation for the vendor and checks if the latest inactivation occurred before the latest grace date. If this is the case, the vendor will be included in the inactivation process.
- The parameter **Include employees** refers to vendors that are linked to an employee. You can set if you want to include those employees.

This process will always exclude vendors where the value in the **Vendor hold** field is **Never**.

Vendors that pass the validations are put on-hold, which sets the **Vendor hold** field value to **All** and the **Reason** to what has been selected. A record in the on-hold history is created for the vendor.

Vendor invoice account

If more than one vendor has the same billing address, or if a vendor is invoiced through a third party, you can specify an invoice account on the vendor record. The invoice account is the account that the invoice amount is credited to when you create a vendor invoice from a purchase order. If you don't enter an invoice account on the vendor record, the vendor account is used as the invoice account.

Vendor bank accounts

If you must make payments to a vendor bank account, you can enter information about the vendor's bank and bank accounts on the **Vendor bank accounts** page. You can also enter information about validation and payments for the bank account. For example, you can add prenotes to vendor bank accounts. These prenotes can be used to verify the accuracy of account data, such as routing numbers and account numbers. You must specify a default account for payments to the vendor. However, when you make an actual payment, you can change this account to one of the vendor's other accounts.

Ledger accounts

You can specify the default accounts that automatically appear in vendor invoice journals for the specified vendor. This functionality can be useful if you typically pay for the same types of items or services from the same vendors over time. When you specify a default account, you can quickly and efficiently enter journal entries in the invoice journal. The default accounts that you specify aren't used for purchase orders, or for vendor invoices that are entered on the **Vendor invoice** page.

You select default accounts on the **Default account setup** page, which you can open from the **Invoice** tab on the vendor record. The accounts that you select here appear in the filtered list of accounts for the vendor account when you enter a journal entry. You can set one of the accounts as a default account.

NOTE

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Create a vendor account

2/18/2021 • 2 minutes to read • [Edit Online](#)

This procedure shows how to create a vendor account, and add an address and contact information. The procedure does not show how to populate all fields for purchasing and financial purposes. To learn more about those fields, please read the field descriptions. You can use this procedure in demo data company USMF or on your own data. Vendor accounts are typically created by a procurement professional or accounts receivable personnel.

Create a vendor account

1. Go to **Navigation pane > Modules > Procurement and sourcing > Vendors > All vendors**.
2. Click **New**.
3. In the **Vendor account** field, type a value.
 - The value may be populated automatically. If so, you can skip this step.
 - You can create vendor accounts for a person or organization. This will affect which fields are available. In this example, we'll create a vendor account for an organization.
4. In the **Name** field, enter or select a value. If your vendor is an already a registered party in your system you can use drop down and select them in this field and the new vendor account will inherit the address and contact information that's already registered.
5. In the **Group** field, enter or select a value. The vendor group is used to group vendors that have any of the following parameters in common: Terms of payment, settle period, inventory posting ledger accounts – including the sales tax group, default ledger accounts, product filter codes, or supply forecast configuration.
6. In the **Number of employees** field, enter a number.
7. In the **Organization number** field, type a value.

Add an address

1. Expand the **Addresses** section.
2. Click **Add**.
3. In the **Purpose** field, enter or select a value. You can select one or more purposes. These are used to select the correct address for a given purpose. For example, if the purpose is "Invoice" that address will be used when you send invoices.
4. In the **Name or description** field, type a value.
5. In the **Country/region** field, enter or select a value. Enter the address details. The country/region that you selected will determine the fields you are presented with, corresponding to the address format for the country/region.
6. Click **OK**.

Add contact information

1. Expand the **Contact information** section.
2. Click **Add**.
3. In the **Description** field, type a value.
4. In the **Type** field, select an option.
5. In the **Contact number/address** field, type a value. You can select the Primary check box if this is the primary contact.

6. Click **Save**.
7. Close the page.
8. Close the page.

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Create a vendor bank account

2/18/2021 • 2 minutes to read • [Edit Online](#)

This procedure shows you how to create a bank account for a vendor. You can use this procedure in demo data company USMF.

1. Go to **Navigation pane > Modules > Procurement and sourcing > Vendors > All vendors**.
2. Select the vendor that you want to create a bank account for, and then click the link on the **Vendor account ID** field.
3. On the **Action Pane**, click **Vendor**.
4. Click **Bank accounts**.
5. On the **Action Pane**, click **New**.
6. In the **Bank account** field, type a value. This ID will be used to identify the bank account on the vendor record.
7. In the **Name** field, type a value.
8. In the **Bank groups** field, enter or select a value.
9. In the **Routing number type** field, select an option. This is the type of routing number that's used for international payments.
10. In the **Bank account number** field, type a value.
11. In the **SWIFT code** field, type a value.
12. In the **IBAN** field, type a value.
 - The IBAN number must be in the correct format. For example, you could use DE89370400440532013000.
 - The status of the bank account is Active if the Active date has been reached, and the Expiration date has not been exceeded. It's also active if both the Active date and Expiration date fields are blank. If the dates in both the Active date and Expiration date fields are in the future electronic payments are not available. Other payment types are available and the bank account is active.
13. Expand the **Setup** section.
14. In the **Text code** field, type a value. This field specifies a code that will appear on the bank statement of the recipient.
15. In the **Message to bank** field, type a value.
16. In the **Exchange reference** field, type a value. This is the reference number for any forward-term or fixed-term rate of exchange.
17. In the **Currency** field, enter or select a value. When prenotes are issued, this section provides an overview of their status (pending or approved).
18. Expand the **Address** section.
19. Expand the **Prenotes** section.
20. Expand the **Contact information** section.
21. In the **Telephone** field, type a value.
22. Close the page.
23. Click **Edit**.
24. Expand the **Payment** section.
25. In the **Bank account** field, select the account that you've just created.
26. Click **Save**. The address may be inherited from the bank group, if one is specified, or you can add it here.

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Vendor posting profiles

2/18/2021 • 4 minutes to read • [Edit Online](#)

Vendor posting profiles control the posting of vendor transactions to the general ledger.

Vendor posting profiles

Vendor posting profiles enable you to assign general ledger accounts and document settings to all vendors, a group of vendors, or a single vendor. These settings will be used when you create purchase orders, vendor invoices, and cash payments. For some transactions, you can select a posting profile that differs from and takes precedence over the posting profiles that are set up for transactions on this page. The default posting profile is defined on the **Ledger and Sales Tax** FastTab on the **Accounts payable parameters** page. The default posting profile is then included automatically on the header of new documents where you can change it to a different posting profile, if needed.

You can also associate posting definitions with transaction posting types on the **Transaction posting definitions** page. Posting definitions control the posting of vendor transactions to the general ledger instead of posting profiles.

Creating a posting profile

Setup

Specify the ledger accounts that are used in the posting of transactions that use the selected posting profile. Select an account code and, whenever possible, an account or group number for the selected posting profile. In the posting process, the most appropriate posting profile for each transaction is located by searching for the most specific account code, account number, or group and number combination in the following priority.

ACCOUNT CODE FIELD VALUE	ACCOUNT/GROUP NUMBER FIELD VALUE	SEARCH PRIORITY
Table	Specific vendor account	1
Group	Vendor group that is assigned to the vendor	2
All	Blank	3

If you want all vendor transactions to have the same posting profile, set up only one posting profile with **All** in the **Account code** field. Specify the following values to set up your posting profile.

FIELD	DESCRIPTION
Posting profile	Enter a code for the posting profile. For example, you could create two posting profiles to obtain one account for vendor balances in the national currency and another for vendor balances in a foreign currency. You could call one account National and the other Foreign.
Description	Enter a description of the posting profile.

FIELD	DESCRIPTION
Account code	<p>Specify whether the posting profile applies to a specific vendor, a group of vendors, or all vendors:</p> <ul style="list-style-type: none"> • Table – The posting profile applies to a single vendor. Select the vendor account in the Account/Group number field. • Group – The posting profile applies to a vendor group. Select the vendor group in the Account/Group number field. • All – The posting profile applies to all vendors. Leave the Account/Group number field blank.
Account/Group number	<p>If Table is selected in the Account code field, select the account number of the vendor that is associated with the posting profile. If Group is selected, select a vendor group. If All is selected, leave this field blank.</p>
Summary account	<p>Select the ledger account that will be used as the summary account for the vendors that the posting profile relates to. The Do not allow manual entry parameter for this main account will be marked. If you subsequently remove this account from the posting profile, validate the Do not allow manual entry setting on the Main accounts page.</p> <p>Note: If the Use posting definitions option is selected on the General ledger parameters page, the transaction posting definition for vendor invoices is used instead of the summary account.</p>
Settle account	<p>Select the liquidity ledger account that is used for cash flow forecasts. This field is only available when cash flow forecasting is enabled.</p>
Sales tax prepayments	<p>Select the account for sales tax payments that are received in advance.</p> <p>Note: The posting profile that is used when the payment is marked as a prepayment is selected in the Posting profile with Prepayment journal voucher field in the Ledger and sales tax area on the Accounts payable parameters page.</p>
Arrival	<p>Select the ledger account that information about unapproved vendor invoices is posted to. The information is entered in the Invoice register journal. For example, a user enters very basic information about vendor invoices when they are received in the invoice register. When the invoice register is posted, the transactions are posted to the account that is entered here and in the Offset account field. When the invoices are approved, the debt is transferred from the arrival account to the vendor summary account.</p>
Offset account	<p>Select the ledger account that is used for offsetting unapproved vendor invoices that are updated by using the invoice register. The offset account acts as the offset account for transactions that are posted to arrival accounts. Therefore, the account contains vendor purchases that have not yet been approved.</p>

Table restrictions

For transactions that have the selected posting profile, specify whether transactions will be settled automatically, interest will be calculated, and collection letters will be issued. You can also select the account that is used when transactions that have the selected posting profile are closed.

Specify the following values to set up your posting profile

FIELD	DESCRIPTION
Settlement	Select this option to enable automatic settlement of transactions that have this posting profile. If this option is cleared, you must manually settle transactions by using the Settle open transactions page.
Cancel	Select this option if you want to be able to cancel transactions that have this posting profile.
Close	Select a posting profile to change to when transactions that have this posting profile are closed. A transaction is regarded as closed when it has been settled in full.

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Vendor request configurations

2/18/2021 • 2 minutes to read • [Edit Online](#)

To complete a vendor request, a vendor contact person must complete the prospective vendor registration wizard.

In the **Vendor request configurations** form, you can create profiles that specify required fields and visible fields in the prospective vendor registration wizard.

The vendor registration wizard will start out by asking the prospective vendor user which country/region the vendor is doing business in. This information determines the applicable configuration. If no specific configuration is defined for a country/region, a default configuration will be used.

Set up a vendor request configuration

By default, there is a vendor configuration available in the Vendor request configurations form.

It is not possible to select country/regions for the default configuration, so the **Countries/regions** section cannot be changed.

1. Click **Procurement and sourcing > Setup > Vendors**, and then click **Vendor request configurations**.
2. Click the **Fields** tab to set the status of the listed fields.
3. Hidden (Not visible)
4. Displayed (Visible but not mandatory)
5. Required (Visible and mandatory)
6. Click the **Content** tab to specify if text is going to be shown on the wizard and if there should be an acknowledgement that the prospective vendor user must accept this before moving to the next step in the wizard. The acknowledgement will be requested for any terms and conditions that the user must accept to continue.

You can also enter a confirmation message that will be displayed when the wizard is finalized, and you can add one or more questionnaires.

Create a vendor configuration for a specific country/region

1. Click **Procurement and sourcing > Setup > Vendors**, and then click **Vendor request configurations**.
2. Click **New** to create a new configuration, and provide a name for the configuration.
3. Click **Save**.
4. Open the **Country/regions** tab to select the country/region that the configuration should be used for.
5. Complete the configuration by following the guidelines for the default configuration.

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Onboard vendors

2/18/2021 • 11 minutes to read • [Edit Online](#)

New vendors can be onboarded and registered as vendors in Microsoft Dynamics 365 Supply Chain Management, based on information that is collected from a person who represents the vendor.

The process consists of the following steps, where various roles perform actions in the system.

1. **Data management OData – Entity import** - The initial request is the prospective vendor registration request. Typically, this request comes from a source such as a customer-hosted website that allows anonymous access. Vendors can sign up by providing basic information, such as the vendor name, justification, organization number, and name and email address of the contact person. The requests are imported via the Data management interface.
2. **Prospective vendor registration request list page** - Based on the information that is provided in the prospective vendor registration request, a procurement professional decides whether the vendor should be onboarded. The procurement professional views the incoming request on the **Prospective vendor registration requests** list page.
3. **User provisioning workflow** - When a procurement professional has verified the information in the incoming request and has decided to continue with the onboarding process, the user request workflow provisions the new user and sends an invitation email to accept the contact person as an authenticated user of Microsoft Dynamics 365.
4. **Vendor registration wizard** - The vendor's contact person signs in by using the new user account. He or she completes a vendor registration wizard to provide information such as addresses, business information, procurement categories, and questionnaire responses.
5. **Approval workflow** - A vendor request that includes the registration information is created. This vendor request is submitted to a workflow, and is routed for review and approval.
6. **Creation of a vendor master and user role modification** - When the vendor request is approved, a vendor record is created. The user account of the vendor's contact person is either granted permission to vendor collaboration or inactivated.

The following table shows the steps and roles that are involved in the process.

ROLE AND "PROCESS"	DATA MANAGEMENT ODATA – ENTITY IMPORT	PROSPECTIVE VENDOR REGISTRATION REQUEST LIST PAGE	USER PROVISIONING WORKFLOW	VENDOR REGISTRATION WIZARD	APPROVAL WORKFLOW	CREATION OF A VENDOR MASTER AND USER ROLE MODIFICATION
System	The request for a new vendor is imported.					After the vendor request is accepted, the vendor record is created.
Procurement professional		Start the onboarding process.			Review and either accept or reject the vendor request.	

ROLE AND "PROCESS"	DATA MANAGEMENT ODATA – ENTITY IMPORT	PROSPECTIVE VENDOR REGISTRATION REQUEST LIST PAGE	USER PROVISIONING WORKFLOW	VENDOR REGISTRATION WIZARD	APPROVAL WORKFLOW	CREATION OF A VENDOR MASTER AND USER ROLE MODIFICATION
Administrator			Create a user in Supply Chain Management and Microsoft Azure.			
Vendor contact person			Send email to the contact person.	Register vendor information.		

For a quick demonstration of the vendor onboarding process, watch this short YouTube video about [How to onboard a new vendor in Finance and Operations](#).

Importing the prospective vendor registration request

The prospective vendor registration request is an entity in Supply Chain Management. You can set up the system to import data via this entity.

The following table shows the information that this entity contains, and that can be imported.

FIELD	DESCRIPTION
Vendor name	The name of the vendor.
Business justification	The reason or reasons for the vendor request.
Organization number	An officially known registration number.
Line of business	The line of business that the vendor is in.
Contact person's first name	The first name of the person who will be invited to register vendor information.
Contact person's middle name	The middle name of the person who will be invited to register vendor information.
Contact person's last name	The last name of the person who will be invited to register vendor information.
Contact person's email	The email address that will be used to create a new user in Supply Chain Management, and that will be registered in the tenant's Azure Active Directory (Azure AD) account.
Submitted date	The date when the request was created in an external system.

FIELD	DESCRIPTION
Legal entity	The legal entity where the vendor is requesting to become a vendor. This value must be a legal entity code that has been registered in Supply Chain Management. If no value is received through the import process, a value from the Procurement and sourcing parameters is applied.
Vendor type	The vendor can be either an organization or a person. The vendor type determines how the vendor is finally created.

After the prospective vendor registration request is imported, it appears on the **Prospective vendor registration request** list page. From this list page, a procurement professional can invite the user. A user request for provisioning the user is sent to a workflow.

Submitting a prospective vendor user request

The purpose of a prospective vendor user request is to provision the person who submitted the initial request, so that he or she can sign in to Supply Chain Management by using the email account that is provided in the prospective vendor registration request.

The prospective vendor user request is processed by the user request workflow. This workflow communicates through Azure AD B2B collaboration. It creates a user in Supply Chain Management that has the appropriate security settings.

New users that are set up have the following security roles:

- System external user
- Vendor prospective (external)

The new user will receive an email that is generated by the user request workflow. This email invites the user to sign in to the system.

For information about the configuration of the email and the workflow in general, see the description of a user request workflow in [Set up and maintain vendor collaboration](#).

Vendor registration

A prospective vendor user who signs in to Supply Chain Management will see the first page of a vendor registration wizard, where he or she can enter vendor information.

The wizard reflects the configuration of the vendor request. The country or region where the vendor does business determines what information is requested in the wizard and what information is mandatory.

For more information about the vendor request configuration, see [Set up and maintain vendor collaboration](#). The following table gives an overview of the pages in the wizard and the purpose of each page.

PAGE	DESCRIPTION
Country/region	The country or region determines the vendor request configuration that is applied on the remaining wizard pages. It also determines values in the Tax state lookup.
Terms and conditions	This page might be available, depending on the vendor request configuration. If it's available, the user must acknowledge the terms and conditions to continue.

PAGE	DESCRIPTION
Vendor information	This page contains the vendor name, which is automatically entered from the original prospective vendor registration request. It also contains the organization number, the vendor's telephone number, fax number, and email address, and the vendor's addresses for various purposes.
Contact person information	This page contains the contact person's name, which is automatically entered from the original prospect vendor registration request. It also contains the contact person's telephone number and email address, and the contact person's addresses for various purposes.
Business information	This page contains tax registration numbers (for various countries or regions) and the numbers of employees. It also indicates whether the business is minority owned.
Procurement categories	This page contains the procurement categories that the vendor is requesting approval for. The user can select categories in the procurement category hierarchy. You can configure the number of levels that are shown in the hierarchy at Procurement and sourcing parameters > Vendor collaboration , under Procurement and sourcing > Setup .
Questionnaires	The wizard might include a set of questionnaires for the vendor. Questionnaires that appear in the wizard are configured either on the vendor request or per procurement category. If questionnaires are configured per procurement category, the procurement categories that the vendor requests approval for determine the questionnaires that appear in the wizard. On the Procurement categories page, you can add a questionnaire under the relevant category and set the activity type to Vendor onboarding .

When the prospective vendor user completes the vendor registration wizard, a vendor request is created.

Manually or automatically submit a vendor request

A vendor request can be created as a draft and manually submitted to a workflow. Alternatively, the vendor request can be automatically submitted to a workflow when the vendor registration wizard is completed. A request can be submitted manually if, for example, a procurement professional wants to assess whether the request should be routed through an approval process before it's submitted to the workflow.

- Select **Procurement and sourcing parameters > Vendor collaboration**, and then select **Auto submit prospective vendor registration to workflow** to configure the vendor request so that it's submitted automatically to a workflow when the vendor registration wizard is completed.

Vendor requests

Vendor requests are available on the **Vendor collaboration user requests** page.

A vendor request contains the information that the prospective vendor user entered in the vendor registration wizard.

The request lets you review the vendor information and decide whether the vendor should become a registered vendor.

The vendor request should be submitted to a workflow, and it should be routed to the relevant reviewers and approvers. For basic information about how to set up workflows, see [Procurement and sourcing workflows](#).

The following table shows the statuses that vendor requests can have.

STATUS	DESCRIPTION
Draft	The vendor request hasn't yet been submitted.
Request submitted	The vendor request has been submitted, and the first step in the workflow is being processed.
Pending review	If there are multiple reviewers in a workflow task, a reviewer can accept the task of reviewing the vendor request and then complete the review. If there is only one reviewer, that participant can complete the review by selecting Completed in the workflow action. He or she doesn't have to accept the work item first.
Request pending approval	The vendor request has been routed to the participants for approval, and there is an option to request additional information. A request for additional information cause the work item to be routed back to the submitter. The vendor request can also be approved or rejected while it's in this status.
Application change request	Additional information has been requested by the approver, and the vendor request has been routed to the person who submitted the vendor request. The submitter can add required information and then resubmit the vendor request. If a vendor request is resubmitted, the status is changed back to Request pending approval status.
Request approved	This status is a final state.
Request rejected	This status is a final state.

Approving a vendor request

When a vendor request is approved, a vendor account is created, and the status **Approved** appears on both the initial prospective vendor registration request and the vendor request.

Before you approve a vendor request, on the **New vendor** page, on the **General** FastTab, select **Vendor group** to select a vendor group.

If the prospective vendor user should have access to Supply Chain Management as a vendor collaboration user who represents the vendor, set the vendor collaboration access permission to **Yes**. To inactivate the user account that the prospective vendor used to register, set this permission to **No**.

If the vendor collaboration access permission is set to **Yes**, when the vendor request is approved, a request is submitted to modify the user's roles so that the user has the roles that are defined for the **Vendor** type in **External roles**. If this permission is set to **No**, when the vendor request is approved, a request is submitted to inactivate the user. In this case, the workflow to inactivate a user request must be set up.

For a vendor account to be created when the vendor request is approved, the number sequence for creating vendors from vendor requests must be set to **Auto**.

For an overview of the access permissions of a vendor collaboration user, see [Set up and maintain vendor](#)

collaboration.

Rejecting a vendor request

If a vendor request is rejected, a reason for rejection must be selected in the vendor request.

When a vendor request is rejected, a request is submitted to inactivate the user. In this case, the workflow to inactivate a user request must be set up. For more information, see [Set up and maintain vendor collaboration](#).

When a vendor request is rejected, the status **Rejected** appears on both the initial prospective vendor registration request and the vendor request.

Deleting a prospective vendor registration request in various statuses

The various statuses of a prospective vendor registration request give an overview of the request's progress.

By using the **Delete** action on the prospective vendor registration request, you can clean up and remove the chain of records that has been created, and you can inactivate the user account. The result of the **Delete** action varies, depending on the status of the prospective vendor registration request, as shown in the following table.

STATUS	STATUS DESCRIPTION	RESULT OF THE DELETE ACTION
New	No actions have been taken on the request.	The prospective vendor registration request is deleted.
User requested	When you select Invite user , the status is changed to User requested , and a prospective user request is created and submitted to a user request workflow.	You can't delete a prospective vendor registration request that has this status, because the user request workflow hasn't ended.
User invited	The user request workflow is approved, and the user is created.	A request to inactivate the user is created, and the prospective vendor registration request is deleted.
Registration in progress	The new user has signed in and has started the vendor registration wizard.	A request to inactivate the user is created, and the prospective vendor registration request and the data that was entered in the vendor registration wizard are deleted.
Vendor request created	The vendor registration wizard has been completed.	A request to inactivate the user is created, and the prospective vendor registration request, the data that was entered in the vendor registration wizard, and the vendor request are deleted. <div style="border: 1px solid #ccc; padding: 5px; margin-top: 10px;">[!NOTE] You can't use the Delete action when the vendor request is in a review process in the workflow.</div>
Approved	The vendor request is approved.	The prospective vendor registration request, the data that was entered in the vendor registration wizard, and the vendor request are deleted.

STATUS	STATUS DESCRIPTION	RESULT OF THE DELETE ACTION
Rejected	The vendor request is rejected.	The prospective vendor registration request, the data that was entered in the vendor registration wizard, and the vendor request are deleted.

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Vendor collaboration with external vendors

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The **Vendor collaboration** module is targeted at vendors who don't have electronic data interchange (EDI) integration with Microsoft Dynamics 365 Supply Chain Management. It lets vendors work with purchase orders (POs), invoices, consignment inventory information, and requests for quotation (RFQs), and also lets them access parts of their vendor master data. This topic explains how you can collaborate with external vendors who use the vendor collaboration interface to work with POs, RFQs, and consignment inventory. It also explains how to enable a specific vendor to use vendor collaboration, and how to define the information that all vendors see when they respond to a PO.

For more information about what external vendors can do in the vendor collaboration interface, see [Vendor collaboration with customers](#).

NOTE

The information about vendor collaboration in this topic applies only to the current version of Supply Chain Management. In Microsoft Dynamics AX 7.0 (February 2016) and Microsoft Dynamics AX application version 7.0.1 (May 2016), you collaborate with vendors by using the **Vendor portal** module. For information about the **Vendor portal** module, see [Collaborate with vendors by using the Vendor portal](#).

For more information about how vendors can use vendor collaboration in invoicing processes, see [Vendor collaboration invoicing workspace](#). For information about how to provision new vendor collaboration users, see [Manage vendor collaboration users](#).

Defining the information that is shown to vendors when they respond to POs

When vendors respond to a PO that you send them, they see one of three message boxes, where they must confirm that they want to accept the PO, reject it, or accept it with changes. Because the information that must be shown to the vendor at that point might be specific to your business, you can specify the text that appears in each confirmation message. For example, the text can inform the vendor about the next steps in the process, or about terms and conditions.

To define the text that's shown in the PO response, follow these steps

1. On the **Information for vendors responding to POs** page, select the response type, and then select **Edit**.
2. In the **Information message** box, enter the information that should be shown to vendors in the message box.

If you must add messages in more than one language, create separate messages, and specify the appropriate language code for each. The message that is shown to each vendor will be in the language that the vendor uses.

Setting the vendor collaboration options for a specific vendor

An administrator configures the general settings for vendor collaboration, such as the security roles that are available for all vendors that you collaborate with. However, there are also settings that can differ for each vendor account. You should configure these settings.

- Enable vendor collaboration.

- Specify whether the vendor should see price information.

Enabling vendor collaboration

Before user accounts can be created for an external vendor, you must configure the vendor account so that vendor can use vendor collaboration. On the **Vendors** page, on the **General** tab, set the **Collaboration activation** field. The following options are available:

- **Active (PO is auto-confirmed)** – POs are automatically confirmed if the vendor accepts them without changes.
- **Active (PO is not auto-confirmed)** – Your organization must manually confirm POs after the vendor has accepted them.

Specifying whether the vendor should see price information

To share price information for POs via the vendor collaboration interface, you must set the **Purchase order prices/amount** option on the **Purchase order defaults** tab for the vendor account to **Yes**. This price information includes the unit price, discounts, and charges.

Working with POs when vendor collaboration is used

Sending a PO to a vendor

POs are prepared in Supply Chain Management. When a PO has a status of **Approved**, you send it to the vendor by selecting **Send for confirmation** on the **Purchase order** page. The PO status is then changed to **In External Review**. After the PO has been sent, the vendor can see it on the **Purchase orders for review** page in the vendor collaboration interface. The vendor can then accept the PO, reject it, or suggest changes to it. The vendor can also add comments to communicate information such as changes to the PO. If you want to draw the vendor's attention to a new PO, you can also use the Print management system to send the PO by email.

Confirmation and acceptance of a PO by a vendor

After a vendor accepts a PO, the PO can be automatically confirmed, or it might have to be manually confirmed. The behavior depends on whether the **Collaboration activation** field is set to **Active (PO is auto-confirmed)** or **Active (PO is not auto-confirmed)** for the vendor.

The following table shows the typical exchange of information, depending on the vendor's response when you send a PO for confirmation.

VENDOR RESPONSE	RESULT
<p>The vendor accepts the order, and Supply Chain Management is configured to automatically confirm POs that the vendor accepts.</p>	<p>The status of the order is updated to Confirmed. If the order can't be updated for some reason, the vendor response is still recorded as Accepted, but the status of the PO remains In External Review.</p> <p>The PO that was sent to the vendor and that has a status of In External Review is updated with confirmed delivery dates on the lines. This update initiates a new version that is automatically set to Confirmed status. When the PO is confirmed, it appears in the vendor collaboration interface.</p>
<p>The vendor accepts the order, but Supply Chain Management isn't configured to automatically confirm POs that the vendor accepts.</p>	<p>The vendor response is recorded as Accepted, but the status of the PO remains In External Review.</p> <p>The PO that was sent to the vendor and that has a status of In External Review is updated with confirmed delivery dates on the lines. This update initiates a new version that is automatically set to In External Review status. You can then manually confirm the PO.</p>

VENDOR RESPONSE	RESULT
The vendor rejects the order.	The vendor response is recorded as Rejected , and the status of the PO remains In External Review . The rejection is received together with the vendor's note.
<p>The vendor accepts the order with changes. Changes are suggested at the line level. The vendor can accept or reject individual lines. Here are some other changes that the vendor can suggest:</p> <ul style="list-style-type: none"> • Change dates or quantities. • Split lines for different delivery dates or quantities. • Substitute an item. <p>The vendor can't change price information and charges. However, the vendor can suggest these changes by using notes.</p>	The vendor response is recorded as Accepted with changes , and the status of the PO remains In External Review . The statuses show the types of changes that the vendor has suggested. For information about the automatic consumption of changes, see the "Update the PO when a vendor suggests changes" section later in this topic.

You can use the **Purchase order preparation** workspace to monitor which POs the vendor has responded to. This workspace contains two lists that contain POs that have a status of **In External Review**:

- In external review requires action
- In external review awaiting vendor response

Changing a PO

To change a PO that a vendor has already responded to, you must send the vendor a new version of the PO. The new PO will have a version suffix to indicate that it's a modified version of a PO that was previously sent. The **Purchase order vendor confirmation history** page lets you and your vendors track the history of each order. The previously confirmed version of a PO remains in the list of confirmed POs until the new PO has been confirmed.

Canceling a PO

When you cancel a PO, the status is changed to **Approved**. You must send the PO back to the vendor, so that the vendor can confirm or reject the cancellation. After the cancellation is confirmed, the PO appears in the vendor's list of confirmed POs as **Cancelled**.

Adding attachments to a PO

You can add attachments such as files, images, and notes to the PO by using the document management system. Attachments of the **External** type will be visible to the vendor when you send the PO.

Updating a PO when a vendor suggests changes

If a vendor has responded to a PO and suggested changes, the next step is to process the response.

In the **Purchase order preparation** workspace, in the **In external review requires action** list, you can identify POs that a vendor has accepted with changes. From this list, you can also navigate to the vendor's response.

On a response, a vendor can change the following information on the header:

- Vendor document reference
- Mode of delivery
- Delivery terms
- Confirmed delivery date

The vendor can also add a note or attachment.

On the lines, the vendor can change the quantity and the delivery dates, add notes and attachments, reject a line, substitute a line with another product that is entered as text, and split a line into multiple deliveries. The status of a line varies, depending on the changes that the vendor has suggested:

- **Accepted with changes**
- **Rejected**
- **Substituted** – In this case, an extra line is added that has a status of **Substitute**.
- **Confirmed**
- **Split into schedule** – In this case, extra lines are added that have a status of **Schedule lines**.

If a line has no changes, the line status is **Accepted**.

On the response, the line statuses tell you the types of changes that the vendor made. Additionally, all fields that were changed appear bold to help you identify the changes.

You can update a PO by selecting **Process PO update** on the response or on one line at a time. An **Is PO update processed?** field on the header and the lines indicates whether the system has processed the header or lines to update the PO with changes that originate from the response. You can run the **Process PO update** action only one time per header or line.

Not all suggested changes can be updated on a PO. Only updates on the header, and updates of dates and quantities on lines, can be automatically updated on the PO. For other changes, you must manually update the PO. In this case, the value of the **Is PO update processed?** field is **Manual update**. For example, if a vendor suggests that a line be split into a schedule, this change must be made manually.

Every line that has a status of **Accepted** will have a confirmed delivery date. When you run the **Process PO update** action, this date is updated on the PO. Notes and attachments aren't automatically transferred to the current PO. Additionally, trade agreements aren't reassessed on the PO lines when you update the current PO via the **Process PO update** action.

PO statuses and versions

This section describes the various statuses that a PO can have up to the time when it's confirmed. It also describes when new versions of a PO are made available to the vendor. The behavior varies, depending on whether you use change management for POs.

Versions and statuses if you don't use change management

The following table shows an example of the changes in status and version that a PO might go through.

ACTION	STATUS AND VERSION
The initial version of the PO is created in Supply Chain Management.	The status is Approved .
The PO is sent to the vendor.	A version is registered in the vendor collaboration interface, and the status is changed to In External Review .
The vendor sends an Accepted with changes response.	The status is still In External review .
You make some changes that the vendor requested.	The state is changed to Approved .
You send the new version of the PO to the vendor.	A new version is registered in the vendor collaboration interface, and the status is changed to In External Review .

ACTION	STATUS AND VERSION
The vendor accepts the new version of the PO.	The status is still In External Review , unless the vendor account is configured to automatically set POs to Confirmed status when the vendor accepts them.

Vendors don't have to confirm a PO by using the vendor collaboration interface. They can also send an email or communicate their acceptance of a PO via other channels. You can then manually confirm the order. In this case, you receive a warning that states that the order is being confirmed even though there is no response from the vendor. The PO then appears in the confirmation history as an open confirmed order that doesn't have any responses. At this point, the vendor no longer has the option to confirm or reject the PO.

NOTE

The version of the PO that is available to other processes in Supply Chain Management is always the latest version, even if that version hasn't yet been registered in the vendor collaboration interface.

Versions and statuses if you use change management

If change management is enabled for POs, POs go through an approval workflow to reach the **Approved** status. This process isn't visible to the vendor.

The following table shows an example of the changes in status and version that a PO might go through when change management is turned on. A version is registered when the PO is approved, not when the PO is sent to the vendor or confirmed.

ACTION	STATUS AND VERSION
The initial version of the PO is created in Supply Chain Management.	The status is Draft .
The PO is submitted to the approval process. (The approval process is an internal process that the vendor isn't involved in.)	The status is changed from Draft to In Review to Approval if the PO isn't rejected during the approval process. The approved PO is registered as a version.
The PO is sent to the vendor.	The version is registered in the vendor collaboration interface, and the status is changed to In External Review .
You make some changes that the vendor requested, either manually or by using the Process PO update action on the response to update the PO.	The status is changed back to Draft .
The PO is submitted to the approval process again.	The status is changed from Draft to In Review to Approval if the PO isn't rejected during the approval process. Alternatively, the system can be configured so that specific field changes don't require re-approval. In this case, the status is first changed to Draft and is then automatically updated to Approved . The approved PO is registered as a new version.
You send the new version of the PO to the vendor.	The new version is registered in the vendor collaboration interface, and the status is changed to In External Review .
The vendor approves the new version of the PO.	The status is changed to Confirmed , either automatically, or when you receive the response from the vendor and then confirm the PO.

Sharing information about consignment inventory

If you're using consignment inventory, vendors can use the vendor collaboration interface to view information on the following pages:

- **Purchase orders consuming consignment inventory** – POs for consignment inventory are generated when the ownership of the inventory is changed from the vendor to your company. A product receipt is posted at the same time. These consignment POs are shown only on the **Purchase orders consuming consignment inventory** page. They aren't included on the **All confirmed purchase orders** page in the **Vendor collaboration** module.
- **Products received from consignment inventory** – This page lists all the transactions where the ownership of products has been transferred from the vendor to your company. Vendors can use this information to invoice the customer.
- **On-hand consignment inventory** – This page shows the vendor-owned on-hand consignment inventory that has been received at your warehouse.

Working with RFQs when you use vendor collaboration

This section describes the interactions between customers and vendors during the RFQ process. It also explains how information is communicated to the vendors. For a basic overview of support for the RFQ process, see [Requests for quotation \(RFQs\) overview](#).

Alternates, attachments, amendments, and returns

- **Alternates** – On the header of an RFQ case, you can specify that alternates are allowed for non-catalog item lines. When alternates are enabled, vendors can add an alternate line for each requested line.
- **Attachments** – Attachments can be added at both the header level and the line level of an RFQ case. Attachments can be classified as either internal or external. Internal attachments can be viewed only on the customer side, whereas vendors can view external attachments after they are sent.

Vendors can also add attachments on their bid reply. These attachments can be viewed on the customer side after a vendor submits the bid reply. Attachments that vendors add are always classified as external. To access an attachment that a vendor has submitted together with a bid, select **Bid attachments** or **Bid line attachments**.

To open attachments that were sent together with the RFQ case, use the document handling paper clip symbol on the reply.

- **Amendments** – When an amendment is finalized, the existing bid replies are removed so that they can be replaced by updated values. Information such as the line price and quantity from previous bid replies can be viewed via the journals on the RFQ case.

To enforce amendment processing, on the **Procurement and sourcing parameters** page, on the **Request for quotations** FastTab, set the **Lock RFQs when they are sent** option to **Yes**. (This option is set and required for Public sector.)

- **Returns** – If a vendor has submitted a bid, but more or modified information is required for the RFQ case, the customer can return the bid to the vendor. The data from the bid that was previously submitted is retained, and the vendor can make the requested modifications without having to restart the bid process.

Public sector extensions

For Public sector, the extended functionality enables an RFQ case to be sent to vendors and published. When you publish an RFQ, anyone who requests the information can view the work that complies with most public-sector regulations. All available work is reflected on the **Open published requests for quotations** list page, and the

canceled, pending, or awarded RFQs can be viewed on the **Closed published requests for quotations** list page. These documents can also be viewed on a site outside Supply Chain Management through integrations with the following data entities:

- Published requests for quotations
- Published requests for quotations line
- Published requests for quotations header attachments

These entities let people who aren't provisioned users in Supply Chain Management, but who have anonymous access to the external site, view the available and closed work. Additionally, extended functionality in **Send and publish** lets the user who sets up parameters for the RFQ process define an email template. Then, when the procurement professional creates the RFQ case, he or she must select the email template to send the required information to the vendors on the RFQ case.

The user who sets up parameters for the RFQ process can create multiple email templates. These email templates can contain both static text and the following replacement tokens. The tokens will be replaced with contextual values when an email is created.

- %RFQCase%
- %RFQCaseName%
- %bidType%
- %inviteOnly%
- %expiryDateTime%
- %requester%
- %requestingDepartment%
- %accountnum%
- %todaysdate%
- %createddate%

If an amendment is required and is sent after the RFQ is sent, the RFQ will be resent to all invited vendors. The published document will also be updated on the **Open published requests for quotations** page.

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Vendor collaboration with customers

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IMPORTANT

Some or all of the functionality noted in this topic is available as part of a preview release. The content and the functionality are subject to change. For more information about preview releases, see [One version service updates FAQ](#).

This topic describes how you can use vendor collaboration to work with customers in Microsoft Dynamics 365 Supply Chain Management. Vendors can complete a series of business processes from the following workspaces:

- **Purchase order confirmation** – Monitor and respond to purchase orders (POs).
- **Vendor bidding** – View requests for quotation (RFQs), and respond to them by entering bids.
- **Vendor information** – View and update vendor master data.
- **Invoicing** – Work with invoices. This topic doesn't cover the **Invoicing** workspace. For more information about this workspace, see [Vendor collaboration invoicing workspace](#).

Vendors can also monitor information about consignment inventory.

Working with POs in the Purchase order confirmation workspace

The **Purchase order confirmation** workspace lets you respond to the purchase orders (POs) that have been sent to you for review. It also lets you view information about POs that are awaiting action from the customer, and POs that have been confirmed but are still open.

There are three lists in the **Purchase order confirmation** workspace:

- **Purchase orders for review** – This list shows POs that have been sent to you and are awaiting a response from you. After you respond, the PO disappears from the list. If the customer sends you a new version of the PO before you've responded to the previous version, only the latest version is shown.
- **Awaiting customer action** – This list shows all the POs that you've responded to but that the customer hasn't yet confirmed. If you accept a PO, you can monitor it in this list until the status is changed to **Confirmed**. If you reject a PO or accept it with changes, you can monitor it here until the customer sends a new version.
- **Open confirmed purchase orders** – This list shows all the POs for your account that have a status of **Confirmed**. When products or services are fully received against the PO, the PO disappears from the list.

You can use the following pages to work with POs:

- **Purchase orders for review** – This page contains the same information as the **Purchase orders for review** list in the workspace. See the description earlier in this topic.
- **Purchase order vendor confirmation history** – This page contains all POs and all versions of POs that have been sent to the vendor. It also contains all the responses that have been returned from the vendor.
- **Open confirmed purchase orders** This page contains the same information as the **Open confirmed purchase order** list in the workspace. See the description earlier in this topic.
- **All confirmed purchase orders** – This page contains all the POs that have been confirmed. The POs that are shown on this page include POs where products or services have been received. You can use this list to monitor POs that you can send invoices for.

Responding to POs

The POs that the customer sends you to review appear in the **Purchase order confirmation** workspace and on the **Purchase orders for review** page. After you open a PO, you can accept it, reject it, or accept it with changes. There might be attachments on the PO header or on individual lines. Additionally, you can attach information to your response on the PO header or individual lines. For example, you might suggest a substitute item for one of the lines.

You can preview and print the PO as a PDF file by using the **Preview/Print** option. You can also use the **Display dimensions** action to hide or show the following dimension columns: **Site, Warehouse, Color, Size, Style,** and **Configuration**.

If you use the **Accept with changes** option, you can accept or reject individual lines. You can also make the following changes to lines:

- Change dates or quantities. To update the confirmed delivery date on all lines, use the **Update delivery date** option on the PO header.
- Split lines for different delivery dates or quantities.
- Substitute an item. In the **Line details** section, enter an item description and the item number in the **External** field.

You can't change pricing information or charges, but you can use notes to make suggestions for these changes.

If the customer sends you a new version of a PO, it will have a version suffix to indicate that it's a modified version of a PO that was previously sent. The **Purchase order vendor confirmation history** page lets you track the history of each order.

Monitoring consignment inventory

If you're using consignment inventory, you can use the vendor collaboration interface to view information on the following pages:

- **Purchase orders consuming consignment inventory** – POs for consignment inventory are generated when the customer takes ownership of the inventory. These consignment POs are shown only on this page. They aren't included on the **All confirmed purchase orders** page.
- **Products received from consignment inventory** – This page lists all the transactions where the ownership of products has been transferred to the company that is consuming the inventory. You can use this information to invoice the customer.
- **On-hand consignment inventory** – This page shows the on-hand consignment inventory that is owned by your company, but that is on hand at the customer's warehouse.

Working with RFQs in the Vendor bidding workspace

The **Vendor bidding** workspace lets you view the requests for quotation (RFQs) that your company has been invited to respond to. You can also respond to the RFQs.

The workspace also shows all the RFQs that you've lost or won. Additionally, if the system is configured for the public sector, the workspace shows the RFQs that are publicly available.

Viewing RFQs

Open the **Vendor bidding** workspace to access the following information:

- Select **New bid invitations** to see the RFQs that your company has been invited to respond to. From here, you can view an RFQ and start the bidding process. You can also see amended RFQs that a new bid must be submitted for.
- Select **Returned bids** to see the RFQs that the customer has returned to you so that you can provide more

information or update the bid.

- Select **Bids in progress** to see the RFQs that you or a contact person who represents your company has been working on but hasn't yet submitted.
- Select **Awarded bids** to see when the customer has awarded at least one line item in your bid.
- Select **Lost bids** to see bids where all lines have been rejected.
- Select the **Request for quotations** link to see a list of all the vendor's RFQ invitations and any bids that have been submitted. The **Request for quotations** page lists all the RFQs that a vendor has been involved in. You can search by status.
- Select the **Declined bids** link to see a list of all the RFQs where a vendor's contact person has declined to bid.

Working with RFQs that are publicly available

People who work in the Public sector can see open and expired RFQs that have been made available to the public.

- Select the **Open published requests for quotations** link to see a list of open RFQs that are available to the public. An open RFQ is an RFQ that hasn't yet expired. You can find the expiration date and time on the header of the RFQ.

If you've been invited to bid, you can find the same RFQ on the **New bid invitations** page. Sometimes, you might want to bid on an open RFQ, but you haven't been invited to bid. In this case, you might be able to invite yourself, provided that the customer has enabled self-invitation for the RFQ case.

Enhance the accessibility of the **Open published requests for quotations** link by turning on the **Display the "Open published requests for quotation" link as a tile** feature. This feature converts the link to a tile and moves it to a prominent location, so that it's easy to find.

- Select the **Closed published requests for quotations** link to see a list of closed RFQs that are available to the public. A closed RFQ is an RFQ that has expired. You can find the expiration date and time on the header of the RFQ.

A closed RFQ shows all vendor bids down to the line level. As bids are awarded or rejected, this information is reflected in the closed RFQ. Any attachments that are included in the bid are also available.

NOTE

This functionality is available only if the Public sector configuration is turned on.

Bidding

- Select **Bid** to start to bid on an RFQ.

When the editing is enabled for bid fields on the headers and lines of an RFQ you can enter your bid directly in the line grid. You must also consider any additional bid information that should be added in the line details.

When you start to work on a bid, it appears in the **Bids in progress** section.

At any time before the expiration date, you can save a bid. You can then return later to finish and submit the bid. After you submit a bid, you can recall and update it up until the expiration date.

- Select **Reset from RFQ** to reset the data that you entered for a bid and revert to the original RFQ. You can reset the header or the line.
- Select **Add alternate** or **Remove alternate** in the line grid to work with alternates.

Some RFQs allow for alternate bids. You can specify alternate bids only for lines of the **Category** type,

because specific items can't be added as alternates.

- Select **RFQ attachment** or **RFQ lines attachment** to open any attachment that the customer has added to an RFQ. Select **Bid attachments** or **Bid line attachments** to upload attachments together with the bid.

There might be questionnaires that you must answer before you're allowed to submit a bid.

- Select **Decline** if you don't want to bid. After you select **Decline**, you can't recall the action and enter a bid.

If an RFQ is amended, you must enter a new bid. You can find information about the amendment on the **Amendments** tab of the RFQ page. Amended RFQs appear on the **New bid invitations** page.

Accessing vendor master data in the Vendor information workspace

As a vendor, you can access part of the information that the customer maintains in the vendor master record. Therefore, you can keep the information up to date. To update the information, you must have a vendor admin (external) role.

The accessible information is the vendor name, addresses, contact information, contact persons and their contact information, identification numbers, tax registration numbers, procurement categories that the vendor is approved to sell to the customer in, and information about certifications.

Additional resources

[Manage vendor collaboration users](#)

NOTE

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Import vendor catalogs

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Vendor catalogs import

In Dynamics 365 Supply Chain Management, purchasing professionals can create and maintain catalogs for company employees to use when they order items and services for internal use. To create a procurement catalog, you can add the items and services that you want to make available to employees, either by importing the product catalog data or by manually adding the product catalog data to the product master.

You can upload catalog data submitted by a vendor from the Microsoft Dynamics 365 client.

The product data that a vendor submits to you, in the form of a catalog maintenance request (CMR) file, must be in XML file format. The CMR file should contain the details for the products that the vendor supplies to your company.

Import vendor catalog data

To import vendor catalog data, you must complete the following tasks:

1. Set up a project in the Data management workspace where you have defined your data mapping rules. Select **Data management** and then select **Set up roles for data projects**.
2. Set up a procurement category hierarchy, and assign your vendors to procurement categories. If you use commodity codes, add the commodity codes to the procurement categories. For information about setting up a procurement category hierarchy, see [Set up a procurement category hierarchy](#).
3. Configure the vendor for catalog import. Select a vendor, and then select **Procurement > Set up > Configure vendor for catalog import**.
4. Configure workflow for catalog import. Create a CMR file template and share this with your vendor.
5. Select **Procurement and sourcing > Common > Catalogs > Vendor catalogs** to create a vendor catalog. The catalog maintenance request (CMR) files that you receive from your vendor are grouped in this catalog.
6. Upload the CMR file.
7. Review, approve, or reject the products in the vendor catalog. The products are automatically mapped to the procurement categories.

Approved products are added to the product master and are released to the selected legal entities. Only approved products can be added to the procurement catalog.

Generate a catalog import file template

The catalog import file template is an XSD file that you use to create a CMR file for a vendor's products. You can use the CMR file to create a new catalog, replace an existing catalog, or modify an existing catalog.

1. Select **Procurement and sourcing > Catalogs > Vendor catalogs** and double-click the catalog that you want to work with.
2. Download a current catalog import template (XSD file). On the **Update catalog** page, on the **Action Pane**, on the **Catalogs** tab, in the **Related information** group, click **Generate catalog template** and

select **Procurement category**.

- With the **Procurement category** option you can generate a catalog template that includes the procurement categories in which the vendor is authorized to provide products.
3. In the **Save as** dialog box, select the location where you want to store the catalog file template and save the file.

For more information and for examples, refer to this blog post: [Vendor catalogs in Dynamics AX](#).

NOTE

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Set up an external catalog for PunchOut e-procurement

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By using the external catalog, you can ensure that the product and price information that you subsequently process in Supply Chain Management is accurate and up to date. The requisition can then be approved and converted to a purchase order and an order can be placed at the vendor.

When the external catalog is set up and an employee is preparing a requisition, there will be an option to redirect to an external site, the external catalog, and return the shopping basket that was created at the external site. This communication is based on the cXML protocol and it has to be set up between the systems of the buying and the selling organization.

To set up the communication, your vendor has to provide pieces of information for you to use in the configuration of the external catalog such as Identity, domain of the buyers company, for example, "DUNS" and "DUNS number", credentials, and the URL to reach the vendors catalog.

Setting up an external catalog

The external catalog should enable an employee who enters a purchase requisition to be redirected to an external site to select products. The products that the employee selects from the external catalog are returned with up-to-date price information and from here, they can be added to the purchase requisition. The intention is not to enable employees to place an order on the external site. When setting up the external catalog, you need to make sure that the purpose of the site that can be accessed by the external catalog is to collect quote information and not to place a real order.

To set up an external vendor catalog, complete the following tasks:

1. Set up a procurement category hierarchy. For more information, see [Set up policies for procurement category hierarchies](#).
2. Register the vendor in Supply Chain Management. Before you can set up configurations to access an external vendor's catalog, you must set up the vendor and the vendor contact in Microsoft Dynamics 365. The external catalog's vendor must also be added to the selected procurement category. For more information about registering vendors, see [Manage vendor collaboration users](#). For information about how to assign vendors to a procurement category, see [Approve vendors for specific procurement categories](#).
3. Make sure that the units of measure and the currency that the vendor uses are set up. For information about how to create a unit of measure, see [Manage unit of measure](#).
4. Configure the external vendor catalog by using the requirements for your vendor's external catalog site. For more details about this task, see [Configure the external vendor catalog](#).
5. Test the vendor's external catalog configurations to verify that the settings are valid and that you can access the vendor's external catalog. Use the **Validate settings** action to validate the request setup message that you've defined. This message should cause the vendors external catalog site to be opened in a browser window. During validation, you can't order items and services from the vendor. To order items and services, you must access the vendor's catalog from a purchase requisition.
6. Activate the external catalog by using the **Activate catalog** button on the **External catalogs** page. The external catalog must be activated before employees can use it. You can inactivate the external catalog at any time.

Configure the external vendor catalog

This section gives more details about task 4 in the preceding section.

1. Enter a name and description for the vendor's external catalog. The name that you enter will appear on the cart that represents the external catalog that is shown to employees who creates a requisition. Employees can click on the cart to open the catalog on the vendor's external catalog site.
2. Add an image by using the **External catalog image** action. The image will appear on the cart that represents the external catalog that is shown to employees who create a requisition. Note that the image's width and height must be equal. Otherwise the image won't be displayed correctly.
3. Select whether the vendor's external catalog website should appear in the same browser window as the one where the employee has created the requisition, or if it should open in a new window.
4. Select the vendor for the catalog. In the **Legal entities** list, there is a row for each legal entity where the vendor is set up. To allow users to request products directly from the vendor's catalog in some legal entities but not others, you can use the **Prevent access** or **Allow access** button for each legal entity where you want the catalog to be or not to be available.
5. In the **Default expiration (Days)** field, enter the number of days that a quotation received from the external catalog is valid and can be used to purchase from the external vendor. When a quotation is created and retrieved from the vendor's external catalog site, the quotation is valid as of the current system date and remains valid for the number of days that you enter in this field.
6. Click the **Add** button to start mapping the procurement categories to the external catalog. Then, in the Category name list, select a category. The list of categories is a superset of procurement categories that the vendor has been mapped to in all the legal entities that are set up for the vendor.

NOTE

Procurement policies are used to allow or restrict access to categories for the buying legal entity or receiving operating unit. Punchout to an external catalog requires that access be allowed to at least one of the procurement categories that is mapped to the catalog.

7. Set up the cXML setup request message that will be sent to the vendor. The automatically generated message format is the minimal template that is required in order to start a session. Fill in values for the tags.

At any time, you can reload the system-generated message template by clicking **Restore message format**. Note that if you restore the message format, the current message will be replaced by the automatically generated message format, which has empty tags.

cXML setup message

Below you can find a description of the tags that are included in the template:

FIELD	DESCRIPTION
< Header > < From > < Credential domain="" >	The domain of the buyer's company.
< Header > < From > < Credential> < Identity > < /Identity >	The identity of the buyer's company.
< Header > < To > < Credential domain="" >	The domain of the vendor's company.
< Header > < To > < Credential> < Identity > < /Identity >	The identity of the vendor's company.

FIELD	DESCRIPTION
< Header > < Sender > < Credential domain="" >	The domain of the buyer's company.
< Header > < Sender > < Credential > < Identity > < /Identity>	The identity of the buyer's company.
< Header > < Sender > < Credential > < SharedSecret > < /SharedSecret >	The shared secret for the buyer's company.
< Request deploymentMode="" >	The test or production deployment.
< Request > < PunchOutSetupRequest > < SupplierSetup > < URL > < /URL>	The URL of the vendor's PunchOut endpoint.

Extrinsic elements

An extrinsic element is additional information, such as a user name that is based on a user that punches out. The extrinsic element is set when the PunchOut occurs and it can be sent in the request setup message. Your vendor could have a requirement for receiving an extrinsic element in the setup request. In that case, you should add the extrinsic element to the list of extrinsic elements in the **Message format** section of the **External catalog** page. Specify a name for the extrinsic element that the vendor can recognize and map it to a value. The options for values are: User name, User email, or Random value. For more information about the cXML protocol, see the [cXML.org website](http://cXML.org).

Post back message

The post back message is the message that is received from the vendor when the user checks out from the external site and returns to Supply Chain Management. Post back messages can't be configured. The messages are based on the cXML protocol definition. Here is the information that can be part of the post back message that is received on a requisition line.

MESSAGE RECEIVED FROM VENDOR	COPIED TO REQUISITION LINE
< ItemIn quantity="" >	Quantity
< ItemIn> < ItemID > < SupplierPartID > < /SupplierPartID >	External item ID
< ItemDetail> < UnitPrice > < Money currency="" >	Currency
< ItemDetail > < UnitPrice > < Money > < /Money >	Unit price
< ItemDetail > < Description ShortName="" >	Product name
< ItemDetail > < Description > < /Description >	Included in item description; Product name if ShortName is not specified.
< ItemDetail > < UnitOfMeasure > < /UnitOfMeasure >	Unit
< ItemDetail > < Classification > < /Classification >	Included in item description
< ItemDetail > < Classification domain="" >	Included in item description

Delete an external catalog

Delete an external catalog with the Delete action on the page.

If a product from the external vendor catalog has been requested, the external vendor catalog cannot be deleted. Instead, the status of the external vendor catalog is set to inactive. If you want to remove access to the external vendor's catalog site, but not delete it, change the external catalog status to Inactive.

Additional resources

- [Purchasing cXML enhancements](#)
- [Use external catalogs for PunchOut e-procurement](#)

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Purchasing cXML Enhancements

2/18/2021 • 27 minutes to read • [Edit Online](#)

The *Purchasing cXML Enhancements* feature builds on the [existing external catalog functionality](#) that is used for purchase requisitions. This existing functionality is known as *PunchOut*. Although a purchase order doesn't have to originate from a purchase requisition, there must be a connection between the vendor on a purchase order and the parameters that are used to send the purchase order document.

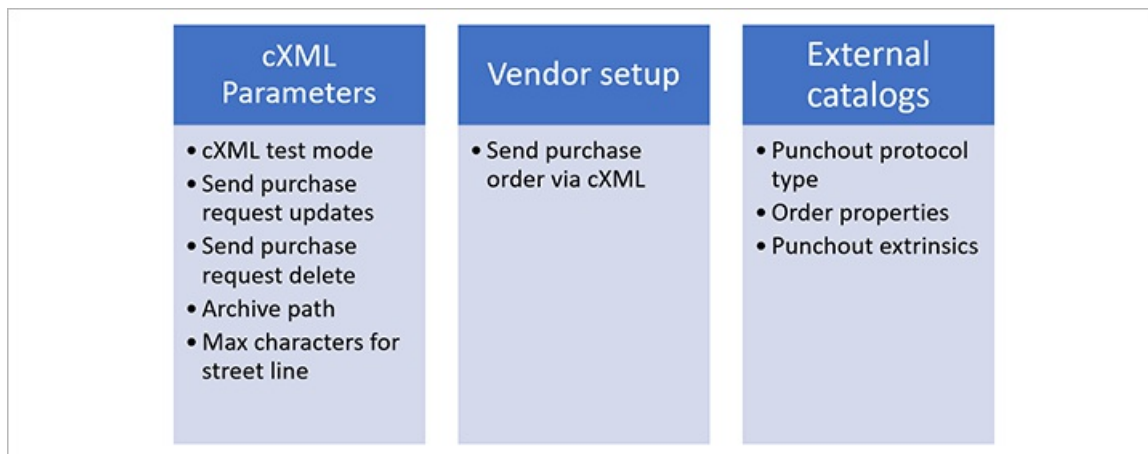
Turn on the Purchasing cXML Enhancements feature

To turn on the feature, open the [Feature management](#) page, and search for the feature that is named *Purchasing cXML Enhancements*. Select the feature, and then select **Enable now** to turn it on.

After you turn on the feature, you should configure settings in the following three areas:

- **cXML parameters** – Use these settings to set up some global parameters for the functionality for sending purchase orders.
- **Vendor setup** – If commerce eXtensible Markup Language (cXML) should be used by default for all new purchase orders that are created for any vendor, set the **Send purchase order via cXML** option to *Yes* for that vendor.
- **External catalogs** – Use the new **Order properties** settings to define the format of the purchase order document and how it's sent.

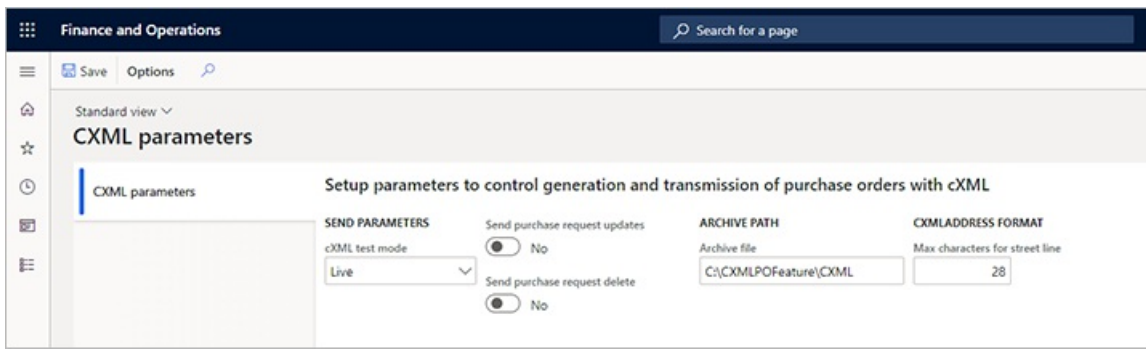
The following illustration summarizes this configuration.



In addition, you must set up the [Purchase order request batch job](#). This batch job is used to send the confirmed purchase orders.

Set up global cXML parameters

Use the [cXML parameters](#) page to make a few global settings that apply to the functionality for sending purchase orders.



Go to **Procurement and sourcing > Setup > cXML management > cXML parameters**, and set the following parameters:

- **cXML test mode** – This global parameter affects the way that purchase orders are physically sent from the batch job. Select one of the following values:
 - **Test** – In this mode, the batch job can be running, and the XML document for the message is generated, but it isn't sent. Instead, it's saved on the purchase order request for review purposes. This mode is helpful when you're in an initial implementation, and you want to see how data is entered in the cXML message. You might also want to generate sample messages that you can send to vendors for initial validation.
 - **Live** – In this mode, the feature uses the [external catalog settings](#) to physically transmit each document to the vendor.
- **Send purchase request updates** – Set this option to *Yes* to send an update message for purchase orders. Set it to *No* to prevent the message from being sent. Most vendors prefer not to receive update messages. Instead, they require that customers contact them by phone or email if a purchase order should be changed. This parameter is a global parameter, and no override can be specified on the external catalog for each vendor. A purchase order will be marked as updated if you post a second confirmation on a purchase order, but the first confirmation has already been sent and acknowledged by the vendor. If there is a second confirmation, but the first confirmation hasn't been sent, the second confirmation will be treated as a new document. You can confirm a purchase order as many times as you want until one confirmation is sent. The next confirmation will then be treated as an update message.
- **Send purchase request delete** – Set this option to *Yes* to send a delete message for purchase orders. Set it to *No* to prevent the message from being sent. Most vendors prefer not to receive delete messages. Instead, they require that customers contact them by phone or email if a purchase order was sent by mistake. This parameter is a global parameter, and no override can be specified on the external catalog for each vendor. A purchase order will be marked as deleted if you cancel the purchase order in Supply Chain Management.
- **Archive file** – Specify the file path where you want to export and save archived cXML documents. The path is used when you run the purge function from the **Purchase order request** page.
- **Max characters for street line** – Enter the maximum number of characters that can be used in the street field for addresses in the cXML document. This global parameter affects all vendors unless an override is specified on the external catalog properties.

Set up vendor purchase orders to use cXML

Every time that you confirm a purchase order where the **Send purchase order via cXML** option is set to *Yes*, the system automatically generates the cXML message and delivers it to the vendor that is associated with that purchase order. There are two ways to control this option for your purchase orders:

- To set up a vendor so that it automatically uses cXML for all new purchase orders that are created from a requisition, go to **Procurement and sourcing > Vendors > All vendors**, and select or create a vendor to

open its details page. Then, on the **Purchase order defaults** FastTab, set the **Send purchase order via cXML** option to *Yes*. If cXML should also automatically be used for new purchase orders that are **not** created from a requisition, you must also set the **ENABLEMANUALPO** order property to *True* for the related external catalog, as described in the [Set the order properties](#) section later in this topic.

- For individual purchase orders, go to **Procurement and sourcing > Purchase orders > All purchase orders**, and select or create a purchase order to open its details page. Switch to the **Header** view, and then, on the **Setup** FastTab, set the **Send purchase order via cXML** option as required.

Set up an external catalog to use cXML

On the **External catalogs** page, for each of your catalogs, you can set up the PunchOut functionality and the functionality for sending purchase orders. To find the relevant settings, go to **Procurement and sourcing > Catalogs > External catalogs**. Start by [setting up each catalog as usual](#). This process includes assigning a vendor, selecting the categories that the vendor is allowed to supply, and activating the catalog. Then configure the additional settings that are described in this section.

NOTE

When you confirm a purchase order that can be sent via cXML, the system looks up the vendor that is associated with the purchase order and then finds the first active external catalog that is associated with that vendor. The system then uses the settings from that external catalog to send the purchase order. If multiple external catalogs are set up, the system uses only the first external catalog that it finds, based on the vendor on the purchase order. Therefore, we recommend that you create just one external catalog for each vendor.

Set the PunchOut protocol type

On the **General** FastTab of the **External catalogs** page, set the **Punchout protocol type** field to *cXML*. This option will be the only available option, unless a partner has extended the functionality and provides an additional option in the extension.

If you're also using the catalog for PunchOut, you must also [set up the message format](#). The message format is used to establish the connection to the vendor in the PunchOut transaction from the requisition. When a purchase order is sent, the order properties will be used to establish the connection with a vendor.

Set the order properties

The *Purchasing cXML Enhancements* feature adds a new **Order properties** FastTab for external catalogs. This FastTab provides a grid where you can define the order properties. It also provides a toolbar. This toolbar contains the following three buttons that you can use to manage the order properties:

- **Default properties** – When you're setting up a new catalog, select this button to add a predefined collection of commonly used properties to the grid.
- **New** – Add a new property to the grid.
- **Delete** – Delete the currently selected property from the grid. If you accidentally delete a default property, select **Default properties** to restore all the missing properties.

Every time that you add one or more properties to the grid, use the right column to specify a value for each.

Use the default properties in the following way:

- **BUYER_COOKIE** – This tracking field can be used to indicate specific information for your company. Unless you have an agreement with the vendor about how this property is used, it doesn't have very much meaning when sending a purchase order. Therefore, you should set it to a simple value.
- **DELIVERTO** – When the shipping address is entered in the document from the purchase order, the **Attention information** field is used to set the **DeliverTo** field in the XML message. If you require that this value be a requester name, and you will set the requester field on the purchase order header, enter the value *REQUESTER* for this property, so that the requester name will be entered in the **DeliverTo** field in the XML. In this case, the primary email address and phone number that are used will be from the requester instead of the orderer.
- **DEPLOYMENTMODE** – Set this property as required by the vendor. The values are usually *PRODUCTION* or *TEST*. Set the value based on your communication with the vendor. Usually, it must match the intended system behind the **ORDERCHECKURL** value that the vendor indicates as a test or production system.
- **FIXEDBILLADDRESSID** – When the **addressID** field in the XML message is set, it picks up the location that is specified on the address. If the ID value that you've communicated to the vendor differs from the value on the address location for some reason, you can force an override by specifying the value here. The assumption is that you will use only one address with the vendor, and that the address is set up in the vendor's system. The billing address is the primary invoice address that is specified for the legal entity in Supply Chain Management.
- **FIXEDSHIPADDRESSID** – When the **addressID** field in the XML message is set, it picks up the location that is specified on the address. If the ID value that you've communicated to the vendor differs from the value on the address location for some reason, you can force an override by specifying the value here. The assumption is that you will use only one address with the vendor, and that the address is set up in the vendor's system. The shipping address is the address that is specified on the header of the purchase order. Most vendors accept only header addresses, not line addresses. Although there are fields for line addresses in the XML, they will be set to the header address.
- **FROM_DOMAIN** – Enter the value that is used to send purchase order documents. This value is supplied by your vendor.
- **FROM_IDENTITY** – Enter the value that is used to send purchase order documents. This value is supplied by your vendor.
- **ORDERCHECKURL** – Enter the URL to transmit the purchase order documents to. This URL starts with

`https://` and is supplied by your vendor.

- **PAYLOAD_ID** – Enter a prefix value for the payload ID, as required for the business processes that are in place for the current vendor.
- **SENDER_DOMAIN** – Enter the value that is used to send purchase order documents. This value is supplied by your vendor.
- **SENDER_IDENTITY** – Enter the value that is used to send purchase order documents. This value is supplied by your vendor.
- **SHARED_SECRET** – Enter the value that is used to send purchase order documents. This value is supplied by your vendor.
- **STREETLENGTH** – Enter a number that represents the maximum number of characters that the vendor will accept as a street name. If a value is entered here, it overrides the value that is specified on the **cXML parameters** page. The system will remove line breaks and spaces to try to fit the standard address in Supply Chain Management into the number of characters that is specified here. Any additional characters will be truncated.
- **TO_DOMAIN** – Enter the value that is used to send purchase order documents. This value is supplied by your vendor.
- **TO_IDENTITY** – Enter the value that is used to send purchase order documents. This value is supplied by your vendor.
- **USERAGENT** – Enter a value to identify the system that you're using. For example, enter *Dynamics 365 Supply Chain Management*.
- **VERSION** – Enter a cXML version number, if the vendor requests this information. The default version is *1.2.008*. This version is stable and is accepted by most vendors.
- **RESPONSETEXT** – Enter any custom text that you expect the vendor to return in the cXML response message after the order has been sent. In this way, the system can mark the message as *Acknowledged*. If the response doesn't match standard text or the customer text that you enter here, the request will be marked as *Error*.
- **RESPONSETEXTSUB** – Set this property to *TRUE* if you want to search the vendor response text for the values that are specified in the **RESPONSETEXT** field. For example, the vendor might return a long string that includes "OK" in the response. In this case, you can enter *OK* in the **RESPONSETEXT** field and set **RESPONSETEXTSUB** to *TRUE* to search for "OK" anywhere in the response. The order can then be set to *Acknowledged*.
- **CONTENTTYPE** – In a typical catalog setup, you don't have to set this property. If you receive a server 500 error from a vendor's system when you send a purchase order, you can do testing by setting this property to *FALSE*. That value will change a setting in the web request and might enable the message to be sent for some platforms.
- **ENABLEHEADERS** – Set this property to *TRUE* to send headers together with the purchase order. You must set this property only if the vendor requires it. If you set this property to *TRUE*, add extra custom properties that are based on the names that the vendor provides, and prefix them with *H_*. Typical examples include **H_USERID**, **H_PASSWORD**, **H_RECEIVERID**, and **H_ACTIONREQUEST**. The following custom properties are included in the default properties:
 - **H_USERID** – If the trading partner requires that you send a user ID as part of the URL to submit a purchase order, enter the value here.
 - **H_PASSWORD** – If the trading partner requires that you send a password as part of the URL to submit a purchase order, enter the value here.

- **ENABLEMANUALPO** – If this property is set to *TRUE*, when users manually create purchase orders (that is, when they don't start from a requisition), those purchase orders will inherit the setting of the **Send purchase order via cXML** option from the vendor. If this property isn't set, or if it's set to *FALSE*, the **Send purchase order via cXML** option won't be set on the purchase order header for manually created purchase orders. For purchase orders that are created from a requisition, the setting of the **Send purchase order via cXML** option is always inherited from the vendor, regardless of the setting of this property. For more information, see the [Set up vendor purchase orders to use cXML](#) section earlier in this topic.
- **PUNCHOUTPOONLY** – If this property is set to *TRUE*, only purchase requisition lines that are created from the PunchOut process will set the **Send purchase order via cXML** option on the purchase order header. In addition, the purchase requisition line type of all lines on the purchase order must be *External catalog item*. Otherwise, the cXML purchase order can't be created.
- **PUNCHOUTSHIPTO** – If this property is set to *TRUE*, the default address of the legal entity will be added to the PunchOut setup request message when the user opens an external catalog. This address is added as the **ShipTo** address. Vendors will use the **ShipTo** address to show pricing based on the company location.
- **TRACEPUNCHOUT** – Set this property to *TRUE* if you receive an error message when you try to browse to an external catalog from the requisition. Trace information will then be filled in for the **PunchOutSetupRequest** and **PunchOutResponse** messages that are sent between Supply Chain Management and the vendor site. You can view this information on the **cXML cart message log** page, which you can open from the **External catalog setup** page for the vendor catalog that you're having issues with. You should set this property to *TRUE* only if you're troubleshooting, because it creates a large performance overhead on the database for each PunchOut. For more information, see the [View the cXML cart message log for external catalog PunchOut](#) section later in this topic.
- **REPLACENEWLINE** – Set this property to *TRUE* if you're having an issue because a vendor's system is sending a **PunchOutResponse** message that includes newline characters (\n). This issue might occur if the vendor's messages are parsed through middleware or a procurement hub. If you're having an issue with a new vendor setup, set the **TRACEPUNCHOUT** property to *TRUE* to view the **PunchOutResponse** message and determine whether the XML tags are broken up by newline characters.
- **POCOMMENTS** – Set this property to *TRUE* if you want the cXML document to include notes that are attached to the purchase order in Supply Chain Management. The attachment text is included in the header comments in the purchase order message. For more information about how the system selects and processes these attachments, see the [Attach notes to a purchase order](#) section later in this topic.
- **VENDCOMMENTS** – Set this property to *TRUE* if you want the cXML document to include notes that are attached to the purchase order in Supply Chain Management. The attachment text is included in the header comments in the purchase order message. For more information about how the system selects and processes these attachments, see the [Attach notes to a purchase order](#) section.
- **CLEANAMP** – Set this property to *TRUE* if you receive an error message when you try to do a PunchOut to a vendor, and the vendor's return URL includes incorrectly encoded ampersands (&).
- **PUNCHOUTTZ** – Set this property to *TRUE* if the vendor that you're working with uses the International Organization for Standardization (ISO) 8601 standard to do a specific validation of the date/time of PunchOut request message. Supply Chain Management uses the Coordinated Universal Time (UTC) date in the **PunchOutSetupRequest** message. Therefore, when you set this property to *TRUE*, *+00:00* is added to the date/time format.
- **WMSADDRESSID** – Set this property to *TRUE* to use the warehouse number on the purchase order header as the **addressID** value in the **ShipTo** address for the purchase order request that is sent to the

vendor. If you set a value for the **FIXEDSHIPADDRESSID** property, that value takes precedence over this value. Therefore, you should use one property or the other to set the **addressID** value in the **ShipTo** address for the document.

- **PUNCHOUTSHIPTOUSER** – This property works together with the **PUNCHOUTSHIPTO** property. If **PUNCHOUTSHIPTO** is set to *TRUE*, the address for the legal entity is picked up. If **PUNCHOUTSHIPTOUSER** is set to *TRUE*, the primary address from the PunchOut user is used instead of the legal entity address.

Activate the external catalog

When you've finished setting up all the properties and configuring other settings for your external catalog, go back to the **General** FastTab of the **External catalogs** page, and set the **Active** option to *Yes*.

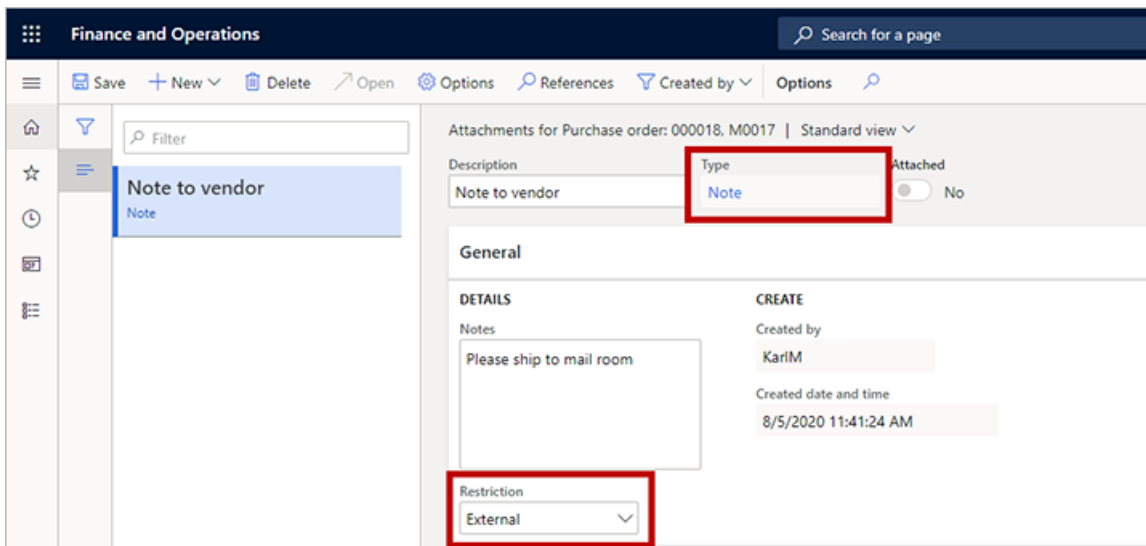
Attach notes to a purchase order

As was mentioned in the [Set the order properties](#) section, if you want your delivered cXML to include text from notes that are attached to the relevant purchase order and/or vendor records, you can set the **POCOMMENTS** and/or **VENDCOMMENTS** property to *TRUE* in the external catalog setup. This section provides more detail about how the system selects and processes these attachments, if you use them.

To set the types of notes that the system will look for, go to **Procurement and sourcing > Setup > Forms > From setup**. Then, on the **Purchase order** tab, set the **Include documents of type** field to the type of note that you want to be able to include. Only text notes will be included, not document attachments.

The screenshot shows the 'Form setup' page in Dynamics 365 Finance and Operations. The page is titled 'Set up formats for purchase orders' and is divided into three main sections: LAYOUT, SHOW IN SHEET, and UPDATES. The LAYOUT section includes a 'Paper format' dropdown menu set to 'Blank paper' and an 'Include document on sheets' dropdown menu set to 'All'. The SHOW IN SHEET section has a list of checkboxes for 'Configuration', 'Size', 'Color', 'Style', 'Site', 'Warehouse', 'Inventory status', 'Location', 'License plate', 'Batch number', 'Serial number', and 'Owner'. The 'Site' and 'Warehouse' checkboxes are checked. The UPDATES section has a 'Mark order updates' toggle switch set to 'Yes'.

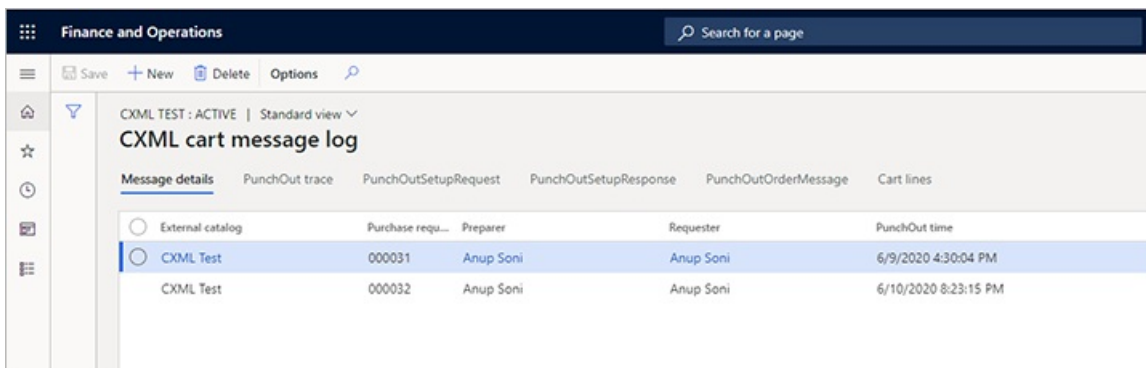
Attachments will be included with a purchase order only if their **Type** field is set to the value that you select in the **Include documents of type** field, and if their **Restriction** field is set to *External*. To create, view, or edit the attachments for a purchase order, go to **Procurement and sourcing > All purchase orders**, select or create a purchase order, and then select the **Attachments** button (paperclip symbol) in the upper-right corner.



View the cXML cart message log for external catalog PunchOut

When you set the **Punchout protocol type** field to *cXML* for an external catalog, the system will capture a message log of the carts that come back from vendors. This log can be used for troubleshooting and other data purposes.

To open the log for an external catalog, select the relevant catalog, and then, on the Action Pane, select **cXML cart message log**. The **cXML cart message log** page shows a list of the carts that have been returned, the XML that is related to those carts, and the lines that were created on the related purchase requisition.



Set the extrinsic elements for external catalog PunchOut

When you set the **Punchout protocol type** field to *cXML* for an external catalog, you can add custom extrinsic elements that will be inserted at the correct place in the request XML message.

To add extrinsic elements to an external catalog, follow these steps.

1. Go to **Procurement and sourcing > Catalogs > External catalogs**.
2. Select the relevant catalog.
3. On the **Message format** FastTab, in the **Extrinsics** section, select **Add** to add a row to the grid for each extrinsic element that you want to include. On each row, set the following fields:
 - **Name** – Enter a name for the element. This value will become the value of the **name** attribute for the **Extrinsic XML** element that is created by each row. Usually, you will work with your vendor to agree on the name for each extrinsic element.
 - **Value** – Select a value for the element. This value will become the value of the XML element that is created by each row. The following values are available:

- **User name** – Use the name of the user who is doing the PunchOut. This name is the sign-in name for Supply Chain Management.
- **User email** – Use the email address of the user who is doing the PunchOut. This address is the address that the user has set up on the **Account** tab of the **User options** page.
- **Random value** – Use a unique random value.
- **User full name** – Use the full name of the contact person who is associated with the user who is accessing the external catalog.
- **Firstname** – Use the first name of the contact person who is associated with the user who is accessing the external catalog.
- **Lastname** – Use the last name of the contact person who is associated with the user who is accessing the external catalog.
- **Phone number** – Use the primary phone number of the contact person who is associated with the user who is accessing the external catalog.

CXML Test : Active

General CXML Test

Vendor

Procurement category mapping

Message format UniqueUserName | User name

cXML setup request

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE cXML SYSTEM "http://xml.coml.org/schemas/cXML/1.2.028/cXML.dtd">
<cXML payloadID="1535056080.0188" timestamp="2018-08-23T20:28:00+00:00" version="1.0" xml:lang="en">
  <Header>
    <From>
      <Credential domain="NetworkId">
        <Identity>MS_CustTest</Identity>
      </Credential>
    </From>
    <To>
      <Credential domain="DUNS">
        <Identity>107627952</Identity>
      </Credential>
    </To>
    <Sender>
      <Credential domain="NetworkId">
        <Identity>Ms_CustTest</Identity>
        <SharedSecret>B1g72</SharedSecret>
      </Credential>
      <UserAgent>Microsoft Dynamics 365 for Finance and Operations</UserAgent>
    </Sender>
  </Header>
```

EXTRINSICS

Name	Value
UniqueUserName	User name
UserEmail	User email
UserFullName	User full name
FirstName	Firstname
LastName	Lastname
PhoneNumber	Phone number

Order properties

The user or admin won't see the extrinsic elements, because they aren't added until the user does a PunchOut. They will automatically be inserted between the **BuyerCookie** and **BrowserFromPost** elements in the cXML setup request message. Therefore, you don't have to set them manually in the XML when you set up the external catalog.

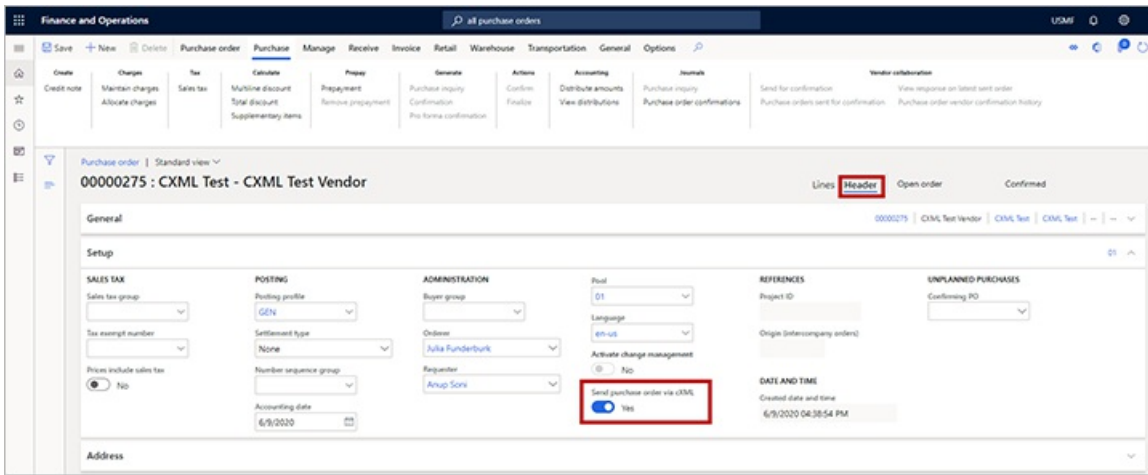
```
<Request deploymentMode="production">
  <PunchOutSetupRequest operation="create">
    <BuyerCookie></BuyerCookie>
    <BrowserFormPost>
      <URL></URL>
    </BrowserFormPost>
  </PunchOutSetupRequest>
</Request>
```

➔

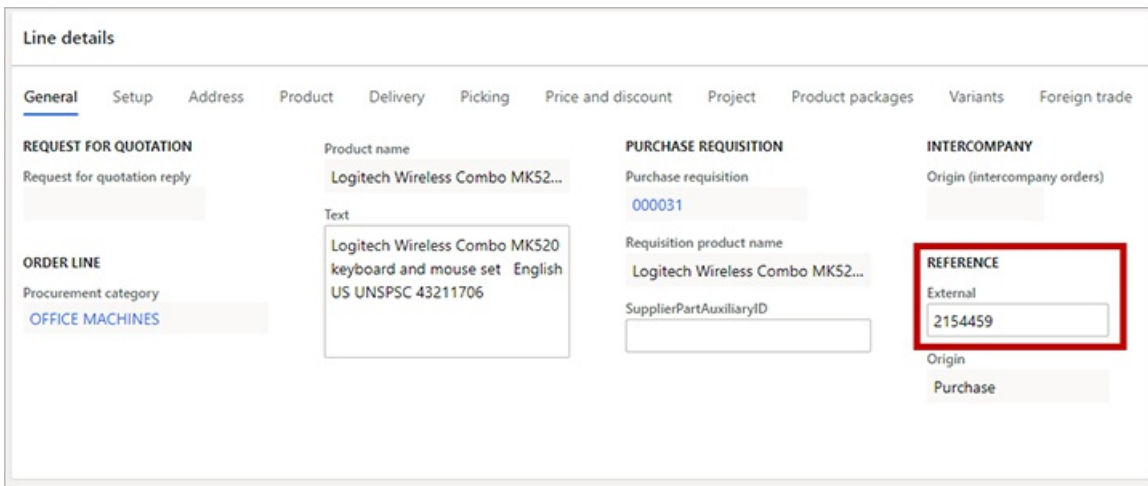
```
<Request deploymentMode="production">
  <PunchOutSetupRequest operation="create">
    <BuyerCookie></BuyerCookie>
    <Extrinsic name="UniqueName"></Extrinsic>
    <Extrinsic name="UserEmail"></Extrinsic>
    <BrowserFormPost>
      <URL></URL>
    </BrowserFormPost>
  </PunchOutSetupRequest>
</Request>
```

Create and process a purchase order

When you create a purchase order for a vendor, it will inherit the setting of the **Send purchase order via cXML** option from that vendor. However, the setting remains available on the **Setup** FastTab in the **Header** view of the purchase order, so that you can change it later as required.



When you create a purchase order from a purchase requisition that came from a PunchOut flow, all the required line details will be filled in. You can then manually add purchase order lines or copy them from other purchase orders. Be sure to set all required fields. These required fields include the external reference number, which is the vendor number that will be used in the cXML message.



When you've finished filling in all the details for the purchase order, be sure to confirm it. No message is sent unless the purchase order is confirmed. To confirm a purchase order, on the Action Pane, on the **Purchase** tab, in the **Actions** group, select **Confirm**.

After the purchase order is confirmed, you can view the status of the confirmation through the **Purchase order confirmations** journals. On the Action Pane, on the **Purchase** tab, in the **Journals** group, select **Purchase order confirmations**.

Each purchase order can have many confirmations. Each confirmation is marked with an incremental number. In the following illustration, the purchase order is *00000275*, and the confirmation is *00000275-1*. This numbering reflects standard Supply Chain Management functionality, where changes in a purchase order, and therefore the type of cXML message that should be sent to the vendor, are identified based on the confirmation. As the illustration shows, the **Purchase order confirmations** page also includes **Order send status** and **Order request vendor status** fields. For more information about the various status values that you might see on this page, see the [Monitor purchase order requests](#) section later in this topic.

Finance and Operations | all purchase orders

Options

00000275 : CXML TEST VENDOR | Standard view

Purchase order confirmations

Overview Lines

Preview/Print Charges Sales tax Prepayment Purchase order request

Purchase order	Purchase jour...	Date	Buyer group	Cu...	Amount in tra...	Order send status	Order request vendor sta...
00000275	00000275-1	6/9/2020		USD	56.04	Sent	Acknowledged

To view more information about the document, select **Purchase order request** above the grid.

The **Purchase order request** page includes two grids. The grid in the upper part of the page has one record for each purchase order that is marked for sending. The grid on the **Purchase order request history** tab in the lower part of the page might have several records for the selected purchase order, to indicate the status of each confirmation. The following illustration shows purchase order 00000275 in the upper grid and document 00000275-1 in the grid on the **Purchase order request history** tab.

Finance and Operations | all purchase orders

Edit + New Delete Purchase order request Options

00000275 : SENT | Standard view

Purchase order request

Purchase order request

Purchase order	Vendor account	Orderer	Order send status	Order request vendor sta...
00000275	CXML Test	Julia Funderburk	Sent	Acknowledged

Purchase order request history Request XML text Response XML

Purchase order	Order request type	Purchase order	Request time	Order send status	Order status time	Order request vendor sta...	Re-submit time
00000275	New	00000275-1	6/9/2020 4:45:59 PM	Sent	6/10/2020 8:41:32 PM	Acknowledged	

If the batch job is set up and running, the document will be sent. You can view the status change after the document has been sent. In the following illustration, the **Order send status** field is set to *Sent*. The **Order request vendor status** field is set to *Acknowledged* to indicate that the vendor received the document, and was able to read it and store it in its system. The grid on the **Purchase order request history** tab shows the time when the document was sent. For more information about the various status values that you might see on this page, see the [Monitor purchase order requests](#) section.

Finance and Operations | all purchase orders

Edit + New Delete Purchase order request Options

00000275 : SENT | Standard view

Purchase order request

Purchase order request

Purchase order	Vendor account	Orderer	Order send status	Order request vendor sta...
00000275	CXML Test	Julia Funderburk	Sent	Acknowledged

Purchase order request history Request XML text Response XML

Purchase order	Order request type	Purchase order	Request time	Order send status	Order status time	Order request vendor sta...	Re-submit time
00000275	New	00000275-1	6/9/2020 4:45:59 PM	Sent	6/10/2020 8:41:32 PM	Acknowledged	

Schedule the Purchase order request batch job

To activate the batch job for sending purchase order requests, go to **Procurement and sourcing > Setup > cXML Management > Purchase order request**, and then, on the Action Pane, on the **Purchase order request** tab, in the **Batch** group, select **Submit job** to open the **Purchase request prepare and send** dialog box. You can use this dialog box to set up the recurrence, just as you usually do for batch jobs in Supply Chain Management. Select an interval, based on your order volume. Although you can run the batch job every minute, it's probably best to send batches throughout the business day, based on order receipt windows that match your vendors' schedules.

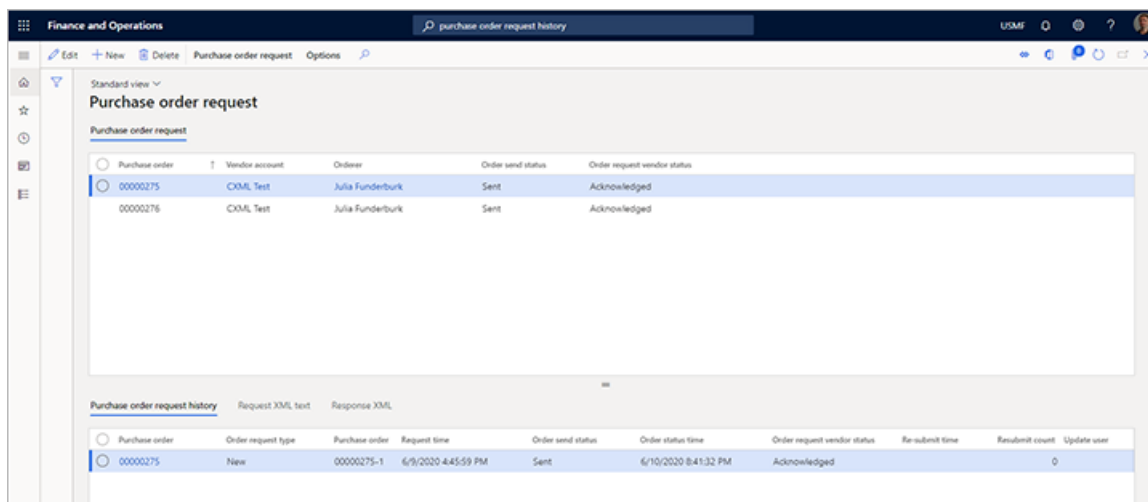
For example, your vendor has a policy that states that all orders that are received by 1 PM will be shipped on the same day. In this case, you might have to run the batch only a few times during the morning to communicate any orders that you have. The remaining orders will then be sent the next day. This decision is purely a business decision. You can review it and set the parameters for it accordingly.

The process will look for purchase order request documents that have a status of *Waiting*. If you have an order that you must send to a vendor immediately, you can select **Submit job** and set the **Batch processing** option to *No*.

Monitor purchase order requests

View the status of a purchase order

When orders that can be sent via cXML are confirmed, they go into *Waiting* status. As was described in the [Create and process a purchase order](#) section, you can view the purchase order status on the **Purchase order request** page. Each purchase order request can have one of several statuses, depending on its parameters and data. This section describes the various status types and the values that they can have. This information can help you manage issues and understand the status of your purchase orders.



Purchase order	Vendor account	Orderer	Order send status	Order request vendor status
00000275	CXML Test	Julia Funderburk	Sent	Acknowledged
00000276	CXML Test	Julia Funderburk	Sent	Acknowledged

Purchase order	Order request type	Purchase order	Request time	Order send status	Order status time	Order request vendor status	Re-submit time	Resubmit count	Update user
00000275	New	00000275-1	6/9/2020 4:45:59 PM	Sent	6/10/2020 8:41:32 PM	Acknowledged		0	

The grid in the upper part of the **Purchase order request** page might show the following status values:

- **Order send status** – This field can have one of the following values:
 - **Waiting** – The document is waiting to be sent.
 - **Sent** – The document has been sent.
 - **Stopped** – The document was marked as *Stopped* before it was sent. (To mark a document as *Stopped*, select **Stop** on the Action Pane of the **Purchase request** page.)
 - **Archive** – The document has been purged. (To purge a document, select **Purge** on the Action Pane of the **Purchase request** page.)
- **Order request vendor status** – This field can have one of the following values:
 - **Waiting** – The document is waiting to be sent.

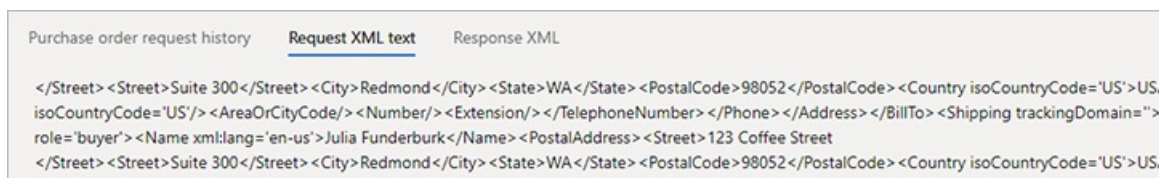
- **Acknowledged** – The document has been acknowledged as received by the vendor. You can review the detailed XML message that is returned from the vendor by selecting the **Response XML** tab in the lower part of the page.
- **Error** – The document was sent to the vendor, but an error occurred. You can review the error message by selecting the **Response XML** tab in the lower part of the page.

The grid on the **Purchase order request history** tab in the lower part of the **Purchase order request** page might show the following values:

- **Order request type** – This field can have one of the following values:
 - **New** – The line is marked as new immediately after the purchase order is confirmed.
 - **Update** – If a confirmation has already been sent and acknowledged by the vendor, the next confirmation will be marked as *Update*. Updates will be sent only if the **Send purchase request updates** option is set to *Yes* in the [global cXML parameters](#).
 - **Delete** – If a confirmation has already been sent and acknowledged by the vendor, but the purchase order is canceled, the confirmation that is waiting will be marked as *Delete*. Deletions will be sent only if the **Send purchase request delete** option is set to *Yes* in the [global cXML parameters](#).
- **Request time** – The time when the order confirmation was created. You can compare the request time with the order status time to determine the time between confirmation and vendor acknowledgment.
- **Order send status** – This field is the same as the **Order send status** field in the upper part of the page. It's repeated here to make it easier to view the status at the confirmation level. If the **Order request type** field is set to *New*, and the purchase order is reconfirmed before a confirmation is sent, the **Order send status** field is set to *Archive*.
- **Order status time** – The time when the purchase order request history record was last updated. (The updates include status changes.)
- **Order request vendor status** – This field is the same as the **Order request vendor status** field in the upper part of the page. It's repeated here to make it easier to view the status at the confirmation level.
- **Re-submit time** – The time when the record was resubmitted.
- **Re-submit count** – The number of times that the record has been resubmitted. A high number indicates multiple failures, and therefore might indicate an issue with either your data setup or your vendor's data setup.

View the XML for a purchase order request message

To view the XML for the purchase order request message, select the **Request XML text** tab at the bottom of the **Purchase order request** page. The information on this tab can be helpful during testing or error validation. To make the information easier to read, you can view it as a formatted message. Copy the contents of the tab to a text file, and then view it in an XML editor.



View the details of the vendor response

To view the content of a vendor acknowledgment or error response, select the **Response XML** tab at the bottom of the **Purchase order request** page.

```
Purchase order request history Request XML text Response XML
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE cXML SYSTEM "http://xml.cxml.org/schemas/cXML/1.2.007/cXML.dtd"> <cXML version="1.2.005" xmlns="en-US" payloadID="6/10/2020 3:41:32 PM
<Response>
  <Status code="200" text="Order Received"> </Status>
</Response>
</cXML>
-----
Start to load the response into to the StringReader
About to try to load the string into the XML reader.
Try to find the status.
Get the text of the response message.
```

Additional resources

- [Set up an external catalog for PunchOut e-procurement](#)
- [Use external catalogs for PunchOut e-procurement](#)

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Use external catalogs for PunchOut e-procurement

2/18/2021 • 2 minutes to read • [Edit Online](#)

By using external catalogs for PunchOut e-procurement, you don't have to maintain information about your vendors' products in your own master data. Instead, the shopping cart on a vendor's website is converted to requisition lines that have the correct product information.

You should avoid maintaining the descriptions and prices of your vendors' products in your own product master data. Instead, use external catalogs for PunchOut e-procurement. Then, when employees create requisitions, they can "punch out" to a vendor's external catalog site (in other words, they leave your system and go to the vendor's site). The products that are added to the shopping cart on the vendor's website can then be converted to requisition lines. Therefore, you get the correct product information: product ID, name, price, and so on.

To use external catalogs, an employee must create a requisition on the **My purchase requisitions** page.

The employee who creates a requisition is referred to as the preparer of the requisition. As a preparer, you can complete the following tasks.

Use the **External catalogs** line action to open a page that includes all external catalogs that are available for the specified requester, buying legal entity, and receiving operating unit.

Depending on your permissions, change the requester, buying legal entity, and receiving operating unit. A change in those values might change the list of external catalogs that are available to a requester. The external catalogs that are available depend on the current active purchasing policies for the buying legal entity or the receiving operating unit. These policies can allow or prevent access to specific procurement categories. Therefore, the list of external catalogs that are mapped to these procurement categories can be affected.

For more information about policies, see [Purchasing policies overview](#).

- To find external catalogs for specific procurement categories, enter text in the catalog search field.
- To add products from a vendor's external catalog on the vendor's website, click the external catalog. Then add products to the shopping cart, and check out. The shopping cart lines will be transferred to Microsoft Dynamics 365.

If there are multiple options for procurement categories, select the correct procurement category before you add the lines to the requisition. After lines have been added to a requisition, you can add more lines without using external catalogs. Alternatively, you can continue to use external catalogs to add lines.

When the requisition is ready, use the **Workflow > Submit** action to submit it for approval.

Additional resources

- [Set up an external catalog for PunchOut e-procurement](#)
- [Purchasing cXML enhancements](#)

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Vendor collaboration mobile workspace

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This topic provides information about the **Vendor collaboration** mobile workspace. This workspace helps your vendors stay up to date about the purchase orders that have been sent to them for approval. They can also view information about new and updated purchase orders and contacts.

This mobile workspace is intended to be used with the Finance and Operations mobile app.

Overview

The **Vendor collaboration** mobile workspace keeps vendors informed about new purchase orders, so that they can view purchase orders and then respond to them in the web client.

NOTE

The mobile workspace should be used as a supplement to the vendor collaboration web interface, not a replacement for it.

Your vendors can use the **Vendor collaboration** mobile workspace to view new purchase orders that are sent to them for approval. It shows purchase order information, such as products, quantities, and requested delivery dates. Price information is also available, depending on the configuration of each vendor.

A user who signs in as a vendor will see which purchase orders have been responded to, and which purchase orders are still awaiting customer action. For example, a purchase order might be awaiting customer action because the vendor suggested another delivery date, but the customer hasn't yet agreed to that date. The vendor will also see a list of purchase orders that have been confirmed but haven't yet been delivered.

To respond to a purchase order, the vendor must use the vendor collaboration web interface that is available in the web client. There, the vendor can also get more information about the order, such as document attachments, the delivery address per line, and charges that are associated with the vendor.

Vendors that have a special security role can see which contact persons are registered for a vendor account. The same security role lets a vendor view the status of any user request that has been submitted.

The vendor collaboration web interface in the web client must be used to create new contacts and submit new user requests.

The **Vendor collaboration** mobile workspace lets a vendor perform these tasks:

- View new purchase orders that are sent to the vendor.
- View purchase orders that the vendor has responded to, and that are awaiting customer action.
- View purchase orders that have been confirmed but haven't yet been fully received.
- View contact person information that is registered for the vendor account. (This task requires an additional security role.)
- View information about a user request that was submitted by the vendor, and follow the status of the request. (This task requires an additional security role.)

Prerequisites

The prerequisites vary, depending on the version of Microsoft Dynamics 365 that has been deployed for your

organization.

Prerequisites if you use Supply Chain Management

If Supply Chain Management has been deployed for your organization, the system administrator must publish the **Vendor collaboration** mobile workspace. For instructions, see [Publish a mobile workspace](#).

Prerequisites if you use Microsoft Dynamics 365 for Operations version 1611 with Platform update 3 or later

If Microsoft Dynamics 365 for Operations version 1611 with Platform update 3 or later has been deployed for your organization, the system administrator must complete the following prerequisites.

PREREQUISITE	ROLE	DESCRIPTION
KB 3216943 must be implemented if you're using Platform update 3.	System administrator	KB 3216943 is a binary update that is required if you're using Platform update 3. To implement this KB, the system administrator must follow these steps. <ol style="list-style-type: none">1. Download KB 3216943 from Microsoft Dynamics Lifecycle Services (LCS).2. Install the binary update, which is delivered as a deployable package. For information about how to apply a deployable package, see Apply a deployable package.
KB 4013633 must be implemented.	System administrator	KB 4013633 is an X++ update or metadata hotfix that contains the Inventory on-hand mobile workspace. To implement KB 4013633, your system administrator must follow these steps. <ol style="list-style-type: none">1. Download the metadata hotfix from LCS.2. Install the metadata hotfix.3. Create a deployable package that contains the SCMMobile model, and then upload the deployable package to LCS.4. Apply the deployable package.
The Vendor collaboration mobile workspace must be published.	System administrator	See Publish a mobile workspace .
The vendor user must have access to the vendor collaboration web interface in the web client and must set up a vendor collaboration user.	Purchasing professionals and the system administrator	Follow the steps in the following topics to set up and work with the vendor collaboration web interface. <ul style="list-style-type: none">• Use vendor collaboration to work with external vendors• Manage vendor collaboration users• Set up and maintain vendor collaboration• Use vendor collaboration to work with customers in Supply Chain Managements

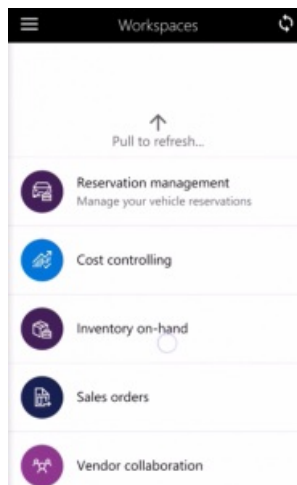
Download and install the mobile app

Download and install the Finance and Operations mobile app:

- [For Android phones](#)
- [For iPhones](#)

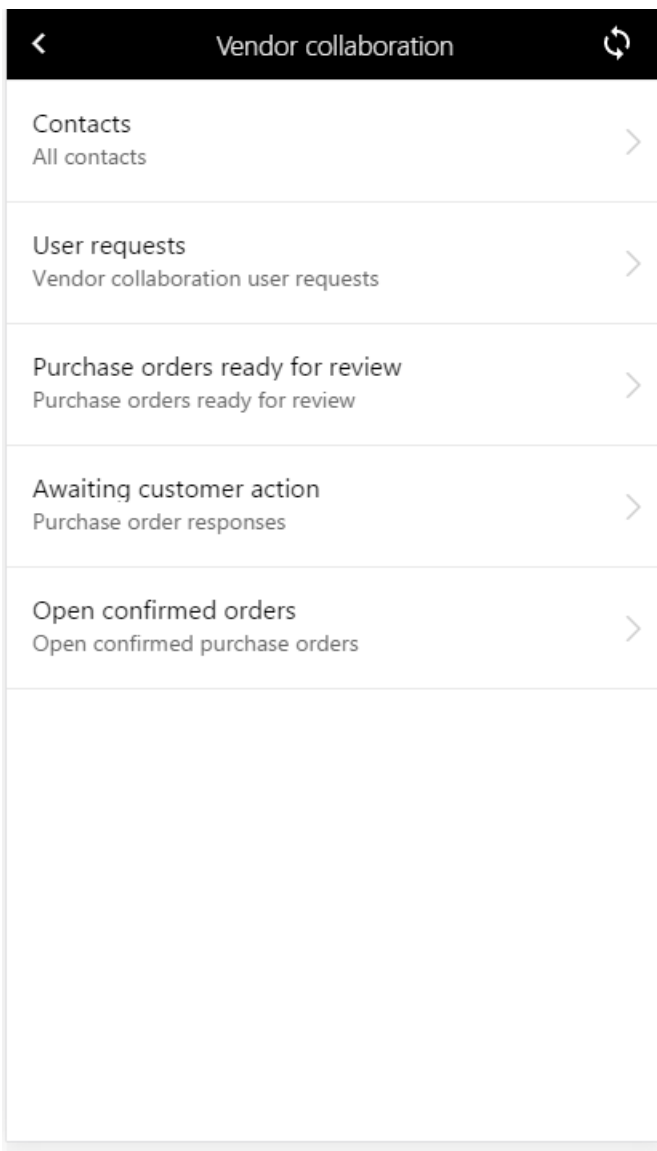
Sign in to the mobile app

1. Start the app on your mobile device.
2. Enter your Microsoft Dynamics 365 URL.
3. The first time that you sign in, you're prompted for your user name and password. Enter your credentials.
4. After you sign in, the available workspaces for your company are shown. Note that if your system administrator publishes a new workspace later, you will have to refresh the list of mobile workspaces.



Use the Vendor collaboration mobile workspace

When you select the **Vendor collaboration** workspace, you'll see the following options.



The **Vendor collaboration** workspace includes the following pages.

Contacts

The **Contacts** page lets you see all the contacts that have been set up for the vendor account. It shows the contact person's name, primary email address, and user alias, if the contact person has an alias. This page also shows whether the contact person's user account is active. When you select a contact, you see contact details, such as the legal entities that the person is a contact for. You also see contact information, such as a telephone number or an alternative email address.

User requests

The **User requests** page lets you see all the user requests that you've submitted via the vendor collaboration web interface. You can also follow the status of those requests. When you select a user request, you can see what was requested, add or inactivate a user, change security, and see which security roles were requested for the user.

Purchase orders ready for review

The **Purchase orders ready for review** page lets you see all the purchase orders that the customer has sent, but that haven't yet been responded to. You can view selected information about the order, such as which products were requested and when those products should be delivered. Price information is also available, depending on the configuration of the vendor.

You can also see whether the purchase order has notes or attachments. However, to open notes and attachments, you must use vendor collaboration web interface in the web client. Select **Purchase order line** to see all the lines together with their details. For each line, an indicator will show whether there are notes or

attachments, or whether the delivery address differs from the delivery address that is shown on the header.

To respond to the purchase order, you must use the vendor collaboration web interface in the web client.

Awaiting customer action

The **Awaiting customer action** page lets you find purchase orders that you or another person in your company who has access to vendor collaboration has responded to. The purchase orders are visible in this list only if the customer must take one of the following actions on the purchase order:

- If the purchase order was rejected, the customer must either update or cancel the original order, and then send it again. When the purchase order is sent again, it no longer appears on the **Awaiting customer action** page.
- If the purchase order was accepted with changes, the customer must either update the original order and then send it again for review, or update the order per the requested changes and then confirm it immediately. In both cases, the purchase order no longer appears on the **Awaiting customer action** page.
- If the purchase order was accepted but still appears on the **Awaiting customer action** page, the purchase order wasn't automatically confirmed when it was accepted. It's now waiting for a purchasing agent to change the order status to **Confirmed**. Typically, a purchase order is considered an agreement between the customer and the vendor as soon as the vendor accepts the order. Therefore, the update to **Confirmed** status is usually just a formality.

When you select a purchase order, additional details appear about the response. You can see the line details and response for every line. The line status shows which of the following responses has been given:

- Accepted
- Rejected
- Accepted with changes
- Substituted/Substitute
- Split into schedule/Schedule line

Note that the **Delivering** field is set to either **Yes** or **No** to indicate whether the lines will be delivered. A line might not be delivered because for the following reasons:

- The line was rejected.
- A substitution was made, and the original line isn't expected to be delivered as requested in the received order.
- The line was split into multiple schedule lines, and the original line isn't expected to be delivered as requested in the received order.

Any changes that have been made to the order line response are shown. However, uploaded notes and attachments aren't shown. To view notes and attachments, you must use the vendor collaboration web interface in the web client.

Open confirmed orders

When the purchase order is confirmed by the customer (that is, the status of the purchase order is changed to **Confirmed**), it appears in the open confirmed order. It will remain in the list until it's registered as received by the customer.

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Approve vendors for specific procurement categories

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This topic explains how to approve vendors for specific procurement categories in Dynamics 365 Supply Chain Management. When a purchase requisition is created, there may be a requirement to select an approved or preferred vendor, depending on how the purchasing policies are set up. This procedure shows you how to specify that a vendor is approved or preferred for a specific procurement category. This task would usually be carried out by a procurement professional. You can use this procedure in demo data company USMF.

1. In the navigation pane, go to **Modules > Procurement and sourcing > Vendors > All vendors**.
2. Select the vendor that you want to set as an approved or preferred vendor for a category.
3. On the Action Pane, select **General**.
4. Select **Categories**.
5. Select **Add category**.
6. In the **Category** field, select **OFFICE AND DESK ACCESSORIES (OFFICE AND DESK ACCESSORIES)**.
7. In the **Vendor category status** field, select **Preferred**. It's possible to specify more than one preferred vendor for a category.
8. Select **Save**.
9. In the navigation pane, go to **Modules > Procurement and sourcing > Procurement categories**.
10. In the tree, select **CORP PROCUREMENT CATEGORIES\OFFICE AND DESK ACCESSORIES**.
11. Expand the **Vendors** section. Check if the vendor that you selected appears as a preferred vendor for the Office and desk accessories category. If you're running this procedure as a task guide, you may have to select the **Unlock** button to be able to scroll down to the list of vendors. It's also possible to add preferred and approved vendors on this page.
12. In the tree, expand **OFFICE AND DESK ACCESSORIES** and select **Scissors**.
13. Select **No** in the **Inherit vendors from parent category:** field.
14. Select **Yes** in the **Inherit vendors from parent category:** field.

NOTE

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Approve vendors for specific products

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This procedure shows you how to approve vendors for specific products. This allows you to control which vendors can be used when the product is added to a purchase order. You can use this procedure in demo data company USMF, or on your own data. This task would typically be carried out by a Purchasing manager.

1. In Navigation Pane, go to **Modules > Product information management > Products > Released products**.
2. In the list, find and select the desired record.
3. In the list, click the link in the selected row.
4. Expand the **Purchase** fastTab. If there is a primary vendor shown in the **Vendor** field, then you need to add this vendor as an approved vendor in the following steps. Make a note of the vendor number, if one is shown.
5. On the Action Pane, click **Purchase**.
6. Click **Setup**.
7. Click **Add**.
8. In the **Vendor** field, enter or select a value. Select the approved vendor. At least one of the lines has to be the primary vendor if there was one in the product record. If you made a note of the vendor number earlier, select it here.
9. In the **Expiration** field, enter a date. Choose a date that is a few months ahead.
10. Click **Add**.
11. In the **Vendor** field, enter or select a value.
12. In the **Expiration** field, enter a date. Choose a date that is different than the previous expiration date.
13. Close the page.
14. On the Action Pane, click **Approved vendors**.
15. In the **Expiration** field, enter a date. This date acts as a filter so you can see who the approved vendors are, up to a certain date.
16. Close the page.
17. On the Action Pane, click **Effective period**.
18. In the **Show vendors expired by** field, enter a date. You can use this page to identify vendors where the approval status will expire after a certain date.
19. Close the page.
20. Click **Edit**.
21. In the **Approved vendor check method** field, select an option. This field allows you to select the policy for what should happen if the product is added to a purchase order line where the vendor is not an approved vendor.
22. Click **Save**.
23. Close the page.
24. Close the page.
25. In Navigation Pane, go to **Modules > Procurement and sourcing > Vendors > Vendor/item relations > Approved vendor list by item**. This page gives you an overview of all products and the approved vendors.
26. Close the page.
27. In Navigation Pane, go to **Modules > Procurement and sourcing > Vendors > All vendors**. You can also start from a vendor and then go to the list of approved products for that vendor account.
28. In the list, find and select the desired record.

29. On the Action Pane, click **Procurement**.
30. Click **Approved vendor list by vendor**.
31. Close the page.
32. Close the page.

NOTE

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Search for vendors

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Learn how to search for vendors based on specific criteria. This example shows you how to search for vendors that are approved for a particular procurement category and have their primary address in a specific country. You can run this procedure in demo data company USMF, or on your own data. This task would usually be carried out by a procurement professional.

1. Go to Procurement and sourcing > Vendors > Vendor search.
2. Click on the Plus icon to open the Procurement category selection page.
3. In the tree, select 'CORP PROCUREMENT CATEGORIES\OFFICE MACHINES'.
 - If you're running this procedure as a task guide, you may have to click the Unlock button before you can select the correct node. If you're not using USMF, select one of the categories that you have.
4. Click Add.
 - It's possible to select more than one category here. If you do so, the search will find all the vendors that are approved for at least one of the categories.
5. Click OK.
6. In the Country/region field, type a value.
7. Click OK.

NOTE

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Set up permissions for ordering products on behalf of someone else

2/18/2021 • 2 minutes to read • [Edit Online](#)

This topic explains how to grant workers permission to prepare purchase requisitions on behalf of other workers. In other words, a purchase requisition "preparer" can create a requisition for another "requester." The procedure also shows how to grant a worker permission to order items and services in different legal entities or operating units. Typically, these tasks are performed by a purchasing manager. You can use this procedure either on data for the USMF demo company or on your own data.

Grant permission to enter purchase requisitions on behalf of another worker

1. In the navigation pane, go to **Modules > Procurement and sourcing > Setup > Policies > Purchase requisition permissions**. Make sure that the **Current view** field is set to **By preparer**. The list in the left pane shows the people who can be granted permission to prepare requisitions on behalf of other people.
2. Select the person to grant permission to (the preparer).
3. Select **Add**.
4. Find and select the person to add as a requester.
 - The requester is the person that the preparer can create requisitions on behalf of.
 - In the **Authorization** field, select **Specific** if the preparer should be able to create purchase requisitions on behalf of the selected worker. Select **Reporting** if the preparer should also be able to create purchase requisitions on behalf of all workers who report to that worker.
5. In the **Effective** field, enter a date.
6. In the **Expiration** field, enter a date.

View preparers who have permission to create purchase requisitions for a selected worker

1. In the **Current view** field, select **By requester**. This view shows a list of preparers who have been granted permission to create purchase requisitions on behalf of a selected worker.
2. Use the Quick Filter to find the worker that you just added as the requester.
3. Select the requester. The Preparer list shows the people who have permission to order items on behalf of the requester who is selected in the left pane. You can add additional preparers here. This view also lets you grant the requester permission to create requisitions in legal entities and operating units that aren't that person's primary legal entity or operating unit.

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Set up project resource information

2/18/2021 • 2 minutes to read • [Edit Online](#)

This procedure shows how to set up a project resource. This task uses the USMF data set.

1. Go to Project management and accounting > Project resources > Resources list.
2. Click New resource.
3. In the Worker field, enter or select a value.
4. In the Calendar field, enter or select a value.
5. In the Period code field, enter or select a value.
6. Click Create.
7. Click Cost prices.
8. Click Cost price - hour.
9. Click New.
10. In the Effective date field, enter a date.
11. In the Cost price field, enter a number.
12. Click Save.
13. Close the page.
14. Click Sales prices.
15. Click Sales price - hour.
16. Click New.
17. In the Effective date field, enter a date.
18. In the Pricing field, enter a number.
19. In the Valid for field, select an option.
20. Click Save.
21. Close the page.

NOTE

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Submit and approve project budget

2/18/2021 • 2 minutes to read • [Edit Online](#)

This procedure shows you how to create and submit the budget for a project.

When you create a project budget, you can enter estimated revenues and costs for a project, and then use those to control actual project transactions. In project budgeting, all original budgets and revisions must be sent to project workflow for approval. Workflow gives you increased control over the process and creates a change history record.

This task was created using the USSI data set.

1. In the **Navigation pane**, go to **Modules > Project management and accounting > Projects > All projects**.
2. In the list, find and select the desired record.
3. In the list, click the link in the selected row.
4. On the **Action Pane**, click **Plan**.
5. Click **Project budget**.
6. In the **Description** field, type a value.
7. Expand the **Cost** fastTab.
8. Click **New**.
9. In the **Transaction type** field, select an option.
10. In the **Category** field, enter or select a value.
11. In the **Original budget** field, enter a number.
12. Expand the **Revenues** fastTab.
13. Click **New**.
14. In the list, mark the selected row.
15. In the **Transaction type** field, select an option.
16. In the **Category** field, enter or select a value.
17. In the **Original budget** field, enter a number.
18. Click **Save**.
19. Click **Workflow**.
20. Click **Submit**.
21. In the **Comment** field, type a value.
22. Click **Submit**.

NOTE

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Submit and approve project budget revision

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This procedure provides information about revising a project budget. You can revise a project budget as many times as necessary, however you can't see the amount of an individual revision if the budget has been revised more than one time.

This task uses the SSI data set.

1. Go to Project management and accounting > Projects > All projects.
2. In the list, find and select the desired record.
3. In the list, click the link in the selected row.
4. On the Action Pane, click Plan.
5. Click Project budget.
6. Click New revision.
7. Expand the Costs section.
8. In the Revision amount field, enter a number.
9. Click Save.
10. Click Workflow.
11. Click Submit.
12. In the Comment field, type a value.
13. Click Submit.

NOTE

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Product information overview

2/18/2021 • 5 minutes to read • [Edit Online](#)

NOTE

Effective November 2020:

- Common Data Service has been renamed to Microsoft Dataverse. For more information, see [Power Automate Blog](#).
- Some terminology in Microsoft Dataverse has been updated. For example, *entity* is now *table* and *field* is now *column*. For more information, see [Terminology updates](#).

This topic will be updated soon to reflect the latest terminology.

This topic provides information about product information management. Product information management works with a shared product definition, categorization, and identifiers across all legal entities, and also specific configurations of a product, to fit into the business processes.

Product information is the backbone of supply chain and commerce applications across all industries. It refers to processes and technologies that focus on centrally managing information about products (for example, across supply chains). It's crucial that shared product definitions, documentation, attributes, and identifiers be used. In the various modules of a business solution, product-specific information and configuration are required in order to manage the business processes that are related to specific products, product families, or product categories.

Product definition

A product is primarily defined by a product number, name, and description. However, other data is also required in order to describe a product or service:

- Product type: Item or service
- Product subtype: Distinct products or product masters
- Definition of the product variant model:
 - Product dimensions and dimension groups
 - Product nomenclature
 - Product configuration models
- Association of the product with one or more categories
- Definition of the product and category attributes
- Product images
- Attachments
- Units of measure and related conversions
- Translations for all names and descriptions

Distribution, export, and import of product data

The product definition can be created in Supply Chain Management. It can also be imported from product lifecycle management (PLM), product data management (PDM), or product information management (PIM)

systems. When more than one instance of Supply Chain Management is used, one instance is typically used as the master of the product data for all other instances. This approach is supported by a large set of data entities that enable the export and import of product definition data from one instance to another.

To support the distribution of product data to many instances, Supply Chain Management lets you use Microsoft Dataverse. The product definitions can be exported from an instance of Supply Chain Management to Microsoft Dataverse. The product definitions can then be used to provision other business applications, such as Dynamics 365 Sales, with product data.

Note that, in dynamic and agile organizations, product information data changes every day. Therefore, maintenance of accurate and actual product data is a critical business process on its own.

Product masters and product variants

In an agile world, where products must be quickly adapted to customer requirements, product definitions specify a set of products instead of distinct products. In Supply Chain Management, those generic products are known as *product masters*. Product masters hold the definition and rules that specify how distinct products are described and behave in business processes. Based on these definitions, distinct products can be generated. These distinct products are known as *product variants*.

A product master is associated with a product dimension group and a configuration technology to specify the business rules. The product dimensions (Color, Size, Style, and Configuration) are a specific set of attributes that can be used throughout the application to define and track specific behaviors of the related products. These dimensions also help users search for and identify the products.

Configuration technologies

You can choose among three configuration technologies:

- The predefined variants are defined by predefined product dimensions. The variant definition includes the definition of a specific valid combination of dimensions, such as Color, Style, and Size. Each combination produces a distinct product variant.
- The dimension-based configuration is typically used in manufacturing scenarios and lets you use the Configuration dimension in the definition of the bills of materials (BOMs). After a specific configuration is selected, the system uses the subset of BOM lines that are valid for that configuration for planning and production. This concept is also known as *global BOM*, because one shared BOM is used for all configurations of a product.
- The constraint-based configuration uses a product configuration model to describe all possible attributes and components that are required in order to describe all possible variants of a product in a single model. The constraints of combinations of attributes can be described through regular expressions or table-based constraints. Configuration models and configurators become more important in product information management and are used across all industries.

When you plan the implementation of Supply Chain Management, it's very important that you choose the correct configuration technology for a business process. A product can't be converted from one model to another after implementation.

Product variant model definition workspace

The **Product variant model definition** workspace gives an overview of the product masters. It also shows the status of the release of masters and related variants to specific legal entities.

Released products

The products that are released to a specific legal entity are known as *released products*. Products can be

released in bulk to one legal entity or many legal entities at a time. Because various properties and attributes of the products might have to be added per legal entity, the **Released product maintenance** workspace lets you monitor and complete the recently released products in each legal entity, or in the suborganizations of a legal entity.

Released product maintenance workspace

You can configure the **Released product maintenance** workspace from the **Configure my workspace** menu item. Select a category hierarchy and category to filter the workspace by. To adjust the relevant product data in the workspace, you can also define, in days, the time fences for **Recently released products** and **Stopped released products**.

The workspace consists of a summary of tiles and two lists. The **Open cases** list shows product change cases that have products in the selected product category hierarchy that aren't completed and closed. The **Recently released** list shows products that have been released within the time fence that is set in the workspace configuration. For each item in the list, validation is run, and the validation status is shown. This status might indicate that the required configurations for the legal entity hasn't been completed. From the list, you can directly access the **Released product details**, **Product attribute maintenance**, **Product category maintenance**, **Default order settings**, and **Text translations** pages to complete the required configuration of the product.

Manually creating a new released product

You can manually create a released product in a single run, depending on the organization's business processes and any rules about whether this function should be used. This function creates a new product and automatically releases it to the current legal entity. To create a new product, click **Released products** in the **Released product maintenance** workspace or on the **Released product** list page.

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Product identifiers

2/18/2021 • 18 minutes to read • [Edit Online](#)

NOTE

Effective November 2020:

- Common Data Service has been renamed to Microsoft Dataverse. For more information, see [Power Automate Blog](#).
- Some terminology in Microsoft Dataverse has been updated. For example, *entity* is now *table* and *field* is now *column*. For more information, see [Terminology updates](#).

This topic will be updated soon to reflect the latest terminology.

This topic provides information about the various types of product identifiers and explains how you can add product identifiers in your product data.

When you work with products on the shop floor or in a warehouse in Microsoft Dynamics ERP or Microsoft Dynamics CRM, you must have a good strategy for identifying those products and product variants.

Unique product number/product ID

In Dynamics 365 Supply Chain Management, the primary identifier for a product is the product number (that is, the unique product ID). This number can be automatically generated by a number sequence or manually associated with a product. For product variants, the numbers can be defined through the product nomenclature template.

In many cases, the product number isn't originally created in Dynamics 365 Supply Chain Management. Instead, it's associated with a product in a product lifecycle management (PLM) system or a product data management (PDM) system. In this case, you use data entities to import the products and product variants. Supply Chain Management then uses the numbers in all operations.

When you implement Supply Chain Management, you should give special consideration to your strategy for product numbers. A good numbering system improves logistics flows and helps prevent errors. A good product identifier has a maximum of 15 characters. Ideally, it has fewer than 10 characters and includes no more than five classifying characters. You can also use search names to enable quick searches. A search name is an additional name that represents the classifications of a product.

When you use Microsoft Dataverse, the product number in Supply Chain Management is also the product number in Microsoft Dataverse. Product variants are synchronized to Dataverse as distinct products.

Item number and product dimensions

The item number is the product identifier that is used by a specific legal entity. Ideally, the item number should be identical to the product number. If the nomenclature differs per legal entity, it becomes difficult to follow a product throughout the supply chain, and burdensome relabeling and referencing processes are introduced. For compatibility with older versions (that is, with Microsoft Dynamics AX 2009 and earlier), we have preserved this model. However, we recommend that you eliminate identifiers that are specific to legal entities whenever you can, and that you use the unique product number as the primary identifier instead.

Additionally, a product variant can't be uniquely identified by an item number. It always requires the combination of an item number and all the product dimensions that are defined on the product master. This requirement can become cumbersome and can slow down the identification processes. For this reason too, we

recommend that you use the unique product number instead the item number whenever you can.

Many pages still have the item number and product dimensions as the primary identifiers. However, the product numbers can be used for searches. At **Sales and marketing > Setup > Search > Search parameters**, you can change the search lookup so that it uses product numbers instead of item numbers as the primary search strategy. If you set the **Enable lookup for product search** option to **Yes**, the lookup will show not only product masters but product variants. For more information, see [Search for products and product variants during order entry](#).

Additionally, you will be able to search and filter on the product number, the product name and description, and the product dimension IDs of the product variant. When you select a variant, the related item number and all product dimension IDs will be selected. Therefore, you can more easily find and select the correct variant. This setting is highly recommended if you use product variants and the unique product number as the primary identifiers for products. The only exception might be the fashion industry, where the business processes often require that you select the master before you select a variant. You should carefully evaluate this option before you implement the numbering system.

NOTE

The item number for a product can't be changed once one or more transactions exist for that product.

Product name and description

The product name and description are the human-readable identifiers of a product and can be maintained in many languages. By default, the Supply Chain Management client shows all product information in the default company language, not in the user's language. However, translated product names and descriptions are used in all communication with customers and vendors. The translations are based on the language code of the customer and vendor accounts.

For product variants, the product name can be generated through a product nomenclature template. Because there is no requirement that product names be unique, you might find multiple products that have the same name.

Product and item search names

Supply Chain Management offers a secondary search name for products and also for items (released products). This search name doesn't have to be unique, and it can be changed after a product or product variant is created. We recommend that you use the search name to search for products by categories. The search names enable quick searches, especially in sales and purchase processes.

The search name can also contain a customer or vendor product ID, or some other external product ID, if this external ID is the primary search criterion for a product.

External product identifiers (Customer and vendor identifiers)

For released products, you can maintain the item numbers, item names, and item descriptions that the customer or vendor uses. The references are shown on external documents, such as sales orders, purchase orders, packing slips, and invoices. In the current version of Supply Chain Management, the external references aren't shown on core operations pages. The only exception is the vendor item number. This number is shown in the **Product information** dialog box if a default vendor is defined for the released product.

You can maintain the external product identifiers by released product, released product variant, customer or customer group, or vendor or vendor group.

On the **Released products** page, follow one of these steps.

- For customers, on the **Sell** tab, in the **Related information** group, select **External item description**.
- For vendors, on the **Purchase** tab, in the **Related information** group, select **External item description**.

On the **External item descriptions** page, you can associate the customer's or vendor's item number with a released product. This association must be done for each legal entity. The following information can be captured. Unfortunately, the labels are slightly misleading in the current version of Supply Chain Management. However, these labels might be changed in a future version.

FIELD	CORRESPONDING CUSTOMER INFORMATION	CORRESPONDING VENDOR INFORMATION
External item number	The customer's item number	The vendor's item number
Description	The name that the customer associates with the item	The name that the vendor associates with the item
External item text	The customer's item description	The vendor's item description

If many customers or vendors use the same item numbers (as in the case of a purchase association or a commerce group, for example), you can create groups of customer or vendors to simplify the maintenance of external product information.

- For customer groups, go to **Sales > Setup > Items > External item description** to create and maintain the groups and the related item numbers. To associate customers with a group, go to **Accounts receivable > Customers > All customers**, and then, on the **Sales order defaults** FastTab, specify a value in the **Item - customer group** field.
- For vendor groups, go to **Procurement and sourcing > Setup > External item description group** to create and maintain the groups the related item numbers. To associate vendors with a group, go to **Accounts payable > Vendors > All vendors**, and then, on the **Purchase order defaults** FastTab, specify a value in the **Item - vendor group** field.

Bar codes

If you want to use a bar code scanner to identify products, the product identifier must meet the requirements of the bar code standard that is used. Therefore, bar codes don't typically contain the raw product number but a number that is generated specifically for the selected bar code technology. You can maintain multiple bar codes by bar code type. You can even associate the same bar code with multiple products and then select the actual active association when you scan a bar code.

Before you define bar codes, you can define one or more bar code setups. The bar code setups can help validate that bar codes follow the required guidelines, and that they can therefore be effectively printed and scanned. You can also maintain special bar codes for specific product quantities.

We recommend that you use the bar code setup to maintain Global Trade Item Number (GTIN) or International Article Number (EAN) codes.

To maintain bar codes, on the **Released products** page, on the **Manage inventory** tab, in the **Warehouse** group, select **Bar codes**.

GTIN codes

In e-commerce, it's crucial that all parties speak a common language and refer to products by using a common set of identifiers. Therefore, some industries rely on the [GTIN](#), which is a global item number system that is facilitated by GS1.

We recommend that you maintain the GTIN as a bar code. However, you can also maintain it on the **Item -**

GTIN page. To open this page, on the **Released products** page, on the **Manage inventory** tab, in the **Warehouse** group, select **GTIN codes**. Note that the GTIN isn't maintained as a global number. Instead, it's maintained by legal entity.

In Supply Chain Management, you define packaging variants in the warehouse operations by defining specific units of measure. For example, an item might be stored in pieces, in bundles of six, in trays of 18, or in full pallets. A specific unit of measure will be defined for each of these packaging variants. Because the GTIN is typically related to the packaging unit of a product, the **Item - GTIN** page lets you maintain multiple GTIN codes per product and unit of measure. However, you can't use the same GTIN code more than one time for different items or product variants of a legal entity.

To maintain **GTIN codes**, on the **Released products** page, on the **Manage inventory** tab, in the **Warehouse** group, select **GTIN**.

External codes

External codes can be defined for many entities. For example, you can define external codes to identify products and released products. These external codes can be used to associate statistical codes or tax codes with released products and released product variants. External codes are defined by legal entity and code type. They must be unique by legal entity, code type, and table reference.

Unfortunately, there is no standard functionality that lets you search for products by external codes.

Data entities that are used to import and export product identifiers

ENTITY NAME	IMPORT IDENTIFIERS	EXPORT IDENTIFIERS	COMMENTS
Products V2	Product number, product search name, product name, product description	Product number, product search name, product name, product description	Depending on the settings of the entity and the number sequence for the product number, the product number can be automatically created at the time of import.
Product variants	Product number, product search name, product name, product description	Product number, product search name, product name, product description	Depending on the product nomenclature template, the product number can be automatically created at the time of import. However, you can import any unique product number, and that product number doesn't have to follow the structure of the product nomenclature templates.
Product translations	Product name, product description	Product name, product description	This entity overwrites any language. Note that when the name or description of a legal entity's primary language is overwritten, the name and description of the product itself is changed.

ENTITY NAME	IMPORT IDENTIFIERS	EXPORT IDENTIFIERS	COMMENTS
Released product creation V2	Item number, product number, item search name	Item number, product number, item search name, product search name, product name	This entity can be a challenge when number sequences are used during the creation of new released products. Both the Item number number sequence and the Product number number sequence have an influence. However, the Item number number sequence is per legal entity, whereas the Product number number sequence is global. Therefore, we don't recommend that you use the Item number number sequence when you deploy new released products. Obviously, when the entity is used to release an existing product, the product number must be given in the entity. For more information, see the "Product and item number sequences" section in this topic.
Released product variants	Item number, product dimensions, product number	Product number, product search name, product name, product description, product dimensions	Like the Product variants entity, this entity can be used to create new products that either follow the product nomenclature template or use their own product numbers for the variant.
External item description for customers	Customer item number, customer item name, customer description, customer account	Customer item number, customer item name, customer description, customer account	A group of customers (for example, a buyer association) can be aggregated into one group by using the External item description customer groups entity.
External item description for vendors	Vendor item number, vendor item name, vendor description, vendor account	Vendor item number, vendor item name, vendor description, vendor account	A group of vendors (for example, a sales association or industry organization) can be aggregated into one group by using the External item description vendor groups entity.

ENTITY NAME	IMPORT IDENTIFIERS	EXPORT IDENTIFIERS	COMMENTS
Item Barcode	Bar code	Bar code	Note that, at the time of import, you must refer to a bar code setup that is defined in the target system. The imported bar code references are validated against that bar code setup and are rejected if the bar codes don't match the requirements that are defined in that bar code setup.
External codes for released products	External code	External code, external code classes, item number	External codes are by legal entity. For import, you must refer to a defined code class. Import the code classes by using the External code classes for released products entity.
External codes for released product variants	External code	External code, external code classes, item number, product dimensions	External codes are by legal entity. For import, you must refer to a defined code class. Import the code classes by using the External code classes for released products entity. This entity refers to product variants by the item number and product dimensions.
External codes for released product variants by product number identifier	External code	External code, external code classes, product number	External codes are by legal entity. For import, you must refer to a defined code class. Import the code classes by using the External code classes for released products entity. This entity refers to product variants by the product number of the variant. (From the next major release)
GTIN	Not applicable	Not applicable	Currently, there is no specific entity that is used to import and export GTIN codes. We recommend that you use the Item Barcode entity instead.

ENTITY NAME	IMPORT IDENTIFIERS	EXPORT IDENTIFIERS	COMMENTS
Product entity common data service identifier entity	Not applicable	Item number, item search name, product search name, vendor item number, customer item number, external codes, GTIN codes, bar codes	This entity consolidates all identifiers into one data model, so that one interface can be used to easily export all identifiers and their related types. Use the Product entity identifier code entity to export the identifier codes and descriptions. Use the Product entity identifier scope entity to export additional scope information to an identifier, such as the party, legal entity, quantity, or unit.

Product and item number sequences

You can define two different number sequences:

- The **Product number** number sequence for the global product number
- The **Item number** number sequence for the item number per legal entity

NOTE

You should use the item number as a separate identifier only when you migrate different legal entities from different sources that had different numbering systems. You should always try to use a product identifier that is unique across all legal entities. Therefore, you should set the **Manual** option to **Yes** for the **Item number** number sequence. In this way, the item number will follow the product number on creation. If Supply Chain Management isn't the leading system for new product numbers, you should set the **Manual** option to **Yes** for both the **Item number** and **Product number** number sequences.

When you use the **Released product creation V2** entity to create products, multiple settings can affect how the number sequences are used to create the product number and item number:

- Settings of the **Product number** number sequence
- Settings of the **Item number** number sequence
- The mapping of the item number
- The mapping of the product number

The following table provides an overview of the results of import and manual creation when specific combinations of the number sequence and field mapping settings.

PRODUCT NUMBER NUMBER SEQUENCE	ITEM NUMBER NUMBER SEQUENCE	MAPPING OF THE ITEM NUMBER	MAPPING OF THE PRODUCT NUMBER	RESULT OF ENTITY IMPORT	RESULT OF MANUAL CREATION	CONCLUSION
--------------------------------	-----------------------------	----------------------------	-------------------------------	-------------------------	---------------------------	------------

PRODUCT NUMBER NUMBER SEQUENCE	ITEM NUMBER NUMBER SEQUENCE	MAPPING OF THE ITEM NUMBER	MAPPING OF THE PRODUCT NUMBER	RESULT OF ENTITY IMPORT	RESULT OF MANUAL CREATION	CONCLUSION
Manual = No	Manual = No	No mapping	No mapping	Product numbers use the Product number sequence. Item numbers use the Item number sequence.	Product numbers use the Product number sequence. Item numbers use the Item number sequence.	With this configuration, product numbers will follow the product number sequence and item numbers will follow the item number sequence. However, this configuration won't work if there is more than one item (row) to be imported.
Manual = No	Manual = Yes	Auto generate	No mapping	Both product numbers and item numbers use the Item number sequence.	Both product numbers and item numbers use the Product number sequence.	Both product numbers and item numbers will follow the product number sequence. This is the recommended approach to import bulk products with the Released product creation V2 data entity.
Manual = No	Manual = Yes	No mapping	No mapping	Both product numbers and item numbers use the Product number sequence.	Both product numbers and item numbers use the Product number sequence.	Both product numbers and item numbers will use the product number sequence. However, this configuration won't work if there is more than one item (row) to be imported.

PRODUCT NUMBER NUMBER SEQUENCE	ITEM NUMBER NUMBER SEQUENCE	MAPPING OF THE ITEM NUMBER	MAPPING OF THE PRODUCT NUMBER	RESULT OF ENTITY IMPORT	RESULT OF MANUAL CREATION	CONCLUSION
Manual = Yes	Not applicable	Not applicable	Auto generate	You receive the following error message: "Number sequence can't be detected."	According to the Item number number sequence	This setting isn't supported for import.

Product entity identifier (Export all product identifiers)

The product entity identifier model was created to enable version 1.0 of Dataverse to be provisioned with all identifiers that are used to refer to a product. To simplify this task, all identifiers are aggregated into one global identifier table, so that they can be exported as one model. Note that this version of Dataverse doesn't use the product identifiers model. Therefore, the **Product entity common data service identifier entity** entity and this process have limited practical use and will likely be subject to change in the future.

The product identifier table is a global table that is populated from all reference tables of the Main legal entity through a recurring batch job. You must select a legal entity and a product category hierarchy as the definition of the global product master scope. Generation of the global product identifier table is limited to products that are released to the selected legal entity and products that are members of the product hierarchy that is selected for the **Common data service** role in the product category hierarchy.

This process assumes that product master data is primarily maintained in one central legal entity. (However, this legal entity can be a virtual legal entity that is used only to maintain global master data.)

Follow these steps to configure the environment.

1. Select the category hierarchy for Dataverse. On the **Category hierarchy role associations** page, if no hierarchy is associated with the **Common data service** role, you must create a new association. Select the **Common data service** role, and then associate the category hierarchy that represents the product portfolio that should be synchronized to Dataverse.
2. Select the legal entity for global product master data. On the **Product information management parameters** page, on the **Product attributes** tab, select the master company where the product and item identifiers are primarily maintained.
3. Define the identifier code types and codes that should be exported. Go to **Product information management > Setup > Product identifier codes**. To generate the identifier code types, select **Generate codes**. A code type entry is generated for each type for identifier that is found in the selected legal entity.

Note that, for bar codes, a code type is generated for each bar code setup. For external codes, a code type is generated for each external code class.

You can now maintain the list of code types. You can change the code, name, and description. You can also delete code types. Code types that you delete won't be used to populate the global product entity identifier tables.

4. When you've finished defining the product identifier code types, you can create the identifiers in the global table by starting the **Create product entity identifiers** job on the **Product entity identifier codes** page. You should run this job in a batch. This job should be set up as a periodic batch job so that the table is populated according to new entries.

You can now use the **Product entity common data service identifier entity**, **Product entity identifier code**, and **Product entity identifier scope** data entities to export the identifiers for any target system.

Related topic

[Search for products and product variants during order entry](#)

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Create a hierarchy of product classification

2/18/2021 • 2 minutes to read • [Edit Online](#)

This procedure shows how to create a new category hierarchy and assign a commodity code hierarchy type. The demo data company used to create this procedure is USMF. This procedure is intended for the category manager.

Create the new category hierarchy

1. Go to **Navigation pane > Modules > Product information management > Setup > Categories and attributes > Category hierarchies**.
2. Click **New**.
3. In the **Name** field, type a value.
4. In the **Description** field, type a value.
5. Click **Create**.

Build the hierarchy

1. Click **New** category node.
2. In the **Name** field, type a value.
3. In the **Code** field, type a value.
4. In the **Friendly name** field, type a value.
5. Click **New** category node.
6. In the **Name** field, type a value.
7. In the **Code** field, type a value.
8. In the **Friendly name** field, type a value.
9. Click **New** category node.
10. In the **Name** field, type a value.
11. In the **Code** field, type a value.
12. In the **Friendly name** field, type a value.
13. Click **New** category node.
14. In the **Name** field, type a value.
15. In the **Code** field, type a value.
16. In the **Friendly name** field, type a value.
17. Close the page.

Classify the hierarchy

1. In the list, find and select the desired record.
2. On the **Action Pane**, click **Category hierarchy**.
3. Click **Associate hierarchy type**.
4. Click **New**.
5. In the **Category hierarchy type** field, select an option. Select the **Commodity code category hierarchy type for product classification**.
6. In the **Category hierarchy** field, click the drop-down button to open the lookup.
7. In the list, find and select the desired record.

8. In the list, click the link in the selected row.

9. Close the page.

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Classify a product using category hierarchies

2/18/2021 • 2 minutes to read • [Edit Online](#)

This topic describes how to classify a product using category hierarchies. Use category hierarchies to classify products for export, procurement, sales, or other purposes. This task is typically performed by a product manager. The example uses product number M0009 in demo data company USMF.

1. Select **Released product maintenance**.
2. Select **All released products**.
3. In the list, find and select the desired record.
4. On the Action Pane, select **Product**.
5. Select **Product categories**.
6. Select **New**.
7. In the **Category hierarchy** field, enter or select a value.
8. In the **Category** field, enter or select a value.
9. Select **New**.
10. In the **Category hierarchy** field, enter or select a value.
11. In the **Category** field, enter or select a value.
12. Close the page.

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Nomenclature of product variant numbers and names

2/18/2021 • 6 minutes to read • [Edit Online](#)

This topic describes how you can set up a product number nomenclature to replace the fixed [Product master number - Configuration - Size - Color - Style] format. The new nomenclature has a targeted format that includes the product master number, active product dimensions, and text delimiters of your choice. You can also create a nomenclature for product names. Finally, you can build a nomenclature to identify configurations that are created by the constraint-based product configurator. These nomenclatures can contain attributes of your choice.

The new nomenclatures for product variant numbers and product variant names let you include segments in the identifiers for product variants. These segments can include the product master number and name, product dimension IDs and names, number sequences, text constants, and attributes. This functionality lets you quickly find a specific product variant when you create a sales order or a purchase order. You create nomenclatures for both product variant numbers and product variant names by using the **Product nomenclature** page. To open this page, click **Product information management > Setup**.

Nomenclature of predefined product variants

Product variants are generated for product masters according to one of three configuration technologies:

- Predefined variants
- Constraint-based
- Dimension-based

Each product variant has a number and a name, and the product variant identification nomenclatures let you select the segments that will be included in each product variant number or name. You can select the following segments on the **Product nomenclature** page:

- Product master number
- Product master name
- Number sequence value
- Text constant
- Product dimensions
 - Configuration ID or name
 - Color ID or name
 - Size ID or name
 - Style ID or name

After you define a product variant identification number nomenclature, you can associate it with a product dimension group. All product masters that reference this product dimension group will then be assigned product variant numbers according to the nomenclature. However, product variant name nomenclatures can't be associated with product dimension groups. You can also assign a product variant identification nomenclature directly to a product master. In this case, the product variants that belong to the product master will be assigned product variant numbers and names according to the nomenclatures.

Example

A T-shirt (TS1234) is produced in three sizes (S, M, L), four colors (Red, Green, Blue, Yellow), and two styles (Polo, V). Therefore, 24 product variants are possible ($= 3 \times 4 \times 2$). You create a product variant number nomenclature

that has the following segments:

1. Product master number
2. Text constant: "-"
3. Color
4. Text constant: "-"
5. Size
6. Text constant: "-"
7. Style

In this case, the product variant number for a red, small, polo T-shirt will be TS1234-Red-Small-Polo.

Nomenclature of constraint-based configurations

For constraint-based configurations, you can create a dedicated nomenclature for the configuration product dimension. You can select the following segments on the **Product nomenclature** page:

- Number sequence value
- Text constant
- Attribute value

Each component in a product configuration model can have its own configuration nomenclature. Only attributes that belong to the component can be used. Attributes from subcomponents or user requirements can't be used.

Example

A product configuration model has a root component that has two attributes:

- Material (Plastic, Wood, Steel)
- Length (10...100)

You create a configuration nomenclature that has the following segments:

1. Attribute value: Material
2. Text constant: "AAA"
3. Attribute value: Length

In this case, the configuration ID for wood material that has a length of 78 will be WoodAAA78.

Nomenclature of dimension-based configurations

For dimension-based configurations, you can create a dedicated nomenclature for the configuration product dimension. You can select the following segments on the **Product nomenclature** page:

- Number sequence value
- Text constant
- Configuration group item

You can define a configuration nomenclature for a bill of materials (BOM).

Example

A BOM has four BOM lines that are divided into two configuration groups:

- BOM line: M0007, Standard cabinet
 - Configuration group: Cabinet
- BOM line: M0008, High end cabinet
 - Configuration group: Cabinet

- BOM line: M0021, Front grill cloth
 - Configuration group: Front grill
- BOM line: M0022, Front grill metal
 - Configuration group: Front grill

You create a configuration nomenclature that has the following segments:

1. Configuration group: Cabinet
2. Text constant: "&"
3. Configuration group: Front grill

In this case, the configuration ID for a standard cabinet that has a cloth front grill will be M0007&M0021.

Nomenclature for a combination of product variants and configurations

When you use either the constraint-based configuration technology or the dimension-based configuration technology to configure product variants for a product master, the product variant numbers of the product variants can include the nomenclature from the configuration dimension. Follow these steps to configure variants.

1. On the **Product nomenclature** page, define a product variant number nomenclature that includes the configuration dimension.
2. Assign the nomenclature to a product dimension group that has the configuration dimension.
3. Define a configuration nomenclature for the components or BOMs that will be used to configure the product variants.

You can also create nomenclatures for the product variant names. The product variant names can be configured to include the configuration ID or name.

Example for constraint-based configurations

For this example, you use a product variant number nomenclature that consists of the following segments:

1. Product master number
2. Text constant "_"
3. Configuration

The configuration nomenclature consists of the following segments:

1. Attribute value: Material
2. Text constant: "AAA"
3. Attribute value: Length

You enter the following values for segments:

- Product master number = **M0099**
- Material = **Plastic**
- Length = **12**

In this case, the product variant number will be M0099_PlasticAAA12.

Example for dimension-based configurations

For this example, you use a product variant number nomenclature that consists of the following segments:

1. Product master number

2. Text constant "/"
3. Configuration

The configuration nomenclature consists of the following segments:

1. Configuration group: Cabinet
2. Text constant: "&"
3. Configuration group: Front grill

You enter the following values for segments:

- Product master number = **D0123**
- Cabinet = **M0008**
- Front grill = **M0022**

In this case, the product variant number will be D0123//M0008&M0022.

Numbering conflicts

In some cases, a product variant number nomenclature that you set up might not produce unique product variant numbers. For example, the product variant numbers won't be unique if one active product dimension isn't included in the nomenclature for a product master that uses the predefined variant configuration technology. The way that you handle conflicts varies, depending on the configuration technology.

Predefined variants

An error occurs if you try to manually create or automatically generate product variants, and more than one product variant ends up with the same product variant number. To avoid this scenario, you should use all active product dimensions in the product dimension group. Alternatively, include a number sequence to help guarantee that the product variant numbers are unique.

Constraint-based configurations

Depending on the nomenclature, the system might try to assign a non-unique product variant number to a configuration. In this case, the system uses the number sequence for the configuration dimension as the product variant number instead, and you receive a warning. To avoid this scenario, you should include enough attributes in the nomenclature to help guarantee unique product variant numbers. You should also make sure that the **Reuse** option is turned on for the component.

Dimension-based configurations

During one step of the configuration process, the system suggests a configuration value according to the nomenclature. In this step, you can manually change the configuration value. When you save the configuration, the system verifies that the configuration value is unique. If the value that you entered isn't unique, you receive an error message. To save the configuration, you must enter a unique configuration value.

Additional resources

[Create a product number nomenclature for predefined product variants](#)

[Create a product number nomenclature for configured product variants](#)

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Create a product number nomenclature for predefined product variants

2/18/2021 • 2 minutes to read • [Edit Online](#)

This topic explains how to set up a product number nomenclature for predefined product variants, and how you assign it to the appropriate product dimension group. The demo data company used to create this procedure is USMF. The new product number nomenclature is assigned to the Color and Size product dimension group. This task would typically be done by a product designer.

Create a product number nomenclature

1. Select **Product variant model definition**.
2. Select **Product nomenclature**.
3. Select **New**.
4. In the **Name** field, enter a nomenclature name that helps to identify the target product dimension group, for example, .
5. In the **Description** field, type a value.
6. Select **Add**.
7. Select **Product master number**.
8. Select **Add**.
9. Select **Text constant**.
10. In the **Text** field, type a value.
11. Select **Add**.
12. Select **Color**.
13. Select **Add**.
14. Select **Text constant**.
15. In the **Text** field, type a value.
16. Select **Add**.
17. Select **Size**.
18. Close the page.

Assign the nomenclature to a product master

1. Select **Product dimension groups**.
2. Select the **SizeCol product dimension group**.
3. Select **Edit**.
4. Select **Yes** in the **Use nomenclature** field.
5. In the **Product variant number nomenclature** field, enter or select a value.
6. Close the page.

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Create a product number nomenclature for configured product variants

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This procedure shows you how to set up a product number nomenclature for configured product variants, and how it can be attached to a configurable product master. This procedure also demonstrates how you can build a configuration nomenclature for a product configuration model component. The demo data company used to create this procedure is USMF. The new product number nomenclature is assigned to the D0004 product master. This task would typically be done by a product designer.

Create a product number nomenclature

1. Click Product variant model definition.
2. Click Product nomenclature.
3. Click New.
4. In the Name field, type a value.
5. In the Description field, type a value.
6. Click Add.
7. Click Product master number.
8. Click Add.
9. Click Text constant.
10. In the list, mark the selected row.
11. In the Text field, type a value.
12. Click Add.
13. Click Configuration.
14. Close the page.

Assign the product number nomenclature to a product master

1. Click Product masters.
2. Use the Quick Filter to find records. For example, filter on the Product number field with a value of 'D'.
3. In the list, click the link in the selected row.
4. Click Edit.
5. Select Yes in the Use nomenclature field.
6. In the Product variant number nomenclature field, enter or select a value.
7. Close the page.
8. Close the page.

Create nomenclature for a product configuration model component

1. Click Product configuration models.
2. In the list, find and select the desired record.
3. In the list, click the link in the selected row.
4. Click Edit.
5. Select Yes in the Use configuration nomenclature field.

6. Click Add.
7. Click Attribute value.
8. In the list, mark the selected row.
9. In the Attribute field, enter or select a value.
10. Click Add.
11. Click Text constant.
12. In the list, mark the selected row.
13. In the Text field, type a value.
14. Click Add.
15. Click Attribute value.
16. In the list, mark the selected row.
17. In the Attribute field, enter or select a value.
18. Click Add.
19. Click Text constant.
20. In the list, mark the selected row.
21. In the Text field, type a value.
22. Click Add.
23. Click Attribute value.
24. In the list, mark the selected row.
25. In the Attribute field, enter or select a value.
26. Click Add.
27. Click Text constant.
28. In the list, mark the selected row.
29. In the Text field, type a value.
30. Click Add.
31. Click Attribute value.
32. In the list, mark the selected row.
33. In the Attribute field, enter or select a value.
34. Click Add.
35. Click Text constant.
36. In the list, mark the selected row.
37. In the Text field, type a value.
38. Click Add.
39. Click Number sequence value.
40. In the list, mark the selected row.
41. In the Number sequence field, enter or select a value.
42. Close the page.
43. Close the page.
44. Close the page.

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Create a new product

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This topic describes how to create a new shared product. It is usually carried out by a product designer. The demo data company used to create this task is USMF.

Create a product

1. In the Navigation pane, go to **Modules > Product information management > Products > Products**.
2. Select **New**.
3. In the **Product number** field, type a value. If a number sequence has not been set up for the product number, it must be entered manually.
4. In the **Product name** field, type a value. The product name defaults to the search name. You can change this if needed.
5. Select **OK**.

Set up dimension groups

1. Select **Dimension groups** to open the drop dialog.
2. In the **Storage dimension group** field, enter or select a value. The storage dimension group determines which storage dimensions you must enter on each transaction for the product and how it will be tracked in inventory.
3. In the **Tracking dimension group** field, enter or select a value. The tracking dimension group determines which tracking dimensions you must enter for each transaction for the product, and how it will be handled in inventory.
4. Select **OK**.

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Create a product master

2/18/2021 • 2 minutes to read • [Edit Online](#)

Create a product master for the predefined variants. The demo data company used to create this procedure is USMF. This procedure is intended for the product designer.

Create a new product master

1. Go to **Navigation pane > Modules > Product information management > Products > Product masters**.
2. Click **New**.
3. In the **Product number** field, type a value. The number must be unique. A number sequence can be set for the **Product number** field. In this case, the user doesn't have to enter a value.
4. In the **Product name** field, type a value. Enter a descriptive product name. The value defaults to the search name, but this can be changed by the user.
5. In the **Product dimension group** field, click the drop-down button to open the lookup. The product dimension group determines which of the 4 product dimensions that can be used to create product variants. This example uses a group with color and size.
6. In the list, find and select the desired record.
7. In the list, click the link in the selected row. The default **Configuration technology** is 'Predefined variant'. This will be used for this example.
8. Click **OK**.

Select product dimension groups

1. In the **Color group** field, click the drop-down button to open the lookup.
2. In the list, find and select the desired record.
3. In the list, click the link in the selected row.
4. In the **Size group** field, click the drop-down button to open the lookup.
5. In the list, find and select the desired record.
6. In the list, click the link in the selected row.

Add dimension groups

1. On the **Action Pane**, click **Product**.
2. Click **Dimension groups** to open the drop dialog.
3. In the **Storage dimension group** field, click the drop-down button to open the lookup. The storage dimensions help you control how items are stored and taken from inventory. For example, a storage dimension can include Site and Warehouse.
4. In the list, find and select the desired record.
5. In the list, click the link in the selected row.
6. In the **Tracking dimension group** field, click the drop-down button to open the lookup. The tracking dimension group determines which tracking dimensions you can add to a product. For example, the batch number and serial number are used to track inventory items.
7. In the list, find and select the desired record.
8. In the list, click the link in the selected row.
9. Click **OK**.

10. Click **Save**.

11. Close the page.

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Create predefined product variants

2/18/2021 • 2 minutes to read • [Edit Online](#)

This procedure walks through creating product variants for a product master using the combinations of product dimensions. The demo company used to create this procedure is USMF.

Create a product master

1. Go to Product information management > Products > Product masters.
2. Click New.
3. In the Product number field, type a value.
 - Entering a product number manually is only required if no number sequence has been set for the product number field. In other words, skip the step if number sequence has been set for the field.
4. In the Product name field, type a value.
5. In the Product dimension group field, enter or select a value.
 - Select the product dimension group SizeCol (Size and Color).
6. Click OK.

Add product dimensions

1. Click Product dimensions.
 - This example shows how to manually enter product dimensions. You can also choose to select a size, color or style group that includes the product dimension values you want to use.
2. Click New.
3. In the list, mark the selected row.
4. In the Size field, enter or select a value.
5. In the Name field, type a value.
6. Click New.
7. In the list, mark the selected row.
8. In the Size field, enter or select a value.
9. In the Name field, type a value.
10. Click the Colors tab.
11. Click New.
12. In the list, mark the selected row.
13. In the Color field, enter or select a value.
14. In the Name field, type a value.
15. Click New.
16. In the list, mark the selected row.
17. In the Color field, enter or select a value.
18. In the Name field, type a value.
19. Click Save.
20. Close the page.

Generate product variants

1. Click Product variants.

2. Click Variant suggestions.
3. Click Select all.
 - In this example, all possible variants are selected. If only a subset of the possible product dimension combinations will be used to create variants, you can select the individual entries.
4. Click Create.
 - You can generate descriptions for all your variants based on the combination of product dimension values. The descriptions are optional.
5. Click Save.

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Unit of measure conversion per product variant

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This topic explains how to set up unit of measure conversions for various product variants.

Instead of creating multiple individual products that must be maintained, you can use product variants to create variations of a single product. For example, a product variant might be a T-shirt of a given size and color.

Previously, unit conversions could be set up only on the product master. Therefore, all product variants had the same unit conversion rules. However, when the *Unit of measure conversions for product variants* feature is turned on, if your T-shirts are sold in boxes, and the number of T-shirts that can be packed in a box depends on the size of the T-shirts, you can now set up unit conversions between the different shirt sizes and the boxes that are used for packaging.

Turn on the feature in your system

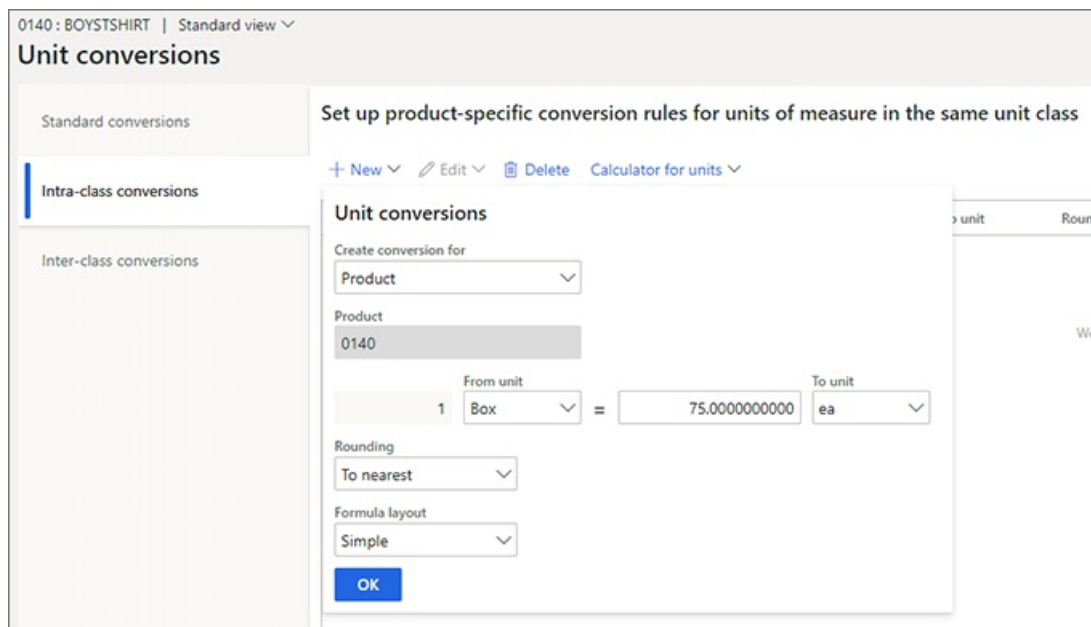
If you don't already see this feature in your system, go to [Feature management](#), and turn on the *Unit of measure conversions for product variants* feature.

Set up a product for unit conversion per variant

Product variants can be created only for products that are product masters. For more information, see [Create a product master](#). The *Unit of measure conversions for product variants* feature isn't available for products that are set up for catch-weight processes.

To configure a product master to support unit conversion per variant, follow these steps.

1. Go to **Product information management > Products > Product masters**.
2. Create or open a product master to go to its **Product details** page.
3. Set the **Enable unit of measure conversions** option to *Yes*.
4. On the Action Pane, on the **Product** tab, in the **Set up** group, select **Unit conversions**.
5. The **Unit conversions** page opens. Select one of the following tabs:
 - **Intra-class conversions** – Select this tab to convert between units that belong to the same unit class.
 - **Inter-class conversions** – Select this tab to convert between units that belong to different unit classes.
6. Select **New** to add a new unit conversion.
7. Set the **Create conversion for** field to one of the following values:
 - **Product** – If you select this value, you can set up a unit conversion for the product master. That unit conversion will be used as a fallback for all product variants that no unit conversion is defined for.
 - **Product variant** – If you select this value, you can set up a unit conversion for a specific product variant. Use the **Product variant** field to select the variant.



8. Use the other fields that are provided to set up your unit conversion.

9. Select **OK** to save the new unit conversion.

TIP

You can open the **Unit conversions** page for a product or a product variant from any of the following pages:

- Product details
- Released products details
- Released product variants

Example scenario

In this scenario, a company sells T-shirts in sizes small, medium, large, and extra-large. The T-shirt is defined as a product, and the different sizes are defined as variants of that product. The shirts are packed in boxes. For sizes small, medium, and large, there can be five shirts in each box. However, for size extra-large, there is space for only four shirts in each box.

The company wants to track the different variants in the *Pieces* unit, but it's selling them in the *Boxes* unit. For sizes small, medium, and large, the conversion between the inventory unit and the sales unit is 1 Box = 5 Pieces. For size extra-large, the conversion is 1 Box = 4 Pieces.

1. From the **Released product details** page for the T-Shirt product, open the **Unit conversions** page.
2. On the **Unit conversions** page, set up the following unit conversion for the **X-Large** released product variant.

FIELD	SETTING
Create conversion for	Product variant
Product variant	T-Shirt : : X-Large : :
From unit	Boxes
Factor	4

FIELD	SETTING
To Unit	Pieces

3. Because the **Small**, **Medium**, and **Large** product variants all have the same unit conversion between the *Box* and *Pieces* units, you can define the following unit conversion for them on the product master.

FIELD	SETTING
Create conversion for	Product
Product	T-Shirt
From unit	Boxes
Factor	5
To Unit	Pieces

Using Excel to update the unit conversions

If a product has many product variants that have different unit conversions, it's a good idea to export the unit conversions to a Microsoft Excel workbook, update them, and then publish them back to Dynamics 365 Supply Chain Management.

To export unit conversions to Excel, on the **Unit conversions** page, on the Action Pane, select **Open in Microsoft Office**.

Additional resources

[Manage unit of measure](#)

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Create a released product for a single company

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This procedure walks through how to create a single released product in the context of a single legal unit. After the released product is created, it's immediately available in this unit only. You can walk through this procedure in demo data company USMF. This task is usually performed by a product designer.

Create a released product

1. Go to Released products.
2. Click New.
3. In the Product number field, type a value.
 - If a product number is not automatically entered in the Product number field, type a unique product number. This step is only required if no number sequence has been set up for product numbers.
4. In the Product name field, type a value.
 - The Product name is defaulted to the search name. If needed, you can select to change the search name.
5. In the Item model group field, click the drop-down button to open the lookup.
 - The item model groups contain settings that determine how items are controlled and handled on item receipts and issues. The settings also determine how the consumption of items are calculated.
6. In the list, find and select the desired record.
7. In the list, click the link in the selected row.
8. In the Item group field, click the drop-down button to open the lookup.
 - Item groups are used to manage inventory by dividing inventory items into groups based on item characteristics. For example, to manage how information is posted to main accounts, you can create a series of different item groups that are associated with specific main accounts. This lets you track the inventory value of items at different stages.
9. In the list, find and select the desired record.
10. In the list, click the link in the selected row.
11. In the Storage dimension group field, click the drop-down button to open the lookup.
 - The storage dimensions help you control how items are stored and taken from inventory. For example, a storage dimension can be Site and Warehouse.
12. In the list, find and select the desired record.
13. In the list, click the link in the selected row.
14. In the Tracking dimension group field, click the drop-down button to open the lookup.
 - The tracking dimension group determines which tracking dimensions you can add to a product. For example, the batch number and serial number are used to track inventory items.
15. In the list, find and select the desired record.
16. In the list, click the link in the selected row.
17. In the Inventory unit field, click the drop-down button to open the lookup.
 - The inventory unit determines how the product is quantified when it's stored in inventory.
18. In the list, find and select the desired record.
19. In the list, click the link in the selected row.
20. In the Purchase unit field, click the drop-down button to open the lookup.
 - The purchase unit determines how the product is quantified when it's purchased from a vendor.

21. In the list, find and select the desired record.
22. In the list, click the link in the selected row.
23. In the Sales unit field, click the drop-down button to open the lookup.
 - The sales unit determines how the product is quantified when it's sold to a customer.
24. In the list, find and select the desired record.
25. In the list, click the link in the selected row.
26. In the BOM unit field, click the drop-down button to open the lookup.
 - The BOM unit determines how the product is quantified when including it in a bill of materials (BOM).
27. In the list, find and select the desired record.
28. In the list, click the link in the selected row.
29. In the Item sales tax group field, click the drop-down button to open the lookup.
 - The item sales tax group in the Sales taxation group determines how sales tax is calculated for each item.
30. In the list, find and select the desired record.
31. In the list, click the link in the selected row.
32. In the Item sales tax group field, click the drop-down button to open the lookup.
 - The item sales tax group in the Purchase taxation group determines how purchase tax is calculated for each item.
33. In the list, find and select the desired record.
34. In the list, click the link in the selected row.
35. Click OK.

Add product characteristics

1. Expand or collapse the Manage inventory section.
2. In the Net weight field, enter a number.
3. In the Tare weight field, enter a number.
4. In the Gross depth field, enter a number.
5. In the Gross width field, enter a number.
6. In the Gross height field, enter a number.
7. In the Volume field, enter a number.

Add financial dimensions

1. Expand or collapse the Financial dimensions section.
2. In the BusinessUnit field, click the drop-down button to open the lookup.
3. In the list, find and select the desired record.
4. In the list, click the link in the selected row.
5. In the CostCenter field, click the drop-down button to open the lookup.
6. In the list, find and select the desired record.
7. In the list, click the link in the selected row.
8. In the Department field, click the drop-down button to open the lookup.
9. In the list, find and select the desired record.
10. In the list, click the link in the selected row.
11. In the ItemGroup field, click the drop-down button to open the lookup.
12. In the list, find and select the desired record.
13. In the list, click the link in the selected row.

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Product data entities

2/18/2021 • 4 minutes to read • [Edit Online](#)

To import and export product data, you must use data entities. The following table provides details about the product-related data entities and describes the purpose of each.

ENTITY	APPLICATION OBJECT TREE (AOT) NAME (TYPE)	NOTES
Products V2	<code>EcoResProductV2Entity</code>	This entity is used to import and export shared products-distinct products and product masters. It allows for updates. It doesn't support set-based SQL operations. It's enabled for Open Data Protocol (OData).
Released products V2	<code>EcoResReleasedProductV2Entity</code>	This entity is used to import and export released products-distinct products and product masters. It allows for updates. It requires that the shared product already be created. When a new released product is imported, a release of the shared product occurs. There are also separate entities that can be used to import and export released product masters and released distinct variants. This entity doesn't support set-based SQL operations or delete operations. It's enabled for OData.
Released product creation V2	<code>EcoResReleasedProductCreationV2Entity</code>	This entity is used to import shared products and released products in one step. Although it supports exports, that use isn't recommended, because the purpose of the entity is product creation. It doesn't support updates. It supports a limited set of fields (fields that are available in the product creation dialog box). It doesn't support set-based SQL operations. It isn't exposed through OData.
Product variants	<code>EcoResProductVariantEntity</code>	This entity is used to import and export shared product variants. It allows for updates. It requires that dimension values already be created. The integration key is the product master plus product dimensions. This entity doesn't support set-based SQL operations. It's enabled for OData. It supports delete operations. It can't be extended through the addition of new product dimensions.

ENTITY	APPLICATION OBJECT TREE (AOT) NAME (TYPE)	NOTES
Product variants by product number identification	EcoResProductNumberIdentifiedProductVariantEntity	This entity is used to import and export shared product variants. It allows for updates. It requires that dimension values already be created. The integration key is the product number (whereas the integration key for the Product variants entity is the product master plus product dimensions).
Released product variants	EcoResReleasedProductVariantEntity	This entity is used to import and export released product variants. It allows for updates. It requires that shared product variants already be created. When a new released product variant is imported, a release of the shared product variant occurs. This entity doesn't support set-based SQL operations. It's enabled for OData. Although it supports delete operations, that use currently causes data corruption because of a bug in the current platform. This entity can't be extended through the addition of new product dimensions.
Released product variants by product number identification	EcoResProductNumberIdentifiedReleasedProductVariantEntity	This entity resembles the Released product variants entity, but the integration key is the product number instead of the product master plus product dimensions. It can be extended through the addition of new product dimensions.
Sellable released products	EcoResSellableReleasedProductEntity	This entity is used to export only sellable products. Sellable products are products that have the information that they require in order to be used in a sales order. The same rules apply when a product is validated by using the Validate function on the Released products page.
Released Distinct products V2	EcoResDistinctProductV2Entity	This entity is used to export distinct products. Those distinct products can be products, subtype products, and product variants.
Released products masters V2	EcoResProductMasterV2Entity	This entity is used to import and export product masters. It isn't enabled for data management.
Item - barcode	EcoResProductBarcodeEntityV3	This entity is used to export products and bar codes. This entity doesn't allow change tracking, updates, or deletes. To use change tracking, updates, or deletes on barcodes, use the Item - barcode association entity.

ENTITY	APPLICATION OBJECT TREE (AOT) NAME (TYPE)	NOTES
Item - barcode association	EcoResProductBarcodeAssociationEntity	<p>This entity is used to export products and bar codes. It allows change tracking, updates, and deletes. To use the entity, the feature <i>Item - barcode improvements</i> must be enabled in feature management. Its entity key is <code>AssociationID</code>, which creates the association between the barcode and the product. To add support for this key, the table <code>InventitemBarcodeAssociation</code> will be populated for existing item barcode data when you turn on the feature. The table is populated using a batch job and if your barcode table has a large number of records, it could take significant time to run the batch job. Therefore, we recommend that you plan to enable the feature (and therefore run the batch job) at a time that fits your business schedule.</p>
Product lifecycle states	EcoResProductLifecycleStateEntity	<p>This entity is used to import and export the different product lifecycle states that can be assigned to a product.</p>

NOTE

You can use the **Released Products V2** data entity to import products into the system only if the shared product has already been created. Otherwise, to import products into the system, you must use the **Product creation** data entity.

NOTE

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Product lifecycle state overview

2/18/2021 • 5 minutes to read • [Edit Online](#)

A product lifecycle state documents the lifecycle state of a released product or product variant. Product lifecycle states are defined by the user, typically a product manager or a product master data manager. Specific business processes, such as master planning, can be affected by a specific lifecycle state.

A released product or product variant can be associated with a product lifecycle state that documents in which lifecycle state a specific product or variant is currently in. You can define any number of product lifecycle states by assigning a state name and description. You can select one lifecycle state as the default state for new released products. Released product variants inherit their product lifecycle state from their released product master on creation. When changing the lifecycle state on a released product master, you can choose to update all existing variants that have the same original state.

Create a new product lifecycle state

- To create a new product lifecycle state, see [Create a new product lifecycle state](#).
- To create a default product lifecycle state, see [Create a default product lifecycle state](#).

Associate product lifecycle states to released products

There are multiple ways to associate a product lifecycle state to released products or product variants.

- On creation of a new released product, the default **Product lifecycle state** is automatically assigned.
- On release of a product to a legal entity, the default **Product lifecycle state** is automatically assigned.
- On release of a product variant to a legal entity, the **Product lifecycle state** associated to the released product master in this legal entity is automatically assigned to the new variant.

You can manually update the product lifecycle state by using:

- The **Released products** list page or **Details view**.
- The **Released product variants** list page or **Details view**.
- Find the obsolete products or product variants based on demand and associate a lifecycle state.

For more information:

- To associate a product lifecycle state to a released product master, see [Assign a product lifecycle state to a released product master](#).
- To associate a product lifecycle state to a release product, see [Assign a product lifecycle state to a released product](#).

Impact on master planning

The product lifecycle state has only one control flag: **Is active for planning**. By default, this is set to **Yes** for all created product lifecycle states, but it can be changed to **No**. When set to **No**, the associated released products or released product variants are:

- Excluded from master planning.
- Excluded from BOM-level calculation.

For detailed information about how to use product lifecycle state to exclude products from master planning and

BOM-level calculation, see [Create a product lifecycle state to exclude products from Master planning](#)

NOTE

For performance reasons, it is highly recommended to associate all obsolete released products or product variants, especially when working with non-reusable product configuration variants, with a product lifecycle state that is deactivated for master planning.

Default migration, import, and export

The product lifecycle states are supported by data entities, and the lifecycle state can be set to a variable state through either the released product data entity or the released variant data entity.

Find obsolete products and products variants

You can run a simulation analysis to find the obsolete released products or product variants and then update their product lifecycle status. To find obsolete products, see [Find obsolete product variants and assign a product lifecycle state](#). This topic shows how to find obsolete released products or product variants and how to associate a product lifecycle state to the obsolete products. It also shows how to view the simulation results and assess how many products and product variants will be associated with a new product lifecycle state when running the update without simulation.

By running the analysis in a simulation mode, the products and product variants identified as obsolete are displayed in a specific form, where they can easily be reviewed. The analysis searches for transactions and specific master data to identify products that have no demand within a variable period and no master data that can result in demand. New released products within a variable period can be excluded from the analysis. When the analysis simulation returns the expected result, the user can run the analysis and set a new product lifecycle state to all products identified as obsolete by the analysis.

NOTE

Note that all analysis and updates must be done within the same legal entity.

Criteria to select and update released products or product variants

Use the following criteria to select and update the released products and product variants:

- The product lifecycle state of the product or product variant must be different from the new desired state.
- The product or product variant was created some days ago based on the number of days that you enter in the selection dialog box.
- There are no open production orders (= status < ended) for the product or product variant.
- There are no open inventory transactions (= status issue ReservPhysical to QuotationIssue or status receipt Registered to QuotationReceipt) for the product or product variant.
- There are no inventory transactions within the last number of days for the product or product variant.
- There is no future demand or supply forecast for the product or product variant.
- No minimum stock level has been set in item coverage for the product or product variant.
- No active fixed quantity kanban rule for the product or product variant.
- No service order line for the product or product variant.
- No active or future sales or purchase agreement lines for the product or product variant.
- The product or product variant is not used in a BOM that is associated with a non-expired approved BOM version for a product or variant that is active for planning.

Related topics

- [Create a new product lifecycle state](#)
- [Create a default product lifecycle state](#)
- [Assign a product lifecycle state to a released product master](#)
- [Assign a product lifecycle state to a released product](#)
- [Find obsolete product variants and assign a product lifecycle state](#)
- [Create a product lifecycle state to exclude products from Master planning](#)

NOTE

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Create a new product lifecycle state

2/18/2021 • 2 minutes to read • [Edit Online](#)

This procedure shows how to create a new product lifecycle state. A product lifecycle state documents the lifecycle state of a released product or product variant. Product lifecycle states are defined by the user, typically a product manager, or a product master data manager. Specific business processes, for example, Master planning, can be affected by a specific lifecycle state.

Create a product lifecycle state

1. Go to Product information management > Setup > Product lifecycle state.
2. Click New.
3. In the State field, type a value.
4. In the Description field, type a value.

NOTE

Can you tell us about your documentation language preferences? [Take a short survey](#).

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Create a default product lifecycle state

2/18/2021 • 2 minutes to read • [Edit Online](#)

This procedure shows how to create a default product lifecycle state as well as how to associate the default state with released products.

Create a default lifecycle state

1. Go to Product information management > Setup > Product lifecycle state.
2. Click New.
3. In the State field, type a value.
4. Select Yes in the Default when released to legal entity field.
5. In the Description field, type a value.
6. Select No in the Is active for planning field.

NOTE

If a new released product should not be included in Master planning, select No. If it should be included in Master planning, leave the control at its default value Yes.

Create a new released product

1. Close the page.
2. Go to Product information management > Products > Released products.
3. Click New.
4. In the Product number field, type a value.
5. In the Product name field, type a value.
6. In the Search name field, type a value.
7. In the Item model group field, enter or select a value.
8. In the Item group field, enter or select a value.
9. In the Storage dimension group field, enter or select a value.
10. In the Tracking dimension group field, enter or select a value.
11. Click OK.

NOTE

The default product lifecycle state is a global definition.

Change the product to an active state

1. In the Product lifecycle state field, enter or select a value.

NOTE

Assume that you have set up an active state, you can now select the active state to allow the product to be used in Master planning and BOM-level calculation. Obviously, this only makes sense if all the product details that are required for consistent planning are specified.

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Assign a product lifecycle state to a released product master

2/18/2021 • 2 minutes to read • [Edit Online](#)

This procedure shows how to assign a product lifecycle state to a released product master and its variants.
Prerequisite: You need to play the task guide "Create a new product lifecycle state" first to make sure that you have at least one product lifecycle state created before you can play this task guide.

Find a released product master

1. Go to Product information management > Products > Released products.
2. In the list, find and select the desired record.

NOTE

A product master has the Product subtype Product master.

Update the lifecycle state

1. Click Edit.
2. In the Product lifecycle state field, enter or select a value.
3. Click Save.
4. Click Yes.

NOTE

If Yes is selected, all the related released product variants that have the same original status as the released product master are also updated to the new product lifecycle state. If No is selected, all variants keep their actual state. Variants that have a different product lifecycle state from the released product master are not updated.

Verify the lifecycle state of the variants

1. Click Released product variants.

NOTE

Note that all variants have inherited the selected lifecycle state from the released product master.

2. In the list, mark the selected row.
3. In the Product lifecycle state field, enter or select a value.

NOTE

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Assign a product lifecycle state to a released product

2/18/2021 • 2 minutes to read • [Edit Online](#)

This procedure shows how to assign a product lifecycle state to a released product. Prerequisite: You need to play the task guide "Create a new product lifecycle state" first to make sure that at least one product lifecycle state is created before you can play this guide.

Find a released product that you want to assign a product lifecycle state

1. Go to Product information management > Products > Released products.
2. Use the Quick Filter to find records. For example, filter on the Item number field with a value of 'd'.
3. In the list, click the link in the selected row.
4. Click Edit.
5. In the Product lifecycle state field, enter or select a value.
6. Click Save.

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Find obsolete product variants

2/18/2021 • 2 minutes to read • [Edit Online](#)

This procedure shows how to find obsolete released products or product variants and how to associate a product lifecycle state to the obsolete products. Prerequisite: You need to define at least one product lifecycle state that is inactive for planning before you can play this task guide.

Run a simulation

1. Go to Product information management > Periodic tasks > Change lifecycle state for obsolete products.
2. In the New product lifecycle state field, enter or select a value.
3. Select Yes in the Run simulation without updating product data field.
4. In the Exclude products created within this number of days field, enter a number.
5. In the Exclude products used in transactions (in number of days) field, enter a number.
6. Expand the Records to include section.
7. Click Filter.
8. In the list, mark the selected row.
9. In the Criteria field, type a value.
10. Click OK.
11. Click OK.

NOTE

It is recommended to run the simulation in batch if you expect to search a large number of products. Also, make sure that the simulation is not run during the most active working time of the company.

Review the simulation results

1. Go to Product information management > Inquiries and reports > Product lifecycle state maintenance history.

NOTE

On this page, you can review the simulation results and make an assessment of how many products and product variants will be associated with a new product lifecycle state when running the update without simulation.

Run the update of the Product lifecycle state for obsolete products

1. Close the page.
2. Go to Product information management > Periodic tasks > Change lifecycle state for obsolete products.
3. Expand the Records to include section.

NOTE

Note that the last selection has been saved.

4. Select No in the Run simulation without updating product data field.
5. Expand the Run in the background section.

NOTE

Depending on how many products and product variants are affected, consider running this job in batch. Make sure that you are not running a large update job during the most active working hours in the company.

6. Click OK.
7. Go to Product information management > Inquiries and reports > Product lifecycle state maintenance history.

NOTE

Review the changed released products and product variants.

8. In the list, find and select the desired record.

NOTE

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Create a product lifecycle state to exclude products from Master planning

2/18/2021 • 2 minutes to read • [Edit Online](#)

This procedure shows how to create a new product lifecycle state that excludes the products from Master planning and BOM-level calculation.

Create an obsolete state

1. Go to Product information management > Setup > Product lifecycle state.
2. Click New.
3. In the State field, type a value.
4. Select No in the Is active for planning field.
5. In the Description field, type a value.

Associate the obsolete state to a released product

1. Close the page.
2. Go to Product information management > Products > Released products.
3. Use the Quick Filter to find records. For example, filter on the Search name field with a value of 'M00'.
4. Click Edit.
5. In the list, mark the selected row.
6. In the Product lifecycle state field, enter or select a value.

NOTE

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Create a bar code for a product

2/18/2021 • 2 minutes to read • [Edit Online](#)

This topic shows how to manually create a bar code using the item number M0001 as an example. The demo data company used to create this procedure is USMF.

1. Select **Released product maintenance** on the homepage.
2. Go to **Products > Released products** under the **Links** section.
3. In the list, find and select the desired record. For this example, select item number **M0001**.
4. On the Action Pane, select **Manage inventory**.
5. Select **Bar codes**.
6. Select **New**.
7. Mark the selected row that is created in the list below.
8. In the **Barcode setup** field, enter or select a value.
9. In the **Bar code** field, enter or select a value.
10. In the **Bar code** field, type a value.
11. In the **Quantity** field, enter a number.
12. Select **Save**.
13. Close the page.

NOTE

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Enter the GTIN code for a product

2/18/2021 • 2 minutes to read • [Edit Online](#)

GTIN codes are assigned by the GS1 organization. In this example, you will enter a code for product number M0001 in demo data company USMF.

1. Click Released product maintenance.
2. Click Released products.
3. Expand the Product image FactBox.
4. In the list, find and select the desired record.
5. On the Action Pane, click Manage inventory.
6. Click GTIN codes.
7. Click New.
8. In the list, mark the selected row.
9. In the Unit field, enter or select a value.
10. In the GTIN code field, select an option.
11. In the GTIN field, type a value.
12. Close the page.

NOTE

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Create batch attributes for a product

2/18/2021 • 2 minutes to read • [Edit Online](#)

This procedure shows how to create a batch attribute, assign default value ranges, and include the attribute in a group. The demo data company used to create this procedure is the USP2 Company.

1. Go to Inventory management > Setup > Batch > Batch attributes.
2. Click New.
3. In the Attribute field, type a value.
4. In the Description field, type a value.
5. In the Attribute type field, select 'Fraction'.
 - This procedure uses the Fraction type to enable decimal values. You can select other attribute types. If you select the Enumeration type, you must enter values in the enumeration list before you can enter a value in the Target field.
6. In the Minimum field, enter a number.
7. In the Maximum field, enter a number.
8. In the Increment field, enter a number.
9. In the Target field, type a value.
10. Click Save.
11. Close the page.
12. Go to Inventory management > Setup > Batch > Batch attribute groups.
13. Click New.
14. In the Attribute group field, type a value.
15. In the Description field, type a value.
16. Click Save.
17. Click Group attributes.
18. Click New.
19. In the Attribute field, click the drop-down button to open the lookup.
20. In the list, find and select the desired record.
21. In the list, click the link in the selected row.
 - An attribute can be included in any of the groups.
22. Click Save.
23. Close the page.

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Add an image to a product

2/18/2021 • 2 minutes to read • [Edit Online](#)

This procedure shows how to add an image to a product. The demo data company used to create this task is USMF.

1. Go to Product information management > Products > Released products.
2. Expand the Product image FactBox.
3. In the list, find and select the desired record.
 - For example, select the item number C0002.
4. Click Change image.
5. Click New.
 - Click Browse. Find the image that you want to use, select it, and then close the dialog box.

NOTE

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Country of origin

2/18/2021 • 3 minutes to read • [Edit Online](#)

IMPORTANT

Some or all of the functionality noted in this topic is available as part of a preview release. The content and the functionality are subject to change. For more information about preview releases, see [One version service updates FAQ](#).

Many organizations issue certificates to their vendors to ensure that products meet specific certification standards. These certificates often depend on the country of origin. The country of origin feature lets you link a product to its country of origin and keep track of its product certifications.

Turn on the country of origin feature

Before you can use this feature, it must be turned on in your system. Admins can use the [feature management](#) settings to check the status of the feature and turn it on. In the **Feature management** workspace, the feature is listed in the following way:

- **Module:** *Product information management*
- **Feature name:** *Country of origin management feature*

Configure source and destination countries

Before you issue a certificate for a product, you must link the product to its destination country and its country of origin.

1. Go to **Product information management > Setup > Product compliance > Country of origin > Country of origin rules**.
2. Select an existing country setup to edit, or select **New** on the Action Pane to create a new country setup.
3. Set the following values for the selected or new country.

FIELD	DESCRIPTION
Item number	Select the item number of the product.
Destination country	Select the country that you're sending the product to.
Origin country	Select the country that you're shipping the product from.

The purpose of this setup is to help you generate a bill of materials (BOM) report where you can include the country of origin for each part that source and destination countries are specified for. This report will help you get a holistic picture of where your parts come from and where they are going.

Keep track of vendor certificates

You can use the **Country of origin vendor certificates** page to keep track of certificates that you issue to vendors.

You must decide which certificate documents you're issuing and how you will report them to customers. This

feature helps you keep track of your certificates. It also lets you choose whether the relevant certificate numbers appear on invoices, packing slips, and/or order confirmations.

To set up your certificate information, follow these steps.

1. Go to **Product information management > Setup > Product compliance > Country of origin > Country of origin vendor certificates**.
2. Select an existing certificate setup to edit, or select **New** on the Action Pane to create a new certificate setup.
3. Set the following settings for the selected or new certificate.

FIELD	DESCRIPTION
Vendor account	Select the vendor that you issued the certificate to.
Item number	Select the item that you issued the certificate for.
Country/region	The destination country or region where you must use this certificate.
Certificate number	Enter the identification number of the certificate that you issued.
Effective	Select the first date when the current certificate is valid.
Expiration	Select the last date when the current certificate is valid.
Print on invoice	Select this check box to print the certificate number on invoices that are addressed to the specified country during the specified date range.
Print on packing slip	Select this check box to print the certificate number on packing slips that are addressed to the specified country during the specified date range.
Print on sales order	Select this check box to print the certificate number on sales orders that are addressed to the specified country during the specified date range.

Include the country of origin on BOM reports

When you generate a BOM report, you can include the country of origin for each part that you specified source and destination countries for on the **Country of origin rules** page.

1. Go to **Product information management > Products > Released products**.
2. Select or create a product to open its **Released product details** page.
3. On the Action Pane, on the **Engineer** tab, in the **BOM** group, select **Designer**.
4. On the page that appears, on the Action Pane, select **BOM > Print**.
5. In **Bill of materials lines** dialog box, set the **Destination country** field to the destination country that you want to view on your report.
6. Select **OK**.

A report that shows information about the country of origin of each part is generated and shown. Here is an example of the report.

Finance and Operations Search for a page

Options

Go to | Find | Zoom | Export

Lines - Destination Country: FRA
Contoso Entertainment System USA

Item number	Product name	Item group		From quantity		From date	To date	Active	Approved by	Approved	
X330	X330	Audio		1.00				Yes	000020	Yes	
Item number	Product name	Origin	Item type	Position	Operation number	Quantity	Per series	Unit	Formula	Line type	Configuration group
X300	X300	USA	Item			1.0000	1 ea		Standard	Item	
X301	X301	USA	Item			1.0000	1 ea		Standard	Item	
X302	X302	USA	Item			1.0000	1 ea		Standard	Item	

NOTE

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Dual-use goods

2/18/2021 • 5 minutes to read • [Edit Online](#)

Dual-use goods are typically items that have both civilian and military applications. For example, a chemical might be used as either a fertilizer or an explosive. Many countries have special regulations that apply to the export, import, and transportation of dual-use goods. Therefore, it's important that companies that are involved in the international trade of dual-use goods keep track of the various policies and certificates.

The dual-use feature helps companies keep track of products that are identified as dual-use goods, stores certificate numbers for each relevant product and destination country, and print valid certificate numbers on relevant invoices, packing slips, and/or sales orders. It helps ensure that, when your products are shipped, they always include up-to-date certifications.

Consider the following scenario:

1. The **Dual use country setup** page in your system indicates that shipments to France require a certification.
2. The **Released product details** page for product X-100 indicates that it's a dual-use good. Together, the code, category, group, and regime indicate the export control classification that the product belongs to.
3. The **Dual use certificates** page includes a certificate for product X-100 when it's shipped to France. This certificate expires January 1, 2020.
4. On June 17, 2020, you create a sales order for a customer company that is based in France, and the order includes product X-100.
5. When you save the sales order, the system determines the following information:
 - a. Does the order include any products that are dual-use goods?
 - b. If the order includes dual-use goods, does the destination country require dual-use certificates?
 - c. If the country requires dual-use certificates, does a valid certificate exist for each dual-use good for the destination country?
6. The order includes product X-100, the product is being shipped to France, and a French certificate exists for the product. However, the certificate has expired. Therefore, you receive the following warning message: "Dual use certificates for one or more dual-use items in this sales order aren't valid. Do you want to proceed with the confirmation?"

This topic explains how to configure all the settings that are required to set up dual-use goods and support this scenario.

Define dual-use requirements for each relevant country

Different countries have different requirements for dual-use goods. You use the **Dual use country setup** page to keep track of the countries that do and don't require a certificate. The information that you specify here is checked when you create sales orders, and you will be reminded to provide the required certifications.

To set up the information about dual-use requirements for different countries, follow these steps.

1. Go to **Product information management > Setup > Product compliance > Dual use products > Dual use country setup**.
2. Select an existing country setup to edit it, or select **New** on the Action Pane to create a new country

setup.

3. Set the following values for the selected or new country setup.

FIELD	DESCRIPTION
Country/region	Select the country that you're tracking requirements for.
Certificate Required	Select this check box for countries that require a certification for dual-use goods. Clear it for countries that don't require this certification.

Create dual-use categories

Dual-use goods must often be categorized according to their export control classification number (ECCN). The ECCN is an alphanumeric code that categorizes items based on factors such as the commodity and technology. The **Dual use categories** page helps you make a list of the categories that you use, for reporting purposes.

To set up dual-use categories, follow these steps.

1. Go to **Product information management > Setup > Product compliance > Dual use products > Dual use categories**.
2. Select an existing category to edit it, or select **New** on the Action Pane to create a new category.
3. Set the following values for the selected or new category.

FIELDS	DESCRIPTION
Dual use code	Enter the full ECCN code (for example, <i>3A001</i>).
Dual use category	Enter the commerce control list (CCL) category part of the ECCN code. For example, for the ECCN code <i>3A001</i> , this value is <i>3</i> .
Dual use group	Enter the product group part of the ECCN code. For example, for the ECCN code <i>3A001</i> , this value is <i>A</i> .
Dual use regime	Enter the regime code for the item. This code identifies the reason why the item is classified as a dual-use good. For example, for the ECCN code <i>3A001</i> , this value is <i>001</i> .

Apply dual-use categories to products

To identify a product as a dual-use good and apply a dual-use category to it, follow these steps.

1. Go to **Product information management > Products > Released products**.
2. Select or create a product to open its **Released product details** page.
3. On the **Foreign trade** FastTab, set the **Dual use products** option to **Yes** to identify the current product as a dual-use good.
4. Set the **Dual use code** field to the code that applies to the current product. (You defined this code on the **Dual use categories** page.)

This setup is checked when you create a sales order.

Set up dual-use certificates

You use the **Dual use certificates** page to set up and manage the required dual-use certificates for each product and country. You can track each certificate's details, such as the country and the dates of validity. You can also set options to specify where this information should be printed. For example, the information can be printed on the invoice, packing slip, and/or sales order. This setup is checked when you create a sales order.

1. Go to **Product information management > Setup > Product compliance > Dual use products > Dual use certificates**.
2. Select an existing certificate to edit it, or select **New** on the Action Pane to create a new certificate.
3. Set the following values for the selected or new certificate.

FIELD	DESCRIPTION
Item number	Select the item number of the dual-use good that this certificate applies to.
Country/region	The destination country or region where you must use this certificate.
Certificate number	The number that appears on the certificate that is issued to the vendor or customer.
Effective	Select the first date when the current certificate is valid.
Expiration	Select the last date when the current certificate is valid.
Print on invoice	Select this check box to print the certificate number on invoices that are addressed to the specified country during the specified date range.
Print on packing slip	Select this check box to print the certificate number on packing slips that are addressed to the specified country during the specified date range.
Print on sales order	Select this check box to print the certificate number on sales orders that are addressed to the specified country during the specified date range.

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Hazardous materials overview

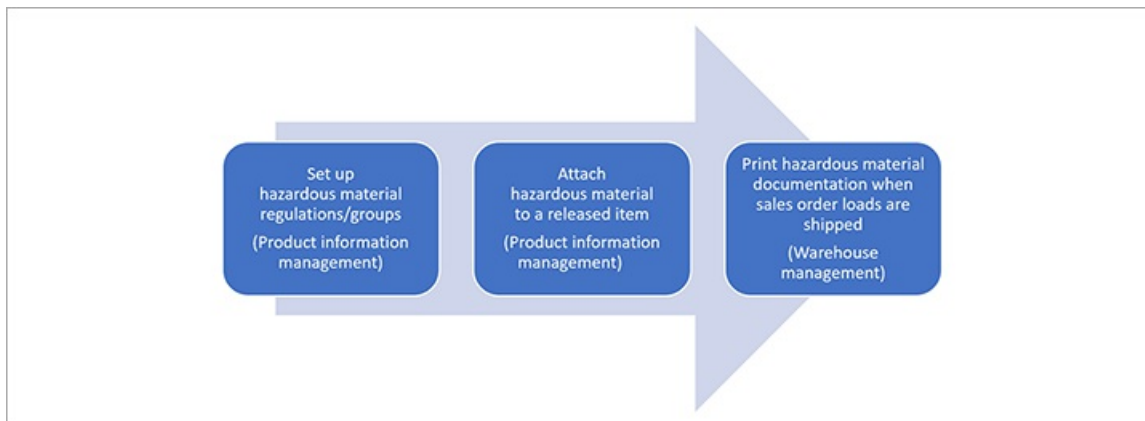
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IMPORTANT

Some or all of the functionality noted in this topic is available as part of a preview release. The content and the functionality are subject to change. For more information about preview releases, see [One version service updates FAQ](#).

To remain compliant with shipping and transport regulations, organizations that ship materials that are classified as dangerous goods must include additional paperwork with their shipments. The hazardous materials feature lets customers store information that is related to released items. This information can then be used to help prepare shipping documentation. An organization that ships dangerous goods must have its own processes and procedures for managing the shipping process. Microsoft Dynamics 365 Supply Chain Management is just a tool that can help generate the required documents.

The following diagram illustrates the steps needed to set up and use the hazardous materials feature.



The hazardous materials feature is set up in Product information management and provides documents that can be printed through Warehouse management. Therefore, broadly speaking, those areas are the two main areas where you will review, set up, and use this feature's functionality:

- **Product information management** – Set up the codes that will be applied to a released product.
- **Warehouse management** – Work with additional shipping documents that will be printed for shipments.

IMPORTANT

The hazardous materials features in Supply Chain Management provide a collection of useful product information fields and related functionality that can help you record and reference information that is related to your hazardous products. These features can also help you design and print shipment documents that include some of the same information about any hazardous materials that you're shipping. However, the system won't automatically make you compliant with all applicable regulations in your country or region. Although these tools are intended to help you comply with common regulations, they are neither sufficient in themselves nor guaranteed to be so. Your organization is responsible for being aware of all applicable regulations and for taking all necessary steps to comply with them.

Product information management

Product information management provides a range of setup tables where you can enter reference information for the various dangerous goods lists for road, air, and sea freight.

The following common regulations were referenced when this functionality was developed:

- **ADR** – Regulations that are related to the international carriage of dangerous goods by road
- **CFR 49** – Regulations in the United States for the carriage of dangerous goods
- **IMDG** – The International Marine Dangerous Goods (IMDG) code
- **IATA** – The International Air Transport Association (IATA) dangerous goods regulations

Each set of regulations provides standardized lists of dangerous goods and reference codes. Therefore, Supply Chain Management provides a reference table for the common codes on those lists. Each list also has some unique codes that you can define.

For more information about how to set up regulations and values for hazardous materials, and how to assign the values to relevant products, see the following topics:

- [Set up hazardous materials](#)
- [Hazardous materials in products, orders, shipments, and loads](#)

Warehouse management

When you prepare a shipment in Warehouse management, you will be able to print several new reports that use the information that you set up in Product information management. For more information about the available reports and how to use them, see [Hazardous materials inquiries and reports](#).

NOTE

Can you tell us about your documentation language preferences? [Take a short survey](#).

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Set up hazardous materials

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IMPORTANT

Some or all of the functionality noted in this topic is available as part of a preview release. The content and the functionality are subject to change. For more information about preview releases, see [One version service updates FAQ](#).

To use hazardous materials functionality, you must first set up the data that is required to classify items as hazardous materials. Then, when you create a sales order that includes an item that is classified as a hazardous material, the system generates hazardous material documentation for that sales order when it's shipped.

Turn on the hazardous materials feature for your system

Before you can use this feature, it must be turned on in your system. Admins can use the [feature management](#) settings to check the status of the feature and turn it on. In the **Feature management** workspace, the feature is listed in the following way:

- **Module:** *Product information management*
- **Feature name:** *Hazardous materials product information and shipping documentation*

Hazardous material regulations

To use the hazardous materials processes, you must first create a regulation. Regulations define how the printed shipping text is created for an item. They also define the associated modes of delivery.

Here are some common regulations:

- **ADR** – Regulations that are related to the international carriage of dangerous goods by road
- **CFR 49** – Regulations in the United States for the carriage of dangerous goods
- **IMDG** – The International Marine Dangerous Goods (IMDG) code
- **IATA** – The International Air Transport Association (IATA) dangerous goods regulations

These regulations help determine what information should be shown when you print the shipping text for an item. You can define as many regulations as you must comply with.

IMPORTANT

The functionality for setting up information codes that are related to hazardous materials doesn't make your company compliant with regulations. It's only a tool that helps you build processes for your company.

Typically, a regulation is available for a specific mode of transport, such sea freight, road freight, or air freight. Therefore, you can associate each regulation with a mode of delivery. The mode of delivery will be used when specific documents are printed in Warehouse management. In Warehouse management, each shipment is linked to a shipping carrier and carrier service that are set up in the **Transportation** module. The mode of delivery is associated with the shipping carrier and carrier service. When you run a report, the mode of delivery is used to find the shipping print text that is associated with a released item.

This setup data isn't specific to each legal entity (company). Therefore, you can have a common set of hazardous material information that is shared among all your legal entities.

For each regulation, you can define a materials list and use it as a template list that is associated with released items. For each regulation, you can also define a print setup. A print setup lets you define how the shipping text for an item is constructed. The print setup is used to construct the shipping print text for a released item.

To set up hazardous material regulations, go to **Product information management > Setup > Hazardous material shipping documentation > Hazardous material regulation**. On the **Hazardous material regulation** page, you can create any number of regulations and configure each by using the fields that are described in the following subsections.

Hazardous material regulation header

Each regulation has a code and a description. The following table describes the fields that are available on the header.

FIELD	DESCRIPTION
Regulation code	Enter a code to identify the hazardous material regulation record.
Description	Enter a description of the hazardous material regulation.

Print setup FastTab

Each regulation can have any number of print setups. You define the print setups on the **Print setup** FastTab. The following table describes the fields that are available for each print setup.

FIELD	DESCRIPTION
Sequence	Define the order in which fields will be referenced in the shipping text.

FIELD	DESCRIPTION
Print field	<p>Select the field to include in the shipping text. Not all fields for the hazardous material will be available to print. Only the common fields that are used to define shipping text in the various regulations will be available. You should define the first print field as a field separator that has a Sequence value of 0 (zero), so that it can be used as the separator between other fields. Only one reference to the field separator is required.</p> <p>The following values are available:</p> <ul style="list-style-type: none"> • Field separator – This print field is used as the field separator for the text. Only one field separator is required in the sequence. Usually you should set the Sequence value for this print field to 0 (zero). The system will look for a field separator and use the first one that it finds in the list. The text value that is used in the string will come from the Print after field. • Identification – This print field puts the identifying code and/or description in the print text. • Class – This print field puts the class code and/or description in the print text. • Division – This print field puts the division code and/or description in the print text. • Packing group – This print field puts the packing group code and/or description in the print text. • Tunnel code and/or description – This print field puts the tunnel code and/or description in the print text. • Proper shipping name – This print field puts the proper shipping name in the print text. • Technical name – This print field puts the technical name and/or description in the print text. • Transport category – This print field puts the transport category code and/or description in the print text. • Stowage – This print field puts the stowage code and/or description in the print text. • Fixed text – This print field enters the text that is defined in the Fixed text field for this row. • Label code and/or description – This print field puts the label code and/or description in the print text. • Aircraft packing – This print field puts the aircraft packing instructions code and/or description in the print text. • Limited quantity – This print field checks whether the item is marked as a limited-quantity item and, if it is, enters the text that is defined in the Fixed text field for this row. • Packing description – This print field puts the packing description in the print text.
Print before	Enter the text that should be printed before the content that is defined by the Print field setting.
Print after	Enter text that should be printed after the content that is defined by the Print field setting.

FIELD	DESCRIPTION
Print with previous	Select this check box to prevent the field separator from being printed between the previous field and this field. Use this check box for print fields that are either optional or included with another print field.
Fixed text	If you set the Print field field to Fixed text or Limited quantity , enter the text that should be printed.
Include in print	Select which value or values from the selected print field should be printed for this row. You can print the code, the description, or both the code and the description.

Mode of delivery FastTab

The regulation is a shared table and isn't specific to each legal entity. However, modes of delivery are legal entity-specific. Therefore, when you set up a mode of delivery, you must select the relationship between the regulation, legal entity, and mode of delivery.

The following table describes the fields that are available on the **Mode of delivery** FastTab.

FIELD	DESCRIPTION
Company	Select a legal entity to associate with this regulation.
Mode of delivery	Based on the legal entity that you selected, select the mode of delivery that should be associated with the regulation.

Country FastTab

For reference purposes, you can list the countries or regions that the regulation is relevant for. However, when shipment reports are run, only the mode of delivery is used to determine the regulation. When you review a warehouse shipment, there isn't a direct link to the mode of delivery. The shipment can be associated with a shipping carrier and carrier service. When you define a carrier service, you must associate it with a mode of delivery. This relationship will be used on shipment reports such as the bill of lading to find the shipping print text for an item.

The following table describes the field that is available on the **Country** FastTab.

FIELD	DESCRIPTION
Country/region	Select a country/region to associate with the regulation.

Material codes

Material codes establish settings that are related to a specific hazardous component that might be included in a released product. Each material code belongs to a specific hazardous material regulation, and its definition must conform to that regulation. When you apply a material code to a released product by using the **Material code** field, all the material code's hazardous materials settings are automatically applied to that product. Therefore, the process of setting up released products is faster and less prone to error.

To manage your hazardous material definitions, follow these steps.

1. Go to **Product information management > Setup > Hazardous material shipping documentation > Hazardous material regulation**.

2. Select the regulation to set up a hazardous material definition for.
3. On the Action Pane, on the **Setup** tab, select **Hazardous materials**.
4. In the **Material code** field, enter a material code for the hazardous material definition. You will select this value when you apply the material code to a released product.

The **Regulation code** field is read-only and shows the regulation that you selected in step 2.

5. Use the remaining fields on this page to create and set up each hazardous material that applies to your selected regulation. The fields that are available are a subset of the hazardous material fields that are available for individual released products. For more information, see [Hazardous materials in products, orders, shipments, and loads](#).

Hazardous material classification groups

Each hazardous material classification group defines a group of field values that establish a template. You can use this template later, when you set up hazardous material information for a released item.

When you assign the code for a hazardous material classification group to a released item, the information that is associated with that classification group will be copied into the appropriate fields of the item. Therefore, you can simplify the setup processes by establishing a set of related field values that you often use together.

This setup data isn't specific to each legal entity. Therefore, you can have a common set of hazardous material information that is shared among all your legal entities.

To set up hazardous material classification groups, go to **Product information management > Setup > Hazardous material shipping documentation > Hazardous material classification group**. On the **Hazardous material classification group** page, you can create any number of groups and configure each by using the fields that are described in the following table.

FIELD	DESCRIPTION
Group code	Enter a code to identify the group.
Description	Enter a description of the group.
Class code	Associate a hazardous material class code with the group.
Division code	Associate a hazardous material division code with the group.
Packing group code	Associate a packing group code with the group.
Transport category code	Associate a transport category code with the group.
Multiplier	Enter the hazardous material multiplier that applies to the selected class and division of hazardous materials, according to the applicable regulation. This multiplier is used as part of the formula that calculates the total <i>hazardous material points</i> that are included in a load or shipment. For more information about hazardous material points and this multiplier, see Material management FastTab .

Hazardous material classes

A hazardous material class is typically mapped to the list of classes that is provided in the regulation that you're conforming to. For example, US regulation CFR 49 lists "class 3" as flammable and combustible liquids. You can

set up the classes that are relevant to the materials that you must classify.

Each class will be assigned to a material setup in the materials list that is related to the regulation. You will assign a class to each released item as required, to describe the hazardous nature of a product.

This setup data isn't specific to each legal entity. Therefore, you can have a common set of hazardous material information that is shared among all your legal entities.

Hazardous material classes work together with divisions, groups, and compatibility groups in the following way:

- When you assign a hazardous material class to a released item, you must also assign a [hazardous material division](#).
- You can use hazardous material classes together with [hazardous material classification groups](#) to establish a template of codes for setting up items.
- You can use [hazardous material compatibility groups](#) to establish which hazardous material classes and divisions can be shipped together.

To set up hazardous material classes, go to **Product information management > Setup > Hazardous material shipping documentation > Hazardous material class**. On the **Hazardous material class** page, you can create any number of classes and configure each by using the fields that are described in the following table.

FIELD	DESCRIPTION
Class code	Enter a code to identify this class. You define this code for the item. It will then be used in lookup lists when you assign a hazardous material class to a released item.
Description	Enter a description of the class.

Hazardous material divisions

A hazardous material division is a subset of a hazardous material class. You must assign both a division and a class to every product that includes hazardous materials.

For classes that don't have any divisions, create a division where the code is 0. For example, in the IATA regulation, class-7 radioactive materials have no subdivisions. In this case, you will create a 0 division that you can associate with a released product when you assign the class.

This setup data isn't specific to each legal entity. Therefore, you can have a common set of hazardous material information that is shared among all your legal entities.

Hazardous material divisions work together with classes, groups, and compatibility groups in the following ways:

- When you assign a hazardous material division to a released item, you must also assign a [hazardous material class](#).
- You can use hazardous material divisions together with [hazardous material classification groups](#) to establish a template of codes for setting up items.
- You can use [hazardous material compatibility groups](#) to establish which hazardous material classes and divisions can be shipped together.

To set up hazardous material divisions, go to **Product information management > Setup > Hazardous material shipping documentation > Hazardous material division**. On the **Hazardous material division** page, you can create any number of divisions and configure each by using the fields that are described in the following table.

FIELD	DESCRIPTION
Division	Enter a code to use as a reference number for the division.
Description	Enter a description of the division.
Class	Look up and assign the class that the division belongs to.

Hazardous material compatibility groups

Hazardous material compatibility groups establish which hazardous material classes and divisions can be shipped together. When operators create warehouse loads or shipments, they can run a compatibility check that will issue a warning if the load or shipment includes items that don't all belong to the same compatibility group.

This setup data isn't specific to each legal entity. Therefore, you can have a common set of hazardous material information that is shared among all your legal entities.

To set up hazardous material compatibility groups, go to **Product information management > Setup > Hazardous material shipping documentation > Hazardous material compatibility group**. On the **Hazardous material compatibility group** page, you can create any number of compatibility groups and configure each by using the fields that are described in the following subsections.

Hazardous material compatibility group header

Each compatibility group has a code and a description. The following table describes the fields that are available on the header.

FIELD	DESCRIPTION
Compatibility group	Enter a code to identify the compatibility group
Description	Enter a description of the compatibility group.

Compatibility group details

Each compatibility group establishes a list of classes and divisions of hazardous materials that can be shipped together.

FIELD	DESCRIPTION
Class	Select a hazardous material class that is compatible with all other classes in the group.
Division	Select a hazardous material division that belongs to the selected class.

Hazardous material specification values

Microsoft Dynamics 365 Supply Chain Management provides several types of hazardous material specifications. For each type, you must establish a centralized set of values for each relevant field. Users can then select among those values when they configure hazardous material definitions or released products. Supply Chain Management provides a collection of pages where you can establish the values. Each page is dedicated to one type of specification. For a description of each available specification and information about how to establish the values that are available for it, see the following subsections.

One example of a hazardous material specification is the *stowage code*, which specifies how a given material can be stored during transport. By using the information in this section, you will establish a central collection of stowage codes. This collection will then be presented to users in a drop-down list when they set the stowage code for a released product.

These hazardous material specification values aren't specific to each legal entity, Therefore, you can have a set of common values that are shared among all your legal entities.

You will use [material codes](#) to establish common collections of settings for each specification as it applies to a given regulation. You can then apply the appropriate code to each released product as required. For information about how to apply a hazardous material code to a specific released product, and how to configure individual settings of that product for any specification that is described here, see [Hazardous materials in products, orders, shipments, and loads](#).

Hazardous material emergency response

The *Hazardous material emergency response* specification indicates what should be done if something goes wrong while a product that contains a given hazardous material is being transported.

To set up values for this specification, go to **Product information management > Setup > Hazardous material shipping documentation > Hazardous material emergency response**. On the **Hazardous material emergency response** page, you can create any number of values and configure each with a classification code and a short description.

Hazardous material identification

The *Hazardous material identification* specification identifies the class or nature of a hazardous material. The value is typically a code that is based on a United Nations (UN) standard. Each class is identified by a code and a description, and it can set limits on transport methods. For example, to identify a flammable item or material, you create a hazardous material class that uses the code *FL* and the description *Flammable*. You also specify that the class must not be transported by air.

To set up values for this specification, go to **Product information management > Setup > Hazardous material shipping documentation > Hazardous material identification**. On the **Hazardous material identification** page, you can create any number of values and configure each by using the fields that are described in the following table.

FIELD	DESCRIPTION
Identification	Enter a code to use as a reference number that identifies this class of hazardous material.
Description	Enter a description of this class.
Restrict from air transport	Select this check box to indicate that this class of hazardous material should not be transported by air.
Restrict from sea transport	Select this check box to indicate that this class of hazardous material should not be transported by sea.

Hazardous material label

The *Hazardous material label* specification identifies the dangerous goods label that must be applied to relevant released products. The labels themselves will describe how the product should be handled. For example, you have a product that contains a poisonous gas. In this case, you set up a label code that represents the poisonous gas label. You also build your business process so that it looks up this value when you ship products.

To set up values for this specification, go to **Product information management > Setup > Hazardous**

material shipping documentation > Hazardous material label. On the **Hazardous material label** page, you can create any number of labels and configure each with an identifying code and a short description.

Hazardous material packing descriptions

The *Hazardous material packing descriptions* specification indicates how a hazardous item must be packed. For example, it might have to be packed in a specific type of steel drum or some other type of special packaging.

To set up values for this specification, go to **Product information management > Setup > Hazardous material shipping documentation > Hazardous material packing descriptions**. On the **Hazardous material packing descriptions** page, you can create any number of packing descriptions and configure each with an identifying code and a short description.

Hazardous material packing group

The *Hazardous material packing group* specification identifies the packing group for a hazardous item. The packing group lets you define a code and a description to indicate how hazardous material items must be packed during transportation or shipment. The packing group is assigned to the item through the **Item hazardous materials** page.

To set up values for this specification, go to **Product information management > Setup > Hazardous material shipping documentation > Hazardous material packing group**. On the **Hazardous material packing group** page, you can create any number of packing groups and configure each with an identifying code and a short description.

Hazardous material packing instruction

The *Hazardous material packing instruction* specification identifies packing instructions that must be followed when a given hazardous item is prepared for transportation by air.

To set up values for this specification, go to **Product information management > Setup > Hazardous material shipping documentation > Hazardous material packing instruction**. On the **Hazardous material packing instruction** page, you can create any number of packing instruction identifiers and configure each with an identifying code and a short description.

Hazardous material stowage

The *Hazardous material stowage* specification indicates how a product must be stored on a ship when it's transported by sea freight.

To set up values for this specification, go to **Product information management > Setup > Hazardous material shipping documentation > Hazardous material stowage**. On the **Hazardous material stowage** page, you can create any number of stowage identifiers and configure each with an identifying code and a short description.

Hazardous material transport category

The *Hazardous material transport category* specification is typically used to group similar hazardous products on reports. For example, transport categories are used on the **Shipment summary** report, which you can print from the warehouse shipment record.

To set up values for this specification, go to **Product information management > Setup > Hazardous material shipping documentation > Hazardous material transport category**. On the **Hazardous material transport category** page, you can create any number of transport categories and configure each with a display name and a short description.

Hazardous material technical name

The *Hazardous material technical name* specification can be used to provide a commonly used or internal company name that describes each material.

To set up values for this specification, go to **Product information management > Setup > Hazardous**

material shipping documentation > Hazardous material technical name. On the **Hazardous material technical name** page, you can create any number of technical names and configure each with a display name and a short description.

Hazardous material tunnel

The *Hazardous material tunnel* specification limits the types of tunnels that a hazardous material can be transported through by identifying the types of tunnels that must be used. Tunnel categories are established by applicable regulations for hazardous material transport. This specification usually applies only to road transport.

To set up values for this specification, go to **Product information management > Setup > Hazardous material shipping documentation > Hazardous material tunnel**. On the **Hazardous material tunnel** page, you can create any number of tunnel identifiers and configure each with an identifying code and a short description.

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Hazardous materials in products, orders, shipments, and loads

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IMPORTANT

Some or all of the functionality noted in this topic is available as part of a preview release. The content and the functionality are subject to change. For more information about preview releases, see [One version service updates FAQ](#).

This topic explains how to set hazardous material properties for released products, how to put stock limits on hazardous items, and how to include hazardous materials in a sales order, shipment, or load.

Set hazardous material specifications for products

After you've defined a hazardous material regulation and set up the related reference codes as described in [Set up hazardous materials](#), you can associate this information with released items. The shipping text for shipping documents will be drawn from the hazardous materials information for the released items.

As part of the process of associating a released item with a hazardous material, you must specify the regulation code and the material. Different regulation codes might be associated with an item, depending on the modes of transport, and you can associate multiple regulations and material codes with each item.

To set up a released product as a hazardous material, follow these steps.

1. Go to **Product information management > Products > Released products**.
2. Select or create a product to open its **Released product details** page.
3. On the **Manage inventory** FastTab, set the **Hazardous material** option to **Yes**. This setting identifies the item as a dangerous good and is used when shipping documentation is printed.
4. On the Action Pane, on the **Manage inventory** tab, in the **Compliance** group, select **Item hazardous material**.
5. Fill in the **Item hazardous materials** page for the selected item by using the fields that are described in the following subsections.

Item hazardous materials header

The following table describes the fields that are available at the top of the **Item hazardous materials** page.

FIELD	DESCRIPTION
Item number	The released product that you're working with.
Regulation code	Select the hazardous material regulation that applies to the product. The regulation defines how the printed shipping text is created for an item and the associated modes of delivery. After it's assigned, the code can't be edited on this page. However, you can assign a new regulation code by selecting New .

FIELD	DESCRIPTION
Material code	(Optional) Select the hazardous material code that applies to the product. The material code provides a template that includes default values for many other fields on this page. When you select a code, all its hazardous materials specifications will be copied to the current product. However, the system first prompts you to confirm that item material data should be filled in from the material code.
Group code	(Optional) Select the hazardous material classification group code that applies to the product. As for the Material code field, when you select a code, all its hazardous materials specifications will be copied to the current product. However, the system first prompts you to confirm that item class group data should be filled in from the group code.

Descriptions FastTab

The following table describes the fields that are available on the **Descriptions FastTab**.

FIELD	DESCRIPTION
Proper shipping name	Enter the standard description for the material, as specified by the applicable regulation. You can provide translations for this value on the Item ship text translation FastTab , as described in the next section.
Technical name	Select the common or generic name for the material. This name might be a name that your company uses internally for the material.
N.O.S.	Select this check box to indicate that the Proper shipping name value is a not-otherwise-specific (N.O.S.) shipping name for the item. N.O.S. shipping names are used for groups of similar chemicals and materials that have specific end uses, but that might not be listed by name in the hazmat table in a specific regulation.

Item ship text translation FastTab

The **Item ship text translation FastTab** contains a grid that shows translations of the **Proper shipping name** values that are defined for the primary language on the **Descriptions FastTab**. These translations can be used in shipping print text for one or more additional languages.

The following table describes the fields that are available on the **Item ship text translation FastTab**.

FIELD	DESCRIPTION
Language	The language code that the row uses. For example, pt-br indicates Brazilian Portuguese.
Shipping print text	The translated Proper shipping name value in the language that the row uses.

To add or edit a translation, select **Translations** above the grid to open **Text translations** page. Then follow one of these steps:

- To add a new translation, on the Action Pane, select **Add**. Select the language to add, and then, in the

Translated text field, enter the translated text.

- To edit an existing translation, select a target language in the **Language** field, and edit the translated text in the **Translated text** field, as required.

Material management FastTab

The following table describes the fields that are available on the **Material management** FastTab.

FIELD	DESCRIPTION
Class	Select the hazardous material class that the product belongs to, as defined by the regulation that you're conforming to. You must assign both a division and a class to every product that includes hazardous materials.
Description	The description that is defined for the class that is selected in the Class field. This field is read-only.
Division	Select the hazardous material division that the product belongs to, as defined by the regulation that you're conforming to. The division is a subset of the class. You must assign both a division and a class to every product that includes hazardous materials.
Identification	Select the hazardous material identification code. Typically, this code is based on a United Nations (UN) standard.
Packing group	Select the packing group that applies to the current item.
Description	The description that is defined for the group that selected in the Packing group field. This field is read-only.
Packing Descriptions	Select the applicable packing description code. This code references a description that indicates how the product must be packed.
Hazardous material labels	Select a code that references the applicable dangerous goods label that should be applied to the product.
Limited quantity	Set this option to Yes to report the total product weight that is included in each load and on each load line.
Quantity	Enter the quantity of hazardous material in the product, in the specified unit. This value will be used to calculate the total hazardous material score for loads and shipments that include the product.
Multiplier	Enter the multiplier that is applied when the hazardous material score is calculated for each load line that includes the product. This value is specified by the applicable regulation, according to the type of hazardous material that is contained in the product.
Unit	Select the unit of measure that applies to the quantity of hazardous material in the product, as specified in the Quantity field. This value will be used to calculate the total hazardous material score for loads and shipments that include the product.

How the hazardous material score is calculated

Several of the values that are specified on the **Material management** FastTab for a product are used to calculate a *hazardous material score* for each load line that includes that product. The score is calculated by using the following formula:

$$\text{Hazardous material score} = \langle \text{LineQty} \rangle \times \langle \text{HazmatQty} \rangle \times \langle \text{UnitConversion} \rangle \times \langle \text{Multiplier} \rangle$$

Here is a key to the formula:

- $\langle \text{LineQty} \rangle$ is the quantity of product that is specified for a load line.
- $\langle \text{HazmatQty} \rangle$ is the quantity of hazardous material that is specified for a product in the **Quantity** field on the **Material management** FastTab.
- $\langle \text{UnitConversion} \rangle$ is a conversion factor for converting between the unit that is used for the load line quantity and the unit that is specified for a product in the **Unit** field on the **Material management** FastTab.
- $\langle \text{Multiplier} \rangle$ is the multiplier that is specified for a product in the **Multiplier** field on the **Material management** FastTab.

This score is reported for each load line that contains a product where these values are specified. For more information, see the [Shipments that include hazardous materials](#) and [Loads that include hazardous materials](#) sections later in this topic.

How the hazardous material weight is calculated

Loads and load lines that contain products where the **Limited quantity** option on the **Material management** FastTab is set to **Yes** will show the total hazardous material weight, as described in the [Shipments that include hazardous materials](#) and [Loads that include hazardous materials](#) sections later in this topic. The hazardous material weight is calculated by using the following formula:

$$\text{Hazardous material weight} = \langle \text{LineQty} \rangle \times \langle \text{ProductWeight} \rangle \times \langle \text{UnitConversion} \rangle$$

Here is a key to the formula:

- $\langle \text{LineQty} \rangle$ is the quantity of product that is specified for a load line.
- $\langle \text{ProductWeight} \rangle$ is the net weight that is specified for the product, in the inventory unit that is specified for the product.
- $\langle \text{UnitConversion} \rangle$ is a conversion factor for converting between the unit that is used for the load line quantity and the inventory unit that is used for $\langle \text{ProductWeight} \rangle$.

Transport information FastTab

The following table describes the fields that are available on the **Transport information** FastTab.

FIELD	DESCRIPTION
Transport category	Select the related transport category.
Tunnel Code	Select the related tunnel restriction code for the item.
Hazardous material stowage	Select the reference code that is used for sea freight stowage handling when the item is shipped by sea freight.
Aircraft type	Select the aircraft restriction that applies for the material when it's shipped by air freight.
Packing - cargo aircraft only	Based on the value that you selected in the Aircraft type field, select the packing instructions code that applies when the product can be shipped only by cargo aircraft.

FIELD	DESCRIPTION
Packing - passenger and cargo aircraft	Based on the value that you selected in the Aircraft type field, select the packing instructions code that applies when the product can be shipped by either cargo aircraft or passenger aircraft.
IATA Star	Set this option to Yes to indicate that the air transport specifications that are entered on this FastTab are related to the International Air Transport Association (IATA) dangerous goods standard. This field is for informational purposes only.
Emergence response	Select the code that references instructions for handling the material in an emergency.

Environmental information FastTab

The following table describes the fields that are available on the **Environmental information** FastTab.

FIELD	DESCRIPTION
Environmentally dangerous	Set this option to Yes to indicate that the product is environmentally dangerous. Use this field for your own reporting purposes.
Marine pollutant	Set this option to Yes to indicate that the product is a marine pollutant. Use this field for your own reporting purposes.

Set stock limits for hazardous products

For safety reasons, you might have to limit the total amount of a given product that can be stocked at a single location. To set stock limits for a released product, follow these steps.

1. Go to **Product information management > Products > Released products**.
2. Select a product to open its **Released product details** page.
3. On the Action Pane, on the **Manage inventory** tab, in the **Compliance** group, select **Reporting details**.
4. In the **Hazardous stock limit** and **Hazardous warning limit** fields, set appropriate values for the selected product.

The **Hazardous material stock limit** report lets you monitor the stock levels of the hazardous materials in your warehouse locations, to make sure that they remain under the safe limits that are established here. For more information, see [Hazardous material stock limit report](#).

Sales order transactions that include hazardous materials

To include a product that is classified as a hazardous material on a sales order, you must associate the relevant shipping carrier with the sales order. Open the sales order, and then, on the **Delivery** FastTab, set the **Shipping carrier** and **Carrier service** fields as required.

The shipping carrier is also associated with the mode of delivery. Therefore, you must make sure that this information is aligned with the hazardous material regulation. In other words, the mode of delivery that is specified in the hazardous material regulation must match the specifications on the sales order header. In this way, the regulation, shipping carrier, and service are connected to the shipment lines that are used on a sales order.

After a sales order is finalized and ready to be shipped, it can be released to the warehouse to indicate the transfer between sales and warehouse operations.

Shipments that include hazardous materials

View hazardous material scores for each shipment line

The **Shipment details** page for a shipment shows the total hazardous material weight and point values that have been calculated for each load line that is included in that shipment. To view the scores and weights, follow these steps.

1. Go to **Warehouse management > Shipments > All shipments**.
2. Select a shipment to open its **Shipment details** page.
3. On the **Load lines** FastTab, inspect the lines. For each line, you will see the hazardous material calculations in the following fields:
 - **Hazardous material points** – This field shows the hazardous material score for the load line. The value is calculated according to the rules and values that have been established for the applicable regulation and in the released product setup. The calculation takes the quantity on the load line and references the multiplier in the [material management setup](#) for the released product.
 - **Limited quantity net weight** – For products that are marked as limited-quantity products because of their hazardous material content, this field shows the total net weight of hazardous content that is included on the load line. The calculation is based on the products that are marked as hazardous materials in the released product setup. If an item is marked as a limited-quantity item, the calculation takes the quantity on each load line and references the weight in the [material management setup](#) for the released product.

Check for compatibility among hazardous materials that are included in a shipment

The system can evaluate whether all the hazardous materials that are included in a shipment are suitable to be shipped together. To evaluate compatibility, the system checks the compatibility group that is assigned to each product that is included in the shipment. For more information, see [Hazardous material compatibility groups](#).

To run the compatibility check, follow these steps.

1. Go to **Warehouse management > Shipments > All shipments**.
2. Select a shipment to open its **Shipment details** page.
3. On the Action Pane, on the **Shipments** tab, in the **Actions** group, select **Compatibility check**.

You receive a message that informs you of the results of the check.

Loads that include hazardous materials

View hazardous material scores for each load line

The **Load details** page for a load shows the total hazardous material weight and point values that have been calculated for that load and for each load line. To view the scores and weights, follow these steps.

1. Go to **Warehouse management > Shipments > All loads**.
2. Select a load to open its **Load details** page. (You can also open load details by selecting a link from a related shipment.)
3. On the **Load** FastTab, you can review the total hazardous material scores and weights for the whole load by inspecting the following fields:
 - **Hazardous material points** – This field shows the hazardous material score for the load. The value

is calculated according to the rules and values that have been established for the applicable regulation and in the released product setup. The calculation takes the quantity that is included in the load and references the multiplier in the [material management setup](#) for the released product.

- **Limited quantity net weight** – For products that are marked as limited-quantity products because of their hazardous material content, this field shows the total net weight of hazardous content that is included in the load. The calculation is based on the products that are marked as hazardous materials in the released product setup. If an item is marked as a limited-quantity item, the calculation takes the quantity in each load and references the weight in the [material management setup](#) for the released product.
4. To review the scores and weights for individual lines, select the **Load lines** FastTab. The values that are provided for each line resemble the values that are provided for the whole load, as described in the previous step.

Check for compatibility among hazardous materials that are included in a load

The system can evaluate whether all the hazardous materials that are included in a load are suitable to be shipped together. To evaluate compatibility, the system checks the compatibility group that is assigned to each product that is included in the load. For more information, see [Hazardous material compatibility groups](#).

To run the compatibility check, follow these steps.

1. Go to **Warehouse management > Shipments > All loads**.
2. Select a shipment to open its **Load details** page. (You can also open load details by selecting a link from a related shipment.)
3. On the Action Pane, on the **Loads** tab, in the **Actions** group, select **Compatibility check**.

You receive a message that informs you of the results of the check.

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Hazardous materials inquiries and reports

2/18/2021 • 6 minutes to read • [Edit Online](#)

IMPORTANT

Some or all of the functionality noted in this topic is available as part of a preview release. The content and the functionality are subject to change. For more information about preview releases, see [One version service updates FAQ](#).

Microsoft Dynamics 365 Supply Chain Management provides various reports that are related to hazardous materials. Many of these reports are required so that you remain compliant with various hazardous material regulations during shipping and storage.

All these reports, except the **Multimodal dangerous goods** report, use the mode of delivery that is defined for the shipment to find the regulation that should be used to print the shipping text for items. The mode of delivery is associated with the shipping carrier and the carrier service. Therefore, you must set up a shipping carrier and carrier service, and link them to a mode of delivery. The mode of delivery is related to the hazardous materials regulation.

The following illustration shows the sequence of activities that occur when the system generates hazardous materials reports.



Set up hazardous materials reporting

Usually, if you ship items that contain hazardous materials, you must generate specific reports to help preserve safety and comply with hazardous materials regulations. To set up your reports, follow these steps.

1. Go to **Warehouse management > Setup > Warehouse management parameters**.
2. Open the **Reports** tab. On the **Hazardous materials report parameter** FastTab, set the following fields.

SECTION	FIELD	DESCRIPTION
Multimodal Dangerous Goods	Regulation code	Select the regulation that should be used when a Multimodal dangerous goods report is generated.
Hazardous Material stock limits	Regulation code	Select the regulation that should be used when stock limits are evaluated.

SECTION	FIELD	DESCRIPTION
Carriage of merchandise by road	CMR group product	CMR stands for "carcinogenic, mutagenic, and reprotoxic substances." Set this option to Yes to configure the system to print specific warnings and messages that are related to the handling of these substances.
Carriage of merchandise by road	Hazardous material group description	Enter the text of specific warnings that are related to CMR and carriage of merchandise by road. This text will be included on the report.
Shippers declaration	Warning	Enter the text of a warning message that should be printed on the shipper's declaration form (for example, "Warning: Dangerous Goods, Flammable").
Shippers declaration	Footer declaration	Enter the text of a message that should be printed at the bottom of the shipment declaration document.
Hazardous goods report language	Hazardous goods domestic report language	Select the default language for hazardous materials reports that are associated with domestic shipments.
Hazardous goods report language	Hazardous goods export report language	Select the default language for hazardous materials reports that are associated with international shipments.

Hazardous materials report

The **Hazardous materials** report shows a list of all items that have been set up and defined so that they have dangerous goods information. You can use this report to monitor and review the information that you must maintain. The page for the report shows a limited selection of fields from the hazardous material setup. However, you can personalize it to add additional fields as you require.

To view this report, go to **Product information management > Inquiries and reports > Hazardous material shipping documentation > Hazardous materials**.

Hazardous material stock limit report

The **Hazardous material stock limit** report lets you monitor the stock levels of the hazardous materials in your warehouse locations, to make sure that they remain under established, safe limits. These limits come from the limits that are defined for each released product.

To view this report, go to **Product information management > Inquiries and reports > Hazardous shipping documentation > Hazardous material stock limits**.

For more information about how to set stock limits on a released product, see [Set stock limits for hazardous products](#).

The regulation that is used for stock limits is defined on the **Warehouse management parameters** page. Go

to **Warehouse management > Setup > Warehouse management parameters**, and then, on the **Reports** tab, in the **Hazardous materials stock limit**, specify a regulation code. For more information, see the [Set up hazardous materials reporting](#) section earlier in this topic.

Verified gross mass report

The **Verified gross mass** report lets you print information about the weight of a shipment.

To generate and print this report, go to **Warehouse management > Shipments > All shipments**, and open the relevant shipment. Then, on the Action Pane, on the **Shipments** tab, in the **Hazardous materials document** group, select **Verified gross mass**.

Multimodal dangerous goods report

The **Multimodal dangerous goods** report is provided for shipments that must be moved by using a combination of transport methods. It's typically used when a shipment is moved first by road and later by sea.

To generate and print this report, go to **Warehouse management > Shipments > All shipments**, and open the relevant shipment. Then, on the Action Pane, on the **Shipments** tab, in the **Hazardous materials document** group, select **Multi model dangerous goods**.

When you generate this report, the information is saved so that you can edit it and/or reprint the report if you must. To edit a generated report, go to **Warehouse management > Inquiries and reports > Hazardous materials shipping documentation > Multimodal dangerous goods**, and find the relevant report in the list. After you've finished editing the content as you require, select **Print** on the Action Pane to print the report.

Shippers declaration report

The **Shippers declaration** report lets you print information that is related to a declaration of the materials that are included in the shipment.

To generate and print this report, go to **Warehouse management > Shipments > All shipments**, and open the relevant shipment. Then, on the Action Pane, on the **Shipments** tab, in the **Hazardous materials document** group, select **Shippers declaration**.

Carriage of merchandise by road report

The **Carriage of merchandise by road** report resembles a bill of lading but is typically used for road transportation in Europe under the Agreement concerning the International Carriage of Dangerous Goods by Road (ADR) regulations. This report uses the shipping print text for an item unless you set the **Hazardous material group description** field on the **Warehouse management parameters** page.

To generate and print this report, go to **Warehouse management > Shipments > All shipments**, and open the relevant shipment. Then, on the Action Pane, on the **Shipments** tab, in the **Hazardous materials document** group, select **Carriage of merchandise by road**.

When you generate this report, the information is saved so that you can edit it and/or reprint the report if you must. To edit a generated report, go to **Warehouse management > Inquiries and reports > Hazardous materials shipping documentation > Carriage of merchandise by road**, and find the relevant report in the list. After you've finished editing the content as you require, select **Print** on the Action Pane to print the report.

Shipment summary report

The **Shipment summary** report provides information that is summarized by the transport category that is related to the released items.

To generate and print this report, go to **Warehouse management > Shipments > All shipments**, and open the relevant shipment. Then, on the Action Pane, on the **Shipments** tab, in the **Hazardous materials document** group, select **Shipment summary**.

bill of lading report

When the hazardous materials feature is turned on in your system, the **bill of lading** report includes a **Hazardous materials** column that indicates whether a load includes hazardous materials. This report is available from the **All loads** page, as usual.

Packing list report

When the hazardous materials feature is turned on in your system, packing lists include additional information that is related to the shipping print text for an item. This report is available from the **All loads** page, as usual.

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Product-related translations FAQ

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This topic describes how to manage translations for products, product dimension values, and product attributes.

What product-related data can be translated?

You can create translations for the following product-related information:

- Names and descriptions of products.
- Descriptions, friendly names, and help text of product attribute values.
- Names and descriptions of product dimension values.

You can translate the product-related information into any language that is available from the **Text translation** page. For more information, see the following section **How do I create translations for product-related information**.

Where can I view the translated information?

You can view translations of product-related information in any external source document, such as an invoice, that uses a language where translations are available.

How do I create translations for product-related information?

To create translations for a product, follow these steps:

1. Click **Product information management > Common > Released products**.
2. Select a product, and on the Action Pane, in the **Languages** group, click **Translations**.
3. In the **Text translation** page, in the **Language** field, select a language. To add more languages, expand the **Language** field, and then click **OK**.
4. In the **Translated text** group, enter translations in the **Description** and **Product name** fields.

To create translations for product attributes, follow these steps:

1. Click **Product information management > Common > Released products**.
2. Under **Setup**, click **Attributes**, and then click **Attributes**.
3. In the **Attributes** page, click **Translate**.
4. In the **Text translation** page, in the **Language** field, select a language. To add more languages, expand the **Language** field, and then click **OK**.
5. In the **Translated text** group, enter translations in the **Description**, **Friendly name**, and **Help text** fields.

To create translations for product dimension values, follow these steps:

1. Click **Product information management > Common > Released products**.
2. Select a product, and then click **Product dimensions**.
3. Select one of the links for the product dimensions: **Configurations**, **Sizes**, **Colors**, or **Style**.
4. Select a dimension value and then click **Translate**.
5. In the **Text translation** page, in the **Language** field, select a language. To add more languages, expand the **Language** field, and then click **OK**.
6. In the **Translated text** group, enter translations in the **Name** and **Description** fields.

Can the names of product variants be translated?

Product variants are based on the dimensions of a released product. Product variant names are based on a combination of dimension values. When the dimension values that are associated with a product variant are translated, the name of the product variant appears in the translated version.

Example

Your product is a T-shirt that comes in different sizes and colors and the variant names are based on the following details:

- Product number: #3
- Dimensions: Size and color
- Size dimension values: Small, Medium, Large
- Color dimension values: Red, Green, Black

The name of a product variant that is based on the dimension values Small and Red is **#3:Small:Red**.

A customer wants to buy some small, red T-shirts and the name of the T-shirt must appear in French on the invoice. You translate the dimension values, Small and Red, into French, and the name of the product variant is **#3:Petit:Rouge**.

TIP

To set the preferred language of a customer, follow these steps:

1. Click **Sales and marketing > Common > Customers > All customers**.
2. Double-click a customer to open the **Customers** page. On the **General** tab, in the **Language** field, select the **language**.

What happens if a customer has a preferred language for which no translations are available?

If translations are not available in the customer's preferred language, the names and descriptions are displayed in the global language of your own company.

Can I manage translations for a series of dimension values at the same time?

Dimension values are product specific and you can manage the translations for the dimension values for each product. However, if you create a dimension value group and create translations for the values in the value group, it is easier to manage the translations.

Example

Your company produces T-shirts in different styles, and each style is available in the sizes Small, Medium, and Large. The sizes are collected in one dimension value group. When a new T-shirt style is added, you can associate it with the dimension value group that is used for sizes, so that all the sizes are available for the product. You can also add or change translations for the sizes in the dimension value group at any time.

A dimension value that is associated with a product through a dimension variant group must be maintained from the product variant group.

To create a dimension value group, follow these steps:

1. Click **Product information management > Setup > Variant groups**.

2. Select **Size groups**, **Color groups**, or **Style groups**.
3. Click **New**, and then enter a name for the group in the **Size group**, **Color group**, or **Style group** field. Click **Sizes**, **Colors**, or **Styles** to create lines for the groups.
4. In the **Size group lines**, **Color group lines**, or **Style group lines** page, click **New**, and then create the sizes, colors, and styles for the groups.

To manage translations for values in a dimension value group, follow these steps:

1. Follow the steps in the previous procedure for creating a dimension value group to open the **Size group lines**, **Color group lines**, or **Style group lines** page.
2. Click **Text translation**. In the **Text translation** page, in the **Translated text** group, enter translations in the **Name** and **Description** fields.

When can translations of product-related information be managed?

Translations of product-related information can be managed at any time. When translations are updated for a dimension value that is associated with a product, the product information is updated, regardless of whether the product has transactions.

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Search for products and product variants during order entry

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Use the **Item number** field to search for products and product variants when you manually create a sales order line or a purchase order line. This lets you quickly find product variants when you only have the configuration string or one of the product dimensions available.

Sometimes, having too much of something is not the best situation to be in, and this is especially true if you sell a number of products that are similar, and you are trying to remember item numbers or product search names in order to find the right product to put on a sales order. You can use the **Item number** field on a sales order line or a purchase order line as a search field. You can enter any part of a product name, number, or dimension and get a lookup that displays all the items that match the search word.

How search works

When you search for products or product variants, it is important to understand how the search feature finds the products that match the text that you enter. The key search rules in delivering search results are:

- Search results will return any matching record, disregarding the field that the search text is entered in.
- The search text needs to be present in the matching record in its full length.
- A match will occur even if the search text is found in the middle of a text string in the matching record. It does not have to appear in the beginning of a text string.
- The search text is treated as a single text string even if it contains white space.

Examples

The following examples use products and product variants to illustrate how search is handled in various scenarios. **Prerequisite:** Under **Sales and marketing > Setup > Search > Search parameters > Search type**, select the **Full match** option.

PRODUCT TYPE	PRODUCT NAME	DISPLAY PRODUCT NUMBER	ITEM NUMBER	CONFIGURATION
Distinct product	SpeakerMidRange	D0001	D0001	NA
Product variant	Active speaker	D0010:::Black:	D0010	000005
Product variant	Active speaker	D0010:::White:	D0010	White

If you type 'speak' in the **Item number** field, you will get all the products above as a result in the lookup. If you type 'black' in the **Item number** field, you will get the second product as a result, because it has the text 'black' in the display product number. These two examples illustrate that the search is not only at the beginning of the field, a match will occur even if the search text is found in the middle of a text string in the matching record.

If you type '05' you will only get the second product variant as a result, because it has '05' in the configuration. This illustrates that the search is across all the enabled fields on the **Search criteria** page.

If you type 'speak 05' you will not get any results. This is because the search looks for the full text that is entered. The search will not try to find 'speak' and then narrow the results to those containing '05'.

You can limit the number of search results by using the **Number of results** field on the **Sales and marketing**

> **Setup** > **Search** > **Search parameters** page. If you set this field to 0, all search results will be returned. If you set it to 10, for example, it will return a maximum 10 search results.

Configure the product search

Before you can use the product and product variant search feature, follow these steps to configure the product search.



Step 1: Include all the relevant product and product variant identifiers and dimensions in the search criteria

Examples of product and product variant identifiers and dimensions that you can search by are **Product name**, **Item number**, **Display product number**, **Configuration**, **Color**, **Size**, **Style**, **Search name**, etc.

Go to **Sales and marketing** > **Setup** > **Search** > **Search criteria** page. The **Search criteria** page allows you to define criteria for customer, prospect, and product search. Make sure you filter the page by using product search criteria. You can do this by switching to **Product** in the page's menu.

To add the display product number to the search criteria, click **New** in the page's menu. This will add a new record in the **Search criteria** grid. Open the **Field name** column lookup and chose **DisplayProductNumber**. To add the product's configuration to the search criteria, create a new record in the **Search criteria** grid and chose **configId** in the **Field name** column. In the same manner, create a record with **Field name** **InventColorId** for the color dimension, **InventSizeId** for the size dimension, and **InventStyleId** for the style dimension.

Step 2: Populate the database table that is used for product search

In the **Search criteria** page, click the **Update search data** button. In the **Update search data** dialog box, make sure that **Source** is set to **Product**, and then click **OK**. The system will aggregate in one table all the selected search criteria specified in step 1. If you have a lot of products and product variants, this operation can be quite lengthy and you may receive a warning. We recommend that you schedule the search table population on the batch server at a time when the server is not too busy.

Until the table is populated, product search will not provide the correct results. If you do not get any search results, make sure that this table is populated.

The table only has to be populated when the search criteria is modified. Newly released products and variants are automatically added to the table. Deleted products and variants are automatically removed from the table.

Step 3: Enable the lookup for product search on sales and purchase order lines

You can enable this functionality by going to **Sales and marketing** > **Setup** > **Search** > **Search parameters** and setting **Enable lookup for search** to **Yes** on the **General** tab.

For sales order line entry, the default behavior is to open the **Product search** page when you start typing in the **Item number** field, and then press the **Tab** key. The **Product search** page changes the context during order line creation and may be considered unnecessarily intrusive. If you prefer to get the search results in a lookup and not lose context during order line entry, you can use the search lookup instead. If you search for a product or product variant, but you don't select anything in the lookup and press the **Tab** key, the **Product search** page will display.

NOTE

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Default order settings for dimensions and product variants

2/18/2021 • 11 minutes to read • [Edit Online](#)

Default order settings in Dynamics 365 Supply Chain Management define the site and warehouse where items will be sourced from or stored, the minimum, maximum, multiple and standard quantities that will be used for trading or inventory management, the lead times, the stop flag, and the order promising method. Default order settings are used when creating purchase orders, sales orders, transfer orders, inventory journals, and by master planning for generating planned orders. Default order settings can be item specific, site specific, product variant specific, or product dimension specific.

To define the default order settings for a product, follow these steps.

1. Go to **Product information management > Products > Released products**.
2. Select the relevant product in the grid.
3. On the Action Pane, follow one of these steps to open the **Default order settings** page for the selected product:
 - On the **Plan** tab, in the **Order settings** group, select **Default order settings**.
 - On the **Manage inventory** tab, in the **Order settings** group, select **Default order settings**.
4. Configure the settings as described in the rest of this topic.

Default order settings

There are three types of default order settings for purchases, sales, and inventory. The default order settings for purchases are used when creating:

- Purchase order lines
- Purchase agreement lines
- Request for quotation lines
- Purchase requisition lines
- Consignment replenishment lines (partially supported, see note)
- Planned purchase orders

NOTE

For consignment replenishment order lines, the only settings from the **Purchase order** FastTab of the **Default order settings** page that apply are the **Default site** field, **Default warehouse** field, and **Stopped** check box.

The default order settings for sales are used when creating:

- Sales order lines
- Sales agreement lines
- Sales quotation lines
- Return order lines and item replacement lines
- Demand forecast lines

The default sales order settings also apply when creating:

- Project item requirements
- Service order item requirements

The default order settings for inventory are used when creating:

- Inventory journals
- Transfer orders
- Planned transfer orders

The default inventory order settings also apply when creating:

- Quarantine orders
- Quality orders
- Production orders
- BOM lines
- Planned production orders

Full definition of a released product

When you create a transaction, you must specify the full definition of a released product on the line, so that Supply Chain Management can try to identify the default order settings. In the full definition of a released product, the item number and all the active product dimensions, such as configuration, size, style, version, and color, are specified on the transaction. For example, if you manually create a purchase order line for a released product variant, you must specify all the required product dimensions before the site, warehouse, quantities, and lead time will appear by default on the order line.

Not all of the default order settings parameters are applied when creating order or journal lines. Quantities and lead times will only display by default when appropriate. For example, when counting a journal line, only the site and warehouse will display by default when the line is created. For this reason, no default quantity or checks on multiple and minimums are performed when creating the line or posting the journal.

The system always attempts to find a default site and warehouse when an order or journal line is created. The site is not always displayed by default from the order settings. For example, when creating a sales order or a purchase order, the site from the order header is automatically used on the order lines. When creating a BOM line, the site from the BOM header is used. After the site is determined, it will be used to find any site-specific order settings that can then be used as the default for the warehouse.

The default order type, the purchase, and the inventory lead times can be overridden by the item's coverage rules on the **Item coverage** page. Although the default order settings don't allow for the distinction between the production and transfer lead time, the item coverage rules allow for it. However, the item coverage setup will only be used by Master planning (MRP) when creating planned production and planned transfer orders and will not apply when manually creating production and transfer orders.

Default order settings rules

You can define general default order settings and any number of default order setting rules that apply only in certain conditions, such as site or a specific product dimension or product dimensions combination. You can't define warehouse-specific order settings.

Rank in default order settings

The default order settings rules have ranks. The higher the rank, the more important the rule is, meaning that it will have a higher priority and be used before the rules with lower ranks. The general default order settings have rank zero, which can't be modified. There can only be one rule with rank zero. Rules can have the same rank, provided that the dimensions they apply to differ. This is useful for modeling site-specific order settings. When a new default order settings rule is created, the values for order values, stop flag, etc. are inherited from the rule

with rank zero, but can be overridden.

Default order settings for released products

For distinct released products, you can define general order settings or site-specific order settings. The general order settings will always have rank zero. If you set up new sales, purchase, and inventory order settings at the same time, we recommend that you use the **Details view** on the **Default order settings** page. To switch to the details view, go to **Options > Page options > Change view > Details view**.

Site-specific order settings

To create site-specific order settings, select **New**. In **Details view**, enter the site in the **Site** field in the **Settings applicable for** section. In **Grid view**, enter the site in the **Site** column. The new rule is automatically assigned a new rank value that is more than 0 (zero). You can create as many site-specific rules as you require. To indicate that they are equally important, you can assign the same rank value to all the site-specific rules.

If you are in **Details view**, you can't get the overview of the rules created for the item. Use the **Show/Hide list** button to see overview information. When an order line of any type is created and it has no site provided, Supply Chain Management searches for a rule with no site specified. This helps to determine a default site on the order line. This site is then used to search for a site-specific rule, where a default warehouse may have been set. This warehouse is applied to the order line.

Specific order settings for product dimension

You can define order settings rules for any active product dimension or combination of active product dimensions. If a product dimension field is empty, then that the rule applies to all values of the product dimension.

Consider the following example product.

Product name	Photoelectric sensor
Item number	XW56
Configuration (used to model the type of light)	C1-Visible red light, C2-Infrared light
Version	V1, V2, V3

For this example, assume that the product is procured and not produced. Also assume that configuration C1 is more commonly used, so it has shorter lead times.

Create the following default order settings to model this scenario.

RANK	SITE	CONFIGURATION	VERSION	PURCHASE - OVERRIDE DEFAULT SETTINGS	PURCHASE LEAD TIME	PURCHASE - STOPPED	SALES - OVERRIDE DEFAULT SETTINGS	SALES - STOPPED
10		C1		Yes	2			
0					5			

When a purchase order line or a planned purchase order is created for item XW56, configuration C1, regardless of the version or site where the line is put, the lead time will be considered 2. Assume that all versions besides V3 are stopped.

You can create the following default order settings rules.

RANK	SITE	CONFIGURATION	VERSION	PURCHASE - OVERRIDE DEFAULT SETTINGS	PURCHASE LEAD TIME	PURCHASE - STOPPED	SALES - OVERRIDE DEFAULT SETTINGS	SALES - STOPPED
20			V2	Yes		Yes	Yes	Yes
20			V1	Yes		Yes	Yes	Yes
10		C1		Yes	2			
0					5			

The two rules for stopping the old versions have the same rank. Therefore, they are equally important. Because both these rules have a higher rank than the rule for configuration C1, they take precedence over the rule for configuration C1.

This example explains the need for the rank. If the rank isn't used, when a purchase order is created for configuration C1 and version V2, the two rules that are defined for V2 and C1 will be ambiguous. To solve the ambiguity, Supply Chain Management will search through the rules in descending order of rank and apply the first applicable rule. In the current example, when a purchase order line is created for configuration C1 and version V2, the user will receive a warning message that states that the item is on hold, and that this hold is caused by the version value. If the rule for the configuration had a higher rank than the rule for the version, a purchase order line would be successfully created for configuration C1 and version V2, and the user would receive no "item on hold" message.

Consider the following default order setting rules.

RANK	SITE	CONFIGURATION	VERSION	DEFAULT SITE	DEFAULT WAREHOUSE	PURCHASE - OVERRIDE DEFAULT STORAGE DIMENSIONS	PURCHASE WAREHOUSE
20	2					Yes	22
10		C1	V2	2	21		
0				1	11		

The system traverses the set of rules two times to determine the site and warehouse. When a purchase order line is created for configuration C1, version V2, the site is determined based on the rule that has a rank of 10. The system then searches for a rule for site 2 to determine a warehouse. Rule 20 is found, and because it has a higher rank, the warehouse on the purchase order line will be 22, not 21.

As general guidance, specific rules and rules for dimensions that are more important than other dimensions get higher ranks, while more generic rules get lower ranks.

The rule with rank zero serves as a safety net. If no other rules are hit, then the default order settings from rule zero will be used.

Because the rank number is important, on the **Default order settings** Action Pane, there are functions to move a rule up or down and to renumber the rules, so that they are always in increments of 10.

The number of rules created for a released product may be many. In order to get a better understanding of what each rule is overriding and why it's needed, we recommend using the **Grid view** on the **Default order**

settings page. You can enable the grid view by going to **Options > Page options > Change view > Grid view**. The number of columns displayed in the grid could be quite significant, especially for the sales and inventory tabs. To limit the number of columns shown in the grid, groups of columns can be hidden or displayed by using the buttons on the **Default order settings > Column display** menu.

Specific order settings for released product variant

If the rule system for default order settings is too cumbersome, then there is the option to define default order settings for each product variant. The following example shows how this will look for the product and the cases described above.

RANK	SITE	CONFIGURATION	VERSION	PURCHASE - OVERRIDE DEFAULT SETTINGS	PURCHASE LEAD TIME	PURCHASE - STOPPED	SALES - OVERRIDE DEFAULT SETTINGS	SALES - STOPPED
10		C2	V3	Yes	5			
10		C2	V2	Yes	5	Yes	Yes	Yes
10		C2	V1	Yes	5	Yes	Yes	Yes
10		C1	V3	Yes	2			
10		C1	V2	Yes	2	Yes	Yes	Yes
10		C1	V1	Yes	2	Yes	Yes	Yes
0					5			

The rank in this case doesn't really matter, so you can choose to hide it. This solution potentially introduces a maintenance issue. However, you may want to consider using this setup if you are considering integrating with Product Lifecycle Management (PLM) systems.

Use strict or standard validation of default order quantities

You can choose how strict the system should be when validating quantities entered in the **Default order settings** for a product. When you use the new strict option, the **Standard order quantity** must always be a multiple of the specified **Multiple** value for purchase orders, inventory, and sales orders. If you are using strict validation, you won't be able to save default order settings that don't meet this requirement (and an error is shown in the message bar).

Strict validation applies to **Standard order quantity** values specified on the **Purchase order**, **Inventory**, and **Sales order** FastTabs of the **Default order settings** page. Each FastTab has its own **Multiple** setting, which is used to validate the **Standard order quantity** value specified for that FastTab.

Enable the strict validation option

Before you can use the strict validation option, it must be enabled on your system. Administrators can use the [Feature management](#) page to check the feature status and enable it if needed. Here, the feature is listed as:

- **Module** - *Product information management*
- **Feature name** - *Strict validation on default order quantities*

Set the validation option

To set the validation option:

1. Go to **Product information management > Setup > Product information management parameters**.
2. On the **General** tab, set **Validation on default order quantities** to one of the following values:
 - **Strict** - Select this option to ensure that all **Standard order quantity** values will be a multiple of the **Multiple** value for each FastTab (**Purchase order, Inventory, and Sales order**).
 - **Standard** - Select this option to use standard validation (which works the same as when this feature isn't enabled).

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Bills of materials and formulas

2/18/2021 • 7 minutes to read • [Edit Online](#)

This topic provides information about bills of materials (BOMs) and formulas, which are a central part of the definition of products and product variants. BOMs and formulas specify the required materials or ingredients for a specific product. Formulas also specify the co-products and by-products that are received in a specific production context.

Bills of materials

A bill of materials (BOM) defines the components that are required in order to produce a product. The components can be raw materials, semi-finished products, or ingredients. In some cases, services can be referenced in a BOM. However, BOMs typically describe the *material resources* that are required.

When it's combined with a route or production flow that describes the operations and resources that are required in order to build a product, the BOM forms the foundation for calculating the estimated cost of the product.

A BOM is an individual entity that is described by the following information:

- BOM ID
- BOM name
- The BOM lines that describe the components and ingredients
- The BOM versions, which define the product and period that the BOM can be used for

A single BOM describes a single level that is identified by a unique ID. Components might have their own BOMs that are referenced by BOM versions. You can display and edit the complete hierarchy of BOMs for a specific product in the BOM designer.

Formulas, co-products, and by-products

A formula is a subtype of BOM that is typically used for process manufacturing. In addition to components and ingredients, a formula describes co-products and by-products. In the actual version, the definition of co-products and by-products for the formula requires the formula version. A formula is typically defined for one specific finished product (a formula or planning item) that is defined in the formula version.

BOMs in the product lifecycle

In the product lifecycle, many types of BOM might be created for various reasons:

- **Sketching/Draft BOM** – This BOM gives a draft estimation of required materials in an early design phase and helps you do a rough estimate of cost and estimated product attributes. This BOM isn't usually used in enterprise resource planning (ERP).
- **Engineering BOM** – This BOM is typically used when you design products that are based on existing product portfolios. Engineering BOMs are structured to simplify the design process and group complex products into engineering modules. For simple products, it might be possible to use engineering BOMs for the actual production process. However, for other products, the engineering BOM must be converted to an actual production BOM. Engineering BOMs are typically represented by phantoms in the BOM hierarchy. Although engineering BOMs can be used for the planning and execution of manufacturing operations, this approach can lead to inefficiencies, especially in repetitive operations where many orders are created.
- **Planning BOM** – This BOM is used to do planning for material requirements. The demand of components and ingredients is calculated based on the demand of the finished products. Like costing BOMs, planning BOMs might represent a specific mix of material that is used in a period.

- **Production BOM** – This is the actual BOM that is used for a specific production. A production BOM must take into account the actual resources that are used to produce the product. When a production order, batch order, or kanban is created, the multiple levels of BOMs that are represented by phantoms are collapsed into one level and distributed over the operations for the order.
- **Costing BOM** – This BOM is used to calculate the estimated cost of a product. For example, you can use a costing BOM when standard cost is used or the estimated planned cost of a given product is calculated. Costing BOMs can refer to a specific mix of materials and resources that is expected to be used. Therefore, you can use the costing BOM to create a representative estimated cost for a period and help avoid variances over time.

The types of BOM that are actually used in an implementation depend on the implementation, and also on the business scenarios and requirements. In simple implementations, a planning BOM, production BOM, and costing BOM can be modeled as one BOM. In environments that have frequent engineering changes and multiple alternative routes, a larger set of BOM types will probably be required.

Approval of BOMs and formulas

Each BOM and formula can be separately approved or unapproved. Typically, approval of a BOM or formula occurs when the first relevant BOM version is approved. However, in some business scenarios, these approvals might be different steps in the process and might involve different process owners.

Note that, if a BOM is unapproved, all related BOM versions are also unapproved.

BOM and formula versions

To relate a specific BOM or formula to a product variant that can be produced, you must create a BOM version or formula version. The validity of BOM versions and formula versions can be constrained by period, quantity, site, specific product dimensions, and other criteria. Formula versions have additional important attributes, such as yield, co-product and by-product definitions, and the cost distribution instructions for the formula.

Approval of BOM and formula versions

Before a BOM version can be used in the planning or manufacturing process, it must be approved. When a BOM version is approved, the related BOM can also be approved, depending on the user's selection and authentication rights. Note that a BOM version can be approved only if the related BOM itself is approved.

Activation of the default BOM or formula version

To set a specific BOM or formula as the default BOM version or formula version that will be used by master planning or used to create production orders, you must activate the version. When a version is activated, the uniqueness of the version for the given constraints (for example, period, site, or quantity) is verified. You receive an error message if the version that you're trying to activate conflicts with a version that is already active. You must then either inactivate the conflicting version or modify the version constraints (usually the period) to prevent an ambiguous activation.

Product change with case management

The product change case for approval and activation of new or changed BOMs and BOM versions provides an easy way to see an overview of the BOM version constraints. You can also approve and activate all BOMs and formulas that are related to a specific change for one activation date.

Alternative BOM versions

Sometimes, the active BOM version or formula version should not be used in forecasts, sales, or a parent product. In this case, you can select a specific approved BOM as part of the requirement (forecast line, sales line, or BOM line) if an approved BOM version or formula version exists for the alternative BOM or formula.

When planned orders, production orders, or kanbans are created, the planner or shop floor supervisor can use any approved BOM version that is valid on the requested planned production date to plan for or produce a

specific product. The BOM version that is used doesn't have to be activated as the default BOM version.

BOM and formula lines

A BOM line is created for each material, service, or ingredient. The line defines the planned consumption of the specified product variant and also defines the various attributes that are related to the planned consumption.

BOM lines can have the following line types: **Item**, **Phantom**, **Pegged supply**, **Vendor**.

Item

Select the **Item** line type for materials or services that are directly consumed, and that don't require further explosion or pegged supply.

Phantom

Select the **Phantom** line type when you want to explode any lower-level BOM items that are contained on the BOM line. In Master scheduling, in planned cost calculation, or on estimation of a production order that uses BOM lines of the **Phantom** type, the parent BOM line that refers to a product variant that has a phantom BOM is replaced by the component items that are listed as BOM lines in that BOM, as determined by the applicable active BOM version of that product variant. If the product variant has an applicable active route, the operations of that route are merged into the parent route.

Note that phantoms are typically used to simplify the engineering process. Extensive use of phantom BOMs in many levels has an effect on performance, especially in highly repetitive manufacturing scenarios. To improve performance, you should avoid deep hierarchies of phantoms. Instead, use pre-exploded production BOMs and routes.

Pegged supply

Select the **Pegged supply** line type when you want to create a subproduction, a BOM line event kanban, or a direct purchase order for any product variant that the BOM line references. The subproduction, event kanban, or purchase order is created when you estimate the production order. The required item quantities are automatically reserved for the consuming production order.

Vendor

Select the **Vendor** line type if the production process uses a subcontractor, and you want a subproduction or purchase order to be created automatically for the subcontractor.

Note about subcontracted operations in a BOM: The service or work that is performed by the subcontractor must be created as service item that is tracked in inventory. You must attach the service item to the parent item as a BOM line. The route must contain an operation that is assigned to the subcontractor's operations resource.

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BOM designer functionality

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This topic describes how you can use the BOM designer page to design and work with tree structures for bills of materials (BOMs). You can click Setup to select different configurations and specify what information appears on the lines of the tree.

When you open the **BOM designer** page from the **Released products** page, it displays the hierarchy of bills of materials (BOMs) that are active and approved for the selected item, the default order site of the item, and the actual date.

Click **Filter** to change the initial selection in the view. By setting the display principle to **Selected/Active or Selected**, you can select individual BOM or route versions to use in the view. You can select non-approved and non-active BOM versions to show or maintain in the BOM designer.

Note: If you open the BOM designer from the **Bills of materials** list page, it doesn't display route information. Currently, the selection of a BOM or route version is a property of the BOM and route version, and applies to all instances of the BOM designer.

The following sections describe the functionality that is available on the various tabs of the BOM designer.

Analyzing a BOM structure by using the BOM designer

The BOM designer has two sections:

- The tree view of the BOM structure.
- The details section, which shows details of the selected data. When you select a node in the tree view, the FastTabs in the details section are updated based on that node:
 - **BOM line details** – Shows the details of the BOM line that is selected in the tree view.
 - **Item data** – Shows the details of the main item or the item that is used in the selected node. You can click **Edit released product** to maintain the selected item.
 - **BOM** – Shows the header of the BOM that is related to the selected node.
 - **Route** – Shows the header of the route that is related to the selected node.
 - **Route operations** – Shows a preview of the operations for the route. When a BOM line that is assigned to a specific operation is selected, the operation is marked as **Component needed at operations**.

Selecting a BOM and route

The filter that is applied for the BOM and route is displayed in the header of the BOM designer. You can change the filter by using the **Filter** dialog box. The following table describes the fields in this dialog box.

FIELD	DESCRIPTION
Product dimensions	If the selected finished product is a product master, you can define the active product dimensions for the main selection. Note: If you open the BOM designer for a product that isn't a product master, no product dimensions can be selected in the Filter dialog box.

FIELD	DESCRIPTION
Site	Change the site that the BOM tree is displayed for. The default site is the default inventory site of the finished item.
Display principle	Select the version display principle that applies to the current BOM structure and the current route: <ul style="list-style-type: none"> • When the principle is set to Active or Selected/Active, the valid BOM or route version for this date is found. • When the principle is set to Selected/Active or Selected, you can select a BOM version or route version by clicking BOM > BOM versions or Route > Route versions.
Version date	Enter the version date for the BOM and route. The version identifies which BOM version is used on a specific date, as determined by the version dates in the BOM version setup.
From quantity	Filter the versions by selecting a specific from quantity. If you set a value, different BOM and route versions might be selected.
Show valid only	When you select the check box, the tree structure shows only BOM lines that have valid dates. Right-click or double-click a BOM line to open the Edit BOM line page, where you can see the validity dates for that BOM line.

When you use the BOM designer to review or edit BOMs that consist of one or more levels of phantoms, the route that is associated with the top item typically spans the complete BOM hierarchy. To simplify the overview, you can lock the top-level route in the display by clicking **View > Lock route**. To unlock the route, click **View > Unlock route**.

Adding and editing BOMs and BOM lines

Use the **BOM lines** or **BOM** functions to modify the BOM lines or BOM. When you select a node in the tree, the type of the node determines that functions that are available.

FUNCTION	DESCRIPTION	NODE TYPE AND CONDITIONS
BOM lines > Edit	Open a dialog box where you can edit the BOM line attributes.	This function is available when a BOM line node is selected.
BOM lines > Delete	Delete a BOM line from the selected BOM.	This function is available when a BOM line node is selected, and the BOM isn't locked for editing.
BOM lines > Add before line	Open a dialog box where you can select a product variant to include before the selected BOM line.	This function is available when a BOM line node is selected.

FUNCTION	DESCRIPTION	NODE TYPE AND CONDITIONS
BOM lines > Add to component BOM	Open a dialog box where you can select a product variant to include at the end of the selected BOM.	This function is available when the node that is selected has a selected BOM. If this function isn't available, a BOM version might be missing for the selected item variant. In this case, you can click BOM > Create version to create the missing version for the selected node.
BOM lines > Add after line	Open a dialog box where you can select a product variant to include after the selected BOM line.	This function is available when a BOM line node is selected.
BOM > Create version	Create a new BOM version or BOM for the product variant of the selected node.	This function is available when the BOM line node that is selected is linked to an item that has a production type of BOM or Formula .
BOM > Calculation	Open a dialog box where you can run the cost or sales price calculation for the selected product variant.	This function is available when the node that is selected is related to a BOM version.
BOM > Check	Validate and check the selected BOM.	This function is available when the node that is selected is related to a BOM version.

Configuring the tree view

Click **Setup** to customize the information that is shown in the tree view of the BOM designer.

FIELD GROUP	DESCRIPTION
BOM	Use the check boxes to select the criteria that are shown in the tree structure. The BOM designer displays the selected criteria at the bottom of both tabs.
Route	Use the check boxes to select the criteria that are shown for the routes.

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Formula designer

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This topic explains how to use the formula designer to analyze and maintain formulas in a tree view.

When you open the **Formula designer** page from the **Released products** page, the tree in the left pane shows the list of co-products and the hierarchy of ingredients for the released product. The structure is derived from the hierarchy of formulas that are active and approved for the selected item and its ingredients, the default order site of the item, and the actual date.

Click **Setup** to select different configurations and specify what information appears on the lines of the tree.

Click **Filter** to change the initial selection in the view. If you set the display principle to **Selected/Active** or **Selected**, you can select individual formula or route versions to use in the view. You can select non-approved and non-active formula versions to show or maintain in the formula designer.

NOTE

If you open the **Formula designer** page from the **Bills of materials** list page, it doesn't show route information. Currently, the selection of a formula or route version applies to all instances of the formula designer.

The following sections describe the functionality that is available in the BOM designer.

Analyze a formula structure by using the formula designer

The formula designer has two sections:

- The tree view of the formula structure.
- The details section, which shows details of the selected data. When you select a node in the tree view, the FastTabs in the details section are updated based on that node:
 - **Formula line details** – View the details of the formula line that is selected in the tree view.
 - **Item data** – View the details of the main item or the item that is used in the selected node. You can click **Edit released product** to maintain the selected item.
 - **Formula** – View the header of the formula that is related to the selected node.
 - **Route** – View the header of the route that is related to the selected node.
 - **Route operations** – View a preview of the operations for the route. When a bill of materials (BOM) line that is assigned to a specific operation is selected, the operation is marked as **Component needed at operations**.

Select a formula and route

The filter that is applied for the formula and route is shown in the header of the formula designer. You can change the filter by using the **Filter** dialog box. The following table describes the fields in this dialog box.

FIELD	DESCRIPTION
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FIELD	DESCRIPTION
Product dimensions	If the selected finished product is a product master, you can define the active product dimensions for the main selection. Note that if you open the formula designer for a product that isn't a product master, no product dimensions can be selected in the Filter dialog box.
Site	Change the site that the ingredient tree is shown for. The default site is the default inventory site of the finished item.
Display principle	Select the version display principle that applies to the current formula structure and the current route: <ul style="list-style-type: none"> • When the principle is set to Active or Selected/Active, the valid formula or route version for this date is found. • When the principle is set to Selected/Active or Selected, you can select a formula version or route version by clicking Formula > Formula versions or Route > Route versions.
Version date	Enter the version date for the formula and route. The version identifies which formula version is used on a specific date, based on the version dates in the formula version setup.
From quantity	Filter the versions by selecting a specific "from" quantity. If you set a value, different formula and route versions might be selected.
Show valid only	When you select the check box, the tree structure shows only formula lines that have valid dates. Right-click or double-click a formula line to open the Edit formula line page, where you can see the validity dates for that formula line.

When you use the formula designer to review or edit formulas that consist of one or more levels of phantoms, the route that is associated with the top item typically spans the complete formula hierarchy. To simplify the overview, you can lock the top-level route in the display by clicking **View > Lock route**. To unlock the route, click **View > Unlock route**.

Add and edit formulas and formula lines

Use the **BOM lines** or **Formula** functions to modify the formula lines or formula. When you select a node in the tree, the type of the node determines the functions that are available.

FUNCTION	DESCRIPTION	NODE TYPE AND CONDITIONS
BOM lines > Edit	Open a dialog box where you can edit the formula line attributes.	This function is available when a formula line node is selected.
BOM lines > Delete	Delete a formula line from the selected formula.	This function is available when a formula line node is selected, and the formula isn't locked for editing.

FUNCTION	DESCRIPTION	NODE TYPE AND CONDITIONS
BOM lines > Add before line	Open a dialog box where you can select a product variant to include before the selected formula line.	This function is available when a formula line node is selected.
BOM lines > Add to component BOM	Open a dialog box where you can select a product variant to include at the end of the selected formula.	This function is available when the node that is selected has a selected formula. If this function isn't available, a formula version might be missing for the selected item variant. In this case, you can click Formula > Create version to create the missing version for the selected node.
BOM lines > Add after line	Open a dialog box where you can select a product variant to include after the selected formula line.	This function is available when a formula line node is selected.
Formula > Create version	Create a new formula version or formula for the product variant of the selected node.	This function is available when the formula line node that is selected is linked to an item that has a production type of BOM or Formula .
Formula > Calculation	Open a dialog box where you can run the cost or sales price calculation for the selected product variant.	This function is available when the node that is selected is related to a formula version.
Formula > Check	Validate and check the selected formula.	This function is available when the node that is selected is related to a formula version.

Configuring the tree view

Click **Setup** to customize the information that is shown in the tree view of the formula designer.

FIELD GROUP	DESCRIPTION
BOM	Use the check boxes to select the criteria that are shown in the tree structure. The formula designer shows the selected criteria at the bottom of both tabs.
Route	Use the check boxes to select the criteria that are shown for the routes.

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Override the default reservation principle for materials in production

2/18/2021 • 3 minutes to read • [Edit Online](#)

IMPORTANT

Some or all of the functionality noted in this topic is available as part of a preview release. The content and the functionality are subject to change. For more information about preview releases, see [One version service updates FAQ](#).

The *Override default production reservation* feature lets you set a default reservation principle for each item model group. Therefore, different reservation principles can automatically be applied for each item that is part of a production bill of materials (BOM) or batch order formula. You can select whether each item model group should override the default reservation principle that is set for an order, and what reservation principle should be used instead (*manual, estimation, scheduling, release, or start*).

When you create a new production order or batch order, you're prompted to select the reservation principle that should be applied to that order and all its BOM lines or formula lines. When the *Override default production reservation* feature is used, some or all of the BOM or formula lines can override that reservation principle and instead use the reservation principle that is set for the relevant item model group.

For example, if you have raw materials or ingredients that require pick work, BOM or formula lines that are created for those products require a physical reservation, because physical reservation is a prerequisite for the generation of warehouse work. Typically, if you want the reservation to occur automatically, you select one of the following reservation principles: *estimation, scheduling, release, or start*. On the other hand, if you have materials or ingredients that don't require pick work, because they are consumed directly from a location, you typically select the *manual* reservation principle, which doesn't make any physical reservations or generate any pick work.

Turn on the feature

Before you can use the feature, it must be turned on in your system. Admins can use the [feature management](#) settings to check the status of the feature and turn it on. In the **Feature management** workspace, the feature is listed in the following way:

- **Module:** *Production control*
- **Feature name:** *Override default production reservation*

Assign a production reservation policy to an item model group

1. Go to **Cost management > Inventory accounting policies setup > Item model groups**.
2. Create or select an item model group.
3. On the **Inventory policies** FastTab, select the **Override item production reservation** check box.
4. In the **Reservation** field, select the reservation principle for items that belong to the selected model group. (Those items include items that are on a BOM or formula line.)
 - **Manual** – Items in the model group won't automatically be physically reserved for production. However, they can still be manually reserved as required.

- **Estimation** – Items in the model group will be physically reserved during estimation of the production order.
- **Scheduling** – Items in the model group will be physically reserved during scheduling of the production order.
- **Release** – Items in the model group will be physically reserved when the production order is released.
- **Start** – Items in the model group will be physically reserved at the start of the production order.

Example: Using reservation principles in a bulk/pack scenario

A bulk lubricant material is produced in a 1,000-liter mixer. After the bulk material is ready, it's pumped out to several filling stations, where bottles of different sizes are filled. After filling is completed, the bottles are packed into boxes. Those boxes are then packed onto pallets.

In this scenario, a batch order to make 1,000 liters of bulk material is created. (This order is the bulk order.) When this batch order is completed, it's reported as finished to the material input location of the filling stations. A batch order to fill and pack each bottle size is then created. (These orders are the pack orders.) The pack orders have a formula that consists of the bulk material, an empty bottle, a label, and other packing materials. Because the bulk material flows directly from the mixer tank to the filling stations, no warehouse work is required to pick this ingredient, and the bulk material is consumed directly from the input location. Therefore, the reservation principle is set to *manual*. The other materials are staged to the filling station by pick work. Therefore, the reservation principle for these lines is set to *release*, for example, so that the reservation automatically occurs when the pack order is released.

NOTE

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Add variant products to purchase orders using variant weights

2/18/2021 • 2 minutes to read • [Edit Online](#)

This procedure walks through the steps for using variant weights to auto populate purchase order lines for each variant of a product. When you select the quantity of the product you want to purchase, purchase order lines are created for all the variants of the product with suggested quantities based on the weights configured on the product variants. This procedure doesn't include steps to configure weight values on product dimensions and product variants. This procedure uses the USRT company in demo data.

1. Go to Accounts payable > Purchase orders > All purchase orders.
2. Click New.
3. In the Vendor account field, click the drop-down button to open the lookup.
4. In the list, click the link in the selected row.
5. Toggle the expansion of the General section.
6. In the Site field, click the drop-down button to open the lookup.
7. In the list, click the link in the selected row.
8. In the Warehouse field, click the drop-down button to open the lookup.
9. In the list, find and select the desired record.
10. In the list, click the link in the selected row.
11. Click OK.
12. Toggle the expansion of the Line details section.
13. Click the Variants tab.
14. Click Add line.
15. In the list, mark the selected row.
16. In the Item number field, type '0140'.
17. Set Quantity to '1000'.
18. Click Save.

NOTE

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Create a sales order for a configurable product

2/18/2021 • 2 minutes to read • [Edit Online](#)

This procedure shows how to apply a configuration template to a product on a sales order. This example uses the D0006 speaker model in the USMF demo data company. Typically, a sales order processor uses this procedure.

Create a sales order

1. Click Sales order processing and inquiry.
2. Click New.
3. Click Sales order.
4. In the Customer account field, select US-001.
5. Click OK.
6. In the Item number field, select D0006.
 - For this task, you must select a configurable product.
7. Click Product and supply.
8. Click Configure line.
 - Note that the price has changed, based on the configuration that was selected, and that the Include cable field is now set to True.
 - Note the default price and the settings that are selected for the cable.
9. Click Load template.
 - This example shows how you can apply a template to select a predefined configuration. If you're using this procedure as a task guide and want to see the other attribute values that are available, you must click the Unlock button.
10. Click OK.
11. Click OK.
12. Expand the Line details section.
13. Click the Product tab.
 - The configuration of the item is now listed under the product dimensions.
14. Close the page.

Select the product configuration

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Create sales price selection criteria

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This procedure shows how to create a sales price selection criterion for attribute-based sales price models. This procedure requires that at least one sales price model be available. This example uses the price model for the Speaker solution sales price model in the USMF demo data company. Typically, a product manager uses this procedure.

Add a new criterion for an existing sales price model

1. Click Product variant model definition.
2. Click Product configuration models.
3. In the list, select the row for the Speaker solution product model, but don't click the link for the model name.
4. On the Action Pane, click Model.
5. Click Price model criteria.
6. Click New.
7. In the Name field, type 'Customer group 10'.
 - The name of the price model criterion is used to help identify the underlying selection criteria.
8. In the Price model field, enter or select a value.
9. In the Order type field, select Sales order.
 - The order type determines the database fields that will be available for the selection query.
10. In the Valid from field, enter a date.
11. In the Expire by field, enter a date.
12. Click Save.

Create the query for the selection criteria

1. Click Edit.
2. In the Table field, select Customers.
3. In the Field field, select Customer group.
 - In this example, we will use a specific customer group for the selection criteria.
4. In the Criteria field, select Customer group 10.
5. Click OK.

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Set up attribute-based pricing for configurable products

2/18/2021 • 2 minutes to read • [Edit Online](#)

This topic explains how to set up attribute-based pricing. As a prerequisite, you must have a product configuration model that has one or more components and attributes. This example uses the High End Speaker product model in the USMF demo data company. Typically, a product manager uses this procedure.

Create a new price model

1. Select **Product variant model definition** on the home page.
2. Select **Product configuration models** in the **links** section.
3. In the list, select the **High End Speaker** line, but don't select the link for the name.
4. On the Action Pane, select **Model**.
5. Select **Price models**.
6. Select **New**.
7. In the **Price model name** field, type a value. Use a name that makes the model easy to identify.
8. In the **Description** field, type a value.
9. Select **Save**.

Add price elements

1. Select **Edit**. Each component in a product model can have a base price element and any number of price expression rules. You can also add prices in different currencies.
2. In the **Base price expression** field, type a value. For example, type 100. A base price expression can be a numerical value, or it can consist of an arithmetic calculation that involves one or more attributes.
3. Select **Add**.
4. In the **Name** field, type . The price expression name helps identify what the price element represents. In this example, we are creating a price element for the Rosewood speaker cabinet finish option.
5. Select **Edit condition**. A price condition helps guarantee that a price expression element is included in the sales price only if a specific combination of attributes is present.
6. In the **ConstraintBody** field, enter .
7. Select **OK**.
8. In the **Expression** field, type a value. For example, type .
9. Close the page.

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BOM calculations

2/18/2021 • 9 minutes to read • [Edit Online](#)

The cost roll-up and sales price calculations are known as bill of materials (BOM) calculations, and you initiate them from the **Calculations** page. This topic provides information about BOM calculations.

The cost roll-up and sales price calculations are known as bill of materials (BOM) calculations, and you initiate them from the **Calculations** page. You use the **Calculations** page to perform the following tasks:

- Calculate the cost of a manufactured item, and generate an associated item cost record within a costing version.
- Calculate the sales price of a manufactured item, and generate an associated item sales price record within a costing version.

The way that you use the **Calculations** page varies slightly, depending on how you initiate the BOM calculations. The way that you use the **Calculations** page also depends on whether the BOM calculations involve a costing version for standard costs or planned costs, and on several policies that are defined in the costing version that is used in the BOM calculations. **Note:** A variation of the **Calculations** page is used in the context of a sales order, sales quotation, or service order line item. These calculations are known as order-specific BOM calculations. An order-specific BOM calculation doesn't generate an item cost record within a costing version. Instead, it generates a calculation record that appears on the **BOM calculation details** page. The calculation record includes a calculated cost and a calculated sales price. The **Calculations** page can be opened for a single manufactured item or for a costing version:

- To calculate costs for a single manufactured item, you initiate BOM calculations from the **Item price** page. The **Calculations** page inherits the item identifier. The costing version, BOM version, route version, calculation quantity, calculation date, and site must be specified.
 - By default, the BOM version and route version are set to the active versions for the item, site, date, and calculation quantity. However, you can override the default values with approved versions.
 - By default, the calculation quantity is set to the item's standard order quantity. However, you can override the default value.
 - The calculation date or site can be mandated by the costing version, or user-specified values can be set when the date or site isn't mandated in the costing version. A future calculation date determines how pending cost records are used. BOM calculations use a pending cost record that has the nearest from-date that is on or before the calculation date.
- To calculate costs for all manufactured items or selected items, or to update items on a where-used basis, you initiate BOM calculations from the **Costing version setup** page or the **Costing version maintenance** page. The **Calculations** page inherits the costing version.
 - For the calculations, it's assumed that the active BOM version and route version are used for a manufactured item (and for the related site, date, and quantity), unless a manufactured component has a specified sub-BOM or subroute.
 - For the calculations, it's assumed that the standard order quantity is used for manufactured items. The standard order quantity provides the basis for calculating component quantities, determining the relevant BOM versions and route versions (when you use quantity-sensitive BOMs and routes), and amortizing constant costs. However, when a manufactured component has a BOM line type of **Production** or **Vendor**, or when you use a make-to-order explosion mode for the BOM calculations, this assumption doesn't apply, because quantities reflect the specified calculation quantity.
 - The calculation date or site can be mandated by the costing version, or user-specified values can be set when the date or site isn't mandated in the costing version.

Other variations in BOM calculations reflect the costing type and restrictions of the costing version:

- BOM calculations that use standard costs must be restricted by costing version policies, because the restrictions help guarantee that standard costing principles are used. Standard costing principles require the enforcement of restrictions about the use of standard costs for purchased items, a single-level explosion mode, and the inclusion of miscellaneous charges in unit costs.
- BOM calculations that use planned costs don't have to follow standard costing principles. These BOM calculations can use different explosion modes, alternative sources of cost data for purchased items, and optional enforcement of restrictions within the costing version.

BOM calculations that use standard costs

Policies within the costing version (for standard costs) can mandate enforcement of five BOM calculation policies. The **Recording restriction** option in the costing version mandates one of these policies, where miscellaneous charges must be included in the unit price. Miscellaneous charges for purchased items can be entered manually, whereas miscellaneous charges for manufactured items reflect the calculated amortization of constant costs. The **Calculation restriction** option in the costing version mandates the other four BOM calculation policies:

- The source of cost contributions for purchased items must be based on standard costs. In other words, BOM calculations must use the item cost records within the specified costing version, or within the fallback that contains standard costs.
- To help guarantee accurate and consistent calculation of standard costs, the explosion mode must be single-level.
- To help guarantee consistent results when the sales price of the items is calculated, the profit setting must be mandated. The profit setting can be used, and the item sales price records can be generated, only if the costing version allows for content of sales prices.
- The fallback principle must be mandated, and can be set to **None**, **Active** (for active cost records), or **Costing version** (for a specified costing version).

BOM calculations that use planned costs

Policies within the costing version (for planned costs) can optionally mandate enforcement of five BOM calculation policies. Alternatively, the policies can just provide default values. The **Recording restriction** option in the costing version determines whether the BOM calculation policy about miscellaneous charges will be mandated or act as a default value. Miscellaneous charges can optionally be included in the unit price. The **Calculation restriction** option in the costing version determines whether the other four BOM calculation policies will be mandated or act as default values:

- The source of cost contributions for a purchased item can be the item cost records within a costing version. Alternatively, the source can be defined by the BOM calculation group that is assigned to the item. For example, the BOM calculation group can define purchase price trade agreements as the source of cost contribution data.
- The explosion mode can be single-level, multilevel, or make-to-order, or it can be based on the BOM line item. The explosion mode for the BOM line type replicates the cost calculation logic for production order estimates.
- The profit setting can be mandated, or it can be a default value. The profit setting can be used, and the item sales price records can be generated, only if the costing version allows for content of sales prices.
- The fallback principle can be mandated, or it can be a default value. The fallback principle can be set to **None**, **Active** (for active cost records), or **Costing version** (for a specified costing version).

BOM calculations generate warning messages and other types of messages. Several BOM calculation policies determine the types of messages. The warning conditions are defined in the BOM calculation group that is assigned to items. However, you can override these warning conditions when you initiate a BOM calculation. When the fallback principle is used, it's often helpful if the fallback is shown as an information message. When

you're trying to update calculated costs for items that have missing cost records, it's also helpful if the information message identifies items that weren't updated.

BOM calculations that use the fallback principle

The following situations illustrate two uses of the fallback principle:

- **Two-version approach to standard cost updates** - A costing version can contain the incremental changes to standard costs, such as pending cost records that represent new items or cost changes. In this situation, the fallback principle can identify the use of the active standard costs that are contained in other costing versions.
- **Simulation of the effect of cost changes by using planned costs** - A costing version for planned costs can contain incremental changes for simulation purposes. This costing version will include pending cost records that represent the simulated cost changes to items, cost categories, and calculation formulas for indirect cost. In this situation, the fallback principle can identify the use of the active standard costs that are contained in other costing versions.

BOM calculation of a suggested sales price

When you use a cost-plus-markup approach, the calculated sales price for an item reflects the set of profit-setting percentages that is specified for the BOM calculation, and the costs that are associated with the item's component items, routing operations, and applicable manufacturing overheads. The markup reflects profit-setting percentages that are assigned to cost groups, and the cost groups that are assigned to items, cost categories for routing operations, and the indirect cost calculation formulas for manufacturing overheads. The sets of profit-setting percentages are labeled **Standard**, **Profit 1**, **Profit 2**, and **Profit 3**. Within the Profit 1 set, for example, a profit-setting percentage of 50 percent can be defined for a cost group that is assigned to purchased material, and a profit-setting percentage of 80 percent can be defined for a cost group that is assigned to cost categories for routing operations. The context of the BOM calculation determines how the results of a calculated sales price are handled:

- **BOM calculation for an item and specified costing version** - The BOM calculation generates a pending sales price record within the costing version. This sales price record provides the starting point for viewing the calculation details (for example, on the **Calculate item cost** page). The sales price record acts mainly as reference information and isn't used as the basis for a sales price on sales orders.
- **Order-specific BOM calculation** - A variation of the **BOM calculation** page is used in the context of a sales order, sales quotation, or service order line item. An order-specific BOM calculation doesn't generate a record in the within a costing version. Instead, it generates a calculation record that appears on the **BOM calculation results** page. This calculation record provides the starting point for viewing the calculation details (for example, on the **Calculate item cost** page). Information about a selected calculation record can be transferred to the originating line item. For example, the calculated sales price can be transferred to a sales order line item.

Order-specific BOM calculations

An order-specific BOM calculation represents a variation of a BOM calculation for a manufactured item. The order-specific BOM calculation is performed in the context of a sales order, sales quotation, or service order line item. An order-specific BOM calculation generates a calculation record that appears on the **BOM calculation results** page. The calculation record includes a calculated weight, a calculated cost that is based on active cost records, and a calculated sales price. The calculation record that each order-specific BOM calculation for an item generates on the **BOM calculation results** page is uniquely identified by a calculation number. The results of a calculation record can be optionally transferred to the originating line item. An order-specific BOM calculation differs from a BOM calculation for a manufactured item in two ways:

- An order-specific BOM calculation doesn't generate an item cost record within a costing version. Therefore,

the BOM calculation policies aren't applied when an item cost record is created, or when a cost record is overwritten.

- An order-specific BOM calculation always uses the active cost records for components, cost categories, and indirect cost calculation formulas.

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Troubleshoot product information

2/18/2021 • 6 minutes to read • [Edit Online](#)

This topic describes how to fix issues that you might encounter while you work with product information.

I can't delete a released product.

Issue description

You can delete a released product and all its variants only if the released product doesn't have any related transactions.

Issue resolution

Follow these steps to delete a released product or product master.

1. Close all open transactions for the items.
2. Reduce the inventory to 0 (zero).
3. Perform inventory closing.
4. Delete all product variants for the product master that you want to delete.

Can I change the item number of a released product?

In most cases, you can't edit item numbers for released products, because that change will cause data to become corrupted. You can edit the item number only if you must repair data corruption that was caused by a previous rename of the primary key of that released product, as mentioned in the list of [removed or deprecated features for Finance and Operations 10.0.0 with Platform update 24](#).

If you want to be able to edit item numbers for released products, [vote for this idea in Ideas portal](#).

The default flushing principle from the product isn't being entered on the bill of materials line.

Issue description

When you add an item to a bill of materials (BOM) line, the system doesn't use the default flushing principle information that is set up for the item. In other words, the flushing principle from the item doesn't appear on the BOM line page.

Issue resolution

If you specify a flushing principle on a BOM line, it will apply to that BOM line. However, if the flushing principle is blank, or if it isn't set on a BOM line, the flushing principle that is set on the item will still apply to that BOM line, even though it isn't shown on the BOM line.

The defaulting logic for other features in Microsoft Dynamics 365 Supply Chain Management doesn't usually work in this way. However, the current behavior can't be changed. Otherwise, some existing customizations that rely on it might be broken.

The system lets me save duplicate bar codes for different items or for the same item that has different dimensions.

The system doesn't currently enforce unique bar codes, and the addition of this restriction would be a breaking

change. In fact, Microsoft has evidence that some existing customer installations would be broken by this change. However, we will consider a broader design change to enable this feature in the future.

I receive the following error message when I edit item record templates: "The warehouse location cannot be created because the item is not stocked. To stock items, the Stocked product option on the associated item model group must be selected."

Issue description

This issue occurs if you follow these steps to try to create a template for an item that isn't stocked.

1. Open a released product that isn't stocked.
2. On the Action Pane, on the **Options** tab, select **Record info**.
3. In the **Record information** dialog box, select **Company accounts template**.

In this case, you receive the following error message:

The warehouse location cannot be created because the item is not stocked. To stock items, the Stocked product option on the associated item model group must be selected.

Issue resolution

The process of creating product templates requires extra product-specific logic. Therefore, you can't use the generic **Company accounts template** button for this purpose. Instead, follow these steps.

1. Open a released product.
2. On the Action Pane, on the **Product** tab, in the **New** group, select **Template > Create shared template**.

Default Help text that is added in product attributes isn't entered in a released product.

A description and Help text that are added in the product attributes aren't visible or entered by default in the released products. This behavior is by design.

The default quantity that is entered differs when it's registered from a BOM and when it's registered from a BOM version.

Issue description

By default, when you add an item to a BOM, the quantity is set to 1 instead of the quantity that is defined in the **Min. order quantity** field on the **Default order settings** page for a selected product. However, when you add an item from a BOM version, and the item and variant are selected, the quantity that is entered by default takes into account the minimum quantity that is set in the default order settings for the specific dimensions.

Issue resolution

This behavior is expected. However, the fact that the logic differs in the BOM and the BOM version is a known issue. Nevertheless, this behavior won't be changed, because a change could affect many different customer scenarios.

In the released product details, I can't change the attached images that were uploaded from the Product document attachments data entity.

Issue description

This issue can occur when you attach an image to an item by using the *Product document attachments* data entity. In this case, the item image is shown for the item. However, if you select **Change image**, nothing is shown in the list of uploaded images. Additionally, no attachments are shown for the item.

Issue resolution

The *EcoResProductDocumentAttachmentEntity* entity (*Product document attachments*) imports document attachments for *products* but not for *released products*. (Released products are also known as *items*.) To view the attachments for an item on the **Released product details** page, you must use the *EcoResReleasedProductDocumentAttachmentEntity* entity (*Released product document attachments*) instead.

The Microsoft Flow connector shows the following error message: "Update not allowed for field 'ProductNumber'."

Issue description

This issue occurs if you try to update the **Product number** field by using the *Released products* entity V2 and Microsoft Flow.

Issue resolution

This behavior is expected. The ability to edit the product number for a released product was removed in Dynamics 365 Finance and Operations 10.0.0 with platform update 24 to help prevent data corruption. In exceptional cases, where you must repair data corruption that was caused by a previous rename of the primary key of a released product, you can ask Microsoft Support to temporarily remove this restriction.

I can't create a released product variant in another legal entity.

Issue description

If you try to release a product master without variants, and then create the variants in each legal entity (company) as they are required, you won't be able to release the variants by using variant suggestions. You also won't be able to manually create the variants.

Issue resolution

This behavior is by design. The relations of a product master and the dimensions that the master can take are kept at a shared level. Therefore, you can't create the available dimensions for a shared product master in the specific legal entity where those dimensions are released and then replicate the process in each legal entity where the dimensions are required. Instead, you must change your release process to adapt to the designed process.

Here is the process for releasing products.

1. Create the shared product master and the dimensions that can be released to the legal entities.
2. Release the products to the legal entities either by using variant suggestions or by manually adding the combinations that should be released.

Alternatively, you can directly create the released product.

When I release a variant in another company, I receive the following error message: "Product variant with specified dimensions has already been created."

Issue description

If a product variant has already been released in a company A, and you try to release it in company B by using

the **New** button on the **Released product variants** page, you will receive the following error message:

Product variant with specified dimensions has already been created.

Issue resolution

The **New** button on the **Released product variants** page creates the variant and releases it in the company context. If the variant has already been created, you can't use the **New** button to release it in another company.

To fix the issue, open the **Product master** page, and select **Release product** to release the existing variant in the desired company.

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Product configuration overview

2/18/2021 • 9 minutes to read • [Edit Online](#)

The need to configure products to meet special requirements is becoming the rule rather than the exception, in both business-to-business and business-to-consumer relationships.

A manufacturer that supports configure-to-order scenarios has an opportunity to tend more carefully to customer needs. Additionally, by stocking semi-finished goods in the form of generic components instead of finished products, the manufacturer can reduce the capital that is tied to inventory.

A successful move from a manufacture-to-stock setup to a configure-to-order setup requires careful analysis of the product structures, identification of product families, and componentization. To reduce the number of parts and minimize the number of goods that are in process, it's very important that you understand the product interfaces, and that you design for reusability.

There are several product configuration modeling principles, such as rule-based, dimension-based, and constraint-based modeling. Studies show that the constraint-based methodology can reduce the number of code lines in models by about 50 percent compared to other modeling principles. Therefore, this methodology can reduce the total cost of ownership (TCO). By moving from a rule-based model that is based on X++ code to a constraint-based model, you no longer require a developer license in order to maintain product models.

Product configuration

The industrialization period has led to great achievements in producing high-quality and feature-rich products at affordable prices. The economies of scale have made it possible for most people in the industrialized world to buy cars, TVs, household appliances, and other goods that most of us consider a necessary part of our everyday life.

As many products have become commodities, a need to differentiate them has arisen. The immediate response of manufacturers to this challenge has been to create variants of each product, so that customers have more alternatives. This strategy has led to increased forecast challenges, and also to an increase in inventory cost and unsold products that become obsolete.

By adopting a configure-to-order philosophy, manufactures have an opportunity to meet customer demand for unique products while reducing or eliminating obsolete inventory items. When a manufacture-to-stock philosophy is shifted to a configure-to-order philosophy, one immediate challenge that arises is that the need for short lead times must be balanced against low inventory levels.

The key to success here is to carefully analyze the product portfolio, and to look for patterns in both product features and processes. The goal is to identify generic components that can be manufactured by the same equipment and used in all variants.

The new Product configuration feature set includes a user interface (UI) that provides a visual overview of the product configuration model structure, and also a declarative constraint syntax that doesn't have to be compiled. Therefore, companies that want to support a configuration practice can get started more easily. As the following sections explain, a product designer no longer requires the support of a developer to build a product configuration model, test it, and release it to the sales organization.

Building a product configuration model

There are several approaches that a user can take to build a product configuration model. One option is to follow a sequential flow by first creating all the reference data, such as product masters, distinct products, and

operational resources, and then including them as components, bill of materials (BOM) lines, route operations, and other elements of the product configuration model. Alternatively, you can select a more iterative approach by first creating the model and then adding reference data as the need arises.

Components

A product configuration model consists of one or more components that are tied together through subcomponent relationships. Components are defined one time, and can then be used many times in one or more product configuration models. The components are the main building blocks of a product configuration model, and nearly all information about the model is related to them.

Attributes

Each component has one or more attributes that identify its properties. The attributes are what users will choose during the configuration process. Attributes control both inter-component and intra-component relationships through inclusion in constraints or calculations. Through conditions that are applied to BOM lines, the attributes can be used to determine which physical parts the configured product will consist of. Additionally, an attribute can control the property of a BOM line through a mapping mechanism. Similar functionality exists for route operations regarding both inclusion and property settings.

NOTE

When you create attribute types, avoid creating a high number of values for the attribute type domain. Doing so could cause slowdowns in the product configurator.

Expression constraints

Use of a constraint-based product configuration model implies that some limitations exist when the user selects values for the various attributes. Such limitations can be implemented as expression constraints by using the Optimization Modeling Language (OML). Alternatively, a constraint can be implemented in the form of a table constraint.

Table constraints

Table constraints can be user-defined or system-defined.

A user-defined table constraint is built by the user. The user selects a combination of attribute types to represent the columns of the table and then enters values from the domains of the selected attribute types to form the rows in the table constraint.

A system-defined table constraint is defined by selecting which table to use as a reference and then selecting fields from this table to form the columns in the constraint. The rows of the table constraint are the rows of the Supply Chain Management table that are present at configuration time.

A table constraint is included in a product configuration model by referencing the table constraint definition and mapping the relevant attributes in the model to the columns in the table constraint.

Calculations

Calculations represent a mechanism for performing arithmetic operations in a configuration model. For example, a calculation can determine the length of a specific piece of raw material or the processing time for a polishing operation. Calculations are imperative and set the value for a target attribute after all the attribute values that are included in the calculation expression become available.

Subcomponents

Subcomponents represent the nodes in the product configuration model structure. For each subcomponent relationship, a reference must be specified to a product master that has the variant configuration technology set to constraint-based configuration.

User requirements

A user requirement has all the constituents of a subcomponent. The only difference is that a user requirement isn't bound to a product master. The practical effect of this difference is that any BOM lines or route operation that are defined in the context of a user requirement are collapsed into the parent component BOM structure or route. This behavior resembles the behavior of a phantom BOM.

BOM lines

BOM lines are included to identify the manufacturing BOM for each component. A BOM line must reference an item, and all item properties can be set to a fixed value or mapped to an attribute.

Route operations

Route operations are included to identify the manufacturing route. A route operation must reference a defined operation, and all operation properties can be set to a fixed value. All properties except resource requirements can be mapped to an attribute instead of a value.

Validating and testing a product configuration model

Validation of a product configuration model can occur on several levels in the model and can therefore cover various scopes. The lowest level is for a single expression constraint. In this case, validation is typically performed by the product designer to verify that the syntax of an expression is correct.

Similarly, a condition for a BOM line or a route operation can be validated in isolation.

Validation can also be done for a user-defined table constraint definition. In this case, the user can verify that the values that are entered for each field are inside the domain of the corresponding attribute types.

Finally, validation can be done for a complete product configuration model to verify that the complete syntax is correct, and that all naming and modeling conventions have been respected.

Testing

Testing a model is similar to running an actual configuration session. The user can walk through the configuration pages and verify that the model structure supports the configuration process. The user can verify that the attribute values are correct, and that the attribute descriptions guide the user to select the correct values. Finally, after a test session is completed, the system tries to create the BOM and the route that corresponds to the selected attribute values, and presents an error message if anything goes wrong.

The configuration page

To navigate between components, click **Next**, or click a component in the product configuration model tree to set focus on it.

Finalizing a model for configuration

When a product configuration model is ready to be used in configure-to-order scenarios, a version must be created. However, there are several options that can enhance the modeling experience.

User interface

The configuration UI can be modified by introducing attribute groups in one or more subcomponents. Such a grouping can highlight the relationships between specific attributes and help the configuration user identify the area of the product that is currently in focus.

Templates

One or more configuration templates can be created to speed up the configuration process. Alternatively, templates can be created to promote specific attribute combinations, such as when a sales campaign focuses on a specific set of product features.

Translations

If the product will be sold in different countries/regions, translations can be created for all text that appears in the configuration UI. This text includes not only name and description fields, but also attribute text values.

Versions

The last and most important step in the finalization process is to create a version for the product configuration model. The version represents the relationship between the product master, which can be selected for configuration on an order or quotation line, and the product configuration model. A version must be approved and activated before it can be used in a configuration session.

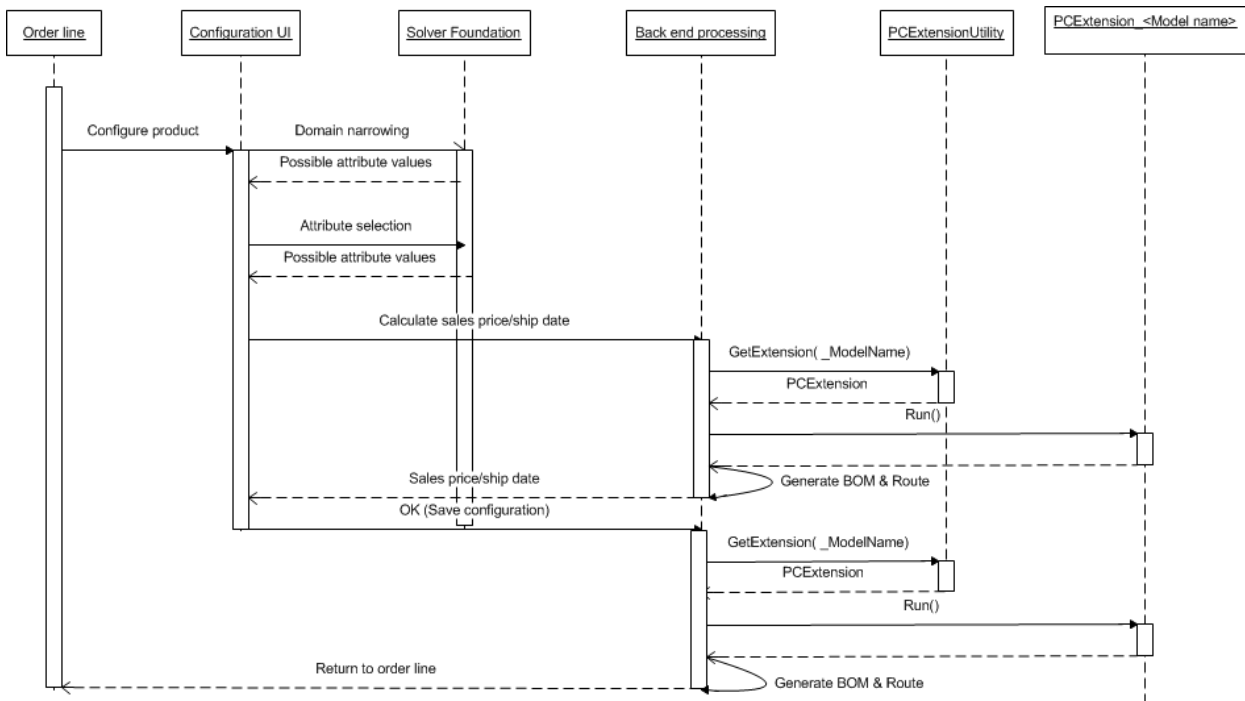
Extending a product configuration model through the API

A dedicated application programming interface (API) has been implemented, so that partners and others who have a developer license can extend the capabilities of a product configuration model. The main goal has been to establish a mechanism that lets partners and customers who use the existing Product Builder migrate the code that is embedded in Product Builder models to the API. In this way, they can migrate their models from Product Builder to a product configuration. However, new partners and customers can also benefit from using the API to extend new product configuration models.

PCAdaptor class

The API is implemented by using a set of **PCAdaptor** classes that expose the data structure of the product configuration models. An instance of the **PCAdaptor** class must be created for each model that will be extended. After a configuration session is completed, the system checks for an instance of this class and runs it if it's found.

The following flow diagram outlines the process.



Product configuration API flow diagram

Product configuration

Product configuration can be performed from the following places:

- Sales order line
- Sales quotation line
- Purchase order line
- Production order line

- Item requirement line (project)

The purpose of the configuration is to create a distinct variant of the product that meets the customer's requirement. A unique configuration ID is created for each new configuration. This ID enables tracking through inventory.

Multiple sites and intercompany

If configuration will be done at a site, or even a company, that differs from the site or company where production will occur, the BOM and the route will be created for and put at the supplier site in the supplying company. The product variant will be released in all companies that participate in the supply chain.

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Dimension-based product configuration overview

2/18/2021 • 3 minutes to read • [Edit Online](#)

Dimension-based product configuration represents a simple solution for creating many product variants from a single product master and its bill of materials.

Dimension-based product configuration is one of the three built-in product configuration technologies. The two other technologies are predefined variants and constraint-based configuration. All three technologies use a product master as the starting point and allow the user to create many product variants for one product master.

Key concepts

Dimension-based product configuration is based on the following key concepts:

- Product masters
- Configuration product dimension
- Configuration groups
- Bill of materials (BOM)
- Configuration route
- Configuration rules

Product masters

A product master is the starting point for any product configuration process. For the dimension-based product configuration, you need a product master with this particular configuration technology and a product dimension group that includes the configuration product dimension.

Configuration product dimension

The configuration product dimension is used to identify the product variants for a product master with the dimension-based configuration technology. The configuration dimension value is entered by the user and should help to identify the individual product variants.

Configuration groups

Configuration groups are defined in a central repository and can be used for all dimension-based product configuration models. Configuration groups are associated to the individual BOM lines and hold together a group of lines that are mutually exclusive. This means that only one line in a group can be selected for a single product variant.

Bill of materials (BOM)

The BOM represent the building blocks for a dimension-based product configuration. It must include all the different products that can be used in any product variant. Each line in the BOM can reference a configuration group. If a line doesn't reference a configuration group, it will be included in all product variants.

Configuration route

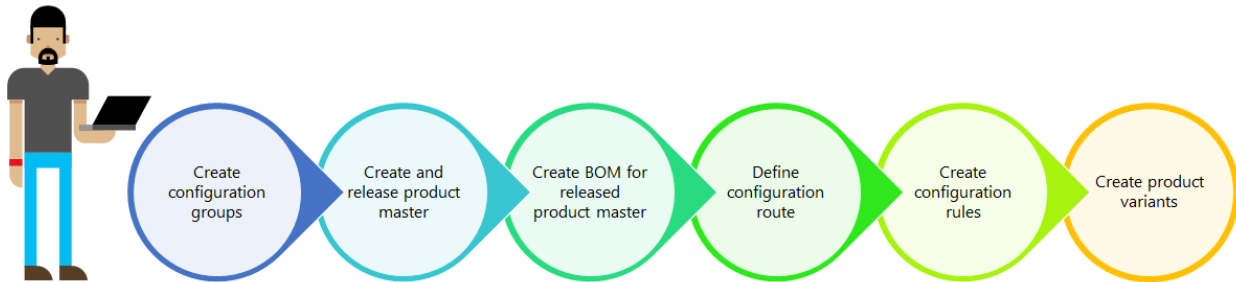
The configuration route determines the sequence of the configuration groups, as they will be displayed to the user during the product configuration process.

Configuration rules

The configuration rules represent a mechanism for ensuring that a product included in one configuration group in a BOM enforces either an inclusion or an exclusion of a product in a different configuration group in the same BOM.

Product modeling process

The natural sequence for building a product model for a dimension-based product starts with defining the relevant configuration groups. It is important to ensure that all products which will be used in the BOM have been released to the company that the product model is built for. With these building blocks in place, the user can create the BOM and assign configuration groups to all relevant BOM lines. When the BOM is complete, a configuration route can be defined for ordering the configuration groups in the proper sequence.



If there are certain products from different configuration groups that either must or must not be used together, you can create configuration rules that will enforce these product relationships. After the BOM has been tied together with a dimension-based product master through a BOM version and both have been approved and activated, you can create product configurations and enter a name for each configuration. The configurations can be defined before any transactions are generated or it can be done when the need for a certain configuration occurs.

Suggested use

The dimension-based configuration technology is best used for products with limited variability and the combination of the standard product dimensions size, color, style, and configuration is unsuitable for identifying a specific product variant. An example could be bicycle with frame height, wheel size, brake types, and different gears.

Next step

The following eight task guides are listed in the order in which you should complete them.

1. [Create a dimension-based product master](#)
2. [Release a dimension-based product master](#)
3. [Complete basic setup of a released product master](#)
4. [Define configuration groups](#)
5. [Create a bill of materials for a dimension-based product master](#)
6. [Define configuration routes](#)
7. [Create configuration rules](#)
8. [Create dimension-based configurations](#)

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Product dimensions

2/18/2021 • 7 minutes to read • [Edit Online](#)

There are five product dimensions: color, configuration, size, style, and version. You combine product dimensions in dimension groups and assign dimension groups to product masters. The combinations of product dimensions determine how product variants are defined.

Product dimensions are characteristics that serve to identify a product variant. You can use combinations of product dimensions to define product variants. You must define at least one product dimension for a product master in order to create a product variant.

Product variants

Product variants are also referred to as items. An item is a tangible product, which isn't the same as a service. It's also possible to define a product master with the service type. By using the service type, you can specify product variants that include services. For example, you can specify a product master for consultancy work and product variants for work that is performed by senior consultants and junior consultants.

Product dimensions

A product variant can be generated based on the product dimension values.

Product dimension values for the size, color, and style dimensions can be created in the following locations:

- **Size page** (**Product information management > Setup > Dimension and variant groups > Sizes**)
- **Color page** (**Product information management > Setup > Dimension and variant groups > Colors**)
- **Style page** (**Product information management > Setup > Dimension and variant groups > Styles**)

Product dimension values for the configuration dimension are typically created by using either the Product configurator or the Dimension-based configurator.

Product versions are usually created for specific versions as the product evolves during its lifecycle. Product versions are covered in detail later in this topic.

Product dimensions can also be created and maintained on the **Product dimensions** page, which can be accessed from the following locations:

- Go to **Product information management > Products > Product masters**. On the Action Pane, select **Product dimensions**.
- Go to **Product information management > Products > All products and product masters**. Select a product master. On the Action Pane, select **Product dimensions**.
- Go to **Product information management > Released products**. Select a product master. On the Action Pane, on the **Product** tab, in the **Product master** group, select **Product dimensions**.

The number of variants that you can create for an item is limited by the number of possible product dimension combinations.

TIP

When you use a product on an order line, for example, you select the product dimensions to identify the product variant that you want to work with.

Example

A company sells denim jeans. The item, *Jeans*, uses the color and size product dimensions. The jeans are sold in three different colors and six different sizes. The colors are blue, black, and brown. The sizes are XS, S, M, L, XL, and XXL. Not all sizes are available in all three colors. If all combinations were available, there would be 18 different types of jeans. However, in this example, only the following nine product variant combinations are produced.

COLOR	SIZE
Blue	XS
Blue	S
Blue	M
Black	M
Black	L
Black	XL
Brown	L
Brown	XL
Brown	XXL

The version product dimension

Version is a product dimension that is intended to help you maintain and track multiple versions of a product throughout the supply chain. Version tracking is essential to the success of manufacturers that operate in a world of constantly shrinking product lifecycles, increased quality and reliability requirements, and increased focus on product safety.

As a standard product dimension, version will behave similarly to the existing product dimensions (size, style, color, and configuration). Therefore, you can use it for other purposes besides tracking product versions.

Turn on the version dimension

Before you turn on the version dimension

When you turn on the version dimension, some functionality could become broken or stop working as expected if you've installed other solutions that add customizations to the inventory dimensions. For the version dimension to be fully functional, you might have to update those solutions so that they include the version dimension in their references to the inventory dimensions.

When you're testing your solutions for compatibility with the version dimension, look for the following elements:

1. **Functionality:** Most importantly, any customizations that involve the inventory dimensions must be assessed to ensure that they can work in conjunction with the version dimension.
2. **References to the inventory dimensions:** Look out for references to the inventory dimensions (that is, places where the dimensions are explicitly referenced). References to `InventDimId` should work out of the box, but look out for references to style or color. For example, be sure to check the following elements:
 - API calls in extended classes
 - All references to specific inventory dimensions in extension code (This code must float the version dimension together with the style, color, and size dimensions.)
3. **References to obsolete API calls:** In its introduction of the version dimension, Microsoft has tried to make as few APIs as possible obsolete. The few APIs that have been made obsolete will issue a warning when you turn on the **Product dimension - version** configuration key. Calls to those API must be fixed in your extended solutions before you turn on the version dimension in a production system. Here are the version-specific obsolete APIs:
 - RetailTransactionServiceInventory::getProductRecordId
 - EcoResProductNumberIdentifiedProductVariantEntity::find
 - EGAISAlcoholProduction_RU::findByItemDim
 - PCVariantConfiguration::findByProductMasterAndDimensions
4. **Maps:** If any maps use the inventory dimensions, the corresponding relation mapping to these maps must be updated so that they include the version dimension. In the extended model or table extensions, look out for tables where the fields include inventory dimensions.
5. **Microsoft Dynamics 365 Commerce functionality:** After it's turned on, the version dimension will appear throughout the Commerce-specific code in Dynamics 365 Supply Chain Management. However, the version dimension isn't yet supported by the Commerce channel database or in the Point of Sale (POS) or e-Commerce applications. These Commerce-specific applications won't support users selling/shipping or returning/receiving inventory by version dimension. Inventory availability lookup functions won't discern inventory by version dimension in Commerce apps. This behavior resembles the current behavior of the config dimension throughout Commerce.

Turn on the version dimension

Before you can use the version dimension, it must be turned on in your system. This task requires admin permissions.

1. Go to **System administration > Workspaces > Feature management**.
2. Turn on the feature that is named *Product dimension version*. (For more information, see [Feature management](#).)
3. Put your system into [Maintenance mode](#).
4. Go to **System administration > Setup > License configuration**.
5. On the **Configuration keys** tab, expand **Trade**, and select the check box for **Product dimension - version**.
6. Turn off [Maintenance mode](#).

Areas where the version dimension isn't supported

The following areas don't support the version dimension (you can still use these areas but you won't be able to add versioned products (products where the version dimension is used) to them). For example, you can't add a versioned item to a vendor catalog. This is because adding products with the version dimension to these areas would cause breaking changes.

- Cost object monthly statement
- Cost object statement cache
- MCR sales statistics per item

- Vendor catalogs
- EcoResProductDimensionGroupEntity

In addition, the order creation and order processing features in Commerce (for example, for POS, call center, and e-commerce orders) don't support the version dimension. There is no confirmed timeline as to when Commerce orders will be enhanced to support it.

Functional characteristics of the version dimension

The version dimension works like the other product dimensions. However, because of its specific nature, and because it's intended to maintain and track multiple versions of a product, it behaves slightly differently. Here are some of the differences and similarities:

- **There is no version group.**

Although the concept of groups exists for size, color, and style (color group, size group, and style group), no version group concept exists. Groups let you predefine the applicable values so that when, for example, you assign a color group to a product, the product can use all the colors in that color group. This concept doesn't apply to the version dimension, because the versions that a product takes aren't predefined when the product is created. Instead, versions are created during the lifecycle of the product, as they are required. Typically, if the form, fit, and function of the product remain the same, you create a new version instead of a new product.

- **Product variant suggestions work as they currently do.**

Product variant suggestions will create suggestions for all version dimension values, just as they do for other dimensions. The process of creating and releasing versioned products is the same as it is for products that use other dimensions. When you create a versioned product, the first version (V1) will be created as a product dimension, and the variants will be released. As the product changes and a new version is needed, the new version value (V2) will be added, and the required variants will be released. There is no expectation that all the versions (V1, V2, and V3) will be created in advance for the product.

IMPORTANT

If you turn on and use the version dimension, some solutions that reference the inventory dimensions might stop working as expected. To confirm and fix these issues, contact the independent software vendor (ISV) for your affected solutions. For more information, see [Enable the version dimension](#).

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Create a dimension-based product master

2/18/2021 • 2 minutes to read • [Edit Online](#)

This procedure shows how to create a new product master with dimension-based configuration technology. The demo data company used to create this procedure is USMF. This is the first procedure out of eight that explains how to build combinations for dimension-based configuration.

1. Go to Product information management > Products > Product masters.
2. Click New.
3. In the Product number field, type a value.
 - Entering a product number is mandatory if no number sequence has been set up for the product number field.
4. In the Product name field, type a value.
5. In the Product dimension group field, click the drop-down button to open the lookup.
6. In the list, find and select the desired record.
 - Select the configuration dimension for this procedure.
7. In the list, click the link in the selected row.
8. In the Configuration technology field, select an option.
 - Select the Dimension-based configuration technology.
9. Click OK.

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Release a dimension-based product master

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This procedure shows how to release a product master, which will be used for the dimension-based configurations. The demo data company used to create this procedure is USMF. It is a prerequisite that you have created a product master with the dimension-based configuration technology. This is the second procedure out of eight which explains how to build combinations for dimension-based configuration.

1. Go to Product information management > Products > Product masters.
 - Filter the Configuration technology column so that only the dimension-based configuration is displayed. For example, you can filter the column by typing Dimension.
2. In the list, mark the selected row.
3. Click Release products.
4. Click Next.
 - For products that are created with the dimension-based configuration technology, the product variants must be created in the company where the bill of materials will be created.
5. Click Next.
6. In the list, find and select the desired record.
 - Select the company USMF for this procedure.
7. Click Next.
8. Click Finish.

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Complete basic setup of a released product master

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This topic shows how to complete the minimum setup that is required before the product master can be used in BOM versions.

This is the third procedure out of eight which explains how to build combinations for dimension-based configuration. The demo data company used to create this procedure is USMF.

1. Go to **Navigation pane > Modules > Product information management > Products > Released products**.
2. In the list, find and select the desired record. Select the product master that you have released in the second procedure. This product master is created with the dimension-based configuration technology.
3. On the Action Pane, select **Product**.
4. Select **Dimension groups** to open the drop dialog.
5. In the **Storage dimension group** field, select the drop-down button to open the lookup.
6. In the list, find and select the desired record. The storage dimension group determines which storage dimensions are used for product transaction. Select **Site** for this procedure.
7. In the **Tracking dimension group** field, select the drop-down button to open the lookup.
8. In the list, find and select the desired record. The tracking dimension group determines which tracking dimensions are used for product transaction. Select **None** for this procedure.
9. Click **OK**.
10. Click **Edit**.
11. In the **Item model group** field, select the drop-down button to open the lookup.
12. In the list, find and select the desired record. Item model groups contain settings that determine how items are controlled and handled on item receipts and issues. They also determine how item consumption is calculated. Select **FIFO** for this procedure.
13. Expand the **Manage costs** section.
14. In the **Item group** field, select the drop-down button to open the lookup.
15. In the list, find and select the desired record. Item groups are used to manage inventory by dividing inventory items into groups. Select **CarAudio** for this procedure.
16. On the Action Pane, select **Plan**.
17. Select **Default order settings**.
18. In the **Default order type** field, select an option. Select **Production** to specify that the default supply option for this product master is to produce it.
19. Select **Save**.
20. Close the page.
21. Close the **Released product details** form.

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Define configuration groups

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This procedure shows how to define product configuration groups by creating two groups in the demo data company USMF Company. This is the fourth procedure out of eight which explains how to build combinations for dimension-based configuration.

1. Go to Product information management > Setup > Bills of materials and formulas > Configuration groups.
2. Click New.
3. In the Configuration group field, type a value.
 - Type a name for the configuration group that will be used for the bill of material lines.
4. In the Name field, type a value.
5. Click New.
6. In the Configuration group field, type a value.
 - Type a name for the configuration group that will be used for the bill of material lines.
7. In the Name field, type a value.
8. Close the page.

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Create a bill of materials for a dimension-based product master

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For this procedure you should have completed the previous 4 guides in this sequence of eight recordings. The first 4 recordings set up data that is required to complete this procedure. The demo data company used to create this procedure is USMF. This task is typically handled by the product designer.

Select the product

1. Click Released product maintenance.
2. Click Released products.
3. In the list, mark the selected row.
 - Find the released product master with dimension-based configuration technology that you created in the first task guide in this sequence.
4. On the Action Pane, click Engineer.
5. Click BOM versions.

Create new BOM and BOM version

1. Click New.
2. Click BOM and BOM version.
3. In the Name field, type a value.
 - Setting a site
 - In this procedure we don't set a specific site for the BOM.
4. Click OK.
5. Click New.
 - In this procedure we will add four lines to the BOM. Two lines represent cable options and two lines represent cabinet options.
6. In the list, mark the selected row.
7. In the Item number field, enter or select a value.
 - Select item number A0001, HDMI 6' Cables.
8. In the Configuration group field, enter or select a value.
 - Select the Cable configuration group created in guide 4 in this sequence.
9. Click New.
 - Select item number A0002, HDMI 12' Cables.
10. In the list, mark the selected row.
11. In the Item number field, enter or select a value.
12. In the Configuration group field, enter or select a value.
 - Select the Cable configuration group again.
13. Click New.
14. In the list, mark the selected row.
15. In the Item number field, enter or select a value.
 - Select item number D0002 Cabinet.
16. In the Configuration group field, enter or select a value.

- Select the Cabinet configuration group for this BOM line.

17. Click New.

18. In the list, mark the selected row.

19. In the Item number field, enter or select a value.

- Select Item number M0007 StandardCabinet as the last BOM line.

20. In the Configuration group field, enter or select a value.

- Select the Cabinet configuration group for the last BOM line.

Approve and activate

1. Close the page.

2. Click Approve.

3. In the Approved by field, enter or select a value.

4. Select Yes in the Do you also want to approve the bill of materials? field.

5. Click OK.

6. Click Activate.

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Define configuration route

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This procedure focuses on defining a configuration route that determines the sequence in which the configuration groups will be presented. The demo data company used to create this procedure is USMF. This is the sixth procedure out of eight that explains how to build combinations for dimension-based configuration.

1. Go to Product information management > Bills of materials and formulas > Bills of materials.
2. In the list, find and select the desired record.
3. On the Action Pane, click Options.
4. Click Change view.
5. Click Header view.
6. Expand or collapse the Configuration route section.
7. Click Add.
8. In the list, mark the selected row.
9. In the Configuration group field, click the drop-down button to open the lookup.
10. In the list, click the link in the selected row.
11. Click Add.
12. In the list, mark the selected row.
13. In the Configuration group field, click the drop-down button to open the lookup.
14. In the list, find and select the desired record.
15. In the list, click the link in the selected row.
16. Click Save.

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Create configuration rules

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This procedure creates configuration rules that can be used for dimension-based configuration to enforce or prevent certain combinations of BOM lines. The demo data company used to create this procedure is USMF. This is the seventh procedure out of eight that explains how to build combinations for dimension-based configuration.

1. Go to Product information management > Bills of materials and formulas > Bills of materials.
2. In the list, find and select the desired record.
 - Find and select the BOM for the dimension-based configuration.
3. On the Action Pane, click Options.
4. Click Change view.
5. Click Header view.
 - Open the header view to access the Configuration route FastTab.
6. Expand or collapse the Configuration route section.
 - The Configuration route FastTab must be in the expanded mode.
7. Click Configuration rules.
8. Click New.
9. In the list, mark the selected row.
10. In the Item number field, click the drop-down button to open the lookup.
 - The items in the current configuration group are displayed. Select the one that represents the condition in the rule.
11. In the list, click the link in the selected row.
12. In the Method field, select an option.
 - It is possible to enforce either a selection or a deselection of an item from another configuration group.
13. In the Derived group field, click the drop-down button to open the lookup.
14. In the list, find and select the desired record.
15. In the list, click the link in the selected row.
 - Select the desired configuration group.
16. In the Derived item number field, click the drop-down button to open the lookup.
17. In the list, click the link in the selected row.
 - Select the item number that will be either selected or deselected depending on the chosen method.
18. Close the page.

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Create dimension-based configurations

2/18/2021 • 2 minutes to read • [Edit Online](#)

This procedure shows how to define a configuration for a dimension-based product. This is the last procedure in the series that explains how to build combinations for dimension-based configuration. The execution of this procedure is dependent on the data created in the previous seven recordings. The demo data company used to create this procedure is USMF.

Find the dimension-based product master

1. Click Released product maintenance.
2. Click Released products.
3. In the list, mark the selected row.
 - Select the dimension-based product master that you created in the first recording in this sequence of 8 recordings.

Create configurations

1. On the Engineering Action Pane, click Maintain configurations.
2. Click Configure.
3. In the list, mark the selected row.
4. In the Item number field, enter or select a value.
 - Select any of the items in the first configuration group.
5. In the list, find and select the desired record.
6. In the Item number field, enter or select a value.
 - Select any item from the second configuration group.
7. Click OK.
8. In the list, mark the selected row.
9. In the Configuration field, type a value.
 - Enter a configuration name that will make it easy to identify the configuration.
10. In the Description field, type a value.
 - Enter a description of the configuration to explain what it contains.
11. Click OK.

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Set up a product configuration model

2/18/2021 • 3 minutes to read • [Edit Online](#)

This article describes the steps for setting up and creating a product configuration model.

TASK	DESCRIPTION
Create a product master.	Create a product master from the Product master list. Release the product master to all relevant companies. For a product master that is used as a version for a product configuration model or as a subcomponent, Constraint-based configuration must be selected as the configuration technology, and the configuration dimension must be selected only for the product dimension group.
Create components.	Create components on the Components page. Components are the building blocks of a product configuration model and can be reused in multiple product configuration models.
Create attribute types.	Create attribute types on the Attribute types page. Attribute types specify the set of data types for all attributes that are used in product configuration models. Attributes of the Boolean , Text with a fixed list, and Integer with a range types list the set of values that are available when you configure a product variant based on a product configuration model.
Create a product configuration model.	Create a product configuration model on the New product configuration model page.
Add attributes to a product configuration model.	Create an attribute on the Attributes FastTab on the Constraint-based product configuration model details page. Attributes describe the features of the product configuration model.
Add constraints to a product configuration model.	Create constraints on the Constraints FastTab on the Constraint-based product configuration model details page. Constraints are limitations that a product configuration must satisfy. Constraints are either expression constraints or table constraints.
Add subcomponents to a product configuration model.	Create subcomponents on the Subcomponents FastTab on the Constraint-based product configuration model details page. Subcomponents are related to components and are linked to items that represent the subcomponent.
Add user requirements to a product configuration model.	User requirements are similar to subcomponents, but they don't reference an item. You can think about user requirements as a phantom BOM. Any BOM lines or route operations that are placed directly under the user requirement will be collapsed into the parent component.

TASK	DESCRIPTION
Add BOM lines to a product configuration model.	Create BOM lines on the BOM lines FastTab on the Constraint-based product configuration model details page. BOM lines represent a part that is required to build a variant of the product.
Add route operations to a product configuration model.	Create route operations on the Route operations FastTab on the Constraint-based product configuration model details page. Route operations represent a step in a sequence of steps that are performed to make a variant of the product.
Create an active version for a product configuration model.	Create an active version of the product configuration model on the Versions page. A version is the relationship between a product configuration model and a product master. A product configuration model that has an active version can be configured from a sales order, sales quotation, purchase order, or production order.
Test a product configuration model.	Test the product configuration model from either the Constraint-based product configuration model details page or the Product configuration models list page. Testing the product configuration models simulates the product model configuration process that occurs during order handling.
Create product configuration model template.	Create a product configuration model template on the Configuration templates page. A configuration template includes values for attributes in the product configuration model. Select the attribute values on the Configure line page. You can select to load a product model configuration template during product model configuration.
Configure an item.	Product configuration models can be configured from a sales order, sales quotation, purchase order, or production order.

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Calculations for product configuration models FAQ

2/18/2021 • 4 minutes to read • [Edit Online](#)

This topic describes calculations for product configuration models and explains how to use calculations together with constraints.

Calculations can be used for arithmetic or logical operations. They complement expression constraints in product configuration models. You can define calculations on the **Constraint-based product configuration model details** page and then build expressions for the calculations in the expression editor. For more information, see [Create calculations](#).

What is a calculation?

A calculation is an element that you can use in a product configuration model. Calculations complement constraints by letting you use decimal numbers to calculate values when you configure a product. Additionally, calculations have a larger set of available operators than constraints have.

Like a constraint, a calculation is associated with a specific component in a product configuration model, and can't be reused by or shared with another component. One important difference between calculations and constraints is that calculations are imperative (unidirectional), whereas constraints are declarative (bi-directional). For more information about constraints, see [Expression constraints and table constraints in product configuration models](#).

A calculation consists of a target attribute and a calculation expression.

What is a target attribute?

A target attribute is an attribute that receives the result of the calculation expression.

In the following expression, the target attribute is a tablecloth measurement:

Expression: `If[decimalAttribute1 <= decimalAttribute2, True, False]`

DecimalAttribute1 is the table length, and **decimalAttribute2** is the tablecloth length. The expression returns the value **True** to the target attribute if **decimalAttribute2** is greater than or equal to **decimalAttribute1**. Otherwise, the expression returns **False**. Therefore, the tablecloth measurement is acceptable if the tablecloth length is the same as or exceeds the length of the table.

What attribute types can be set to target attributes?

All attribute types that the product configurator supports can be set to target attributes, except text without a fixed list.

Can the value of a target attribute restrict the values of the input attributes in a calculation?

No, the value of a target attribute can't restrict the values of the input attributes, because calculations are unidirectional. Therefore, the value of the target attribute is set based on changes in the value of the input attributes, but a change in the value of the target doesn't affect the value of the input attributes. This behavior differs from the behavior for constraints. Constraints occur in both directions.

Example

In the following expression, the target for the calculation is the length of a power cord, and the input value is a color:

Expression: [If Color == "Green", 1.5, 1.0]

When you configure the item, the length of the power cord is set to 1.5 if you specify **Green** as the value of color attribute. If you specify any other color, the length is set to 1.0. However, because calculations are unidirectional, the calculation doesn't set the value of the color attribute to **Green** if you specify a length of 1.5.

What happens if a calculation has a target attribute of the integer type but a calculation generates a decimal number?

If a target attribute is of the integer type, but a calculation generates a decimal number, only the integer part of the calculated result is returned. The decimal part is removed, and the result isn't rounded. For example, a result of 12.70 is shown as 12.

When do calculations occur?

Calculations occur when a value has been provided for all input attributes.

Can I overwrite the value that is calculated for the target attribute?

You can overwrite the value that is calculated for the target attribute, unless the target attribute is set as hidden or read-only.

How do I set a target attribute as hidden or read-only?

To set an attribute as hidden or read-only, follow these steps.

1. Click **Product information management > Common > Product configuration models**.
2. Select a product configuration model, and then, on the Action Pane, click **Edit**.
3. On the **Constraint-based product configuration model details** page, select the attribute to use as a target attribute.
4. On the **Attributes** FastTab, select **Hidden** or **Read-only**.

Can a calculation overwrite the values that I set?

No. The values that you set when you configure a product are the values that are used. The calculation that occurs when the input values in a calculation are changed can't overwrite the values that you provide for a specific attribute.

What happens if I remove an input value in a calculation?

If you remove an input value in a calculation, the value of the target attribute is also removed.

Why do I receive an error message that says that my model is in contradiction?

This message is shown when a calculation includes an error, or when a contradiction exists in one or more constraints. For more information about contradictions in constraints, see [Expression constraints and table constraints in product configuration models](#). Here are some situations where errors can occur in calculations:

- A value is divided by 0 (zero).
- A conflict exists between the following two elements:

- The values that are available for an attribute and are limited by a constraint
- A value that is generated by a calculation
- The values that are returned by the calculation are outside the domain of the attribute. An example is an integer from [1..10] that is calculated to 0.

Why do I receive an error message even though I successfully validated my product model?

Calculations aren't included in the validation. You must test the product configuration model to find errors in calculations. To test a product configuration model, follow these steps.

1. Click **Product information management > Common > Product configuration models**.
2. Select a product configuration model, and then, on the Action Pane, in the **Run** group, click **Test**.

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Configuration rules

2/18/2021 • 2 minutes to read • [Edit Online](#)

This article provides general information about configuration rules. Configuration rules define relationships between items in a bill of materials (BOM) for products that use the dimension-based configuration technology.

Configuration rules are available when you define dimension-based configuration models. Configuration rules are used to either enforce or prohibit specific item combinations in a bill of materials (BOM). After a BOM has been created and the relevant items have been assigned to their respective configuration groups, one or more configuration rules can be defined. If two items belong together, the **Select** operator is used to ensure inclusion. If two items are mutually exclusive, the **Deselect** operator is used to ensure exclusion.

Note: This information applies only to product masters that use the dimension-based configuration technology.

Existing configurations aren't affected by subsequent changes to the configuration rules. However, it's important that you set the rules before you define a new configuration, and that you check the rules if you think they have been changed.

Note: For the **Select** method, the derived configuration group, item number, and configuration are automatically selected. For the **Deselect** method, the derived configuration group, item number, and configuration can't be selected.

Additional resources

[Dimension-based product configuration overview](#)

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Expression constraints and table constraints in product configuration models

2/18/2021 • 6 minutes to read • [Edit Online](#)

This topic describes the use of expression constraints and table constraints. Constraints control the attribute values that you can select when you configure products for a sales order, sales quotation, purchase order, or production order. You can use expression constraints or table constraints, depending on how you prefer to build the constraints.

Constraints are used to control the attribute values that you can select when you configure products for a sales order, sales quotation, purchase order, or production order. You can use expression constraints or table constraints, depending on how you prefer to build the constraints.

What are expression constraints?

Expression constraints are characterized by an expression that uses arithmetic and Boolean operators and functions. An expression constraint is written for a specific component in a product configuration model. It can't be reused by or shared with another component. However, the expression constraints for a component can reference attributes of the component's subcomponents.

What are table constraints?

Table constraints list the combinations of values that are allowed for attributes when you configure a product. Table constraint definitions can be used generically. When you create a table constraint for a component in a product configuration model, you select a table constraint definition. To create the combinations that are allowed, you add attributes of specific types to the components. Each attribute type has a specific value.

Example of a table constraint

This example shows how you can limit the configuration of a speaker to specific cabinet finishes and fronts. The first table shows the cabinet finishes and fronts that are generally available for configuration. The values are defined for the **Cabinet finish** and **Front grill** attribute types.

ATTRIBUTE TYPE	VALUES
Cabinet finish	Black, Oak, Rosewood, White
Front grill	Black, Metal, White

The next table shows the combinations that are defined by the **Color and finish** table constraint. By using this table constraint, you can configure a speaker that has an oak finish and a black grill, a Rosewood finish and a white grill, and so on.

FINISH	GRILL
Oak	Black
Rosewood	White
White	Black

FINISH	GRILL
White	White
Black	Black
Black	Metal

You can create system-defined and user-defined table constraints. For more information, see [System-defined and user-defined table constraints](#).

What syntax should be used to write constraints?

You must use Optimization Modeling Language (OML) syntax when you write constraints. The system uses Microsoft Solver Foundation constraint solver to solve the constraints.

Should I use table constraints or expression constraints?

You can use either expression constraints or table constraints, depending on how you prefer to build the constraints. You build a table constraint as a matrix, whereas an expression constraint is an individual statement. When you configure a product, it doesn't matter what kind of constraint is used. The following example shows how the two methods differ.

When you configure a product by using the following constraint setups, these combinations are allowed:

- A product in the color Black, and in size 30 or 50
- A product in the color Red and in size 20

Table constraint setup

COLOR	SIZE
Black	30
Black	50
Red	20

Expression constraint setup

```
(Color == "Black" & (size == "30" | size == "50")) | (color == "Red" & size = "20")
```

Should I use operators or infix notation when I write expression constraints?

You can write an expression constraint by using either the available prefix operators or infix notation. For the **Min**, **Max**, and **Abs** operators, you can't use infix notation. These operators are included as standard operators in most programming languages.

What operators and infix notation can I use when I write expression constraints?

The following tables list the operators and infix notation that you can use when you write an expression constraint for a component in a product configuration model. The examples in the first table show how to write

an expression by using either infix notation or operators.

OPERATOR	DESCRIPTION	SYNTAX	EXAMPLES
Implies	This is true if the first condition is false, the second condition is true, or both.	Implies[a, b], infix: a -: b	<ul style="list-style-type: none"> • Operator: Implies[x != 0, y >= 0] • Infix notation: x != 0 -: y >= 0
And	This is true only if all conditions are true. If the number of conditions is 0 (zero), it produces True .	And[args], infix: a & b & ... & z	<ul style="list-style-type: none"> • Operator: And[x == 2, y <= 2] • Infix notation: x == 2 & y <= 2
Or	This is true if any condition is true. If the number of conditions is 0 (zero), it produces False .	Or[args], infix: a b ... z	<ul style="list-style-type: none"> • Operator: Or[x == 2, y <= 2] • Infix notation: x == 2 y <= 2
Plus	This sums its conditions. If the number of conditions is 0 (zero), it produces 0 .	Plus[args], infix: a + b + ... + z	<ul style="list-style-type: none"> • Operator: Plus[x, y, 2] == z • Infix notation: x + y + 2 == z
Minus	This negates its argument. It must have exactly one condition.	Minus[expr], infix: -expr	<ul style="list-style-type: none"> • Operator: Minus[x] == y • Infix notation: -x == y
Abs	This takes the absolute value of its condition. It must have exactly one condition.	Abs[expr]	Operator: Abs[x]
Times	This takes the product of its conditions. If the number of conditions is 0 (zero), it produces 1.	Times[args], infix: a * b * ... * z	<ul style="list-style-type: none"> • Operator: Times[x, y, 2] == z • Infix notation: x * y * 2 == z
Power	This takes an exponential. It applies exponentiation from right to left. (In other words, it's right-associative.) Therefore, Power[a, b, c] is equivalent to Power[a, Power[b, c]] . Power can be used only if the exponent is a positive constant.	Power[args], infix: a ^ b ^ ... ^ z	<ul style="list-style-type: none"> • Operator: Power[x, 2] == y • Infix notation: x ^ 2 == y
Max	This produces the largest condition. If the number of conditions is 0 (zero), it produces Infinity .	Max[args]	Operator: Max[x, y, 2] == z

OPERATOR	DESCRIPTION	SYNTAX	EXAMPLES
Min	This produces the smallest condition. If the number of conditions is 0 (zero), it produces Infinity .	Min[args]	Operator: Min[x, y, 2] == z
Not	This produces the logical inverse of its condition. It must have exactly one condition.	Not[expr], infix: !expr	<ul style="list-style-type: none"> • Operator: Not[x] & Not[y == 3] • Infix notation: !x! (y == 3)

The examples in the next table show how to write infix notation.

INFIX NOTATION	DESCRIPTION
$x + y + z$	Addition
$x * y * z$	Multiplication
$x - y$	Binary subtraction is translated the same as binary addition where there is a negated second.
$x ^ y ^ z$	Exponentiation that has right associativity
!x	Boolean not
$x \text{ :- } y$	Boolean implication
x	y
$x \& y \& z$	Boolean and
$x == y == z$	Equality
$x != y != z$	Distinct
$x < y < z$	Less than
$x > y > z$	Greater than
$x <= y <= z$	Less than or equal to
$x >= y >= z$	Greater than or equal to
(x)	Parentheses override default precedence.

Why aren't my expression constraints validated correctly?

You can't use reserved keywords as solver names for attributes, components, or subcomponents in a product configuration model. Here is a list of the reserved keywords that you can't use:

- Ceiling

- Element
- Equal
- Floor
- If
- Less
- Greater
- Implies
- Log
- Max
- Min
- Minus
- Plus
- Power
- Times
- Slot
- Model
- Decision
- Goal

Additional resources

[Create an expression constraint](#)

[Add a calculation to a product configuration model](#)

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Solver strategy for product configuration

2/18/2021 • 2 minutes to read • [Edit Online](#)

This topic describes how you can use the solver strategy to improve the performance of product configuration.

The concept of solver strategies was first introduced in Cumulative update 7 (CU7) for Microsoft Dynamics AX 2012 R2. It was extended in Cumulative update 8 (CU8) for Microsoft Dynamics AX 2012 R3 and Microsoft Dynamics 365 for Finance and Operations, Enterprise edition 7.3.

The solver strategy concept now consists of the following strategies:

- Default
- Minimal domains first
- Top-down
- Z3

Solver strategy

A product configuration model can be formulated as a [constraint satisfaction problem \(CSP\)](#). Microsoft Solver Foundation (MSF) provides two types of solver strategies to solve the CSPs that can be used from product configuration models. These solver strategies rely on [heuristics](#), which are used to determine the order that the variables of the CSPs are considered in when the problem is being solved. Heuristics can significantly affect performance when a problem or class of problems is being solved.

The solver strategy for product configuration models determines which solver is used with heuristics. The **Default**, **Minimal domains first**, and **Top-down** strategies use the two solvers from MSF, whereas the **Z3** strategy uses the Z3 solver.

Real customer implementation studies have shown that a change in the solver strategy for a product configuration model can reduce the response time from minutes to milliseconds. Therefore, it's worth the effort to try different solver strategies to find the most efficient strategy for your product configuration model.

Change the settings for the solver strategy

To change the solver strategy, on the **Product configuration models** page, on the Action Pane, select **Model properties**. Then, in the **Edit the model details** dialog box, select a solver strategy.

The screenshot shows the Dynamics 365 interface for product configuration models. The main window displays a list of models under the heading 'PRODUCT CONFIGURATION MODELS'. The list includes:

Name	Description
Car Audio System	Car audio system - kit
High End Speaker (D0004)	Configurable high end speaker
Licensed High End Speaker	Configurable high end speaker
Speaker solution	High end speaker with cable an...

The 'Edit the model details' dialog box is open, showing the following fields and options:

- Name: Car Audio System
- Description: Car audio system - kit
- Solver strategy: Default (selected)
- Minimal domains first
- Top-down
- Z3
- Select existing component (checked)
- Name: (empty)
- OK and Cancel buttons

Currently, there is no logic that automatically detects which solver strategy will be the most efficient strategy for constraint-based product configuration. Therefore, you must try the solver strategies one by one.

The following table provides recommendations about the solver strategy to use in various scenarios.

SOLVER STRATEGY	USE THE STRATEGY IN THIS SCENARIO
Default	The Default strategy has been optimized to solve models that rely on table constraints. Customer implementation studies have shown that this strategy is the most efficient strategy in scenarios where table constraints are used extensively.
Minimal domains first	The Minimal domains first and Top-down strategies are closely related. Customer implementation studies have shown that the Top-down strategy, outperforms the Minimal domains first strategy. However, the Minimal domains first strategy is kept in the product for backward compatibility. Both these solver strategies have been shown to be more efficient at solving models that contain several arithmetic expressions where no table constraints are used. However, in some cases, the Default strategy outperforms these two strategies. Therefore, remember to try each strategy.
Top-down	The Minimal domains first and Top-down strategies are closely related. Customer implementation studies have shown that the Top-down strategy, outperforms the Minimal domains first strategy. However, the Minimal domains first strategy is kept in the product for backward compatibility. Both these solver strategies have been shown to be more efficient at solving models that contain several arithmetic expressions where no table constraints are used. However, in some cases, the Default strategy outperforms these two strategies. Therefore, remember to try each strategy.
Z3	We recommend that you use the Z3 strategy as the default solver strategy. If you're concerned about performance and scalability, you can evaluate the other strategies.

Additional resources

[Product configuration overview](#)

[Heuristics](#)

[Constraint Satisfaction Problem](#)

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Reuse product configurations

2/18/2021 • 2 minutes to read • [Edit Online](#)

You can specify that you want to automatically reuse an existing configuration for a product. Then, when a user has completed a configuration session, the system verifies whether a configuration that matches the user's selections already exists. If a matching configuration is found, the configuration ID, corresponding bill of materials (BOM), and route are reused.

Requirements for reusing configurations

To enable configurations to be reused, you must specify the following information for the components and attributes on the **Product configuration model details** page:

- **Components and subcomponents** – On the **General** FastTab, in the **Reuse configurations** field, select **Yes**.
- **Attributes** – On the **Attributes** FastTab, select the **Include in reuse** option. This option appears only when the related component is enabled for reuse. If you don't select any attributes for reuse, the configuration is always reused, regardless of the user's selections during a configuration session. The attribute values in the existing configuration must match the user's selections. For example, if the user selects **Blue** as the color during a configuration session, the system verifies whether an existing configuration of the component has the color blue.

Resetting configuration reuse

When you reset configuration reuse, previously created configurations are no longer considered. You might want to reset configuration reuse if the BOM or route was changed, but no related attributes were changed. You reset configuration reuse on the **General** FastTab for the component.

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System-defined and user-defined table constraints

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This article explains the two types of table constraints for components in a product configuration model - user-defined and system-defined. Table constraints represent matrices of the allowed attribute combinations, where each row defines one set of possible attribute values.

Table constraints represent matrices of the combinations of attributes that are allowed for components in a product configuration model. Each row in the table defines one set of possible attribute values. You can declare two types of constraints in a product configuration model:

- **Expression constraint** – Create an expression that defines relations between attributes to guarantee that only compatible values can be selected during product configuration.
- **Table constraint** – Create a table that defines all the combinations that are allowed for a specified set of attributes. Two types of table constraints are available: user-defined table constraints and system-defined table constraints.

This article describes user-defined and system-defined table constraints for components in a product configuration model.

User-defined table constraints

A user-defined table constraint is a type of matrix that is used to describe the combinations of attribute values that are defined by attribute types. For example, if you produce speakers, you can include columns for the cabinet finish and the front grill in the user-defined table constraint. The attribute type for the cabinet finish has four values, and the attribute type for the front grill has three values. Therefore, if constraints aren't used, there are $4 \times 3 = 12$ possible combinations. However, in this example, only six combinations are allowed, as shown in the following table. This information is displayed on the **Allowed combinations** tab on the **Edit table constraint** page.

CABINET FINISH	FRONT GRILL
Black	Black
Black	Metal
Oak	Black
Rosewood	White
White	Black
White	White

User-defined table constraints are defined by static table input that works the same way as an expression constraint. When you use a user-defined table constraint, the advantage is that tables are often easier to create, understand, and maintain than long expression constraints.

System-defined table constraints

A system-defined table constraint creates a dynamic mapping between an attribute type and a field in a table. When a system-defined table constraint is included in a product configuration model, the mapping guarantees that the data in the table is shown instead of the values of the attribute type. The result is a dynamic constraint, because the table contents can be modified (for example, by other modules).

When you create a system-defined table constraint, you select a table, optionally define the query to use, and then associate attribute types to the fields in the selected table. The types of fields must match the types of attribute types.

Before a table constraint can take effect on a product configuration model, the table constraint must be included in a constraint on one of the model's components. The procedure is to create a new constraint, select the table constraint type, and then select the table constraint definition to use. Finally, all fields in the table constraint must be mapped to attributes in the product configuration model.

Additional resources

[Product configuration models overview](#)

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Create product model components

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Constraint-based product configuration models use components as building blocks to establish the product model structure. The components must be created before a product model can be built. The demo data company used to create this procedure is USMF.

1. Click Product variant model definition.
2. Click Product configuration models.
3. On the Action Pane, click Model.
4. Click Components.
5. Click New.
6. In the Name field, type a value.
7. In the Description field, type a value.
8. Close the page.

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Create a product configuration model

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This procedure shows how to create a product configuration model and enter basic information such as attributes and subcomponents. The demo data company used to create this procedure is USMF.

Create a product model

1. Click Product variant model definition.
2. Click Product configuration models.
3. Click New.
4. In the Name field, type a value.
5. In the Description field, type a value.
6. In the Solver strategy field, select an option.
 - The solver strategy determines how the constraints in a constraint-based product configuration model are processed. This selection can have an impact on the performance of the product configuration model.
7. In the Name field, type a value.
 - The root component represents the product configuration model, but it can also be used in other product models.
8. Click OK.
9. In the Reuse configurations field, select an option.
 - If the reuse configurations parameter is set to Yes, the system will check for identical configurations after each configuration session and reuse if an exact match is found.

Add attributes

1. Expand the Attributes section.
2. Click Add.
3. In the list, mark the selected row.
4. In the Name field, type a value.
5. In the Solver name field, type a value.
 - The Solver name is used by the constraint solver of the product configurator. It must not include spaces or special characters except _ (underscore).
6. In the Description field, type a value.
 - The description text is displayed to the configuration user and can therefore serve as help in selecting the right attribute value.
7. In the Attribute type field, enter or select a value.
 - The attribute type determines which values are available for the attribute.
8. Select the Include in reuse check box.
 - This option is only available when the Reuse configurations option is selected. Including the attribute in the reuse check box means that this attribute will be considered when the system is looking for an exact match.

Add subcomponents

1. Expand the Subcomponents section.
2. Click Add.
3. In the list, mark the selected row.
4. In the Name field, type a value.
5. In the Solver name field, type a value.
6. In the Description field, type a value.
7. In the Component field, enter or select a value.
 - Each subcomponent must reference a component definition. This design supports reusable components and ensures that once a component has been defined it can be used in many product models.
8. Click Save.
9. Click BOM line details.
 - The BOM line details form enables the user to select the required properties for the subcomponent. Each property can be given a fixed value or mapped to an attribute. Mapping to an attribute will result in the BOM line property getting different values depending on the configuration selection.
10. In the Item number field, enter or select a value.
 - Each subcomponent represents a configurable product master with constraint-based configuration technology. The reference is made through the item number.
11. Select the Set check box.
12. Select Yes in the Calculation field.
 - Setting the calculation option ensures that the product will be included when running a cost calculation for the product.
13. Click the Setup tab.
14. Select the Set check box.
15. In the Quantity field, enter a number.
 - The quantity field determines how much of this product will be consumed in the configured product.
16. Select the Set check box.
17. In the Per series field, enter a number.
18. Click OK.

NOTE

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Add an expression constraint to a product configuration model

2/18/2021 • 2 minutes to read • [Edit Online](#)

This procedure shows how you can add a new constraint expression to a product configuration model. It shows how you can mandate that corner protection must be applied to a speaker if the user has selected a front grill in metal. The procedure uses the High end speaker component in the demo company USMF.

Create an expression constraint

1. Click Product variant model definition.
2. Click Product configuration models.
3. In the list, find and select the desired record.
 - This example uses the high end speaker model.
4. In the list, click the link in the selected row.
5. Expand the Constraints section.
6. Click Add.
7. Click Create.
8. In the Name field, type a value.

Enter expression

1. Click Edit expression.
 - If you unlock the user interface in the task recording at this stage, you can use IntelliSense and the list of symbols to build the constraint expression .
2. In the ConstraintBody field, enter 'Implies[FrontGrill=="Metal", CornerProtection] ' .
 - This expression logic states: If the Front grill is metal, then the corner protection option must be selected.
3. Click Validate.
 - The validate function runs through the constraint expression and checks for syntax errors.
4. Click Close.
5. Click OK.

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Add a calculation to a product configuration model

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This procedure shows how to add a new calculation to a product configuration model. It shows how you can create a logical expression using the "If" operator to set a speaker height to 10 for white speakers and 15 for all other cabinet finishes. The procedure uses the High end speaker component in the demo company USMF.

Add a calculation

Create calculation expression

1. Click Edit expression.
2. In the ConstraintBody field, enter 'If[CabinetFinish=="White", 10, 15]'.
3. Click Validate.
4. Click Close.
5. Click OK.

NOTE

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Maintain BOM for a product configuration model

2/18/2021 • 2 minutes to read • [Edit Online](#)

Running this procedure requires an existing product configuration model. The High end speaker model in the demo company USMF is used to create this procedure.

Add a BOM line

1. Click Product variant model definition.
2. Click Product configuration models.
3. In the list, find and select the desired record.
 - Select the High end speaker for this procedure.
4. In the list, click the link in the selected row.
5. Expand the BOM lines section.
6. Click Add.
7. In the Name field, type a value.
8. In the Description field, type a value.
9. Click Save.

Add BOM line details

1. Click BOM line details.
2. In the Item number field, enter or select a value.
 - For example, you can select the item M0055.
 - For each BOM line property, you can select if it takes a fixed value or is mapped to an attribute.
3. Select the Set check box.
4. Select Yes in the Calculation field.
 - Setting the Calculation property to Yes ensures that the BOM line is included in cost calculations.
5. Click the Setup tab.
6. Select the Set check box.
7. In the Quantity field, enter a number.
 - The quantity field determines how much of the item that will be included in the BOM. This could be an obvious candidate for an attribute mapping.
8. Click the Dimension tab.
 - Verify if any of the product dimensions are active, and therefore must have a value or attribute assigned.
9. Click OK.

NOTE

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Maintain route for a product model

2/18/2021 • 2 minutes to read • [Edit Online](#)

Running this procedure requires that a product configuration model exists. This procedure uses the High end speaker model in the demo company USMF to walk you through the process.

Add a route operation

1. Click Product variant model definition.
2. Click Product configuration models.
3. In the list, find and select the desired record.
 - Select the High end speaker model for this exercise.
4. In the list, click the link in the selected row.
5. Expand the Route operations section.
6. Click Add.
7. In the Name field, type a value.
8. In the Description field, type a value.
9. Click Save.

Enter route operation details

1. Click Route operation details.
2. In the Operation field, enter or select a value.
3. In the Oper. No. field, enter a number.
 - Operation numbers determine the route sequence.
 - Each property on a route operation can get a static value or be mapped to an attribute. Mapping to an attribute will result in the value being set as part of the configuration.
4. In the Route group field, enter or select a value.
 - The route group determines essential behavior for costing, consumption, and setup.
5. Click the Setup tab.
6. Click the Times tab.
7. In the Process qty. field, enter a number.
 - Determine how many will be processed during one operation.
8. In the Hours/time field, enter a number.
 - Enter the time ratio.
9. Select the Set check box.
10. In the Run time field, enter a number.
 - Determine the processing time for the quantity that you have specified.
11. Click the Resource requirements tab.
12. Click Add.
13. In the list, mark the selected row.
14. In the Requirement type field, select an option.
 - Decide if you want to specify specific resources or capabilities that they must possess.
15. In the Requirement field, enter or select a value.
16. Click OK.

NOTE

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Attribute-based sales prices for constraint-based product configuration

2/18/2021 • 7 minutes to read • [Edit Online](#)

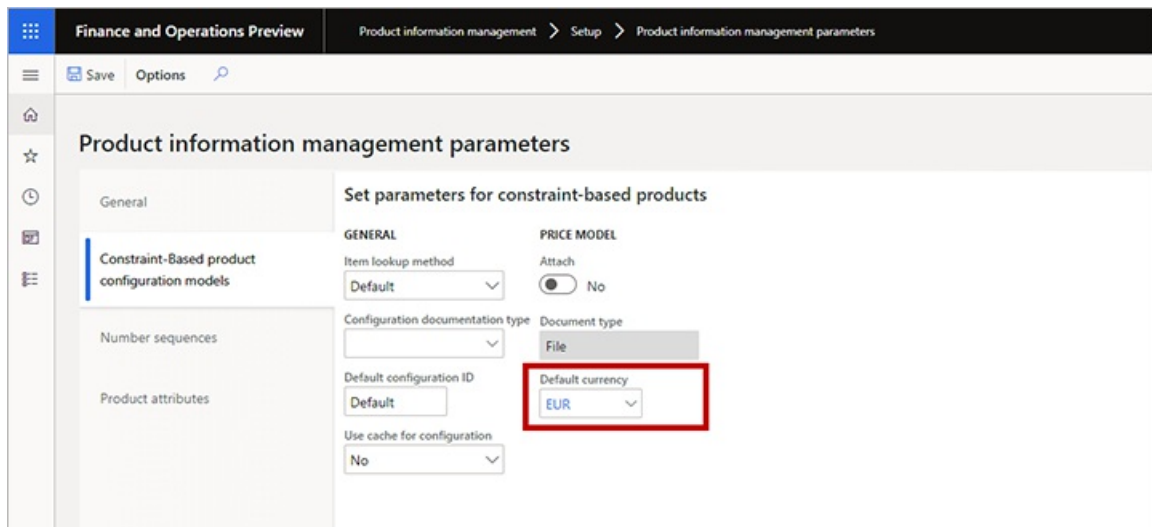
This topic describes how to build sales price models with sales prices based on components and attributes rather than on the physical bill of material and the route. You can build several sales price models for each product configuration model.

Set relevant product information management parameters

Before you start building your price models, you must define a default currency, which is used when you build your sales price models. You can also choose whether to attach a Microsoft Excel file with a price breakdown for all order or quotation lines. The price breakdown will enable you to share details with customers about how you arrived at a specific sales price for a configured product.

To set your default currency:

1. Go to **Product information management > Setup > Product information management parameters**.
2. Open the **Constraint-Based product configuration models** tab.
3. Open the **Default currency** drop-down list and select your currency.



4. If you'd like to attach an Excel file with a price breakdown for all order or quotation lines, then in the **Price model** section, set **Attach** to **Yes**.

Build your sales price models

To build a sales price model:

1. Go to **Product information management > Products > Product configuration models**.
2. Select the target product configuration model.
3. On the Action pane, open the **Model** tab and, from the **Set up** group, select **Price models**.
4. The **Price models** page opens.
5. Select a price model or add a new one to the grid.

- Select **Edit** to open the edit page for your selected model, which provides the following features:
 - The header of the form shows the default currency and lets you add new currencies for your price setup.
 - The left pane shows all the components and user requirements of the product model. Each node in the product model tree can have one base-price expression and an optional number of expression rules. An expression rule consists of a condition and an expression and each expression rule covers a product option that helps control the price of the product.
 - When you build your conditions and expressions, you have the same operators available as for calculations in a product model. The expression editor also supports both conditions and expressions.
- Select a node in the left column and then use the features described in the previous step to establish pricing rules for it (see also the example provided after this procedure). Repeat this step for each node as needed.

The following example shows a base price of a static number of 899.95 EUR, which can be modified by one or more of the following five expression rules, depending on the configuration selected by the customer:

- For white cabinet finish, subtract 59.95 EUR.
- For corner protection, add 35.95 EUR.
- For a metal front grill, add 89.95 EUR.
- For rosewood cabinet finish, add 119.95 EUR.
- Add 12.95 EUR for each unit of speaker height.

Name	Condition	Expression
All white	CabinetFinish == "White"	-59.95
Corner protection	CornerProtection	35.95
Metal front grill	FrontGrill == "Metal"	89.95
Rosewood	CabinetFinish == "Rosewood"	119.95
Speaker height		SpeakerHeight * 12.95

Add support for multiple currencies

When a configurable product is sold, the system checks whether the prices have been set explicitly in the currency of the customer. If so, the explicit values are used. If not, the system uses the currency exchange rates established for the sales company to convert the default currency value to the customer's currency.

To add explicit prices in an additional currency:

- Open the edit page for your price model, as described in [Build your sales price models](#).
- Select the **Add** button in the header of the price model to open the **Currencies** drop-down dialog box, which lists the available currencies.
- Select the currency you want to add in the **Currencies** drop-down dialog box and then select **OK**.
- The **Current currency** drop-down list now includes the currency that you just added, plus any other currencies that may have been added previously. Select your new currency and notice that the grid in the **Expression rules** section now includes two expression fields:

- **Expression** - Shows the expression (or constant value) for finding the price using the currency currently selected for **Current currency**.
- **Default expressions** - Shows the expression (or constant value) for finding the price using the default currently (shown in the **Default currency** field).

NOTE

The **Condition** field for the expression rules is "owned" by the default currency, which means that you can't modify the condition for other currencies. You also can't add new expression rules while a currency other than the default currency is selected as the **Current currency**.

5. Edit values in the **Expression** column as needed for the current currency.

In the example below, *EUR* is the default currency, and *USD* has been added as an additional currency.

The screenshot shows the 'Standard prices' configuration for 'SPEAKER SOLUTION'. The 'Current currency' is set to USD. The 'Expression rules' table is as follows:

Name	Condition	Expression	Default expression
All white	CabinetFinish == "White"	-79.95	-59.95
Corner protection	CornerProtection	59.95	35.95
Metal front grill	FrontGrill == "Metal"	109.95	83.95
Rosewood	CabinetFinish == "Rosewood"	159.95	119.95
Speaker height		SpeakerHeight * 15.95	SpeakerHeight * 12.95

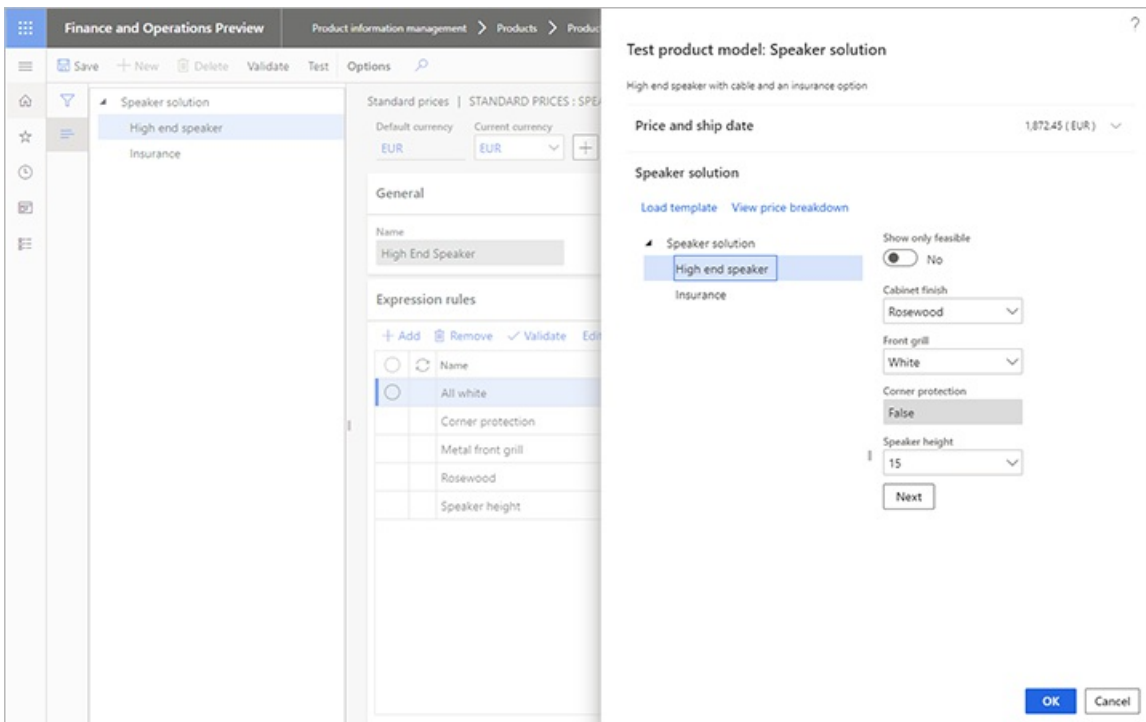
NOTE

You can't add expression rules that are unique for a non-default currency. To create expression rules that would be relevant only for a currency other than the default currency, set the price expression for the default currency to zero. Then set the appropriate expression for the non-default currency.

Test your price model

To test how the sales prices work in a configuration session, open the edit page for your price model, as described in [Build your sales price models](#) and then select **Test** on the Action Pane. The **Test product model** dialog box opens, where you can do the following:

- Use the configuration settings offered here to select product options and then see how they affect the value shown for **Price and ship date**.
- Select **View price breakdown** to download an Excel document that shows full details about how the price was calculated.



The downloaded spreadsheet shows both the absolute value and the contribution as a percentage for each active price element. If you have set the **Attach** price model option on the **Product information management parameters** page, this Excel sheet gets attached to the order or quotation line.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	
1	Price breakdown																
2	Test product model: Speaker solution																
3																	
4																	
5																	
6																	
7	Time of configuration: 8/17/2020 03:44:19 am										Total sales price		1,872.45		EUR		
8																	
9							Price		Price element		By percentage		By percentage				
10	Test product model: Speaker solution						1,872.45				100						
11	Speaker solution						578.40				30.90						
12		<i>Base price</i>							299.95					16.02			
13		<i>Cable included</i>							69.95					3.74			
14		<i>Cable size 30</i>							208.50					11.14			
15	High end speaker						1,214.15				64.85						
16		<i>Base price</i>							899.95					48.07			
17		<i>Rosewood</i>							119.95					6.41			
18		<i>Speaker height</i>							194.25					10.38			
19	Insurance						79.90				4.27						
20		<i>Insurance period</i>							79.90					4.27			
21																	

Set up selection criteria for price models

When your price models are in place, you must establish at least one selection criterion to pick up the price model when you configure to quote or to order. You'll do this by setting up one or more queries. In a combination with matching sales price models, the queries provide great flexibility in targeting sales prices for particular customers, regions, periods, and other criteria.

To set up selection criteria for price models:

1. Go to **Product information management > Products > Product configuration models**.
2. Select the target product configuration model.
3. On the Action pane, open the **Model** tab and, from the **Set up** group, select **Price model criteria**. The **Price model criteria** page opens.
4. If the query row you need doesn't exist yet, select **New** on the Action Pane to add a new row to the grid and make the following settings for it:

- **Name** - Enter a name for this row.
- **Description** - Briefly describe the query and what it is for.
- **Price model** - Select a **price model** (from the current configuration model) that the query will apply when triggered.
- **Order type** - Select the type of order where the query will apply.
- **Valid from** - Specify the first day when the query will apply.
- **Expire by** - Specify the last date when the query will apply.

Name	Description	Price model	Order type	Valid from	Expire by
Standard prices - orders	Query for standard prices on sal...	Standard prices	Sales order	11/1/2013	12/31/2154
Standard prices - customer quo...	Query for standard prices on ou...	Standard prices	Quotation type customer	11/1/2013	12/31/2154
Standard prices - prospects	Query for standard prices on pr...	Standard prices	Quotation type prospect	11/1/2013	12/31/2154

5. Select the row for the query you want to define and then select **Edit** on the **Action Pane**. The query designer dialog box opens. It works like most query designers in Supply Chain Management. Use it to define the conditions under which the price model for the row you selected should be applied.
6. Repeat steps 4-5 for each query you require.

TIP

You can save time by copying an existing row that is already similar to a new one that you need to add. To do this, select a target row and then select **Duplicate** on the Action Pane.

7. When you have finished setting up your criteria, arrange them into the proper order in the **Price model criteria** list. To reposition a row, select the row and then select **Up** or **Down** on the Action Pane.

IMPORTANT

At configuration time, the system starts searching from the top of the list and uses the first query that matches the data on the quote or the order line. Therefore, you must put your most specific queries on top. If you place a general query at the top of the list, this is the one that will be used even though there might be a query further down the list that targets the exact customer or prospect of the configuration.

Set attribute-based sales prices for the product model version

The final step is to specify attribute-based sales prices for the product model version. To do this:

1. Go to **Product information management > Products > Product configuration models**.
2. Select the target product configuration model.
3. On the Action Pane, open the **Model** tab and, from the **Product model details** group, select **Versions**.
4. The **Versions** page opens. Make sure the **Pricing method** is set to **Attribute based**.

Finance and Operations Preview | Product information management > Products > Product configuration models

Edit + New Delete Approve Activate Options

Versions | SPEAKER SOLUTION

Filter

Product number	From date	To date	Approved	Approver	Active	Pricing method
D0006	1/3/2009	12/31/2154	✓	000019	✓	Attribute based

NOTE

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Approve a product configuration model

2/18/2021 • 2 minutes to read • [Edit Online](#)

Running this procedure requires that at least one product configuration model is available. This procedure uses the High end speaker model in the demo data company USMF. Note that this model has already been approved, but the procedure walks you through the entire process.

1. Click Product variant model definition.
2. Click Product configuration models.
3. In the list, find and select the desired record.
 - Select the High end speaker model for this procedure.
4. Click Versions.
5. Click New.
6. In the Product number field, enter or select a value.
 - The reference to a product represents a version of a product configuration model. Only product masters which have the constraint-based configuration technology will appear in this list.
7. In the From date field, enter a date.
 - Select when the product model version will be available.
8. In the To date field, enter a date.
 - Select an end date when this product model version will expire, or select Never.
9. Click Approve to open the drop dialog.
10. In the Approved by field, enter or select a value.
 - Select the person who is responsible for approving product models for use in operations.
11. Click OK.
12. In the Pricing method field, select an option.
 - Activate the product model version. It is only possible to have one product active for one product model at a time.
13. Close the page.

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Transfer data for product models

2/18/2021 • 2 minutes to read • [Edit Online](#)

Exporting data for a product configuration model requires that you have at least one product model available. This procedure uses the High end speaker model in the demo company USMF to show you how to export data for this model.

1. Click Product variant model definition.
2. Click Product configuration models.
3. In the list, find and select the desired record.
 - Select the High end speaker model for this procedure.
4. On the Action Pane, click Model.
5. Click Export product model.
 - The download behavior varies from browser to browser depending on how the security settings are set up.

NOTE

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Troubleshoot the product configurator

2/18/2021 • 2 minutes to read • [Edit Online](#)

This topic describes how to fix issues that you might encounter while you work with the product configurator.

Item text is overwritten when I configure a product on a sales order line.

Issue description

This issue occurs when you create a sales order line for a configurable item and then modify the item text. When you configure the item and then select **OK**, the text is overwritten with the standard text.

Issue resolution

This behavior is expected. The text field includes the variant name, which is filled in only after you configure the line. Therefore, you must change the text after you've configured the line, not before.

Integer attributes are incorrectly rounded when product configuration models are calculated.

Issue description

This issue can occur when you perform the following series of actions:

1. Set up the following attributes on a production configuration model:
 - Input (integer)
 - Percent (decimal)
 - Result (integer)
2. Create a calculation that has the following expression:

$$\text{Result} = \text{Input} \times \text{Percent} \div 100$$

In this case, the integer result isn't always correctly rounded. For example, the input is 1,000, and the percentage is 2.40. Therefore, you expect the integer result to be 24, because 2.40 percent of 1,000 is 24 (or 24.00 in decimal form). Instead, the result is shown as 23. However, when the percentage is 2.39, the calculation is rounded to 24 instead of 23. When the percentage is 2.50, the calculation is rounded to 25, as expected.

Issue resolution

This issue occurs because of the way that Microsoft Solver Foundation internally represents numbers by using fractions. For the preceding example, the result of the calculation where the percentage is 2.40 is represented as $27021597764222975 \div 1125899906842624 = 23.999999999999991182158029987476766109466552734375$. When .NET casts this value as an integer, it will return 23.

This behavior won't be changed, because other scenarios depend on it. For the preceding example, you can fix the issue by introducing an additional decimal attribute and a calculation.

For example, you can set up the following attributes on a production configuration model:

- Input (integer)
- Percent (decimal)

- `ResultDecimal` (decimal)
- `ResultInteger` (integer)

You can then add the following calculations:

- $ResultDecimal = Input \times Percent \div 100$
- $ResultInteger = ResultDecimal$

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Engineering change management overview

2/18/2021 • 2 minutes to read • [Edit Online](#)

Feature summary

Today's manufacturers require strong product data management, version control, and engineering change management to succeed in a world of constantly shrinking product lifecycles, increased quality and reliability requirements, and an increased focus on product safety.

Engineering change management brings structure and discipline to the product data management process, and enables products to be defined, released, and revised in a controlled manner that is supported by workflows. Through product versions and engineering change management, you can document, assess the impact of, and apply engineering changes throughout the whole lifecycle of a product.

Engineering change management helps you plan and manage product versioning, and manage product lifecycles and engineering changes. Here is a list of its main features:

- Product versioning
- Enhanced product release functionality that lets you maintain product master data in one legal entity (the engineering company) and publish the fully configured released product to other legal entities
- Rules for validating that required information is entered before a product version is activated (readiness checks)
- Improved product lifecycle management through fine-grained control over when a released product can be used in specific business processes
- Engineering change requests that are supported by workflows
- Engineering change orders that are supported by workflows

The preceding video ([Change management capabilities in Dynamics 365 Supply Chain Management](#)) is included in the [Finance and Operations playlist](#) available on YouTube.

Turn on the engineering change management and version dimension features for your system

Before you can use engineering change management, you must enable both the *Engineering Change Management* feature and its configuration key. If you also want to track the version dimension of products in transactions (optional), then you must also enable the *Product version dimension* feature and its configuration key.

First, turn on the features by following these steps.

1. Go to [Feature management](#).
2. Check for updates.
3. Turn on the feature that is named **Engineering Change Management**.
4. If you want to use it, then also turn on the feature that is named **Product dimension version**.

Next, turn on the configuration keys by following these steps.

1. Put your system into maintenance mode, as described in [Maintenance mode](#).
2. Go to **System administration > Setup > License configuration**.

3. Expand the **Trade** node
4. Select the **Engineering Change Management** check box.
5. If you want to use it, then also select the **Product dimension - Version** check box.
6. Turn off maintenance mode, as described in [Maintenance mode](#).

NOTE

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Engineering change management feature walkthrough

2/18/2021 • 15 minutes to read • [Edit Online](#)

This topic provides an end-to-end walkthrough that shows how to work with engineering change management. It goes through each of the most important scenarios:

- Basic feature configuration
- How an engineering company creates a new engineering product
- How an engineering company releases an engineering product to a local company
- How a local company can review and accept a product that has been released to it by an engineering company
- How a local company can use an engineering product in standard transactions
- How to add an engineering product to a sales order
- How to request changes to an engineering product by creating an engineering change request
- How to schedule and implement requested changes by creating an engineering change order
- How to release a product that has been changed

All the exercises in this topic use the standard sample data that is provided for Microsoft Dynamics 365 Supply Chain Management. Additionally, each exercise builds on the previous exercise. Therefore, we recommend that you work through the exercises in order, from beginning to end, especially if you've never used the engineering change management feature before. In this way, you will gain a complete understanding of the feature.

Set up for the sample scenario

To follow the sample scenario that is provided in this topic, you must first prepare the feature by making demo data available and adding a few custom records.

Before you try to do any of the exercises in the rest of this topic, follow the instructions in all the following subsections. These subsections also introduce several important settings pages that you will use when you set up engineering change management for your own organization.

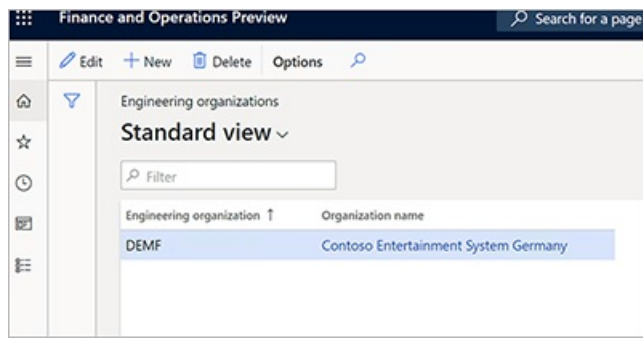
Make standard demo data available

Work on a system where the [standard demo data is installed](#). The standard demo data adds data for several demo legal entities (companies and organizations). As you work through the exercises, you will use the company picker on the right side of the navigation bar to switch between one company (*DEMF*) that is set up as an *engineering organization* and another company (*USMF*) that is set up as an *operational organization*.

Set up an engineering organization

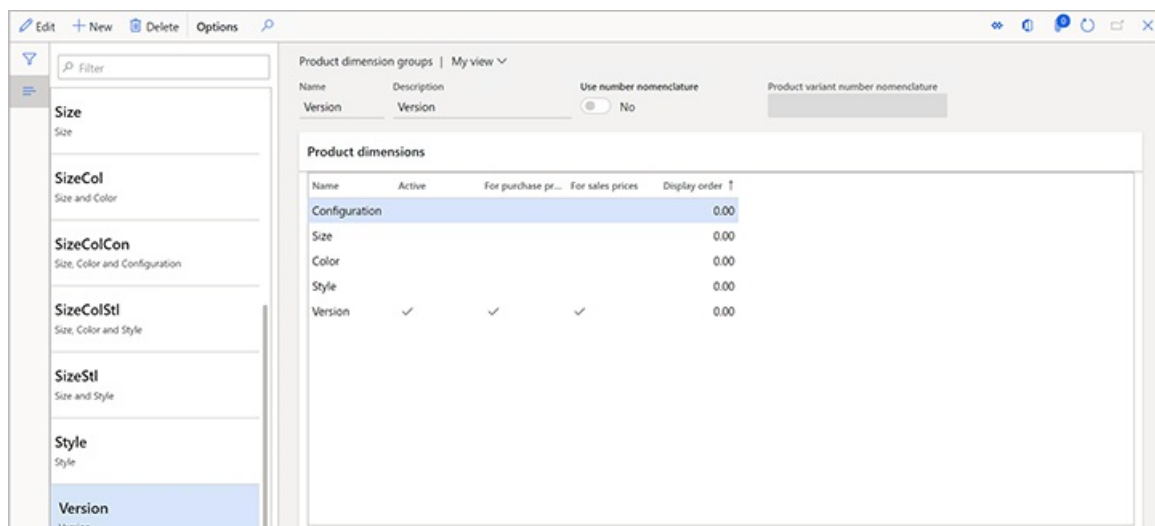
An engineering organization owns the engineering data, and is responsible for product design and product changes. To set up your engineering organizations, follow these steps.

1. Go to **Engineering change management > Setup > Engineering organizations**.
2. Select **New** to add a row to the grid, and set the following values for it:
 - **Engineering organization:** *DEMF*
 - **Organization name:** *Contoso Entertainment System Germany*



Set up the version product dimension group

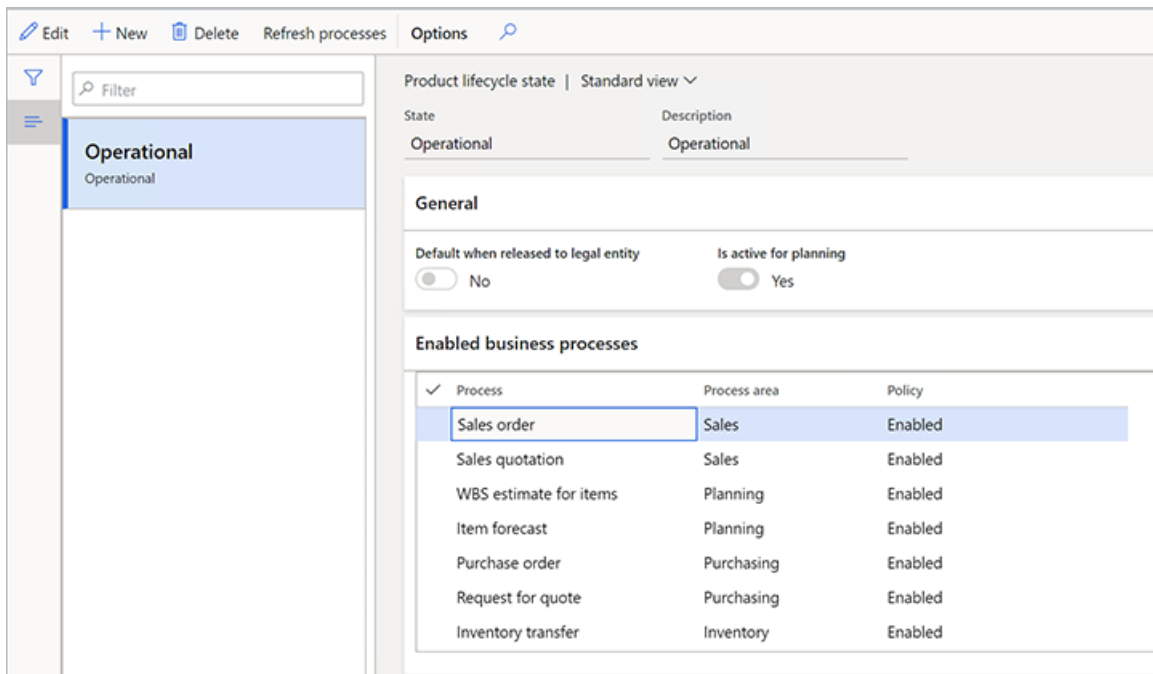
1. Go to **Product information management > Setup > Dimensions and variant groups > Product dimension groups**.
2. Select **New** to create a product dimension group.
3. Set the **Name** field to *Version*.
4. Select **Save** to save the new dimension and load values onto the **Product dimensions** FastTab.
5. On the **Product dimensions** FastTab, set **Version** as an active product dimension.



Set up product lifecycle states

As an engineering product goes through its lifecycle, it's important that you be able to control which transactions are allowed for each lifecycle state. To set up the product lifecycle states, follow these steps.

1. Go to **Engineering change management > Setup > Product lifecycle state**.
2. Select **New** to add a lifecycle state, and set the following values for it:
 - **State:** *Operational*
 - **Description:** *Operational*
3. Select **Save** to save the new lifecycle state and load values onto the **Enabled business processes** FastTab.
4. On the **Enabled business processes** FastTab, select the business processes that should be available. For this example, leave the **Policy** field set to *Enabled* for all business processes.

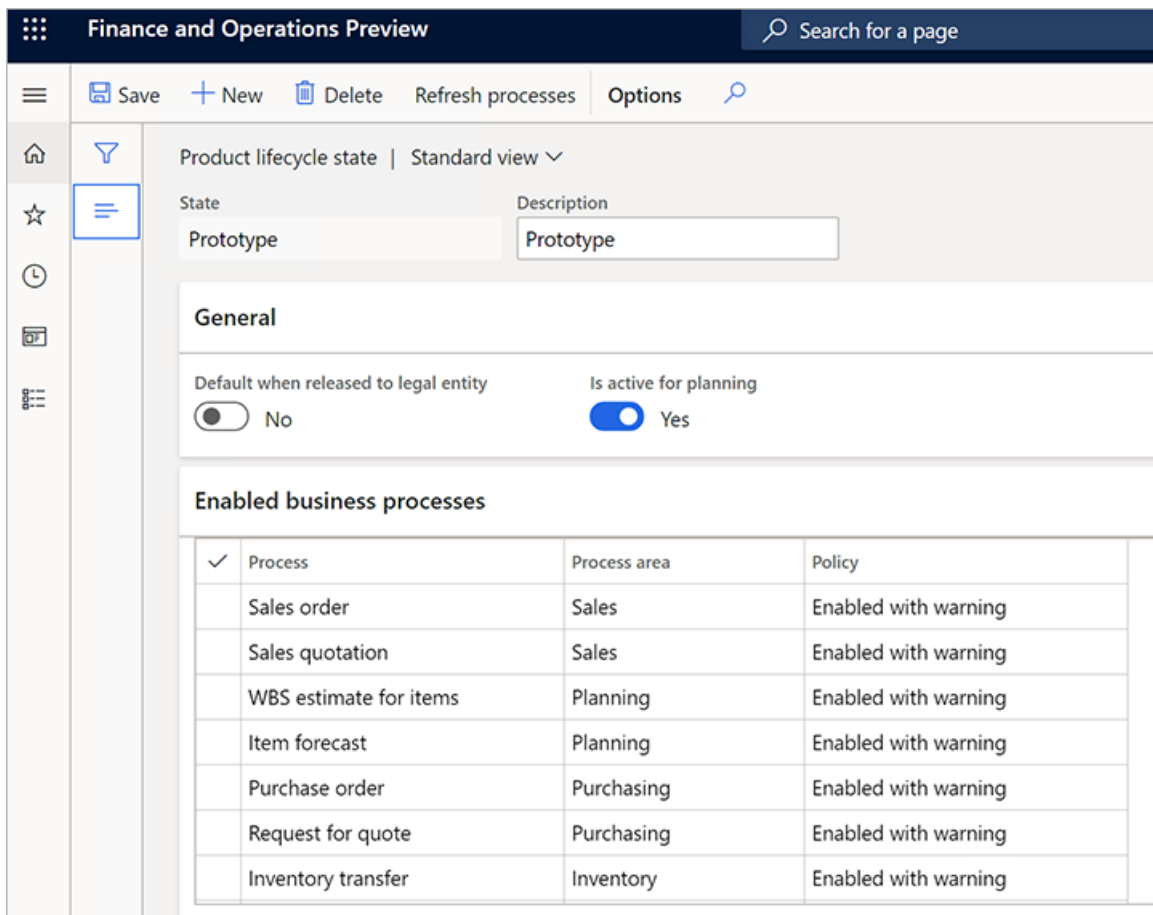


5. Select **New** to add another lifecycle state, and set the following values for it:

- **State:** *Prototype*
- **Description:** *Prototype*

6. Select **Save** to save the new lifecycle state and load values onto the **Enabled business processes** FastTab.

7. On the **Enabled business processes** FastTab, select the business processes that should be available. For this example, set the **Policy** field to *Enabled with warning* for all business processes.

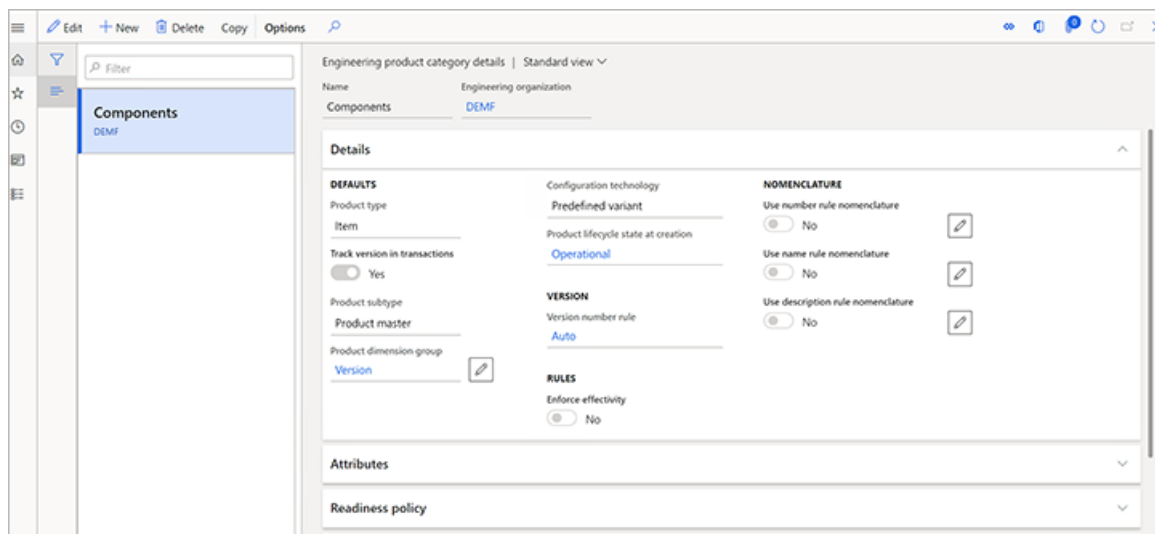


Set up a version number rule

Set up an engineering product category

Engineering product categories provide the basis for creating engineering products (that is, products that are versioned and controlled through engineering change management). To set up engineering product categories, follow these steps.

1. Go to **Engineering change management > Engineering product category details**.
2. Select **New** to create a category.
3. On the **Details** FastTab, set the following values:
 - **Name:** *Components*
 - **Engineering organization:** *DEMF*
 - **Product type:** *Item*
 - **Track version in transactions:** *Yes*
 - **Product dimension group:** *Version*
 - **Product lifecycle state at creation:** *Operational*
 - **Version number rule:** *Auto*
 - **Enforce effectivity:** *No*
 - **Use number rule nomenclature:** *No*
 - **Use name rule nomenclature:** *No*
 - **Use description rule nomenclature:** *No*
4. On the **Release policy** FastTab, set the **Product release policy** field to *Components*.
5. Select **Save**.



Set up product acceptance conditions

1. Use the company picker on the right side of the navigation bar to switch to the *USMF* legal entity (company).
2. Go to **Engineering change management > Setup > Engineering change management parameters**.
3. On the **Release control** tab, in the **Product acceptance** section, set the **Product acceptance** field to *Manual*.

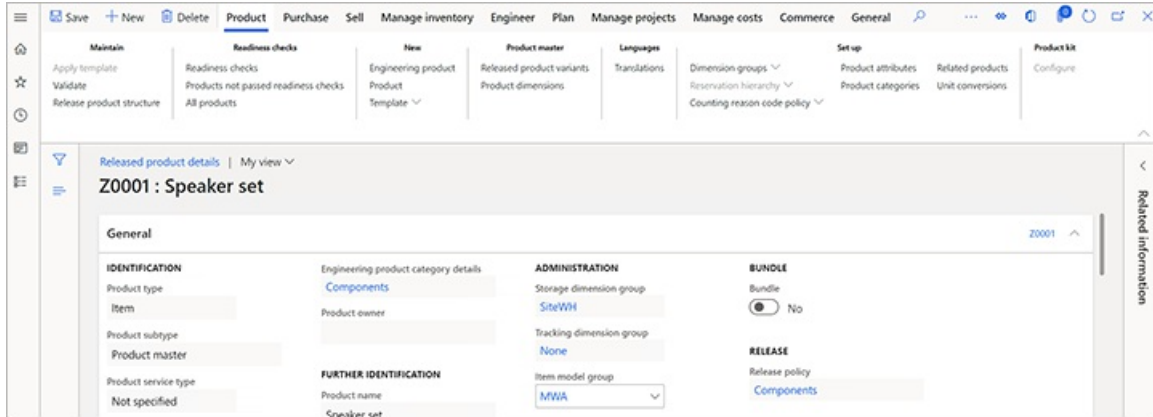
Create a new engineering product

An engineering product is a product that is versioned and controlled through engineering change management. In other words, you can control the changes during its life, and the change information will be saved using engineering change orders. To create engineering products, follow these steps.

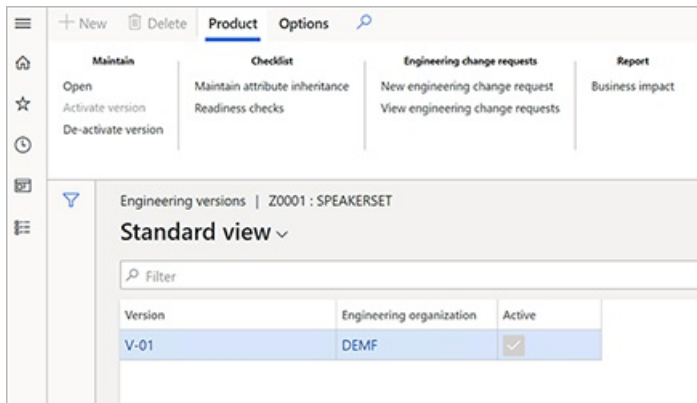
1. Make sure that you're in the legal entity of your engineering organization (*DEMF* for this example). Use the company picker on the right side of the navigation bar as required.
2. Open the **Released products** page by following one of these steps:
 - Go to **Product information management > Products > Released products**.
 - Go to **Engineering change management > Common > Released products**.
3. On the Action Pane, on the **Product** tab, in the **New** group, select **Engineering product**.
4. In the **New product** dialog box, set the following values:
 - **Engineering Product Category:** *Components*
 - **Product number:** *Z0001*
 - **Product name:** *Speaker set*

Note that the **Version** field is automatically set by using the product version number rule that you set up earlier.

- Select **OK** to create the product and close the dialog box.
- The details page for the new product is opened. Notice that values are already filled in for some fields, such as **Storage dimension group**, **Tracking dimension group**, and/or **Item model group**. These fields were automatically set because the product is being released in the *DEMF* legal entity and uses the *Components* product release policy, which is associated with the *Components* engineering product category. Because you previously used item *D0006* as a template to set up a line for the *DEMF* legal entity, the values that were filled in were taken from item *D0006*.

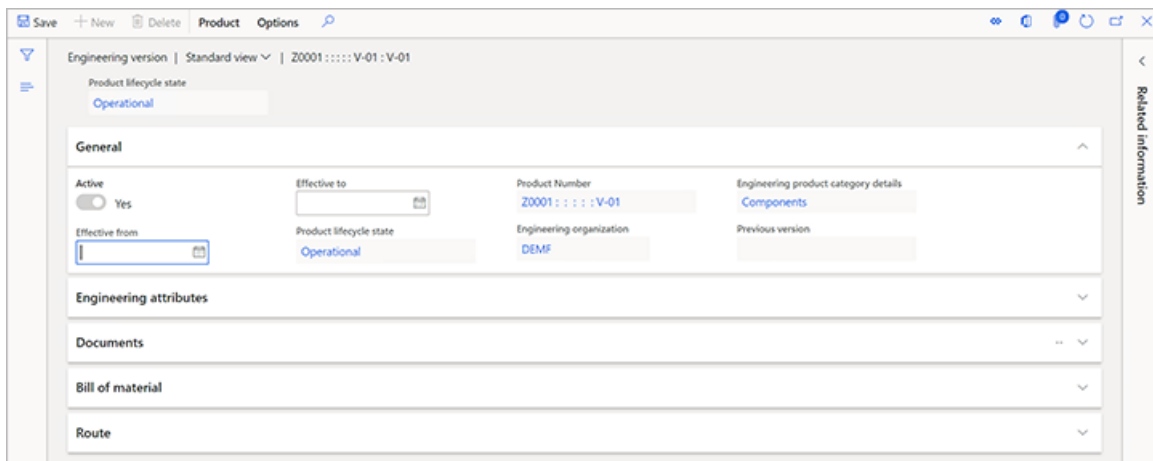


- On the Action Pane, on the **Engineer** tab, in the **Engineering change management** group, select **Engineering versions** to view the versions of the product.



- On the **Engineering versions** page, notice that there is only one version for the product, and it's active.

- Select the version to view its details.



- On the **Engineering version** page, on the **Bill of material** FastTab, select **Create BOM**.

- In the **Create BOM** dialog box, set the following values:

- **BOM number:** Z0001

- Name: Speaker set
- Site: 1

12. Select **OK** to add the BOM and close the dialog box.

13. On the **Bill of materials** FastTab, select **Bill of material**.

14. On the **Bill of materials** page, on the **Bill of materials lines** FastTab, add three lines, one each for item numbers *D0001*, *D0003*, and *D0006*.

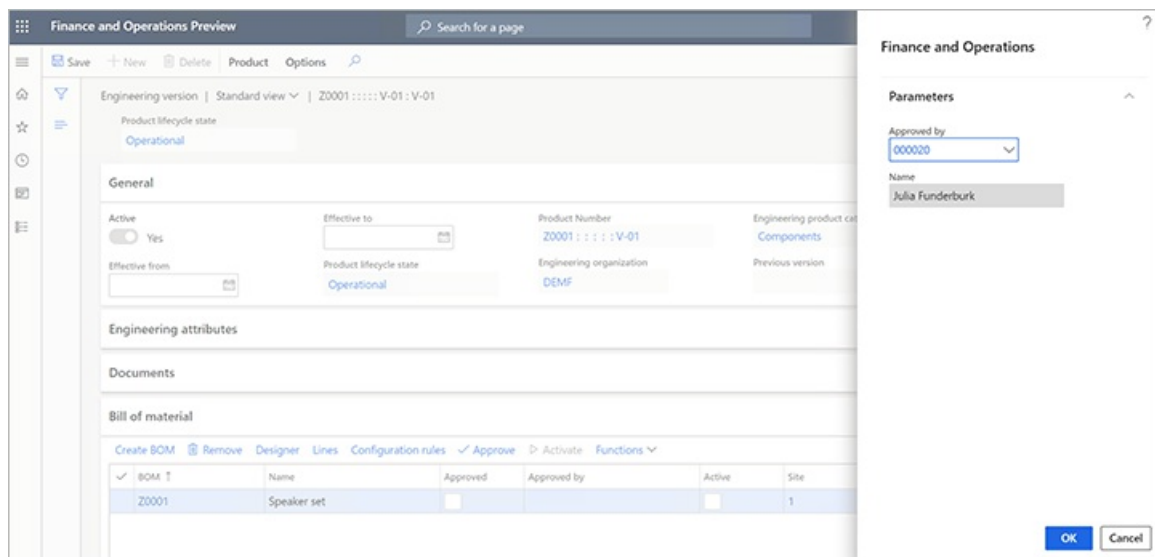
Item number	Configuration	Size	Color	Style	Version	Warehouse	Resource cons.
D0006	Default						<input type="checkbox"/>
D0001						11	<input type="checkbox"/>
D0003						11	<input type="checkbox"/>

15. Select **Save**.

16. Close the page.

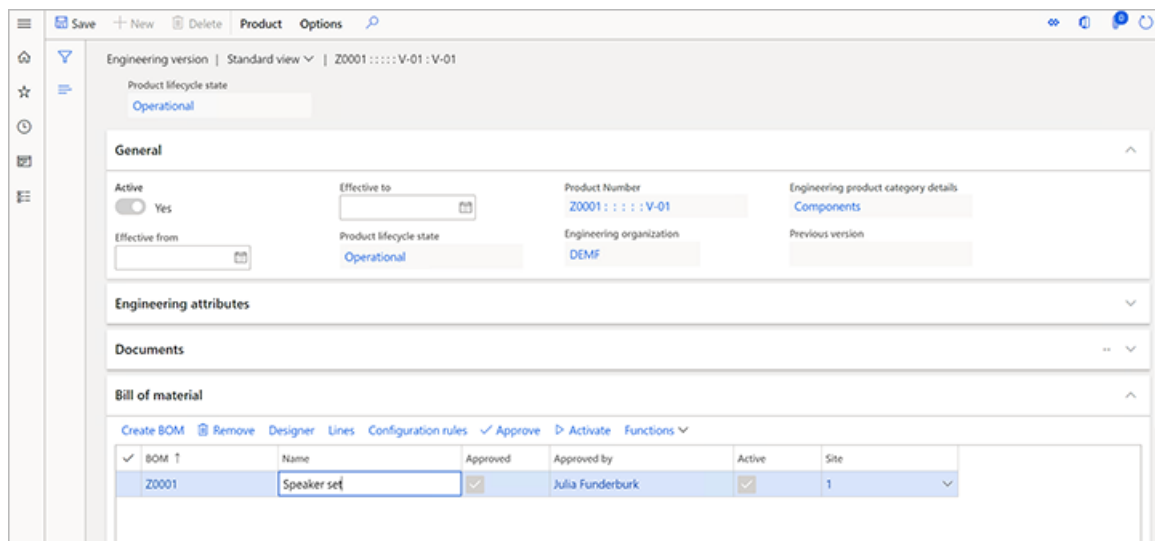
17. On the **Engineering version** page, on the **Bill of material** FastTab, select **Approve**.

18. In the dialog box that appears, select **OK**.



19. On the **Engineering version** page, on the **Bill of material** FastTab, select **Activate**.

20. Notice that the **Active** and **Approved** check boxes are selected for the BOM.

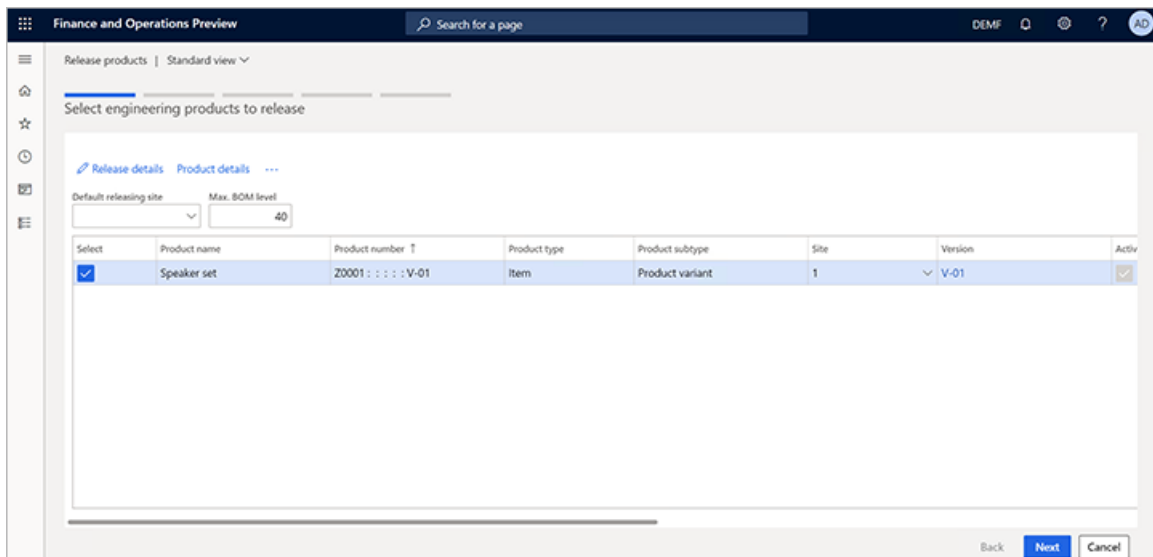


21. Close the page.

Release an engineering product to a local company

The product has now been designed by the Engineering department. For this example, the product is a prototype that engineering has designed for a customer. Because the customer is a customer of the *USMF* legal entity, the product must be released to that legal entity.

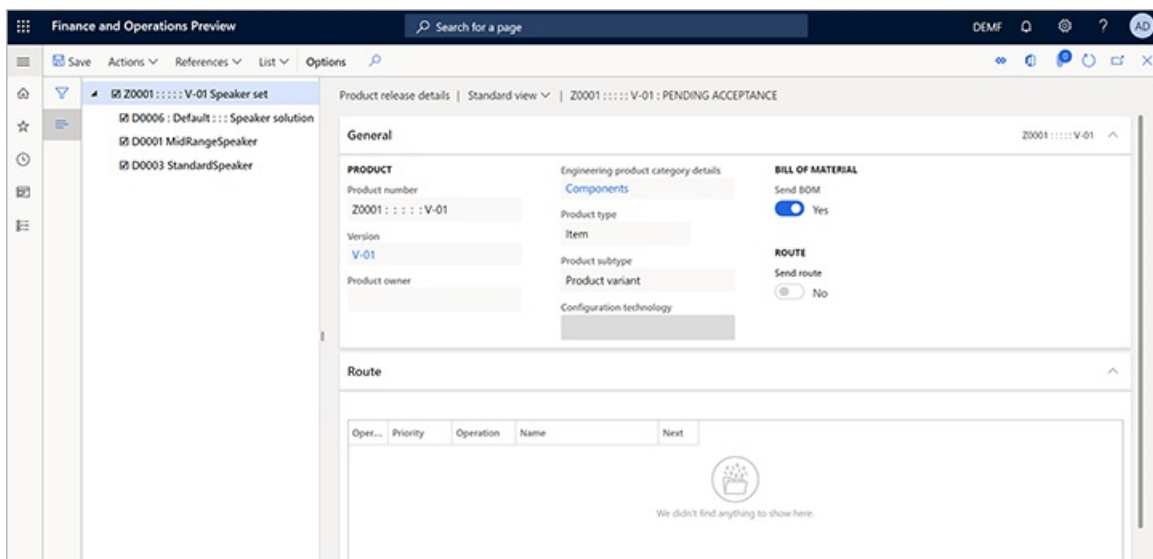
1. Keep the legal entity set to *DEMF*. (Use the company picker on the right side of the navigation bar as required.)
2. Go to **Product information management > Products > Released products**.
3. Select product *Z0001*.
4. On the Action Pane, on the **Product** tab, in the **Maintain** group, select **Release product structure** to open the **Release products** wizard.
5. On the **Select engineering products to release** page, select the **Select** check box for product *Z0001*.



6. Select **Release details**.

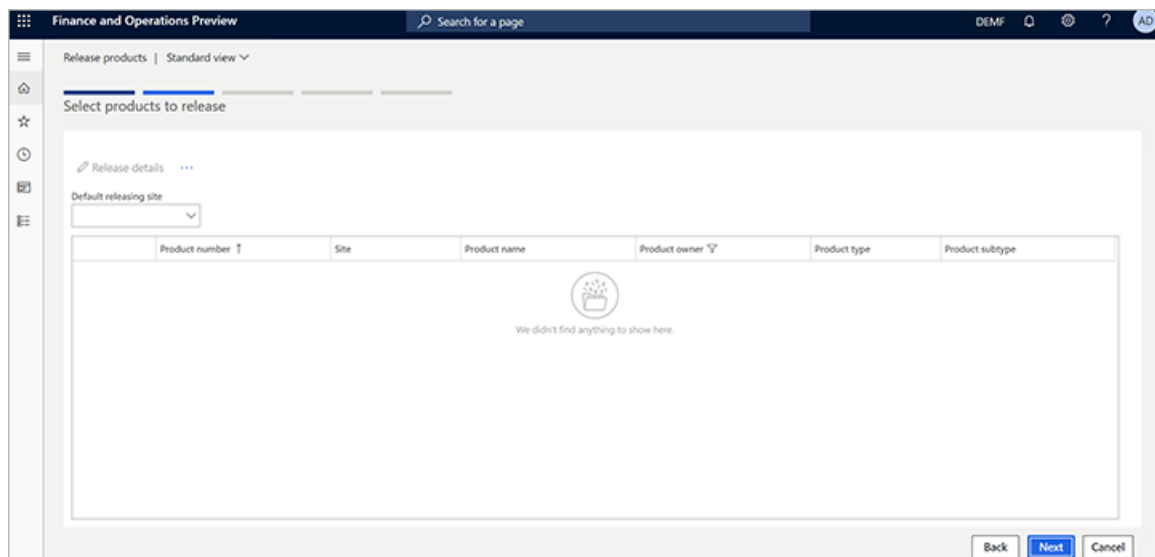
7. The **Product release details** page appears, where you can review the details of the product that will be released, and its product structure. Notice that the **Send BOM** option is set to **Yes**. Therefore, both product *Z0001* and all its child items from the BOM will be released.

You can select any child item in the left pane to review its details. If any child item has a BOM, you can also select to release the BOM of that child item.



8. Close the page to return to the **Release products** wizard.

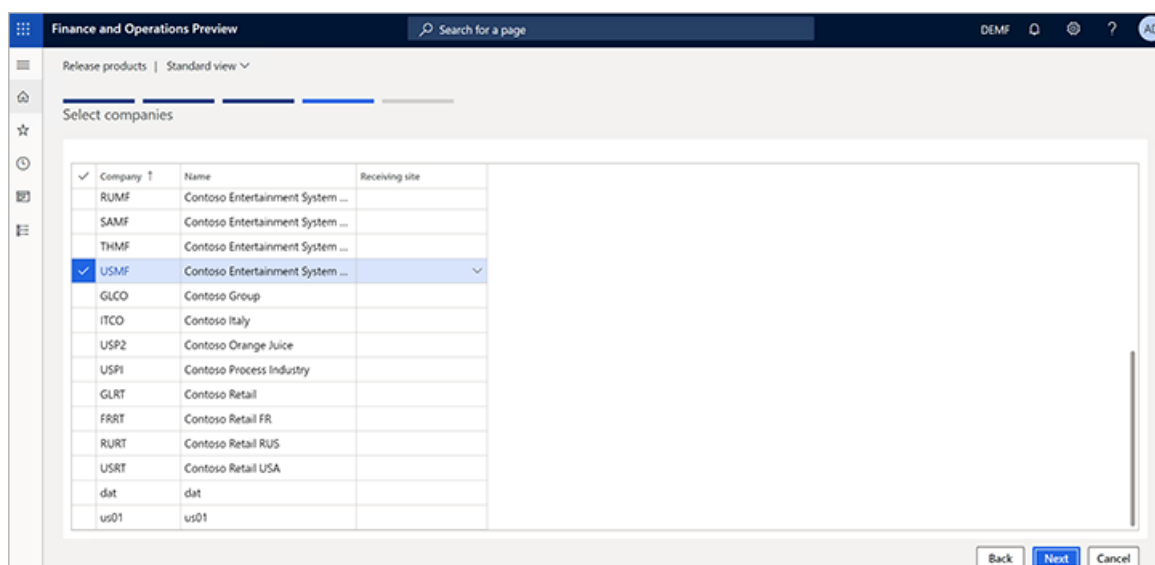
9. Select **Next** to open the **Select products to release** page. If you had selected any standard (non-engineering) products, they would appear on this page. Note that when you release a standard product by selecting **Release product structure**, its BOM and route are also released.



10. Select **Next** to open the **Select product variants to release** page. For this example, there aren't any variants.

11. Select **Next** to open the **Select companies** page.

12. Select the companies that the product should be released to. For this example, select the check box for **USMF**.



13. Select **Next** to open the **Confirm selection** page.

14. Select **Finish**.

Review and accept the product before you release it in the local company

The Engineering department has now released the information to the local companies where the product will be used. For this example, the local company is *USMF*.

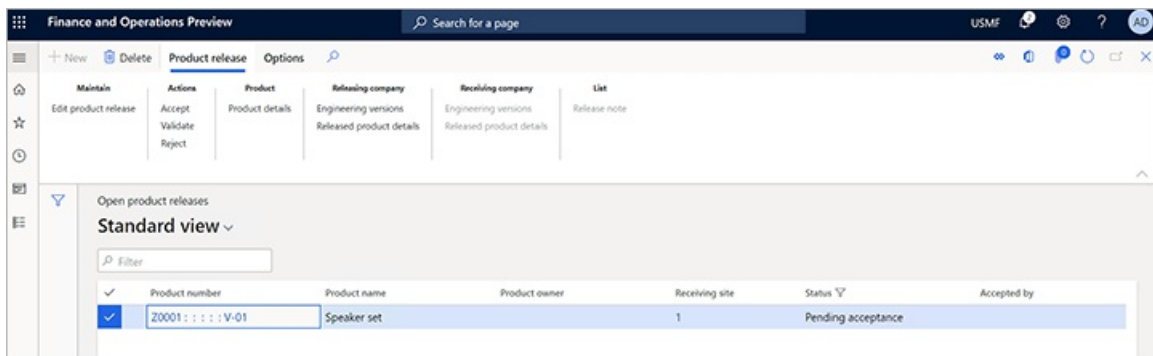
Because you set the **Product acceptance** field to *Manual* on the **Engineering change management parameters** page for the *USMF* company, products must be manually accepted before they are released to that company. In other words, they must be reviewed and accepted before they become released products.

To review the product and release it in the *USMF* company, follow these steps.

1. Set the legal entity to *USMF*. (Use the company picker on the right side of the navigation bar.)

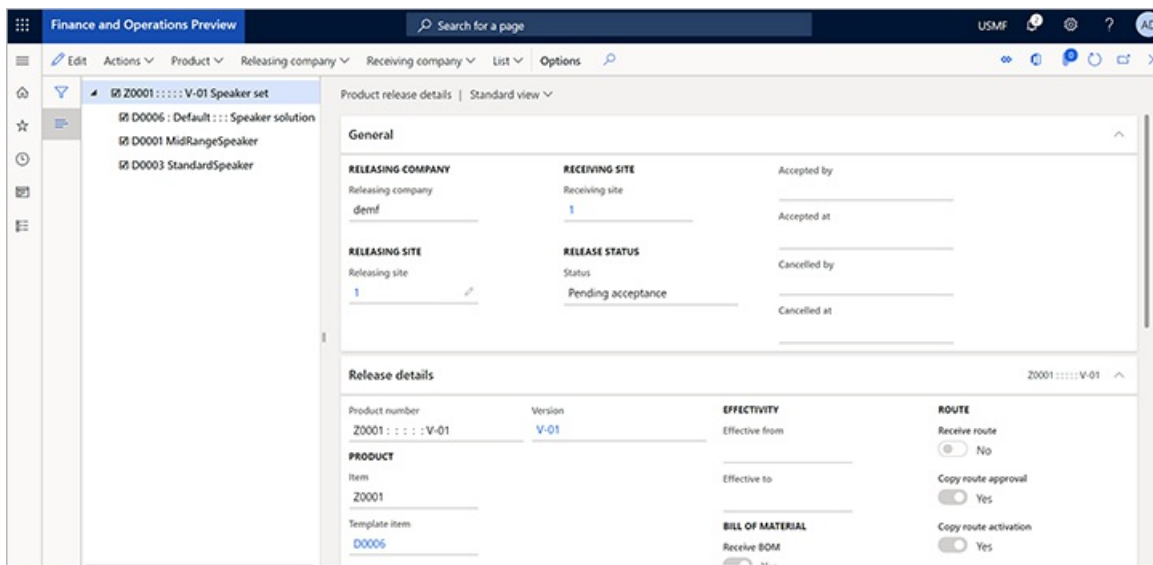
- Go to **Engineering change management > Common > Product releases > Open product releases**.

The **Open product releases** page shows product *Z0001*, which has a status of *Pending acceptance*.



- Select the value in the **Product number** column to open the **Product release details** page. Notice the following details:

- The **General** FastTab shows information about the product release, such as the releasing company (*DEMF* for this example), the releasing site (*1*), and the receiving site (*1*). Because you didn't specify a receiving site in the **Release products** wizard, the releasing site value is copied to the receiving site.
- The **Release details** FastTab shows information about the product and the version that was released. Here, you can modify settings such as the effectivity dates.
- The **Route** FastTab shows the route of the product. However, for this example, you didn't release any routes.



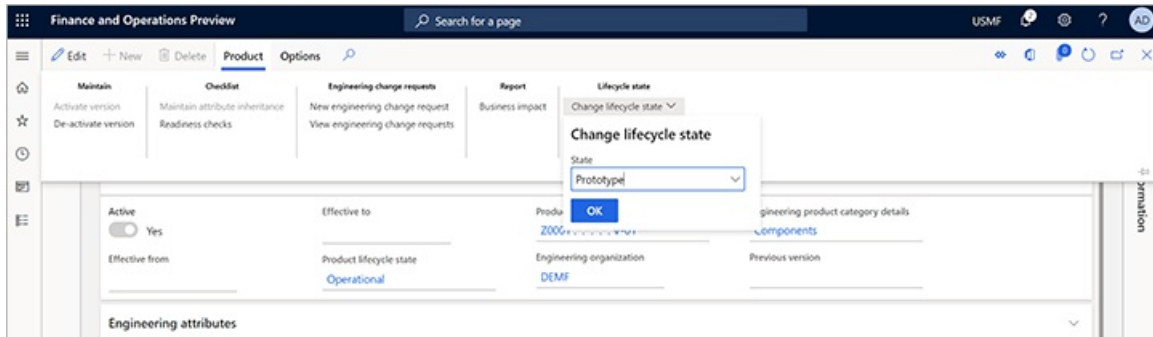
- When you've finished reviewing the information, you're ready to accept the product and, in this way, release it in the *USMF* company. On the Action Pane, select **Actions > Accept**.
- The product is now released in the *USMF* company. Go to **Product information management > Products > Released products**. You should see item *Z0001*.

Use the product in transactions in the local company

The master data manager for the *USMF* company wants to make sure that the product is in a *Prototype* state, to ensure that users will be warned if they accidentally add it to processes that they are working on.

- Go to **Product information management > Products > Released products**.
- Select product *Z0001* to open its details page. (You can use the filter to find the product.)

3. On the Action Pane, on the **Engineer** tab, in the **Engineering change management** group, select **Engineering versions**.
4. On the **Engineering versions** page, select version number *V-01* to open its details page.
5. On the Action Pane, on the **Product** tab, in the **Lifecycle state** group, select **Change lifecycle state**.
6. In the **Change lifecycle state** drop-down dialog box, set the **State** field to *Prototype*, and then select **OK**.

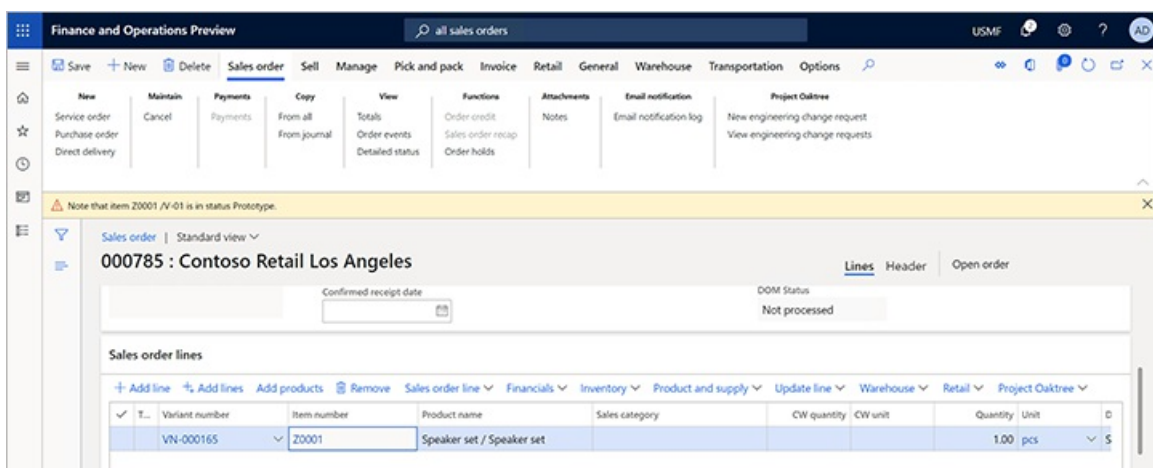


Add the engineering product to a sales order

The product can now be sold to a customer. To add the product to a sales order, follow these steps.

1. Go to **Sales and marketing > Sales orders > All sales orders**.
2. On the Action Pane, select **New**.
3. In the **Create sales order** dialog box, set the **Customer account** field to *US-0002*, and then select **OK**.
4. The new sales order is opened. On the **Sales order lines** FastTab, add a row, and set the **Item number** field to *Z000* for it.
5. On the Action Pane, select **Save**.

You receive a warning message that informs you that the item has a status of *Prototype*. However, because the message is just a warning, the sales order was still created.

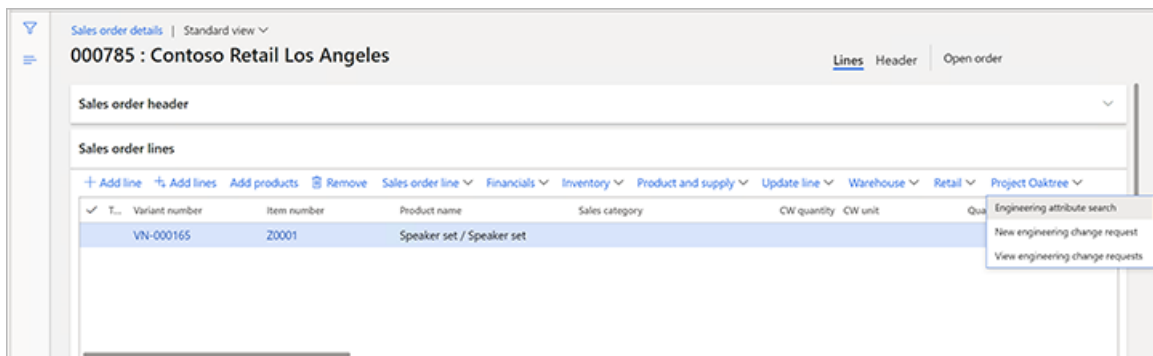


Request changes in the engineering product

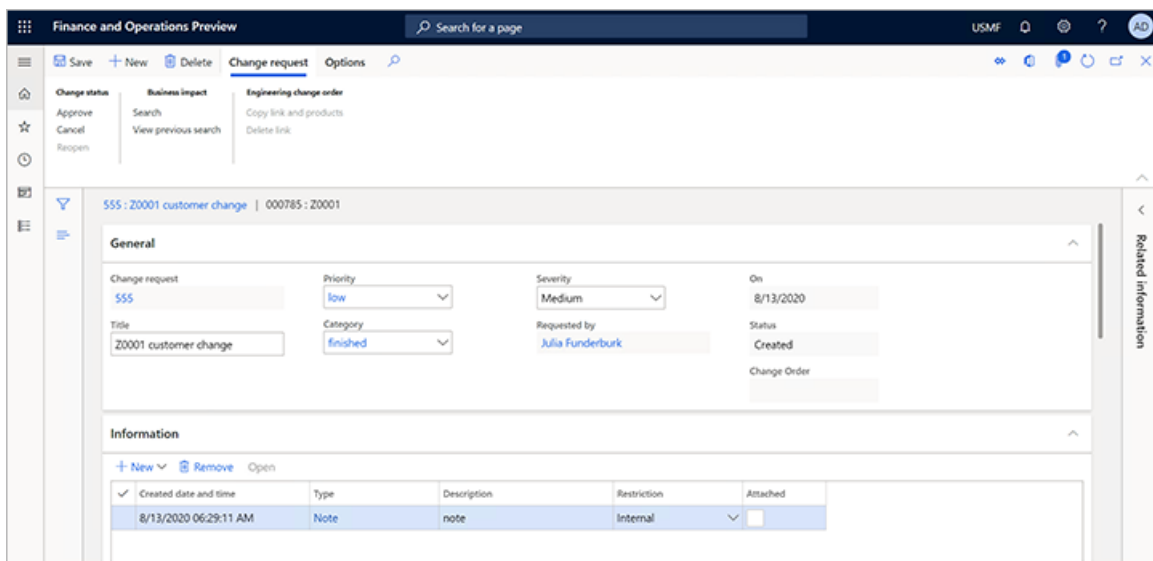
The product was sent to a customer, but the customer wasn't completely satisfied and provides feedback that includes suggestions for improvement. While the customer is speaking with a sales clerk on the phone, the sales clerk can request the changes that the customer is describing.

1. Go to **Sales and marketing > Sales orders > All sales orders**.

- Find and open the sales order that you created in the previous exercise.
- On the **Sales order lines** FastTab, select **Engineering change management > New engineering change request**.



- Fill in the engineering change request, based on the customer's feedback. For this example, set the following values:
 - **Change request:** *555*
 - **Title:** *Z0001 customer change*
 - **Priority:** *low*
 - **Category:** *set change*
 - **Severity:** *Medium*
- On the **Information** FastTab, select **New > Note** to add a note to the grid.
- In the **Description** field for the new note, indicate that item *D0003* should be deleted from the BOM. If you must add more information for the note, you can enter text in the **Notes** field.



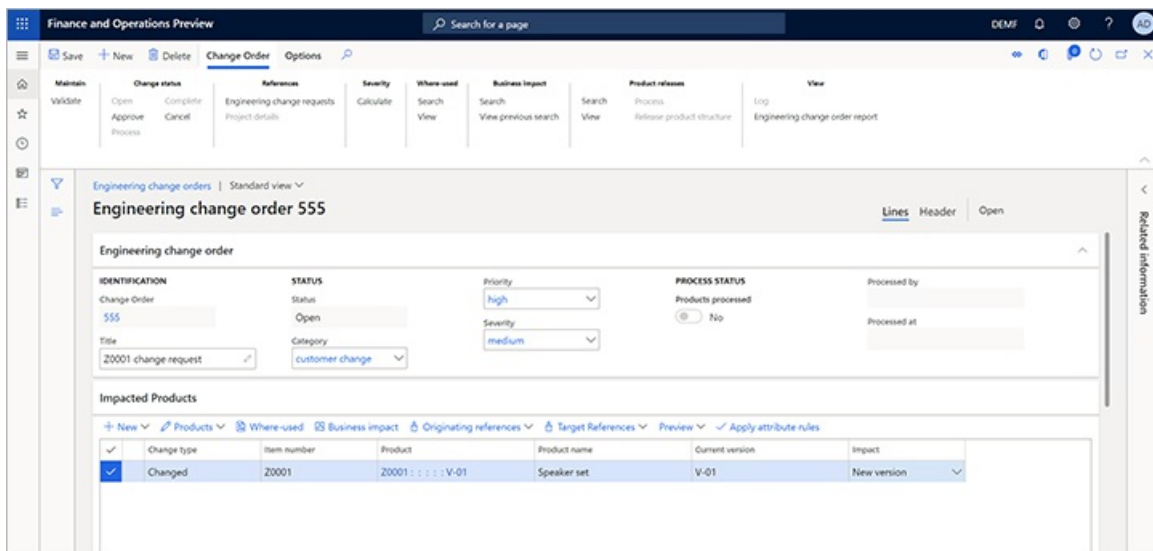
- On the **Action** Pane, select **Save**.
- Notice that the item has automatically been added on the **Products** FastTab, and that the source of the engineering change request (the sales order) has been added on the **Source** FastTab.

Make changes to the product by using an engineering change order

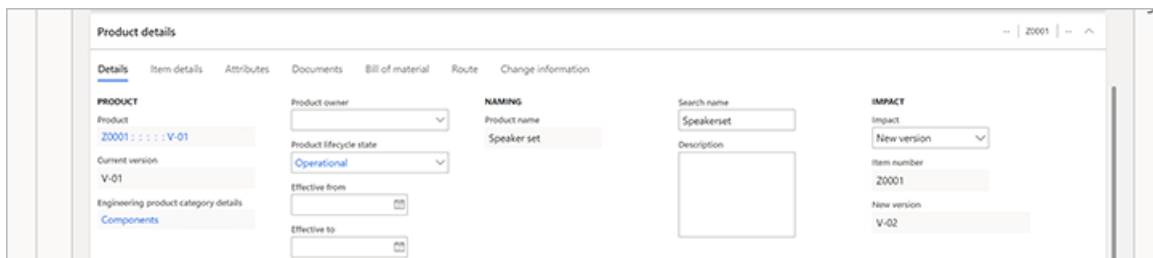
The sales clerk knows that the product is important and was designed especially for the customer. Therefore, the sales clerk calls an engineer in the *DEMF* company to notify them about the change request. In this way, the engineer can speed up the process.

The engineer now reviews the request from the customer and creates a change order for the product.

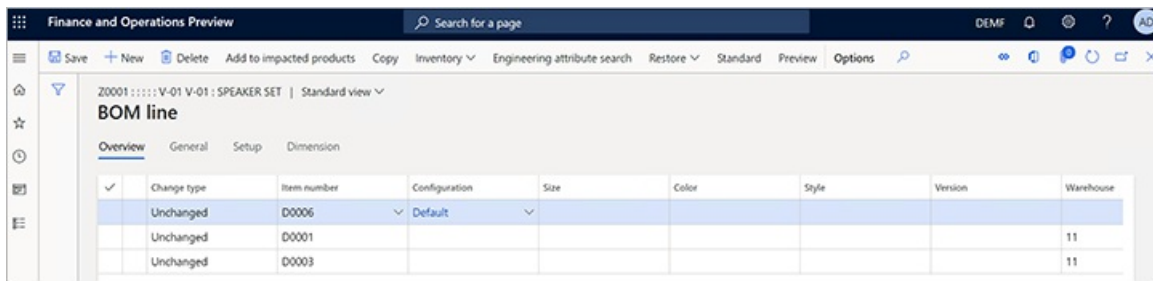
1. Because the engineer works in the *DEMF* company, set the legal entity to *DEMF*. (Use the company picker on the right side of the navigation bar.)
2. Go to **Engineering change management > Common > Engineering change requests**.
3. Open change request *555*.
4. Review the information, and then approve the change. On the Action Pane, on the **Change request** tab, in the **Change status** group, select **Approve**.
5. Go to **Engineering change management > Common > Engineering change orders**.
6. On the Action Pane, select **New** to create a change order, and set the following values for it:
 - **Change order:** *555*
 - **Title:** *Z0001 customer change*
 - **Category:** *Customer change*
 - **Priority:** *Low*
 - **Severity:** *Medium*
7. On the **Impacted products** FastTab, select **New > Add existing product** to add a row to the grid, and set the following values for it:
 - **Product:** *Z0001*
 - **Impact:** *New version*



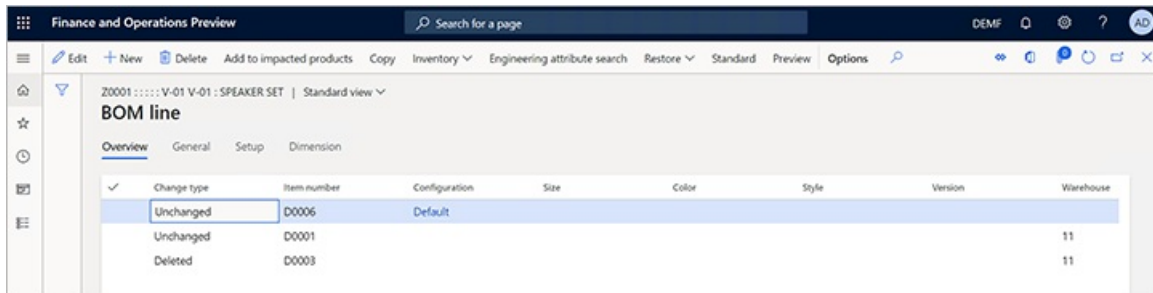
8. Notice that, because you set the **Impact** field to *New version*, the **New version** field on the **Details** tab of the **Product details** FastTab shows what the new version number will be (*V-02* for this example).



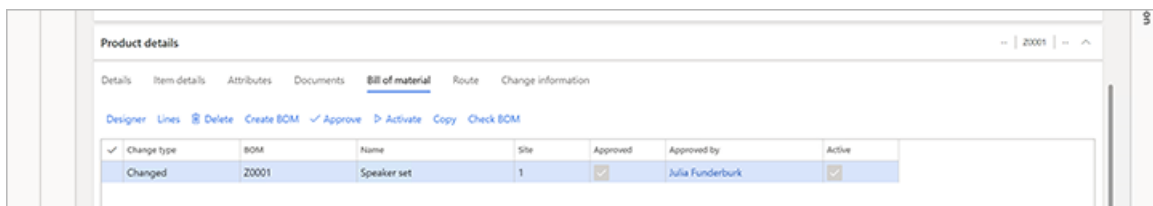
9. On the Action Pane, select **Save**.
10. On the **Product details** FastTab, on the **Bill of material** tab, select **Lines** to open the BOM for version *V-01* of product *Z0001*.



- Select the line for item number *D0003*, and then, on the Action Pane, select **Delete**. The value of the **Change type** field for this line changes to *Deleted*.
- On the Action Pane, select **Save**.



- Close the **BOM line** page to return to the **Engineering change order** page.
- On the **Product details** FastTab, on the **Bill of material** tab, notice that the value of the **Change type** field for BOM *Z0001* is now *Changed*.



The order must now be approved before the changes can be processed. When the changes are processed, the products are updated with the changes that are included in the engineering change order. For this example, the person who creates the engineering change order has been specified as the approver.

- On the Action Pane, on the **Change order** tab, in the **Change status** group, select **Approve**.
- Select **Process** to update the product's information.
- Select **Complete** to mark the change order as completed.

Release the changed product

The product can now be released again to the *USMF* company and then sent to the customer. To release the product directly from the engineering change order, follow these steps.

- Open the engineering change order that you created in the previous exercise, if it isn't already open.
- On the Action Pane, on the **Change order** tab, in the **Product releases** group, select **Search**.
- The search results show which companies the affected products have been released to. Close the search results.
- On the Action Pane, on the **Change order** tab, in the **Product releases** group, select **View** to open the **Releases** dialog box, where you can view the results of the previous search.
- Select each company that you want to release products to.
- Select **OK** to close the **Releases** dialog box and return to the change order.

7. On the Action Pane, on the **Change order** tab, in the **Product releases** group, select **Process** to release the affected products to the selected companies. Alternatively, select **Release product structure** to start the release process.

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Engineering change management parameters

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The **Engineering change management parameters** page contains setup parameters that change the default behavior that is related to the release product structure and engineering change management processes.

Open the Engineering change management parameters page

To open the **Engineering change management parameters** page, go to **Engineering change management > Setup > Engineering change management parameters**. You can then set the fields as described in the remaining sections of this topic.

Release control tab

The following table describes the fields that are available on the **Release control** tab of the **Engineering change management parameters** page. These fields affect the release product structure process.

FIELD	DESCRIPTION
Item number rule	Select how the item number should be defined when the product is released to a legal entity. Select <i>Engineering product number</i> if the product number in the receiving legal entity should match the product number in the engineering company. Select <i>Local item number sequence</i> if the product should take the next number in the number sequence for product numbers in the receiving legal entity.
BOM name rule	Select how the name of the bill of materials (BOM) is defined when the product is received (released) in a legal entity. Select either <i>Engineering name</i> or <i>Receiving item number</i> .
Route name rule	Select how the route name should be defined when the route of a product is received (released) in a legal entity. Select either <i>Engineering name</i> or <i>Receiving item number</i> .
Run BOM check	Select whether a BOM check will be run when the product is received (released) in a legal entity.
Release behavior of inactive BOM	Select whether a product can be released if it has an inactive BOM. Select <i>Accept</i> , <i>Warning only</i> , or <i>Not allowed</i> .
Release behavior of inactive route	Select whether a product can be released if it has an inactive route. Select <i>Accept</i> , <i>Warning only</i> , or <i>Not allowed</i> .
Product acceptance	Select whether an additional step for acceptance is required before the product can be released in the legal entity. Select <i>Manual</i> to add the acceptance step. In this case, the Open product releases page will show the products. Select <i>Automatic</i> to show the product directly on the Released products page in the target legal entity immediately after the product is released together with its release product structure.

Engineering change management tab

The following table describes the fields that are available on the **Engineering change management** tab of the **Engineering change management parameters** page. These settings affect the engineering change management process.

FIELD	DESCRIPTION
Category	The default category that will be used when an engineering change request is created.
Priority	The default priority that will be used when an engineering change request is created.
Severity rule	Select how the severity of an engineering change order should be established. Select <i>Manual</i> if the user is expected to enter a value in the Severity field. Select <i>Calculate</i> to have the system calculate the value of the Severity field when you select Calculate severity on the Action Pane of the engineering change order. In this case, the system will use the severity rules that are defined on the Severity rule set page. Select <i>Calculate automatically</i> to have the value of the Severity field automatically calculated and filled in according to the severity rule sets.
Re-release impacted products	This field is applicable when you re-release products via an engineering change order. You can select whether all products or only the affected products should be proposed in the Releases dialog box.
BOM levels to release	The depth of the BOM level to release. If the BOM has more levels (that is, if it's deeper) than the value that is specified here, only the levels up through the specified value will be released.

NOTE

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Establish common values for engineering change management

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When you set up engineering change management, you must establish several collections of values that will be used to fill in drop-down lists in other parts of the user interface (UI). You should specify these values according to the types of products that you produce and your specific business needs.

Engineering change categories

You use engineering change categories to organize your engineering change orders, so that they are easier to manage and review. For example, you might find it useful to set up a workflow where, depending on the category, a specific department must review the proposed changes. Therefore, the engineering change order includes a **Category** field.

To establish the collection of engineering change categories that is used in your company, go to **Engineering change management > Setup > Engineering change management > Engineering change categories**. You can then use the buttons on the Action Pane to add, remove, and edit values, and to arrange them into the order in which they should appear in the drop-down lists where they are shown.

Engineering change priorities

You use engineering change priorities to indicate the importance or urgency of an engineering change order. They can help you keep track of the importance of an engineering change order, so that you can easily identify which orders should be processed first, and how quickly.

To establish the collection of engineering change priorities that is used in your company, go to **Engineering change management > Setup > Engineering change management > Engineering change priorities**. You can then use the buttons on the Action Pane to add, remove, and edit values, and to arrange them into the order in which they should appear in the drop-down lists where they are shown.

Engineering change reasons

Engineering change reasons indicate the cause or nature of the change in the change order.

To establish the collection of engineering change reasons that is used in your company, go to **Engineering change management > Setup > Engineering change management > Engineering change reasons**. You can then use the buttons on the Action Pane to add, remove, and edit values, and to arrange them into the order in which they should appear in the drop-down lists where they are shown.

Material disposal codes

You use material disposal codes to categorize materials that are used in your finished goods, or components that must be disposed of in a specific way or require some treatment before they can be added to your regular trash. When you add a relevant product to an engineering change order, you can assign a disposal code as part of the change details.

To establish the collection of material disposal codes that is used in your company, go to **Engineering change management > Setup > Engineering change management > Material disposal codes**. You can then use the buttons on the Action Pane to add, remove, and edit values, and to arrange them into the order in which

they should appear in the drop-down lists where they are shown.

Received customer approval

When you design products for a specific customer, the design and specifications often must be validated before the product can be set as ready. The **Received customer approval** field lets you indicate how far in the customer approval process the product is and/or whether the approval has been received.

To establish the collection of received customer approval values that is used in your company, go to **Engineering change management > Setup > Engineering change management > Received customer approval**. You can then use the buttons on the Action Pane to add, remove, and edit values, and to arrange them into the order in which they should appear in the drop-down lists where they are shown.

Engineering change – Environmental health and safety codes

If any standard environmental health and safety regulations, or company-specific regulations or procedures, must be considered in the manufacture of a product, you can use the environmental health and safety codes to define them. In the engineering change order, you can indicate which codes apply to the manufacture of a product while you edit the details of the affected product.

To establish the collection of health and safety values that is used in your company, go to **Engineering change management > Setup > Engineering change management > Engineering change - Environmental health and safety codes**. You can then use the buttons on the Action Pane to add, remove, and edit values, and to arrange them into the order in which they should appear in the drop-down lists where they are shown.

Engineering change severities

You use engineering change severities to indicate the level of impact that applies to the products in an engineering change order.

To establish the collection of engineering change severities that is used in your company, go to **Engineering change management > Setup > Engineering change management > Engineering change severities**. You can then use the buttons on the Action Pane to add, remove, and edit values, and to arrange them into the order in which they should appear in the drop-down lists where they are shown.

You can establish rules that apply to each severity level that you create. For more information about how to assign these rules, see the next section.

Engineering change severity rule sets

You use engineering change severity rule sets to establish a group of rules that you can use to automatically calculate the severity of the change order, based on the type of changes in the affected products. To use the severity rules, open the **Engineering change management parameters** page, and set the **Severity rule** field to *Calculate* or *Calculate automatically*.

When the system evaluates severity, it processes the rules in the order in which they appear on the page, from top to bottom. For a rule to be selected and have its priority established, all the rules in a rule set must be met.

To set up the rules that apply to each change severity level that you've defined, go to **Engineering change management > Setup > Engineering change management > Engineering change severity rule sets**. Then follow one of these steps.

- To create a new rule set, select **New** on the Action Pane, and then set the fields as described later in this section.
- To edit an existing rule set, select it in the list pane, select **Edit** on the Action Pane, and then set the fields as described later in this section.

- To delete an existing rule set, select it in the list pane, and then select **Delete** on the Action Pane.
- To rearrange the list of rule sets, select a rule set in the list pane, and then use the **Up** and **Down** buttons on the Action Pane to reposition it.

For each rule set, set the following field:

- **Severity** – Select the severity level to establish rules for. You use the **Engineering change severities** page to create and name the levels. (For more information, see the previous section.)

Use the buttons on the **Rules** FastTab to add or remove a rule for the current severity setting. Each rule has a **Rule** field and a **Name** field. The rules are established by the system and indicate the types of changes that a product can have. The name indicates the type of change.

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Engineering companies and data ownership rules

2/18/2021 • 4 minutes to read • [Edit Online](#)

Engineering companies and operational companies

To ensure that the master data for products is centrally created and maintained, you can use one or more *engineering companies*. An engineering company owns the engineering products and their engineering-relevant data. It's always connected to (based on) an existing *legal entity*, which is also a company. Through this connection, the system establishes a central entry point for all engineering-relevant data for engineering products in the engineering company. In this central entry point, engineering products are created, and engineering-relevant data is maintained. From it, the engineering products and engineering-relevant data will be released to *operational companies*, which are other legal entities. (For more information about the release management, see [Release product structures](#).) These operational companies will use the engineering data as it has been designed by the engineering company. Any logistical data is locally maintained by each engineering company and operational company.

To create an engineering company, go to **Engineering change management > Setup > Engineering organizations**. Select **New**, enter a name for the engineering company, and select the existing company (legal entity) that it's based on.

If you're integrating with external product lifecycle management (PLM) systems, you must create a business unit (type of company) that will become an external company.

Engineering product categories and engineering companies

Engineering product categories help ensure that engineering products are created according to your company's business rules and behave as required. For more information about engineering product categories, see [Engineering versions and engineering product categories](#).

Each engineering product category belongs to a specific engineering company and can create only products that belong to that company. Likewise, the right to maintain an engineering product also belongs to the company that is associated with that product's engineering product category.

Data that is owned by the engineering company

Because the engineering company owns the engineering-relevant data, it controls the following processes:

- **Creation of engineering products:** Each engineering company can only create new engineering products that are based on an engineering product category that it owns. In some cases, operational companies maintain their own local data that is related to those products.
- **Creation of engineering versions:** When a company creates a new engineering product, the system automatically creates an initial engineering version for it. Only the owning engineering company will be able to create new versions of that product.
- **Creation and maintenance of engineering attributes:** When a company creates a new engineering product, the system automatically adds engineering attributes to it. Only the owning engineering company will be able to create and maintain the values for those attributes. For more information about engineering attributes, see [Engineering attributes and engineering attribute search](#).
- **Creation and maintenance of bills of materials (BOMs) that are connected to the engineering versions:** The owning engineering company can directly connect a BOM to an engineering product

version. When these BOMs are released to other legal entities, changes to the engineering data on the BOMs are limited in the following ways:

- The operational company can't remove released BOM lines.
- The engineering fields on the BOM lines are read-only for the operational company. All other fields are logistical implementation fields and can be edited by the operational company.
- The operational company can add BOM lines to the same BOM. In this way, it can add local additions, such as packaging materials or lubrication fluids.
- The operational company can add a completely new, local BOM. This change might be required in cases where, for example, no BOM is provided during the release. The operational company owns and maintains these local BOMs. For more information about release management, see [Release product structures](#).
- All local BOMs and BOM lines are preserved when the engineering company updates its BOM.
- **Creation and maintenance of routes that are connected to the engineering versions:** The engineering company can directly connect a route to each engineering version. When these routes are released to other legal entities, changes to the data on the routes are limited in the following ways:
 - The other legal entities can't remove the engineering data on the routes.
 - The other legal entities can add operations to the route. In this way, they can add local route steps.
 - Operational companies can add completely new, local routes. This change might be required if, for example, you haven't included routes during the release. The operational companies own and maintain these local routes. For more information about release management, see [Release product structures](#).
 - All changes that are made locally are preserved when updates from the engineering company are released again to the routes.
- **Creation and maintenance of engineering documents:** The engineering company can attach engineering documents to each engineering version.
 - When these documents are released to other legal entities, the documents are protected from being removed by the operational company.
 - Other legal entities can add completely new, local documents. The operational company owns and maintains these local documents.

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Product owners

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The product owner is a group of users who are responsible for specific products. When a product owner group is assigned to a product, only the members of that group can release the product. The product owner can also be used in the approval workflow in engineering change management.

Product owners are global settings. Therefore, they are available to all legal entities.

Create a product owner group

To create a product owner group and add members to it, follow these steps.

1. Go to **Engineering change management > Setup > Product owners**.
2. On the Action Pane, select **New**.
3. In the **Product owner** field, enter a name for the group.
4. In the **Name** field, enter a description of the group.
5. On the **Members** FastTab, add the workers who should be members of the group.

Assign a product owner to a product

To assign a product owner to a product, follow these steps.

1. Open the **Product details** page for the relevant product or product master.
2. On the **General** FastTab, set the **Product owner** field to the name of the relevant product owner group.

While a product owner is assigned to a product, only the members of the product owner group can edit the **Product owner** setting.

The product owner is also visible on the **Released products** page.

Product owners and product releases

Only users from a product's product owner group can release that product. However, there is an exception when the product is a child item, and its parent is released by the parent's owner. In other words, if the product is part of the BOM of another product, the system doesn't check the product owner of each item in the BOM. It checks only the product owner of the parent item.

For example, product X is assigned to the *Design cabinets* product owner group. Product X is also part of the BOM of product Y, which is assigned to the *Design Speakers* product owner group. If a user from the *Design Speakers* product owner group releases product Y and its BOM, product X will be released together with product Y.

Product owners and approvals

Because product owners know whether specific engineering changes will benefit their products, it often makes sense to include them as part of the approval process in engineering change management. You can implement this approach by setting up the product owners as participant providers in the workflows that are used for engineering change management. The system will then assign approval tasks in the workflows, based on the products that are in engineering change requests and engineering change orders. For more information, see [Manage changes to engineering products](#).

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Engineering attributes and engineering attribute search

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To ensure that all product master data can be registered in the system, you should use engineering attributes to specify all non-standard characteristics. You can then use engineering attribute search to easily find products, based on those registered characteristics.

Engineering attributes

Typically, engineering products have many characteristics and properties that you must capture. Although you can register some of the properties by using the standard product fields, you can also create new engineering properties as required. You can define your own *engineering attributes* and make them part of the product definition.

Create engineering attributes and attribute types

Each engineering attribute must belong to an *attribute type*. This requirement exists because each engineering attribute must have a *data type* that defines the types of values that it can hold. An engineering attribute type can be a standard type (such as free text, integer, or decimal) or a custom type (such as text that has a specific set of values to select from). You can reuse each attribute type with any number of engineering attributes.

Set up engineering attribute types

To view, create, or edit an engineering attribute type, follow these steps.

1. Go to **Engineering change management > Setup > Attributes > Attribute types**.
2. Select an existing attribute type in the list pane, or select **New** on the Action Pane to create a new attribute type.
3. Set the following fields:
 - **Attribute type name** – Enter a name for the attribute type.
 - **Type** – Select a standard data type (*Currency, DateTime, Decimal, Integer, Text, Boolean, or Reference*).
 - **Fixed list** – This option is available only if you set the **Type** field to *Text*. Set it to *Yes* to define specific values for attributes of this type. In this case, a drop-down list will be created. You use the **Value** FastTab to establish the values that are available for this attribute type. Set this option to *No* to allow users to enter any value. In this case, an input field will be created.
 - **Value range** – This option is available only if you set the **Type** field to *Integer, Decimal, or Currency*. Set it to *Yes* to establish minimum and maximum values that will be accepted for attributes of this type. You use the **Range** FastTab to establish the minimum and maximum values, and (for currency) the currency that applies for the limits that you entered. Set this option to *No* to accept any value.
 - **Unit of measure** – This field is available only if you set the **Type** field to *Integer or Decimal*. Select the unit of measure that applies for this attribute type. If no unit is required, leave this field blank.

Set up engineering attributes

To view, create, or edit an engineering attribute, follow these steps.

1. Go to **Engineering change management > Setup > Attributes > Engineering attributes**.
2. Select an existing attribute in the list pane, or select **New** on the Action Pane to create a new attribute.
3. Set the following fields:

- **Name** – Enter a name for the attribute. This name appears only on the **Engineering attributes** page. Everywhere else in the system, the value of the **Friendly name** field is usually shown to identify the attribute.
 - **Attribute type** – Select an attribute type that you defined in the previous section.
 - **Friendly name** – Enter a name that will identify the attribute in the system (except on the **Engineering attributes** page).
 - **Description** – Enter a description of the attribute.
 - **Help text** – Enter Help text that tells other users what the attribute is for.
 - **Default value** – Enter a default value for the attribute. The options that are presented depend on the attribute type that you selected.
 - **Currency** – If the attribute type that you selected is a currency, select the currency that the attribute will accept and show values in.
4. If the attribute type that you selected is an integer or a decimal, the **Range** FastTab is shown. On this FastTab, set the following fields as required:
- **Tolerance action** – Select how the system should respond if a user enters a value outside the specified range. If you select *Warning*, a warning is shown, but the user can save the value. If you select *Not allowed*, a warning is shown, and the value can't be saved until the user corrects it.
 - **Minimum** – Enter the minimum recommended or accepted value.
 - **Maximum** – Enter the maximum recommended or accepted value.

Connect engineering attributes to an engineering product category

Some engineering attributes apply to all products, whereas others are specific to individual products or product categories. For example, electrical attributes aren't required for mechanical products. Therefore, you can set up *engineering product categories*. An engineering product category establishes the collection of engineering attributes that must be part of the definition for products that belong to that category. You can also specify which engineering attributes are mandatory and whether there is a default value.

For more information about how to work with engineering product categories, including information about how to connect attributes to categories, see [Engineering versions and engineering product categories](#).

Set values for engineering attributes

The engineering attributes that are connected to an engineering product category are presented when you create a new engineering product that is based on that category. At that time, you can set values for the attributes. Later, those values can be changed on the **Engineering version** page or as part of engineering change management in an engineering change order. For more information, see [Manage changes to engineering products](#).

Create an engineering product

To create an engineering product, open the **Released products** page. Then, on the Action Pane, on **Product** tab, in the **New** group, select **Engineering product**.

You must specify the engineering category that the product belongs to. The category will set all the default values and characteristics for the product. It will also set the attributes that are applicable to the product. After the category is selected, values will be set for the attributes. You can then modify those values.

Search for products by using engineering attribute values

You can use engineering attribute search to find products by searching for their engineering attributes values. Therefore, you can easily find engineering products, based on their characteristics. You can search in the products that belong to an engineering product category, or you can search across all engineering products.

The search is available on product master data pages and from transactional items in the system, such as sales

orders. For a transactional item, you can use the **Engineering attribute search** page to search for a product. You can then use the **Add as new line** button to add the product to the sales order lines. Products in the search results can also be added directly to the order.

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Engineering versions and engineering product categories

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Engineering products evolve during their product lifecycle, for many reasons. For example, changes might be introduced to improve product serviceability, change a component because the supplier no longer offers it, respond to new insights, or fix mistakes in the initial design. There are also many reasons why these changes should be stored as part of an ongoing product, in such a way that previous data isn't overwritten. Here are some of these reasons:

- You want to keep track of the product as it was manufactured and delivered to your customers in previous lifecycle states.
- You need a lead time before you approve and apply the changes.
- You want to have a timestamp on each change, and you want to be able to deliver previously manufactured products separately from each other.

Engineering versions ensure that the various states of a product and its data are kept current and clear, and that they can be visualized in the system. This concept helps you maintain consistency, lock down the bill of materials (BOM) for production, eliminate variability, and easily identify changes.

Generally, the *form-fit-function* rule is applied to determine whether a change requires a new product, a new version, or an update to an existing version. Each of the three terms in the name of this rule refers to a specific aspect of a part, which helps engineers match parts to needs. The form-fit-function rule increases the flexibility of design changes, because minimal documentation and design cost are required to change a part, provided that the fit, form, and function of the product are maintained.

- **Fit** refers to the ability of the part or feature to connect to, mate with, or join to another feature or part in an assembly. The fit enables the part to meet the required assembly tolerances so that it can be useful.
- **Form** refers to characteristics of a part or assembly, such as the external dimensions, weight, size, and visual appearance. The form is the aspect that is most affected by an engineer's aesthetic choices. It includes the enclosure, chassis, and control panel, which become the outward "face" of the product.
- **Function** is a criterion that is met when the part effectively and reliably performs its stated purpose. For example, in an electronics product, function can depend on the solid-state components that are used, and the software or firmware. Often, it can also depend on the features of the selected enclosure. Two of the most common reasons that an enclosure can fail the function criterion are poorly placed or poorly sized ports, and misleading or missing labeling.

Engineering versions

When you use engineering products, each product has at least one engineering version. The initial engineering version is automatically created when you create an engineering product. Each engineering version stores the engineering-relevant data that is specific to that version. Here are some examples of this data:

- The version number and previous version number (if applicable)
- The effective-from and effective-to dates
- The product version active status, which indicates whether the version can be released and used in transactions (For more information, see [Product readiness](#).)
- The engineering company that created and owns the product (For more information, see [Engineering companies and data ownership rules](#).)

- Related engineering documents, such as an assembly manual, user instructions, pictures, and links
- The engineering attributes (For more information, see [Engineering attributes and engineering attribute search](#).)
- The engineering BOMs
- The engineering routes

You can update this data on an existing version, or create a new version, by using an *engineering change order*. (For more information, see [Manage changes to engineering products](#).) If you create a new version of a product, the system copies all engineering-relevant data to that new version. You can then modify the data for that new version. In this way, you can track specific data for each consecutive version. To compare the differences between consecutive engineering versions, inspect the engineering change order, which includes change types that indicate all changes.

As has been stated, the initial engineering version is automatically created when you create an engineering product. The version number for this version follows the version number rule that is defined in the engineering category for the product. To transition to a subsequent version, you must add the product to an engineering change order as a line, and you must set the **Impact** field to *New version*. The engineering change order will include the details of the change from the current version to the next version.

Note that an engineering product can be in only one engineering change order at a time. This restriction ensures data accuracy, and helps avoid overlapping or contradictory changes in the product. Also note that the **Engineer** field in the **Header** view of the engineering change order shows the engineer who is responsible for the change order. If the engineer belongs to a team that is defined in the system, the **Responsible** field shows the leader of that team.

Track versions in transactions

When you use engineering change management, your product master data always includes one or more engineering versions. In your setup of engineering products, you can choose whether the engineering version is also part of *logistical transactions*. (For more information, see the [Set up engineering product categories](#) section later in this topic.) If the logistical impact is relevant, it differs per product and per company. Sometimes, only the latest version of a product is used. Therefore, when you introduce a new version, the previous version can no longer be used. In other cases, the previous version is required in logistical transactions to overcome the following challenges:

- The Logistics department must ship two pieces of a product to a customer. In this case, you must decide whether you want or will allow two different versions to be shipped.
- It's later discovered that a problem occurs, and that it's related to a specific change. In this case, it might be beneficial to determine exactly which version was shipped in each order.
- Companies typically want to ship old versions first, to phase them out of inventory. Especially for low-volume products, this approach can often be managed by determining the effectivity dates of the new version in relation to predictions about when stock of the old version will be depleted. However, sometimes you might not be able to make this comparison, or you may consider the uncertainty of stock level predictions to be too high.

The decision about whether to make versions visible in inventory depends on factors such as those that were previously mentioned, plus company practice and other considerations that are specific to each company. You can specify the behavior for the *engineering product category*. It will then apply to all products that are created from that category, for all companies that the product is released to.

For products that are set up so that they have logistical impact, the engineering version must be specified on each transaction. Although the system will propose the *latest active version*, you can select among all the active versions that are available for the company. For products that are set up so that they don't have logistical impact, the engineering version isn't specified on transactions. However, the system uses the latest active version. For

example, when you add a product to a production BOM, the latest version will be used, and when you run master planning, the latest version will be assumed.

Set up engineering product categories

An engineering product category provides a basis for creating a specific engineering product. Each category establishes a set of default values and policies. Therefore, when you create an engineering product, you first select the category to create it from.

Note that a new category hierarchy type (*engineering product hierarchy*) is automatically set up for you. You can manually create the categories by going to **Engineering change management > Setup > Engineering product category details**.

Each engineering product category establishes the default behavior of the engineering products that are created based on that category. After you've created an engineering product, you can't change its engineering product category. However, if you select the incorrect category, you can delete the product and then re-create it.

When an engineering product category is created, you're prevented from changing the following settings:

- Engineering company
- Product type
- Product subtype
- Product dimension group
- Configuration technology
- Version number rule

Other settings might inherit default values that are set up for the engineering product category. However, according to the system rules, those values can be changed.

To work with engineering product categories, go to **Engineering change management > Setup > Engineering product category details**. Then follow one of these steps.

- To create a new category, select **New** on the Action Pane, and then set the fields as described in the following subsections.
- To edit an existing category, select it in the list pane, select **Edit** on the Action Pane, and then set the fields as described in the following subsections.
- To delete an existing category, select it in the list pane, and then select **Delete** on the Action Pane.

Set the following fields on the header of an engineering product category.

FIELD	DESCRIPTION
Name	Enter a name for the engineering product category.
Engineering company	Select the engineering company where products in this engineering product category can be created and where they will be maintained.

Details FastTab

Set the following fields on the **Details** FastTab of an engineering product category.

FIELD	DESCRIPTION
Product type	Select whether the category applies to products or services.

FIELD	DESCRIPTION
Track versions in transactions	<p>Select whether the version of the product should be stamped on all transactions (logistical impact). For example, if you track the version in transactions, each sales order will show which specific version of the product was sold in that sales order. If you don't track the version in transactions, sales orders won't show which specific version was sold. Instead, they always show the latest version.</p> <ul style="list-style-type: none"> • If this option is set to <i>Yes</i>, a product master is created for the product, and each version of the product will be a variant that uses the <i>version</i> product dimension. The Product subtype field is automatically set to <i>Product master</i>, and you must select a product dimension group where the <i>version</i> dimension is active. Only product dimension groups where <i>version</i> is an active dimension will be shown. You can create new product dimension groups by selecting the Edit button (pencil symbol). • If this option is set to <i>No</i>, the <i>version</i> product dimension won't be used. You can then select whether to create a product or a product master that uses the other dimensions. <p>This option is often used for products that have a cost difference between versions, or products where different conditions apply in relation to the customer. Therefore, it's important to indicate which version was used in each transaction.</p>
Product subtype	<p>Select whether the category will hold products or product masters. For product masters, product dimensions will be used.</p>
Product dimension group	<p>The Track versions in transactions setting helps you select the product subtype. If you specified that you want to track the version in transactions, the product dimension groups where the <i>version</i> dimension is used will be shown. Otherwise, only product dimension groups where the <i>version</i> dimension isn't used will be shown.</p>
Product lifecycle state at creation	<p>Set up the default product lifecycle state that an engineering product should have when it's first created. For more information, see Product lifecycle states and transactions.</p>
Version number rule	<p>Select the version number rule that applies to the category:</p> <ul style="list-style-type: none"> • Manual – You choose the version number for each new version. • Automatic – The system sets the version number, based on a format that you define. When you set up the format, use a number sign (#) to represent a digit and any other character to represent a constant value. For example, if you define the format as <i>V-##</i>, the first version will be "V-01," the second version will be "V-02," and so on. • List – The system takes the next number from a predefined list of custom values that you define.

FIELD	DESCRIPTION
Enforce effectivity	<p>Select whether the effectivity dates of engineering versions must be contiguous, or whether there can be gaps and overlaps. This setting affects the way that you can use the Effective from and Effective to fields for each engineering version where the category applies.</p> <ul style="list-style-type: none"> If this option is set to <i>Yes</i>, an Effective from value must be specified for each version, and neither overlaps nor gaps are allowed between versions. The date range for each engineering version is connected directly to the previous and next engineering versions, if they exist. In this scenario, the newest version is always used, and older versions are no longer used. If this option is set to No, there are no restrictions on the effectivity date fields for engineering versions, and both overlaps and gaps are allowed. In this scenario, multiple versions can be active at the same time, and you can work with any active version. <p>This option also affects BOMs and routes that are connected to a product version. For more information, see the Connect BOMs and routes to engineering versions section later in this topic.</p>
Use number rule nomenclature	<p>Set this option to <i>Yes</i> to enable rules for defining a product number by using number sequences, engineering attribute names and values, and text constants as segments. To create or modify rules, select the Edit button.</p>
Use name rule nomenclature	<p>Set this option to <i>Yes</i> to enable rules for defining a name by using the engineering attribute names, engineering attribute values, and text constants as segments. To create or modify rules, select the Edit button.</p>
Use description rule nomenclature	<p>Set this option to <i>Yes</i> to enable rules for defining the description by using the engineering attribute names, engineering attribute values, and text constants as segments. To create or modify rules, select the Edit button.</p>

Attributes FastTab

Use the grid on the **Attributes** FastTab to set up the engineering attributes that apply to products that belong to this category. For information about how to create engineering attributes, see [Engineering attributes and engineering attribute search](#).

Use the buttons on the **Attributes** FastTab to add, remove, and arrange attributes in the grid.

If you change the selection of attributes for an engineering category, and products already exist that are based on that category, you must decide whether to apply your changes to those products. If you want existing products to reflect the changes, select **Update existing products** on the **Attributes** FastTab.

For each row that you add to the grid, set the following fields.

FIELD	DESCRIPTION
Name	Select the attribute to add.

FIELD	DESCRIPTION
Value	Select the default value for the attribute.
Mandatory	For attributes of the <i>Boolean</i> type, if this option is set to <i>Yes</i> , users must set the attribute to <i>Yes</i> . If this option is set to <i>No</i> , users can set the attribute to either <i>Yes</i> or <i>No</i> . For other data types, the setting of this option is just informational.
Batch attribute	Select whether the attribute should be propagated through the batch functionality.

Readiness policy FastTab

Use the **Product readiness policy** field to select the readiness policy that applies to products that belong to this category. For more information, see [Product readiness](#).

Release policy FastTab

Use the **Product release policy** field to select the release policy that applies to products that belong to this category. For more information, see [Release product structures](#).

Connect BOMs and routes to engineering versions

The setting of the **Enforce effectivity** option is important for the connection of BOMs and routes to each engineering version. You can activate multiple BOMs or routes per product only if there is a difference in any of the following settings:

- Product dimension
- Quantity
- Site
- Effectivity dates

Engineering BOMs and routes are created from the engineering version where they apply. They can be recognized by the check mark in the **Engineering controlled** check box. When you work with engineering BOMs and routes, you won't typically design them by using different quantities. You also won't typically design different BOMs per site. Additionally, for engineering BOMs and routes, the effectivity dates are always taken from the engineering version. Therefore, an engineering version, its BOM, and its route will all have the same effectivity dates.

For products where you're using the *version* product dimension (together with logistical impact on the transactions), the version is also added to the BOMs and routes. This behavior helps differentiate the BOMs and routes of consecutive versions, regardless of the **Enforce effectivity** setting.

For products where you aren't using the *version* product dimension (without logistical impact on the transactions), the version isn't added to the BOMs or routes. Therefore, there will be no difference between the BOMs and routes of consecutive versions. In this case, we highly recommend that you set the **Enforce effectivity** option to *Yes*. In this way, you help prevent engineering versions from overlapping, and you can also activate the BOM and route of a newer version without first having to inactivate the BOM and route of the previous version. If you do set the **Enforce effectivity** option to *Yes* in this case, you must manually inactivate the BOMs and routes of older versions before you can activate the latest version.

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Enable change management on existing products

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This topic explains how you can enable change management for existing products. It also describes cases where your ability to enable change management is limited.

When you enable change management for an existing product, you can create versions of that product and trace changes that are made to it throughout its life. Therefore, you can track those changes by using change orders. To enable change management, you must convert the relevant products to *engineering items* (also referred to as engineering products). Engineering products are products that are versioned and managed through change management. A wizard is provided to guide you through the conversion process.

Turn on the feature in your system

To use this capability, you must complete the following tasks:

1. Enable the Engineering change management feature and its configuration key as described in [Engineering change management overview](#).
2. Turn on the *Enable change management on existing products* feature in feature management. For more information, see [Feature management overview](#).

Restrictions and limitations

Not all product types can be converted to all other types. The following restrictions and limitations apply:

- When you convert a product to an engineering product, it remains a *product*. It doesn't become a *product master*.
- When you convert a product master that has a specific set of dimensions, those dimensions are maintained after the change. For example, if you convert a product master that has the size dimension, it will keep the size dimension.

Therefore, if you have a distinct product, you can change it only to an engineering product that doesn't track the product dimension in transactions (that is, the version dimension isn't used). See the remaining sections of this topic for more information about these issues.

Prepare for conversion by creating all required engineering product categories

An *engineering product category* must be assigned to every engineering product. You will do this assignment when you run the **Convert to engineering product** wizard. Engineering product categories must exist for all relevant standard products *before* you can convert those products.

The engineering product category provides a basis for creating an engineering product, and it establishes a set of default values and policies. The engineering product category must match the product that you assign it to. For example, the product type and dimension group must match both the product and its engineering product category. For more information, see [Engineering versions and engineering product categories](#).

IMPORTANT

The **Convert to engineering product** wizard can convert product only to engineering products where the version isn't tracked in transactions. Therefore, the **Track version in transactions** option must be set to *No* for engineering product categories that you create to convert existing products.

For information about how to create engineering product categories, see [Engineering versions and engineering product categories](#).

Run the Convert to engineering product wizard

The **Convert to engineering product** wizard helps you convert one or more existing products to engineering products. It converts the products into engineering products (versioned products) where the version isn't tracked in transactions (that is, the version dimension isn't used). After the conversion is completed, you can manage the products by using Engineering change management.

The conversion is permanent. Therefore, you won't be able to reverse it later.

Each converted engineering product will continue to be released in the same companies that the original product was released in. However, the engineering bill of materials (BOM) and routes won't automatically be released to those companies.

Follow these steps to run the **Convert to engineering product** wizard and convert a product to an engineering product.

1. Go to **Product information management > Products > Released products**.
2. In the grid, select the check box for each product that you want to convert.
3. On the Action Pane, on the **Engineer** tab, in the **Engineering change management** group, select **Convert to engineering product** to open the wizard.
4. The first page of the wizard is the **Welcome** page. If you aren't already familiar with the conversion process, carefully read the information on this page. When you're ready to continue, select **Next**.
5. The **Select details for the products to be converted** page shows each product that you selected before you opened the wizard. Inspect the list. Use the **New** and **Delete** buttons on the toolbar to add or remove products as you require.
6. Use the following fields at the top of the grid to assign default values to every product that is listed. (You will be able to change these values for individual products after the conversion is completed.) Default values won't be assigned to products where a relevant value has already been assigned.
 - **Default engineering category** – Select an initial engineering product category to assign to every listed product. The category that you select will be applied only to products that are compatible with it.
 - **Default version** – Enter the initial product version to assign to every listed product. Every engineering product has at least one engineering version.
 - **Default lifecycle state** – Select the initial product lifecycle state to assign to every listed product.
 - **Current BOM will be part of the engineering product** – Select this check box if the current BOM for each listed product should be used as a BOM for the engineering product.

For more information about product settings, see the next step.

7. Review each product that is listed in the grid, and evaluate how well the default values that you assigned apply to it. For each row, review the following information and set any relevant fields:
 - **Product number** – The product number.

- **Product name** – The name of the product.
 - **Engineering category** – Select the engineering product category that the product should belong to after it's converted. An appropriate category must already exist for each product, as was explained in the previous section of this topic. You must assign a category to every product.
 - **Version** – Enter the product version to assign to the product after it's converted. For example, you might select a number that fits in the number sequence that your category already uses. Each engineering version stores the engineering-relevant data that is specific to that version. For more information, see [Engineering versions and engineering product categories](#).
 - **Product lifecycle state** – Select the product lifecycle state that the product should be in after it's converted. The product lifecycle state lets you to control which transactions are allowed for a given engineering version. For more information, see [Product lifecycle states and transactions](#).
 - **Has BOM** – A selected check box indicates that the product has a BOM. The setting of this check box can help you decide how to set the **Current BOM will be part of the engineering product** check box.
 - **Current BOM will be part of the engineering product** – Select this check box if the current BOM of the product should be used as a BOM for the engineering product. That BOM will then be managed by Engineering change management. If the product doesn't have a BOM, or if you prefer to manually create a BOM for the converted product later, clear this check box.
 - **Has errors** – A selected check box indicates that the product setup has one or more errors. For example, the product type or the dimension group might not match in the category. Products that have errors will be skipped and won't be converted.
8. When you've finished, select **Validate** on the toolbar to validate the product setup. For each row, the **Has errors** check box will be updated to indicate the product's status. Adjust the values until the setup of every product is free of errors.
 9. When all the products are set up correctly, select **Next** to continue.
 10. The **Confirm selection** page shows the number of products that have no errors in their setup and are therefore ready for conversion. It also shows the number of products that will be skipped because of errors. To run the conversion as a batch job, set the **Run in batch** option to *Yes*.
 11. Select **Finish** to apply your settings and start to convert the products to engineering products.

NOTE

If your system is set up to manually accept products before they are released, you must accept each converted product by using the **Open product releases** page in the appropriate companies. For more information, see [Review and accept the product before you release it in the local company](#).

Product lifecycle states and transactions

2/18/2021 • 4 minutes to read • [Edit Online](#)

As an engineering product goes through its lifecycle, it's important that you be able to control which transactions are allowed for each lifecycle state. For example, products that aren't yet in a mature state should not be put on a sales order. Alternatively, if a product is reaching its end-of-life state, you might want to control the inflow of that product.

For an engineering product, changes to the lifecycle state are connected to the product's engineering versions. Therefore, the product's lifecycle state can also be connected to its engineering versions. When the product lifecycle state is connected to an engineering version, you can use the lifecycle state to control which transactions are allowed for the engineering version.

Create and manage product lifecycle states

To work with product lifecycle states, go to **Engineering change management > Setup > Product lifecycle state**. Then follow one of these steps.

- To create a new lifecycle state, select **New** on the Action Pane, and then set the fields as described in the following subsections.
- To edit an existing lifecycle state, select it in the list pane, select **Edit** on the Action Pane, and then set the fields as described in the following subsections.
- To delete an existing lifecycle state, select it in the list pane, and then select **Delete** on the Action Pane.

NOTE

Engineering products use the same product lifecycle states as standard (non-engineering) products. You can also open the **Product lifecycle state** page that is described in this topic by going to **Product information management > Setup > Product lifecycle state**. For more information about product lifecycle states, for both engineering products and standard products, see [Product lifecycle state overview](#).

Set the following fields on the header of a product lifecycle state.

FIELD	DESCRIPTION
State	Enter a name for the product lifecycle state.
Description	Enter a description of the product lifecycle state.

General FastTab

Set the following fields on the **General** FastTab.

FIELD	DESCRIPTION
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FIELD	DESCRIPTION
Default when released to a legal entity	<p>For standard products, set this option to <i>Yes</i> if this lifecycle state should be applied to all products by default when they are first released. Set it to <i>No</i> if this lifecycle state will be manually applied later.</p> <p>This setting isn't applicable to engineering products. The lifecycle state of an engineering product version after it's created in the engineering company is specified in its engineering change category. When the product is released to an operational company, the lifecycle state of the product is copied. In other words, when an engineering product is released to an operational company, it has the same lifecycle state that it had in the engineering company. The lifecycle state can be overwritten in the operational company.</p>
Is active for planning	<p>Set this option to <i>Yes</i> to include products that are in this lifecycle state in calculations at the master planning and bill of materials (BOM) levels. Set it to <i>No</i> to exclude products that are in this lifecycle state from the calculations.</p>

Enabled business processes FastTab

Use the **Enabled business processes** FastTab to control which of the available business processes can be used with products in the current lifecycle state. The processes that are listed on this FastTab are automatically found in the following way:

- The first time that you save a new lifecycle state, the page loads the business processes that are currently available.
- If you add new business processes to your system, you can update the list on the **Enabled business processes** FastTab for an existing lifecycle state by selecting **Check for updates** on the Action Pane.

The following fields are available for each process that is listed on the **Enabled business processes** FastTab.

FIELD	DESCRIPTION
Process	This read-only field shows the name of an existing business process.
Process area	This read-only field shows the name of an existing process area.

FIELD	DESCRIPTION
Policy	<p>Select one of the following values to control whether and how the current process will be permitted for products that are in this lifecycle state:</p> <ul style="list-style-type: none">• Enabled – The business process is allowed.• Blocked – The process isn't allowed. If a user tries to use the process on a product that is in this lifecycle state, the system will block the attempt and show an error instead. For example, you might block end-of-life products from being purchased.• Enabled with warning – The process is allowed, but a warning will be shown. For example, you might want a prototype product to be put on a production order that is created by the Research and Development department. However, other departments should be aware that they should not produce the product yet.

If you're adding more lifecycle state rules as a customization, you can view those rules in the user interface (UI) by selecting **Refresh processes** in the upper pane. The **Refresh processes** button is available only to administrators.

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Manage changes to engineering products

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Engineering change management provides structured processes for managing changes to engineering products. You can use the *engineering change request* process to propose and request changes, and then use the *engineering change order* process to actually make those changes. Users can create engineering change requests or engineering change orders, and there is then a process for reviewing and approving them, assessing their impact on existing transactions, and following up on them.

Engineering change requests

The engineering change request process lets you capture requests for changes from all the relevant departments in your company. It doesn't matter whether you work as an engineer, or in the Manufacturing, Sourcing, Warehouse, or Sales department: anybody can use an engineering change request to request a change. This change might be an idea for a new product, an issue that you discovered while you were working with an existing product, a suggestion for improving an existing product, or something else.

After someone submits a request for change, the *review and approval* process is managed by a workflow that identifies who must approve the change (for example, the product owner).

To set up a workflow for engineering change orders or engineering change requests, go to **Engineering change management > Engineering workflows**. Select **New**, select whether the workflow will be used to review engineering change orders or engineering change requests, and then configure the workflow.

For more information about workflows see [Workflow system overview](#). For more information about product owners, see [Product owners](#).

Create a new engineering change request

To create an engineering change request, follow one of these steps.

- Go to **Engineering change management > Common > Engineering change management > Engineering change requests**, and then select **New** on the Action Pane.
- Open the **Product details** page for an existing engineering product. Then, on the Action Pane, on the **Engineer** tab, in the **Engineering change management** group, select **Engineering change request > New engineering change request**.

A new change request is created. You can now set the fields on each FastTab, as described in the following subsections.

General FastTab

The **General** FastTab lets you provide a basic description of the change request. The following table describes the fields on this FastTab.

FIELD	DESCRIPTION
Change request	Enter a name for the engineering change request.
Title	Enter text that briefly describes or identifies the changes in the request.

FIELD	DESCRIPTION
Priority	Select a value to indicate how high the priority of the change is. You can customize the available values for your company, as required. (For more information, see Establish common values for engineering change management .)
Category	Select a value to describe the type of change that you're requesting. You can customize the available values for your company, as required. (For more information, see Establish common values for engineering change management .)
Severity	Select a value to indicate the severity of the issue that should be fixed by implementing the request. You can customize the available values for your company, as required. (For more information, see Establish common values for engineering change management .)
Requested by	The name of the user who created the request.
On	The date when the request was created.
Status	The status of the request. When a request is first created, the status is <i>Created</i> . When the request is approved, the status changes to <i>Approved</i> . If a related change order has been created for the request, the status changes to <i>Followed up</i> .
Change order	The change order number, if the change request was followed up on via a change order.

Information FastTab

The **Information** FastTab lets you add more information about the request.

To add a row to the grid, select **New** on the toolbar above the grid, and then select one of the following options:

- **File** – Upload a file.
- **Image** – Upload an image file.
- **Note** – Enter a note directly in the grid.
- **URL** – Enter a URL directly in the grid.

The following table describes the fields on each row.

FIELD	DESCRIPTION
Created date and time	The date and time when the row was created.
Type	The type of information that the row was created for (file, image, note, or URL).
Description	Enter a description for the row.
Restriction	A value that indicates whether the information that has been added came from an internal or external source.

FIELD	DESCRIPTION
Attached	A selected check box indicates that the row includes an attachment (file or image). To download the attachment, select the row, and then select Open on the toolbar above the grid.

Products FastTab

The **Products** FastTab lets you list each product that is affected by the change request. You can use the buttons on the toolbar to add products to the grid, or to remove products.

This list is for informational purposes only. Therefore, you can add as many related products as you consider relevant. If you create a change request from the **Product details** page for an existing product, that product should be listed on the **Products** FastTab after you save the request record.

Source FastTab

The **Source** FastTab lets you track the starting point of the change request. It's useful if, for example, you want to see whether the change request was created from a sales order, who created it, and which company it was created in.

Evaluate the business impact of a change request

When you review a request for change, you can search for dependencies. In this way, you can assess the impact of the requested change on open transactions, such as sales orders, production orders, and on-hand inventory.

1. Go to **Engineering change management > Common > Engineering change management > Engineering change requests**.
2. Either open an existing change request, or select **New** on the Action Pane to create a new change request.
3. On the Action Pane, on the **Change request** tab, in the **Business impact** group, select one of the following buttons:
 - **Search** – Scans all open transactions, and then open the **Business impact to open transactions** dialog box, which lists all transactions that will be affected by the change.
 - **View previous search** – Open the **Business impact to open transactions** dialog box, which lists the results of the previous search. (A new search isn't done.)
4. If the issue that requires a change is found to be critical, you can block the open transactions or notify the responsible user by using the buttons on the toolbar in the **Business impact to open transactions** dialog box.

Create a change order from a change request

An engineer who is reviewing an engineering change request can create an engineering change order directly from the **Engineering change requests** page. On the Action Pane, on the **Change request** tab, in the **Engineering change order** group, select **Copy link and products**.

Engineering change orders

Engineering change orders provide a structured process for making changes to engineering products. You propose changes by using a copy of the engineering-relevant data. The real master data isn't affected. For more information about engineering-relevant data, see [Engineering versions and engineering product categories](#).

You can create an engineering change order that is based on an approved engineering change request. Engineers can also create engineering change orders from scratch. You can include multiple products on a single engineering change order by following any of these steps:

- Manually select products.

- Use the bill of materials (BOM) to include products that are lower in the product structure (that is, children).
- Use a where-used search to include products that are higher in the product structure (that is, parents).

After the proposal for changes is completed, the review and approval process will be handled by a workflow. You can set up different workflows, based on priority and severity.

To set up a workflow for engineering change orders or engineering change requests, go to **Engineering change management > Engineering workflows**. Select **New**, select whether the workflow will be used to review engineering change orders or engineering change requests, and then configure the workflow.

For more information about workflows, see [Workflow system overview](#).

Here are some typical stakeholders who might have to approve an engineering change order:

- **Product owners** – For more information about product owners, see [Product owners](#).
- **Responsible team lead** – The **Engineer** field in the **Header** view of the engineering change order shows the engineer who created the engineering change order. If the engineer belongs to a team that is defined in the system, the **Responsible** field shows the leader of that team.
- **Finance department** – The Finance department might have to review cases where the change involves high costs.

You can choose whether the engineering change order should be processed directly after it's approved, as part of the workflow, or whether the processing should be done later, as a manual step. During processing of an engineering change order, engineering data on the actual product is updated.

While you're reviewing a request for change, on the Action Pane, on the **Change request** tab, in the **Business impact** group, select **Search** to assess the impact of the proposed change on open transactions, such as sales orders, production orders, and inventory on-hand. The results are shown in the **Business impact to open transactions** dialog box, where you can select impacted transactions and then use commands in the toolbar to view more information, notify the responsible user, or block the transaction.

Engineering change orders in engineering or operational companies

As is described in [Engineering companies and data ownership rules](#), the product data that you can edit varies, depending on the type of legal entity that you're working in (an engineering company versus an operational company). Data ownership rules are also applied to engineering change orders. Therefore, depending on the legal entity where you create an engineering change order, different types of changes can be made. Here are some examples:

- For engineering change orders in an **engineering company**, you can make basic changes to the engineering data. For example, you can create new versions of a product, change a product's structure via the BOM, and change engineering attribute values. For each affected product, select one of the following values in the **Impact** field:
 - **None** – Update the existing product version (in-version update).
 - **New version** – Create a new version that is based on the selected product version.
 - **New product** – Create a completely new product or product variant that is based on the selected product version.
- For engineering change orders in an **operational company**, you can change the logistical data of the product. For example, you can enrich the existing BOM with settings for sourcing, add local routes or local BOMs, and even enrich a BOM by adding new BOM lines for local packaging materials, lubrication fluids, or instructions in the local language. Enrichments that users make in the operational company will be preserved when new updates are sent from the engineering company. For more information, see [Engineering companies and data ownership rules](#).

When engineering change orders are processed in the engineering company, the products are created and/or updated only in the engineering company. Therefore, if the product master data should also be

updated, you must also release the products to operational companies.

- You can release products directly from engineering change orders. Open the change order, and then, on the Action Pane, on the **Change order** tab, in the **Product releases** group, select **Release product structure**. The process works just as it works when you release products from the **Released products** page. For more information, see [Release product structures](#).
- You can have products automatically released from engineering change orders, based on the following factors:
 - Re-releases to companies where products were previously released. Select **Search** to scan all previous releases, and then select **View** to view the results. The **View** page shows the previous product releases, and you can select which products you want to re-release. Then close the **View** page, and select **Process** to re-release the selected products.
 - Automatic release settings in the release control of the engineering product category. You can do this release as part of the workflow. When the **collect release proposal** block is used, the release proposal will be filled with re-releasing proposals (see the previous list item), and products will be released to companies if the **Auto release** check box is selected in the release control of the engineering product category. You can select **View** to view the results, as described in the previous list item. The products will also be released when the **process release proposal** block is used. If you choose only to collect the release proposal as part of the workflow, you can manually start the release by selecting **Process**, as described in the previous list item.

Follow up on an engineering change request via an engineering change order

As soon as an engineering change request is approved, you can follow up on it via an engineering change order. You can combine multiple engineering change requests into a single engineering change order. A single engineering change order can even include multiple products. (Typically, you use this approach when the same change must be applied to multiple products.) However, you can't create multiple engineering change orders from a single engineering change request.

To follow up on a change request via a change order, open the change request, and then, on the Action Pane, on the **Change order** tab, in the **Engineering change order** group, select **Copy link and products**. You can then select an existing engineering change order to connect the change request to, or you can create a new engineering change order for that specific request.

Engineering change order report

Engineering change order reports describe the changes that were made in an engineering change order. They are useful both during and after the review and approval process.

To view an engineering change order report, open the relevant change order, and then, on the Action Pane, on the **Change order** tab, in the **View** group, select **Engineering change order report**.

Fields on an engineering change order

Most of the fields on engineering change orders are the same as the fields for released products, engineering versions, documents, BOMs (lines) and routes (operations). However, the fields in the following table are unique to change orders.

FIELD	DESCRIPTION
Engineering change reasons	Select the reason for changing the affected product.

FIELD	DESCRIPTION
Change description	Enter a description of the change.
Required special tooling	Specify whether special tooling is required to apply the change.
Engineering material disposition	Select a material disposition code for any waste that is produced when the change is applied.
Customer approval required	Specify whether customer approval is required before the change can be applied.
Received customer approval	Specify the status of the customer approval.
Environmental health and safety	Specify whether environmental health and safety rules are applicable to the change. If they are, you can then select the applicable rules.

You can use the **Maintain/copy change information** button to copy change information between affected products.

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Product readiness

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You can use readiness checks to ensure that all the required master data has been specified for a product before it's used in transactions. When readiness checks are used, a user or team is made responsible for validating specific predefined product-related data. If there is an open readiness check for a product, the product can't be released or used in transactions.

The **Active** check box for an engineering product, variant, or version is available only after all the required data has been entered and verified, and after all the readiness checks have been processed. At that point, the product, version, or variant can be released to other companies and used in transactions. You can create readiness checks for new products, new variants, and new engineering versions.

Types of readiness checks

There are three types of readiness checks:

- **System check** – The system verifies whether there is a valid record. For example, the record might be an active bill of materials (BOM).
- **Manual check** – A user verifies whether the record is valid. For example, a readiness check might require validation of the default order settings. In some cases, such as when the product is still being designed and therefore won't be placed in stock, no default order settings are required. However, default order settings might be required for another product of the same type, because the product can be held in stock. The user is responsible for knowing how to correctly decision whether a readiness check is required.
- **Checklist** – The user answers a series of questions from a checklist, and the system determines whether the answers meet expectations. The checklist can have any subject. For example, it can be used to determine whether marketing materials or product documentation is completed.

How readiness checks are created for a new product, variant, or version

When you create a new engineering **product**, the system determines whether a readiness check policy has been set up for the engineering product category. (Readiness check policies can be applied on the released product level, the released variant level, and the engineering version level.) If a policy has been set up, the following events occur:

- Readiness checks are created for the product, according to the applicable policy.
- The engineering version is set to inactive to block the product from being used. All the versions for the specific product that is involved are set to inactive.

If a new **variant** is created for a product, the system checks whether readiness checks have been set up on the engineering product category. (Readiness checks can be applied on released variant level and the engineering version level.) If a readiness check has been set up, the following events occur:

- Readiness checks are created for the product.
- The engineering version is set to inactive to block the product from being used.

If a new engineering **version** is created for a product, the system checks whether readiness checks have been set up on the engineering product category. (Readiness checks can be applied on the engineering version level.) If a readiness check has been set up, the following events occur:

- Readiness checks are created for the product.
- The engineering version is set to inactive to block the product from being used.

View readiness checks

View open readiness checks for a product or product version

To find the open readiness checks for a product, open the **Released products details** page. Then, on the Action Pane, on the **Product** tab, in the **Readiness checks** group, select **Readiness checks**.

To find the open readiness checks for a product version, open the **Engineering versions** page for a released product and choose a version. Then, on the Action Pane, on the **Product** tab, in the **Checklist** group, select **Readiness checks**.

View open readiness checks that are assigned to you

To view the open readiness checks that are assigned to you, follow one of these steps.

- Go to **Engineering change management > Common > Product readiness > My open readiness checks**.
- Go to **Product information management > Workspaces > Product readiness for discrete manufacturing**.

The setup that specifies who a readiness check is assigned to is done for the engineering product category. Readiness checks can be assigned to a person or a team. If a readiness check is assigned to a team, there is one person on the team who must process the readiness check. For more information, see [Engineering versions and engineering product categories](#).

Process open readiness checks

Process system and manual readiness checks

After you open the **Readiness checks** page, you can view the subject of system and manual readiness checks by selecting **View related information** on the Action Pane. You can then complete and/or validate the data for the readiness check. Open readiness checks have a **Status** value of *Pending*. This status indicates that the readiness check must still be processed. To process a readiness check, follow one of these steps.

- On the Action Pane, select **Check/complete** to review and complete the readiness check. When you've finished, the **Status** field is updated to *Passed*.
- On the Action Pane, select **Skip** if you want to skip a readiness check that isn't mandatory. For example, you set up a readiness check for price calculations. However, you decide to skip this check while the product is still in the design phase. In this case, the **Status** field is updated to *Skipped*.

Depending on the configuration of the readiness policy, when the **Status** field for a readiness check is updated to *Passed*, an extra step might be required to approve the readiness check. In this case, select **Approval** to complete the readiness check. This approval step is always mandatory when the readiness check is skipped.

When all the open readiness checks for a new product, variant, or version have been processed and approved as required, the item automatically becomes active and therefore ready to use.

Process checklist readiness checks

To open a checklist, open the **Readiness checks** page, and then, on the Action Pane, select **Start checklist**. When you've completed the checklist, the system validates whether the readiness check is passed, based on the settings in the questionnaire. If the check is passed, the **Status** field is updated to *Passed*. If the readiness check isn't mandatory, you can skip it. In this case, the **Status** field is updated to *Skipped*.

Depending on the configuration of the readiness policy, when the **Status** field for a readiness check is updated to *Passed*, an extra step might be required to approve the readiness check. In this case, select **Approval** to

complete the readiness check. This approval step is always mandatory when the readiness check is skipped.

When all the open readiness checks for a new product, variant, or version have been processed and approved as needed, the item automatically becomes active and therefore ready to use.

Create and manage product readiness policies

Use product readiness policies to manage the readiness checks that apply to a product. Because a readiness policy is assigned to the engineering category, all the checks in the readiness policy apply to all the engineering products that are based on the engineering category. For more information, see [Engineering versions and engineering product categories](#).

Each readiness policy contains a set of readiness checks. When a readiness policy is assigned to an engineering product category, all the products that are created from that engineering product category will have the readiness checks that are indicated in the readiness policy.

To work with product readiness policies, go to **Engineering change management > Setup > Product readiness policies**. Then follow one of these steps.

- To create a new policy, select **New** on the Action Pane, and then set the fields as described in the following subsections.
- To edit an existing policy, select it in the list pane, select **Edit** on the Action Pane, and then set the fields as described in the following subsections.
- To delete an existing policy, select it in the list pane, select **Edit** on the Action Pane, and then, on the **General** FastTab, make sure that the **Active** option is set to *No*. Then select **Delete** on the Action Pane.

Set the following fields on the header of a product readiness policy.

FIELD	DESCRIPTION
Name	Enter a name for the policy.
Description	Enter a description of the policy.

General FastTab

Set the following fields on the **General** FastTab of a product readiness policy.

FIELD	DESCRIPTION
Product type	Select whether the policy applies to products of the <i>Item</i> or <i>Service</i> type. You can't change this setting after you save the record.
Active	Use this option to help maintain your readiness policies. Set it to <i>Yes</i> for all readiness policies that you use. Set it to <i>No</i> to mark a readiness policy as inactive when it isn't used. Note that you can't inactivate a readiness policy that is assigned to an engineering product category, and you can delete only inactive release policies.

Readiness control FastTab

For each type of readiness check that you want to include in the policy, add a row on the **Readiness control** FastTab. Use the following buttons on the FastTab toolbar to add and remove rows as you require:

- **Add check** – Add a standard readiness check to the policy. When you select this button, the **Add check** dialog box appears. There, you can select from a list of available checks.

- **Add existing questionnaire** – Add a blank row to the grid. You can then assign an existing questionnaire by setting the fields in the following table.
- **Copy** – Add a copy of the selected row to the grid.
- **Delete** – Delete the selected row from the grid.

For each row that you add, set the following fields.

FIELD	DESCRIPTION
Process area	Select the area that the check is related to.
Type	Select whether the check is a system check, a manual check, or a checklist (questionnaire).
Name	If the check is a checklist, enter a name. For system and manual checks, this field is automatically set.
Description	If the check is a checklist, enter a description. For system and manual checks, this field is automatically set, and the description explains the focus of the check.
Apply checks on	Select whether the row should generate readiness checks in response to a new released product, released variant, or released version.
Execute in	Select whether readiness checks that the row generates apply to all companies or a single company.
Company	If you set the Execute in field to <i>Single company</i> , select the company.
Owner type	Select whether readiness checks that the row generates should be assigned to a person or a team.
Owner	Select the person or team that readiness checks that the row generates should be assigned to.
Questionnaire	Select the questionnaire that should be used for the checklist. The checklist is a local checklist in the company where the readiness check is done. The system must be able to evaluate whether the checklist is correctly answered. Therefore, the checklist must be set up so that an evaluation is done based on correct answers. For more information about how to create questionnaires, see Using questionnaires and its related topics.
Automatic approval	Readiness check records include an Approved check box that indicates the approval status. Select the Automatic approval check box for checks that should be set to approved immediately after the assigned user completes them. Clear this check box to require explicit approval as an extra step.
Mandatory	Select this check box for checks that must be completed by the assigned user. Mandatory checks can't be skipped.

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Release product structures

2/18/2021 • 10 minutes to read • [Edit Online](#)

To ensure that engineering-relevant product data can easily be reused in different legal entities, you can release complete product structures in addition to releasing products together with their engineering versions. Therefore, you can release multilevel bill of materials (BOM) structures together with the parent in a single release action. In this case, the BOM and the lower-level products are also released.

Engineering products are created and maintained by their engineering company in such way that they meet quality requirements as they are designed. Each operational company that manufactures a product needs the same product and underlying BOM. Depending on the production facility, the route might be created locally. In this case, you won't release a route together with the product. For legal entities that will sell the products but won't manufacture them, the BOM might not be required.

To make the process more efficient, all engineering-relevant data can be released to other operational companies at the same time. This data includes the product structure. During the release process, you can choose which part of the product data should be released.

For more information about engineering companies and operational companies, see [Engineering companies and data ownership rules](#).

Note that you can release both standard products and engineering products together with the release product structure. During this process, the whole product structure will be released, even the BOM and route from the company that the products are being released in.

For an example of how to release a product, see [Release an engineering product to a local company](#)

Released data for a product when the release product structure is used

The following data is included in the release of engineering products:

- **Product data** – A new released product is created.
- **Engineering version data** – The engineering version and its data are created or updated. Note that if you release the same engineering version again to an operational company, the engineering data will be overwritten.
- **Engineering attributes** – The engineering attributes and their values are created or updated.
- **Engineering bill of materials** – The engineering BOM and its lines can be created or updated. For more information about data ownership, see [Product owners](#).
- **Engineering routes** – The engineering routes and their operations can be created or updated. For more information about data ownership, see [Product owners](#).
- **Engineering documents** – The engineering documents that are connected to the engineering version are created or updated.

When you turn on engineering change management on your system, the release product structure is available. In addition, standard products will include their BOMs and routes when they are released.

Product acceptance

Product acceptance is a key parameter that influences the release process. You can set this parameter for each company by going to **Engineering change management > Setup > Engineering change management**

parameters. For more information, see [Engineering change management parameters](#).

Automatic product acceptance

Each release of engineering products starts when somebody from the engineering company selects a product to release. When the **Product acceptance** parameter is set to *Automatic*, the user at the engineering company decides which product data should be automatically released to the operational companies. The product will then automatically be released to the companies that are selected in the release wizard.

Manual product acceptance

Each release of engineering products starts when somebody from the engineering company selects a product to release. When the **Product acceptance** parameter is set to *Manual*, the user at the engineering company decides which product data should be released to the operational companies. A user from each operational company then reviews the product data and decides whether to accept the release. The user at the operational company can set the following options when the data is received:

- If the products (updates) aren't relevant for the operational company, the user can choose not to accept the release.
- The user can change the item template for new products.
- The user can choose whether the product should be released together with their BOMs and/or routes, and whether they should be released as approved and active.
- The user can change the effective-from dates of the products.

For an example of how to accept a product, see [Review and accept the product before you release it in the local company](#).

NOTE

For standard products, you can release from any legal entity to any other legal entity. For engineering products, the only legal entity that you can release from is the engineering company.

Release policies

Not all operational companies need the same product data. In general, operational companies that manufacture engineering products require a BOM, whereas operational company that only sell engineering products don't require a BOM. You can use release policies to establish the parameters that are used for the release of products.

For engineering products, the release policy is assigned in the engineering product category, and the field is mandatory. For standard products, the policy is assigned to the shared product, and the field is optional.

For more information about engineering product categories, see [Engineering versions and engineering product categories](#).

During the release process, you can influence the settings.

Create and manage product release policies

To work with product release policies, go to **Engineering change management > Setup > product release policies**. Then follow one of these steps.

- To create a new policy, select **New** on the Action Pane, and then set the fields as described in the following subsections.
- To edit an existing policy, select it in the list pane, select **Edit** on the Action Pane, and then set the fields as described in the following subsections.
- To delete an existing policy, select it in the list pane, select **Edit** on the Action Pane, and then, on the **General**

FastTab, make sure that the **Active** option is set to *No*. Then select **Delete** on the Action Pane.

Set the following fields on the header of a product release policy.

FIELD	DESCRIPTION
Name	Enter a name for the policy.
Description	Enter a description of the policy.

General FastTab

Set the following fields on the **General** FastTab of a product release policy.

FIELD	DESCRIPTION
Product type	Select whether the policy applies to products of the <i>Item</i> or <i>Service</i> type. You can't change this setting after you save the record.
Apply templates	Select one of the following options to specify whether and how product release templates should be applied when the policy is used: <ul style="list-style-type: none">• Always – A template released product must always be used for releases. If you select this option, use the All products FastTab to specify the template that is used for each company that you release to. If you don't specify a template for each company that is listed on the All products FastTab, you will receive an error when you try to save the policy.• Optional – If a template released product is specified for a company that is listed on the All products FastTab, that template will be used when you release to that company. Otherwise, no template will be used. If you select this option, you can save the policy without assigning templates to all companies. (No warning will be shown.)• Never – No template released product will be used for any companies that you release to, even if a template is specified for companies that are listed on All products FastTab. The template columns will be unavailable.
Active	Use this option to help maintain your release policies. Set it to <i>Yes</i> for all release policies that you use. Set it to <i>No</i> to mark a release policy as inactive when it isn't used. Note that you can't inactivate a release policy that is assigned to an engineering product category, and you can delete only inactive release policies.

All products FastTab

On the **All products** FastTab, add a row for each operational company that you want to use this policy to release to. Use the buttons on the **All products** FastTab to add and remove rows as you require. For each row that you add, set the following fields.

NOTE

The settings on the **All products** FastTab apply to both engineering products and standard products.

FIELD	DESCRIPTION
Company accounts ID	Select the company that the row applies to. The parameters on the row will apply when products are released to this company.
Template released product	Add a template for the product.
Copy BOM approval	Select this check box to copy the BOM approval status to the receiving company.
Copy BOM activation	Select this check box to copy the BOM activation status to the receiving company.
Copy route approval	Select this check box to copy the route approval status to the receiving company.
Copy route activation	Select this check box to copy the route activation status to the receiving company.

Option parameters for engineering products FastTab

Every time that you add a row on the **All products** FastTab, a row that has a matching **Company accounts ID** value is also created on the **Option parameters for engineering products** FastTab. Then, if you remove a row from the **All products** FastTab, the row that has a matching **Company accounts ID** value is also removed from the **Option parameters for engineering products** FastTab.

For each row that is shown on the **Option parameters for engineering products** FastTab, set the following fields.

NOTE

The settings on the **Option parameters for engineering products** FastTab apply only to engineering products.

FIELD	DESCRIPTION
Template BOM	When a product that has a BOM is released, the lines of the specified template BOM will be added. This field is useful for adding local components, such as packaging or instructions in the local language.
Template route	When a product that has a route is released, the lines of the specified template will be added.
Copy effectivity	Select whether effectivity dates should be copied from the engineering company to the operational company when you release products.
Automatically add to release proposal	Select this check box for products that should automatically be released on the engineering change order. In this way, products that belong to engineering product categories that use this release policy can automatically be released to operational companies where this option is set up. (For more information, see Manage changes to engineering products.)

Review each product when you release it

When engineering products that have BOMs or routes are released, the parameters will be set to default values, as indicated in the release policy. As a user, you can influence this behavior on the releasing side when you use the release product structure.

To release engineering products, on the **Released products** page, select the products to release, and then select **Release product structure** to open the release wizard. The **Select engineering products to release** page shows the products. Select a single product, and then select **Release details** to review the release details for the product.

On the **Release details** page, you can change the value of the **Receive BOM**, **Copy BOM approval**, **Copy BOM activation**, **Receive BOM**, **Copy route approval** and **Copy route activation** fields. In the push-pull scenario, you can change the value of the same fields on the receiving side, provided that the BOM and route are released.

Product owners and product releases

Because product owners know which legal entities need their products, a product can be released only by the members of that product's product owner group. Other users can't release products that they don't own.

This behavior applies only when a product is directly selected for release. Products that are part of another product's structure via a BOM *can* be released by non-owner users when they release the parent product, provided that they own the parent product.

For example, product X is assigned to the *Design cabinets* product owner group. Product X is also part of the BOM of product Y, which is assigned to the *Design speakers* product owner group. If a user from the *Design speakers* product owner group releases product Y and its BOM, product X will be released together with product Y.

For more information, see [Product owners](#).

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Production process overview

2/18/2021 • 9 minutes to read • [Edit Online](#)

This topic gives an overview of the production processes. It describes the various stages of production orders, batch orders, and kanbans, from order creation to closing of the financial period.

The production of products, a process that is also known as the production life cycle, follows specific steps that are required to complete the manufacture of an item. The life cycle begins with the creation of the production order, batch order, or kanban. It ends with a finished, manufactured item that is ready for either a customer or another phase of production. Each step in the life cycle requires different kinds of information to complete the process. As each step is completed, the production order, batch order, or kanban shows a change in the production status. Different types of products require different manufacturing processes.

The **Production control** module is linked to other modules, such as **Product information management**, **Inventory management**, **General ledger**, **Warehouse management**, **Project accounting**, and **Organization administration**. This integration supports the information flow that is required to complete the manufacturing of a finished item.

The production process is typically influenced by the cost accounting and inventory valuation methods that are chosen for a specific production process. Supply Chain Management supports both actual cost (first in, first out [FIFO]; last in, first out [LIFO]; moving average; and periodic weighted average) and standard cost methods. Lean manufacturing is implemented based on the backflush costing principle.

The choice of the cost measurement methods also defines the requirements for reporting about material and resource consumption during the production process. Typically, actual cost methods require accurate reporting on the job level, whereas periodic costing methods allow for less granular reporting of material and resource consumption.

Mixed mode manufacturing

Different products and production topologies require the application of different order types. Supply Chain Management can apply the various order types in a mixed mode. In other words, all order types can occur during the end-to-end process of producing one finished product.

- **Production order** – This is the classic order type to produce a specific product or product variant in a given quantity on a specific date. Production orders are based on bills of materials (BOMs) and routes.
- **Batch order** – This order type is used for process industries and discrete processes where the manufacturing conversion is based on a formula, or where co-products and by-products can be end products, either in addition to or instead of the main product. Batch orders use **Formula** type BOMs and routes.
- **Kanban** – Kanbans are used to signal repetitive lean manufacturing processes that are based on production flows, kanban rules, and BOMs.
- **Project** – A manufacturing project combines products and services with a given schedule and budget. The manufacturing part of a project can be delivered through any of the other order types.

Manufacturing principles

To select the manufacturing principle that best applies to a particular product and related market, you must consider the requirements of production and logistics, and also customer expectations about delivery lead times.

- **Make to stock** – This is the classic manufacturing principle, where products are produced for stock, based on forecast or minimum stock refill (the latter is typically calculated based on forecast or historic consumption).
- **Make to order** – Standard products are made to order or finished to order. Although pre-production might be done by using the Make to stock principle, expensive steps of the value chain, or steps that create variants, are triggered by a sales order or transfer order.
- **Configure to order** – As for the Make to order principle, the final operations of the value chain are made to order. The actual product variant that is produced isn't predefined but is created at the time of order entry, based on the configuration model of the sales product. The Configure to order principle requires a certain level of process unification for a given product line.
- **Engineer to order** – Engineer to order processes are typically addressed by a project and usually start with the engineering phase. During the engineering phase, the actual products that are required fulfill the order are designed and described. Production orders, batch orders, or kanbans can then be created to produce the products.

Overview of the production life cycle

The following steps in the production life cycle can occur for all order types of mixed mode manufacturing. However, not all of them are represented as an explicit order status.

1. **Created** – You can create a production order, batch order, or kanban manually, or you can configure the system to generate them based on various demand signals. Master planning creates production orders, batch orders, or kanbans by firming planned orders. Other demand signals are sales orders or pegged supply signals from other production orders or kanbans. For fixed-quantity kanbans, demand signals are generated when kanbans are registered as empty.
2. **Estimated** – You can calculate estimates for material and resource consumption. The estimation generates inventory transactions for raw materials that have a status of **On order**. The receipts for main products, co-products, and by-products are generated when production orders or batch orders are estimated. If the BOM contains lines of the **Pegged supply** type, purchase orders for materials or subcontracted operation services are generated and pegged to the production order or batch order. Items or orders are reserved according to the reservation strategy of the production order, and the price of the finished goods is calculated based on parameter settings.
3. **Scheduled** – You can schedule production based on operations, individual jobs, or both.
 - **Operations scheduling** – This scheduling method provides a rough, long-term plan. By using this method, you can assign start and end dates to production orders. If the production orders are attached to route operations, you can assign them to cost center groups.
 - **Job scheduling** – This scheduling method provides a detailed plan. Each operation is broken down into individual jobs that have specific dates, times, and assigned operations resources. If finite capacity is used, jobs are assigned to operations resources based on availability. You can view and change the schedule in a Gantt chart.
 - **Kanban schedule** – Kanban jobs are scheduled on the kanban schedule board or automatically scheduled based on the automatic planning configuration of the kanban rules.
4. **Released** – You can release the production order or batch order when the schedule is finished and the material is available to be picked or prepared. The material availability check helps the shop floor supervisor assess the availability of material for the production orders or batch orders. You can also print the production order documents, such as the pick lists, job card, route card, and route job. When the production order is released, the status of the order changes to indicate that the production can begin. When warehouse management is used, release of the production order or batch order releases the production BOM lines to warehouse management. Warehouse waves and warehouse work are then generated according to the setup of the warehouse.

5. **Prepared/Picked** – When all materials and resources have been staged at the production location, the production BOM lines or kanban lines are updated to a status of **Picked**. Pegged supply orders and related warehouse work are typically completed at this stage. The kanban cards or job cards that are required to report production progress should be assigned and printed.
6. **Started** – When a production order, batch order, or kanban is started, you can report material and resource consumption against the order. The system can be configured to automatically post the material and resource consumption that are allocated to the order when the order is started. This allocation is known as preflushing, forward flushing, or autoconsumption. You can manually allocate materials to production orders or batch orders by creating additional picking list journals. You can also manually allocate labor and other route costs to the order. If you're using operations scheduling, you can allocate these costs by creating a route card journal. If you're using job scheduling, you can allocate the costs by creating a job card journal. Production orders or batch orders can be started in batches of the requested final quantity. Within a production order, batch order, or kanban, the jobs that are created can be started and reported separately through journals, the manufacturing execution terminal (MES Terminal), or the kanban boards.
7. **Report progress/Complete jobs** – Use the MES Terminal, production journals, kanban boards, or mobile scanning capabilities to report the production progress by job or resource. Material and resource consumption will be posted, and the status of the related kanbans, production orders, and batch orders might be updated to **Received** or **Reported as finished**. Put-away work for the warehouse might be created, depending on the warehouse configuration.
8. **Reported as finished** (the product receipt) – When a production order or batch order is reported as finished, the quantity of the finished goods that were completed is updated in inventory. This quantity includes the quantity of relevant co-products and by-products. If you're using work-in-process (WIP) accounting, a ledger journal is generated to reduce the WIP accounts and increase the inventory of the finished goods. When the cost of a production order is calculated, the actual cost of the production is posted. If the material and labor costs that are associated with a production aren't already allocated in a journal or by preflushing, they can be automatically allocated through back-flushing. Allocation through back-flushing involves the post-deducting of inventory transaction processes. If the production order is completed, select the **End job** check box to change the remaining status to **Ended**. Otherwise, leave the field empty to enable reporting of additional quantities that are produced.
9. **Quality assessment** – A product receipt can trigger the creation of quality orders, depending on the configuration of test processes and the quality rules that are established for specific products. Because a quality order can update the inventory status or the batch attributes of the tested products, quality assessment is a mandatory process in many industries.
10. **Put away and Ship to order** – After product receipt and quality assessment, optional put-away work directs the received products to the next point of consumption, to a finished goods warehouse, or to a shipment zone if there are ship-to-order requirements.
11. **Ended** – Before production is ended, actual costs are calculated for the quantity that was produced. All estimated costs of material, labor, and overhead are reversed and replaced with actual costs. If you select the **End job** check box when you run the cost calculation, the production order status changes to **Ended**. This status prevents any additional costs from being posted to a completed production order.
12. **Period closure** – Some cost accounting principles, such as periodic average, back-flush costing, FIFO, or LIFO, require periodic activities to close the inventory or financial period. Typically, the system tries to report all material and resource consumption, and also corrections of inventory and scrap, before the periods are closed. This reporting is typically done by using inventory movement journals or adjustment journals. The goal is to assess the economic performance of operating units per period. In some cases, when long-running production orders are used that span the financial reporting periods, production journals are used to report the production progress and resource consumption by the end of the period.

Additional resources

[Production feedback](#)

[Product configuration models overview](#)

[Lean manufacturing overview](#)

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Mixed mode planning - Combine discrete, process, and lean sourcing

2/18/2021 • 3 minutes to read • [Edit Online](#)

This topic provides information about mixed mode planning. In mixed mode planning, you can model your supply chain based on the material flow. Dynamics 365 Supply Chain Management makes sure that the material flow follows your models, regardless of the supply policy that is selected (kanbans, production orders, purchase orders, batch orders, or transfer orders).

You can select your overall strategy for supplying a product, regardless of the product structure.

For example, you can have kanban control in the assembly, where materials are sourced for the assembly area by production orders, kanbans, transfers, batch orders, or any combination that is appropriate for the characteristics of your supply chain, but you can still have full visibility across supplies. This capability leads to optimized supply chain processes and enhanced visibility into your supply chain.

The granularity of the supply policies that are used in master scheduling depends on the storage dimensions that are enabled as coverage dimensions. To enable master scheduling to control the replenishment and supply of different types of locations (for example, by separating the production floor for different production units, or by separating different types of material and finished goods warehouses), we recommend that you enable Site and Warehouse as coverage dimensions. Alternatively, Warehouse can be omitted as a coverage dimension. In that case, when you use advanced warehouse management, all movements inside a warehouse are controlled by warehouse work, whereas all movements across warehouses can be controlled by withdrawal kanbans.

Supply policies

Mixed mode planning controls how a product is supplied and, based on the supply, how derived requirements (consumption of items from a bill of materials [BOM]) are issued. Based on the order type, the system automatically sources materials to match the requirements.

Supply policies can be defined at the product level or at any granularity that supports your requirements. You define the granularity of supply policies on the **Default order settings** page.

Supply policies can be controlled by product, item dimensions (configuration, color, and size), site, and warehouse. This setup is done on the **Item coverage** page.

The default order type controls what order master planning generates.

Regardless of how the supply chain is modeled, Supply Chain Management supports your mix of supply policies. You can have production orders that are sourced from kanbans. Alternatively, you can have a batch order that requires a product that is supplied by transfers or by kanbans.

Supply Chain Management makes sure that the material flow follows the model.

The warehouse for picking material is assigned dynamically at run time, after the supply policy has been defined.

Typically, kanbans aren't created for future dates, because a kanban has a short life cycle. To maintain full visibility into the supply chain, we have introduced the new planning concept of a "planned kanban," which is used to calculate derived requirements and helps guarantee that the requirements are sourced based on the same logic that is used when the actual kanban is created.

The same logic is present for all other supply policy types. Therefore, long-term materials planning is based on

the same logic that you expect to run with the actual orders after production and supply are approved.

Materials allocation cross-supply policy – Resource consumption on BOMs

Resource consumption is an important functionality. Resource consumption enables a warehouse for picking materials to be selected dynamically, based on the supply policy (order type), and also makes maintenance of base data easier.

Resource consumption requires that the warehouse that materials are picked from be assigned based on the way that the product is supplied. In other words, at run time, the system finds the resources that should be used for manufacturing. Based on those resources, the system then finds the picking warehouse.

For work that is independent of a supply policy, you don't have to change information on the BOM if the supply is changed. For ad-hoc changes, Supply Chain Management makes sure that materials are sourced from the right warehouse.

Process manufacturing – The production type

For full flexibility in mixed mode, we recommend that you use production type BOMs for all products. You can then use production orders, kanbans, transfer orders, or purchase orders to supply a product. For process manufacturing, you must use a production type of **Formula**, **Co-product**, **By-product**, or **Planning item**. Kanbans and production orders can't be used for these production types.

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Manage subcontracting work in production

2/18/2021 • 9 minutes to read • [Edit Online](#)

This topic explains how subcontracted operations are managed in Dynamics 365 Supply Chain Management. In other words, it explains how production operations that are allocated to a resource are managed by a vendor.

In [production processes](#), work can be done by resources that are owned or administered by vendors. Typically, vendor resources are used to level periodic excess demand that surpasses the available capacity of a company's own resources. The vendor might also be able to offer specific [resource capabilities](#) or resources at a lower price.

Depending on the vendor resources that are used in a production process, a [route](#) often has additional logistic requirements, because the material and semi-finished products must first be transported to the vendor's site. Then the result of the subcontracted operation must be transported either to the location that is allocated to the next operation or to a finished goods warehouse.

When subcontracting operations or activities are used, they affect all stages of operations, from the definition of the operations that are required in production, costing, forecasting, planning, and scheduling, to the management of logistics for materials, semi-finished products, and finished goods. Finally, these resources require their own processes for accounting and cost control.

For internal resources, a fixed cost rate is typically allocated for a period. By contrast, the cost of subcontracted resources is based on the purchase price of the related service. The service is defined as another product, and is used to drive the procurement and purchase processes for a given subcontracted operation.

Currently, there is no explicit concept of semi-finished products in Supply Chain Management. For a production order that requires more than one operation in order to transform raw materials into a finished good, the finished good is posted back into inventory only in the last operation. The semi-finished products that the earlier operations produce are accounted in work in progress (WIP), but they aren't posted or tracked in inventory. Although you can split the routes and bills of materials (BOMs) into multiple smaller units, this approach increases the number of products, BOMs, and routes that must be managed.

There are two methods for modeling subcontracting work for production operations. These methods differ in the way that the subcontracting process can be modeled, the way that semi-finished products are represented in the process, and the way that cost control is managed.

- Subcontracting of route operations in production orders or batch orders
 - The service product must be a stocked product, and it must be part of the BOM.
 - This method supports first in, first out (FIFO) or standard cost.
 - Semi-finished products are represented by the service product in the process.
 - Cost control allocates the costs that are associated with subcontracted work to the material costs.
- Subcontracting of production flow activities in a lean production flow
 - The service is a non-stocked service product, and it isn't part of the BOM.
 - This method uses purchase agreements as service agreements.
 - This method uses backflush costing.
 - This method allows for aggregated and asynchronous procurement. (Material flow is independent of the procurement process.)
 - Cost control allocates subcontracted work in its own cost breakdown block.

Subcontracting of route operations

To use subcontracting of route operations for production or batch orders, the service product that is used for the procurement of the service must be defined as a product of the **Service** type. Additionally, it must have an item model group that has the **Stocked product** option under **Inventory policy** set to **Yes**. This option defines whether a product is accounted as inventory on product receipt (**Stocked product = Yes**), or whether the product is expensed on a profit and loss account (**Stocked product = No**). Although this behavior might seem contradictory, it's based on the fact that only products that have this policy will create inventory transactions that can be used in cost control to calculate planned cost and determine the actual cost when a production order is ended.

To be considered in planning and cost calculation, the service must be added to the BOM. The BOM line must be of the **Vendor** type, and it must be allocated to the route operation that the service is allocated to. This route operation must have a costing resource and resource requirement that point to a resource of the **Vendor** type that connects the operation and the related service to the corresponding vendor account.

When this configuration is used, a purchase order is created for the related service product, based on estimation of a production order. The purchase order of the service is used as an anchor for the subcontracted operations. The subcontracted work can be managed through the **Subcontracted work** list page in Production control. The subcontracted work is used to ship raw material and, eventually, a semi-finished product to the vendor in preparation for the operation. It's also used to receive the resulting product of the subcontracted operation in item arrival, where the service product is used to identify the arrival of the semi-finished product. When the purchase order line is received, the production operation is updated as completed.

A production order can have many operations, and each operation can be allocated to a different vendor. Therefore, an end-to-end production order might trigger multiple purchase orders.

Subcontracting of production flow activities

The [lean manufacturing](#) solution models the subcontracting work as a service that is related to an activity of a [production flow](#) (Task guide topic). Therefore, this type of subcontracting is also referred to as [activity-based subcontracting](#). A special cost group type, **Direct outsourcing**, has been introduced, and the subcontracting services aren't part of the BOM of the finished goods. When you use lean manufacturing, all activities are defined by kanbans that can be related to one or multiple production flow activities. So far, that explanation sounds just like an explanation of production orders. However, whereas production orders must always end with a finished product, you can create kanbans to supply a semi-finished product. You don't have to introduce a new product and BOM level.

Because kanban rules can be very dynamic, you can model different variants of supply for the same product on a production flow. When you use lean subcontracting, the material flow and the financial flow are strictly separated. All material flow is represented by kanban activities. The purchase orders for the service products and the receipt postings of those services can be automated, based on the status of kanban jobs in the production flow. Kanban jobs can be started and completed even before the purchase orders are created. The subcontracting documents (purchase order and purchase receipt of the service) can be aggregated by period and service. Therefore, the number of purchase documents and lines can be kept small, even in highly repetitive operations where vendors provide subcontracted services in a single-piece flow.

Modeling subcontracting in a production flow

In a [lean production flow](#), a process activity can be defined as subcontracted when it's allocated to a work cell (resource group) that has a single vendor resource. When a work cell is subcontracted, the related process activities must be linked to an active purchase agreement line that contains the service item and the price of the service. The service agreement of the activity also defines the calculation ratio between the product quantity of the kanban job and the resulting service quantity. You can select whether the service quantity is calculated based on the number of jobs, the good product quantity that is reported on the jobs, or the total product quantity (this total quantity includes scrapped products).

Transfer activities can also be defined as subcontracted. This definition occurs implicitly when you select the

responsible party for the shipping in the transfer activity. When you select **Shipper** or **Recipient**, if the corresponding source or target warehouse is a vendor-managed warehouse, the activity is considered subcontracted. When you select **Carrier**, the activity is always subcontracted. Like subcontracted process activities, a subcontracted transfer activity must be connected to a service agreement before the production flow can be activated.

Backflush costing

The cost accounting of subcontracted work is completely integrated into the costing for the lean manufacturing solution (backflush costing). When the purchase order receipt of the service is posted, or when invoicing occurs, the cost of the service is allocated to the production flow. For backflush costing, the variance of subcontracted services is calculated by offsetting the subcontracting block of the standard cost of the received products against the actual received and invoiced service quantities.

Material supply for subcontracted operations

Semi-finished products and other related materials must be transferred to the location where the work is physically performed. When you use subcontracted operations and activities, this transfer is often related to additional transport to a vendor-operated site. By allocating material in the BOM to the subcontracted operation, you declare that the material must be staged at the input location of the resource group for the allocated resource. Master planning or lean replenishment then provisions the material to that location.

To model the inventory that is located at a vendor site, it's a best practice in the industry to define a vendor-managed warehouse. You can easily define a vendor-managed warehouse by creating a new warehouse and assigning the vendor account. To document that material must be transferred to the vendor before an operation can be performed, you should allocate the vendor-managed warehouse to the input warehouse of the resource group that holds the resource.

To replenish material at this warehouse, you can use multiple strategies:

- Transfer orders
- Transfer journals
- Withdrawal kanbans
- Direct purchase to the vendor location

Semi-finished products are the exception to this rule. To transfer semi-finished products, you're limited to these options:

- For production and batch orders, semi-finished products can only be transferred logically by using the Picking list journal from the **Subcontracted work** list page. This journal will create a delivery note document that can be used to transfer semi-finished and raw material to the vendor.
- For subcontracted operations in production flows, the transfer of semi-finished products is documented by the receipt of withdrawal or production kanbans at the vendor location. To model an explicit transfer activity, you can end a production kanban with an additional transfer activity.

Note: A production route for a single production order can't cross multiple sites. This rule also applies to the subcontracted work. Therefore, the warehouses that represent the vendor-managed material locations must be defined in the same site as the internal resources that are used in the route. Although production flows can cross sites, they can't transport semi-finished products from one site to another, because that operation implies a change of cost context.

Typically, the output warehouse and location of a subcontracted resource group are directly allocated to the warehouse and location of the next step of the operation in the route or production flow. This setup helps reduce the amount of job reporting that occurs or the number additional transfer operations that must be modeled.

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Production setup requirements

2/18/2021 • 3 minutes to read • [Edit Online](#)

This article provides information about setup requirements before you can work with Production control.

Production control is integrated with features in other modules. This interconnectivity lets you change production orders and make sure that they are automatically updated in all other related processes and calculations in the system. The following setup processes are listed in the order that you should complete them in.

Required baseline setup in other modules

Information in other modules must be set up before you can work with Production control. This setup includes the following tasks:

- Set up general company information.
- Set up the general ledger.
- Define item groups.
- Set up ledger accounts for item groups.
- Set up the inventory item table in Inventory management.
- Create bills of materials (BOMs) and BOM versions in Inventory management.

Required calendar and resource setup

Before you use Production control, open Organization administration, and create and define the calendar and operations resources in the following order:

1. **Working time templates** – Set up working time templates to define the times that are available for production scheduling.
2. **Calendars** – Set up working time calendars to define the days of the year that are available for production scheduling.
3. **Resource groups** – Set up resource groups to group the operations resources, so that you can get an overview of any free capacity when you run scheduling. You don't have to set up resource groups before you set up operations resources. However, we recommend that you understand how to group resources when you set up Production control.
4. **Resources** – Set up operations resources to define the resources that are used to complete the production process and plan for capacity.

Required production parameters setup

Production control parameters – Set up basic production parameters to define how the system handles and processes production orders. Define how production orders are created, estimated, scheduled, and consumed. You can also select what kind of feedback you want and how cost accounting is done.

Required journal name identification

Production journal names – Specify the production journal names that are used to record and post transactions.

Setup if you use operations

Operations represent the specific activities that are completed to produce the finished product. **Note:** You must know the types of activities that are required in order to produce your item, and the order and priorities of those activities. You must also know which resources are involved, and how many.

1. **Operations** – Set up operations to represent the tasks that must be completed to produce the finished item.
2. **Relations** – Set up operation relations to establish detailed properties. To define operation relations, click **Relations** on the **Operations** page.

Setup if you use routes

If you're working with routes, operations must be defined for every production route that you set up. The route represents the path that the item takes from operation to operation, from the start of the production process to the end.

1. **Cost categories** – Set up cost categories to define the cost per hour of specified processes and setup times.
2. **Cost groups** – Set up cost groups to create and maintain different types of costing.
3. **Route groups** – Set up route groups to define parameters that are related to groups of routes. You must set up route groups before you can create production routes.
4. **Routes** – Set up production routes, and define default settings to control scheduling, costing, and pricing of route operations, and to control progress reporting.
5. **Route version** – Set up route versions to enable item variations in production.

Optional advanced settings

1. **Production groups** – Set up production groups to establish relationships between the production order and ledger accounts. The ledger accounts are used to post or group orders for reporting.
2. **Production pools** – Create production pools to group production orders so that you can process urgent production orders, or delete and post groups of orders.
3. **Properties** – Define properties to create special attributes that you can assign to your resources to control the order of productions. These attributes are connected to the working time template.

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Bills of materials and formulas

2/18/2021 • 7 minutes to read • [Edit Online](#)

This topic provides information about bills of materials (BOMs) and formulas, which are a central part of the definition of products and product variants. BOMs and formulas specify the required materials or ingredients for a specific product. Formulas also specify the co-products and by-products that are received in a specific production context.

Bills of materials

A bill of materials (BOM) defines the components that are required in order to produce a product. The components can be raw materials, semi-finished products, or ingredients. In some cases, services can be referenced in a BOM. However, BOMs typically describe the *material resources* that are required.

When it's combined with a route or production flow that describes the operations and resources that are required in order to build a product, the BOM forms the foundation for calculating the estimated cost of the product.

A BOM is an individual entity that is described by the following information:

- BOM ID
- BOM name
- The BOM lines that describe the components and ingredients
- The BOM versions, which define the product and period that the BOM can be used for

A single BOM describes a single level that is identified by a unique ID. Components might have their own BOMs that are referenced by BOM versions. You can display and edit the complete hierarchy of BOMs for a specific product in the BOM designer.

Formulas, co-products, and by-products

A formula is a subtype of BOM that is typically used for process manufacturing. In addition to components and ingredients, a formula describes co-products and by-products. In the actual version, the definition of co-products and by-products for the formula requires the formula version. A formula is typically defined for one specific finished product (a formula or planning item) that is defined in the formula version.

BOMs in the product lifecycle

In the product lifecycle, many types of BOM might be created for various reasons:

- **Sketching/Draft BOM** – This BOM gives a draft estimation of required materials in an early design phase and helps you do a rough estimate of cost and estimated product attributes. This BOM isn't usually used in enterprise resource planning (ERP).
- **Engineering BOM** – This BOM is typically used when you design products that are based on existing product portfolios. Engineering BOMs are structured to simplify the design process and group complex products into engineering modules. For simple products, it might be possible to use engineering BOMs for the actual production process. However, for other products, the engineering BOM must be converted to an actual production BOM. Engineering BOMs are typically represented by phantoms in the BOM hierarchy. Although engineering BOMs can be used for the planning and execution of manufacturing operations, this approach can lead to inefficiencies, especially in repetitive operations where many orders are created.
- **Planning BOM** – This BOM is used to do planning for material requirements. The demand of components and ingredients is calculated based on the demand of the finished products. Like costing BOMs, planning BOMs might represent a specific mix of material that is used in a period.

- **Production BOM** – This is the actual BOM that is used for a specific production. A production BOM must take into account the actual resources that are used to produce the product. When a production order, batch order, or kanban is created, the multiple levels of BOMs that are represented by phantoms are collapsed into one level and distributed over the operations for the order.
- **Costing BOM** – This BOM is used to calculate the estimated cost of a product. For example, you can use a costing BOM when standard cost is used or the estimated planned cost of a given product is calculated. Costing BOMs can refer to a specific mix of materials and resources that is expected to be used. Therefore, you can use the costing BOM to create a representative estimated cost for a period and help avoid variances over time.

The types of BOM that are actually used in an implementation depend on the implementation, and also on the business scenarios and requirements. In simple implementations, a planning BOM, production BOM, and costing BOM can be modeled as one BOM. In environments that have frequent engineering changes and multiple alternative routes, a larger set of BOM types will probably be required.

Approval of BOMs and formulas

Each BOM and formula can be separately approved or unapproved. Typically, approval of a BOM or formula occurs when the first relevant BOM version is approved. However, in some business scenarios, these approvals might be different steps in the process and might involve different process owners.

Note that, if a BOM is unapproved, all related BOM versions are also unapproved.

BOM and formula versions

To relate a specific BOM or formula to a product variant that can be produced, you must create a BOM version or formula version. The validity of BOM versions and formula versions can be constrained by period, quantity, site, specific product dimensions, and other criteria. Formula versions have additional important attributes, such as yield, co-product and by-product definitions, and the cost distribution instructions for the formula.

Approval of BOM and formula versions

Before a BOM version can be used in the planning or manufacturing process, it must be approved. When a BOM version is approved, the related BOM can also be approved, depending on the user's selection and authentication rights. Note that a BOM version can be approved only if the related BOM itself is approved.

Activation of the default BOM or formula version

To set a specific BOM or formula as the default BOM version or formula version that will be used by master planning or used to create production orders, you must activate the version. When a version is activated, the uniqueness of the version for the given constraints (for example, period, site, or quantity) is verified. You receive an error message if the version that you're trying to activate conflicts with a version that is already active. You must then either inactivate the conflicting version or modify the version constraints (usually the period) to prevent an ambiguous activation.

Product change with case management

The product change case for approval and activation of new or changed BOMs and BOM versions provides an easy way to see an overview of the BOM version constraints. You can also approve and activate all BOMs and formulas that are related to a specific change for one activation date.

Alternative BOM versions

Sometimes, the active BOM version or formula version should not be used in forecasts, sales, or a parent product. In this case, you can select a specific approved BOM as part of the requirement (forecast line, sales line, or BOM line) if an approved BOM version or formula version exists for the alternative BOM or formula.

When planned orders, production orders, or kanbans are created, the planner or shop floor supervisor can use any approved BOM version that is valid on the requested planned production date to plan for or produce a

specific product. The BOM version that is used doesn't have to be activated as the default BOM version.

BOM and formula lines

A BOM line is created for each material, service, or ingredient. The line defines the planned consumption of the specified product variant and also defines the various attributes that are related to the planned consumption.

BOM lines can have the following line types: **Item**, **Phantom**, **Pegged supply**, **Vendor**.

Item

Select the **Item** line type for materials or services that are directly consumed, and that don't require further explosion or pegged supply.

Phantom

Select the **Phantom** line type when you want to explode any lower-level BOM items that are contained on the BOM line. In Master scheduling, in planned cost calculation, or on estimation of a production order that uses BOM lines of the **Phantom** type, the parent BOM line that refers to a product variant that has a phantom BOM is replaced by the component items that are listed as BOM lines in that BOM, as determined by the applicable active BOM version of that product variant. If the product variant has an applicable active route, the operations of that route are merged into the parent route.

Note that phantoms are typically used to simplify the engineering process. Extensive use of phantom BOMs in many levels has an effect on performance, especially in highly repetitive manufacturing scenarios. To improve performance, you should avoid deep hierarchies of phantoms. Instead, use pre-exploded production BOMs and routes.

Pegged supply

Select the **Pegged supply** line type when you want to create a subproduction, a BOM line event kanban, or a direct purchase order for any product variant that the BOM line references. The subproduction, event kanban, or purchase order is created when you estimate the production order. The required item quantities are automatically reserved for the consuming production order.

Vendor

Select the **Vendor** line type if the production process uses a subcontractor, and you want a subproduction or purchase order to be created automatically for the subcontractor.

Note about subcontracted operations in a BOM: The service or work that is performed by the subcontractor must be created as service item that is tracked in inventory. You must attach the service item to the parent item as a BOM line. The route must contain an operation that is assigned to the subcontractor's operations resource.

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BOM designer functionality

2/18/2021 • 5 minutes to read • [Edit Online](#)

This topic describes how you can use the BOM designer page to design and work with tree structures for bills of materials (BOMs). You can click Setup to select different configurations and specify what information appears on the lines of the tree.

When you open the **BOM designer** page from the **Released products** page, it displays the hierarchy of bills of materials (BOMs) that are active and approved for the selected item, the default order site of the item, and the actual date.

Click **Filter** to change the initial selection in the view. By setting the display principle to **Selected/Active or Selected**, you can select individual BOM or route versions to use in the view. You can select non-approved and non-active BOM versions to show or maintain in the BOM designer.

Note: If you open the BOM designer from the **Bills of materials** list page, it doesn't display route information. Currently, the selection of a BOM or route version is a property of the BOM and route version, and applies to all instances of the BOM designer.

The following sections describe the functionality that is available on the various tabs of the BOM designer.

Analyzing a BOM structure by using the BOM designer

The BOM designer has two sections:

- The tree view of the BOM structure.
- The details section, which shows details of the selected data. When you select a node in the tree view, the FastTabs in the details section are updated based on that node:
 - **BOM line details** – Shows the details of the BOM line that is selected in the tree view.
 - **Item data** – Shows the details of the main item or the item that is used in the selected node. You can click **Edit released product** to maintain the selected item.
 - **BOM** – Shows the header of the BOM that is related to the selected node.
 - **Route** – Shows the header of the route that is related to the selected node.
 - **Route operations** – Shows a preview of the operations for the route. When a BOM line that is assigned to a specific operation is selected, the operation is marked as **Component needed at operations**.

Selecting a BOM and route

The filter that is applied for the BOM and route is displayed in the header of the BOM designer. You can change the filter by using the **Filter** dialog box. The following table describes the fields in this dialog box.

FIELD	DESCRIPTION
Product dimensions	If the selected finished product is a product master, you can define the active product dimensions for the main selection. Note: If you open the BOM designer for a product that isn't a product master, no product dimensions can be selected in the Filter dialog box.

FIELD	DESCRIPTION
Site	Change the site that the BOM tree is displayed for. The default site is the default inventory site of the finished item.
Display principle	Select the version display principle that applies to the current BOM structure and the current route: <ul style="list-style-type: none"> • When the principle is set to Active or Selected/Active, the valid BOM or route version for this date is found. • When the principle is set to Selected/Active or Selected, you can select a BOM version or route version by clicking BOM > BOM versions or Route > Route versions.
Version date	Enter the version date for the BOM and route. The version identifies which BOM version is used on a specific date, as determined by the version dates in the BOM version setup.
From quantity	Filter the versions by selecting a specific from quantity. If you set a value, different BOM and route versions might be selected.
Show valid only	When you select the check box, the tree structure shows only BOM lines that have valid dates. Right-click or double-click a BOM line to open the Edit BOM line page, where you can see the validity dates for that BOM line.

When you use the BOM designer to review or edit BOMs that consist of one or more levels of phantoms, the route that is associated with the top item typically spans the complete BOM hierarchy. To simplify the overview, you can lock the top-level route in the display by clicking **View > Lock route**. To unlock the route, click **View > Unlock route**.

Adding and editing BOMs and BOM lines

Use the **BOM lines** or **BOM** functions to modify the BOM lines or BOM. When you select a node in the tree, the type of the node determines that functions that are available.

FUNCTION	DESCRIPTION	NODE TYPE AND CONDITIONS
BOM lines > Edit	Open a dialog box where you can edit the BOM line attributes.	This function is available when a BOM line node is selected.
BOM lines > Delete	Delete a BOM line from the selected BOM.	This function is available when a BOM line node is selected, and the BOM isn't locked for editing.
BOM lines > Add before line	Open a dialog box where you can select a product variant to include before the selected BOM line.	This function is available when a BOM line node is selected.

FUNCTION	DESCRIPTION	NODE TYPE AND CONDITIONS
BOM lines > Add to component BOM	Open a dialog box where you can select a product variant to include at the end of the selected BOM.	This function is available when the node that is selected has a selected BOM. If this function isn't available, a BOM version might be missing for the selected item variant. In this case, you can click BOM > Create version to create the missing version for the selected node.
BOM lines > Add after line	Open a dialog box where you can select a product variant to include after the selected BOM line.	This function is available when a BOM line node is selected.
BOM > Create version	Create a new BOM version or BOM for the product variant of the selected node.	This function is available when the BOM line node that is selected is linked to an item that has a production type of BOM or Formula .
BOM > Calculation	Open a dialog box where you can run the cost or sales price calculation for the selected product variant.	This function is available when the node that is selected is related to a BOM version.
BOM > Check	Validate and check the selected BOM.	This function is available when the node that is selected is related to a BOM version.

Configuring the tree view

Click **Setup** to customize the information that is shown in the tree view of the BOM designer.

FIELD GROUP	DESCRIPTION
BOM	Use the check boxes to select the criteria that are shown in the tree structure. The BOM designer displays the selected criteria at the bottom of both tabs.
Route	Use the check boxes to select the criteria that are shown for the routes.

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Override the default reservation principle for materials in production

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IMPORTANT

Some or all of the functionality noted in this topic is available as part of a preview release. The content and the functionality are subject to change. For more information about preview releases, see [One version service updates FAQ](#).

The *Override default production reservation* feature lets you set a default reservation principle for each item model group. Therefore, different reservation principles can automatically be applied for each item that is part of a production bill of materials (BOM) or batch order formula. You can select whether each item model group should override the default reservation principle that is set for an order, and what reservation principle should be used instead (*manual, estimation, scheduling, release, or start*).

When you create a new production order or batch order, you're prompted to select the reservation principle that should be applied to that order and all its BOM lines or formula lines. When the *Override default production reservation* feature is used, some or all of the BOM or formula lines can override that reservation principle and instead use the reservation principle that is set for the relevant item model group.

For example, if you have raw materials or ingredients that require pick work, BOM or formula lines that are created for those products require a physical reservation, because physical reservation is a prerequisite for the generation of warehouse work. Typically, if you want the reservation to occur automatically, you select one of the following reservation principles: *estimation, scheduling, release, or start*. On the other hand, if you have materials or ingredients that don't require pick work, because they are consumed directly from a location, you typically select the *manual* reservation principle, which doesn't make any physical reservations or generate any pick work.

Turn on the feature

Before you can use the feature, it must be turned on in your system. Admins can use the [feature management](#) settings to check the status of the feature and turn it on. In the **Feature management** workspace, the feature is listed in the following way:

- **Module:** *Production control*
- **Feature name:** *Override default production reservation*

Assign a production reservation policy to an item model group

1. Go to **Cost management > Inventory accounting policies setup > Item model groups**.
2. Create or select an item model group.
3. On the **Inventory policies** FastTab, select the **Override item production reservation** check box.
4. In the **Reservation** field, select the reservation principle for items that belong to the selected model group. (Those items include items that are on a BOM or formula line.)
 - **Manual** – Items in the model group won't automatically be physically reserved for production. However, they can still be manually reserved as required.

- **Estimation** – Items in the model group will be physically reserved during estimation of the production order.
- **Scheduling** – Items in the model group will be physically reserved during scheduling of the production order.
- **Release** – Items in the model group will be physically reserved when the production order is released.
- **Start** – Items in the model group will be physically reserved at the start of the production order.

Example: Using reservation principles in a bulk/pack scenario

A bulk lubricant material is produced in a 1,000-liter mixer. After the bulk material is ready, it's pumped out to several filling stations, where bottles of different sizes are filled. After filling is completed, the bottles are packed into boxes. Those boxes are then packed onto pallets.

In this scenario, a batch order to make 1,000 liters of bulk material is created. (This order is the bulk order.) When this batch order is completed, it's reported as finished to the material input location of the filling stations. A batch order to fill and pack each bottle size is then created. (These orders are the pack orders.) The pack orders have a formula that consists of the bulk material, an empty bottle, a label, and other packing materials. Because the bulk material flows directly from the mixer tank to the filling stations, no warehouse work is required to pick this ingredient, and the bulk material is consumed directly from the input location. Therefore, the reservation principle is set to *manual*. The other materials are staged to the filling station by pick work. Therefore, the reservation principle for these lines is set to *release*, for example, so that the reservation automatically occurs when the pack order is released.

NOTE

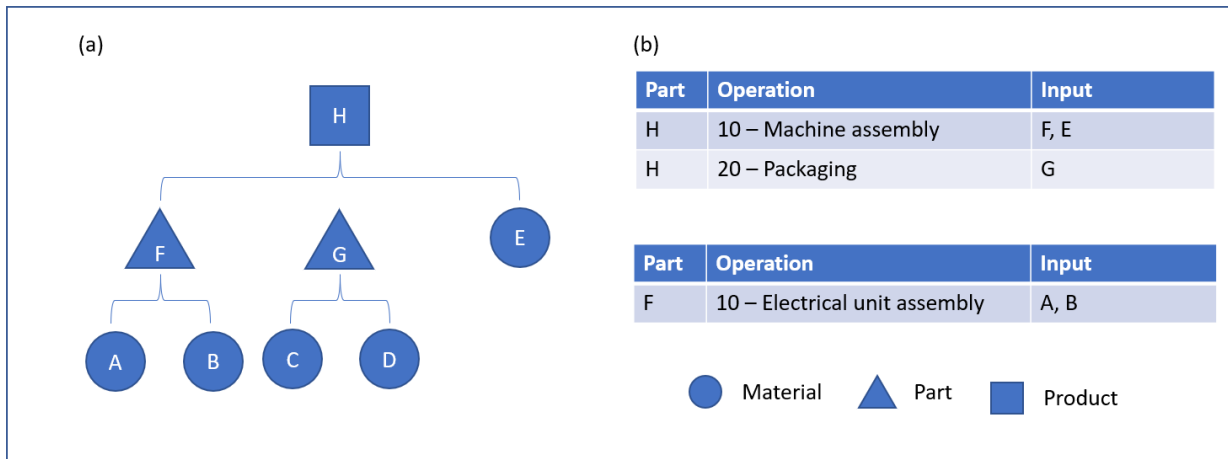
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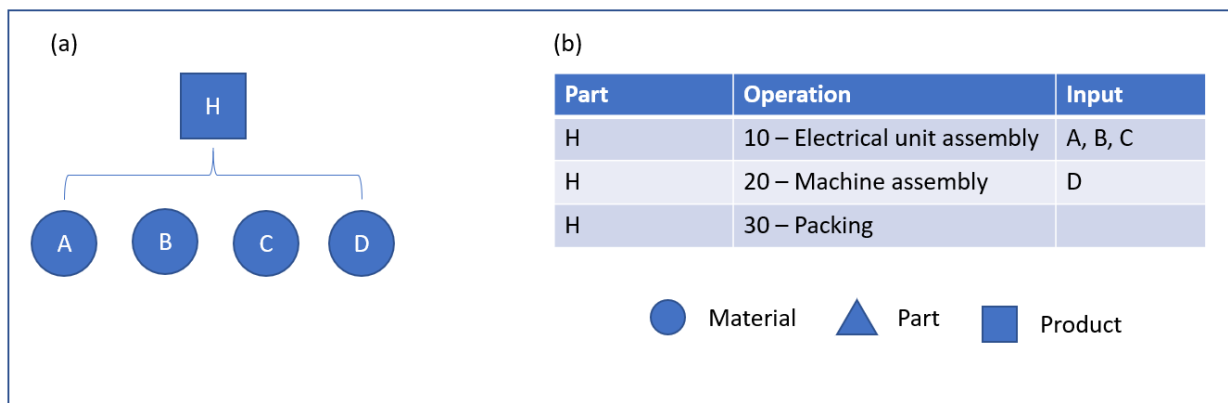
Phantom items

2/18/2021 • 4 minutes to read • [Edit Online](#)

This topic describes, in detail, how the Phantom line type can be used for the lines of a bill of materials (BOM) and a formula. In the following illustration, (a) is the BOM for product H and parts F and G, and (b) is the route sheet for products H and part F.



This illustration shows an example of a BOM structure in two levels. Finished product H represents a product for a machine assembly. The machine assembly consists of two parts, an electrical unit (F) that has two materials (A and B) and a group of packaging materials (G) that also has two materials (C and D). Another material (E) is used during the general assembly of the machine.



The preceding illustration represents the Engineering BOM for product H. This structure provides a good overview of the parts and components of the overall machine assembly. However, although product designers might prefer to see the BOM represented in this way, this structure might not correctly represent the way that the machine is built on the shop floor.

For example, the Engineering BOM in the preceding illustration indicates that electrical unit F is assembled as a separate part on a separate work order. However, on the shop floor, it might be judged more optimal to assemble the electrical unit as part of the overall machine assembly, not as a separate work order.

This Engineering BOM also indicates that part G is a separate part. However, in this structure, part G doesn't represent a physical part but a collection of packaging materials.

Therefore, although an Engineering BOM provides great value for the design of a product and maintenance of that design, it might not be the most logical way to support the manufacturing execution process of the product. By contrast, a Manufacturing BOM represents the best way to build a product.

The following illustration shows how the preceding Engineering BOM is transitioned into a Manufacturing BOM. In this illustration, (a) is the BOM for product H, and b is the route sheet for product H.

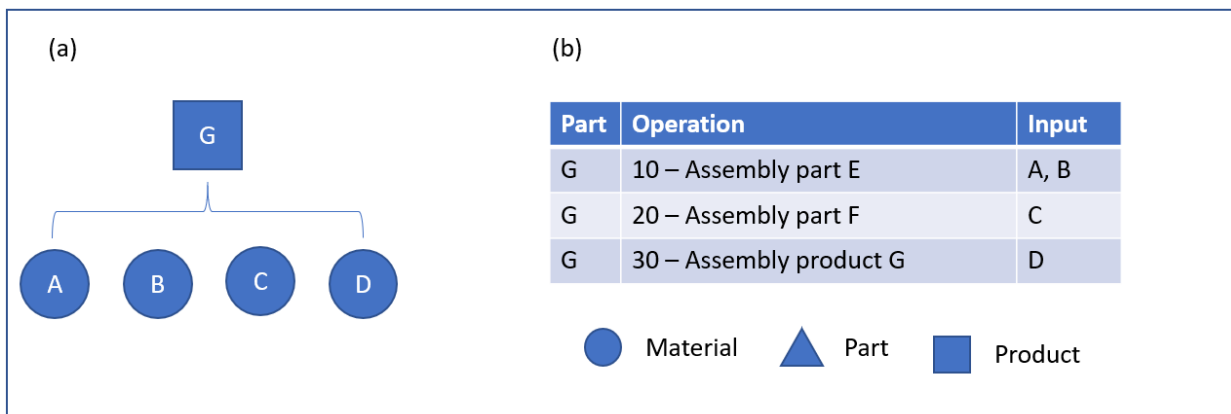
In this structure, you can see that there is no notion of parts F and G, and the materials that these parts consist of have been elevated to the next BOM level.

Unlike the Engineering BOM, which had two operations sheets, the Manufacturing BOM has only one operations sheet. The packaging operation that was linked to part G has also been elevated and is now part of the operations sheet for product H. The assembly of the electrical unit is the first operation. This order makes good sense, because this unit is used in the next operation, which is the machine assembly. The last operation is the packaging operation, which consumes two packing materials (C and D).

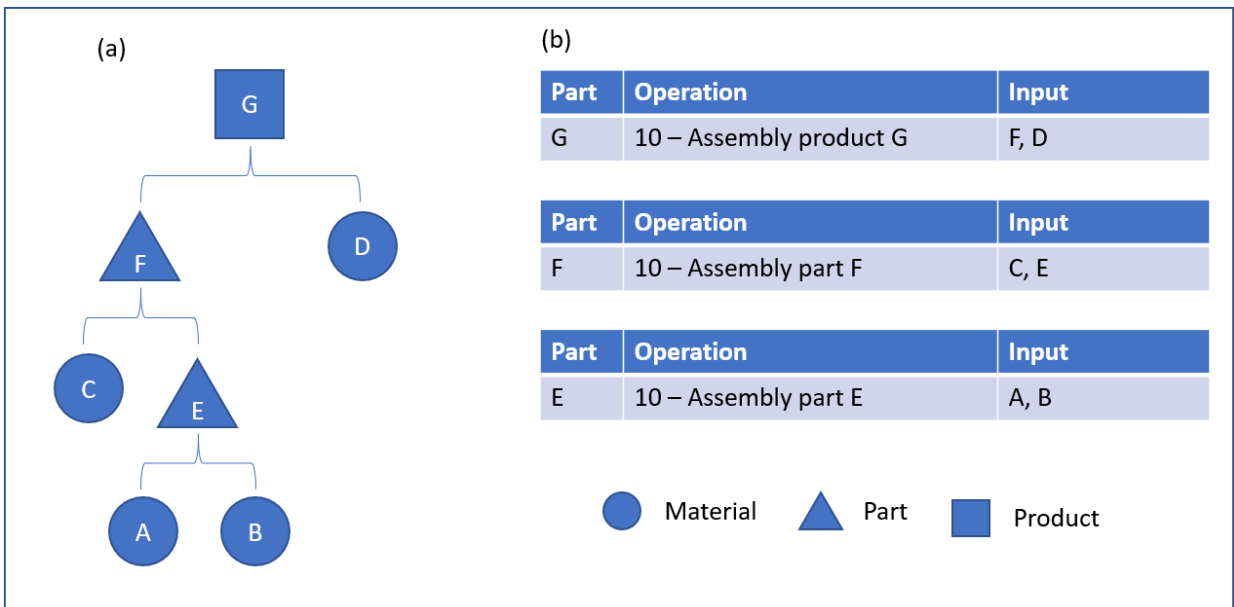
The transition between the Engineering BOM and the Manufacturing BOM is enabled through the Phantom BOM line type. As the term “phantom” indicates, parts F and G have disappeared during the transition between the two BOM types. In this example, the Phantom line type is applied to the BOM lines for parts F and G in the Engineering BOM. When a production or batch order is created, the Engineering BOM is copied to the production or batch order. Then, when the order is estimated, the transition from the Engineering BOM to the Manufacturing BOM occurs, as shown in the preceding illustrations. From the operations sheet in the second illustration, packaging materials C and D are input for the operation.

Multilevel phantom BOM structures

The Phantom line type can be used in multilevel BOM structures, as shown in the following illustration. In this illustration, (a) is the BOM for product G, and (b) is the route sheet for parts E and F and product G.

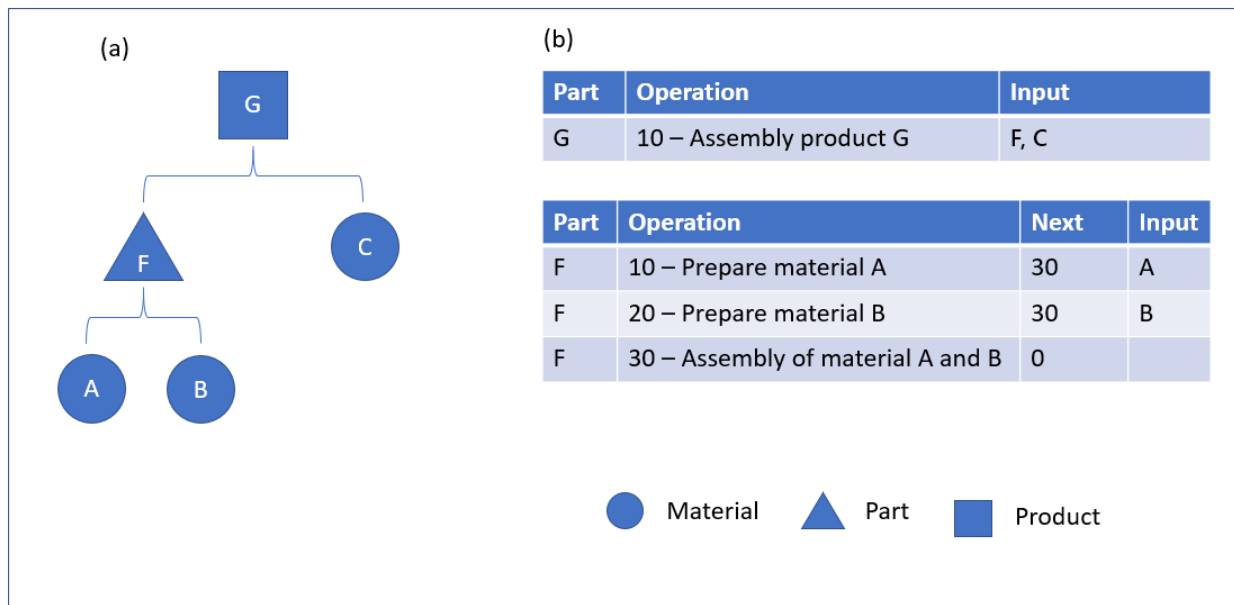


The following illustration shows the resulting Manufacturing BOM and route sheet if the BOM lines for parts E and F are configured so that the line type is Phantom. In this illustration, (a) is the BOM for product G, and (b) is the route sheet for product G.



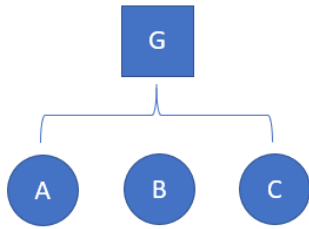
Phantom and route network

Phantom BOMs can also be used for a BOM that has a route network. In a route network, one or more operations run in parallel. The following illustration shows an example of a route network that is used in a multilevel BOM. In this illustration, (a) is the BOM for product G and part F, and (b) is the route sheet for product G and part F, which has a route network.



In the following illustration, (a) is the BOM for product G and part F, and (b) is the route sheet for product G and part F.

(a)



(b)

Part	Operation	Next	Input
G	10 – Prepare material A	30	A
G	20 – Prepare material B	30	B
G	30 – Assembly of material A and B	40	C
G	40 – Assembly product G	0	

● Material ▲ Part ■ Product

NOTE

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BOM calculations

2/18/2021 • 9 minutes to read • [Edit Online](#)

The cost roll-up and sales price calculations are known as bill of materials (BOM) calculations, and you initiate them from the **Calculations** page. This topic provides information about BOM calculations.

The cost roll-up and sales price calculations are known as bill of materials (BOM) calculations, and you initiate them from the **Calculations** page. You use the **Calculations** page to perform the following tasks:

- Calculate the cost of a manufactured item, and generate an associated item cost record within a costing version.
- Calculate the sales price of a manufactured item, and generate an associated item sales price record within a costing version.

The way that you use the **Calculations** page varies slightly, depending on how you initiate the BOM calculations. The way that you use the **Calculations** page also depends on whether the BOM calculations involve a costing version for standard costs or planned costs, and on several policies that are defined in the costing version that is used in the BOM calculations. **Note:** A variation of the **Calculations** page is used in the context of a sales order, sales quotation, or service order line item. These calculations are known as order-specific BOM calculations. An order-specific BOM calculation doesn't generate an item cost record within a costing version. Instead, it generates a calculation record that appears on the **BOM calculation details** page. The calculation record includes a calculated cost and a calculated sales price. The **Calculations** page can be opened for a single manufactured item or for a costing version:

- To calculate costs for a single manufactured item, you initiate BOM calculations from the **Item price** page. The **Calculations** page inherits the item identifier. The costing version, BOM version, route version, calculation quantity, calculation date, and site must be specified.
 - By default, the BOM version and route version are set to the active versions for the item, site, date, and calculation quantity. However, you can override the default values with approved versions.
 - By default, the calculation quantity is set to the item's standard order quantity. However, you can override the default value.
 - The calculation date or site can be mandated by the costing version, or user-specified values can be set when the date or site isn't mandated in the costing version. A future calculation date determines how pending cost records are used. BOM calculations use a pending cost record that has the nearest from-date that is on or before the calculation date.
- To calculate costs for all manufactured items or selected items, or to update items on a where-used basis, you initiate BOM calculations from the **Costing version setup** page or the **Costing version maintenance** page. The **Calculations** page inherits the costing version.
 - For the calculations, it's assumed that the active BOM version and route version are used for a manufactured item (and for the related site, date, and quantity), unless a manufactured component has a specified sub-BOM or subroute.
 - For the calculations, it's assumed that the standard order quantity is used for manufactured items. The standard order quantity provides the basis for calculating component quantities, determining the relevant BOM versions and route versions (when you use quantity-sensitive BOMs and routes), and amortizing constant costs. However, when a manufactured component has a BOM line type of **Production** or **Vendor**, or when you use a make-to-order explosion mode for the BOM calculations, this assumption doesn't apply, because quantities reflect the specified calculation quantity.
 - The calculation date or site can be mandated by the costing version, or user-specified values can be set when the date or site isn't mandated in the costing version.

Other variations in BOM calculations reflect the costing type and restrictions of the costing version:

- BOM calculations that use standard costs must be restricted by costing version policies, because the restrictions help guarantee that standard costing principles are used. Standard costing principles require the enforcement of restrictions about the use of standard costs for purchased items, a single-level explosion mode, and the inclusion of miscellaneous charges in unit costs.
- BOM calculations that use planned costs don't have to follow standard costing principles. These BOM calculations can use different explosion modes, alternative sources of cost data for purchased items, and optional enforcement of restrictions within the costing version.

BOM calculations that use standard costs

Policies within the costing version (for standard costs) can mandate enforcement of five BOM calculation policies. The **Recording restriction** option in the costing version mandates one of these policies, where miscellaneous charges must be included in the unit price. Miscellaneous charges for purchased items can be entered manually, whereas miscellaneous charges for manufactured items reflect the calculated amortization of constant costs. The **Calculation restriction** option in the costing version mandates the other four BOM calculation policies:

- The source of cost contributions for purchased items must be based on standard costs. In other words, BOM calculations must use the item cost records within the specified costing version, or within the fallback that contains standard costs.
- To help guarantee accurate and consistent calculation of standard costs, the explosion mode must be single-level.
- To help guarantee consistent results when the sales price of the items is calculated, the profit setting must be mandated. The profit setting can be used, and the item sales price records can be generated, only if the costing version allows for content of sales prices.
- The fallback principle must be mandated, and can be set to **None**, **Active** (for active cost records), or **Costing version** (for a specified costing version).

BOM calculations that use planned costs

Policies within the costing version (for planned costs) can optionally mandate enforcement of five BOM calculation policies. Alternatively, the policies can just provide default values. The **Recording restriction** option in the costing version determines whether the BOM calculation policy about miscellaneous charges will be mandated or act as a default value. Miscellaneous charges can optionally be included in the unit price. The **Calculation restriction** option in the costing version determines whether the other four BOM calculation policies will be mandated or act as default values:

- The source of cost contributions for a purchased item can be the item cost records within a costing version. Alternatively, the source can be defined by the BOM calculation group that is assigned to the item. For example, the BOM calculation group can define purchase price trade agreements as the source of cost contribution data.
- The explosion mode can be single-level, multilevel, or make-to-order, or it can be based on the BOM line item. The explosion mode for the BOM line type replicates the cost calculation logic for production order estimates.
- The profit setting can be mandated, or it can be a default value. The profit setting can be used, and the item sales price records can be generated, only if the costing version allows for content of sales prices.
- The fallback principle can be mandated, or it can be a default value. The fallback principle can be set to **None**, **Active** (for active cost records), or **Costing version** (for a specified costing version).

BOM calculations generate warning messages and other types of messages. Several BOM calculation policies determine the types of messages. The warning conditions are defined in the BOM calculation group that is assigned to items. However, you can override these warning conditions when you initiate a BOM calculation. When the fallback principle is used, it's often helpful if the fallback is shown as an information message. When

you're trying to update calculated costs for items that have missing cost records, it's also helpful if the information message identifies items that weren't updated.

BOM calculations that use the fallback principle

The following situations illustrate two uses of the fallback principle:

- **Two-version approach to standard cost updates** - A costing version can contain the incremental changes to standard costs, such as pending cost records that represent new items or cost changes. In this situation, the fallback principle can identify the use of the active standard costs that are contained in other costing versions.
- **Simulation of the effect of cost changes by using planned costs** - A costing version for planned costs can contain incremental changes for simulation purposes. This costing version will include pending cost records that represent the simulated cost changes to items, cost categories, and calculation formulas for indirect cost. In this situation, the fallback principle can identify the use of the active standard costs that are contained in other costing versions.

BOM calculation of a suggested sales price

When you use a cost-plus-markup approach, the calculated sales price for an item reflects the set of profit-setting percentages that is specified for the BOM calculation, and the costs that are associated with the item's component items, routing operations, and applicable manufacturing overheads. The markup reflects profit-setting percentages that are assigned to cost groups, and the cost groups that are assigned to items, cost categories for routing operations, and the indirect cost calculation formulas for manufacturing overheads. The sets of profit-setting percentages are labeled **Standard**, **Profit 1**, **Profit 2**, and **Profit 3**. Within the Profit 1 set, for example, a profit-setting percentage of 50 percent can be defined for a cost group that is assigned to purchased material, and a profit-setting percentage of 80 percent can be defined for a cost group that is assigned to cost categories for routing operations. The context of the BOM calculation determines how the results of a calculated sales price are handled:

- **BOM calculation for an item and specified costing version** - The BOM calculation generates a pending sales price record within the costing version. This sales price record provides the starting point for viewing the calculation details (for example, on the **Calculate item cost** page). The sales price record acts mainly as reference information and isn't used as the basis for a sales price on sales orders.
- **Order-specific BOM calculation** - A variation of the **BOM calculation** page is used in the context of a sales order, sales quotation, or service order line item. An order-specific BOM calculation doesn't generate a record in the within a costing version. Instead, it generates a calculation record that appears on the **BOM calculation results** page. This calculation record provides the starting point for viewing the calculation details (for example, on the **Calculate item cost** page). Information about a selected calculation record can be transferred to the originating line item. For example, the calculated sales price can be transferred to a sales order line item.

Order-specific BOM calculations

An order-specific BOM calculation represents a variation of a BOM calculation for a manufactured item. The order-specific BOM calculation is performed in the context of a sales order, sales quotation, or service order line item. An order-specific BOM calculation generates a calculation record that appears on the **BOM calculation results** page. The calculation record includes a calculated weight, a calculated cost that is based on active cost records, and a calculated sales price. The calculation record that each order-specific BOM calculation for an item generates on the **BOM calculation results** page is uniquely identified by a calculation number. The results of a calculation record can be optionally transferred to the originating line item. An order-specific BOM calculation differs from a BOM calculation for a manufactured item in two ways:

- An order-specific BOM calculation doesn't generate an item cost record within a costing version. Therefore,

the BOM calculation policies aren't applied when an item cost record is created, or when a cost record is overwritten.

- An order-specific BOM calculation always uses the active cost records for components, cost categories, and indirect cost calculation formulas.

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Manage unit of measure

2/18/2021 • 2 minutes to read • [Edit Online](#)

This procedure shows how to define a unit of measure, provide translations for the unit and its description, and define conversion rules for related units. You can walk through this procedure using demo data, or using your own data.

1. Go to **Navigation pane > Modules > Product information management > Released product maintenance**.
2. Click **Units**.

Create a unit of measure

1. Click **New**.
2. In the **Unit** field, type a value. Enter the ID or symbol to use when referring to the unit of measure.
3. In the **Description** field, type a value. Enter a descriptive name for the unit of measure in the system language.
4. In the **Unit class** field, select an option. The unit class defines what logical grouping, such as area, mass, or quantity, the unit of measure is part of.
5. In the **Decimal precision** field, enter a number. Specify the number of decimals that the converted unit of measure must be rounded to when a calculation is completed for the unit of measure.
6. Click **Save**.

Define unit translations

1. On the **Action Pane**, click **Unit texts**.
2. Click **New**. Use unit text to create a translation of the ID or a symbol representing the unit of measure for use on external documents in customer- or vendor-specific languages.
3. In the **Language** field, enter or select a value.
4. In the **Text** field, type a value.
5. Click **Save**.
6. Close the page.
7. On the **Action Pane**, click **Translated unit descriptions**.
8. Click **New**. Define language-specific descriptions for the unit of measure.
9. In the **Language** field, enter or select a value.
10. In the **Description** field, type a value.
11. Click **Save**.
12. Close the page.

Define unit conversion rules

1. On the **Action Pane**, click **Unit conversions**. Define rules for converting the unit of measure to and from other units of measure in the selected unit class.
2. Click **New** to open the drop dialog.
3. In the **Factor** field, enter a number. Conversion factor between the From unit and the To unit. For example, the conversion factor from centimeter to meter is 100 because there are 100 centimeters in one meter.
4. In the **To unit** field, enter or select a value.

5. In the **Rounding** field, select an option. Define how the converted value should be rounded.
6. Click **OK**.
7. Close the page.

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Production parameters in Manufacturing execution

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This topic provides information about the setup of production parameters in Manufacturing execution.

The **Manufacturing execution** module is intended primarily for manufacturing companies. It can be used to register time and item consumption on production jobs or projects. Before you start to use Manufacturing execution for job registrations, you must set up various production parameters that define how and when registrations are posted during the production process. The settings of production parameters affect inventory management, production management, and cost calculation.

Before workers start to make registrations on production jobs, you should carefully consider all settings on the **Production parameters** page. Click **Production control > Setup > Manufacturing execution > Production order defaults**. If your company uses the multisite functionality, you might want to set up different production parameters for each site. The parameters for integration with the **Production** module are set up on the following tabs on the **Production parameters** page:

- **General** – General parameter settings for production jobs in Manufacturing execution.
- **Start** – Parameters that are used when production operations are started.
- **Operations** – Parameters that are applied to production operations and feedback about operations during the production process.
- **Report as finished** – Parameters that are used when items are reported as finished on the last operation of a production order.
- **Quantity validation** – Parameters that are used to validate start and feedback quantities on production orders.

Types of production jobs

On the **Operations** tab, you select which types of production jobs require registration on the **Job registration** page.

Typically, workers make registrations on setup jobs and process jobs. However, if job scheduling is applied, you can select other job types that workers must make registrations on when production orders are processed. For example, you can require registrations on transport jobs.

IMPORTANT

Make sure that you select all relevant job types. Otherwise, jobs might not be available for registration on the **Job registration** page. Your selections should match the selections in the **Job management** column on the **Setup** tab of the **Route groups** page (**Production control > Setup > Routes > Route groups**).

If **Job management** is selected on the route group, this job type is reported as finished on the production order when the job is reported as finished in Manufacturing execution. When all job types that **Job management** is selected for have been reported as finished on an operation, Manufacturing execution reports the operation as finished.

NOTE

Some job types can be manually reported through production journals. In this case, select **Job management** for the job type, but don't select the job type for registration on the **Operations** tab on the **Production parameters** page in Manufacturing execution.

BOM consumption and picking list journals

A consistent setup for bill of materials (BOM) consumption is important, because it helps guarantee that inventory management is efficient. For example, if BOM consumption parameters aren't set up correctly in Manufacturing execution, materials might be deducted from inventory two times or not at all.

On the **Production parameters** page, automatic BOM consumption is set up in three stages:

- At the start of a production. Set up this stage on the **Start** tab.
- During the production process when an operation is completed. Set up this stage on the **Operations** tab.
- When a production order is reported as finished. Set up this stage on the **Report as finished** tab.

For each stage, the **Automatic BOM consumption** field lets you select one of three methods for picking items for a production order:

- **Flushing principle** – This option is used in combination with an option that is defined for the BOM in the **Production** module. Click **Production control > Common > Production orders > All production orders**. On the **All production orders** page, select a production order in the list, and then, on the Action Pane, click **BOM**. On the **BOM** page, on the **Setup** tab, in **Flushing principle** field, select one of the following options:
 - **Start**
 - **Finish**
 - **Manual**
 - Blank (No option is selected.)
 - **Available at location**

In Manufacturing execution, if **Flushing principle** is selected in the **Automatic BOM consumption** field on the **Start** tab, all materials that are set to **Start** in the BOM are deducted from inventory when the operation is started. The **Available at location** option is used for products that are enabled for advanced warehouse processes. If you select this flushing principle, material is flushed when warehouse work for raw material picking is completed. Material is also flushed when a BOM line that uses this flushing principle is released to warehouse and the material is available at the production input location.

NOTE

If the **Flushing principle** field is set on the **Start** tab in Manufacturing execution, you must select the same principle on either the **Operations** tab or the **Report as finished** tab. This requirement helps guarantee that materials are deducted from inventory on BOMs that use **Finish** as a flushing principle on the production order. If the same flushing principle isn't selected on either the **Operations** tab or the **Report as finished** tab, materials might be deducted from inventory two times.

- **Always** – If you select this option for a stage, materials are always deducted from inventory at that stage. For example, materials for the production are deducted when the production order is started. This setting requires that **Never** be selected on the **Operations** and **Report as finished** tabs. This requirement

helps prevent items from being deducted from inventory two times.

- **Never** – If you select this option for a stage, no BOM consumption occurs at that stage. For example, if you select **Never** on all three tabs (**Start**, **Operations**, and **Report as finished**), materials must be manually deducted from inventory.

IMPORTANT

Carefully consider your setup of the production parameters, and make sure that the parameters that are selected on the various tabs of the **Production parameters** page don't contradict each other.

The following examples illustrate parameter settings that support various BOM consumption principles. The parameters are set up on the **Production parameters** page in Manufacturing execution.

Example 1: Backflushing on operations

Use the following settings if picking list journals and BOM item consumption should be generated when items are reported as finished on an operation.

TAB	FIELD	SETTING
Start	Update start on-line	Status or Status + quantity
Start	Automatic BOM consumption	Never
Operations	Automatic BOM consumption	Always
Report as finished	Automatic BOM consumption	Never
Report as finished	Update finished report on-line	Status + quantity

Example 2: Backflushing on production

Use the following settings if picking list journals and BOM item consumption should be generated when items are reported as finished on the production order.

TAB	FIELD	SETTING
Start	Update start on-line	Status or Status + quantity
Start	Automatic BOM consumption	Never
Operations	Automatic BOM consumption	Never
Report as finished	Automatic BOM consumption	Always
Report as finished	Update finished report on-line	Status + quantity

Example 3: Flushing principle

Use the following settings if picking list journals and BOM item consumption should be generated according to the flushing principle that is set for the BOM items.

TAB	FIELD	SETTING
Start	Update start on-line	Status + quantity
Start	Automatic BOM consumption	Flushing principle
Operations	Automatic BOM consumption	Flushing principle
Report as finished	Automatic BOM consumption	Never
Report as finished	Update finished report on-line	Status + quantity

Example 4: Deduction of materials during startup of a production order

Use the following settings if picking list journals and BOM item consumption should be generated when a production is started.

TAB	FIELD	SETTING
Start	Update start on-line	Status + quantity
Start	Automatic BOM consumption	Always
Operations	Automatic BOM consumption	Never
Report as finished	Automatic BOM consumption	Never
Report as finished	Update finished report on-line	Status or Status + quantity

Based on the selections that are described earlier in this section, picking list journals are posted at various stages of the production order process:

- When an operation is started
- When quantity feedback is reported on an operation
- When items are reported as finished on the production order

Example 5: Manual BOM consumption

You can use the following settings if materials should always be manually deducted from inventory. In this case, picking list journals aren't posted.

TAB	FIELD	SETTING
Start	Update start on-line	Status
Start	Automatic BOM consumption	Never
Operations	Automatic BOM consumption	Never
Report as finished	Automatic BOM consumption	Never
Report as finished	Update finished report on-line	Status

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Operations resources

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Operations resources perform the activities of a project or a production process. They can be of different types, and can have different capabilities.

Operations resources

Operations resources are the machines, tools, workers, facilities, physical areas or vendors that perform the activities of a project or a production process. They can be of different types and can have different capabilities.

- **Vendor** – An external resource that performs project activities or production operations. An example is a subcontractor. By linking vendor resources to a vendor account, you can generate purchases for subcontractors, based on the bill of materials (BOM) lines or production lines.
- **Human resources** – A project or production worker that perform an activity, either alone or as an operator of a tool or a machine. If you're using the Human resources functionality, you can link human resources to a worker. The scheduling engine can then allocate the resources, based on the competencies that are defined for the corresponding worker.
- **Machine** – A machine or other production equipment that is required in production.
- **Tool** – An instrument or device that is typically used together with another resource to perform an activity in a project or in production.
- **Location** – A physical location of a specific size that is required in order to perform an activity. An example is an assembly area.
- **Facility** – A building or fixed structure that is required in order to perform an activity.

Calendars

A calendar can be assigned to an operations resource and describes the capacity (in hours) of that resource. The working times of the operations resource are determined by the calendar that is assigned to the resource group that the operations resource is part of. You can set an effective date and an expiration date for the assigned calendar. You can then assign more than one calendar to an operations resource. However, the dates of the assigned calendars can't overlap, and the operations resource can be assigned only one calendar at a time.

Note: If there are no effective working calendars for a resource group (for example, if the last assigned calendar or the only assigned calendar has expired), you can no longer access the operations resources that are assigned to the resource group for production planning and operations scheduling. You can also assign a calendar to a resource group to specify the working times for both the resource group and all the operations resources that are assigned to the resource group. The capacity of the resource group is calculated as the sum of the capacities of each operations resource that is assigned to that resource group. The calendar that is assigned to a resource group can change over time.

Resource capabilities

A capability is the ability of an operations resource to perform a particular activity. You can assign one or more capabilities to an operations resource. The scheduling engine will then allocate resources by matching the resource requirements of each activity to the capabilities of the available operations resources. Capabilities can be assigned to all types of operations resources (**Tool**, **Vendor**, **Machine**, **Human resources**, **Location**, or **Facility**). To assign capabilities to operations resources for a limited time, define a start date and an expiration date on the capability assignment. For more information, see [Resource capabilities](#).

Resource groups

A resource group is a set of operations resources that represents the granularity at which you want to schedule resources when you use the operations scheduling method. Therefore, resource groups typically correspond to the physical organization of work cells that is demarcated by yellow lines on the production shop floor. The resource group defines the site, production unit, and warehouse context for operations resources that are assigned to the group. When you assign an operations resource to a resource group, the resource can be scheduled at the site where the resource group is located. You don't have to assign the operations resources that you create to a resource group. However, an operations resource must be assigned to a resource group before it can be scheduled to perform work. An operations resource can be assigned to a resource group for a limited time. You can also assign an operations resource to multiple resource groups, so that you can then share the resource across sites. However, the effective dates and expiration dates can't overlap. In other words, you can't assign an operations resource to two resource groups at the same time. Changes in resource group assignments are effective only for new resource allocations. Capacity reservations for jobs, operations, and project hour forecasts that are already scheduled won't be affected. **Note:** When you assign operations resources of the **Vendor** type to a resource group, all operations resources that are assigned to that resource group must be of the **Vendor** type and must be linked to the same vendor account.

Production units

A production unit is an administrative unit that is a collection of resource groups. A production unit can contain multiple resource groups, but a resource group can be assigned to only one production unit. A production unit reflects the physical layout of production resources, and has no effect on transactions or how they are processed. You must associate a production unit with a site. You can also assign a picking warehouse and a storage warehouse to a production unit. You can use a production unit to consolidate and filter production-related data. For example, a shop floor manager can see an overview of the outstanding workload and the available capacity for a particular production unit. You can change the production unit that is assigned to a resource group. You can also delete a production unit. However, these changes to the production unit are effective only for new orders that are created after master scheduling is run. If you want to apply the production unit change to existing orders, you must make this change manually.

Resource scheduling

Operations resources are assigned to activities when a project or a production is scheduled. Two scheduling methods are available: operations scheduling and job scheduling. When you use operations scheduling, each operation or project activity is scheduled on the resource group that contains operations resources that match the resource requirements that are specified for the operation. If a specific operations resource is required for the operation, scheduling reserves capacity only on a specific operations resource in the group. Job scheduling is a more detailed form of scheduling than operations scheduling. It breaks down each operation into its individual tasks or jobs. These jobs are then assigned to the operations resources that will perform them. Scheduling reserves capacity on the resource groups, based on the operation times that are defined on the production route or project activities. If you're working with finite capacity, the schedule depends on the availability of the operations resources that are required in order to complete the activity. For operations scheduling, the capacity of the resource group is the sum of the available capacity of the operations resources that are part of that group. Capacity reservations that already exist for the operations resources are considered unavailable capacity. If there isn't enough available capacity for production, the production orders can be delayed or even stopped. On the **Resources** page, you can define several properties that control how capacity reservations are made:

- **Capacity** – Specify the operations resource's capacity per hour in terms of the capacity unit of measure.
- **Batch capacity** – Specify the maximum number of pieces that the operations resource can process per run.
- **Efficiency percentage** – Specify the efficiency that you expect from the operations resource. The efficiency percentage adjusts the throughput of the operations resource and affects the time that is reserved for the

resource. The lead times for the operations that use the operations resource are also adjusted accordingly. Here is the formula that is used for the calculation: $\text{Scheduling time} = \text{Time} \times 100 \div \text{Efficiency percentage}$. *Time* includes both the run time and setup time.

- **Operations scheduling percentage** – Specify the maximum percentage of capacity of the operations resource that you want to use in operations scheduling. To allow for flexibility in capacity during job scheduling, you should set this percentage to less than 100 percent.
- **Finite capacity** – Set this option to **Yes** if the operations resource should be scheduled based on the actual capacity that is available, and if existing capacity reservations should be considered. If this option is set to **No**, the operations resource is assumed to have infinite capacity, and the resource might therefore be overbooked.
- **Finite property** – Set this option to **Yes** if you want the operations resource to be scheduled based on the actual capacity that is available with respect to the required working time scheduling properties.
- **Exclusive** – Set this option to **Yes** if you don't want the operations resource to be available for another job or operation until the current production is completed. In this case, the operations resource can't be used even if there are gaps in the resource's run time.
- **Bottleneck resource** – Define the operations resource as a bottleneck resource. A bottleneck resource is scheduled by using finite capacity when the **Finite capacity** and **Bottleneck scheduling** options on the **Master plans** page are selected.

To schedule multiple operations resources at the same time to perform, for example, an operation in production, you must specify the requirements for the various resources by using primary and secondary operations. You can then also reserve multiple operations resources that have different capacity. The operations resource that are scheduled for the primary operation determine the duration of the activity.

Lean work cells

You can specify that a resource group is a lean work cell. The resource group can then be part of a production flow. By specifying a resource group as a lean work cell, you also prevent the resource group and the assigned operations resources from being allocated to the operations of a production order or a project hour forecast. For each resource group that acts as a lean work cell, you must specify the following information:

- **Calendar** – The working calendar of the work cell, which must have the property of a standard workday.
- **Input warehouse and location** – The default location that is used to pick material for an activity.
- **Output warehouse and location** – The default location where all output of the work cell is put.
- **Runtime cost category** – This category must be defined for the work cell if direct labor is tracked in costing.

When a resource group is used as a lean work cell, the capacity of the work cell is specified directly on the resource group. Therefore, you don't have to assign operations resources to the resource group. Only when the work cell is managed by a subcontractor, an operations resource of the **Vendor** type must be assigned to the work cell. If you assign an operations resource to a resource group that is marked as a work cell, the capacity of the work cell isn't affected.

Costing resources

When you define an activity such as a route operation or a project hour forecast, you can specify the requirement for a specific operations resource or resource group. However, you can also specify the requirement for an operations resource of a specific type, or an operations resource that has a specific capability or competency. For this reason, the actual resource assignment isn't made until the activity is scheduled and capacity is reserved. Therefore, on a route operation, you can specify that estimation and BOM calculation must be based on a specific operations resource. This operations resource is referred to as the costing resource. You can also transfer cost categories and operation times from the costing resource to the activity. When the operation is scheduled, estimation and BOM calculation are done by using the operations resource that is

actually scheduled.

NOTE

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Create an operations resource

2/18/2021 • 2 minutes to read • [Edit Online](#)

An operations resource performs the activities of a project or a production process. This procedure shows you how to define an operations resource. You can walk through this procedure in demo data company USMF, or using your own data.

1. Go to Resources.
2. Click New.
3. In the Resource field, type a value.
4. In the Description field, type a value.

Define capacity and consumption parameters

1. Expand the Operation section.
2. In the Scrap percentage field, enter a number.
3. In the Setup category field, enter or select a value.
 - Specify the cost category that defines how to account for the cost of setup.
4. In the Run time category field, enter or select a value.
 - Specify the cost category that defines how to account for the cost of run time.
5. In the Quantity category field, enter or select a value.
 - Specify the cost category that defines how to account for the resource cost based on the output quantity.
6. In the Capacity unit field, select an option.
 - Specify the unit in which to express the capacity of the operations resource.
7. In the Capacity field, enter a number.
8. In the Efficiency percentage field, enter a number.
 - Specify the efficiency that you expect from the operations resource. The efficiency percentage adjusts the throughput of the operations resource and affects the time that is reserved for the resource.
9. In the Operations scheduling percentage field, enter a number.
 - Specify the maximum percentage of capacity of the operations resource that you want to use in operations scheduling.
10. Select Yes in the Finite capacity field.
 - Set this option to Yes if the operations resource should be scheduled based on the actual capacity that is available, and if existing capacity reservations should be considered. If this option is set to No, the operations resource is assumed to have infinite capacity, and the resource might be overbooked.
11. Select Yes in the Bottleneck resource field.

Define working times

1. Expand the Calendars section.
2. Click Add.
3. In the Calendar field, enter or select a value.
 - Specify the working time calendar that defines the capacity (in hours) of the resource.
4. In the list, find and select the desired record.
5. In the list, click the link in the selected row.

Define resource capabilities

1. Expand the Capabilities section.
2. Click Add.
 - A capability is the ability of an operations resource to perform a particular activity. The scheduling engine allocates resources by matching the resource requirements of each activity to the capabilities of the available operations resources.
3. In the Capability field, enter or select a value.
4. In the Level field, enter a number.
 - Specify the level of proficiency by which the resource processes the capability.
5. In the Priority field, enter a number.
 - Specify the priority of the operations resource with respect to the capability. When scheduling by priority, the operations resource with the highest priority (lowest numeric value) is selected first.

Assign resource to resource group

1. Expand the Resource groups section.
2. Click Add.
 - The resource group defines the site, production unit, and warehouse context for operations resources. The operations resource can only be scheduled when assigned to a resource group, and only on the site where the resource group is located.
3. In the Resource group field, enter or select a value.
4. In the Input location field, enter or select a value.
 - Specify the warehouse location from where the operations resource is consuming materials.

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Resource capabilities

2/18/2021 • 4 minutes to read • [Edit Online](#)

This article provides information about resource capabilities. A capability is the ability of an operations resource to perform a particular activity. The article explains how capabilities and related concepts, such as proficiency level and priority, are used to select appropriate resources for an activity.

A capability is the ability of an operations resource to perform a particular activity. An operations resource can have more than one capability assigned to it, and a capability can be assigned to more than one resource. You can temporarily assign capabilities to resources by defining a start date and expiration date on the capability assignment. When the capability for a resource expires, the resource can't be scheduled for a project or a production that requires that capability. A capability that has expired can be renewed. You can delete capabilities, provided that they aren't on a route relation or on part of a production route of an active production order. In general, be careful when you delete capabilities. Instead, consider adjusting the expiration date on the resources that have the capability. Capabilities can be assigned to all types of resources: tool, vendor, machine, location, facility, or human resource.

Level

Multiple resources often have the same functional capability but at different levels of proficiency (for example, strength, processing speed, or accuracy). Therefore, when you assign a capability to a resource, you can specify a **Level** value. The level is a simple numeric value. If you specify that a capability is a resource requirement for a production route, you can also specify a **Minimum level needed** value for that capability. The scheduling engine then selects only resources that have the required capability at a level that is equal to or exceeds the minimum level that is specified in the resource requirement.

Priority

Operations resources that have the same capabilities can be assigned a priority. Then, if multiple resources have capabilities that satisfy the scheduling requirements at the required level, and have free capacity, the scheduling engine can select among those resources. If **Priority** is selected in the **Primary resource selection** field on the **Scheduling parameters** page, the resource that has the highest priority (the lowest numeric value in the **Priority** field) is selected first during scheduling.

Resource requirements

When you define resource requirements for a production route, you can specify one or more capabilities as requirements. During production scheduling, the capabilities that are defined in the resource requirements on the route operation are matched with the capabilities that are defined for the resources. Resources that have capabilities that satisfy the requirements are selected. If multiple resources have the same functional capability but different proficiencies (such as strength, processing speed, or accuracy), you can either define multiple capabilities or use the capability level to qualify the capability of the resource. Here is an example:

- On a route, the drilling process time is set to 10 units per hour, but the requirement itself is defined as Drilling.
- You have two drilling machines, M1 and M2.
- The Drilling capability is assigned to both resources, the M1 machine and the M2 machine.
- The M1 machine can drill two units per hour, and the M2 machine can drill 11 units per hour.

In this example, both machines can be selected by the scheduling engine, because both satisfy the basic

capability requirement (Drilling). However, the M1 machine can drill only two units per hour. Because this rate is much less than the 10 units per hour that are specified on the route, the M1 machine will cause production problems if it's selected. There are two ways to resolve this issue and make sure that the M2 machine is selected instead:

- Create two separate capabilities: Low-speed drilling and High speed drilling. Define Low-speed drilling as drilling that has a process time of one to nine units per hour. Define High-speed drilling as drilling that has a drilling process time of 10 to 19 units per hour. Then assign the M1 machine the Low-speed drilling capability, and assign the M2 machine the High-speed drilling capability. Finally, change the resource capability requirement on the route to High-speed drilling. The scheduling engine will then select the correct machine (M2).
- Use the capability level to qualify the Drilling capability that is assigned to the drilling machines. Specify that the M1 machine has the Drilling capability at a level of 2.0, and that the M2 machine has the Drilling capability at a level of 11.0. Then specify that 10.0 is the minimum level that is required for the Drilling capability requirement on the route. The scheduling engine will then determine that only the M2 machine satisfies the resource requirements.

Competencies for human resources

When you have operations resources of the **Human resources** type that are linked to workers in Human resources, you can also take advantage of the competencies of workers when you define the resource requirements for a production route. In other words, you can also specify requirements for specific skills, courses, certificates, or titles. The scheduling engine can then select resources that are linked to workers, and the selection will be based on the competencies of those workers. The competencies are set up in Human resources, not on the **Resource capabilities** page. When you define skills, courses, certificates, or titles as resource requirements, you must use the Human resources functionality and link each resource of the **Human resources** type to a corresponding worker. If you aren't using the Human resources functionality, you can define capabilities on the **Resource capabilities** page that resemble or duplicate the competencies from Human resources. However, the **Resource capabilities** page doesn't contain the functionality that is required in order to maintain skills, courses, certifications, or titles.

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Define resource capabilities

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Resource capabilities describe what operations resources can do. During scheduling, the requirements of each job and operation are matched against the capabilities of the available resources. This task guide will help you create a resource capability and assign it to a resource. The demo data company used to create this task is USMF.

Create a resource capability

1. Go to Resource capabilities.
2. Click New.
3. In the Capability field, type the ID of the resource capability.
 - For a given operation, you use the capability ID to specify that resources must have this capability to perform the operation.
4. In the Description field, enter a description of the capability.

Assign capability to a resource

1. Click Add.
2. In the Resource field, type the ID of the resource.
 - A resource capability can be assigned to one or more resources.
3. In the Expiration field, enter a date.
 - You can use this field to specify that a resource has the capability for only a limited time.
4. In the Priority field, enter a number.
 - When you schedule jobs and operations, you can specify whether to select resources by priority. If you choose to do this, and more than one resource can perform the job or operation by the requested date, the resource that has the lowest priority with respect to the required capability is selected.
5. In the Level field, enter a number.
 - When you specify that a job or operation requires a particular capability, you can also specify the minimum level that is required. Use the capability level to differentiate resources that can perform the same job, but at different speeds, strengths, sizes, and so on.

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Routes and operations

2/18/2021 • 19 minutes to read • [Edit Online](#)

This topic provides information about routes and operations. A route defines the process for producing a product or product variant. It describes each step (operation) in the production process and the order that these steps must be performed in. For each step, the route also defines the required operations resources, the required setup time and run time, and how the cost should be calculated.

Overview

A route describes the order of operations that is required in order to produce a product or product variant. For each operation, the route also defines the operations resources that are required, the time that is required in order to set up and perform the operation, and how the cost should be calculated. You can use the same route to produce multiple products, or you can define a unique route for each product or product variant. You can even have multiple routes for the same product. In this case, the route that is used varies, depending on factors such as the quantity that must be produced. The definition of a route in Supply Chain Management consists of four separate elements that, together, describe the production process:

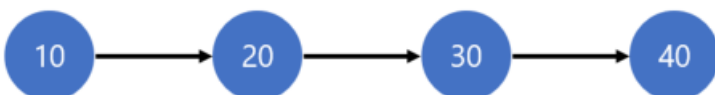
- **Route** – A route defines the structure of the production process. In other words, it defines the order of operations.
- **Operation** – An operation identifies a named step in a route, such as **Assembly**. The same operation can occur in multiple routes and can have different operation numbers.
- **Operation relation** – An operation relation defines the operational properties of an operation, such as the setup time and run time, cost categories, consumption parameters, and resource requirements. The operation relation enables the operational properties of an operation to vary, depending on the route that the operation is used in or the products that are being produced.
- **Route version** – A route version defines the route that is used to produce a product or product variant. Route versions enable routes to be reused across products or changed over time. They also enable different routes to be used to produce the same product. In this case, the route that is used depends on factors such as the location or the quantity that must be produced.

Routes

A route describes the order of operations that is used to produce a product or product variant. Each operation is assigned an operation number and a successor operation. The order of operations forms a route network that can be represented by a directed chart that has one or more starting points and a single end point. In Supply Chain Management, routes are distinguished based on the type of structure. The two types of routes are simple routes and route networks. In the Production control parameters, you can specify whether only simple routes can be used, or whether the more complex route networks can be used.

Simple routes

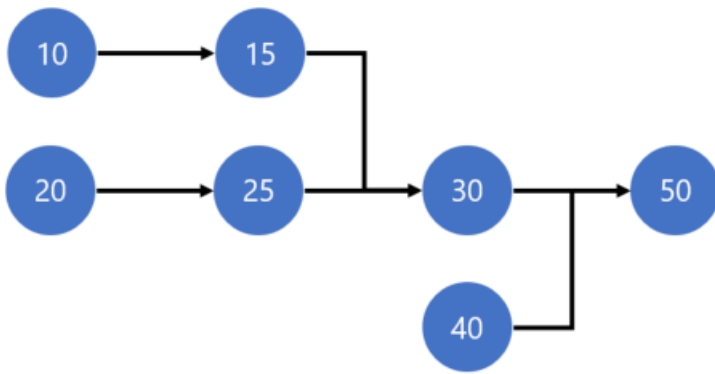
A simple route is sequential, and there is only one starting point for the route.



If you enable only simple routes in the Production control parameters, Supply Chain Management automatically generates the operation numbers (10, 20, 30, and so on) when you define the route.

Route networks

If you enable the more complex route networks in the Production control parameters, you can define routes that have multiple starting points and operations that can be run in parallel.

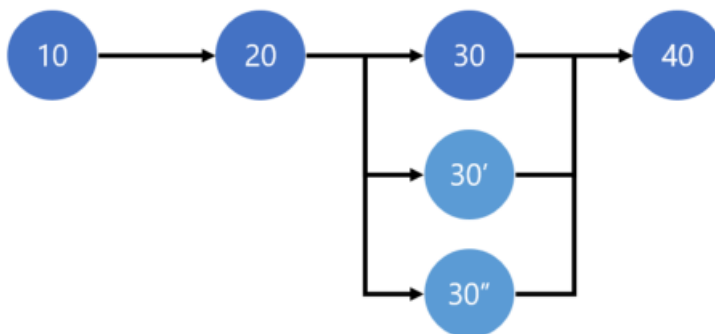


NOTE

- Each operation can have only one successor operation, and the entire route must end in a single operation.
- This does not ensure that multiple operations that have the same successor operation (for example, operations 30 and 40 in the preceding illustration) will actually be run in parallel. The availability and capacity of resources might put constraints on the way that operations are scheduled.
- You can't use 0 (zero) as the operation number. That number is reserved and is used to specify that the last operation in the route has no successor operation.

Parallel operations

Sometimes, a combination of multiple operations resources that have different characteristics is required in order to perform an operation. For example, an assembly operation might require a machine, a tool, and one worker for every two machines to oversee the operation. This example can be modeled by using parallel operations, where one operation is designated as the primary operation and the others are secondary.



Typically, the primary operation represents the bottleneck resource and dictates the run time for the secondary operations. However, during scheduling that involves finite capacity, the resources that are scheduled for both the primary operation and the secondary operations must be available and have free capacity at the same time.

Both the primary operation and the secondary operations must have the same operation number (30 in the preceding illustration).

In the preceding example, the resource requirement for the primary operation (30) is the machine, whereas the resource requirements for the secondary operations (30' and 30'') are the tool and the worker. A fifty-percent load helps guarantee that the scheduled worker can oversee two machines at the same time.

Approval of routes

A route must be approved before it can be used in the planning or manufacturing process. Approval indicates that the route design has been completed. The same released product or released product variant can have

multiple approved routes. Typically, approval of a route occurs when the first relevant route version is approved. However, in some business scenarios, the approval of the route and the route version are separate activities that might involve different process owners.

Each route can be approved or unapproved separately. However, note that, when a route is unapproved, all related route versions are also unapproved. In the Production control parameters, you can specify whether routes can be unapproved, and whether approved routes can be changed.

If you must keep a log that records who approves each route, you can require electronic signatures for route approval. Users will then have to confirm their identity by using an [electronic signature](#).

Operations

An operation is a step in the production process. Each operation has an ID and a simple description. The following tables shows typical examples of operations from a machine shop.

OPERATION	DESCRIPTION
PipeCut	Pipe cutting
TIGweld	TIG welding
JigAssy	Jig assembly
Inspection	Quality inspection

The operational properties of the operation, such as the setup time and run time, resource requirements, costing information, and consumption calculation, are specified on the operation relation. (For more information about operation relations, see the next section.)

Operation relations

The following operational properties of an operation are maintained on the operation relation:

- Cost categories
- Consumption parameters
- Processing times
- Processing quantities
- Resource requirements
- Notes and instructions

You can define multiple operation relations for the same operation. However, each operation relation is specific to one operation, and stores properties that are specific to a route, a released product, or a set of released products that are related to an item group. Therefore, the same operation can be used in multiple routes that have different operational properties. In addition, you can more easily maintain your master data if you use standard operations that have the same operational properties, regardless of the route that is used and product that is produced. The scope of the operation relation is defined through the **Item code**, **Item relation**, **Route code** and **Route relation** properties, as shown in the following table.

ITEM CODE	ITEM RELATION	ROUTE CODE	ROUTE RELATION	SCOPE OF THE OPERATION RELATION
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ITEM CODE	ITEM RELATION	ROUTE CODE	ROUTE RELATION	SCOPE OF THE OPERATION RELATION
Table	<Item ID>	Route	<Route ID>	The operational properties of an operation when it's used in the route where Route number = <route ID> to produce the released product where Item number = <item ID>.
Table	<Item ID>	All		The default operational properties of an operation when it's used to produce the released product where Item number = <item ID>. In other words, these operational properties apply when there is no route-specific operation relation for the released product.
Group	<Item group ID>	Route	<Route ID>	The operational properties of an operation when it's used in the route where Route number = <route ID> to produce released products that are associated with item group <item group ID>, unless there is a route-specific operation relation for the released product.
Group	<Item group ID>	All		The default operational properties of an operation when it's used to produce released products that are associated with item group <item group ID>, unless a more specific operation relation exists.

ITEM CODE	ITEM RELATION	ROUTE CODE	ROUTE RELATION	SCOPE OF THE OPERATION RELATION
All		Route	<Route ID>	The default operational properties of the operation when it's used in the route where Route number = <route ID>. In other words, these operational properties apply when there is no operation relation for this route that is specific to either the released product or its associated item group.
All		All		The default operational properties of an operation. These operational properties apply when a more specific operation relation doesn't exist.

You can also specify that an operation relation is specific to a site. In this way, the operational properties of an operation can vary, depending on the location (that is, the site) where the operation is performed. For configured products, you can also specify different operational properties for each product configuration.

Operation relations give you lots of flexibility when you define your routes. Additionally, the ability to define default properties helps reduce the amount of master data that you must maintain. However, this flexibility also means that you must be aware of the context that you modify an operation relation in.

NOTE

Because the operational properties are stored in operation relations per operation for each route, all occurrences of the same operation (for example, Assembly) have the same setup time, run time, and resource requirements. Therefore, if two occurrences of an operation must occur in the same route but have different run times, you must create two separate operations, such as Assembly1 and Assembly2.

Modifying product-specific routes

When you open the **Route** page from the **Released product details** page, the route versions that are associated with the selected released product are shown. In this context, for each operation, Supply Chain Management shows the operational properties from the operation relation that best matches the route version. You will notice that the list of operations includes the **Item code** and **Route code** properties from the operation relation. Therefore, you can determine which operation relation is shown.

On the **Route** page, you can modify the operational properties of the operation, such as the run time or the cost categories. Your changes are stored on the operation relation that is specific to the route and released product that are referenced in the current route version. If the operation relation that is shown isn't specific to the route and the released product, before your changes are stored, the system creates a copy of the operation relation.

This copy *is* specific to the route and released product. Therefore, your changes won't affect other routes or released products. To verify which operation relation is being modified on the **Route** page, look at the **Item code** and **Route code** fields.

You can also manually create an operation that is specific to a route and released product by using the **Copy and edit relation** function.

NOTE

If you add a new operation to a route on the **Route** page, an operation relation is created only for the current released product. Therefore, if the route is also used to produce other released products, no applicable operation relation will exist for those released products, and the route can no longer be used for those released products.

Maintaining operation relations per route

When you open the **Route details** page from the **Routes** list page, a list of all the operation relations that apply to the selected route is shown. Therefore, you can easily verify which operational properties are used for which products. You can modify both default property values and product-specific property values.

If you add a new operation relation on the **Route details** page, the **Route code** field is automatically set to **Route**, and the **Route relation** field is set to the route number of the current route.

Maintaining operation relations per operation

From the **Operations** page, you can open the **Operation relations** page. On this page, you can modify all operation relations for a specific operation. You can even modify operation relations that contain default values.

If your business uses standard operations, and if the operational parameters are the same across all products and processes, the **Operation relations** page provides a convenient way to maintain the default operational properties of those operations.

Applying operation relations

In some cases, Supply Chain Management must find the operational properties for an operation. For example, when a purchase order is created, the operational properties of each operation must be copied from the operation relations to the production route. In these situations, Supply Chain Management searches the relevant operation relations from the most specific combination to the least specific combination.

When Supply Chain Management searches for the most relevant operation relation for a released product, an operation relation that matches the item ID of the released product is preferred over an operation relation that matches the item group ID. In turn, an operation relation that matches the item group ID is preferred over the default operation relation. The search is done in the following order:

1. **Item code=Table** and **Item relation**= <item ID>
2. **Item code=Group** and **Item relation**= <item group ID>
3. **Item code=All**
4. **Route code=Route** and **Route relation**= <route ID>
5. **Route code=All**
6. **Configuration**= <configuration ID>
7. **Configuration**=
8. **Site**= <site ID>
9. **Site**=

Therefore, an operation should be used only one time for each route. If the operation occurs multiple times in the same route, all occurrences of that operation will have the same operation relation, and you won't be able to have different properties (for example, run times) for each occurrence.

Route versions

Route versions are used to accommodate variations in the production of products or provide greater control over the production process. They define which route should be used when a specific released product or released product variant is produced. You can use the following constraints to define which route is used for a released product:

- Product dimensions (size, color, style, or configuration)
- Production quantity
- Production site
- Production date

When you're producing the product at a specific site, in a specific quantity, or in a specific period, you can designate a specific route version as the default route version. However, note that only one active route is allowed for a given released product and a given set of constraints.

In the Production control parameters, you can require that the validity period of a route version always be specified.

Approval of route versions

Before a route version can be used in the planning or manufacturing process, it must be approved. When you approve a route version, you can also approve the related route. However, note that a route version can be approved only if the related route is also approved.

Activating the default route version

When you activate a route version, you designate it as the default route version that master planning will use, or that will be used to create production orders. You can have only one active route version for a given set of constraints (for example, period, site, or quantity). If the version that you're trying to activate conflicts with a version that is already active, you receive an error message. To prevent an ambiguous activation, you must then either inactivate the conflicting version or modify the constraints (usually the period) on the route version.

Electronic signatures

If you must keep a log that records who approves and activates each route version, you can require electronic signatures for these tasks. Users who approve and activate route versions will then have to confirm their identity by using an [electronic signature](#).

Product change that uses case management

The product change case for the approval and activation of new or changed routes and route versions gives you an easy way to see an overview of the route version constraints. You can also approve and activate all routes that are related to a specific change in one operation and document the results in the product change case.

Maintaining routes

Depending on your business requirements, you might be able to reduce the effort that is required in order to maintain your process definitions.

Making routes independent of resources

In many systems, the operations resource or resource group that should perform an operation must be specified in the route. However, in Supply Chain Management, you can define a set of requirements that an operations resource must meet to be applicable for the operation. Therefore, the specific operations resource or resource group that should be used doesn't have to be determined until the operation is actually scheduled. This functionality is especially useful when you have many workers or machines that can perform the same operation.

For example, you specify that an operation requires an operations resource of the **Machine** type that has a

Stamping capability of 20 tons. The scheduling engine will then resolve these requirements to a specific operations resource or resource group when the operation is scheduled. Because you can just specify these requirements instead of binding the operation to a specific machine, you have much more flexibility. Additionally, maintenance is easier when resources are moved or new resources are added.

For more information about the various types of resource requirements and how to use them, see [Operations resource requirements](#) and [Resource capabilities](#).

Sharing routes across sites

If you produce the same product at more than one production site, and if the steps for producing the product are the same at all sites, you can often design a shared route that is used across all production sites. To create a shared route, don't specify a site on the route itself. However, you must still create a route version that associates the shared route with the product at each site.

You must also make sure that the resource requirements for each operation in the route don't call for specific operations resources or resource groups, but are instead expressed in terms of the characteristics of the required resources. The scheduling engine will then be able to assign the appropriate operations resources from the site that the production is scheduled on. For example, if there are small differences in the run time, or if the setup time for a certain operation is site-specific, you can specify this information by adding an additional operation relation for that site.

To take full advantage of the benefits of shared routes, you should also use resource consumption on the corresponding bill of materials (BOM). When you set the flag for resource consumption on the BOM line, the warehouse and location that raw materials should be consumed from is inferred from the operations resource that the operation is scheduled on. Therefore, the warehouse and location don't have to be determined until the production is actually scheduled. In this way, you can make both the BOM and the route independent of the physical location where the product is produced.

Standard operation relations

If your business uses standardized operations throughout production, and if there is little or no variation in the setup time, run time, consumption calculation, cost calculation, and so on, you might benefit from creating default operation relations for all operations. In this case, avoid creating operation relations that are specific to any route or released product.

If you also express resource requirements in terms of skills and capabilities, and make your routes site-independent, you can help keep the ongoing maintenance of your business processes to a minimum.

When you use this approach, the **Operation relations** page becomes your primary destination for maintaining run times and other properties.

Resource-specific process times

If you don't specify an operations resource or resource group as part of the resource requirements for an operation, the applicable resources might operate at different speeds. Therefore, the time that is required in order to process an operation might vary. To resolve this issue, you can use the **Formula** field on the operation relation to specify how the process time is calculated. The following options are available:

- **Standard** – (Default option) The calculation uses only the fields from the operation relation and multiplies the specified run time by the order quantity.
- **Capacity** – The calculation includes the **Capacity** field from the operations resource. Therefore, the time is resource-dependent. The value that is specified on the operations resource is capacity per hour. The **Process time** is calculated as **Order quantity** divided by **Capacity**.
- **Batch** – A batch capacity is calculated by using information from the operation relation. The number of batches and, therefore, the process time can then be calculated based on the order quantity.
- **Resource batch** – This option is basically the same as the **Batch** option. However, the calculation includes the **Batch capacity** field from the operations resource. Therefore, the time is resource dependent.

Set up route groups

You can define the route groups and the setup for its route or job types under **Production control > Setup > Routes > Route groups**. For each Route/job type in the route group, you can select or clear the following options:

- **Activation** - Select this option to enable calculations and scheduling for the selected job type, and to receive job feedback when you run job scheduling. You need to select this option to enable the job type and then, select the rest of the options for that job type. If the activation is not selected, that job type will not be enabled, regardless of the selection of the other options.
- **Job management** - Select this option to include the job type in job management when you run job scheduling.
- **Working time** Select this option to schedule the job type according to the working time calendar that is defined for the operations resource, otherwise the Gregorian calendar is used. Working time can be scheduled either according to the Gregorian calendar or the defined working calendar. If you select this option, scheduling is based on the defined working time calendar. Additionally, the job of the job type is scheduled from midnight on the date that is defined as the job's starting date.
- **Capacity** - Select this option to reserve capacity for the job type when you run job scheduling. If you select this option, capacity is reserved when scheduling is run for the selected job type. This gives you an overview of which job types in each route group use the operations resources. For example, in a situation where drying resources are bottleneck resources, these resources must be specified as bottlenecks. Drying operations that are assigned to queue time job types will reserve drying resources.

For each of the job types, you first need to activate or de-activate it. When de-activated, none of the other setup (Job management, working time, and capacity) will be considered, as the job type will not be active.

Among the job types you can find Overlap. Overlap allows different jobs to be performed at the same time. When jobs are overlapping, the resources can be used but cannot be reserved for the specific jobs. Therefore, when Activation is selected for Overlap, the rest of the settings (Job management, Working time, and Capacity) do not make any impact in the route group.

NOTE

When you upgrade versions, you might encounter the following error: "CRL Error occurred while invoking the scheduling engine". If you receive this error, go to the **Route groups** page and for all the routes where you have activated **Overlap**, clear the **Job management**, **Working time**, and **Capacity** options.

Additional resources

- [Bills of materials and formulas](#)
- [Cost categories used in production routing](#)
- [Resource capabilities](#)
- [Electronic signature overview](#)

NOTE

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Work policies

2/18/2021 • 13 minutes to read • [Edit Online](#)

This topic explains how to set up the system and the warehouse app so that they support work policies. You can use this functionality to quickly register inventory without creating putaway work when you receive purchase or transfer orders, or when you complete manufacturing processes. This topic provides general information. For detailed information that is related to license plate receiving, see [License plate receiving via the warehouse app](#).

A work policy controls whether warehouse work is created when a manufactured item is reported as finished, or when goods are received by using the warehouse app. You set up each work policy by defining the conditions where it applies: the work order types and processes, the inventory location, and (optionally) the products. For example, a purchase order for product *A0001* must be received in location *RECV* in warehouse *24*. Later, the product is consumed in another process at location *RECV*. In this case, you can set up a work policy to prevent putaway work from being created when a worker reports product *A0001* as received in location *RECV*.

NOTE

- For a work policy to be active, you must define at least one location for it on the **Inventory locations** FastTab of the **Work policies** page.
- You can't specify the same location for multiple work policies.
- The **Print label** option for mobile device menu items won't print a license plate label unless work was created.

Activate the features in your system

To make all the functionality that is described in this topic available in your system, turn on the following two features in [Feature management](#):

- License plate receiving enhancements
- Work policy enhancements for inbound work

The Work policies page

To set up work policies, go to **Warehouse management > Setup > Work > Work policies**. Then, on each FastTab, set the fields as described in the following subsections.

The Work order types FastTab

On the **Work order types** FastTab, add all the work order types, and the related work processes, that the work policy applies to. The following work order types and related work processes are supported for work policies.

WORK ORDER TYPE	WORK PROCESS
Raw material picking	All related processes
Co-product and by-product put away	All related processes
Finished goods putaway	All related processes
Transfer receipt	License plate receiving (and putaway)

WORK ORDER TYPE	WORK PROCESS
Purchase orders	<ul style="list-style-type: none"> • License plate receiving (and putaway) • Load item receiving (and putaway) • Purchase order line receiving (and putaway) • Purchase order item receiving (and putaway)

To set up a work policy so that it applies to several work processes of the same work order type, add a separate line for each work process to the grid.

For each line in the grid, set the **Work creation method** field to one of the following values:

- **Never** – The work policy will prevent warehouse work from being created for the selected work order type and related work process.
- **Cross docking** – The work policy will create cross-docking work by using the policy that you select in the **Cross docking policy name** field.

The Inventory locations FastTab

On the **Inventory locations** FastTab, add all the locations where this work policy should be applied. If no location is associated with a work policy, the work policy won't be applied to any process.

You can't specify the same location for multiple work policies.

You can use a warehouse location that is assigned to a location profile where the **Use license plate tracking** option is turned off. In this case, workers will directly register the on-hand inventory.

The Products FastTab

On the **Products** tab, set the **Product selection** field to control which products the policy should apply to:

- **All** – The policy should apply to all products.
- **Selected** – The policy should apply only to products that are listed in the grid. Use the toolbar on the **Products** FastTab to add products to the grid or remove them from the grid.

Default and custom "to" locations

NOTE

To make the functionality that is described in this section available in your system, you must turn on the *License plate receiving enhancements* and *Work policy enhancements for inbound work* features in [Feature management](#).

Previously, the system supported receiving only at the default location that is defined for each warehouse. However, mobile device menu items that use the following work creation processes now provide the **Use default data** option. This option lets you assign a custom "to" location to one or more menu items. (This option was already available for some other types of menu items.)

- License plate receiving (and putaway)
- Load item receiving (and putaway)
- Purchase order line receiving (and putaway)
- Purchase order item receiving (and putaway)

The **To location** setting for a menu item overrides the default receiving location for the warehouse, for all orders that are processed by using that menu item.

To set up a mobile device menu item to support receiving at a custom location, follow these steps.

1. Go to **Warehouse management > Setup > Mobile device > Mobile device menu items**.
2. Select or create a menu item that uses one of the work creation processes that are listed earlier in this section.
3. On the **General** FastTab, set the **Use default data** option to **Yes**.
4. On the Action Pane, select **Default data**.
5. On the **Default data** page, set the following values:
 - **Default data field:** Set this field to *To location*.
 - **Warehouse:** Select the destination warehouse to use with this menu item.
 - **Location:** This field lists all the location IDs that are available for the selected warehouse. However, the setting of this field doesn't actually have any effect. Therefore, you can leave it blank. Nevertheless, you can use the list to confirm the ID that you must enter in the **Hardcoded value** field.
 - **Hardcoded value:** Enter the location ID for the receiving location that applies to this menu item.

TIP

A work policy can be applied only if all the receiving locations are listed in the relevant work policy setup. This requirement applies regardless of whether you're using the default warehouse receiving location or a custom "to" location.

Example scenario: Warehouse receiving

All products that are received by the *Purchase order item receiving (and putaway)* process must be registered in location *FL-001*, and they must be available in warehouse *24*. However, work should not be created. Products that are received by any other process (that is, by using other mobile device menu items) should be registered at the default warehouse receiving location (*RECV*), and work should be created as usual. (This scenario doesn't show the default receiving setup.)

This scenario requires the following elements:

- A work policy for the *Purchase order item receiving (and putaway)* process in location *FL-001*, for all products
- A mobile device menu item that has default data, and that sets the **To location** field to *FL-001*

Prerequisites

To make the functionality that is described in this scenario available in your system, you must turn on the *License plate receiving enhancements* and *Work policy enhancements for inbound work* features in [Feature management](#).

This scenario uses the standard demo data. Therefore, if you want to work through it by using the values that are provided here, you must work on a system where demo data is installed. Additionally, you must select the **USMF** legal entity.

Set up a work policy

1. Go to **Warehouse management > Setup > Work > Work policies**.
2. Select **New**.
3. In the **Work policy name** field, enter *No purchase item putaway work*.
4. Select **Save**.
5. On the **Work order types** FastTab, select **Add** to add a row to the grid, and then set the following values for the new row:

- **Work order type:** *Purchase orders*
 - **Work process:** *Purchase order item receiving (and putaway)*
 - **Work creation method:** *Never*
 - **Cross docking policy name:** Leave this field blank.
6. On the **Inventory locations** FastTab, select **Add** to add a row to the grid, and then set the following values for the new row:
 - **Warehouse:** *24*
 - **Location:** *FL-001*
 7. On the **Products** FastTab, set the **Product selection** field to *All*.
 8. Select **Save**.

Set up a mobile device menu item to change the receiving location

1. Go to **Warehouse management > Setup > Mobile device > Mobile device menu items**.
2. In the left pane, select the existing **Purchase receive** menu item.
3. On the **General** FastTab, set the **Use default data** option to *Yes*.
4. Select **Save**.
5. On the Action Pane, select **Default data**.
6. On the **Default data** page, on the Action Pane, select **New** to add a row to the grid, and then set the following values for the new row:
 - **Default data field:** *To location*
 - **Warehouse:** *24*
 - **Location:** Leave this field blank.
 - **Hardcoded value:** *FL-001*
7. Select **Save**.

Receive a purchase order without creating work

The example in this section shows how to receive a purchase order item, but without creating work, at a location that differs from the default receiving location that is set up for the warehouse. This example uses the work policy and mobile device item that you created earlier in this scenario.

Create a purchase order

1. Go to **Procurement and sourcing > Purchase orders > All purchase orders**.
2. Select **New**.
3. In the **Create purchase order** dialog box, set the following values:
 - **Vendor account:** *US-101*
 - **Site:** *2*
 - **Warehouse:** *24*
4. Select **OK** to close the dialog box and open the new purchase order.
5. On the **Purchase order lines** FastTab, set the following values for the empty row:
 - **Item number:** *A0001*
 - **Quantity:** *1*
6. Select **Save**.
7. Make a note of the purchase order number.

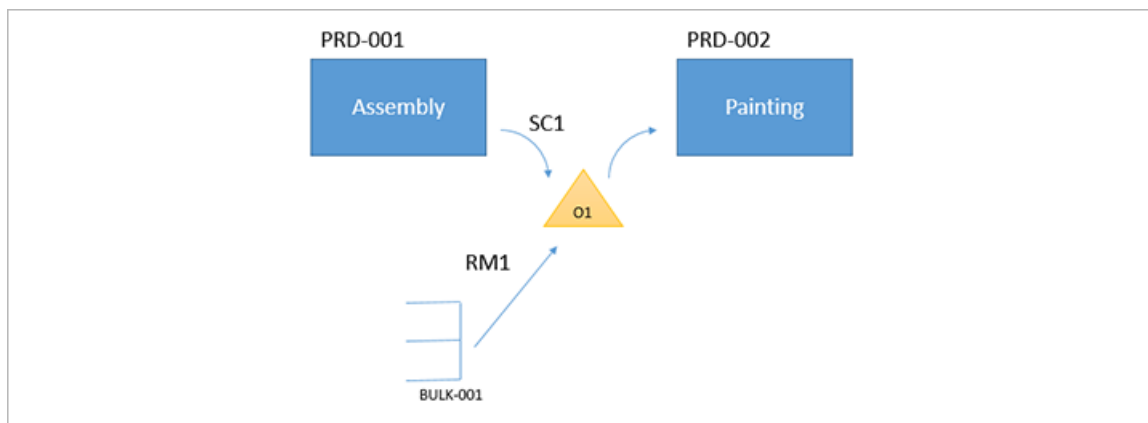
Receive a purchase order

1. On the mobile device, sign in to warehouse *24* by using *24* as the user ID and *1* as the password.
2. Select **Inbound**.
3. Select **Purchase receive**. The **Location** field should be set to *FL-001*.
4. Enter the purchase order number for the purchase order that you created in the previous procedure.
5. In the **Item number** field, enter *A0001*.
6. Select **OK**.
7. In the **Quantity** field, enter *1*.
8. Select **OK**.

The purchase order is now received, but no work is associated with it. The on-hand inventory has been updated, and a quantity of *1* of item *A0001* is now available at location *FL-001*.

Example scenario: Manufacturing

In the following example, there are two production orders, *PRD-001* and *PRD-002*. Production order *PRD-001* has an operation that is named *Assembly*, where product *SC1* is being reported as finished to location *001*. Production order *PRD-002* has an operation that is named *Painting* and consumes product *SC1* from location *001*. Production order *PRD-002* also consumes raw material *RM1* from location *001*. Raw material *RM1* is stored in warehouse location *BULK-001* and will be picked to location *001* by warehouse work for raw material picking. The picking work is generated when production *PRD-002* is released.



When you're planning to configure a warehouse work policy for this scenario, you should consider the following points:

- Warehouse work for putaway of finished goods isn't required when you report product *SC1* as finished from production order *PRD-001* to location *001*. The reason is that the *Painting* operation for production order *PRD-002* consumes product *SC1* at the same location.
- Warehouse work for raw material picking is required to move raw material *RM1* from warehouse location *BULK-001* to location *001*.

Here is an example of a work policy that you can set up, based on these considerations:

- **Work policy name:** *No putaway work*
- **Work order types:** *Finished goods put away* and *Co-product and by-product put away*
- **Inventory locations:** Warehouse *51* and location *001*
- **Products:** *SC1*

The following example scenario provides step-by-step instructions for setting up the warehouse work policy for this scenario.

Example scenario: Report as finished to a location that isn't license

plate-controlled

This scenario shows an example where a production order is reported as finished to a location that isn't license plate-controlled.

This scenario uses the standard demo data. Therefore, if you want to work through it by using the values that are provided here, you must work on a system where demo data is installed. Additionally, you must select the USMF legal entity.

Set up a warehouse work policy

Warehouse processes don't always include warehouse work. By defining a work policy, you can prevent the creation of work for raw material picking and putaway of finished goods for a set of products at specific locations.

1. Go to **Warehouse management > Setup > Work > Work policies**.
2. Select **New**.
3. In the **Work policy name** field, enter *No putaway work*.
4. On the Action Pane, select **Save**.
5. On the **Work order types** FastTab, select **Add** to add a row to the grid, and then set the following values for the new row:
 - **Work order type:** *Finished goods put away*
 - **Work process:** *All related work processes*
 - **Work creation method:** *Never*
 - **Cross docking policy name:** Leave this field blank.
6. Select **Add** again to add a second row to the grid, and then set the following values for the new row:
 - **Work order type:** *Co-product and by-product put away*
 - **Work process:** *All related work processes*
 - **Work creation method:** *Never*
 - **Cross docking policy name:** Leave this field blank.
7. On the **Inventory locations** FastTab, select **Add** to add a row to the grid, and then set the following values for the new row:
 - **Warehouse:** *51*
 - **Location:** *001*
8. On the **Products** FastTab, set the **Product selection** field to *Selected*.
9. On the **Products** FastTab, select **Add** to add a row to the grid.
10. In the new row, set the **Item number** field to *L0101*.
11. On the Action Pane, select **Save**.

Set up an output location

1. Go to **Organization administration > Resources > Resource groups**.
2. In the left pane, select resource group **5102**.
3. On the **General** FastTab, set the following values:
 - **Output warehouse:** *51*
 - **Output location:** *001*
4. On the Action Pane, select **Save**.

NOTE

Location *001* isn't a license plate–controlled location. You can set up an output location that isn't license plate–controlled only if an applicable work policy exists for the location.

Create a production order and report it as finished

1. Go to **Production control > Production orders > All production orders**.
2. On the Action Pane, select **New production order**.
3. In the **Create production order** dialog box, set the **Item number** field to *L0101*.
4. Select **Create** to create the order and close the dialog box.

A new production order is added to the grid on the **All production orders** page.

Keep the new production order selected.

5. On the Action Pane, on the **Production order** tab, in the **Process** group, select **Estimate**.
6. In the **Estimate** dialog box, read the estimate, and then select **OK** to close the dialog box.
7. On the Action Pane, on the **Production order** tab, in the **Process** group, select **Start**.
8. In the **Start** dialog box, on the **General** tab, set the **Automatic BOM consumption** field to *Never*.
9. Select **OK** to save your setting and close the dialog box.
10. On the Action Pane, on the **Production order** tab, in the **Process** group, select **Report as finished**.
11. In the **Report as finished** dialog box, on the **General** tab, set the **Accept error** option to *Yes*.
12. Select **OK** to save your setting and close the dialog box.
13. On the Action Pane, on the **Warehouse** tab, in the **General** group, select **Work details**.

When the production order is reported as finished, no work is generated for putaway. This behavior occurs because a work policy is defined that prevents work from being generated when product *L0101* is reported as finished to location *001*.

More information

For more information about mobile device menu items, see [Set up mobile devices for warehouse work](#).

For more information about license plate receiving and work policies, see [License plate receiving via the warehouse app](#).

For more information about inbound load management, see [Warehouse handling of inbound loads for purchase orders](#).

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Create working time scheduling properties

2/18/2021 • 2 minutes to read • [Edit Online](#)

Working time scheduling properties are used to categorize working time intervals and define the settings that operators must take into account. This procedure shows how to define a working time scheduling property and associated property values. You can walk through this procedure in demo data company USMF, or using your own data.

1. Go to All workspaces > Resource lifecycle management.
2. Click Properties.

Create property

1. Click New.
2. In the Property field, type a value.
3. In the Name field, type a value.

Create property values

1. In the list, mark the selected row.
2. In the Name field, type a value.
3. In the Value field, type a value.
4. Click Save.

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Create working time templates

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Working time templates define the working hours throughout a week and are used to generate working times for a period of time. This procedure shows you how to define a working time template using working time scheduling properties for categorizing working time intervals. You can walk through this procedure in demo data company USMF, or using your own data.

1. Go to All workspaces > Resource lifecycle management.
2. Click Working time templates.

Create working time template

1. Click New.
2. In the Working time template field, type a value.
3. In the Name field, type a value.
4. Expand the Monday section.
5. Click Add.
6. In the From field, enter a time.
 - Specify the time when work begins in the morning.
7. In the To field, enter a time.
 - Specify the time when workers break for lunch.
8. Click Add.
9. In the From field, enter a time.
 - Specify the time when work resumes after lunch.
10. In the To field, enter a time.
 - Specify the end of the work day.

Replicate working times to all week days

1. Click Copy day.
 - Copy the working times definitions from Monday to Tuesday.
2. Click OK.
3. Click Copy day.
 - Copy the working times definitions from Monday to Wednesday.
4. In the To weekday field, select an option.
5. Click OK.
6. Click Copy day.
 - Copy the working times definitions from Monday to Thursday.
7. In the To weekday field, select an option.
8. Click OK.
9. Click Copy day.
 - Copy the working times definitions from Monday to Friday.
10. In the To weekday field, select an option.
11. Click OK.

Define time slots for special operations

1. Expand the Friday section.
2. In the list, find and select the desired record.
3. In the Property field, enter or select a value.
4. In the list, find and select the desired record.
5. In the Property field, enter or select a value.

Mark weekend days as closed for pickup

1. Expand the Saturday section.
2. Select Yes in the Closed for pickup field.
3. Expand the Sunday section.
4. Select Yes in the Closed for pickup field.

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Define discrete manufacturing resource group

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A resource group is a set of operations resources that typically correspond to the physical organization of work cells, defined by yellow lines on the production shop floor. This procedure shows you how to define a resource group for use in discrete production. You can walk through this procedure in demo data company USMF, or use your own data.

1. Go to Resource groups.
2. Click New.
3. In the Resource group field, type a value.
4. In the Description field, type a value.
5. In the Site field, enter or select a value.
6. In the Production unit field, enter or select a value.

Define default operational parameters

1. Expand the Operation section.
2. In the Scrap percentage field, enter a number.
3. In the Setup category field, enter or select a value.
4. In the Run time category field, enter or select a value.
5. In the Operations scheduling percentage field, enter a number.

Define operating hours

1. Expand the Calendars section.
2. Click Add.
3. In the Calendar field, enter or select a value.

Add operations resources

1. Expand the Resources section.
2. Click Add.
3. In the Resource field, enter or select a value.
4. Click Add.
5. In the Resource field, enter or select a value.
6. In the list, find and select the desired record.
7. In the list, click the link in the selected row.

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Add an existing activity to a production flow version

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When creating new versions of production flows, you can choose to add activities created for the older versions, to the new version. This procedure shows how a new version is created for an existing production flow, without copying the activities. In the next step, an existing activity is added to the new version.

This task requires production flow with version and activities already created.

Create a new production flow version

1. Go to Production control > Setup > Lean production flow > Production flows.
2. In the list, find and select the desired record.
3. In the list, click the link in the selected row.
4. Click Edit.
5. In the list, mark the selected row.
6. In the Expiration date field, enter a date and time.
 - Note that before you create a new production flow version, make sure to check the expiration date and time of the active version. The new version will be created with an effective start date, which connects to the expiry date of the selected version.
7. Click Add.
8. Select No in the Copy from version field.
 - Select No to start with an empty version if most of the activities of the copied version will be replaced by new activities. Add the unchanged activities to the Add existing function in the activity form manually.
9. Select No in the Duplicate kanban rules field.
 - When the activities are not copied to the new version, it is not possible to copy the kanban rules at the time of creation of the new version. Instead you will use the create replacement kanban function later in the kanban rule form, to replace kanban rules of the old production flow version with kanban rules using the activities of the new version.
10. Click OK.
11. In the list, find and select the desired record.

Add an existing activity

1. Click Activities.
2. Click Add existing to open the drop dialog.
 - Find and select an existing activity to be added to the new production flow version. Note that the list shows all activities that have been created for this production flow for all previous versions of the flow.
3. In the Activity field, enter or select a value.
4. Click OK.

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Deactivate a production flow version

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When an active production flow version is no longer needed, it can be deactivated. You should only use this option if all kanban rules and activities have ended and will not be activated again. Note that the expiry date of all kanban rules related to this production flow version will be updated with the current date and time.

To modify an active production flow version, consider setting an expiry date for the active version and create a new version. This will allow you to continue your production operations while preparing the new version and related kanban rules.

To expire an active production flow version, you need to set an expiry date. In that sense, deactivation is more like an exception than a rule.

For this procedure you need a production flow with a version that can be deactivated. Do not try this in a production environment unless you are 100% positive that the version is fully obsolete.

Deactivate a production flow version

1. Go to Production control > Setup > Lean production flow > Production flows.
2. In the list, find and select the desired record.
3. In the list, click the link in the selected row.
4. In the list, find and select the desired record.
5. Click Deactivate.
 - Do not proceed if you are not 100% positive that this production flow version is obsolete. Clicking Ok will expire all active kanban rules and put an immediate stop to all production and replenishment activities of this production flow version.
6. Click OK.

NOTE

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Define an expiry date for a production flow version

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To end the validity and the processing of a production flow version on a given date, or to plan replacement of an active version with a new version, you have to set an expiry date on the version. It is not necessary to deactivate the version.

Set an expiration date to end a production flow version

1. Go to Production control > Setup > Lean production flow > Production flows.
2. In the list, find and select the desired record.
 - Select any production flow that has a version that is already defined.
3. In the list, click the link in the selected row.
4. Click Edit.
5. In the list, mark the selected row.
6. In the Expiration date field, enter a date and time.
 - For the expiration date, a new version will not start or become activated. It will also no longer be possible to create or start jobs for this production flow. You can still complete started jobs after the expiration date.

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Define production flow models

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Production flow models describe how the capacity of lean manufacturing work cells is calculated and maintained. Therefore the definition of a production flow model is a prerequisite of the definition of work cells. The demo data company used to create this procedure is USMF.

Define a production flow model.

1. Go to Production control > Setup > Lean production flow > Production flow models.
2. Click New.
3. In the Production flow model field, enter an ID for the production flow model.
4. In the Model type field, select an option.
 - There are two model types: Throughput type and Hours type. For Throughput type, the capacity of work cells that use this production flow model will be expressed and calculated in product quantities. For Hours type, the capacity of work cells that uses this production flow model will be expressed and calculated in hours. Note that this property can't be changed for an existing production flow model. After a work cell has capacity reservations, the production flow model type can't be changed.
5. Enter the number of days in the EPE Cycle.
 - The interval describes the period when every part produced by a production flow or work cell will be produced at least once. The shorter the EPE cycle, the more flexible the production process is. If EPE Cycle = 0, all demand can be produced in the same day. The EPE Cycle is used to schedule lean process jobs. When scheduling a job on a work cell with EPE Cycle = 5, the scheduling process will look for capacity on the work cell at Due date - EPE Cycle (5 days ahead of the due date) to ensure that the product can be produced in that cycle. The inventory lead time of a product is usually equal to or greater than the EPE Cycle of the related production process.
6. In the Planning period type field, select an option.
 - After a work cell has capacity reservations, the planning period type cannot be changed. You can only select production flow models with the same period type for this given work cell.
7. In the Planning time fence field, enter a number.
 - The planning time fence describes the number of days where capacity reservations can be made for the related work cells. In the Planning time fence, enter the number of days. Kanban process jobs that fall outside of this period are not planned with automatic planning. The planning time fence is typically two times the average inventory lead time of the products produced in a production flow or work cell. The EPE Cycle should not be more than half the planning time fence.
8. In the Capacity shortage reaction field, select an option.
 - The options include: Postpone - Postponing the full demand of the scheduling event on the next available production day, with available throughput. Cancel - End the automatic planning for the scheduling event and leave the related jobs unplanned. Add to requested day - Plan the requested jobs for the requested period. This overloads the cell for this day and requires the planner to review and to a manual interaction. Distribute to available periods - Distribute the different jobs of the scheduling event to all available production days, beginning from the first available day. The minimum distribution quantity is the kanban job quantity. The distribution assigns the minimum planning quantity (kanban quantity) to every day with enough available throughput.

NOTE

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Operations scheduling

2/18/2021 • 4 minutes to read • [Edit Online](#)

This topic provides information about operations scheduling. You can use operations scheduling to provide a general estimate of the production process over time.

You can schedule production at the operation level and the job level. Unlike job scheduling, operations scheduling doesn't explode the operations for the production route into jobs. If you want to include more detail in the scheduling, such as information about current capacity, you can run job scheduling after you run operations scheduling. You can also run job scheduling only. Job scheduling is typically used to schedule individual jobs on the shop floor for an immediate or short-term time frame.

Components of operations scheduling

The main components of operations scheduling are the scheduling direction, the capacity of resources, and materials optimization. By using operations scheduling, you can achieve the following goals:

- Control the planning method by scheduling forward or backward from a given date.
- Optimize the use of resources by scheduling productions based on the capacity of the resources. This approach also helps identify when alternative resources should be used.
- Optimize the use of materials by scheduling productions based on the availability of the required materials.
- Schedule and synchronize reference productions. The dates of the reference productions are adjusted when the production order's schedule is changed.

You must estimate the cost of a production order before you can run operations scheduling. If you haven't run an estimate, it's automatically run before operations scheduling is started. An operations schedule specifies the following information:

- The product that is planned for production
- The configuration of the product
- The quantities that are involved in the production
- The dates when the production will start and end
- The capacity reservations for the resources that perform the production activities

The setup time, process time, and run time are set for operations in the production. After you run operations scheduling, the status of the production order is **Scheduled**, and all operations are scheduled in the order that is specified by the production route. However, only the duration of the operation is considered. Start times and end times aren't scheduled.

Scheduling direction and date

The scheduling direction is fundamental to the scheduling process. Production can be scheduled forward or backward from any date, depending on timing and scheduling requirements.

- **Forward from the scheduling date** – You can schedule production to start as early as possible. Production can be started today, tomorrow, or on any date in the future. The production is scheduled forward in time to the earliest possible end date.
- **Backward from the scheduling date** – You can schedule production to start as late as possible. Backward scheduling is based on the date when the production must be completed. The schedule counts backward from that date to the latest possible date that the production can be started and still be completed on time.

Resource scheduling

When you run an operations schedule, each operation in the production route is scheduled for the resource that is specified for the operation. Additionally, the duration of each operation is specified on the production route. If a resource group is specified for an operation, the scheduling reserves capacity on the group. However, unlike job scheduling, operations scheduling doesn't select the specific resources in the group. If you're working with finite capacity, the schedule depends on the availability of the resources that are required in order to complete production. Operations scheduling follows the sequence of operations that is specified on the production route. The scheduling reserves capacity on the resource groups, based on the operation times that are defined on the production route. The sum of available capacity on the resources that are involved determines the capacity for the resource group. Capacity reservations that already exist for the resources are considered unavailable capacity. If there isn't enough available capacity for the production, the production orders can be delayed or even stopped. You can also specify the efficiency that you expect from the resources that are involved in the production. You specify the efficiency as a percentage on the resource. The efficiency percentage adjusts the throughput of the resource. This adjustment affects the time that is reserved for the resource. The lead times for the operations that use the resource are also adjusted accordingly.

Operations scheduling and master planning

The operations schedule also drives master planning and determines calculations for material requirements. Operations scheduling considers the following information:

- **Backlogged productions** – Products that are planned, released, or started
- **Material availability** – Inventory, subproductions, suppliers, and vendors
- **Capacity availability** – Resources that are required for production

NOTE

If you're using multi-threaded master planning and operations scheduling, finite capacity will not be considered.

Cancellations

When you run operations scheduling, you can cancel specific parts of the routing. These parts include the queue time, setup time, process time, overlap time, and transport times.

Finite materials

If you're working with finite materials, scheduling also depends on the availability of the materials that are required for production. If there aren't enough available components for the production, production can be delayed. You can base scheduling on the use of materials by specifying the materials that must be available for production. When you optimize on both resource capacity and the availability of materials, production is calculated according to these restrictions. A production order can't be scheduled to start until capacity and materials are available at the same time and in the required quantities.

Additional resources

[Operations scheduling options](#)

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Job scheduling

2/18/2021 • 5 minutes to read • [Edit Online](#)

This article provides information about job scheduling, which is a more detailed form of scheduling than operations scheduling. You can use job scheduling to schedule individual jobs or shop orders, and to control the manufacturing environment.

You can use job scheduling to schedule individual jobs or shop orders, and to control the manufacturing environment. Job scheduling breaks down each operation into its individual tasks or jobs. These jobs are then assigned to the operations resources that will perform them. Job scheduling also lets you synchronize all jobs that are referenced by the selected job. You can specify a start date and time or end date and time for the job, and then run scheduling. The time that you specify can be the start time or the end time, depending on the scheduling direction. This functionality is useful when, for example, a job can be run only on one machine at a time, or when you want to optimize the job that is run for each resource.

Tasks in the job scheduling process

The job scheduling process includes the following tasks:

- Split operations into jobs.
- Schedule jobs, based on the dates and times for the resources that are specified for the related operation.
- Calculate start times and end times for each job. You can use finite capacity to make sure that there are no overlapping times.
- Determine which resources in the resource group to run the job on. This task requires that a resource group be specified for an operation. Job scheduling selects the resources or resource groups based on the shortest lead time, and also considers any previous reservations on the resources.
- Explode operations into jobs when you run job scheduling. The jobs are scheduled by date and time, according to the order that is specified by the production route. The setup of the operation determines the jobs that are exploded during the scheduling process. The route group that is assigned to the operation controls whether jobs are generated. A job is generated only if it has a specific duration. For example, a transport time job is generated if a transport time was specified for the selected operation.

Scheduling direction

You can schedule jobs either forward or backward.

- **Forward** – Use the forward scheduling direction to start the production as early as possible. This is also known as the push method, because the production is being pushed forward through the production process. The production is scheduled to start and end on the earliest possible dates.
- **Backward** – Use the backward scheduling direction to start the production as late as possible. This is also known as the pull method, because it's based on the date when the production must be completed. Backward scheduling counts backward to the latest possible date that the production can be started without missing its target deadline.

Finite capacity

You can schedule jobs by using finite capacity. When you use finite capacity, the capacity that is scheduled can't be larger than the capacity that is available for the resource. Available time is defined as the interval when the resource is available and there are no other reservations on capacity. Scheduling that is based on finite capacity makes sure that start times and end times for an operation on a specific date don't overlap. The resource

capacity that is already reserved is considered, and overlaps between the start times and end times are also considered. Finite capacity determines the amount of capacity that must be available for a resource in order to achieve optimal use of that resource. This determination is balanced against a calculation of the shortest possible lead time between operations.

Finite materials

Job scheduling that is based on finite materials makes sure that the required materials are available when the operation starts. The coverage rules for items define these limits. Scheduling uses requirement explosion to determine when the component items are available. If you schedule without setting finite materials, the system assumes that all items are available when they are required.

Finite properties

Job scheduling that is based on special properties requires that properties be specified for the operations on the production route. These properties must be fulfilled to reserve capacity.

References

Job scheduling schedules all productions that are referenced by the current production. If a production has one or more subproductions, the subproductions should be scheduled at the same time as the main production, because the main production can't be started until the related subproductions are completed.

Schedule resources

The scheduling engine examines combinations of resources to identify those combinations that can satisfy requirements. You can specify selection criteria by selecting one of the following values in the **Primary resource selection** field on the **Scheduling parameters** page:

- **Duration** – The scheduling engine selects the resource that has the shortest lead time. **Note:** Scheduling by duration can cause decreased performance when the same resource group contains many resources and secondary operations are used. You can schedule a maximum of 32 resources per operation. If you exceed this quantity, an Infolog message is displayed, and job scheduling doesn't find the best alternative resource.
- **Priority** – The scheduling engine selects the resource that has the highest priority if two or more resources have identical capabilities and levels. The resource that has the lowest numeric value in this field has the highest priority.

When job scheduling is run, the system plans the resources, based on the limitations that are defined in the resource parameters. You can control the capacity of the resources by using calendar settings. The system calculates loads for resources during the scheduling process. **Note:** For productions that use the operations scheduling function, you can run job scheduling after operations scheduling. If you aren't using operations scheduling, you can run job scheduling alone.

Maximum capacities for resources per job order

Resources are assigned to jobs through job scheduling. You can establish maximum capacities for resources per job order. For example, you can set up the system to schedule no more than 50 percent of total capacity for a production order. This setup gives you more control over the scheduling of resources on the job scheduling level. Therefore, it can help prevent issues if not enough capacity is available to perform simultaneous productions.

Resource efficiency

Job scheduling considers the efficiency percentages that are specified for the resources. Efficiency percentages

reduce or increase the time that is reserved for the resource. Therefore, lead time is also increased or decreased. The following formula is used for the calculation: $\text{Scheduling time} = \text{Time} \times 100 \div \text{Efficiency percentage}$ In this formula, *Time* includes both the run time and the setup time.

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Gantt chart for job scheduling

2/18/2021 • 11 minutes to read • [Edit Online](#)

The Gantt chart is designed to empower production planners to control and optimize the production plan. The Gantt chart makes the flow of operations transparent and makes it easy to adjust the production schedule while taking into account material or resource shortages. This helps planners make the best use of available resources, minimize work in progress, and optimize throughput times for production orders.

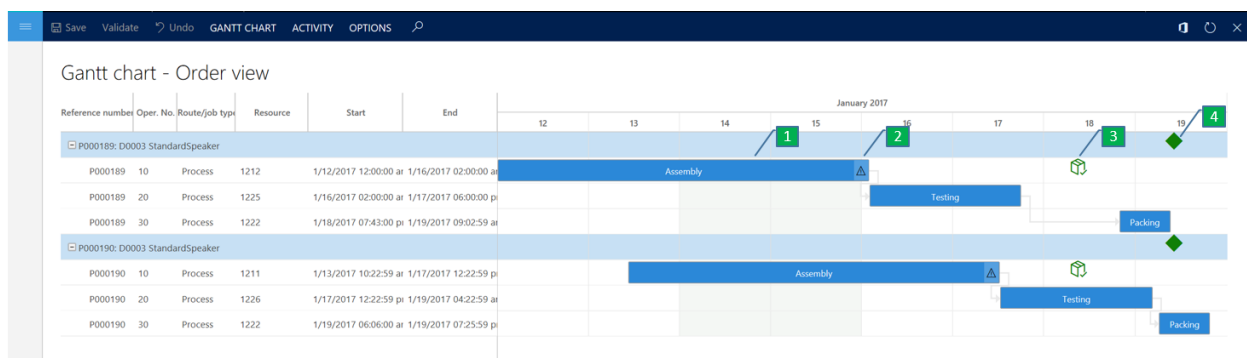
A Gantt chart is a visual representation of scheduled activities within a defined time interval. The activities are scheduled on resources that have capacity defined by a capacity calendar. The following types of activities can be shown in the Gantt chart.

- Jobs from production orders that are job scheduled.
- Jobs from planned production orders.
- Job scheduled project activities of type Hour forecasts.

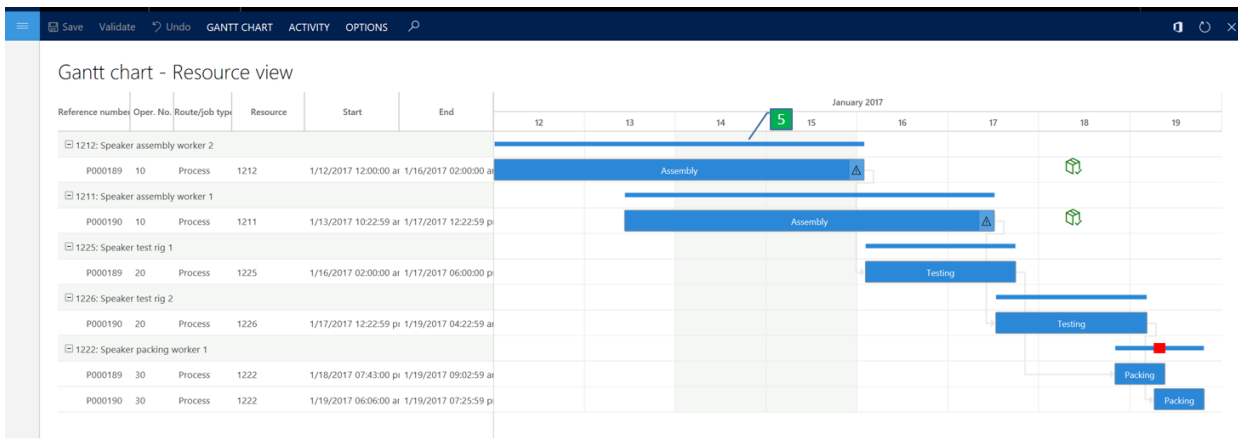
The Gantt chart can be opened in two different views, **Order view** and **Resource view**. In **Order view**, activities are grouped under production orders. This can be useful, for example, if you want to maintain an overview of all the jobs belonging to the same orders. In **Resource view** all jobs are grouped under individual resources. This view can be useful when optimizing the plan at a resource level, for example, a machine or a group of machines. The Gantt charts shown in the illustrations below show **Order view** and **Resource view** with these key elements:

1. Gantt chart activity
2. Material shortage icon
3. Material availability icon
4. Order delivery date icon
5. Capacity bar

Order view



Resource view



Activities

The activities appear as bars and are organized in a time scale grid with a scheduled start and end time, making the length of the bars proportional to the time that is necessary to complete the activity. The activities are shown according to a time scale. You can adjust the time scale on the menu where you select a start and end date and a time unit, for example, hours or days. By adjusting the time scale you can set focus on a time interval in which you want to manage activities.

To get a better overview, there are different options for controlling the color of the activities. You can configure an individual color for activities, use the theme color that is the general color theme used for the application, or set up the color to be controlled by the color code for production orders.

The time interval for activities has a background shade. Periods with a white shade indicate a time interval with defined capacity on the resource for the activity, whereas periods with a grey shade indicate time intervals with no capacity defined.

On the left side of the chart there is additional information about the activity, for example, the resource on which the activity is scheduled and production order number. The connection between jobs belonging to the same order is shown with an arrow.

You can get more information about an activity in the activity dialog box. To open the dialog box, double-click the activity or select the **information** menu. In the activity dialog you can see the scheduled start and end date, and time information about which materials the activity is planned to consume.

The activities can be grouped in Grouping levels. The Grouping levels are hierarchical and can be used to make a logical grouping of activities. For example, if you have a layout where manufacturing activities are grouped by Site, Production units, Resource groups, and Resources, you can use the Grouping levels to group the activities according to that layout. The grouping levels can be expanded and collapsed either on the individual grouping level or for all levels in the chart by using the **Expand all** and **Collapse all** buttons on the menu. You can also configure the grouping levels to be expanded or collapsed when the chart is opened.

Material availability

The Gantt chart can be set up to provide the planner with detailed information about material status for the individual activities. For example, this can be helpful if material is delayed and is affecting the production plan. In this case, the material issues will be highlighted in the Gantt chart to help the planner to understand consequences and make necessary adjustments.

A job will appear with a material shortage icon if the schedule start date of the job is later than the material availability date for materials consumed by the job. The material availability date is calculated based on the pegging information in the dynamic master plan. The material shortage icon will for example appear on a job that is consuming a material that is pegged against a purchase order that has a receipt that is later than the planned start date of the job.

Indicator of material availability date

When you set up the chart to show jobs with material shortages an icon for showing the material availability date for the job can also be shown. The icon will only be shown if the material availability date is within the defined time interval of the chart. If the material availability date lies outside the defined time interval, then more detailed material availability information can be retrieved from the material list in the job dialog box. In the list there is also an icon showing late materials for the job. You can reschedule a job using the material availability date as a start date.

Indicator of order delivery date

This icon indicates the delivery date for a production order. The icon is only visible in the Order view.

Capacity bar

You can configure the chart to show a resource capacity bar. This bar provides an overview of the resource capacity for an activity in the defined time interval of the chart. The capacity bar is not shown for periods of the time where the resource is not booked. In periods where the resource is booked to capacity, the capacity bar is shown as a solid bar. In periods where the resource is overbooked, the bar will appear thicker and in a red color. For example, if two jobs overlap, the capacity bar will indicate an overbooking in the time interval where there is an overlap. The capacity bar is updated dynamically when you schedule a job. You enable the capacity bar on the **Show capacity bar** menu. It can only be shown in **Resource view**. If you want to get a more detailed view of the capacity load on a resource, use the **Capacity load** chart, which can be opened from the menu or the context menu for a selected activity.

Job scheduling in the Gantt chart

The Gantt chart offers different options for making adjustments to the production plan. In the Gantt chart, you can re-schedule activities as a drag-and-drop interaction or from a schedule menu. In the planning process, you can take resource capacity, resource capabilities, and material constraints into account.

Schedule a job as a drag-and-drop interaction

You can re-schedule job within the defined time interval as a drag-and-drop interaction. You can only re-schedule the job on the same resource, and you can only schedule one job at a time.

Schedule a job from the menu

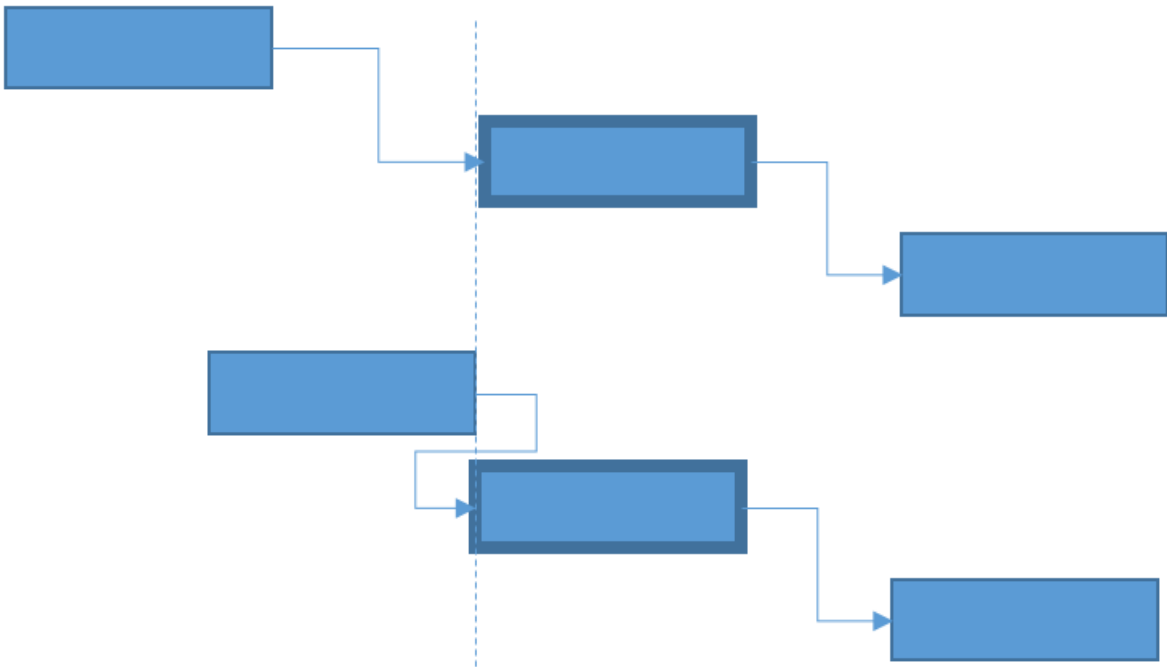
On the **Schedule jobs** menu, you can schedule one or more selected job in the chart based on a scheduling direction and a scheduling date time. There are three available schedule directions.

- Forward from scheduling date
- Backward from scheduling date
- Forward from material availability date

It is not possible to schedule a job outside the defined time interval of the Gantt chart. If you do that, the job will be left unscheduled and you will receive the error message, "Could not schedule the job within the loaded time period."

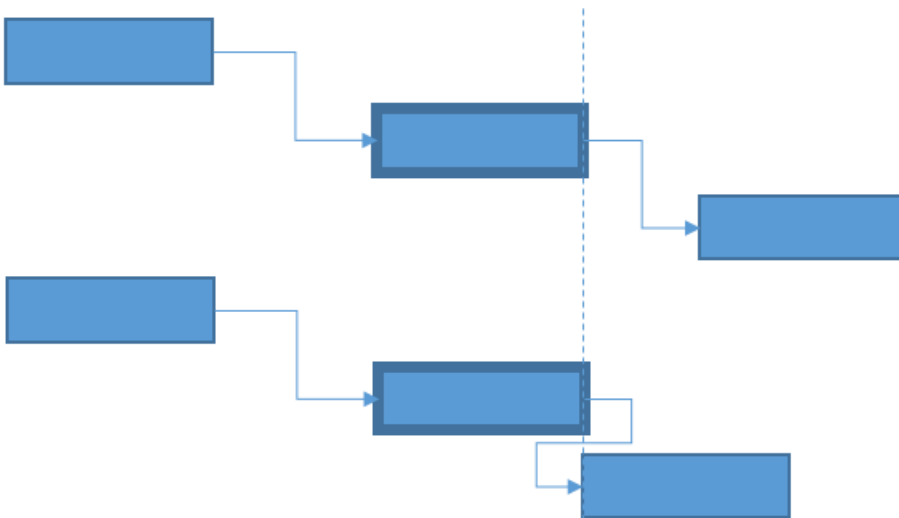
Schedule previous jobs

In a network of activities, such as jobs belonging to the same production order, you can use the **Schedule previous jobs** function to schedule the previous jobs relative to a selected job in the network. In the following example, the highlighted activity is the selected job. The diagram shows before a previous job is scheduled and after the previous job is scheduled.



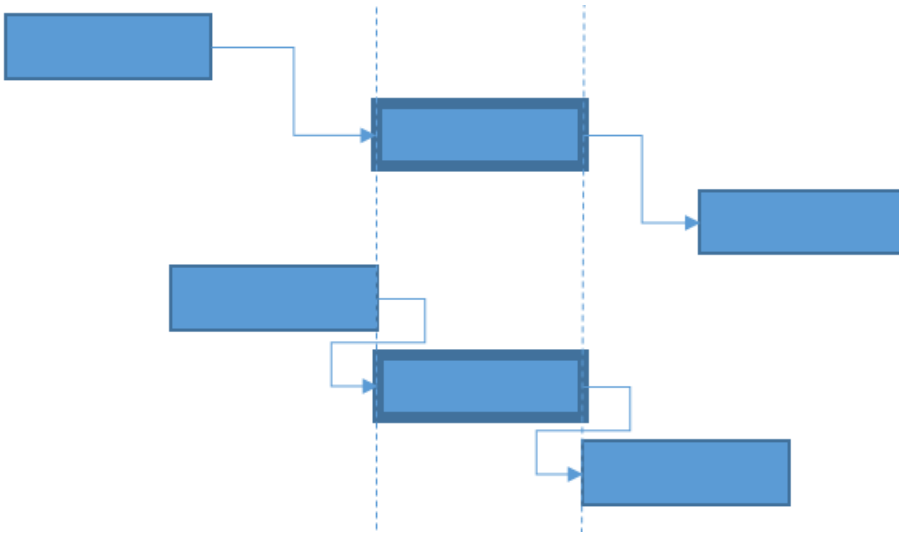
Schedule next jobs

You can use the **Schedule next jobs** function to schedule the next jobs relative to a selected job in a network of activities. In the following example, the highlighted activity is the selected job. The diagram shows before the next job is scheduled and after the next job is scheduled.



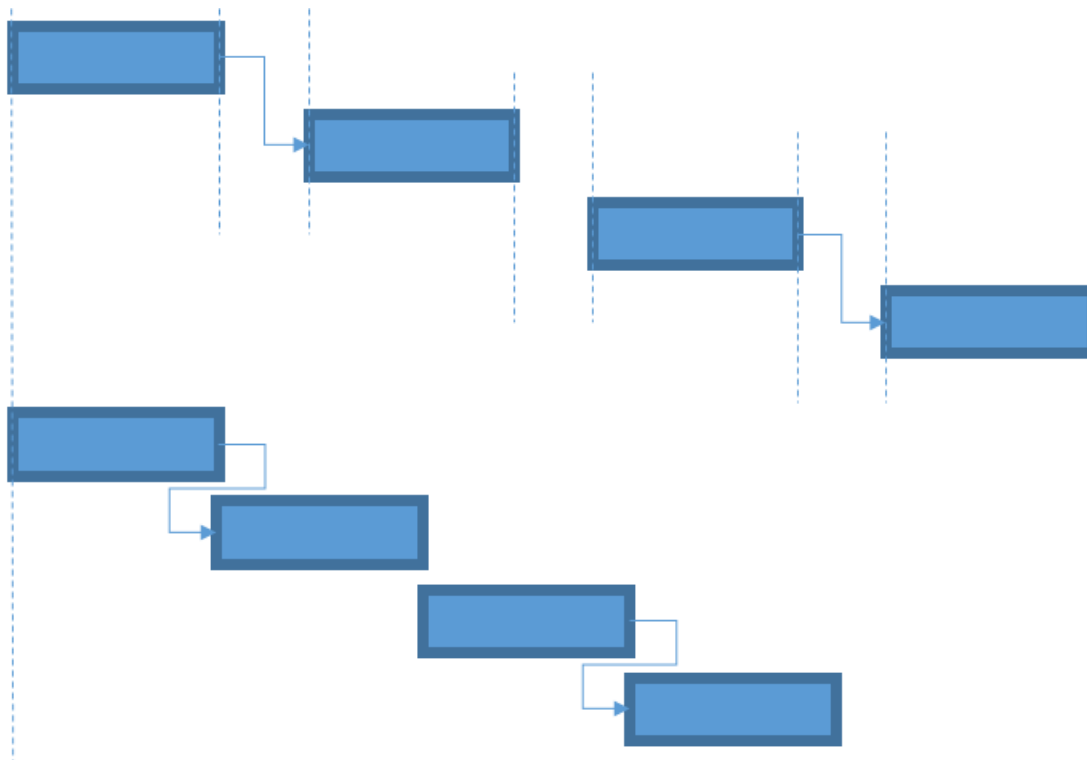
Schedule around job

You can use the **Schedule around job** function to schedule the next job and the previous job relative to a selected job in a network of activities. In the following example, the highlighted activity is the selected job. The diagram shows before a job is scheduled and after the job is scheduled.



Arrange jobs

You can use the **Arrange** function to arrange selected activities on the same resource. These activities can be in the same network of activities, but can also belong to different networks. When you use the arrange function the time gaps between the selected activities will be eliminated. You can use this function to optimize the capacity utilization of the resources. The diagram shows before a job is scheduled and after the job is scheduled.



Reassign activities from one resource to another

You can reassign a job from one resource to another. This can be useful in situations where a machine is out of order or overbooked, and you need to find another available resource that can do the job.

Reassigning an activity as a drag-and-drop interaction

In the **Resource** view, you can reassign an activity to a different resource in the Gantt chart as a drag-and-drop interaction. You do that by selecting the row in which the activity is scheduled. After the row is selected you can drag the row to the resource in the chart grouped under a different resource grouping level.

Reassigning an activity from the **Schedule jobs** menu

You can reassign a job from the **Schedule job** dialog box opened from the **Schedule job** menu. From this menu you can only reassign a job to a resource that is already loaded to the Gantt chart. If you only select one job, then the drop down for the resource will be sorted by applicable resources. If you select more jobs, then

there will be no information about applicable resources from the resource list.

Load additional resources to the Gantt chart

In the **Resource view**, you have an option to load additional resources to the Gantt chart. This can be useful if you want to find an alternative resource for a job that is scheduled on a machine that is overbooked or broken down. On the **Load additional resources** page, you will get a list of resources that are date efficient as of the date the list is opened. Applicable resources, relative to a selected job in the Gantt chart, will be listed first. If you have multiple jobs selected, prior to opening the list, no indication of applicable resources will be shown. On the **Load additional resources** page, you can select one or more resources, that will be loaded to the Gantt chart when you confirm your selection. If there are no jobs scheduled on the selected resource in the time interval of the Gantt chart, then the resource will be placed under a resource grouping level in the bottom of the list of activities in the Gantt chart.

Access the Gantt chart

The Gantt chart can be opened from the following pages.

PAGE	DESCRIPTION
Production order list and detail	On the Production order list and detail page, you can open the Gantt chart from one or more selected orders. Opening the chart from the Gantt chart menu item will load all jobs related to the selected production orders, but also jobs from other production orders that are scheduled on the same resources. Opening the chart from the Gantt chart – Fast view menu item will only load jobs related to the selected production orders. In this view, it is not possible to schedule jobs.
Resource	On the Resource page, you can open the Gantt chart from the menu item Gantt chart . When selected, all the jobs scheduled on the resource in a selected time interval will be loaded to the chart.
Resource group	On the Resource group page, you can open the Gantt chart from the menu item Gantt chart . When selected, all the jobs scheduled on the resources in the resource group will be shown in a selected time interval.
Gantt charts	On the Gantt charts page you can configure Gantt charts by resources and resource groups. For example, if you want to control production activities for specific sets of resources or resource groups, then you can make individual configurations of those on the Gantt charts page. You can then open the Gantt chart from each configuration.
Hour forecasts (project)	Project activities of type Hour forecast can be job scheduled on resources. On the Hour forecast page on the Scheduling menu you can open the Gantt chart on an order to see job scheduled project activities of type hour forecast.
Job to complete (List in Production floor management workspace)	The Jobs to complete list in the Production floor management workspace shows jobs from production and batch orders that are in progress on the selected resources for the workspace. On the Gantt chart menu item you can open the Gantt chart, where all the jobs selected in the list will be loaded to the chart.

PAGE	DESCRIPTION
Production orders to release (Opened from the Production floor management workspace)	The production orders to release page is opened from the Production floor management workspace. This page shows scheduled production and batch orders pending release. On this page you can open the Gantt chart for selected production orders.

Additional resources

[Visual scheduling with Gantt chart for production and batch orders \(Video\)](#)

[Visual scheduling for production \(demo script\)](#)

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Operations scheduling options

2/18/2021 • 7 minutes to read • [Edit Online](#)

This topic describes the options for operations scheduling. You can use operations scheduling to provide a general estimate of the production process over time.

Operations scheduling calculates the following information for a production order:

- Start and end dates are set for the production order and each operation.
- Resources are assigned to operations.

Several settings determine how production schedules are calculated. You define these settings on the **Operations scheduling** page. The following information describes the scheduling options.

Operations scheduling

Scheduling direction

The scheduling direction is fundamental to the scheduling process. A production can be scheduled forward or backward from any date, depending on timing and scheduling requirements.

- **Forward scheduling** – You can schedule a production to start as early as possible. The production can be started today, tomorrow, or on any specific date in the future. The production is scheduled to start on the earliest possible date and is planned forward in time to the earliest possible end date.
- **Backward scheduling** – You can schedule a production to start as late as possible. The schedule is based on the date when the production must be completed and counts backward to the latest possible date that the production can be started without missing its target deadline.

The following options are available:

- **Forward from today** – Schedule forward from the current date. (The current date is the system date.)
- **Forward from planned start** – Schedule forward from an earlier start date. If there is no previous scheduling, the scheduling direction is forward from the current date.
- **Forward from scheduling date** – Schedule forward from the date that is specified in the **Scheduling date** field. If you don't specify a scheduling date, the scheduling direction is forward from the current date.
- **Backward from delivery date** – Schedule backward from the delivery date that is specified for the production order. If you select this option, but no delivery date is specified, the delivery date is the current date.
- **Backward from planned end** – Schedule backward from a previously calculated end date. If there is no previous scheduling, the end date is the current date.
- **Backward from scheduling date** – Schedule backward from the date that is specified in the **Scheduling date** field. If you don't specify a scheduling date, the current date is used. Backward from scheduling date is calculated for the production order the last time that a requirement was calculated. If no date is specified for the production order, the current system date is used.
- **Backward from futures date** – Schedule backward from the futures date that was calculated for the production order the last time that a requirement was calculated. If no futures date is specified for the production order, the current system date is used.
- **As last scheduling** – For operations scheduling and job scheduling, the selected scheduling direction and date are saved. Therefore, you can select this option for subsequent scheduling. If there is no previous scheduling of the production order, scheduling is backward from the current system date.
- **Forward from tomorrow** – Schedule forward from the current date plus one day.

- **Forward from previous job** – This option is relevant only in job scheduling. If you select this scheduling direction for operations scheduling, the production order is scheduled forward from the current date. In job scheduling, scheduling is established for one job, and all other jobs for the production are scheduled based on that job.
- **Backward from previous job** – This option is relevant only in job scheduling. If you select this scheduling direction for operations scheduling, planned orders are scheduled backward from the current date. In job scheduling, scheduling is established for one job, and all other jobs for the production are scheduled based on that job.

Scheduling date

This date is used for the **Forward from scheduling date** and **Backward from scheduling date** scheduling directions. Scheduling is backward or forward from this date. For more information, see the previous section, "Scheduling direction."

Recalculate BOM levels

When you select **Recalculate BOM levels**, the selected bill of materials (BOM) levels will be recalculated to help guarantee the correct scheduling order.

Limitations

Finite capacity

Scheduling depends on the availability of the resources that are required in order to complete production. If there isn't enough capacity, production orders can be delayed or even stopped. If finite capacity is applied to operations scheduling, existing capacity reservations that are made on the resources are considered, and that capacity is seen as unavailable. The production order is scheduled based on the availability of capacity on the resources that are required. Operations scheduling uses the specified sequence of operations to determine the order of operations in the production route. Operations scheduling reserves capacity on the resource groups, based on the operation times that are defined on the production route. The capacity of the resource groups is the sum of available capacity on all the resources in the resource groups.

Finite material

Scheduling also depends on the availability of the materials that are required for production. Insufficient component availability can also cause production delays. Scheduling can also be based on the use of materials. Just specify the materials that must be available for production instead of the materials that aren't critical. This type of scheduling is known as scheduling with finite material. When you specify finite materials, production is scheduled based on whether materials are available. **Note:** When you optimize on both capacity and materials, production is calculated to meet both restrictions. The availability of capacity and materials is considered, and the production order's operations can't be scheduled to start until capacity and materials are available at the same time and in the required quantities. Select this check box if materials should be considered limited during scheduling. If the materials are limited, the material's coverage for that time will be considered. In other words, scheduling considers the futures dates that are calculated for the items. Scheduling reserves raw materials and explodes the current production. If scheduling occurs several times, only the first scheduling runs an explosion and makes reservations. If you make changes in the production BOM or route, the next scheduling runs an explosion. For the explosion, it's assumed that the materials are required on the same day. Because the production isn't scheduled at the time of the master schedule explosion, the current date is the best estimate of when the items will be available. The explosion then checks whether the items are available. If the items are available, the production requirement can be fulfilled. If the items aren't available by the current date, a planned order is generated, and an offset selection is made for the planned order. If automatic firming is set for the planned order, the planned order is firmed automatically for purchase or production. The production status is automatically changed to the status that is specified in the **Requested production status** field in the **Coverage groups** dialog box. If the check box is cleared, the materials are always considered available. Therefore, scheduling doesn't consider whether the materials are available at the time of requirement.

Finite property

Select this check box if the job scheduling should include property requirements.

Keep production unit

Select whether the scheduling engine should schedule only resources that are already specified on the production unit.

Keep warehouse from resource

Select whether the scheduling engine should schedule only resources that are associated with the input warehouse that is specified on the resource.

References

Schedule references

When references depend on production orders, they are also known as subproductions. Subproductions can be scheduled as part of the scheduling of a production order. Select this check box if the scheduling of subproductions should be based on the scheduling of the main production. In relation to the main production, overlying productions are scheduled forward, and underlying productions are scheduled backward. You can view production order references can be viewed in the **Reference level** field on the **Production orders** page.

Synchronize references

You can synchronize references with the production order. If this option is selected, the dates of the subproductions are moved and aligned when changes are made to the production order's schedule. If a production order has one or more subproductions, you might want to schedule the subproductions together with the main production. In this case, the main production can't be started until the related subproductions have been completed. Therefore, select this check box if the scheduling of subproductions should be based on the start and end times of the selected production. You can select this check box only if the **Schedule references** check box is also selected.

Cancellation

Cancel queue time

Select this check box to exclude queue time from the scheduling.

Cancel setup

Select this check box to exclude setup time from the scheduling.

Cancel process

Select this check box to exclude run time from the scheduling.

Cancel overlap

Select this check box to exclude overlap time from the scheduling.

Cancel transport

Select this check box to exclude transit time from the scheduling.

Set default

You can save the current values as default values. There are two options:

- Set as my default
- Set as default for everyone

Additional resources

Operations scheduling

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Schedule a production order with operations and job scheduling

2/18/2021 • 2 minutes to read • [Edit Online](#)

This topic focuses on scheduling a production order with operations scheduling and job scheduling. No jobs are created with operations scheduling whereas jobs are created with job scheduling. The demo data company used to create this task is USMF. This procedure is intended for the production manager, production planner, or shop floor supervisor working in a discrete manufacturing environment.

Create a production order

1. In the navigation pane, go to **Modules > Production control > Production orders > All production orders**.
2. Select **New production order**.
3. In the **Item number** field, enter or select a value. Select Item number **D0001**.
4. Select **Create**.

Schedule operations for the production order

1. Mark the newly created row.
2. On the Action Pane, select **Schedule**.
3. Select **Schedule operations**.
4. In the **Scheduling direction** field, select **Forward from scheduling date**.
5. In the **Scheduling date** field, enter a date. Select a future date, for example, today plus one week. With the selected Scheduling direction, the production order will be scheduled forward from this date.
6. Select **OK**.
7. In the list, mark the selected row. Note that the status is changed to **Scheduled**.
8. Select **All jobs**. Note that no jobs are created with operations scheduling.
9. Close the page.

Schedule jobs for the production order

1. On the Action Pane, select **Schedule**.
2. Select **Schedule jobs**.
3. In the **Scheduling direction** field, select **Forward from scheduling date**.
4. In the **Scheduling date** field, enter a date. Select a date in the future, for example, today plus one week. With the selected Scheduling direction, the production order will be scheduled forward from this date.
5. Select **OK**.
6. On the Action Pane, select **Production order**.
7. Select **All jobs**. Note that based on the active route, 5 jobs are created with job scheduling.

NOTE

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Production order lifecycle overview

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When a production order is created, a request is initiated to start producing an item. The production order contains information about what will be produced, the quantity to produce, and the planned finish date. It also contains information about which materials to consume and which process to follow to produce the item.

A production order passes through stages of the production life cycle. When an order is created, it is assigned the status **Created**. When an order is finished, it is assigned the status **Ended**. A parameter setting in each stage allows a user to configure each step. The setting can be set up for a single user or for all users.

The production bill of material and the production route are the main entities of the production order. They are copied to the production order based on the selected item and quantity that are going to be produced. Before the production order is started, the production bill of material and route can be edited.

A production order can be created in the following scenarios:

- Created by master planning execution based on material demand.
- Created directly from a sales order line or when a higher-level production order is created and estimated (pegged supply).
- Created manually.

NOTE

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Create a production order

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This procedure shows how to create a production order. The demo data company used to create this procedure is USMF. This is the first procedure out of seven which explains the production order lifecycle.

Create a production order

1. Go to Production control > Production orders > All production orders.
2. Click New production order.
3. In the Item number field, type 'D0001'.
4. In the Delivery field, enter a date.
 - The delivery date indicates when the production order should end in order to deliver on time. This date can be used in the scheduling process. For example, you can schedule the order backward from the delivery date.
5. Set Quantity to '20'.
 - Note: The BOM number field automatically displays the number of any active BOM for the current item, but you can change the BOM for the production order by selecting an active BOM from the list of approved BOM versions. The Route number field automatically displays the number of any active Route for the current item, but you can change the Route for the production order by selecting an active Route from the list of approved Route versions.
6. Click Create.

Validate the production order

1. In the list, click the link in the selected row.
 - Click the link for the production order number that you have just created. This will open the details page for the order.
2. Click Edit.
3. In the Delivery field, enter a date.
 - For example, you can change the delivery date for the production order.
4. Click Save.
5. Close the page.

Update the BOM

1. On the Action Pane, click Production order.
2. Click BOM.
 - Open the BOM page to validate the BOM data that was copied from the default data when the production order was created. In this procedure, you need to update the quantity for a BOM.
3. Click Edit.
4. In the Quantity field, enter a number.
 - Changing the quantity on the BOM line affects the cost estimate of material consumption for the production order.
5. Click Save.
6. Close the page.

Update the production route

1. On the Action Pane, click Production order.
2. Click Route.
 - Open the Route page to validate the data of the production route that was copied from the default data when the order was created. In this procedure, you need to update the quantity for one of the operations in the production route.
3. In the list, find and select the desired record.
4. Click Edit.
5. In the Process qty. field, enter a number.
 - Changing the process time affects the estimated route consumption and the cost of the production order.
6. Click Save.
7. Close the page.

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Estimate a production order

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You can run this procedure by using the USMF demo data company or your own data set. In both cases, you need to have an open production order that has the Created status. This is the second procedure out of seven which explains the production order lifecycle.

Estimate a production order

1. Go to Production control > Production orders > All production orders.
2. Select an order that has the Created status in the grid.
3. On the Action Pane, click Production order.
4. Click Estimate.
 - In this step, the estimated costs of a single production order is calculated.
5. Click OK.

View the calculation details

1. On the Action Pane, click Manage costs.
2. Click View calculation details.
 - This page displays the cost breakdown. For example, you can view the total cost price per unit for the finished product in the first row. The subsequent rows contain costs according to the bill of materials, production route, and indirect costs.

NOTE

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Schedule a production order

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This procedure shows how to schedule a production order. The demo data company used to create this procedure is USMF. This is the third procedure out of seven which explains the production order lifecycle.

Schedule a production order

1. Go to Production control > Production orders > All production orders.
 - Select a production order that has the Estimated status.
2. On the Action Pane, click Schedule.
3. Click Schedule jobs.
 - The parameters for scheduling are set up on this page. You can set up the parameters for specific users or all users.
4. In the Scheduling direction field, select 'Forward from today'.
5. In the Scheduling date field, enter a date.
6. Select or clear the Finite capacity check box.
7. Select or clear the Finite material check box.
8. Click OK.

View the scheduling results

1. On the Action Pane, click Production order.
2. Click All jobs.
 - This page displays the scheduled jobs that you have just generated.
3. Expand or collapse the Scheduling section.
 - On the Scheduling FastTab, you can view the scheduled date and time.
4. Click Inquiries.
5. Click Capacity load.
 - The Capacity load page displays the capacity that is reserved through job scheduling, the total number of hours that are currently reserved on the resource, and the number of hours that remain available for job scheduling on the resource.
6. Close the page.
7. Close the page.

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Release a production order

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This procedure shows how to release a production order. The demo data company used to create this procedure is USMF. This is the fourth procedure out of seven which explains the production order lifecycle.

1. Go to Production control > Production orders > All production orders.
 - In the grid, select a production order that has the Scheduled status.
2. On the Action Pane, click Production order.
3. Click Release.
 - On this page, you can confirm the release of the selected range of production orders. Click Select if you want to add orders.
 - The Release step indicates when the production order is released to the production shop floor so that the shop floor operators can report progress on the production jobs. Production papers that contain relevant information about processing the jobs can be issued. The warehouse work for raw material picking is generated for the items that are set up for the warehouse process.
4. Click the General tab.
 - Select which production reports should be printed. The Job card report prints a page for each scheduled job and requires the production order to be scheduled at the job level. The report contains information about the scheduled start and end time, the quantity to produce, and which resource processes the job. The Route job report collects the same information on the same page, but does not print a page for each job. The Route card report only shows the operations but not the jobs. Therefore, this report does not require job scheduling, but can be used when production orders are scheduled at the operation level.
5. Click the Print route card checkbox.
6. Click OK.
7. Close the page.

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Start a production order

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This procedure shows how to start a production order on the shop floor. Time and material consumption are reported in this process. The demo data company used to create this procedure is USMF. This is the fifth procedure out of seven which explains the production order lifecycle.

Start a production order

1. Go to Production control > Production orders > All production orders.
 - Select a production order that has the Released status.
2. On the Action Pane, click Production order.
3. Click Start.
 - On this page, you can confirm the start of the production order.
4. Click the General tab.
5. In the From Oper. No. field, enter '10'.
6. In the Automatic route consumption field, select 'Always'.
7. Click the Post route card now checkbox.
8. In the Automatic BOM consumption field, select 'Always'.
9. Click the Post picking list now checkbox.
10. Click the Print picking list checkbox.
11. Click OK.
 - This is the printed picking list that shows the materials used for the production order.
12. Close the page.

Validate the picking list

1. On the Action Pane, click View.
2. Click Picking list.
3. In the list, find and select the desired record.
4. In the list, click the link in the selected row.
5. Click Edit.
6. In the Consumption field, enter a number.
7. Click Post.
8. Click OK.
 - In the picking list journal, the materials consumed by the production order are posted. Before posting the journal, you can make adjustments if there is a difference between the estimated quantity and the actual consumed quantity.
9. Click the GridPanel tab.
10. Close the page.

Verify the route card journal

1. On the Action Pane, click View.
2. Click Route card.
3. In the list, find and select the desired record.

4. In the list, click the link in the selected row.
5. Click Edit.
6. In the Hours field, enter a number.
7. Click Post.
8. Click OK.
 - In the Route card journal, the time spent on the individual operations is recorded. Good and error quantity can also be reported.

NOTE

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Report a production order as finished

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This procedure shows how to report a production order as finished. The demo data company used to create this procedure is USMF. This is the sixth procedure out of seven which explains the production order lifecycle.

Report a production order as finished

1. Go to Production control > Production orders > All production orders.
 - Select a production order that has the Started status.
2. On the Action Pane, click Production order.
3. Click Report as finished.
 - On this page, you can confirm the quantity of the finished product to be reported as finished.
4. Click the General tab.
5. Set Good quantity to '18'.
6. Set Error quantity to '2'.
7. In the Error cause field, select 'Material'.
8. Select or clear the End job check box.
9. Select or clear the Accept error check box.
10. Click OK.

Verify the Report as finished journal

1. On the Action Pane, click View.
2. Click Reported as finished.
3. In the list, mark the selected row.
4. In the list, click the link in the selected row.
 - The Report as finished journal is posted. If you want to make adjustments to the journal, you can manually create a new journal where you can make changes.

NOTE

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End a production order

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This procedure shows how to end a production order. The demo data company used to create this procedure is USMF. This is the final procedure out of seven which explains the production order lifecycle.

End a production order

1. Go to Production control > Production orders > All production orders.
 - Select a production order that has the status Reported as finished.
2. On the Action Pane, click Production order.
3. Click End.
 - On this page, you can confirm that you want to end the production order.
4. Click the General tab.
5. In the Date field, enter a date.
6. In the Scrap method field, select 'Allocation'.
 - When you select the Allocation method, costs from the scrapped materials are added to the finished goods.
7. Click OK.

Validate calculation results

1. On the Action Pane, click Manage costs.
2. Click View cost comparison.
 - After you have ended the production order, you can compare the estimated cost price against the realized cost price to get an overview of the production variances.

NOTE

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Release production orders

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A released production order is an order that has been authorized for production. The term Released is used to describe a state in the production order life cycle, where the production order is available for execution on the production shop floor and for warehouse processes.

Characteristics of the Released state

The **Released** state is one state in the production order life cycle. Production orders that are in the **Released** state are available for execution on the production shop floor and for warehouse processes. The **Released** state has the following characteristics:

- A production order can be changed to the **Released** state either from the production order or by using a batch process. The production order can also be updated automatically from planned production orders that are firmed by using the **Firming time fence** field on the **Master plan** page.
- The **Released** state is the signal for the shop floor operators (operators) to start executing the production jobs on the shop floor.
- Production papers, such as route cards, route jobs, and jobs cards provide information about production jobs and can be issued.
- For materials that are physically reserved, warehouse work is generated to pick materials for the production order.

Releasing jobs to the shop floor

After a production order is released, production jobs that are related to the order are visible and ready for registration. The operators can make job registrations, such as Start, Stop, and Completion, on either the **Job card terminal** page or the **Job card device** page. The registered time and quantity are automatically transferred from the registration pages to production journals to keep track of the consumed time and quantity.

Route cards

A route card provides an overview of information that comes from route and operation setups, and from operation and job scheduling methods.

Route jobs

A route job lists each job of an operation in detail, and includes setup, process, queue, and transportation times. For example, an operation such as painting might require individual jobs, such as setup time, run time for the painting process, and queue time for drying.

Job cards

A job card lists the individual job numbers of a particular operation. One job appears on each page. The jobs that are included on a job card, and their estimated times, come from the route and operation setup information. From a job card, you can open the **Production journal lines, job card** page. People who run operations resources can provide feedback about the production process. There are fields where you can enter consumption statistics and information such as the error quantity.

Warehouse work for raw material picking

Work for raw material picking is generated during release. Work is generated only for the quantity of materials that was physically reserved for the production order before the order was released. The following setup is required to generate warehouse work for raw material picking:

- A location directive for raw materials picking that determines which warehouse location to pick the materials in
- A wave template for raw materials, where policies for the execution of warehouse work are configured
- A production input location that determines where materials are put

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Report production orders as finished

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Report as finished is a production stage. At this stage, a finished product is reported and moved from the production order to the inventory.

When a quantity of the finished goods is reported as finished on a production order it is updated as on-hand in the inventory. Partial quantities of the originally planned order quantity can be reported as finished. It is also possible to report error quantities with an associated error reason when reporting quantities as finished. When the production order reach the stage Reported as finished it indicates that no more quantity is going to be reported at the production order. The following characteristics are also associated with the **Report as finished** process:

- It is possible to set up consumption of raw material and time that are proportional to the reported quantity (back-flushing)
- Put-away work can be generated for items that are enabled for warehouse processes.
- The planned or standard cost value of the finished goods can be set up to be reported to ledger accounts.
- A quality order can be created for the reported quantity based on the setup of a quality association.

The quantity is reported to the output location. Warehouse work is then generated to move the quantity from the output location to its final destination defined by the location directive for the put-away work.

- A quality order can be created when a production order is reported as finished if a quality association has been set up.

Set a production order to Reporting as finished

You can set a production order to **Report as finished** through the standard production order update function, or through the route and job card journals, or through the journal **Report as finished**. You can also update the stage to **Report as finished** through the job card terminal and job card device pages, when you report on the last job of the production order. Finally, you can enable the **Report as finished** option as a process for the handheld warehouse device solution.

NOTE

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Configure the production floor execution interface

2/18/2021 • 7 minutes to read • [Edit Online](#)

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Shop floor workers use the production floor execution interface to register their daily work, such as when they start a job, report feedback about jobs, register indirect activities, and report absence. These registrations are the basis for tracking progress and cost on production orders, and for calculating the basis for the workers' pay.

When you open the production floor execution interface, it automatically loads a selected configuration and job filter that are specific to the browser and device. In the configuration, you set the policies that must be applicable for a specific usage. Here are some usage examples:

- On a device in the company hall, employees clock in when they come into the office, and they clock out when they leave for the day.
- On a device on the shop floor, machine operators register when they start and complete jobs. They also register breaks and indirect activities.

This topic describes the various options for configuring job card devices.

Turn on the production floor execution interface and its related optional features

The production floor execution interface itself, plus several of the optional settings that are described in this topic, must be turned on in your system before you can use them. Use the [Feature management](#) page to turn on any or all of the features described in the following subsections as required.

The production floor execution interface

This is the primary feature described in this topic. It adds the production floor execution interface to your system. To enable it, turn on the following feature in [feature management](#):

- Production floor execution

Generate license plates

These features make license plate functionality available to the production floor execution interface. If you'd like to use them, turn on the following features in [feature management](#) (in this order):

1. License plate for reporting as finished added to the Job Card Device
2. Enable automatic generation of license plate number when reporting as finished in the job card device

Print labels

These features make label printing functionality available to the production floor execution interface. If you'd like to use them, turn on the following features in [feature management](#) (in this order):

1. License plate for reporting as finished added to the Job Card Device
2. Print label from Job Card Device

Allow locking the touch screen

This feature adds a button to the production floor execution interface that enables workers to sanitize the touch screen. If you'd like to use it, turn on the following feature in [feature management](#):

- Feature for locking job card device and job card terminal so that they can be sanitized

Asset management functionality for the production floor execution interface

This feature adds an asset management tab to the production floor execution interface. Workers can use this tab to select an asset that is connected to a machine resource that is within the selected filter of the job list. For the selected machine asset, the worker can view the state and health of the asset from counter values for up to four selected counters. If you'd like to use this feature, turn on the following feature in [feature management](#):

- Asset management functionality for the production floor execution interface

Work with production floor execution configurations

To create and maintain device configurations, go to **Production control > Setup > Manufacturing execution > Configure production floor execution**. The **Configure production floor execution** page shows a list of existing configurations. On this page, you can perform the following actions:

- Select any production floor configuration that is listed in the left column to view and edit it.
- Select **New** on the Action Pane to add a new device configuration to the list. Then, in the **Configuration** field, enter a name to identify the new configuration. The name that you enter must be unique among all device configurations, and you won't be able to edit it later.

Next, configure the various settings for the selected device configuration. The following fields are available:

- **Report quantity at clock-out** – Set this option to *Yes* to prompt workers to report feedback about jobs that are in progress when they clock out. When this option is set to *No*, workers won't be prompted.
- **Lock employee** – When this option is set to *No*, workers will be signed out immediately after they make a registration (such as a new job). The device will then return to the sign-in page. When this option is set to *Yes*, workers will stay signed in to the job card device. However, a worker can manually sign out so that another worker can sign in while the job card device continues to run under the same system user account. For more information about these types of accounts, see [Assigned users](#).
- **Use the actual time of registration** – Set this option to *Yes* to set the time for each new registration to the exact time when the worker submitted the registration. When this option is set to *No*, the sign-in time is used instead. You will usually want to set this option to *Yes* if you've set the **Lock employee** and/or **Single worker** option to *Yes* in cases where workers often remain signed in for longer periods.
- **Single worker** – Set this option to *Yes* if only one worker uses each job card device where this configuration is active. When this option is set to *Yes*, the **Lock employee** option is automatically set to *Yes*. In addition, this setting removes the requirement (and ability) for the worker to sign in by using a badge ID (or another similar ID). Instead, the worker signs in to Microsoft Dynamics 365 Supply Chain Management by using a system user account that is linked to a *time registered worker* (from the *workers* table), and gets signed in to the job card device as that worker at the same time.
- **Allow locking the touchscreen** – Set this option to *Yes* to allow workers to lock the touchscreen of the job card device so that they can sanitize it. When this option is set to *Yes*, a **Lock screen for sanitizing** button is added to the device sign-in page. When a worker selects this button, the touchscreen is temporarily locked to prevent unintended input. A countdown timer is also shown. The worker can then safely clean the device and the screen. When the countdown is completed, the touchscreen is automatically unlocked.
- **Screen lock duration** – When the **Allow locking touchscreen** option is set to *Yes*, use this option to specify the number of seconds that the touchscreen should be locked for sanitizing. The duration must be between 5 and 120 seconds.
- **Generate license plate** – Set this option to *Yes* to generate a new license plate every time that a worker uses the job card device to report as finished. The license plate number is generated from a number sequence that is set up on the **Warehouse management parameters** page. When this option is set to *No*,

workers must specify an existing license plate when they report as finished.

- **Print label** – Set this option to *Yes* to print a license plate label when a worker uses the job card device to report as finished. The configuration of the label is set up in document routing, as described in [Document routing layout for license plate labels](#).
- **Tab selection** – Use the settings in this section to choose which tabs should be displayed by the production floor execution interface when the current configuration is active. You can design as many tabs as you need and then add and arrange them here as required. For details about how to design tabs and work with the settings here, see [Design the production floor execution interface](#).

Clean up job configurations

When the shop floor supervisor sets up the production floor execution interface, they select a configuration and a job filter. These selections are stored in a reference table in Supply Chain Management, and the browser uses an ID that is stored in a local cookie to find the correct row in that table. The table also logs the date and time that a worker last signed in to each device.

A batch job periodically cleans entries in the references table for devices that haven't logged any activity in the last 60 days. You can also manually clean the entries at any time by following these steps.

1. Go to **Production control > Setup > Manufacturing execution > Configure production floor execution**.
2. On the Action Pane, select **Clean up client configurations**.
3. In the **Clean up client configuration** dialog box, set the **Number of days** field to the number of days of inactivity (before today) to consider. You will remove all configurations and sign-in records for devices that haven't been active during that time.
4. Select **OK** to clean up the relevant configurations, based on the **Number of days** setting.

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Design the production floor execution interface

2/18/2021 • 3 minutes to read • [Edit Online](#)

IMPORTANT

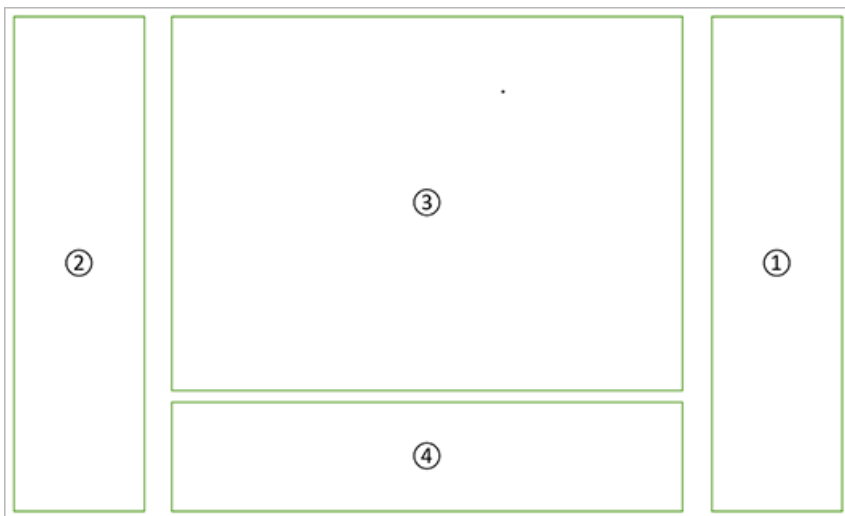
Some or all of the functionality noted in this topic is available as part of a preview release. The content and the functionality are subject to change. For more information about preview releases, see [One version service updates FAQ](#).

You can design the content of the user interface for each configuration used by the production floor execution interface. For example, workers in one work cell might need to be able to open job instructions on the production floor, while in another work cell, instructions are not needed. In that case, two configurations should be created, one with a button for opening document attachments and one without this button.

Design a tab

On the **Configure production floor execution** page, you can create and configure tabs by selecting **Design tabs** on the Action Pane.

Each tab is divided into four sections, as shown in the following illustration.

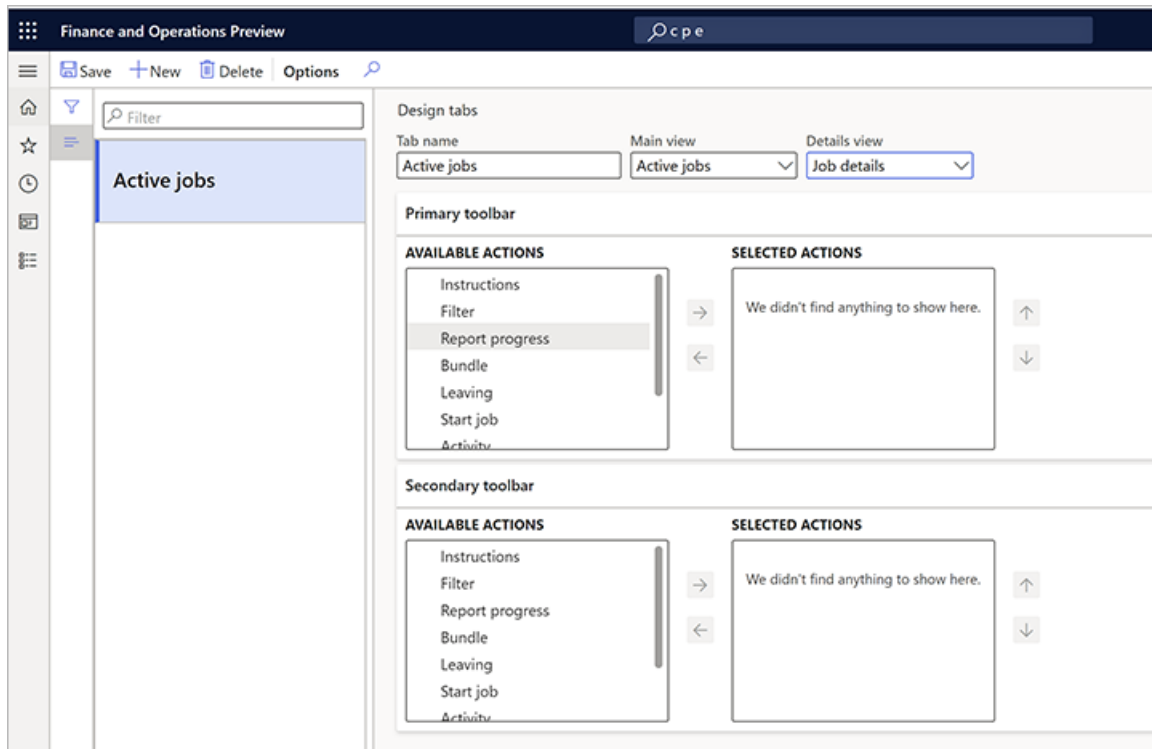


The following elements are shown in the illustration:

1. Primary toolbar
2. Secondary toolbar
3. Main view
4. Detailed view

To create and configure a new tab, follow these steps:

1. Go to **Production control > Setup > Manufacturing execution**.
2. Select **Design tabs** on the Action Pane to open the **Design tabs** page.

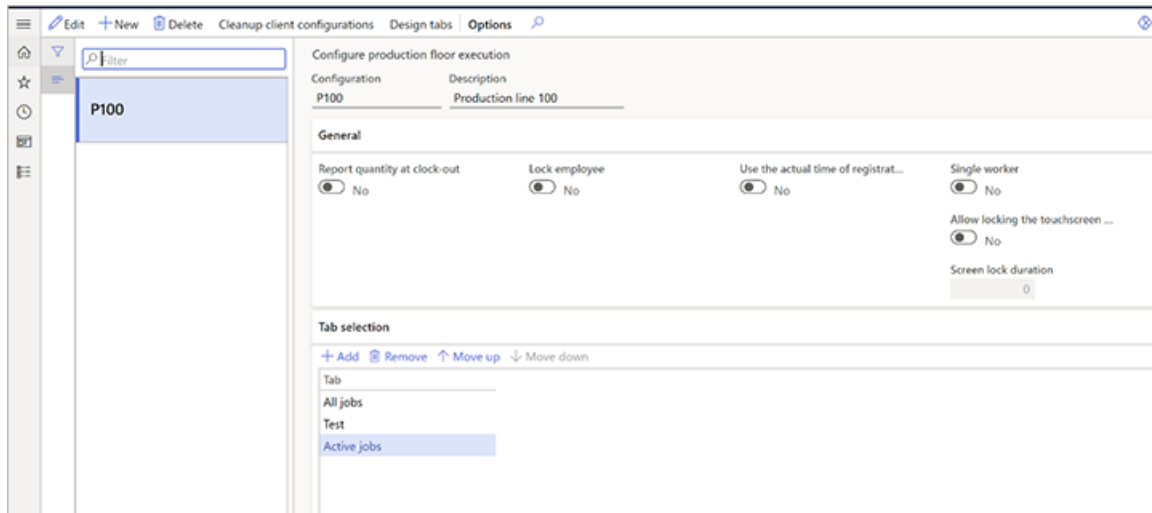


3. Select **New** on the Action Pane.
4. Make the following settings in the header of the page:
 - **Tab name** - Specify a name for the tab.
 - **Main view** - Select between the two pre-defined job lists (*Active jobs*, *All jobs*, or *My machine*).
 - **Details view** - Select between a blank value or **Job details**. If you select the blank value, there will be no detailed view in the tab. If you select **Job details**, the detailed view will contain a detailed description of the job selected in the job list in the main view.
5. In the **Primary toolbar** section, choose which buttons should be available in the primary toolbar. The **Available actions** column shows a list of all the buttons that can be added. The **Selected actions** columns shows a list of all the buttons that are included in the current configuration. Use the buttons between the columns to move selected items between the columns as needed. Use the up and down buttons next to the **Selected actions** column to control the order in which the buttons are presented in the user interface.
6. In the **Secondary toolbar** section, choose which buttons should be available in the secondary toolbar. The **Available actions** column shows a list of all the buttons that can be added. The **Selected actions** columns shows a list of all the buttons that are included in the current configuration. Use the buttons between the columns to move selected items between the columns as needed. Use the up and down buttons next to the **Selected actions** column to control the order in which the buttons are presented in the user interface.

Associate a tab with a configuration

After you designed all the tabs you need, you can associate them with a configuration.

1. Go to **Production control > Setup > Configure production floor execution**.



2. On the **Tab selection** FastTab, select **Add**.
3. A new row is added to the grid. For this new row, select the name of a tab that you want to add to the configuration.
4. Continue to add additional tabs as needed.
5. Use the **Move up** and **Move down** buttons on the toolbar to arrange the tabs as needed. The tabs will be displayed from left to right in the order shown in the above screenshot (the tab at the top is shown on the left).

NOTE

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Set up a device to run the production floor execution interface

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Some or all of the functionality noted in this topic is available as part of a preview release. The content and the functionality are subject to change. For more information about preview releases, see [One version service updates FAQ](#).

The production floor execution interface is set up for every device on the production floor. Companies typically set up each device differently, depending on the purpose that the device serves. For example, a company might have one device in the reception area, where workers clock in and clock out, and another on the shop floor, where workers manage their jobs.

Set the configuration and filters for a specific device

To set the configuration and job filters for a device, sign in to the **Production floor execution** page by using an account that has a security role that includes the *Maintain time supervisor* duty. (Among the out-of-box security roles, only *Shop floor supervisor* has this duty.) Then follow these steps.

1. Go to the device that you want to set up, and sign in to Microsoft Dynamics 365 Supply Chain Management as a shop floor supervisor. (Use an account that includes the *Maintain time supervisor* duty.)
2. Make sure that a configuration is available for the device that you're setting up. If no configuration already exists, a default configuration is provided. For more information about how to set up a configuration, see [Configure the production floor execution interface](#).
3. Go to **Production control > Manufacturing execution > Production floor execution**.

If the production floor execution interface has already been configured at least one time on the current device, a sign-in page appears. Otherwise, a welcome page appears.

4. On either the sign-in page or the welcome page, select **Configure**.
5. Select a configuration in the list.
6. Select **Next**.
7. Select one or more filters to apply to the current device. These filters will help ensure that only relevant jobs are shown on the device. To set a filter, select the filter type to open a list of values, and then select the value to filter on. The following filters are available:
 - **Production unit** – This filter is the highest-level filter. It typically refers to a large work area that has several resource groups and individual resources in it.
 - **Resource group** – This filter is a mid-level filter. It typically refers to a collection of related resources in a limited area of the workspace. If you select a **Production unit** filter first, the list of resource groups shows only groups from that unit. Otherwise, it shows all available resource groups.
 - **Resource** – This filter is the most specific filter. It typically refers to a specific machine or other single resource. If you select a **Resource group** and/or **Production unit** filter first, the list of resources shows only resources from that group and/or unit. Otherwise, it shows all available resources.

8. Select **OK**.
9. The sign-in page appears, and your device is ready for use.

Allow a worker to override the default filters

You can give specific workers permission to change the filter settings on any device that they use. For workers who have this permission, the production floor execution interface provides a **Filter** button on the **All jobs** and **Active job** pages.

NOTE

If a worker changes a filter, the new filter applies from that point forward, for all users who sign in to the device.

To allow a worker to override the default job filters that have been set up for a device, follow these steps.

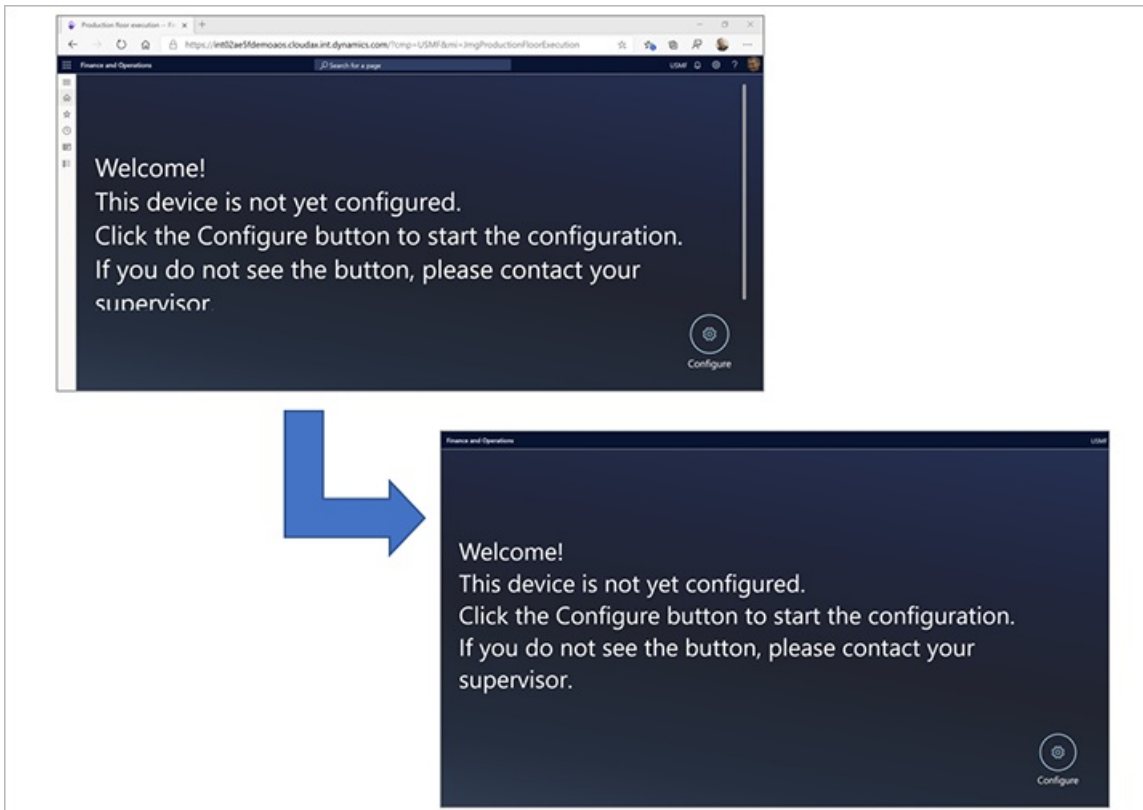
1. Go to **Time and attendance > Setup > Time registration workers**.
2. Select a worker in the list to open that worker's **Time registration workers** page.
3. On the **Time registration** tab, set the **Set filters** option to *Yes*.

Run the interface in full-screen mode

Often, you will run the production floor execution interface on a device that is used exclusively for that purpose. Therefore, it might make sense to run the interface in full-screen mode, without showing any navigation and/or browser chrome.

- To hide the navigation pane that is shown in Supply Chain Management, add the following text to the end of the URL in the browser's address bar: `&limitednav=true`.
- To also hide the browser's address bar, use the browser's native full-screen mode. (For instructions, see your browser's documentation.)

The upper part of the following illustration shows how the interface looks by default. The lower part shows how it looks in full-screen mode when the navigation pane is hidden.



Extend the session past 12 hours

By default, the production floor execution interface automatically signs out if nobody uses it for 12 hours. A Supply Chain Management user must then sign in again. However, you can extend the time-out limit to up to 90 days.

To extend the time-out limit, sign in to Supply Chain Management, and go to **System administration > Users > Session extensions**. Specify the Supply Chain Management user account that is used to sign in to the device, and the number of hours that the session should stay active for.

NOTE

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How workers use the production floor execution interface

2/18/2021 • 12 minutes to read • [Edit Online](#)

IMPORTANT

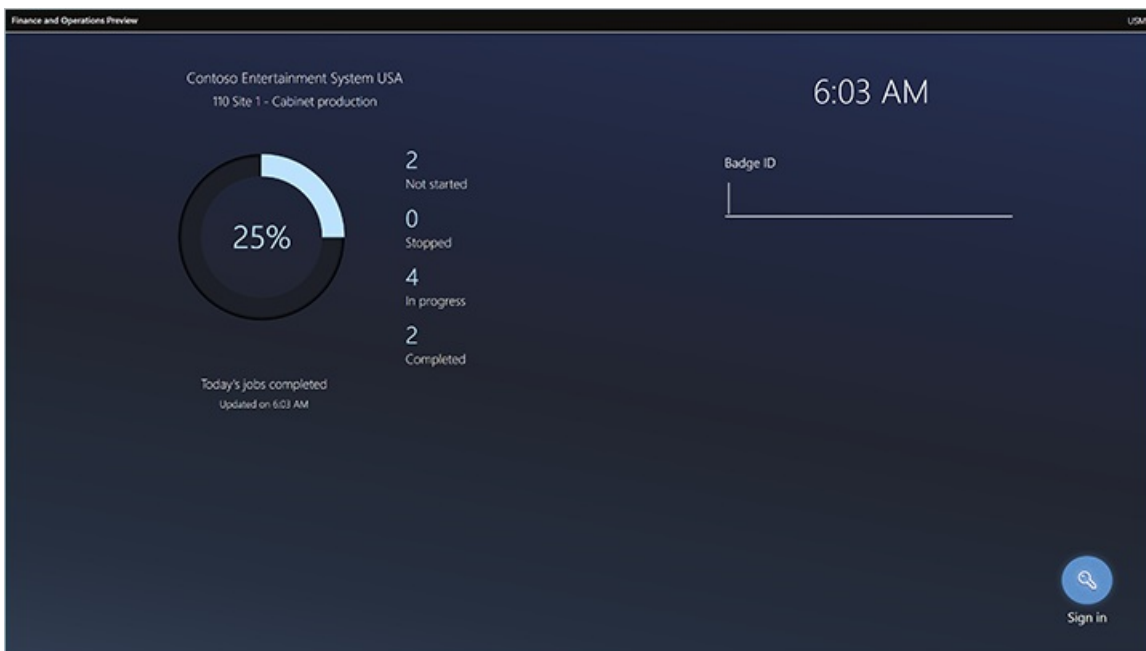
Some or all of the functionality noted in this topic is available as part of a preview release. The content and the functionality are subject to change. For more information about preview releases, see [One version service updates FAQ](#).

The production floor execution interface is optimized for touch interaction. Its design provides visual contrast that meets accessibility requirements for shop floor environments. It offers all the same functional capabilities as the job card device. However, it also enables multiple jobs to be started in parallel from a job list. (This capability is also known as *job bundling*.) Additionally, from a job list, workers can open a guide that was created in Microsoft Dynamics 365 Guide. In this way, they can get visual instructions on a HoloLens.

Sign in to the production floor execution interface as a worker

Before workers can start to use the device, a supervisor or technical staff must prepare it and open the correct page in Dynamics 365 Supply Chain Management. For more information about how to set up the device, see [Set up a device to run the production floor execution interface](#).

After the device has been prepared, the sign-in page appears on it. This page shows information about the status of jobs for the local work cell. This information is updated periodically. On the page, workers use their badge IDs to sign. Although workers don't have to have a user account for Supply Chain Management, they must have a *time registered worker* account that they can use when they sign in.



The remaining sections of this topic describe how workers interact with the interface.

All jobs tab

The **All jobs** tab provides a job list that shows all the production jobs that have a status of *Not started*, *Stopped*,

or *Started*. (This tab name is customizable and may be different for your system.)

1	2	3	4	5	6	7	8	9	10
✓			Order	Description	Requested	Started	Completed	Scrapped	Remaining
	▶	!	P000123	Speaker testing a...	5.00	5.00	0.00	0.00	5.00
✓	▶		P000104	Speaker testing a...	21.00	21.00	0.00	0.00	21.00
			P000124	Speaker testing a...	6.00	6.00	0.00	0.00	6.00
			P000123	Operating the spe...	5.00		0.00	0.00	5.00
			P000123	Packing	5.00		0.00	0.00	5.00

Speaker testing and calibration	
Product	From To
D0001 - MidRangeSpeaker	12/19/2016 10:14:00... 12/19/2016 10:14:00...
Previous operation	Active employees
Assembly, 21.00 Produced, Not started	Christina Portra (+1)

The job list has the following columns. The numbers correspond to the numbers in the previous illustration.

1. **Selection column** – The leftmost column uses check marks to indicate jobs that have been selected by the worker. Workers can select multiple jobs in the list at the same time. To select all the jobs in the list, select the check mark in the column header. When a single job is selected, details about that job are shown in the lower part of the page.
2. **Job status column** – This column uses symbols to indicate the status of each job. Jobs that have no symbol in this column have a status of *Not started*. A green triangle indicates jobs that have a status of *Started*. Two yellow vertical lines indicate jobs that have a status of *Stopped*.
3. **High priority column** – This column uses exclamation marks to indicate jobs that have high priority.
4. **Order** – This column shows the production order number for a job.
5. **Description** – This column shows a description of the operation that a job is part of.
6. **Requested** – This column shows the quantity that a job is planned to produce.
7. **Started** – This column shows the quantity that has already been started for a job.
8. **Completed** – This column shows the quantity that has already been completed for a job.
9. **Scrapped** – This column shows the quantity that has already been scrapped for a job.
10. **Remaining** – This column shows the quantity that remains to be completed for a job.

Active jobs tab

The *Active jobs* tabs shows a list of all jobs that the signed-in worker has already started. (This tab name is customizable and may be different for your system.)

Finance and Operations Preview USMF

FRIDAY 10/2/2020
5:36 AM

All jobs **Active jobs**

	Order	Description	Reques...	Started	Compl...	Scrapp...	Remain...	
Break	<input checked="" type="checkbox"/>	P000104	Installation of wiring	21.00	21.00	0.00	0.00	21.00
Activity	<input type="checkbox"/>	P000104	Speaker assembly	21.00	21.00	0.00	0.00	21.00
Leaving	<input type="checkbox"/>	P000105	Installation of wiring	12.00	12.00	0.00	0.00	12.00
	<input type="checkbox"/>	P000105	Speaker assembly	12.00	12.00	0.00	0.00	12.00

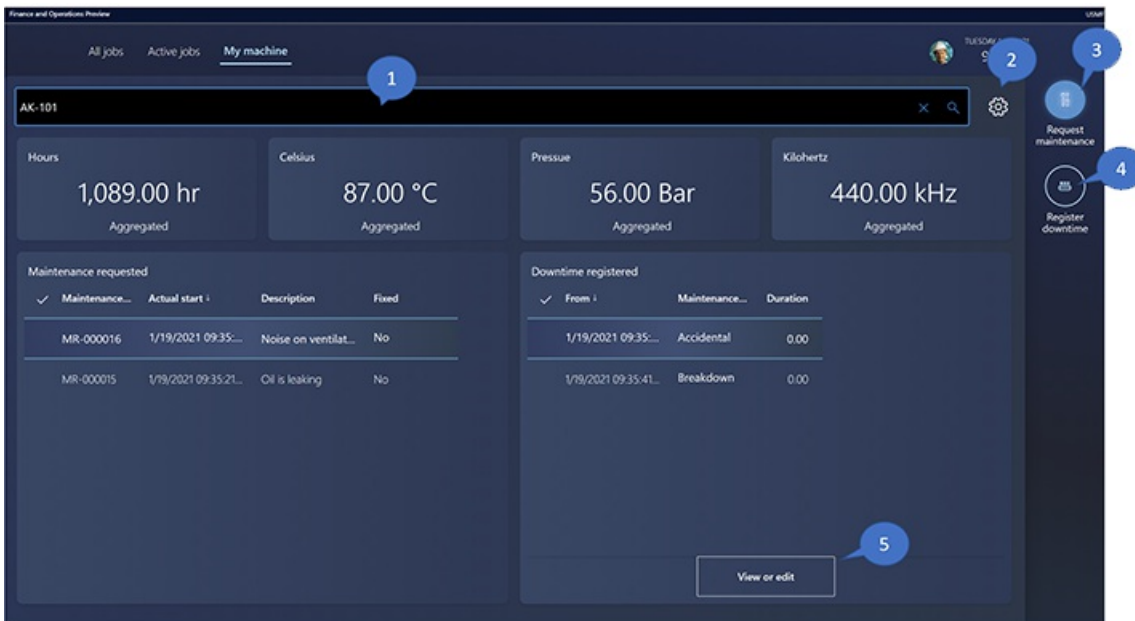
Report progress
Report scrap
Instructions

The active jobs list has the following columns:

- **Selection column** – The leftmost column uses check marks to indicate jobs that have been selected by the worker. Workers can select multiple jobs in the list at the same time. To select all the jobs in the list, select the check mark in the column header. When a single job is selected, details about that job are shown in the lower part of the page.
- **Order** – This column shows the production order number for a job.
- **Description** – This column shows a description of the operation that a job is part of.
- **Requested** – This column shows the quantity that a job is planned to produce.
- **Started** – This column shows the quantity that has already been started for a job.
- **Completed** – This column shows the quantity that has already been completed for a job.
- **Scrapped** – This column shows the quantity that has already been scrapped for a job.
- **Remaining** – This column shows the quantity that remains to be completed for a job.

My machine tab

The **My machine** tab lets workers select an asset that is connected to a machine resource within the filter set on the **All jobs** tab. The worker can then view the state and health of the selected asset by reading values for up to four selected counters and lists of recent maintenance requests and registered downtimes. The worker can also request maintenance for the selected asset and register and edit machine downtime. (This tab name is customizable and may be different for your system.)



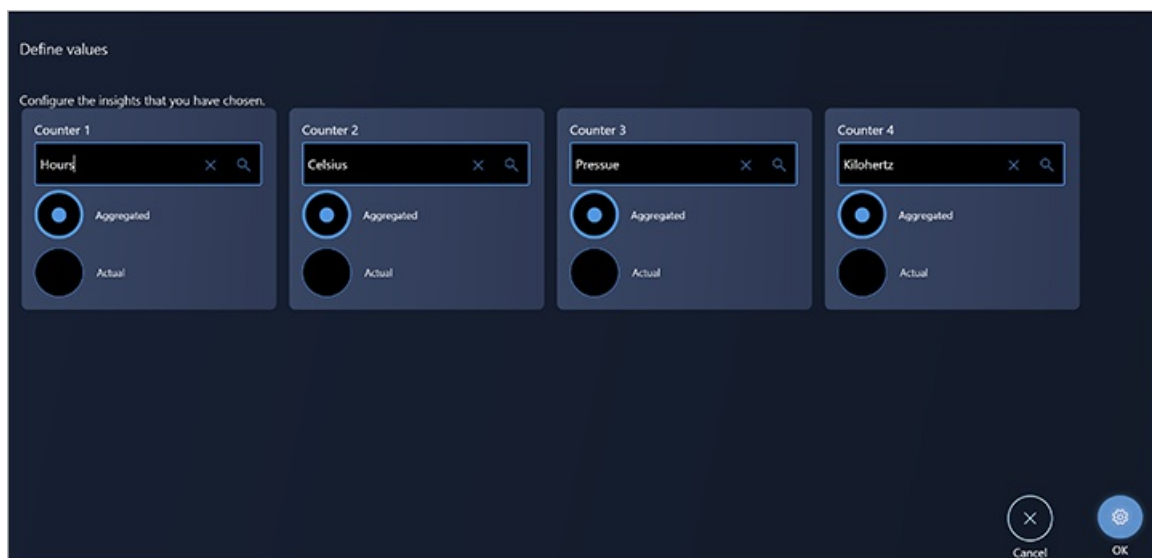
The **My machine** tab has the following columns. The numbers correspond to the numbers in the previous illustration.

1. **Machine asset** – Select the machine asset that you want to track. Start typing a name to select from a list of matching assets, or select the magnifying-glass icon to select from a list of all assets associated with the resources that are within the filter of the job list.

NOTE

Supply Chain Management users can assign a resource to each asset as needed using the **All assets** page (on the **Fixed asset** tab, using the **Resource** drop-down list). For more information, see [Create an asset](#).

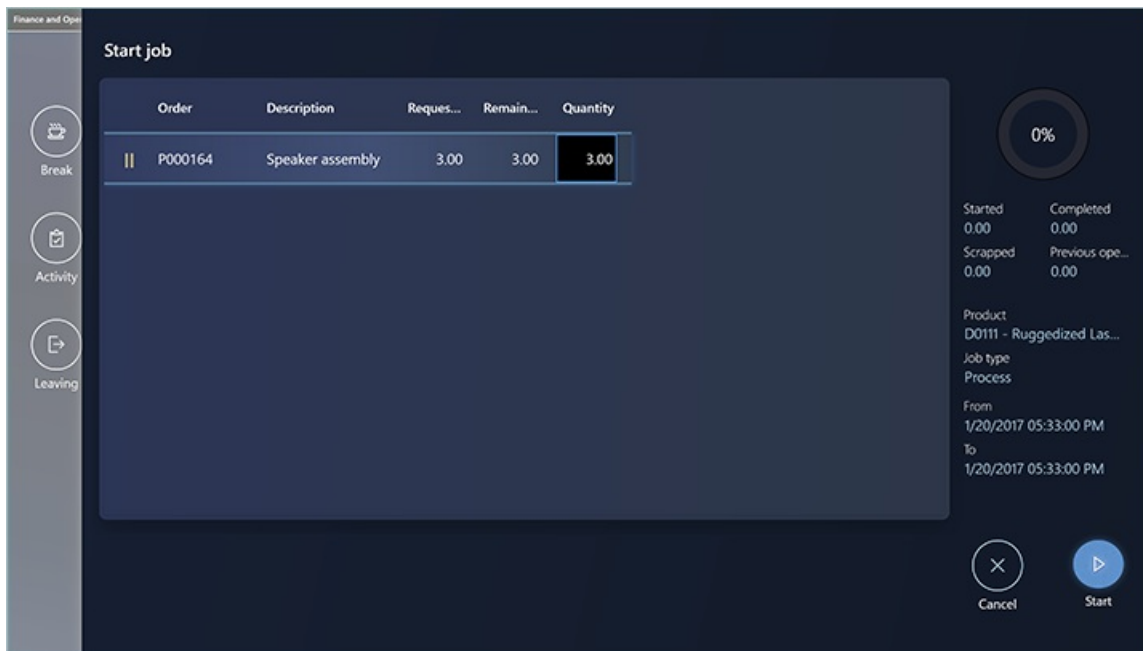
2. **Settings** – Select the gear icon to open a dialog box where you can choose which counters to view for the selected machine asset. Values for these counters are shown at the top of the **Asset management** tab. The **Settings** menu (shown in the following screenshot) lets you enable up to four counters. For each counter that you want to enable, use the lookup field at the top of the tile to select a counter. The lookup field lists all of the counters associated to the asset selected at the top of the **Asset management** page. Set each counter to monitor either the **Aggregated** value or the latest **Actual** value for the counter. For example, if you set a counter that tracks how many hours the machine has been running, then you should set it to **Aggregated**. If you set a counter to measure the latest updated temperature or pressure, then you should set it to **Actual**. Select **OK** to save your settings and close the dialog box.



3. **Request maintenance** – Select this button to open a dialog box where you can create a maintenance request. You'll be able to provide description and a note. The request will be brought to the attention of a Supply Chain Management user, who will then be able to convert the maintenance request to a maintenance work order.
4. **Register downtime** – Select this button to open a dialog box where you can register machine downtime. You'll be able to select a reason code and enter a date/time span for the downtime. The machine downtime registration is used for calculating the efficiency of the machine asset.
5. **View or edit** – Select this button to open a dialog box where you can edit or view existing downtime records.

Starting and completing production jobs

Workers start a production job by selecting a job on the **All jobs** tab and then selecting **Start job** to open the **Start job** dialog box.

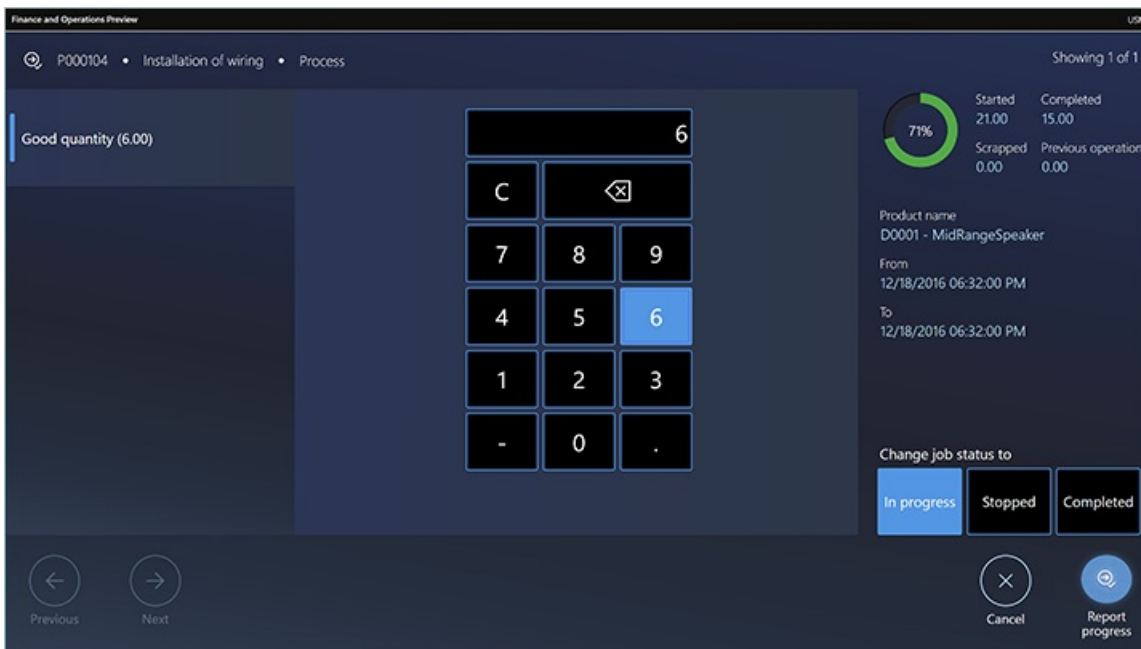


Workers use the **Start job** dialog box to confirm the production quantity and then start the job. Workers can adjust the quantity by selecting the **Quantity** field and then using the numeric keyboard that appears. Workers then select **Start** to start to work on the job. The **Start job** dialog box is closed, and the job is added to the **Active jobs** tab.

Workers can start a job that is in any status. When a worker starts a job that has a status of *Not started*, the **Quantity** field in the **Start job** dialog box initially shows the full quantity. When a worker starts a job that has a status of *Started* or *Stopped*, the **Quantity** field initially shows the remaining quantity.

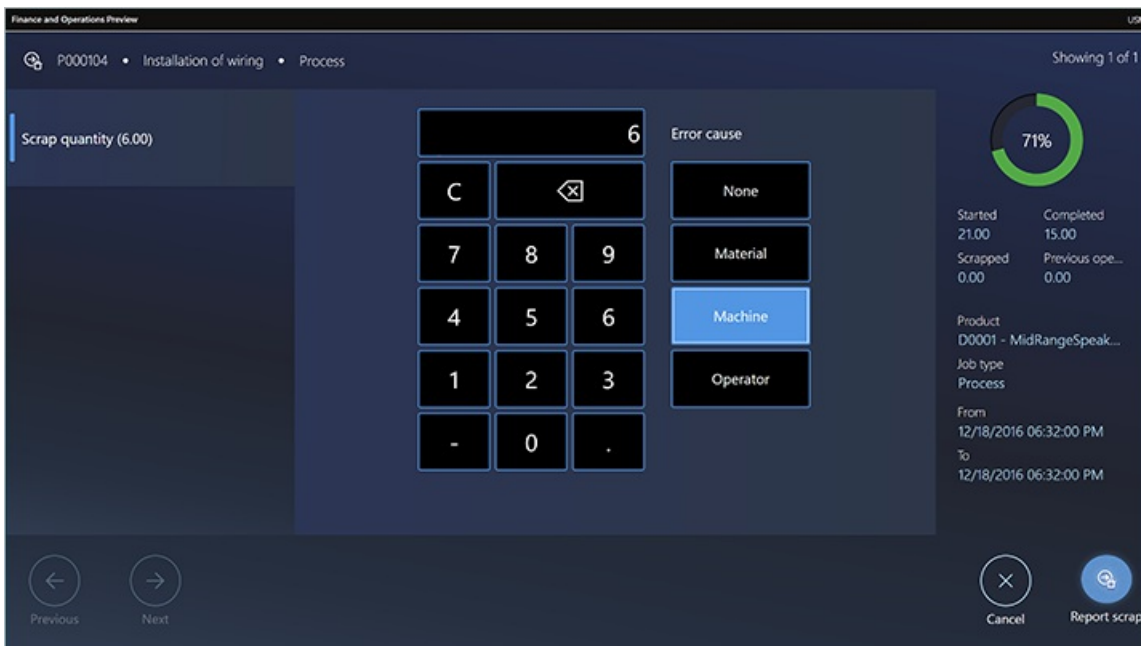
Reporting good quantities

When a worker completes or partially completes a job, they can report good quantities that were produced by selecting a job on the **Active jobs** tab and then selecting **Report progress**. Then, in the **Report progress** dialog box, the worker enters the good quantity by using the numeric keyboard. The quantity is blank by default. After a quantity is entered, the worker can update the status of the job to *In progress*, *Stopped*, or *Completed*.



Reporting scrap

When a worker completes or partially completes a job, they can report scrap by selecting a job on the **Active jobs** tab and then selecting **Report scrap**. Then, in the **Report scrap** dialog box, the worker enters the scrap quantity by using the numeric keyboard. The worker also selects a reason (*None*, *Machine*, *Operator*, or *Material*).



Completing a job and starting a new job

Usually, workers complete a job by selecting one or more current jobs on the **Active jobs** tab and then selecting **Report progress**. They then enter the quantity that was produced (the good quantity) and set the status to *Complete*. If more than one job was selected, a worker then uses the **Previous** and **Next** buttons to move among them. To start a new job, the worker selects it on the **All jobs** tab and then selects **Start job**.

A worker can also start a new job while their previous job is still open. Once again, the worker selects the new job on the **All jobs** tab and then selects **Start job**. However, in this case, the **Start job** dialog box informs the worker that they are currently working on a job, and that they must therefore either stop or complete that job before they start the new job.

Working on multiple jobs in parallel

One worker can work on multiple jobs at the same time (that is, in parallel). In this case, the collection of jobs that the worker is working on is called a *job bundle*. The worker can add new jobs to the bundle, or complete one or more jobs in the bundle. The following two scenarios show how a worker can work on jobs in parallel.

Scenario 1: A worker who has no active jobs wants to start two jobs and work on them in parallel

The worker selects the two jobs on the **All jobs** tab and then selects **Start job**. The **Start job** dialog box shows both selected jobs, and the worker can adjust the quantity to start on each job. The worker then confirms the dialog box and can start both jobs.

Scenario 2: A worker who has two active jobs that are in progress wants to start a third job and work on it in parallel with the other two

The worker selects the third job on the **All jobs** tab and then selects **Bundle**. In the **Bundle** dialog box, the worker can adjust the quantity to start. The worker then confirms the dialog box by selecting **Bundle**.

Working on indirect activities

Indirect activities are activities that aren't directly related to a production order. Indirect activities can be flexibly defined, as described in [Set up indirect activities for time and attendance](#).

For example, Shannon, a floor worker at Contoso, wants to attend a company meeting, and meetings are considered an indirect activity. One of the following two scenarios applies:

- **Shannon is working on one or more active jobs.** Shannon selects **Activity**, identifies the activity (meeting), and confirms her selection. A message that appears informs her that she has jobs that are in progress. From the message, Shannon can choose to complete or stop the jobs that she is working on before she goes to the meeting.
- **Shannon doesn't have any active jobs.** Shannon selects **Activity**, identifies the activity (meeting), and she confirms her selection. She is now registered as being at the meeting.

In both scenarios, after Shannon confirms her selection, she goes to either the sign-in page or a page that will wait for her to confirm that she has returned from her indirect activity. The page that appears depends on the configuration of the production floor execution interface. (For more information, see [Configure the production floor execution interface](#).)

Registering breaks

Workers can register breaks. Breaks can be flexibly defined, as described in [Pay based on registrations](#).

A worker registers a break by selecting **Break** and then selecting the card that represents the break type (such as lunch). After the worker confirms the selection, the device shows either the sign-in page or a page that will wait for the worker to confirm that they have returned from the break. The page that appears depends on the configuration of the production floor execution interface. (For more information, see [Configure the production floor execution interface](#).)

Opening instructions

Workers can open a document that is attached to a job by selecting **Instructions**. The **Instructions** button is available only if a document is associated with the job in the master data. For example, a document that is attached to a product on the **Released products** page in Supply Chain Management will be available for workers to open in the shop floor execution interface.

Opening mixed-reality guides for HoloLens

[Dynamics 365 Guides](#) can help empower workers by providing hands-on learning that uses mixed reality. You can define standardized processes where step-by-step instructions guide workers to the tools and parts that they need and show how to use those tools in real work situations. Here is an overview of the process.

1. Every time that a worker opens a job list in the shop floor execution interface, the interface finds all relevant guides for the jobs that are shown.
2. The worker selects **Guides** to view the list of guides.
3. The worker selects a relevant guide in the list.
4. The shop floor execution interface shows a QR code for the selected guide.
5. The worker puts on a HoloLens and glances at the QR code to start the guide.
6. The worker works through the guide to learn the task.

For more information about how to create, assign, and use guides for HoloLens, see [Provide mixed-reality Guides for workers in production](#).

NOTE

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Configure job card for devices

2/18/2021 • 7 minutes to read • [Edit Online](#)

The job card device is used by the shop floor workers to register their daily work, such as when jobs are started, reporting feedback on jobs, registering indirect activities, and reporting absence. These registrations are the basis for tracking progress and cost on production orders and for calculating the basis for the workers' pay. This topic describes the various options for configuring job card devices.

Enable new features in feature management

A few of the settings described in this topic must be enabled on your system before they will be available to you. Use the [feature management](#) page to enable any or all of the following features as required.

Generate license plate

To make this feature available, enable the following features in [feature management](#) (in order):

1. License plate for reporting as finished added to the Job Card Device
2. Enable automatic generation of license plate number when reporting as finished in the job card device

Print label

To make this feature available, enable the following features in [feature management](#) (in order):

1. License plate for reporting as finished added to the Job Card Device
2. Print label from Job Card Device

Allow locking of touch screen

To make this feature available, enable the following feature in [feature management](#):

- (Preview) Feature for locking job card device and job card terminal so that they can be sanitized

Manage your device configurations

To set up your device configurations, go to **Production control > Setup > Manufacturing execution > Configure job card for devices**. The **Configure job card for devices** page opens, which shows a list of existing configurations. From here, you can do the following:

- Select any device configuration listed in the left column to view and edit it.
- Select **New** on the Action Pane to add a new device configuration to the list. Then enter a name in the **Configuration** field to identify the new configuration. The value you enter here must be unique among all device configurations, and you won't be able to edit it later.

Refer to following sections for details about each of the settings for configuring job card devices.

General settings

The **General** FastTab lets you configure each of the various options available for the selected device configuration. The following settings are available:

- **Report quantity at clock-out** - Set this to **Yes** to prompt workers to report feedback on jobs in progress when clocking out. When set to **No**, workers won't not be prompted.
- **Lock employee** - When this option is set to **No**, each worker will be logged out immediately after they make a registration (such as a new job), and then the device will return to the log-in page. When this option

is set to **Yes**, each worker will stay logged in to the job card device. However, the worker will still be able to log out manually to allow another worker to log in while the job card device remains running under the same system user account. For more information about these types of accounts, see [Assigned users](#).

- **Barcode scanner** - Set this to **Yes** to provide an option on the job card device that allows workers register the start of a new job by scanning a bar code.
- **Use the actual time of registration** - Set this to **Yes** to set the time for each new registration to be equal to the exact time that registration was submitted by a worker. Set to **No** to use the log-in time instead. You'll usually want to set this to **Yes** if you have enabled the **Lock employee** and/or **Single worker** options, where workers often remain logged in for longer periods.
- **Single worker** - Set this option to **Yes** if only one worker uses each job card device where this configuration is active. When this option is selected, the **Lock employee** option is automatically set to **Yes**. In addition, this option removes the requirement (and ability) for the worker to log in using a badge ID (or similar). Instead the worker signs in to Supply Chain Management using a system user account linked to a *time registered worker* (from the *workers* table) and gets logged in to the job card device as that worker at the same time. For more information about these types of accounts, see [Assigned users](#).
- **Allow workers to set personal filters** - Set this option to **Yes** to allow workers to filter the jobs shown to them on the device. The worker can modify values for any of the three filter criteria: **Production unit**, **Resource group** and **Resource**. Only jobs that are scheduled on resources matching the selected filter criteria will be shown on the device. You can also assign default values for any or all of these criteria, and those will apply even with this option is not selected.
- **Allow locking the touchscreen** - Set this option to **Yes** to allow workers to lock the job card device touchscreen so they can sanitize it. When enabled, a **Lock screen for sanitizing** button is added to the device log-in page. When a worker selects this button, the touchscreen temporarily locks to prevent unintended input and a countdown timer is shown. The worker can now safely clean the device and the screen. When the countdown completes, the touchscreen automatically unlocks again.
- **Screen lock duration** - When the **Allow locking touchscreen** option is enabled, use this option so specify number of seconds the touchscreen should be locked for sanitizing. The duration must be between 5 and 120 seconds.
- **Production unit** - Select a production unit to be applied as a default filter criterion for the list of jobs shown to each worker. Only jobs that are scheduled on resources grouped under the selected production unit will initially be displayed by the device. If **Allow workers to set personal filters** is enabled, workers will be able to edit this value, otherwise this filter will always apply when this device configuration is active.
- **Resource group** - Select a resource group to be applied as a default filter criterion for the list of jobs shown to each worker. Only jobs that are scheduled on resources grouped under the selected resource group will initially be displayed by the device. If **Allow workers to set personal filters** is enabled, workers will be able to edit this value, otherwise this filter will always apply when this device configuration is active.
- **Resource** - Select a resource to be applied as a default filter criterion for the list of jobs shown to each worker. Only jobs that are scheduled on the selected resource will initially be displayed by the device. If **Allow workers to set personal filters** is enabled, workers will be able to edit this value, otherwise this filter will always apply when this device configuration is active.
- **Generate license plate** - Set this option to **Yes** to generate a new license plate each time a worker uses the job card device to report as finished. The license plate number is generated from a number sequence set up on the **Warehouse management parameters** page. When set to **No**, workers must specify an existing license plate when reporting as finished.
- **Print label** - Set this option to **Yes** to print a license plate label when a worker uses the job card device to report as finished. The configuration of the label is set up in document routing, as described in [Document routing layout for license plate labels](#).

Assigned users

Use the **Assigned users** FastTab to associate one or more system users with the current device configuration.

Each system user can only be assigned one job device configuration.

When setting up a device, an IT worker typically signs in to Supply Chain Management using a system user account. Thereafter, the job device configuration associated with that system user applies for as long as that system user remains signed in. These system user accounts are typically limited to allow access only to the job card device page and no other part of Supply Chain Management.

After the system user is signed in and the job device configuration is loaded, workers can then log in to the job card device using their *time registered worker* account (for example, by scanning a bar code on their badge) so they can start new jobs and make other kinds of registrations. Various workers can log in and out during the day, while the same device configuration remains in effect on that machine because the system user remains signed in to Supply Chain Management for the day.

However, as mentioned previously, when you use a device configuration with the **Single worker** option, workers themselves typically sign in to Supply Chain Management using a system user linked to their own *time registered worker* account, so they load the device configuration and log in as a worker on the job card device at the same time.

Additional resources

[Report as finished from the job card device](#)

NOTE

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Report as finished from the job card device

2/18/2021 • 10 minutes to read • [Edit Online](#)

Workers use the **Report progress** page on the job card device to report quantities that have been completed for a production job. This topic describes how to set up various options that establish how workers can report as finished using this page and what happens next. Options include:

- Control whether and how quantities that are reported as finished are added to inventory.
- Control whether and how batch numbers are generated and applied when reporting as finished.
- Control whether and how serial numbers are generated and applied when reporting as finished.
- Control whether and how to report as finished to a license plate.

Control whether quantities that are reported as finished are added to inventory

To control whether and how the quantities that are reported as finished on the last operation should be added to inventory, follow these steps.

1. Go to **Product control > Setup > Manufacturing execution > Production order defaults**.
2. On the **Report as finished** tab, set the **Update finished report on-line** field to one of the following values:
 - **No** – No quantity will be added to inventory when quantities are reported on the last operation. The status of the production order will never change.
 - **Status + Quantity** – The status of the production order will change to *Reported as finished*, and the quantity will be reported as finished to inventory.
 - **Quantity** – The quantity will be reported as finished to inventory, but the status of the production order will never change.
 - **Status** – Only the status of the production order will change. No quantities will be added to inventory when quantities are reported on the last operation.

NOTE

Quantities aren't tracked in inventory if the operations that they are reported as finished on aren't defined as the last operation. However, those quantities can be used to view progress. They can also be included in rules that control whether workers can start the next operation before a defined threshold of reported quantities on the previous operation is reached. You can define these rules on the **Quantity validation** tab on the **Production order defaults** page.

For more information about how to work with the **Production order defaults** page, see [Production parameters in Manufacturing execution](#).

Report batch-controlled items as finished

The job card device supports three scenarios for reporting on batch items. These scenarios apply both to items that are enabled for advanced warehouse processes and to items that aren't enabled for advanced warehouse processes.

- **Manually assigned batch numbers** - Workers enter a custom batch number. This batch number might come from an external source that isn't known to the system.

- **Predefined batch numbers** - Workers select a batch number in a list of batch numbers that the system automatically generates before the production order is released to the job card device.
- **Fixed batch numbers** - Workers don't enter or select a batch number. Instead, the system automatically assigns a batch number to the production order before it's released.

Enable the feature on your system

To enable your job card devices to accept a batch number during reporting as finished, you must use [feature management](#) to turn on the following features (in this order):

1. Improved user experience for the Report progress dialog in the Job Card Device
2. Enable to enter batch and serial numbers while reporting as finished from the Job Card Device (Preview)

Configure products that require batch number reporting

To enable a product to support any of the available batch-controlled scenarios, follow these steps:

1. Go to **Product information management > Products > Released products**.
2. Select the product to configure.
3. On the **Manage inventory** FastTab, in the **Batch number group** field, select the tracking number group that is set up to support your scenario.

NOTE

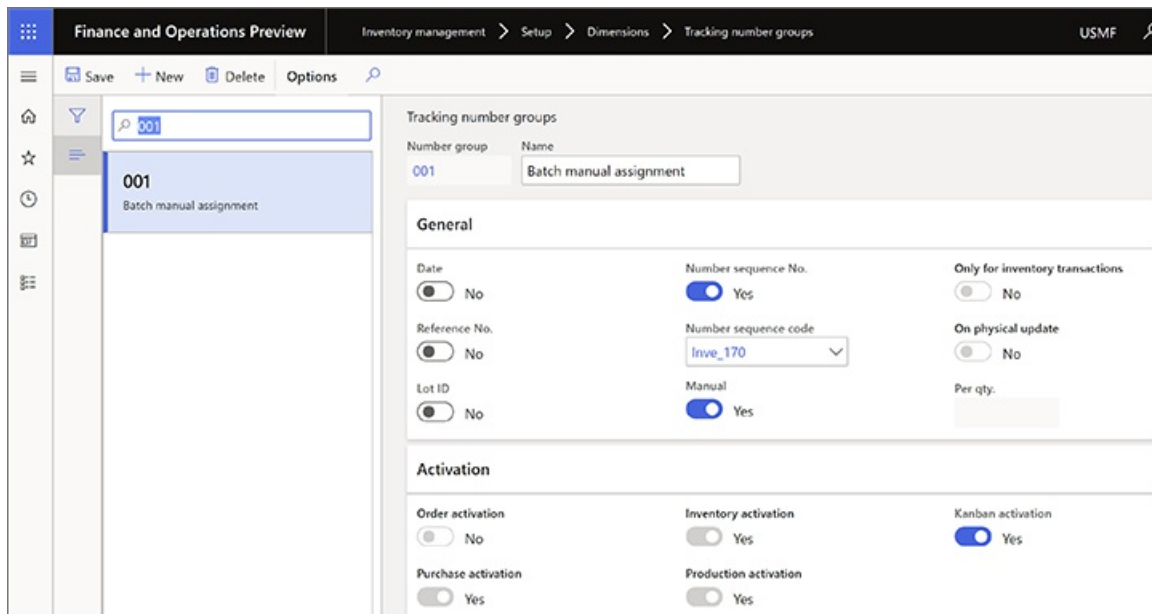
By default, if no batch number group is assigned to a batch-controlled product, the job card device provides manual entry for the batch number during reporting as finished.

The following sections describe how to set up tracking number groups to support each of the three scenarios for reporting on batch items.

Set up a tracking number group that lets workers manually assign a batch number

To allow for manually assigned batch numbers, follow these steps to set up a tracking number group.

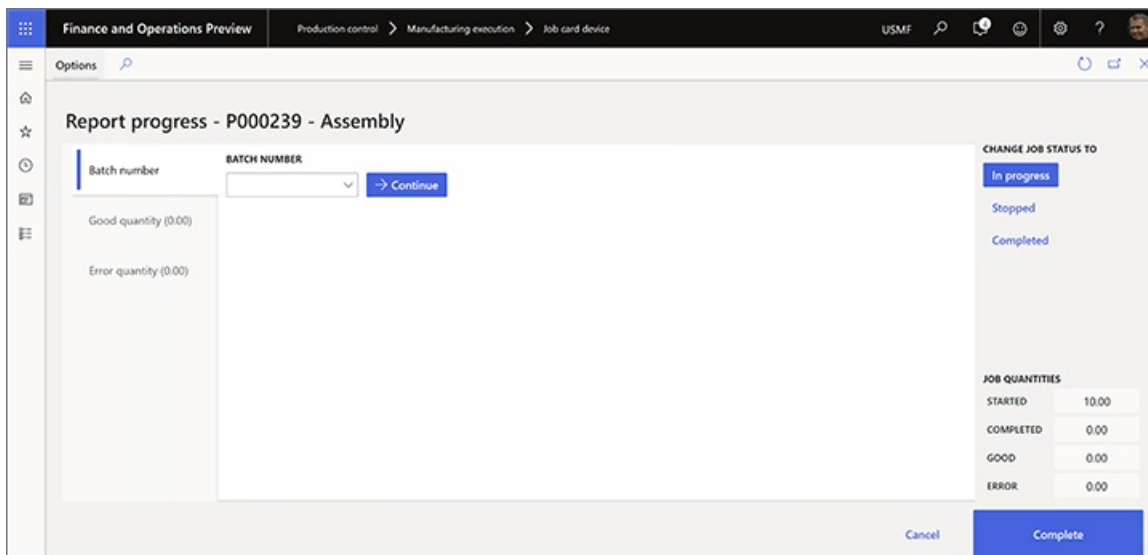
1. Go to **Inventory management > Setup > Dimensions > Tracking number groups**.
2. Create or select the tracking number group to set up.
3. On the **General** FastTab, set the **Manual** option to **Yes**.



4. Set other values as you require, and then select this tracking number group as the batch number group

for released products that you want to use this scenario for.

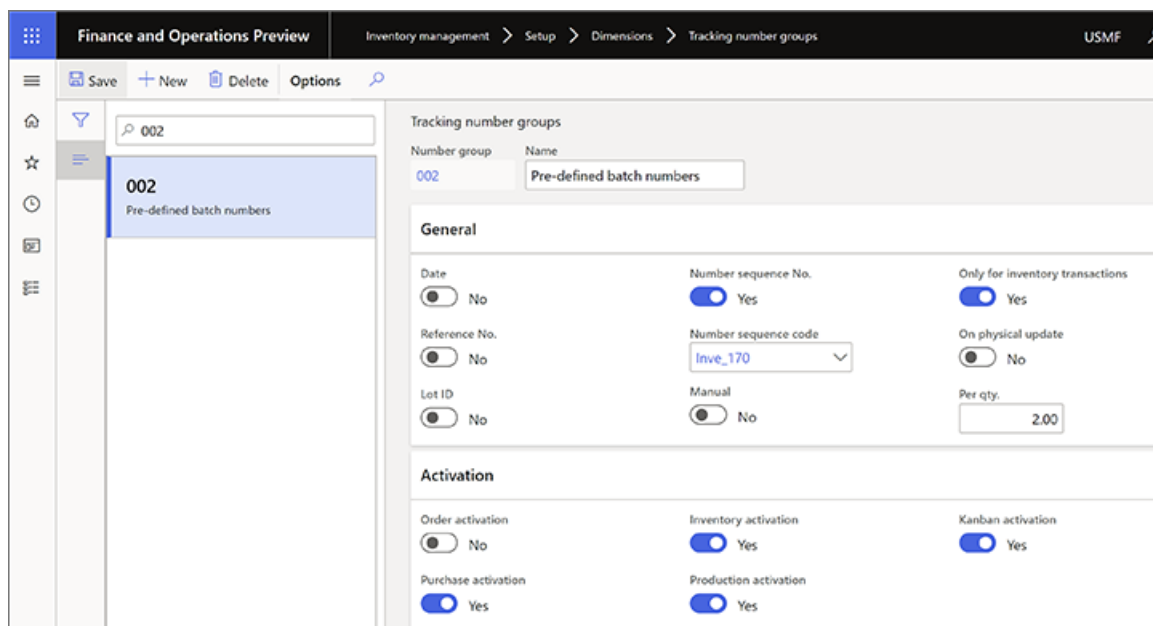
When you use this scenario, the **Batch number** field that the **Report progress** page on the job card device provides is a text box where workers can enter any value.



Set up a tracking number group that provides a list of predefined batch numbers

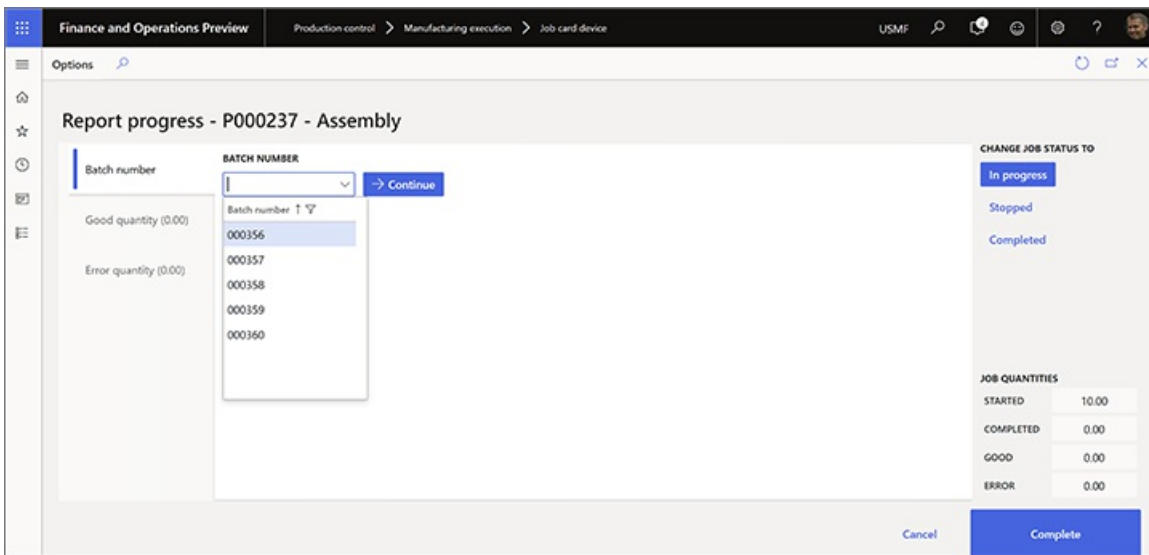
To provide a list of predefined batch numbers, follow these steps to set up a tracking number group.

1. Go to **Inventory management > Setup > Dimensions > Tracking number groups**.
2. Create or select the tracking number group to set up.
3. On the **General** FastTab, set the **Only for inventory transactions** option to **Yes**.
4. Use the **Per qty** field to split batch numbers per quantity, based on the value that you enter. For example, you have a production order for ten pieces, and the **Per qty** field is set to 2. In this case, five batch numbers will be assigned to the production order when it's created.



5. Set other values as you require, and then select this tracking number group as the batch number group for released products that you want to use this scenario for.

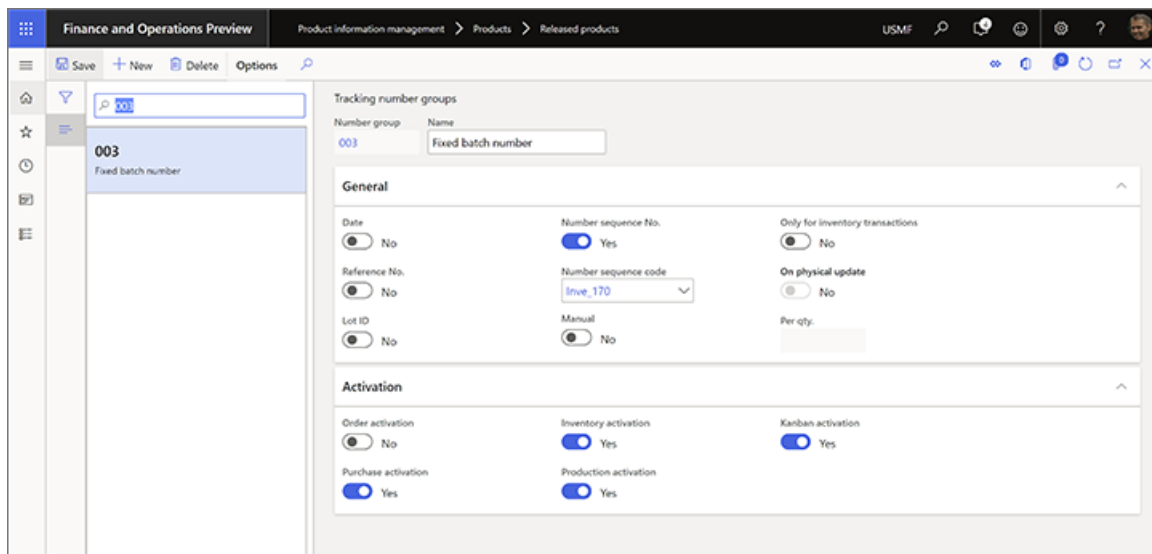
When you use this scenario, the **Batch number** field that the **Report progress** page on the job card device provides is a drop-down list where workers must select a predefined value.



Set up a tracking number group that automatically assigns batch numbers

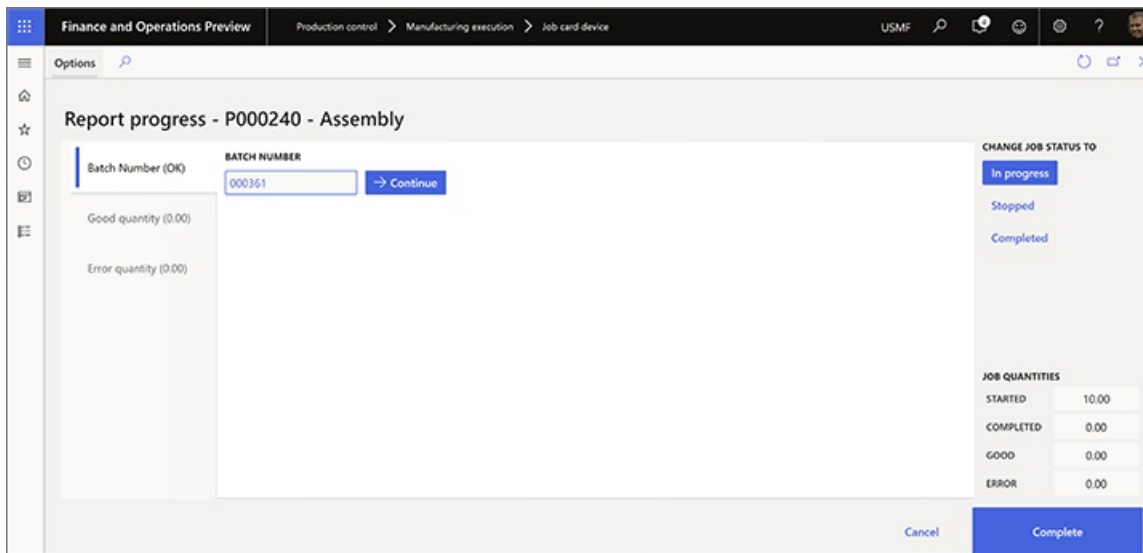
If batch numbers should be assigned automatically, without worker input, follow these steps to set up a tracking number group.

1. Go to Inventory management > Setup > Dimensions > Tracking number groups.
2. Create or select the tracking number group to set up.
3. On the **General** FastTab, set the **Only for inventory transactions** option to **No**.
4. Set the **Manual** option to **No**.



5. Set other values as you require, and then select this tracking number group as the batch number group for released products that you want to use this scenario for.

When you use this scenario, the **Batch number** field that the **Report progress** page on the job card device provides shows a value, but workers can't edit it.



Report serial-controlled items as finished

The job card device supports three scenarios for reporting on serial-controlled items. These scenarios apply both to items that are enabled for advanced warehouse processes and to items that aren't enabled for advanced warehouse processes.

- **Manually assigned serial numbers** - Workers enter a custom serial number. This serial number might come from an external source that isn't known to the system.
- **Predefined serial numbers** - Workers select a serial number in a list of serial numbers that the system automatically generates before the production order is released to the job card device.
- **Fixed serial number** - Workers don't enter or select a serial number. Instead, the system automatically assigns a serial number to the production order before it's released.

Enable the feature on your system

To enable your job card devices to accept a serial number during reporting as finished, you must use [feature management](#) to turn on the following features (in this order):

1. Improved user experience for the Report progress dialog in the Job Card Device
2. Enable to enter batch and serial numbers while reporting as finished from the Job Card Device (Preview)

Configure products that require serial-number reporting

To enable a product to support any of the available serial-controlled scenarios, follow these steps:

To enable each scenario, follow these steps.

1. Go to **Product information management > Products > Released products**.
2. Select the product to configure.
3. On the **Manage inventory** FastTab, in the **Serial number group** field, select the tracking number group that is set up to support your scenario.

NOTE

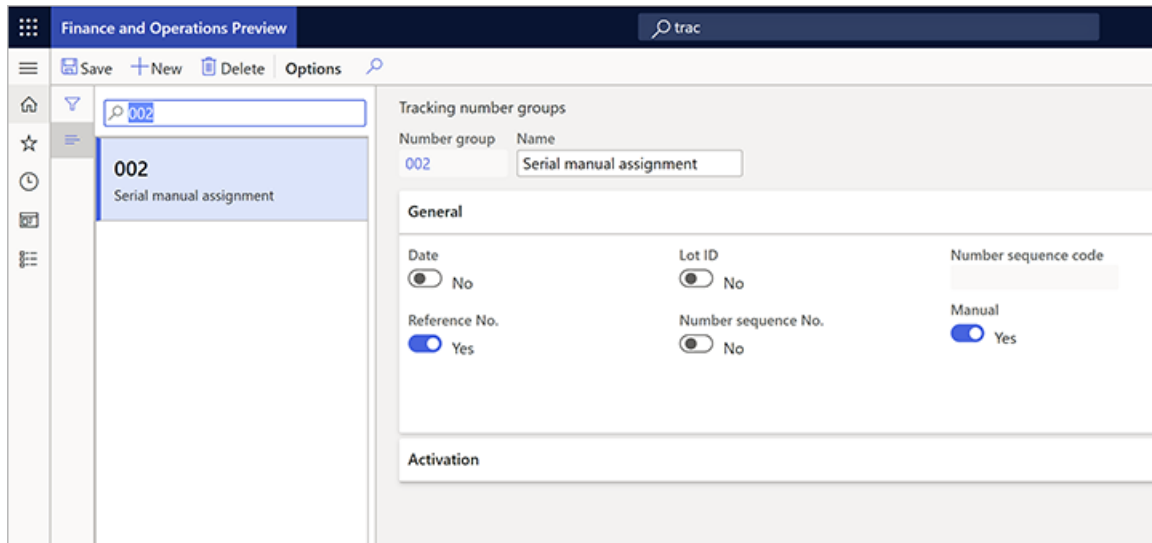
By default, if no serial number group is assigned to a serial-controlled product, the job card device provides manual entry for the serial number during reporting as finished.

The following sections describe how to set up tracking number groups to support each of the three scenarios for reporting on serial-controlled items.

Set up a tracking number group that lets workers manually assign a serial number

To allow for manually assigned serial numbers, follow these steps to set up a tracking number group.

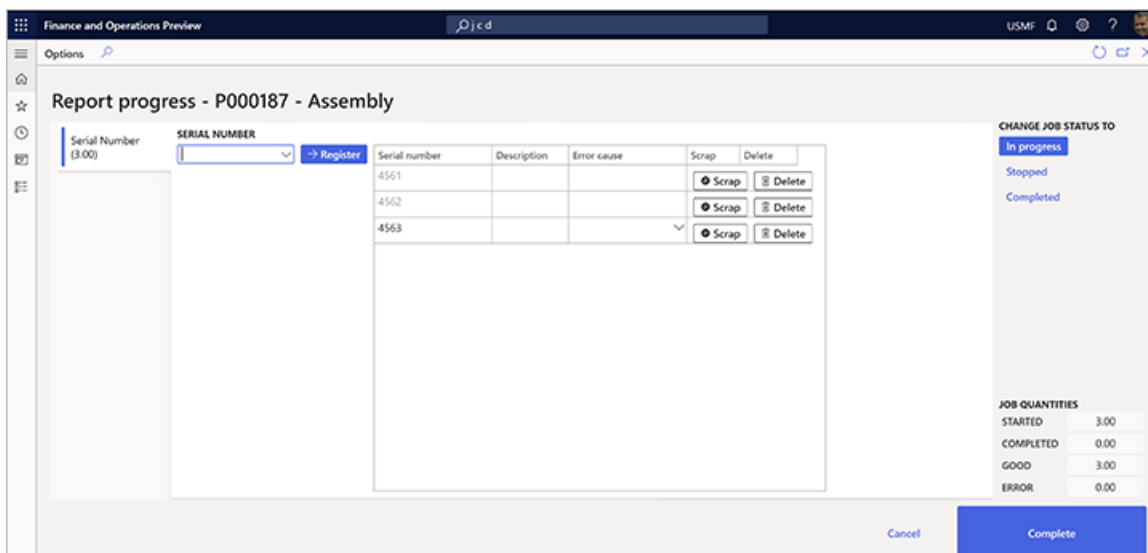
1. Go to **Inventory management > Setup > Dimensions > Tracking number groups**.
2. Create or select the tracking number group to set up.
3. On the **General** FastTab, set the **Manual** option to **Yes**.



4. Set other values as you require, and then select this tracking number group as the serial number group for released products that you want to use this scenario for.

When you use this scenario, the **Serial number** field that the **Report progress** page on the job card device provides is a text box where workers can enter any value for the serial number. On entering a value, it is added to the serial number list. In this list, workers can do the following:

- To mark a serial number as scrapped, select the **Scrap** button for the appropriate row. The worker will be prompted to provide an **Error cause**.
- To delete a serial number, select the **Delete** button for the appropriate row.

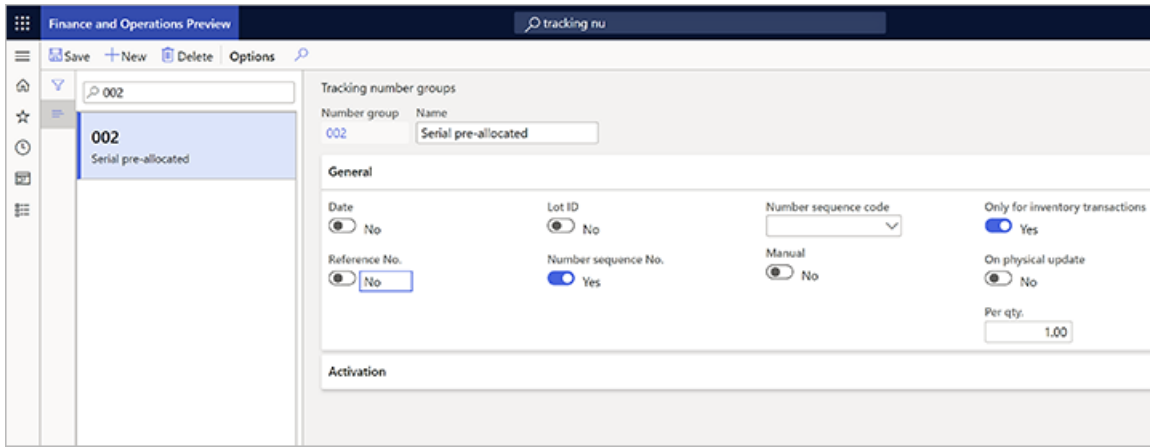


Set up a tracking number group that provides a list of predefined serial numbers

To provide a list of predefined serial numbers, follow these steps to set up a tracking number group.

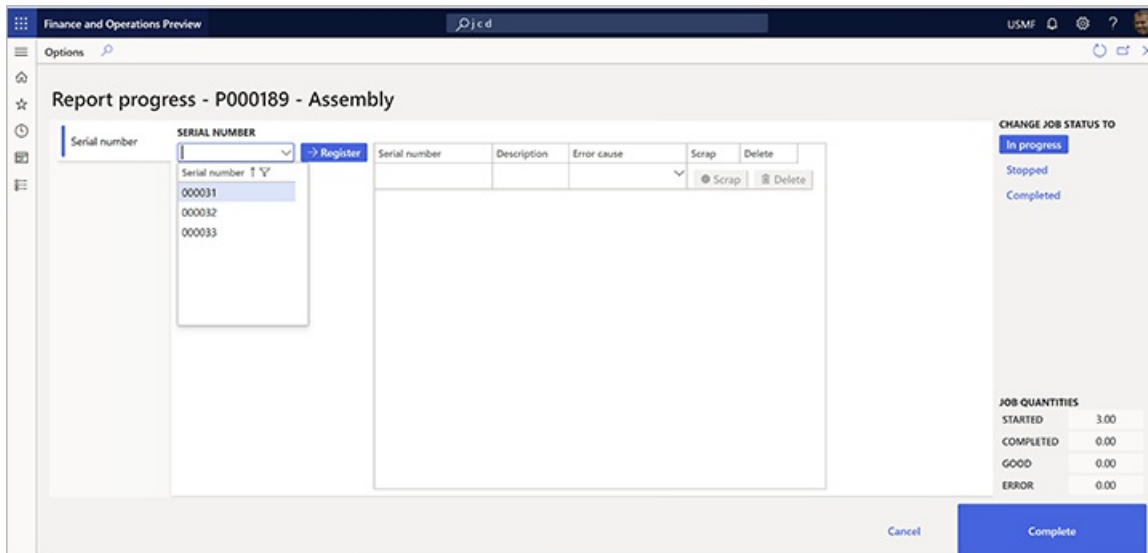
1. Go to **Inventory management > Setup > Dimensions > Tracking number groups**.
2. Create or select the tracking number group to set up.
3. On the **General** FastTab, set the **Only for inventory transactions** option to **Yes**.

4. Use the **Per qty** field to split serial numbers per quantity of one.



5. Set other values as you require, and then select this tracking number group as the serial number group for released products that you want to use this scenario for.

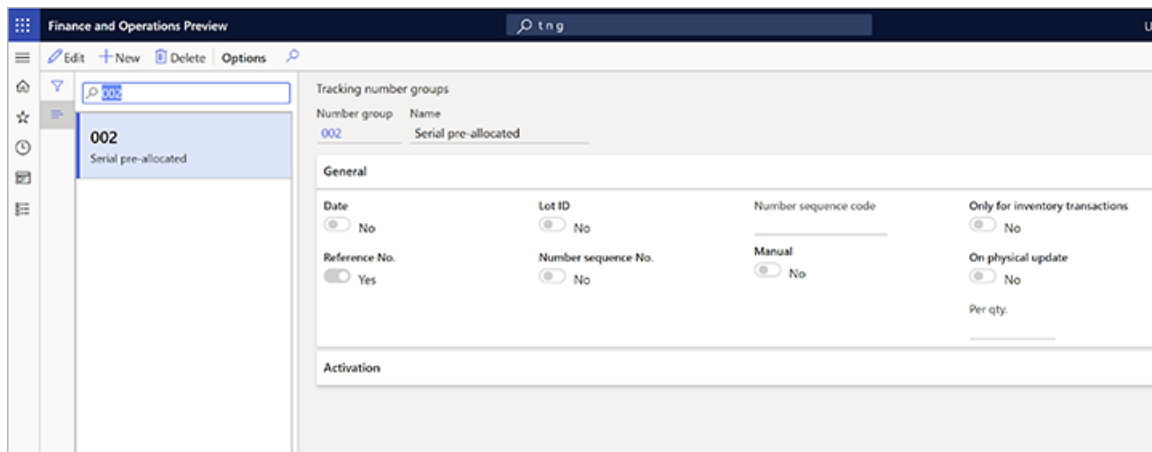
When you use this scenario, the **Serial number** field that the **Report progress** page on the job card device provides is a drop-down list where workers must select a predefined value.



Set up a tracking number group that automatically assigns serial numbers

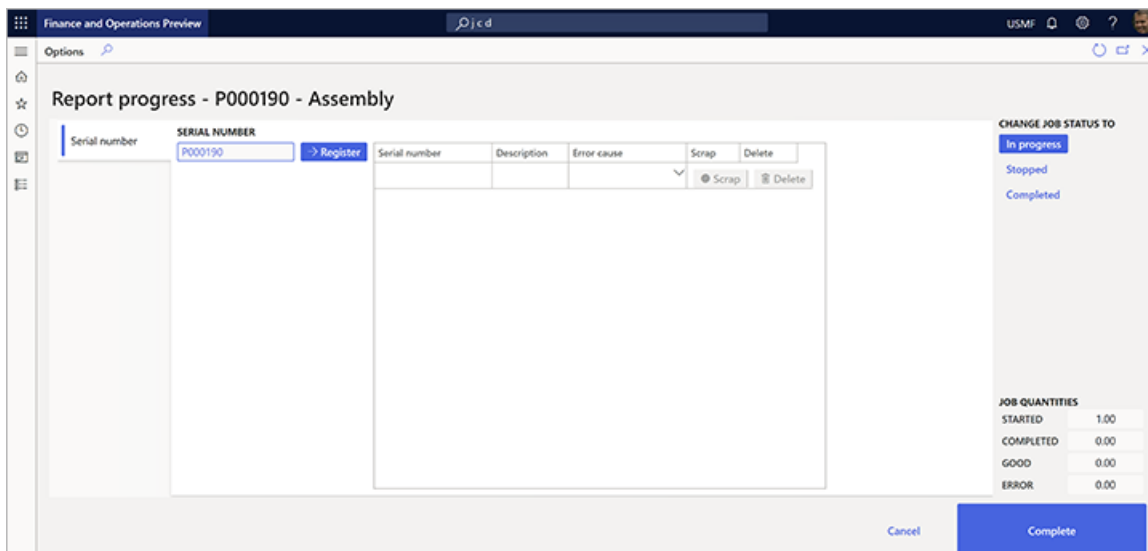
If a serial number should be assigned automatically, without worker input, follow these steps to set up a tracking number group.

1. Go to **Inventory management > Setup > Dimensions > Tracking number groups**.
2. Create or select the tracking number group to set up.
3. On the **General** FastTab, set the **Only for inventory transactions** option to **No**.
4. Set the **Manual** option to **No**.



5. Set other values as you require, and then select this tracking number group as the serial number group for released products that you want to use this scenario for.

When you use this scenario, the **Serial number** field that the **Report progress** page on the job card device provides shows a value, but workers can't edit it. This scenario is only relevant when a production order is created for a quantity of one piece of a serial number-controlled item.



Report as finished to a license plate

Advanced warehouse processes can use the license plate dimension to track inventory on warehouse locations that have been set up for this purpose. In this case, the license plate number is required when a worker reports quantities as finished.

Enable license plate reporting and label printing

To use the features that are described in this section, you must use [feature management](#) to turn on the following features (in this order):

1. License plate for reporting as finished added to the Job Card Device
2. Enable automatic generation of license plate number when reporting as finished in the job card device
3. Print label from Job Card Device

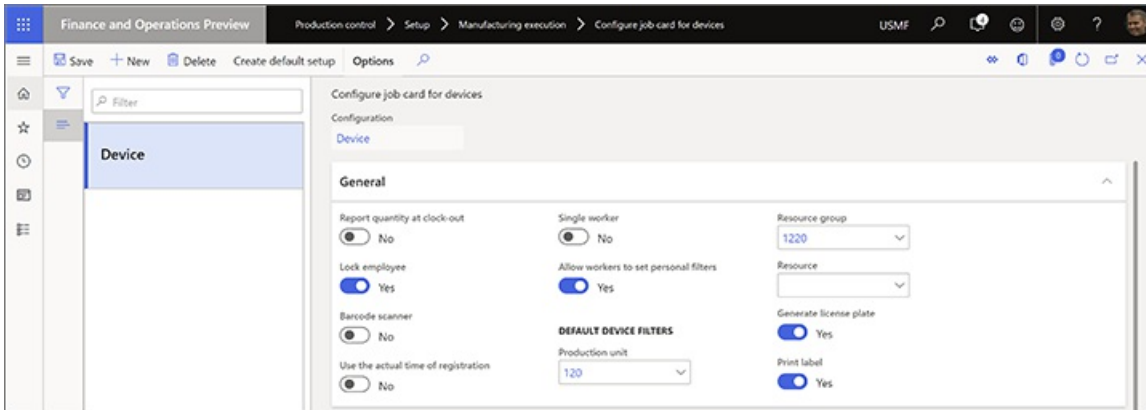
Set up reporting as finished to a license plate

To control whether workers should reuse an existing license plate or generate a new license plate when they report quantities as finished, follow these steps.

1. Go to **Production control > Setup > Manufacturing execution > Configure job card for devices**.

2. Set the following options for each device:

- **Generate license plate** – Set this option to **Yes** to generate a new license plate for each report as finished. Set it to **No** if an existing license plate should be used for each report as finished.
- **Print label** – Set this option to **Yes** if the worker must print a license plate label for each report as finished. Set it to **No** if no label is required.



NOTE

To configure the label, go to **Warehouse management > Setup > Document routing > Document routing**. For more information, see [Enable license plate label printing](#).

NOTE

Can you tell us about your documentation language preferences? [Take a short survey](#).

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Provide mixed-reality Guides for workers in production

2/18/2021 • 15 minutes to read • [Edit Online](#)

NOTE

Effective November 2020:

- Common Data Service has been renamed to Microsoft Dataverse. For more information, see [Power Automate Blog](#).
- Some terminology in Microsoft Dataverse has been updated. For example, *entity* is now *table* and *field* is now *column*. For more information, see [Terminology updates](#).

This topic will be updated soon to reflect the latest terminology.

Workers in production processes will benefit from relevant instructions that are provided at the right time in the context of their work. *Instructions* apply in several domains of work, including: assembly, service, operations, certification, and safety. Across all of these core business functions, ongoing training instructions can help empower workers to achieve more and work better.

Introduction

You can provide instructions in different ways. One efficient system that ships out of the box uses [Dynamics 365 Guides](#).

Dynamics 365 Guides can help empower your employees with hands-on learning. You can define standardized processes with step-by-step instructions that guide your employees to the tools and parts they need and show employees how to use these tools in real work situations.

You can attach guides to various aspects of production control including:

- [Resources](#)
- [Resource groups](#)
- [Released products](#)
- [Formulas](#)
- [Formula versions](#)
- [Bills of material \(BOMs\)](#)
- [BOM versions](#)
- [Routes](#)
- [Route versions](#)
- [Route operation relations](#)

NOTE

You can also attach Guides with Asset Management. For more information about that option, see [Integrate Dynamics 365 Supply Chain Management \(Asset Management\) with Dynamics 365 Guides](#).

When a first-line worker chooses a job on the shop floor through Supply Chain Management, the worker can see [the relevant guides](#) on the job card. When the worker chooses a specific guide, a QR code for that guide is

shown on the screen. The worker then uses their HoloLens to scan the QR code, which launches Guides and shows the required instructions.

The following subsections describe a few selected scenarios where companies across industries can see the biggest value when using Guides to present instructions for manufacturing.

Assembly



Instructions in assembly operations show workers the tools and parts they need and how to use them in real work situations.

Production managers can create and assign Guides, for example, for [production routes](#), [operation relations](#), or [bills of material](#). Workers will find the relevant instructions on the respective operation experience on the shop floor.

Service



Equip technicians with guided instructions at the job site, eliminating the need to schedule additional visits.

Service managers can assign Guides, for example, to specific [products](#) that walk through routines of quality assessment.

Quality



Rollout new processes and ensure increased consistency by turning employee knowledge into a repeatable tool.

Quality assurance managers can assign guides, for example, to [products](#) that walk through routines of quality assessment.

Certifications



Ensure every employee meets high standards by quickly identifying who needs help and where.

Safety



Provide instructions that walk through dangerous procedures virtually before attempting in the physical environment. With a mixed reality approach, workers can experience dangerous procedures virtually.

Production managers can provide dedicated handling instructions for hazardous material handling or delicate handling procedures by assigning instructions to [product items](#), [routes](#), and [operations](#).

Get started with instructions and Guides

To enable instructions in production processes, Supply Chain Management provides an out-of-the-box integration with Dynamics 365 Guides. A licensed and installed application instance of Guides is required to build, maintain, and assign mixed reality instructions to production assets and work.

Prerequisites

To use this feature, your system must include the following:

- Dynamics 365 Supply Chain Management version 10.0.15 or later
- [Dual-write](#) for Supply Chain Management apps.
- [Dynamics 365 Guides](#) version 400.0.1.48 or later

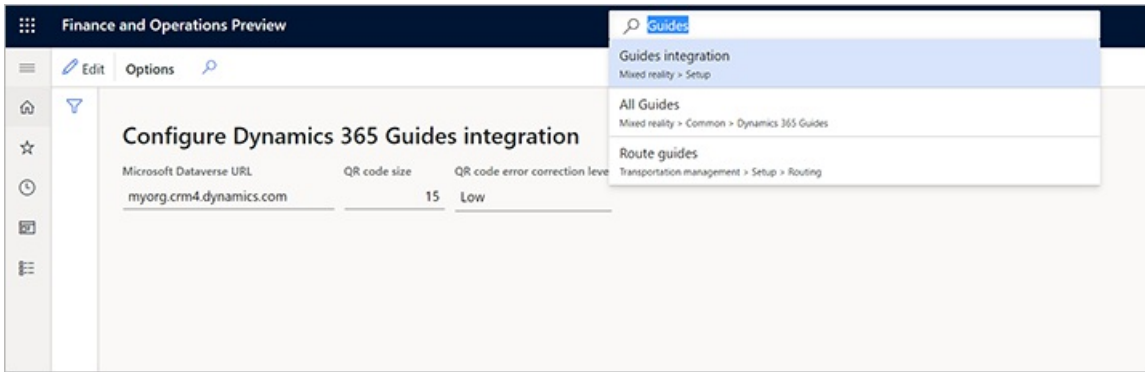
Turn on the feature

To make the feature available on your system, you must enable its configuration keys. You only need to do this once. To do this, an administrator must do the following:

1. Place your system into maintenance mode as described in [Maintenance mode](#).
2. Go to **System administration** > **Setup** > **License configuration**.
3. Expand the **Mixed reality** section and then select the **Mixed reality guide** check box.
4. Expand the **Production management** section and then select the **Production instructions** check box.
5. Turn off maintenance mode as described in [Maintenance mode](#).

Configure how Guides appear on the shop floor

To configure how Guides appear on the shop floor, go to **Mixed Reality > Dynamics 365 Guides > Configure Guides integration**.



Set the following fields:

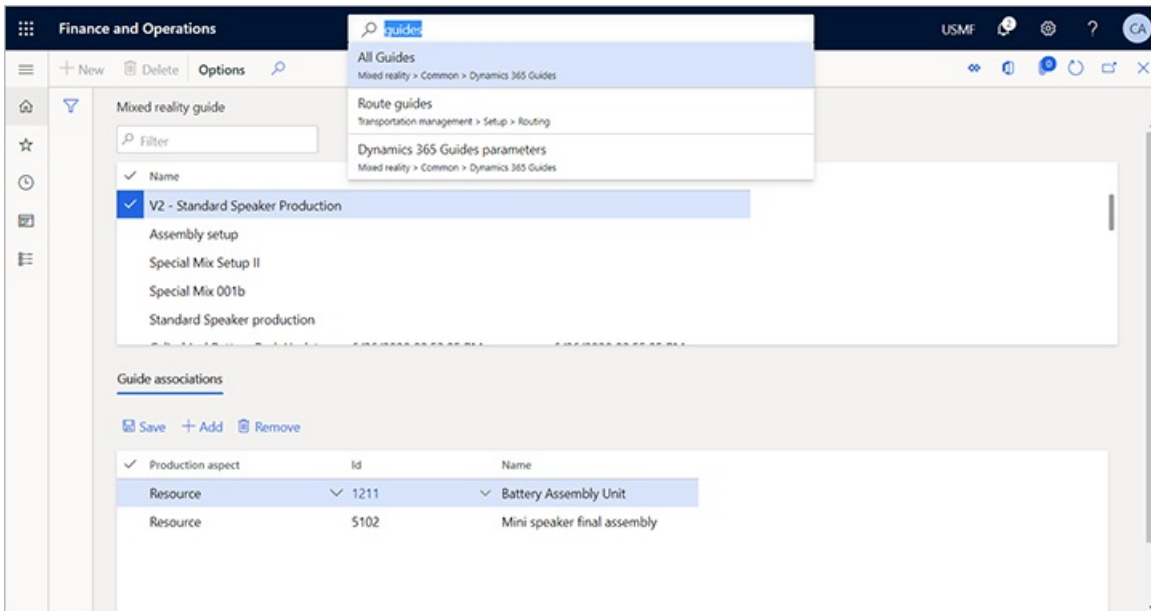
- **Microsoft Dataverse URL** - Specify the URL for the Microsoft Dataverse environment where you create your Guides. The format is "contoso.crm4.dynamics.com", where the first part of the URL is typically named after your organization (such as "contoso."), the second part is specific to the data region of your environment (such as "crm4."), and the last part is the domain (such as "dynamics.com"). One way to find the right URL is to go to home.dynamics.com and then open your Guides app. When Guides opens, you will see the URL in the address bar of your browser (only take the base URL, which should resemble the previous example). This value is used to compose addresses for your guides and will be encoded into the QR codes."
- **QR code size** - Set the size of the rendered QR code. We recommend choosing a size that will fill most of your display screen, but not more. Typically, *15* is a good value.
- **QR code error correction level** - Set the granularity of the QR code. Higher granularity can help increase the code's reliability, but your **QR code size** must be large enough to support the level of detail required by your selected correction level.

TIP

- QR codes sizes that are too large for your display will take a bit longer to render and then be scaled down to fit your display. These do not provide a benefit.
- QR code sizes that are too small may decrease the ability of HoloLens to read the code properly in some environments.
- We recommend that you test the settings for each device that will display QR codes for HoloLens users. Choose settings that provide sufficient readability in your shop floor environment.

Get an overview of all Guide assignments

Use the **All Guides** page to see the list of all available Guides in your organization and all assignments to your production processes and resources. To open it, go to **Mixed reality > Guides > All Guides**. The list at the top shows all the available Guides and you can use the field here to filter the list. The list at the bottom shows all Guide assignments and provides a toolbar for managing them.



The following sections describe the types of objects that you can assign Guides to. Each assigned guide provides instructions that are automatically attached to the respective production jobs and will be available on the shop floor.

Associate a Guide to a resource

Add a Guide to a [resource](#) to offer the Guide in the context of relevant production jobs.

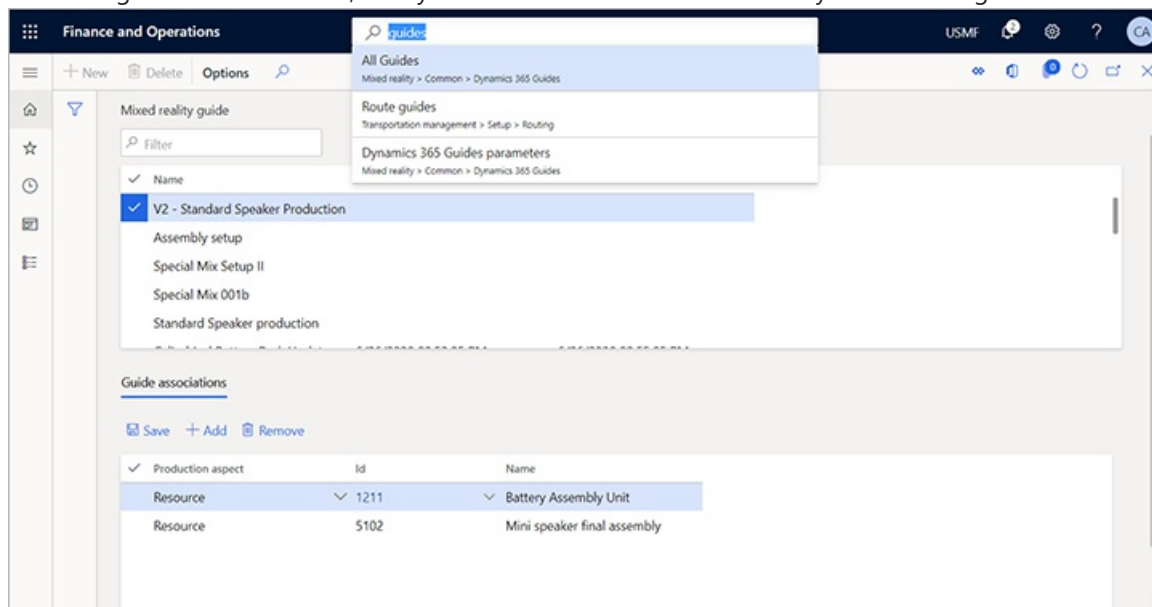
Typical scenario using resources

For example, you could attach a Guide with general machine security or handling instructions to a resource of type machine. Then, the Guide will be available on every job that is performed on the machine.

Add a Guide to a resource

To add a Guide to a resource:

1. Go to **Production control > Setup > Resources > Resources**.
2. From the list pane, select the resource you want to assign a Guide to.
3. Expand the **Associated Guides** FastTab.
4. Select **Add** from the **Associated Guides** toolbar. A new line is added to the grid.
5. For the new line, use the drop-down list in the **Name** column to choose the Guide you want to assign. If you have a large number of Guides, then you can filter the list to find the one you are looking for.



Associate a Guide to a resource group

You can add a guide to [resource groups](#) if you use them to manage groups of machines, production lines, or work cells.

Typical scenarios using resource groups

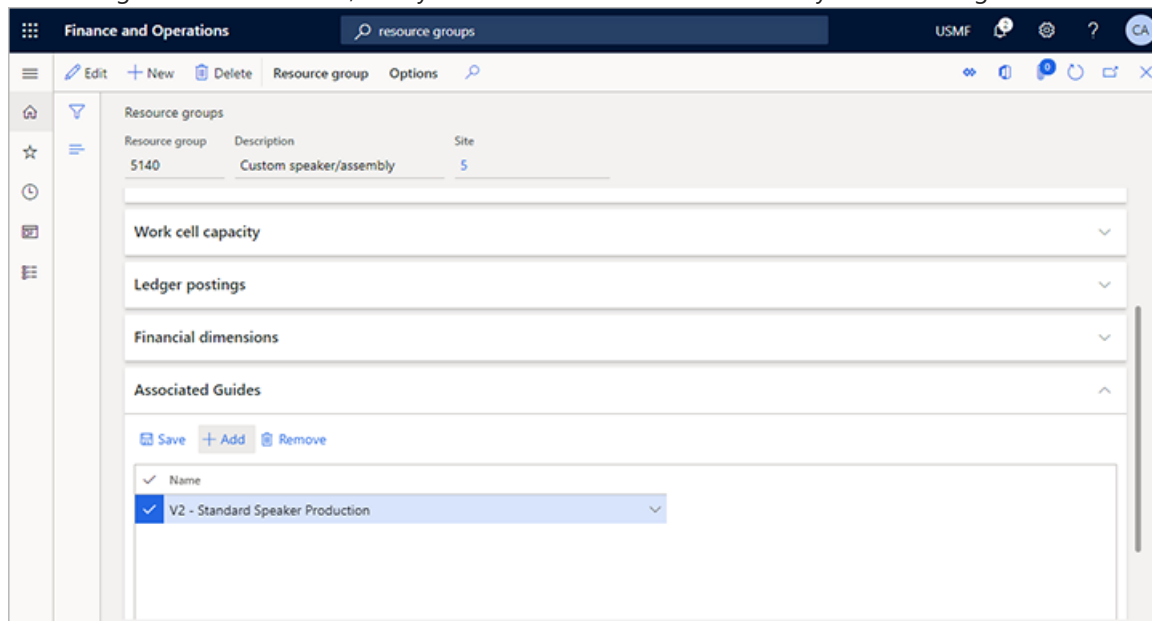
Example 1: You have defined a resource group for several machines of the same model. Instead of assigning the relevant handling instruction guide for the machine model to every relevant resource, you could instead assign the Guide to the resource group that reflects that machine model.

Example 2: You have defined a resource group for a work cell that contains different machines and you have a Guide that provides general instructions for how to maintain the work cell. The Guide applies to any production activity in this work cell.

Add a Guide to a resource group

To add a Guide to a resource group:

1. Go to **Production control > Setup > Resources > Resource groups**.
2. From the list pane, select the resource group you want to assign a Guide to.
3. Expand the **Associated Guides** FastTab.
4. Select **Add** from the **Associated Guides** toolbar. A new line is added to the grid.
5. For the new line, use the drop-down list in the **Name** column to choose the Guide you want to assign. If you have a large number of Guides, then you can filter the list to find the one you are looking for.



Associate a Guide to a released product

You can add a guide to any [released product](#).

Typical scenario using released products

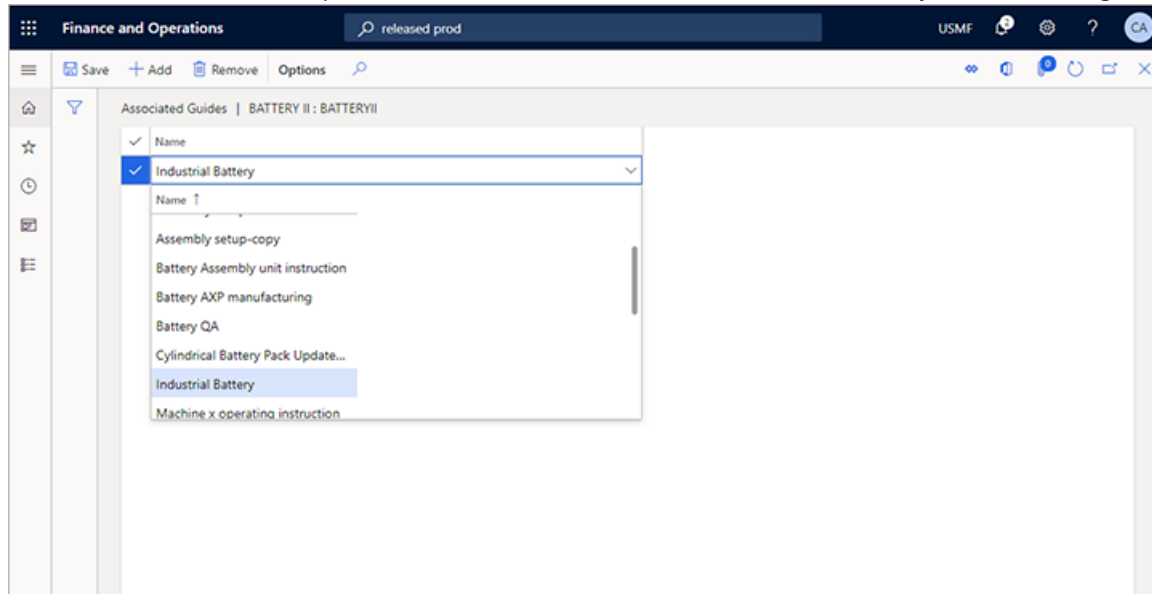
Product-level Guides help shop floor workers with instructions relevant to operating or handling a specific released product or item.

Add a Guide to a released product

To add a Guide to a released product:

1. Go to **Production information management > Products > Released products**.
2. Open the product you want to assign a Guide to.
3. On the Action Pane, open the **Engineer** tab and from the **View** group, select **Associated Guides**.

- The **Associated Guides** page opens for your selected product.
- Select **Add** on the Action Pane to add a new line to the grid.
- For the new line, use the drop-down list in the **Name** column to choose the Guide you want to assign.



Associate a Guide to a formula

You can add a guide to any [formula](#).

Typical scenario using formulas

Formula-level Guides provide shop floor workers with guided handling instructions in the context of a formula or recipe. Guides can also be assigned to versions of a formula.

NOTE

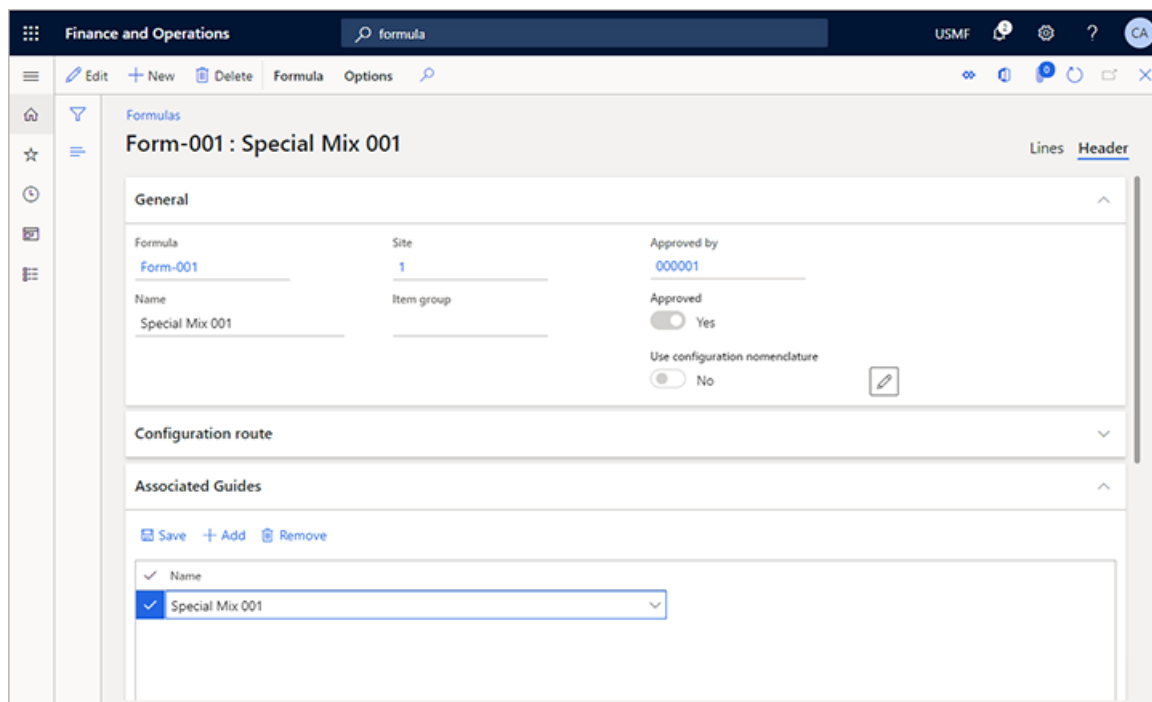
You can assign guidance relevant for production processes based on a formula to a route, route version, or route operation relations.

Guides can't currently be attached to individual formula lines.

Add a Guide to a formula

To add a Guide to a formula:

- Go to **Production information management > Bills of materials and formulas > Formulas**.
- Open the formula you want to assign a Guide to.
- Open the **Header** tab above the top FastTab.
- Expand the **Associated Guides** FastTab.
- Select **Add** from the **Associated Guides** toolbar. A new line is added to the grid.
- For the new line, use the drop-down list in the **Name** column to choose the Guide you want to assign.



Associate a Guide to a formula version

You can add a guide to any [formula version](#).

Typical scenario using formula versions

Guides attached to an individual version of a formula provide shop floor workers with instructions that walk through the production of that version of the formula recipe.

TIP

You can assign guidance relevant for production processes based on this formula version to a route, route version, or route operation relations.

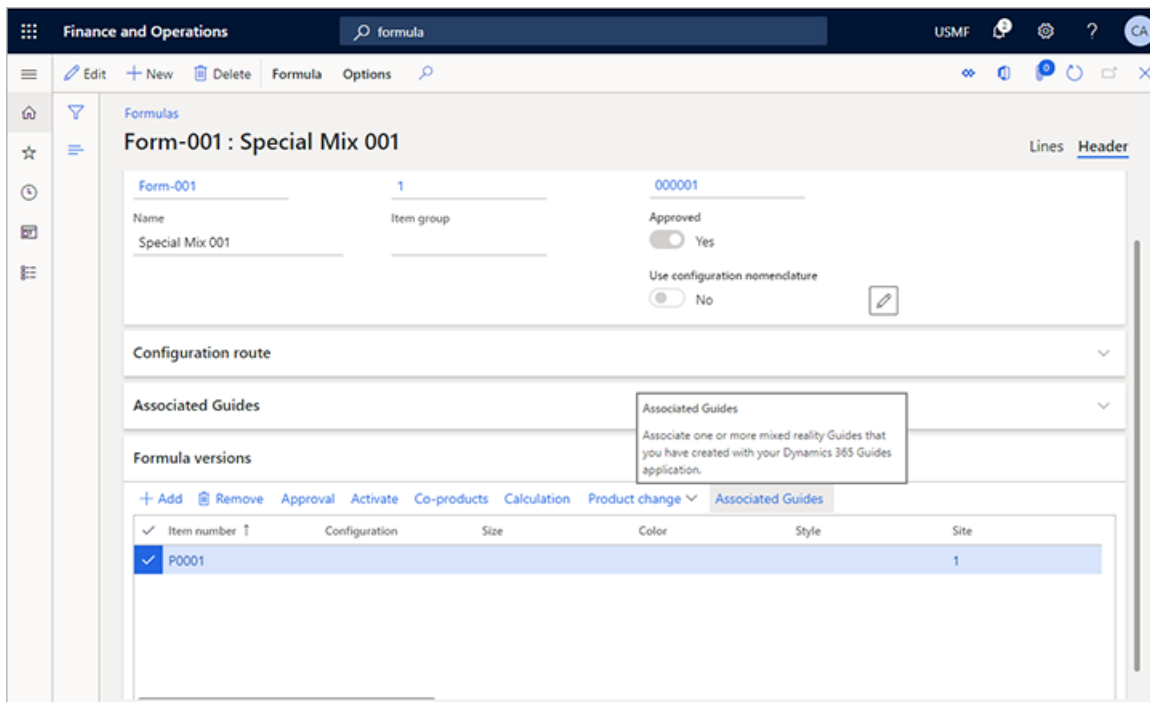
NOTE

Guides can't currently be attached to individual formula lines.

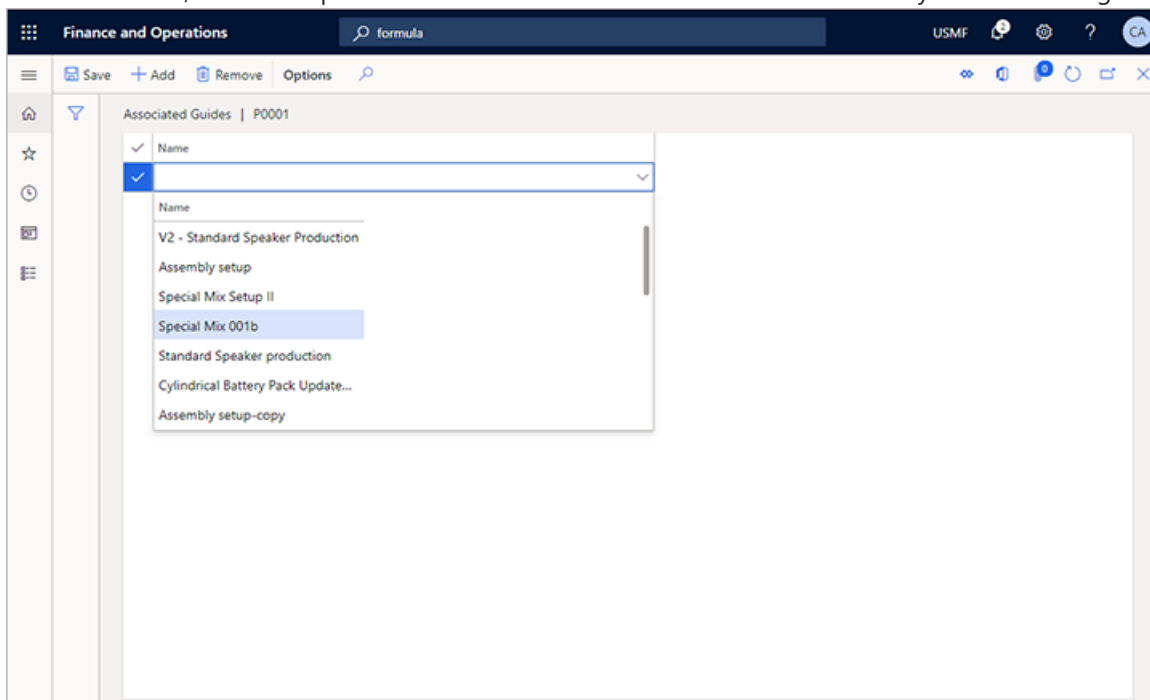
Add a Guide to a formula version

To add a Guide to a formula version:

1. Go to **Production information management > Bills of materials and formulas > Formulas**.
2. Open the formula that includes a version that you want to assign a Guide to.
3. Open the **Header** tab above the top FastTab.
4. On the **Formula versions** FastTab, select the version you want to assign a Guide to.
5. On the **Formula versions** toolbar, select **Associated Guides**.



6. The **Associated Guides** page opens for your formula version.
7. Select **Add** on the Action Pane to add a new line to the grid.
8. For the new line, use the drop-down list in the **Name** column to choose the Guide you want to assign.



Associate a Guide to a bill of materials

You can add a guide to any [bill of materials](#) (BOM).

Typical scenario using bills of materials

Guides attached to a BOM provide shop floor workers with instructions that explain how to prepare and handle material from a BOM. Guides can also be assigned to versions of a BOM.

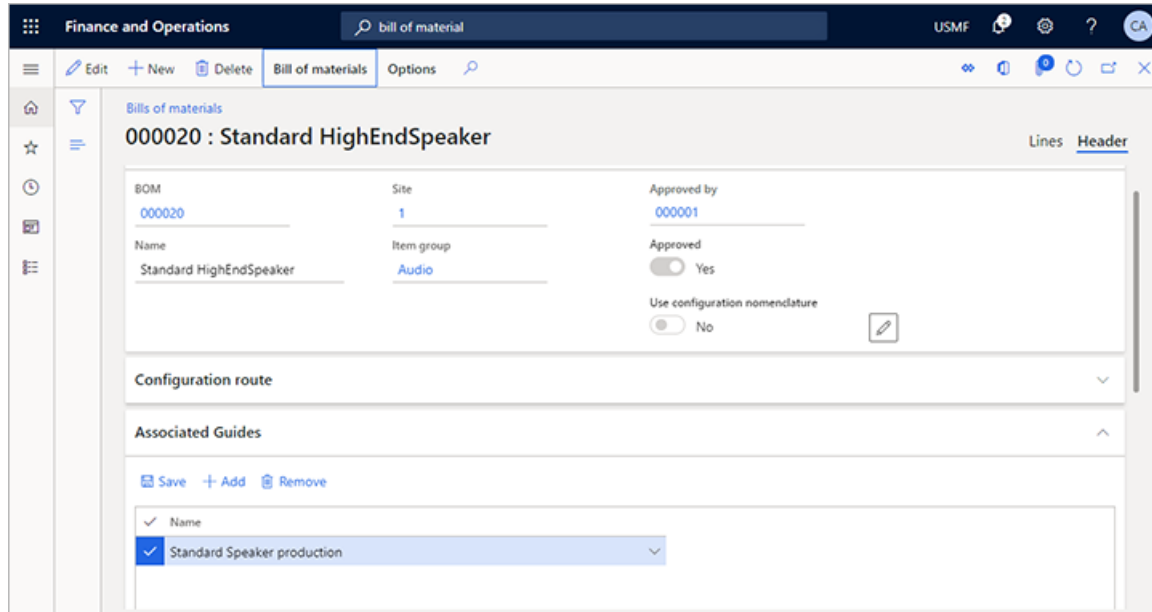
NOTE

Guides can't currently be attached to individual BOM lines.

Add a Guide to a bill of materials

To add a Guide to a bill of material:

1. Go to **Production information management > Bills of materials and formulas > Bills of materials**.
2. Open the bill of materials that you want to assign a Guide to.
3. Open the **Header** tab above the top FastTab.
4. Expand the **Associated Guides** FastTab.
5. Select **Add** from the **Associated Guides** toolbar. A new line is added to the grid.
6. For the new line, use the drop-down list in the **Name** column to choose the Guide you want to assign.



Associate a Guide to a bill of materials version

You can add a guide to any [bill of materials version](#).

Typical scenario using bill of materials versions

Guides attached to an individual BOM version provide shop floor workers with instructions that explain how to prepare and handle material for a version of a BOM that is different from the generic BOM or other versions of it.

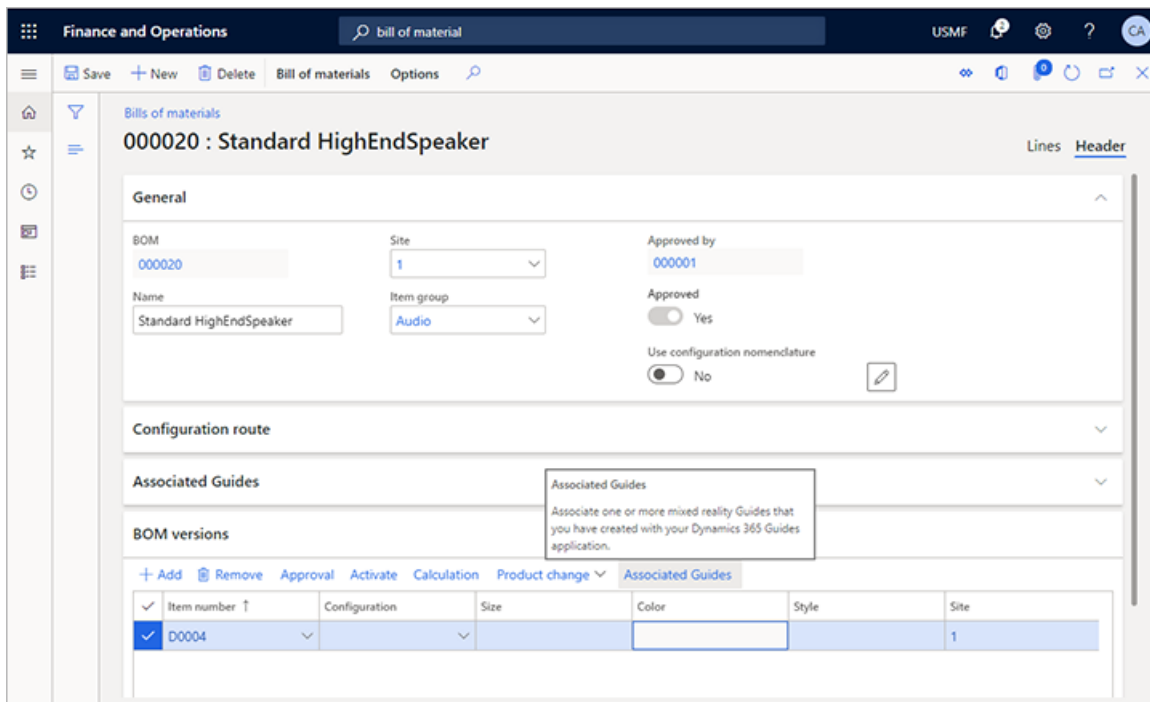
NOTE

Guides can't currently be attached to individual BOM lines.

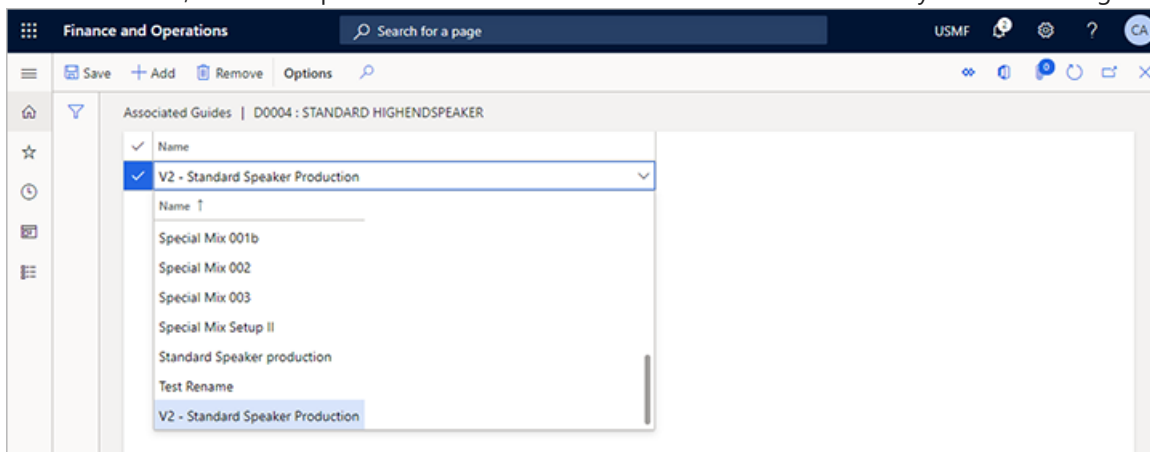
Add a Guide to a bill of materials version

To add a Guide to a bill of materials version:

1. Go to **Production information management > Bills of materials and formulas > Bills of materials**.
2. Open the BOM that includes a version that you want to assign a Guide to.
3. Open the **Header** tab above the top FastTab.
4. On the **BOM versions** FastTab, select the version you want to assign a Guide to.
5. On the **BOM versions** toolbar, select **Associated Guides**.



6. The **Associated Guides** page opens for your BOM version.
7. Select **Add** on the Action Pane to add a new line to the grid.
8. For the new line, use the drop-down list in the **Name** column to choose the Guide you want to assign.



Associate a Guide to a route

You can add a guide to any [route](#).

Typical scenario using routes

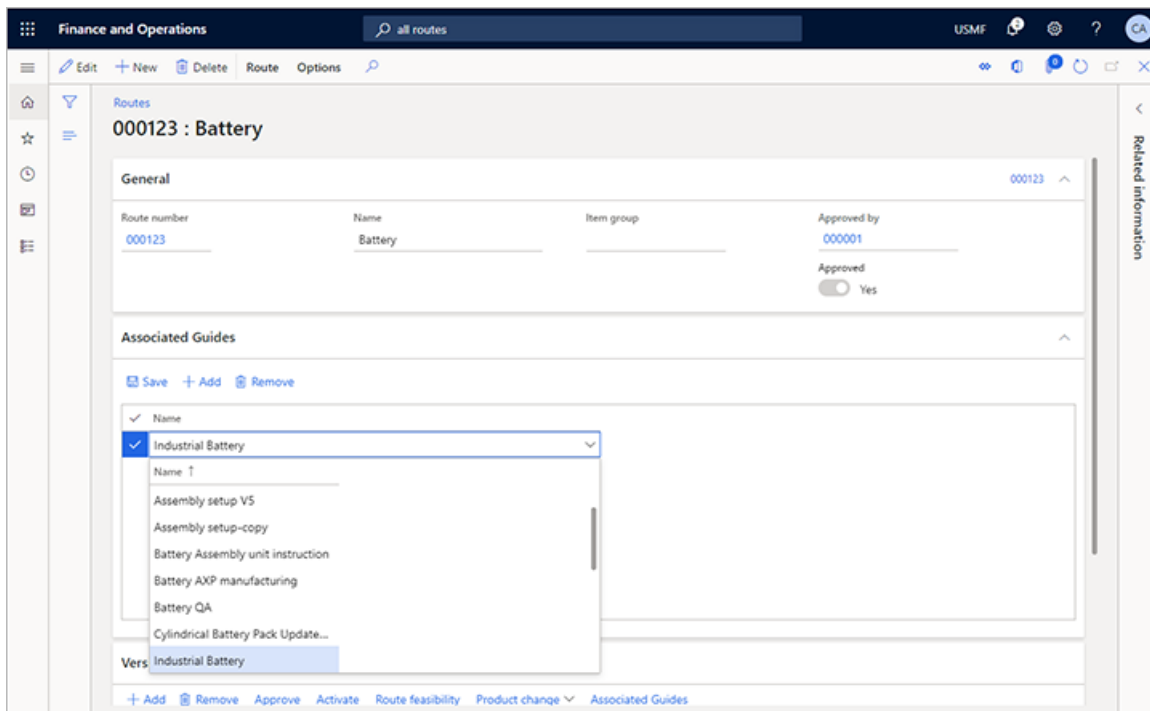
Routes are typically used to specify how a certain released product shall be produced based on a BOM or BOM version and with a set of resources or resource groups.

Assign a Guide to a route to provide step-by-step instructions for the respective production process.

Add a Guide to a route

To add a Guide to a route:

1. Go to **Production control > All routes**.
2. Open the route that you want to assign a Guide to.
3. Expand the **Associated Guides** FastTab.
4. Select **Add** from the **Associated Guides** toolbar. A new line is added to the grid.
5. For the new line, use the drop-down list in the **Name** column to choose the Guide you want to assign.



Associate a Guide to a route version

You can add a guide to any [route version](#).

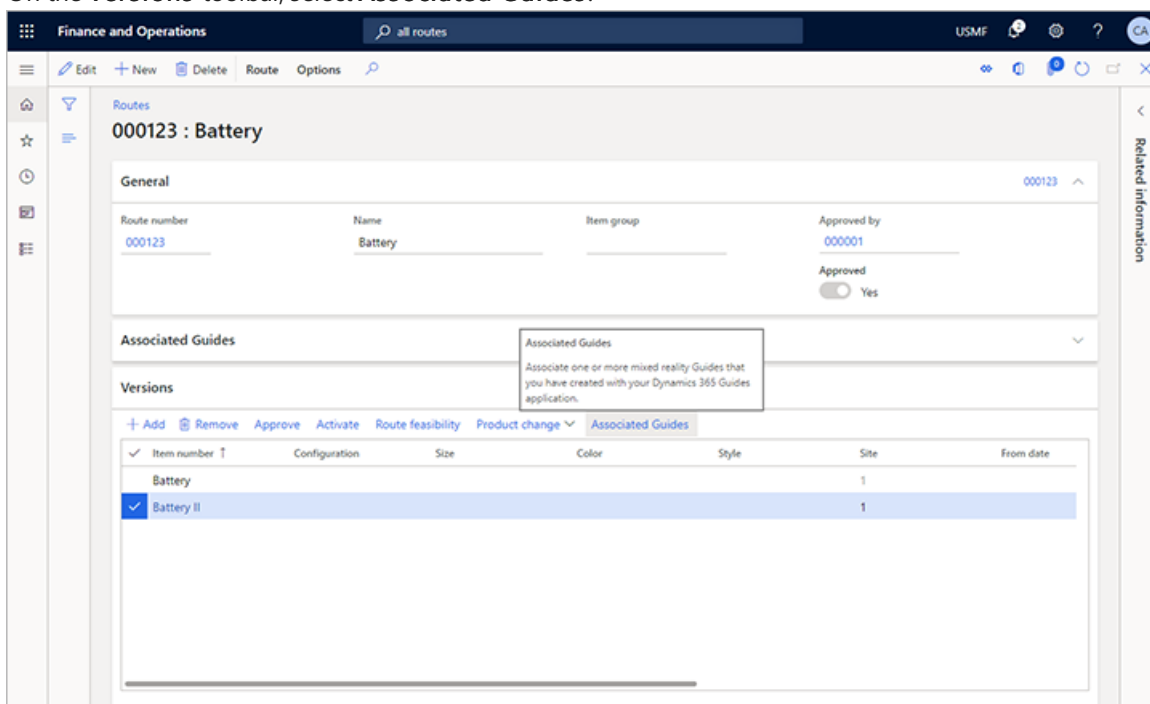
Typical scenario using route versions

Routes versions are typically used to specify variants of production processes based on an existing route. You can assign different Guides to each route version.

Add a Guide to a route version

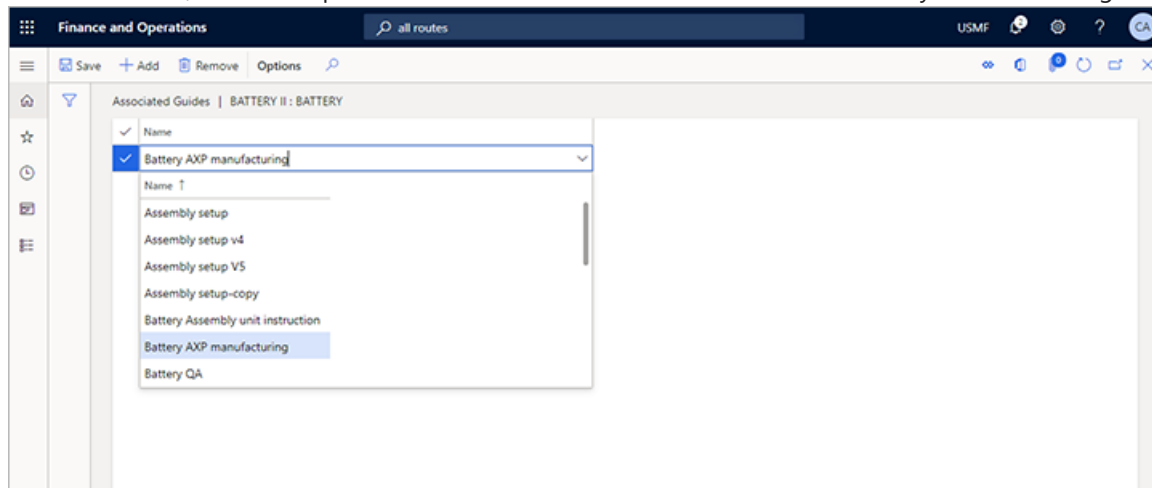
To add a Guide to a route version:

1. Go to **Production control > All routes**.
2. Open the route that you want to assign a Guide to.
3. On the **Versions** FastTab, select the version you want to assign a Guide to.
4. On the **Versions** toolbar, select **Associated Guides**.



5. The **Associated Guides** page opens for your BOM version.

6. Select **Add** on the Action Pane to add a new line to the grid.
7. For the new line, use the drop-down list in the **Name** column to choose the Guide you want to assign.



Associate a Guide to a route operation relation

You can add a guide to any [route operation relation](#).

Typical scenario using route operation relations

Operation relations are the most specific way to add guidance to a product process and its related operations. You can specify guidance for each operation in a route and specify different guidance for any type of relation context specified for a route, such as for specific items, configurations, and more. You can also specify to which stages in the operation the guidance applies (such as setup, queueing, process, or transport).

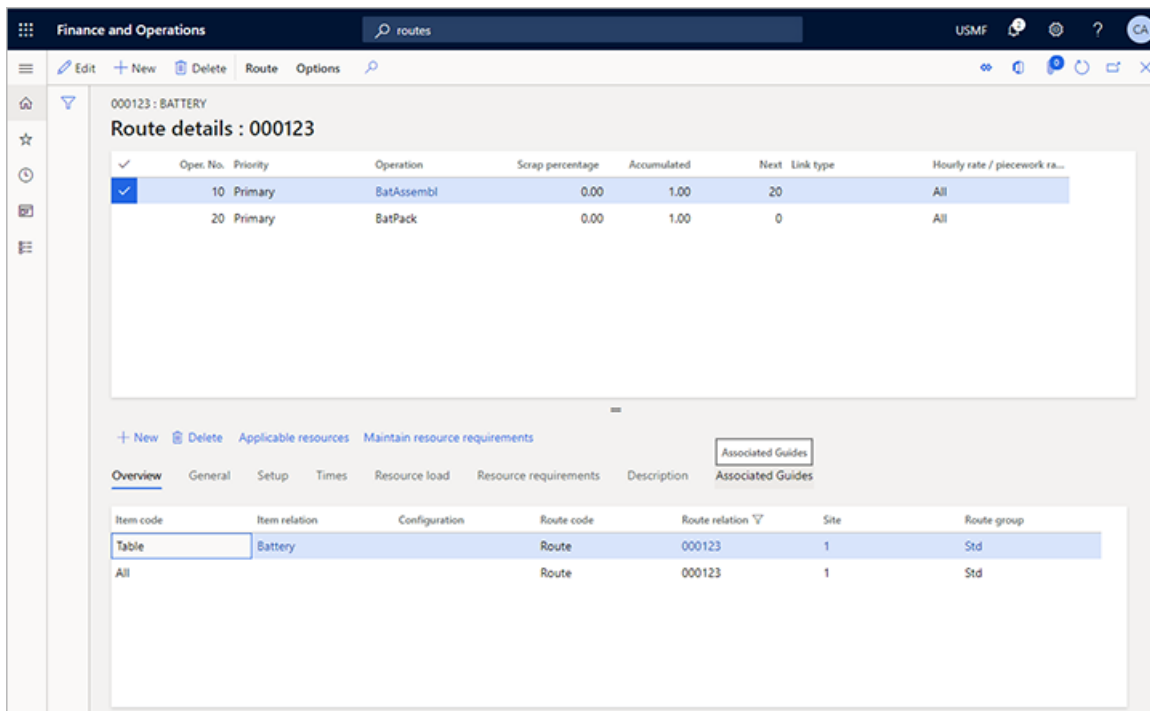
NOTE

If you specify guides for several operation relations of a route, among those guides, only the guide from the most specific relation will be show on the shop floor for the generated job.

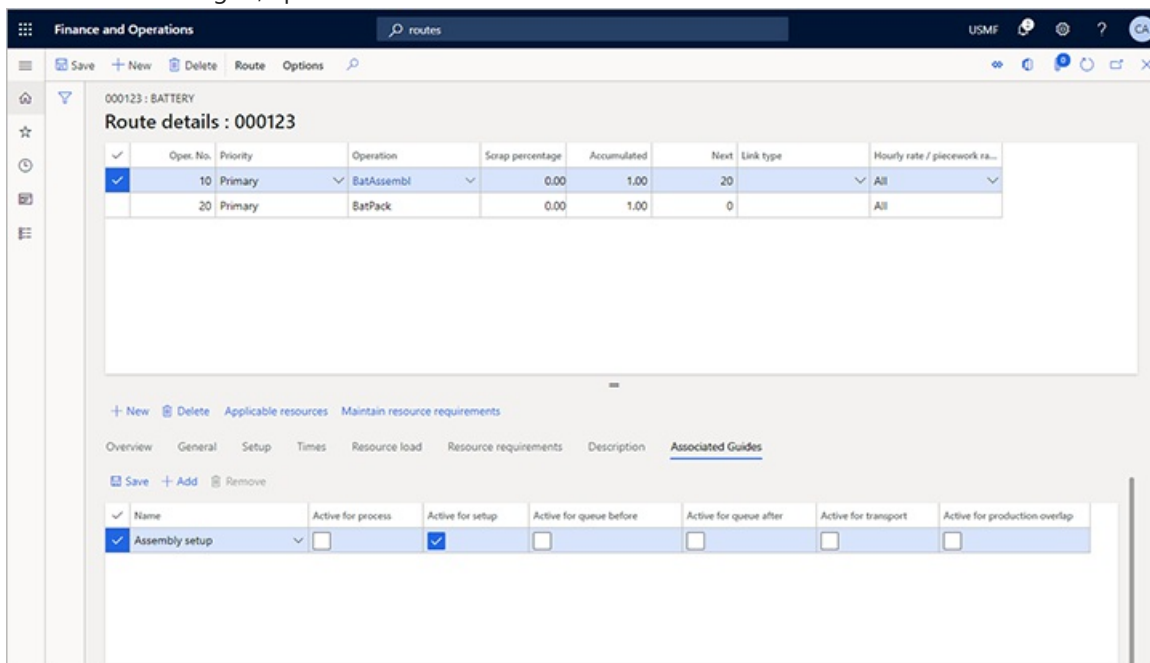
Add a Guide to a route operation relation

To add a Guide to a route operation relation:

1. Go to **Production control > All routes**.
2. Open the route that you want to assign a Guide to.
3. On the Action Pane, open the **Route** tab and from the **Maintain** group, select **Route details**.
4. The **Route details** page opens for your selected rout.
5. In the top grid, select the operation you want to provide guidance for.
6. In the bottom grid, select a specific relation (or the generic **All** relation).



7. Above the bottom grid, open the **Associated Guides** tab.



8. Select **Add** from the toolbar at the top of the bottom grid to add a new line to the grid.

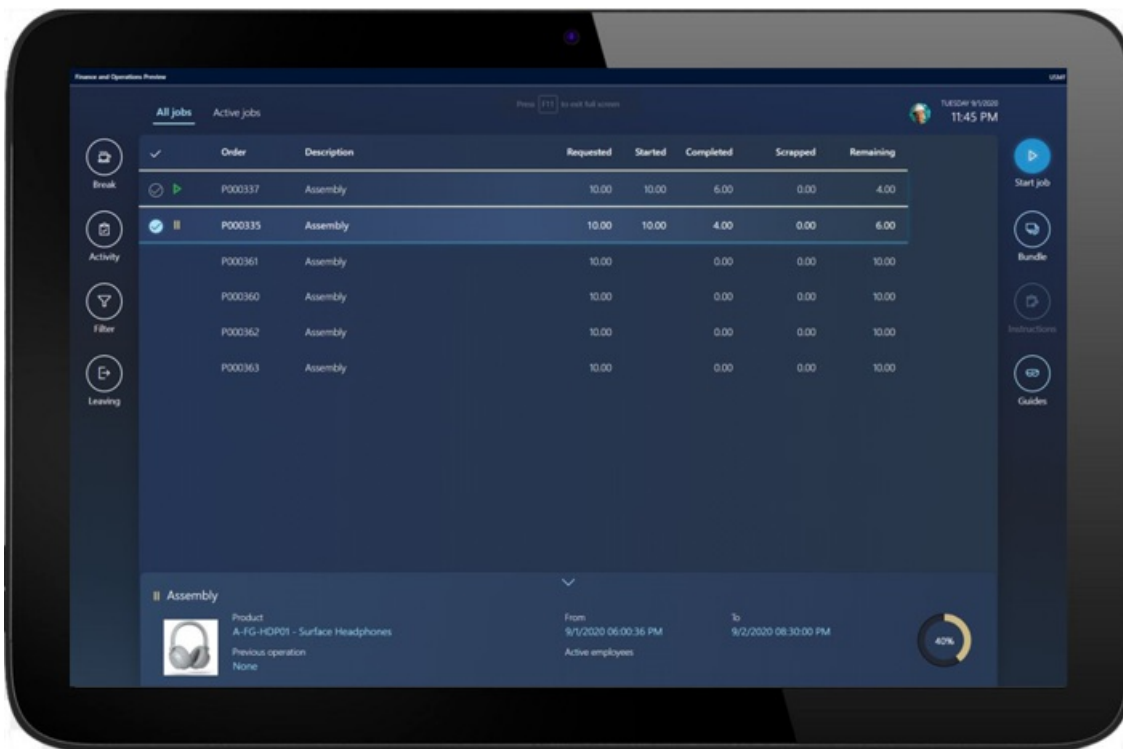
9. For the new row, use the drop-down list in the **Name** column to choose the Guide you want to assign. In the rest of the row, select the check box for each context where the selected Guide should be available.

NOTE

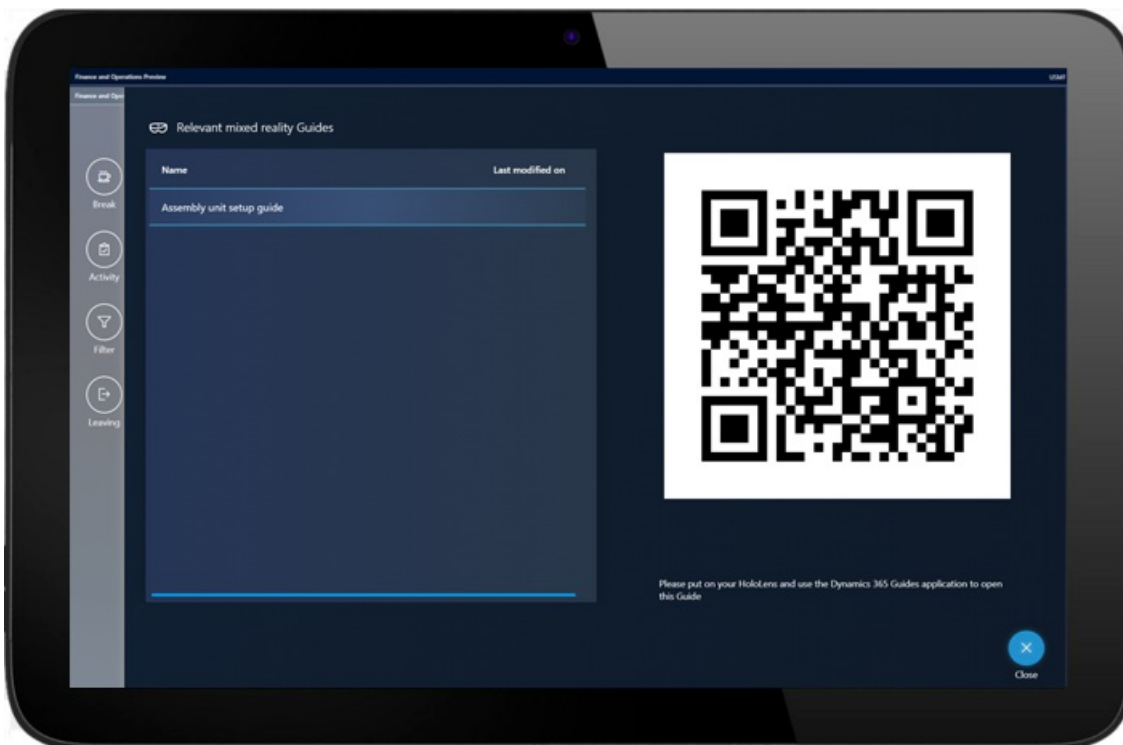
You can add one or more guides for each stage of each operation.

Select guides from the shop floor execution interface

When a worker opens a job list on the shop floor execution interface, Supply Chain Management finds the relevant guides for the jobs shown. Use the **Guides** button to view the relevant guides.



Then put on a HoloLens and access the respective guide by glancing at the QR code and activating the respective Guide.



Resolving the logic for selecting Guides

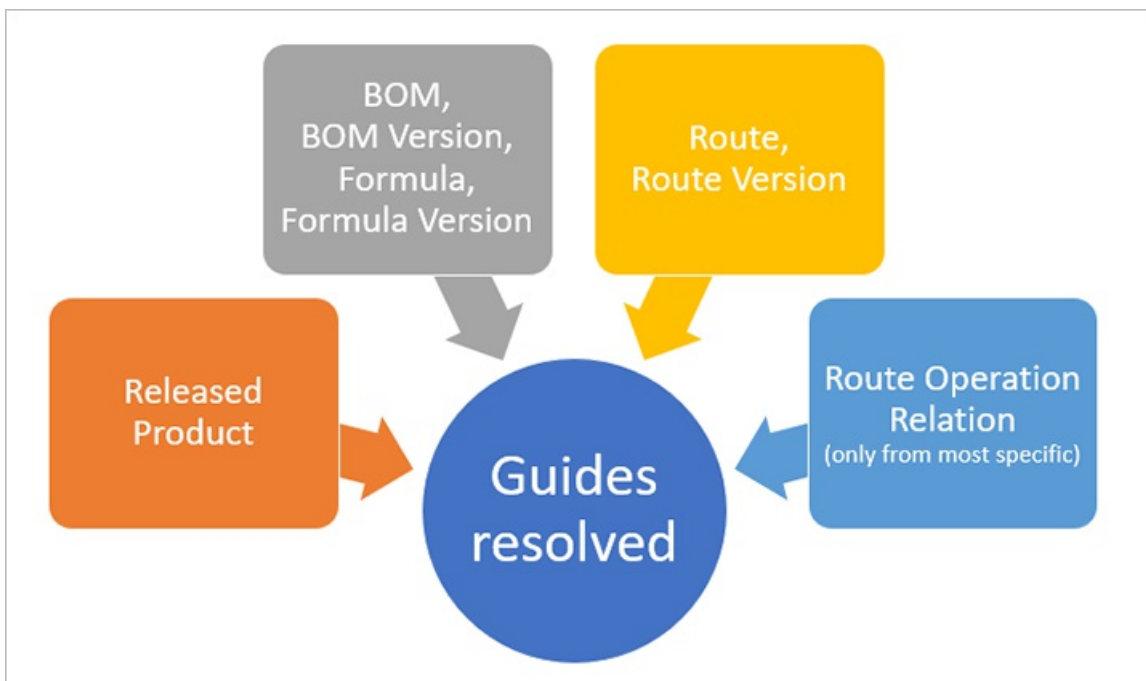
You can add Guides to the following production data:

- Resources
- Resource groups
- Released products
- Formulas
- Formula versions
- Bills of material (BOMs)

- [BOM versions](#)
- [Routes](#)
- [Route versions](#)
- [Route operation relations](#)

When Supply Chain Management generates the jobs for the production floor, it will collect the relevant Guides from those sources. Take note of the following important rules.

- If you attach a BOM version or formula version to a route or production order, then any Guides attached to this version, and also the Guides attached to the parent BOM or formula of that version, will be shown on the job.
- If you attach a route version to a production order, then any Guides attached to this version, and also the Guides attached to the parent route of that version, will be shown on the job.
- If you define several route operation relations that include the *All* relation and assign Guides to those, only the Guides from the most specific relation will be shown for the job.



NOTE

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Reverse the production order status

2/18/2021 • 2 minutes to read • [Edit Online](#)

This topic describes how to reverse production order status.

If you reverse the status of a production order, the order and all operations that are associated with the routes revert to a previous step in the production life cycle. For example, a production order has a status of **Scheduled**, and you change the status back to **Created**. In this case, the system must first change the status to **Estimated**, which is the status that immediately precedes **Scheduled**. It can then change the status to the status that you want, **Created**. **Note:** If your order has reached the **Report as finished** status, you can still reverse it to an earlier status. However, you must re-run estimation and operations scheduling, job scheduling, or both types of scheduling, to update the information on the order. This step is required, because any reservations of remaining item consumption and operations resource consumption must also be reset. The rest of this article explains what occurs when you reverse the status of a production order in the following ways:

- From **Estimated** to **Created**
- From **Scheduled** to **Estimated**
- From **Released** to **Scheduled**
- From **Started** to **Released**

From Estimated to Created

When you reverse the status of a production order from **Estimated** to **Created**, the item consumption that was calculated for the items in the bill of materials (BOM) is removed. Inventory transactions on the production line are deleted, and the **Remain status** field on the production order's BOM lines is reset to **Ended**. When the **Derived purchases** and **Derived production** options are selected, any underlying purchase orders or production orders are deleted. If you estimated the costs of the production order, or if you manually reserved items so that they could be used in production, those transactions are removed.

From Scheduled to Estimated

When you reverse the status of a production order from **Scheduled** to **Estimated**, the scheduled start and end dates and times are removed. Capacity reservations that were made during scheduling are removed, and jobs that were created during job scheduling are deleted. All information that is recorded about operation scheduling and job scheduling on the **Production order details** page is reset.

From Released to Scheduled

When you reverse the status of a production order from **Released** to **Scheduled**, the only change that occurs is the value in the status field.

From Started to Released

When you reverse the status of a production order from **Started** to **Released**, all items that were reported as finished are reverted. If material has been picked, or if inbound and outbound deliveries have been made to production, those settings are reversed. The **Remain status** field on the production order's BOM lines is changed from **Ended** to **Material consumption**. If time has been registered, or if quantities have been reported as finished for the operations in the production route, those settings are reversed. The **Remain status** field is changed from **Ended** to **Route consumption** in the production route. The settings for all items that are posted as in process or work in process are reversed. On the **Production order details** page, fields that show

a quantity that was started or reported as finished are reset. The dates for those transactions are also reset.

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Visibility into material exceptions

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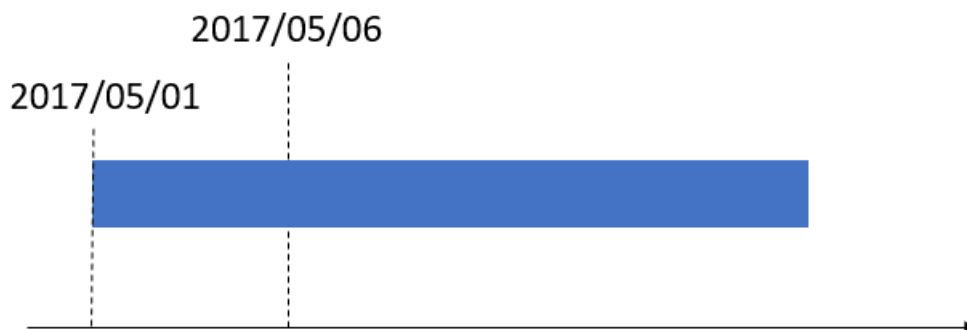
In the **Production floor management** workspace, three tiles give you better visibility into exceptions for raw materials for production orders and batch orders:

- Unreleased material lines needing attention
- Unprocessed waves needing attention
- Open warehouse work needing attention

For all three tiles, the raw material date of the bill of materials (BOM) lines and formula lines is compared against the workspace date, and also against the filters for **Production unit**, **Resource group**, and **Resource** that are set on the **Configure my work space** menu. By default, the workspace date is set to the current date, but you can adjust it.

An unreleased BOM line or formula line requires attention if the raw material date of the line is the same as or earlier than the workspace date, and if it meets the criteria that are defined by the filters in the workspace.

In the following figure, the blue bar represents a production job that is scheduled on a resource. The job is scheduled to start on May 1, 2017 (2017/05/01). This date is the raw material date. In other words, the materials that are assigned to the job on the BOM and formula lines must be ready on this date. The other date in the figure, May 6, 2017 (2017/05/06), represents the workspace date. In this example, the raw material date is earlier than the workspace date. Therefore, the date when consumption of the raw material was supposed to start has passed, and the BOM and formula lines meet the criteria for requiring attention.



Unreleased material lines needing attention

A BOM or formula line can be released to the warehouse in three ways:

- As part of a production order or batch order release
- As a manual release
- Automatically through a batch job

For more information, see [Release BOM and formula lines to the warehouse](#).

If a BOM or formula line hasn't been released or has been only partly released, and if the date and filter criteria of the workspace are met, the line is included in the calculation of the number that appears on the **Unreleased material lines needing attention** tile.

When you select the tile, the **Release to warehouse** page is opened. This page shows the number of unreleased BOM and formula lines that is indicated by the number on the tile. The unreleased lines appear in the

upper grid. This grid shows the quantity that was originally estimated for the line, the quantity that has already been released, and the remaining quantity that must still be released. You can add lines from the upper grid to the lower grid. From the lower grid, you can then release the selected lines to the warehouse. From the lower grid, you can also adjust the quantity to release so that only a partial quantity is released.

Unprocessed waves needing attention

When a BOM or formula line is released, it's added to either a new production wave or an existing open wave, depending on the configuration of the production wave template. Through the configuration of the wave template, you can also set up a wave so that it's automatically processed when a BOM or formula line is released. When the wave is processed, warehouse work for raw material picking is generated. If the wave template is configured so that waves aren't processed at the time of release, the wave remains in an unprocessed state. The **Unprocessed waves needing attention** tile shows the number of BOM and formula lines that have been released to the warehouse on unprocessed waves, and that have a raw material date that is earlier than or the same as the workspace date. The lines must also be consumed by an operation resource that applies to the filter of the workspace.

When the tile is selected, the **All production waves** page is opened. This page is filtered by the number of open waves that contain wave lines from released BOM and formula lines that meet the criteria for the tile. From the **All production waves** page, you can manually process the wave.

Open warehouse work needing attention

The **Open warehouse work needing attention** tile shows the number of BOM and formula lines that have been released to the warehouse, that have unprocessed work, and that have a raw material date that is earlier than or the same as the workspace date. The lines must also be consumed by an operation resource that applies to the filter of the workspace.

When the tile is selected, the **All work** page is opened. This page is filtered by the number of open work headers that contain work lines from released BOM and formula lines that meet the criteria for the tile. From the **All work** page, you can manually process the work.

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Release BOM and formula lines to the warehouse

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This topic describes the process for releasing raw material for bill of materials (BOM) lines and formula lines to the warehouse. When you release a BOM or formula line to the warehouse, the system first determines whether material is already available at the production input location on the shop floor where the material will be consumed for the production process.

- If the material is available at the production input location, it's picked from that location immediately after the signal is given for the release of material to the warehouse.
- If the material isn't available at the production input location, the material release indicates that material must be moved from locations in the warehouse to the production input location. The material is moved via warehouse work for raw material picking. Therefore, warehouse processes for raw material picking must be configured. For more information, see [Replenishment overview](#) and [Control warehouse work by using work templates and location directives](#).

Methods for releasing BOM and formula lines

You can configure the release of BOM and formula lines so that it occurs as part of the release of a production order or batch order. Alternatively, the release can be controlled by a batch job or done as a manual interaction.

The method that is used to release BOM and formula lines is controlled by the **Production line release** parameter. You can find this parameter at **Production control > Setup > Production parameters**.

- **Release BOM and formula lines as part of production or batch order release** – In this method, BOM and formula lines for a production or batch order are released as part of the process of releasing the order. Usually, during the release of a production or batch order, production jobs are released to the shop floor workers, and production papers are printed. During this process, the status of the order is also changed to **Released**.
- **Release BOM and formula lines via a batch job or as a manual interaction** – In this method, BOM and formula lines can be released only through the **Automatic release of BOM and formula lines** batch job or as a manual interaction. To manually release BOM and formula lines, on the production order list page or the production order details page, on the Action Pane, select **Release to warehouse**.

For a quick demonstration of how to release BOM and formula lines to production by using a batch job, watch this short YouTube video: [Release production picking to the warehouse in batch](#).

Releasing the BOM and formula lines by using a batch job

The **Automatic release of BOM and formula lines** batch job goes through selected BOM and formula lines that have a remaining quantity to release. The job considers only orders that have a status of **Released**, **Started**, or **Reported as finished**. If a BOM or formula line has a remaining quantity to release, the job releases up to the quantity that can be covered by the quantity that has already been physically reserved and the quantity that is physically available.

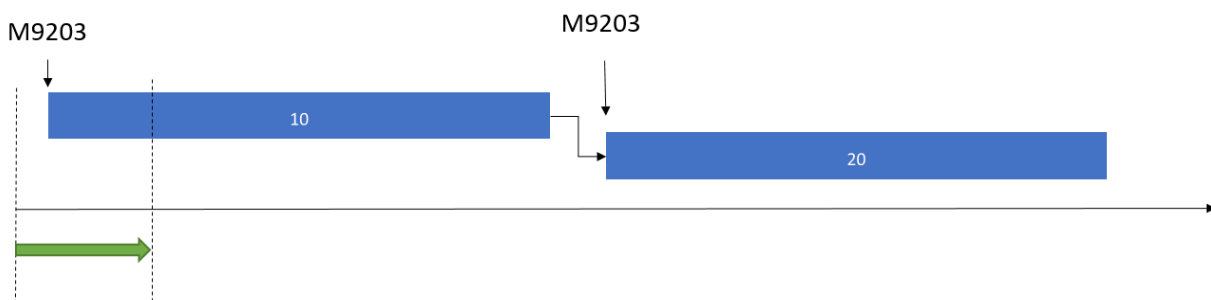
Example of a batch job release

SCENARIO	REMAINING QUANTITY TO RELEASE	PHYSICALLY RESERVED QUANTITY	PHYSICALLY AVAILABLE QUANTITY	QUANTITY RELEASED BY THE BATCH JOB
1	100	20	90	100
2	100	20	70	90
3	100	0	90	90
4	100	0	110	100
5	100	20	0	20

Batch job setup

In the query for the **Automatic release of BOM and formula lines** batch job, you can set up a filter criterion to specify how many days ahead the job should look for lines that have unreleased quantities. In the query for the job, in the **Raw material date** field, use the **(LessThanDate())** function as a filter criterion.

The following illustration shows a production order that has two jobs, 10 and 20, that cover the assembly and packing for the production order. Each job is set up to consume a quantity of material. In this illustration, the release time fence that is indicated by the green arrow below the time line equals the number of days that has been specified in the **(LessThanDate())** criterion. For example, **(LessThanDate(2))** indicates that the job should look for unreleased quantities only within a time fence of two days.



Releasing material per operation number or in proportion to the amount of finished goods

If you release materials by using the **On production order release** parameter setting, when you do a manual release, you have two options for controlling the material release:

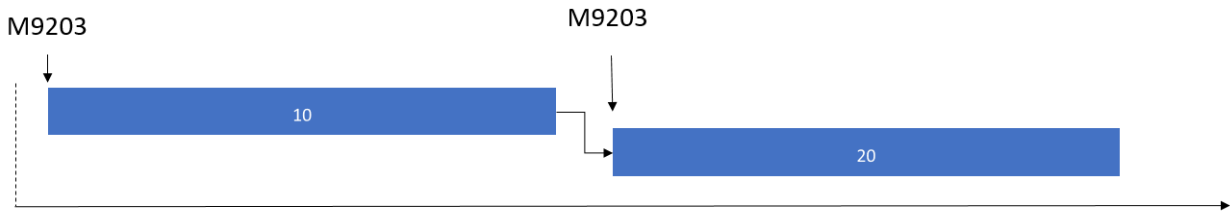
- Release material per operation number.
- Release material in proportion to the amount of finished goods.

Release material per operation number

To control the operations that material should be released to, use the **Release to warehouse** page.

- Select **Production control > Production orders > All production orders**, select a production order, and then, on the **Warehouse** tab, select **Release to warehouse**. Then use the **From Oper. No.** and **To Oper. No** fields to specify the range of operation numbers.

The following illustration shows a production order that has two operations, 10 and 20. In this example, if you limit the release to operation 10, only material M9203 will be released.



For a quick demonstration of how to release material in proportion to the amount of finished goods, watch this short YouTube video about [enhancements to the production order release process](#).

Release material in proportion to the amount of finished goods

You can release raw material for a partial quantity of finished goods or in a specific unit.

- To release raw material for a partial quantity of finished goods, select **Production control** > **Production orders** > **All production orders**, select a production order, and then, on the **Warehouse** tab, select **Release to warehouse**. Then enter a quantity in the **Quantity** field.

For example, a production order is created and scheduled for 1,000 pieces (pcs.). The shop floor supervisor is planning the production of 100 pcs. for the next shift and wants to release materials only for that shift. In this case, the supervisor can use the **Quantity** field to release materials for the 100 pcs. that are planned for the next shift.

- To release raw material in a specific unit, select **Production control** > **Production orders** > **All production orders**, select a production order, and then, on the **Warehouse** tab, select **Release to warehouse**. Then use the **Unit** field to select the unit of the finished good to release material in.

The units that are available are defined in the unit sequence group ID of the finished good.

For example, a finished good has the following unit conversion between pounds (lbs.) and pallet (PL): 1 PL = 100 lbs. To create a production order for 10,000 lbs. of the finished good, you can release raw materials for the number of pallets that you plan to produce. Select **PL** as the unit, and then select a corresponding number in the **Quantity** field.

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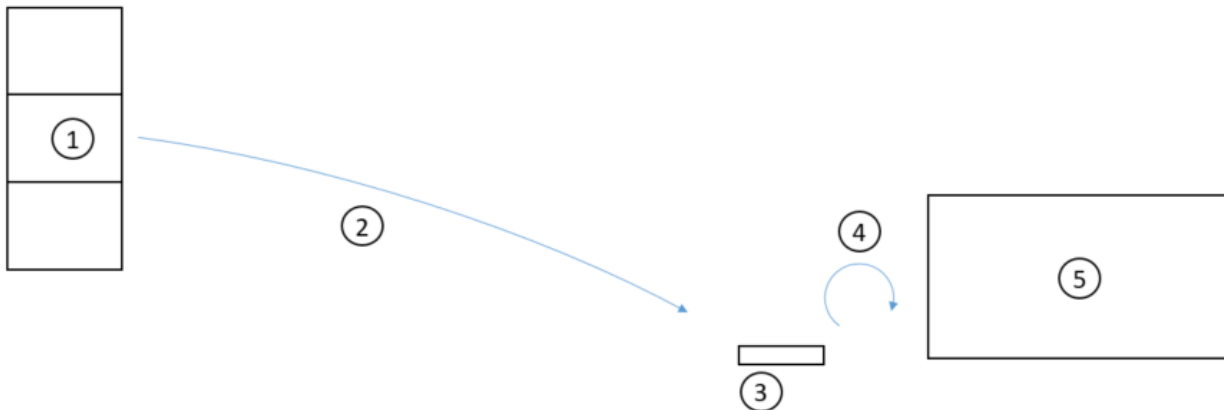
Register material consumption using a mobile device

2/18/2021 • 3 minutes to read • [Edit Online](#)

This topic describes a workflow that enables registration of raw material consumption in production by using a handheld device.

Introduction

This workflow is relevant if there is a strict requirement for material traceability. In those cases, to maintain traceability of the materials, the exact time and quantity must be reported for the consumption. This process can be seen as opposed to pre- or back-flushing operations, where there is an offset between the time of registration and the time when the actual consumption takes place. This explains why a strategy of automatic consumption cannot be used for some materials with traceability requirements. Let's look at a simple scenario that explains how to set up a workflow to enable registration of raw material consumption in production by using a handheld device.



Scenario details

A continuous production process (5) consumes the batch-controlled raw material RM-100. The material is on-hand on location Bulk-001 (1) on license plate PL-1 with two batches, B1 and B2, both with a quantity of 100 lbs. Warehouse work (2) is released and processed for RM-100, and the material is picked from Bulk-001 to the production input location PIL-01 (3), which is defined as non-license plate controlled. The machine operator weighs out material from the production input location (3) and registers the weight and batch number as consumed (4). From the production input location, a portion of the material is manually added to the production process in defined time intervals. When the machine operator adds material, it is weighed on a scale and the batch number is registered.

Set up the workflow to register consumption using a handheld device

Create a finished-good product, FG-100, with a bill of material that has the batch-controlled raw material RM-100. Add two batches, B1 and B2, of RM-100 in a quantity of 100 to location: Bulk-001 on license plate: PL-1. The flushing principle on the bill of material line for RM-100 is set to **Manual**. Set the production input location to PIL-01. You can do that by selecting this location as the default production input location on warehouse 51.

1. Create a new mobile device menu item:

- **Menu item name** - Register material consumption.
- **Title** - Register material consumption.

- **Mode** - Indirect.
 - **Activity code** - Register material consumption.
2. Add the menu item to the **Production Mobile** device menu.
 3. Create a production order for the finished product:

- **Item number** - FG-100
- **Site** - 5
- **Warehouse** - 51
- **Quantity** - 150

The production order is **Estimated** and **Released** and warehouse work is created.

4. Complete the work using the workflow for raw material picking for the handheld device.

This will bring the material from the bulk location to the production input location PIL-01. After the work is completed, the material has the status **Picked on the production input location**. The status after work has been processed can be either **Picked** or **Reserved physical**. This is configured with the parameter **Issue status after put on the warehouse form**.

5. Start the production order either from the client or from the handheld device by using the **Production start** menu item.

After the production order has been started, you can register material consumption with the workflow for the handheld device. Let's start by registering consumption of 25 lbs of batch B1.

6. Select the **Register material consumption** menu item in the menu for the hand held device, enter the following details:

- The production order number.
- The location on which the material is going to be consumed, in this case PIL-01.
- Item number RM-100.
- Batch number B1.
- A quantity of 25.

7. Select **OK**.

Note that the message "Journal line is created" appears on the display. On the production order there is an open journal of the type **Production picking list** for item number RM-100 and batch number B1.

You can now choose to continue your registration, for example on batch number B2, and each time you select **OK**, a new journal line is added to the open journal.

After you have finished your registration, select **Done** to post the journal and end the workflow.

Additional comments

- If a user cancels the workflow after a journal line is created, the journal is in an unposted state but if the user at a later point uses the workflow for the same production order, then the lines will be added to the open journal rather than to a new journal.
- The new workflow also supports the registration of serial numbers.
- It is only possible to register an item number that is defined in the bill of material or in the formula for the selected production order or batch order.
- Material can be overconsumed. For example, if the material is estimated to be consumed with the quantity of 100 lbs, then it can be overconsumed with a quantity of, for example, 105 lbs.

NOTE

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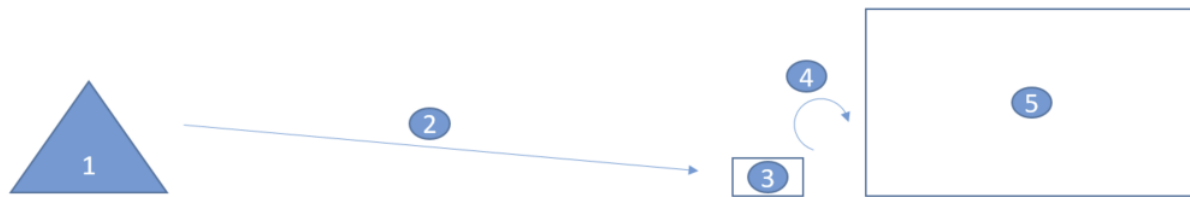
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Flushing principles

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The flushing principles reflect different consumption strategies for raw materials that are used in production processes. Consumption is the process that deducts material from the on-hand inventory and sets the value of the consumed materials to **Work in progress (WIP)** for production orders and batch orders. Raw materials are usually consumed from a location that is configured for the process that consumes the material. This location is known as the production input location.

Before material consumption, the materials are moved to the input location. The following illustration shows the process.



1. Material warehouse
2. Raw material picking
3. Production input location
4. Raw material consumption
5. Production process

Material consumption is controlled by the following four flushing principles:

- Manual
- Start
- Finish
- Available at location

The flushing principles are configured in a hierarchy of default values. The hierarchy starts at the released product, where the flushing principle has the value **Start**. On the bill of materials (BOM) or formula line, the flushing principle from the product can be overridden. The default flushing principle on the production BOM lines or batch order formula lines is taken from the product or the overridden value on the BOM or formulas.

Description of the flushing principles

Manual

The Manual flushing principle indicates that the registration of material consumption is a manual operation. This principle is relevant if, for example, you want to be able to track time, and the quantity of consumed batch numbers or serial numbers must be accounted for, for tracking purposes. Manual consumption is registered in a production picking list journal. For items that are enabled for advanced warehouse processes, a hand-held flow can be applied.

Start

The Start flushing principle indicates that material will be automatically consumed when the production order is started. The amount of material that is consumed is proportional to the quantity that is started. When the Start

flushing principle is used together with the manufacturing execution system, it can also be used to flush materials when an operation or a process job is started. This principle is relevant if, for example, the variance in the consumption is low, the materials are low-value materials, there are no tracking requirements, or there is a short run time on operations.

Finish

The Finish flushing principle indicates that material will be automatically consumed when the production order is reported as finished, or when an operation that is set up to consume the materials is registered as completed. The amount of material that is consumed is proportional to the quantity that is reported as finished. When the Finish flushing principle is used together with the manufacturing execution system, it can also be used to flush materials when an operation or a process job is completed. This principle is relevant in the same situations as the Start principle. However, the Finish principle is for operations that have a longer run time, where materials should not be set to WIP before the operation is completed.

Available at location

The Available at location flushing principle indicates that the material will be automatically consumed when it's registered as picked for production. The material is registered as picked from location when work for the raw material picking is completed, or when material is available on the production input location and the material line is released to the warehouse. The picking list that is generated during the process is posted in a batch job. This principle is relevant if, for example, you have many picking activities against one production order. In this case, you don't have to update the picking list manually, and you can get a current view of the WIP balance.

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Production output location

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This topic describes the hierarchy that is used to identify the production output location.

The production output location is the location where a finished good is first stored after it's produced. Usually, this location is close to the production process that produces the finished good. The production output location is used as intermediate storage for the material before it's moved on to the shipment area, a storage location, a production input location for a downstream production process, and so on.

A default production output location is set when finished goods are reported on a production order or batch order. The following hierarchy is used to identify this output location:

1. Use the output location that is defined on the production order or batch order header.
2. If no location is found there, use the output location that is defined on the resource that is used by the last operation that is defined in the production route.
3. If no location is found there, use the output location that is defined on the resource group that is used by the resource for the last operation that is defined in the production route.
4. If no location is found there, use the output location that is defined on the warehouse that is defined for the production order.

A default production output location is set only for products that are set up by using advanced warehouse processes. When this type of item is reported as finished, warehouse work of the **Finished goods put away** or **Co-product and by-product put away** type is created. This type of work uses the production output location as the pick location. The put-away location is determined by the location directives.

NOTE

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Report BOMs as finished

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This article provides information about reporting BOMs as finished.

The **Report as finished** and **Max. report as Finished** pages are used to report bills of materials (BOMs) as finished. Conceptually, the process for reporting a BOM as finished is the same as the process for reporting a production order as finished. This process can be used in, for example, simple assembly and kitting processes, where the more advanced capabilities of production orders aren't required. The **Report as finished** page lets you report multiple BOMs as finished in a batch. The **Max. report as Finished** page lets you report only one BOM as finished at a time. The **Report as finished** page is available from a menu item in Inventory management, and both pages are available as a menu items on the **Released products** page.

Report as finished page

If you open the **Report as finished** page from a released product, the page suggests that you report the standard inventory default quantity as finished. By default, the active BOM version is shown, but you can change the BOM version if there are other approved versions. The page also lets you delete records and create new records for released products that should be reported as finished. To use a query to select products, click the **Select** menu item. You can manually confirm reporting as finished for the selected products by clicking **OK**. Alternatively, you can set up the process to run in a batch. When the report as finished process is confirmed, the system generates a BOM journal where the posting to inventory is processed. This journal consists of one line item for the finished product and a line item for each BOM line. You can control whether the journal is automatically posted or whether it is left open for additional adjustments.

Max. report as finished page

On the **Max. report as finished** page, each BOM line indicates the number of pieces of the product that can be reported as finished. This calculation is based on the physical available on-hand inventory of each material line. In the following example, one piece of item number FG consumes two pieces of raw material RM10 and one piece of raw material RM20. Because there are only 10 pieces of RM10 on hand, the maximum quantity of FG that can be reported as finished is five pieces. This value is shown in the **Max. Report as finished** field.

LEVEL	ITEM NUMBER	QUANTITY	ON-HAND	MAX. REPORT AS FINISHED
0	FG	1	0	5
1	RM10	-2	10	5
1	RM20	-1	8	8

BOMs that have multiple levels

When a BOM has multiple levels, you can control how materials are accounted for at all levels by using the **Explosion** field. This field is available on both the **Report as finished** page and the **Max. report as Finished** page. The following options are available:

- **Never** – Underlying BOMs aren't exploded if there is a material shortage.
- **Always** – All underlying BOMs are fully exploded. Therefore, any free on-hand inventory for semi-finished

component items isn't used.

- **Shortage** – Underlying BOMs are exploded only if the full quantity of the material that is wanted isn't available.

Example

In this example, three pieces of the finished product (item number FG) are ready to be reported as finished. There is a two-level BOM, as shown here.

LEVEL	ITEM NUMBER	BOM-LINE QUANTITY	ON-HAND
0	FG		
1	COMP	1	2
1	RM	1	

The following tables show how the setting of the **Explosion** field affects the way that BOM journal lines are generated. **Explosion: Never**

LEVEL	ITEM NUMBER	QUANTITY
0	FG	3
1	COMP	-3

As the preceding table shows, only item number COMP is considered deducted in the journal. Item number RM, which is part of COMP, isn't exploded to the journal line, and the two on-hand pieces of COMP aren't considered.

Explosion: Always

LEVEL	ITEM NUMBER	QUANTITY
0	FG	3
1	RM	-3

In this case, item number COMP is exploded into its raw material, item number RM. The two on-hand pieces of COMP aren't considered in the quantity of RM to consume. **Explosion: Shortage**

LEVEL	ITEM NUMBER	QUANTITY
0	FG	3
1	COMP	-2
1	RM	-1

In this case, the two on-hand pieces of item number COMP are considered. However, because three pieces of item number FG are required, one piece of item number RM is also required in order to make the additional one piece of COMP.

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Report as finished to a non-license plate controlled location (Application, May 2016)

2/18/2021 • 2 minutes to read • [Edit Online](#)

This task guide shows an example of reporting as finished to a location that isn't license plate–controlled. An applicable work policy is the prerequisite for this task. A previous task guide showed the setup of the work policy. This task guide requires Dynamics AX application 7.0.1 or later.

Set up an output location

1. Go to Organization administration > Resources > Resource groups.
2. In the list, select resource group '5102'.
3. Click Edit.
4. In the Output warehouse field, enter '51'.
5. In the Output location field, enter '001'.
 - Location 001 isn't a license plate–controlled location. You can set up a non–license plate output location only if an applicable work policy exists for the location.

Create a production order and report it as finished

1. Close the page.
2. Go to Production control > Production orders > All production orders.
3. Click New production order.
4. In the Item number field, enter 'L0101'.
5. Click Create.
6. On the Action Pane, click Production order.
7. Click Estimate.
8. Click OK.
9. Click Start.
10. Click the General tab.
11. In the Automatic BOM consumption field, select 'Never'.
12. Click OK.
13. Click Report as finished.
14. Click the General tab.
15. Select Yes in the Accept error field.
16. Click OK.
17. On the Action Pane, click Warehouse.
18. Click Work details.
 - When the production order was reported as finished, no work was generated for put-away. This occurs because a work policy is defined that prevents work from being generated when product L0101 is reported as finished to location 001.

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Report progress on a mobile job device

2/18/2021 • 2 minutes to read • [Edit Online](#)

This procedure shows you how to start and report progress on a production job in the job device registration form.

To be able to run this procedure you must have the System administrator or Machine Operator role associated with the user account.

1. Go to Production control > Manufacturing execution > Job card device.
2. In the WorkerTextField field, enter the badge of a worker. In the USMF demo data type '123' for Christina Portra..
3. Click Log in.
4. Click the Filter button.
5. Check or uncheck the Apply configuration filter check box. If you set a filter you can use production unit 110 in USMF.
6. In the Production unit field, select the resource group for which production jobs the worker can work on.
7. In the list, click the link in the selected row.
8. Click OK.
9. Click the Start job button.
10. Click OK.
11. Click the Report progress button.
12. Click OK.
13. Click the Next job button.
14. Click the Assigned to see an overview of all production jobs button.
15. Close the page.
16. Click the Break button.
17. In the list, find and select the desired record.
18. Click OK.
19. Click the Leaving button.
20. Select to log out.
21. Click OK.
22. In the WorkerTextField field, log in again. You can select worker '123' in USMF demo data.
23. Click Log in.
24. Click Stop break.
25. Click the Activity button.
26. Click Cancel.
27. Click the Leaving button.
28. Select to clock out.
29. Click OK.
30. Select a reason why you are clocking out early.

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Use the safety stock journal to update minimum coverage

2/18/2021 • 2 minutes to read • [Edit Online](#)

This procedure shows how to calculate minimum coverage proposals based on historical transactions and then update the item coverage with the proposals. This is done using the safety stock journal. The demo data company used to create this task is USMF. This task is intended for the production planner, to help maintain minimum coverage.

Create a new safety stock journal name

1. In the **Navigation** pane, go to **Master planning > Setup > Safety stock journal names**.
2. Click **New**.
3. In the **Name** field, type 'Material'.
4. In the **Description** field, type 'Material'.
5. Close the page.

Create a safety stock journal

1. In the **Navigation** pane, go to **Master planning > Master planning > Run > Safety stock calculation**.
2. Click **New**.
3. In the **Name** field, enter or select a value. Select the safety stock journal name that you created, for example, Material.
4. Click **Create lines**.
5. In the **From date** field, enter a date.
6. In the **To date** field, enter a date.
7. Click **OK**. This will create lines for the dimensions that have inventory transactions.

Calculate proposal

1. Click **Calculate proposal**.
2. Select the **Use average issue during lead time** option.
3. Set **Multiplication factor** to '10'. The Multiply factor is used to adjust the proposal. Because demo data only has a few transactions, you will need to set the factor to get a realistic proposal.
4. Click **OK**. Scroll down to find M0002 and M0003. View the **Calculated minimum** quantity column.

Update minimum quantity

1. In the **New minimum quantity** field, enter a number. Update the New minimum quantity to match the value in the Calculated minimum quantity. If the Calculated minimum is zero, you can enter the desired future value. For example, you can enter the Calculated minimum quantity in this field for M0002 that has warehouse 12.
2. In the list, find and select the desired record. For example, you can select M0002 that has warehouse 12.
3. In the **New minimum quantity** field, enter a number. Update the New minimum quantity to match the value in the Calculated minimum quantity. If the Calculated minimum is zero you can enter the desired future value.

Post the new minimum quantity and validate the result

1. Click **Post**.
2. Click **OK**.
3. Click to follow the link in the **Item number** field.
4. Click to follow the link in the **Item number** field.
5. On the **Action Pane**, click **Plan**.
6. Click **Item coverage**. Notice that the **Minimum quantity** has been updated with the new minimum quantity from the safety stock journal.

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Material substitution in manufacturing

2/18/2021 • 3 minutes to read • [Edit Online](#)

This topic describes how to substitute materials during the production process.

There are three methods for substituting materials during the production process:

- By date, when one material is substituted for another after a specific date
- During master planning, when a material in a formula is substituted with a different material, because it's out of stock
- During production, when a material is unexpectedly out of stock and is substituted with a different material

Substituting material by date

Consider following scenario: A machine that a company is manufacturing contains a component that will expire from the vendor's catalog in two months. From the expiration date onward, the vendor will offer a new component that can be substituted for the old component. From and to validity dates can be set up on bill of materials (BOM) lines. For this example, you set up the old component to expire by entering the expiration date in the **To-date** field. Then, on the BOM, you set up the new, replacement component so that it's valid from the day after the old component expires. To do this, enter the start date in the **From-date** field.

Substituting material by planning

You can substitute materials during planning only when you're using formulas, not when you're using a BOM. Consider following scenario: A food manufacturing company is making a sauce from a formula that has 20 ingredients. One ingredient in the formula can be substituted by one of two other ingredients. However, because these two ingredients are more expensive than the preferred ingredient, substitution is used only if the preferred ingredient is out of stock. The material that can be substituted is called A, whereas the two materials that can replace it are called B and C. Material substitution by planning is controlled by the **Plan group** and **Priority** fields on the formula lines. For this example, you create formula lines for the three materials, and associate the formula lines with the same plan group. In the setup, the formula line for material A has the highest priority (lowest number), the formula line for material C has the lowest priority, and the formula line for material B has a priority that is between the priority of the other two lines. If you have demand for the finished item, master planning first determines whether the demand for material A can be covered. If the demand can't be covered, master planning looks at materials B and C, in order of priority. If material B is on hand, it will be used after a planned batch order is firm for the formula. If none of the materials are on hand, master planning creates a planned order for material A. **Note:** When you set up formula lines in a plan group, you should specify a quantity only on the material that has the highest priority. This quantity will be used to calculate the demand of all materials in the plan, even the materials that have lower priority. You can't specify different quantities on lower-priority items in the plan group.

Substituting material during production

Consider the following scenario: A piece of metal plate is required for a welding operation. During the operation, a warehouse worker informs the machine operator that the plate is out of stock. However, it's decided that the plate can be substituted with a plate that is slightly thicker. That way, the operation can be finalized. Material can be added to the BOM for an open production order. If the production order has a status of **Started**, users are asked to re-estimate the order when they add a new item to the production BOM. After the material is added, a new picking list can be created for the new item. You don't have to add the new material to the production BOM. Instead, you can add it directly to the production picking list. Then, when the picking list is posted, the system

adds the material to the production BOM.

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Registration for manufacturing execution

2/18/2021 • 4 minutes to read • [Edit Online](#)

This topic describes key concepts and terms that you need to understand to configure and use manufacturing execution.

Manufacturing execution is intended to be used primarily by manufacturing companies. Workers can register time and item consumption on production jobs by using the **Job registration** page. All registrations are approved and are later transferred to the relevant modules. Continuous approval and transfer of registrations lets managers easily track actual costs on production orders.

Manufacturing execution and registration terminology

The following table contains terms that pertain to manufacturing execution and related registration tasks.

TERM	DESCRIPTION
Manufacturing execution	A function that is used to register time, material consumption, costs on production jobs, projects, and indirect activities. Registration is done in a manufacturing execution registration client.
Job list	On the Job registration page, workers are shown the list of jobs that they must perform on a specific resource, such as a machine. A worker can register time and item consumption on each job or task in the job list.
Job bundling	If a worker starts more than one job at the same time on the Job registration page, this is called job bundling. The time that is spent on bundled jobs can be allocated to the individual jobs in various ways by using allocation keys.
Pilot/assistant registrations	A worker can register as an assistant to a resource, and can create a small team where several workers work on the same production jobs. Resources that workers are connected to as assistants are called pilots. Only the pilot resource must make registrations. All assistants automatically get the same registrations. For example, if a machine acts as the pilot, workers who have registered as assistants to that machine can make registrations on the Job registration page, and both the machine and the workers who are connected as assistants will receive the same registrations.
Indirect activity	An activity or task that isn't directly related to a production job or a project, such as a department meeting, a cleaning job, or a maintenance job on the shop floor. Workers can make registrations on indirect activities, in the same way that they can register on production jobs and projects.

Registrations in manufacturing execution

Workers can make various types of registrations in manufacturing execution for work that is performed on production jobs. Depending on the system setup, workers might also be able to make registrations on project activities and nonproductive tasks, such as breaks, absences, and indirect activities. Here are the registration

types:

- **Clock-in/clock-out** (available with time and attendance) – Workers clock in when they arrive at work and clock out when they leave to go home.
- **Register on production jobs** – Workers can make registrations, such as starting a job and reporting feedback for a job, on the production jobs that appear in their job list. Workers can start several jobs at the same time. This is referred to as job bundling.
- **Register on inventory** – Workers can make registrations on materials that are used on the shop floor, but that aren't directly related to production jobs. Examples include grease, lubricants, or other materials that are used to keep machinery running. Registration is performed in an inventory journal.
- **Register on projects** (available with time and attendance) – Workers can make registrations, such as starting and finishing work on the projects or project activities that appear in their job list.
- **Register project fees and project items** (available with time and attendance) – Workers can register fees (expenses) that are associated with a project in a project fee journal, such as mileage and bridge toll. Workers can also register item consumption on projects. This is done in a project item journal.
- **Register as assistant to another worker** – If two or more workers will work together on a production job or a project, a worker can register as an assistant to a machine, or to another worker, who will then act as the pilot. The pilot can select another worker as the pilot, as required.
- **Register absence** (available with time and attendance) – Workers can register time on various absence codes that are set up. Absence can be indicated if a worker arrives late, requires absence during the work day, or leaves earlier than expected according to the standard work time profile.
- **Register breaks** (available with time and attendance) – During the work day, workers can register that they are leaving their workstation to take a break. Several break types can be set up. When a worker returns and logs on again, the system registers that the worker is back, and the break registration stops.
- **Register indirect activities** (available with time and attendance) – Indirect activities are nonproductive activities that workers might engage in during a workday, such as a department meeting, a team meeting, or a maintenance job that is performed on the shop floor. Workers can make registrations on the indirect activities that are set up.
- **Register overtime** (available with time and attendance) – Workers who have been asked to work longer hours can select whether the extra hours should be registered as flextime or overtime.

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Production feedback

2/18/2021 • 2 minutes to read • [Edit Online](#)

This article provides information about production feedback, which gives workers feedback about production jobs. The article includes information about the various ways that production feedback can be updated.

Production feedback gives workers feedback about production jobs. It records time and material consumption on production orders, operation quantities and status, and errors that cause a job or operation to fail. Production feedback can be updated in journals that are related to production orders. The **Production job card** and **Production route card** journals are used to report time and quantities per job or operation. For reporting about the last job or operation, quantities on the finished product can be reported as finished. Production feedback can also be updated on the **Job card terminal** and **Job card device** pages. These pages enable production feedback to be updated on the shop floor and are part of the manufacturing execution functionality in the **Production control** module. The **Job card terminal** page has a configurable user interface that shows a list of the released jobs in a prioritized order for a selected work area. It also offers advanced options such as job bundling and team work. The **Job card device** page has a touch-optimized user interface. Production feedback on both pages is updated from the production journals.

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Enable the payroll process for time and attendance

2/18/2021 • 2 minutes to read • [Edit Online](#)

This procedure shows how to enable the payroll process for time and attendance. The demo data company used to create this procedure is USMF.

Create a pay type with a related pay rate

1. Time and attendance > Setup > Payroll > Pay types
2. Click New.
3. In the Pay type field, type a value.
4. In the Description field, type a value.
5. Click Save.
6. Click Rates.
 - Rates for pay types are set up for specific time intervals, and individual rates can be created for workers. It is not always necessary to create rates for pay types in time and attendance. This information may already exist in the payroll system that is used to generate wages.
7. Click New.
8. In the list, mark the selected row.
9. In the Rate field, enter a number.
10. Click Save.

Create a pay agreement

1. Close the page.
2. Close the page.
3. Go to Pay agreements.
 - Time and attendance > Setup > Pay agreements
4. Click New.
5. In the Pay agreement field, type a value.
6. In the Description field, type a value.
7. Click Save.
8. Click Agreement lines.
9. Click New.
10. In the list, mark the selected row.
11. In the Profile type field, enter or select a value.
12. In the Pay type field, enter or select a value.

Set up pay agreement for time and registration worker

1. Close the page.
2. Close the page.
3. Go to Time registration workers.
 - Time and attendance > Setup > Time registration workers
4. In the list, click the link in the selected row.
5. Click the Employment tab.

6. Expand the Time registration section.
7. Click Edit.
8. In the Pay agreement field, enter or select a value.

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Configure a worker using the mobile job device

2/18/2021 • 2 minutes to read • [Edit Online](#)

This topic explains how to assign the correct roles to the user account of a worker, and then enable the worker to do shop floor registrations.

Verify that a worker is assigned a certain role

For this example, verify that user "SHANNON" is assigned the machine operator role before you configure the worker account.

1. Go to **Navigation pane > Modules > System administration > Users > Users**.
2. Search for a user in the quick filter. For this example, enter .
3. Select the link in the **User ID** column of the user account that appears.
4. In the **User's roles** tree, select **Roles > Machine operator**.
5. Close the **user details** and **users** pages to return to the home page.

Configure worker account

1. Go to **Navigation pane > Modules > Human resources > Workers > Workers**.
2. Search for a user in the quick filter. For this example, enter .
3. Select the link in the **Name** column of the user account that appears.
4. Select the **Time registration** tab.
5. Select **Activate on registration terminals**.
6. Enter or select values in the following fields:
 - **Calculation group**
 - **Default calculation group**
 - **Approval group**
 - **Standard profile**
 - **Profile group**
7. Select **OK**.
8. Select **Edit** to enter a badge number for the new time registration worker. Enter a value in the **Badge ID** field.
9. Select **Save**.
10. Close the **Worker details** and **Workers** pages.

Assign worker to device group

1. Go to **Production control > Setup > Manufacturing execution > Configure job card for devices**.
2. Select **Add**.
3. In the list, select the desired worker. For this example, select **SHANNON**.
4. Select **OK**.
5. Select **Edit**.

6. In the **Production unit** field, you can set the default filter for the worker. This will ensure that only production jobs for the selected production unit are shown when the worker logs on to the device. Enter the desired value.
7. Close the page.

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Allocate time to jobs in a job bundle

2/18/2021 • 4 minutes to read • [Edit Online](#)

In Manufacturing execution, you can bundle jobs. You can then start multiple jobs at the same time on the Job list page.

If you bundle jobs, you must define how the total registered time for all the jobs should be allocated to each job. You define the allocation by selecting one of the following options in the **Bundle type** field on the **Allocation keys** page:

- **Estimation** – Time is divided among the jobs, based on the estimated time for the jobs.
- **Jobs** – Time is divided according to total jobs that are bundled and how much time was spent finishing all the jobs.
- **Net time** – Time is divided equally among the jobs that are in the bundle at any time.
- **Real time** – Actual job time is allocated. The cost can be calculated based on the actual payroll cost. **Note:** The **Real time** allocation key is available only if your company uses the payroll functionality in Time and attendance.

The following examples show the results of the various allocation keys.

Example scenario

Three jobs in your job queue must be completed. You start the first job, and then, while that job is in progress, you start the second and third jobs. Therefore, there is a bundle of three jobs. The following table shows the estimated production time for each job.

JOB	PRODUCTION TIME
Job 1	1 hour
Job 2	3 hours
Job 3	4 hours
Total	8 hours

The following table shows the actual work hours that are spent on each job.

JOB	START TIME	END TIME	BUNDLE TIME
Job 1	09:00	11:00	2 hours
Job 2	10:00	13:00	3 hours
Job 3	10:00	15:00	5 hours
Bundle	09:00	15:00	6 hours

The following sections describe the results of the calculated time for each allocation key.

Estimation allocation key

The following table illustrates the formula for calculating allocated time. Here is the formula: Time per job = Total bundle time × (Estimated job time ÷ Total estimated time)

JOB	FORMULA	ALLOCATED TIME
Job 1	$6 \times (1 \div 8)$ hours	0.75 hour
Job 2	$6 \times (3 \div 8)$ hours	2.25 hours
Job 3	$6 \times (4 \div 8)$ hours	3.00 hours

Jobs allocation key

The following table illustrates the formula for calculating allocated time. Here is the formula: Time per job = Total bundle time ÷ Number of jobs

JOB	FORMULA	ALLOCATED TIME
Job 1	$6 \div 3$	2 hours
Job 2	$6 \div 3$	2 hours
Job 3	$6 \div 3$	2 hours

Net time allocation key

The following table illustrates the formula for calculating allocated time. Here is the formula: Calculated time per reporting = Bundle time ÷ Number of jobs

	09:00–10:00 (1 HOUR)	10:00–11:00 (1 HOUR)	11:00–13:00 (2 HOURS)	13:00–15:00 (2 HOURS)	ALLOCATED TIME
Number of jobs in the bundle	1	3	2	1	Not applicable
Job 1	$1 \div 1 = 1$ hour	$1 \div 3 = 0.33$ hour	Not applicable	Not applicable	1.33 hours
Job 2	Not applicable	$1 \div 3 = 0.33$ hour	$2 \div 2 = 1$ hour	Not applicable	1.33 hours
Job 3	Not applicable	$1 \div 3 = 0.33$ hour	$2 \div 2 = 1$ hour	$2 \div 1 = 2$ hours	3.33 hours

Real time allocation key

If you want production costs to be calculated based on real costs, you must clear the **Cost category** option on the **Production order defaults** page. The following table illustrates the formula for calculating allocated time. Here is the formula: Actual time per job = Actual time in bundle

JOB	ACTUAL TIME
Job 1	2 hours
Job 2	3 hours
Job 3	5 hours

Consider the three jobs that are performed by a worker who has an hourly wage of USD 12.00. No overtime bonus or premium was earned in the time that was spent on the jobs. The worker worked on the three bundled jobs for a total of six hours. Therefore, the salary cost is $6 \times \text{USD } 12.00 = \text{USD } 72.00$. When you use real-time allocation, the cost per hour is recalculated by using the factor from the Net time formula. The actual time that was spent on each job is then transferred together with the corrected cost price per hour. In the example, six hours are spent, although 10 hours were allocated. The following table illustrates the formula for calculating cost. Here is the formula: $\text{Cost per hour} = (\text{Total bundle time per job (Net time)} \div \text{Actual time per job}) \times \text{Standard cost price per hour}$

JOB	CALCULATION OF CORRECTED COST PER HOUR	CORRECTED COST PER HOUR	ALLOCATED TIME	TOTAL COST OF JOB
Job 1	$(1.33 \div 2) \times \text{USD } 12.00$	USD 8.00	2 hours	USD 16.00
Job 2	$(1.33 \div 3) \times \text{USD } 12.00$	USD 5.33	3 hours	USD 16.00
Job 3	$(3.33 \div 5) \times \text{USD } 12.00$	USD 8.00	5 hours	USD 40.00

The corrected cost per hour and the job time are posted in a production journal. **Note:** If you select the **Cost category** option on the **General** tab on the **Production order defaults** page, the actual time for each job is transferred to a production journal, where the cost is applied to the cost category of the specific job.

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Calculate material consumption

2/18/2021 • 3 minutes to read • [Edit Online](#)

This article provides information about various options that are related to the calculation of material consumption.

The following options that are related to the calculation of material consumption are available on the **Setup** and **Step consumption** tabs on the **Line details** FastTab of the **Bill of materials** page.

Variable and constant consumption

In the **Consumption is** field, you can select whether consumption should be calculated as a constant quantity or a variable quantity. Select **Constant** if a fixed quantity or volume is required for the production, regardless of the quantity that is produced. Select **Variable**, which is the default setting, if the required amount of material in the finished goods is proportional to the number of finished goods that are produced.

Calculating consumption from a formula

In the **Formula** field, you can set up various formulas for calculating material consumption. If you use the default value, **Standard**, the consumption isn't calculated from a formula. The following formulas work together with the **Height**, **Width**, **Depth**, **Density**, and **Constant** fields:

- Height * Constant
- Height * Width * Constant
- Height * Width * Depth * Constant
- (Height * Width * Depth / Density) * Constant

Rounding up and multiples

Together, the **Rounding up** and **Multiples** fields let you round up the material consumption value. For example, you can round up the value according to the handling unit in which the raw material is picked for production. The following options are available in the **Rounding up** field: **Quantity**, **Measurement**, and **Consumption**.

Quantity

If you select **Quantity** as the rounding-up mechanism, the quantity must be a multiple of the specified quantity. For example, if whole numbers are required, select **1** in the **Multiples** field. Numbers are then rounded up to a quantity that is divisible by 1.

Measurement

Typically, you select **Measurement** as the rounding-up mechanism when the raw material comes in specific dimensions. For example, a piece of 2-meter metal tube is required for a finished good, and the metal tube is stored in 4.5-meter lengths. In this case, the **Measurement** rounding-up mechanism can be used to calculate how many metal tubes are required to produce a specific number of pieces of the finished good. For this example, the **Formula** field is set to **Height * Constant**. The **Height** field is set to **2** to indicate the length of the tube that is required for the finished good. The **Multiple** field is set to **4.5** to indicate that the tube is picked in lengths of 4.5 meters. Here is the calculation:

1. Number of multiples that are required for 10 pieces of the finished good: $10 \div 2 = 5$ pieces
2. Total consumption: $4.5 \times 5 = 22.5$ meters of metal tube

It's assumed that 0.5 meter of tube is scrapped for every five pieces of tube that are consumed.

Consumption

Typically, you select **Consumption** as the rounding-up mechanism when raw material must be picked in whole quantities of a specific handling unit of the product. For example, 2 quarts of paint are used to produce one piece of a finished good, and the paint is picked in 25-quart cans. In this case, the **Consumption** rounding-up mechanism can be used to round up consumption to whole numbers of 25-quart cans. Here is the calculation for the amount of paint that is required if 180 pieces of the finished good must be produced:

1. Paint that is required, excluding scrap: $180 \times 2 = 360$ quarts
2. Number of cans: $360 \div 25 = 14.4$, which is rounded up to 15
3. Paint that is required, including scrap: $15 \times 25 = 375$ quarts

Step consumption

Step consumption is used to calculate constant consumption in quantity intervals. If you select **Step consumption** in the **Formula** field on the **Setup** tab, you can add information about the steps on the **Step consumption** tab. The fixed consumed quantity can be set up in intervals of the produced quantity. For example, step consumption is set up as shown in the following table.

FROM SERIES	QUANTITY
0.00	10.0000
100.00	20.0000
200.00	40.0000

The bill of materials (BOM) quantity is 1, and the production quantity is 110. The formula for the consumption is From series (Quantity) = Consumption. Because the production quantity is 110, it falls into the "From 100 series." Therefore, the quantity is 20.

NOTE

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Production posting

2/18/2021 • 3 minutes to read • [Edit Online](#)

This article provides information about different types of postings in the production process.

Production posting activities follow production processes that are described in the sections below.

Material consumption

Materials are registered as consumed during production when the production picking list journal is posted. This process generates issue transactions that deduct the on-hand inventory. In the production parameters, you can specify whether the value of raw materials that are in progress (work in process [WIP]) should be posted in the ledger. The value of raw materials that are in progress (WIP) is then posted to a dedicated Picking list account and a dedicated Picking list offset account.

Time consumption

The time that workers spend on production jobs is recorded in the Route card journal or the Job card journal. When these journals are posted, ledger posting to a dedicated account for resources that are in progress (WIP) is processed. This posting represents the value of the time that is spent on the production order. After the production order is registered as ended, the WIP accounts are settled.

Reporting finished goods and error quantities

When a production order is reported as finished, the quantity of the finished goods that have been completed is updated in Inventory management through the Report as finished journal. If you're using WIP accounting, which can be set up in the production parameters, a ledger journal is made to reduce the WIP accounts and increase the inventory of the finished goods. The journal uses the standard cost that is defined for the product.

Ending the production order

Before a production order is ended, actual costs are calculated for the quantity that was produced. All estimated costs of material, labor, and overhead are reversed and replaced with actual costs. The overall cost of the finished item is debited from the inventory Receipt account and credited to the inventory Issues account. If you select the **End job** check box when you run the cost calculation, the status of the production order is changed to **Ended**. This status prevents any additional costs from being unintentionally posted to a completed production order. You can specify that the value of error quantities that are reported during reporting as finished should be allocated to the good quantities that are reported as finished. Alternatively, you can specify that the value of error quantities should be posted to a dedicated scrap account.

Controlling the level of ledger posting

In the **Production control parameters**, you can use the **Ledger posting** field to set the level of ledger posting for production processes. The following values are available:

- **Item and resource** – Use the ledger accounts that are set up on the item groups for raw materials and finished goods. WIP for time consumption is taken from resource or resource group from the route operations.
- **Item and category** – Use the ledger accounts that are set up on the item groups for raw materials and finished goods. WIP for time consumption is taken from the cost categories that are associated with the route

operations.

- **Production groups** – Use the ledger accounts that are set up on the production groups for both material and time consumption. The production groups are associated with the released products and copied to the production orders when those orders are created. The posting on the production orders will then follow the production groups that are associated with the production order.

Note: If the standard method for calculating the cost of the finished item was used, the final transactions reflect this fact. If actual costs and the costs that are calculated by using the standard method differ, the difference is posted to the account that shows profit or loss.

NOTE

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Time and attendance registration overview

2/18/2021 • 6 minutes to read • [Edit Online](#)

Time registration workers can enter different types of time registrations, for example, clock in, clock out, register indirect activities, and absence registration. This topic describes registrations, their calculation, approval, and the use of workflow to add structure and automated approval to the process of approving timesheets.

Registrations

In companies that use Time and attendance, workers must register the time that they spend at work, as well as their attendance. Some companies may only require workers to register clocking-in and clocking-out times. In other companies, workers may also be required to register time consumption on the actual activities they perform as well as the breaks they take. The intended users of Time and attendance are:

- Workers, who are required to register time and attendance at regular intervals, for example daily, weekly or bi-weekly.
- Supervisors, managers, and payroll officers who calculate, approve, and transfer worker registrations for further processing.

NOTE

If you run Time and attendance together with Manufacturing execution, all registrations on projects, project activities, indirect activities, absence codes, and overtime and flex time will be recorded and are used to calculate payroll in both modules.

Time registrations workers

To be able to register time and absence, workers must be set up as time registration workers in the company they are employed in.

After setup, the workers can enter different types of registrations.

- Clocking in- and out when arriving or leaving work.
- Time and item consumption on production jobs.
- Time used on a machine on the shop floor, if the machine has been defined as a resource.

NOTE

A worker can be automatically assigned the time registrations that are made on a particular machine on the shop floor, if the worker chooses to work as an assistant to the machine when he or she starts the production job.

- Time registrations on projects and project activities.
- Registering project fees and item consumption via the respective project fee journals and project item journals.
- Planned absence.
- Absence when arriving late to work or leaving earlier than planned.
- Work breaks, either manually registered or automatically calculated by the system.
- Indirect activities, which are non-productive activities a worker might engage in during a workday. Examples of these activities include meetings or cleaning their workspace.
- Overtime, which can be registered either as extra hours, flextime, or overtime.

Adding clock-out registrations

If a worker forgets to clock-out at the end of their workday, the missing registration can be added by running a batch job. The system will compare the clock-in time and the clock-out time according to the associated profile of the worker, and automatically insert the missing clock-out registration to match the profile's end time. Both the clock-in and clock-out registrations are vital for the subsequent calculation and approval of time registrations before they can be transferred to payroll.

Calculating registrations

When a registration worker is assigned a calculation group that typically relates to a specific team, shift, or work group. The team manager or supervisor typically validates the registrations made by the workers, and is therefore also the responsible person to run the calculation for the respective calculation groups on a daily basis. As part of the calculation process the team manager or supervisor is able to:

- Correct erroneous registrations. For example, change switch codes and adjust feedback on production jobs.
- Add missing registrations. For example, create clock-out registrations and create absence transactions.
- Delete incorrect registrations.

Because the registered time must match the worker's time profile prior to calculating the registrations, you must override the work time profile for any worker who has an exception to his standard work time profile. In the case, where the worker profile is day shift, and the worker has agreed to work a night shift with no overtime pay, the team manager or supervisor must override the default worker profile in order to calculate the working time at the standard night rate and not as overtime. The calculation will also display an error if an absence registration is missing. It must be added before the calculation can be completed.

Approving registrations

Just as you assign a calculation group to a time registration worker, you must assign an approval group as well. Typically the group will be specific to a team, shift, or work group. You must approve the time registrations that were calculated correctly – this means doing a calculation without errors – before pay items can be generated that afterward can be transferred to a payroll system. The payroll administrator will typically do the approval of registrations, and prior to the approval he is able to:

- Override pay agreements for individual workers.
- Add manual premiums.
- Enter additional information about absence registrations.

NOTE

If overtime has been calculated for specific workers, the overtime can be allocated to specific jobs during the day. This is relevant if job cost is calculated based on worker pay.

Approving registrations using workflow

You can set up a workflow approval process that automatically approves registrations which comply with workflow rules, leaving only deviations to be handled manually. If workflow approval is activated, the team manager or supervisor submits the calculated registrations for approval. The workflow process will generate the appropriate approvals and tasks, and then assign them to the right users and roles as identified in the workflow. There are two workflow approvals for time and attendance.

WORKFLOW	PURPOSE	REGISTRATION TYPE
Time and attendance days total	The workflow validates registrations against, for example, the expected number of work hours for the day.	
Time and attendance journal registration.	The workflow validates each registration type for the date of the registration.	Time and attendance • Clock-in • Clock-out • Absence • Break • Switch code • Project • Project activity • Indirect activity Production jobs • Queue before • Setup • Process • Overlap • Transport • Queue after • Start assistance • Stop assistance

Transferring approved registrations

After approval of the registrations you can transfer them to a periodic payroll job. A transferred registration is posted to an activity or job that it relates to, for example, a production order or a project. Payroll transactions are generated for each worker based on the registrations.

Reversing transferred registrations

The task of reversing transactions – rolling them back – can be done until the time when the payroll period's pay transfer is run. This means that payroll data has been transferred to an external file. When reversed, all registrations are withdrawn, and any transactions posted on production orders or projects are offset and neutralized.

NOTE

The external file can be imported into a payroll system.

Registrations in electronic timecards

Workers with job tasks that do not require immediate feedback, as is the case with production jobs, but who work on project activities, can benefit from using the electronic timecard. Electronic timecards offer the flexibility to enter registrations any time and in the best way for your business schedule – daily, weekly, or when a worker is in the office again after being away. To use electronic timecards or these workers, you must specify, Use timecard, in the worker details. Electronic timecards enable the worker to register:

- Date
- Registration type
- Job reference, such as project, indirect activity, or production order
- Job identification
- Time consumption
- Project fees
- Project items

NOTE

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Pay based on registrations

2/18/2021 • 27 minutes to read • [Edit Online](#)

This topic explains, in detail, how pay is calculated based on worker registrations. It includes examples that show how the various combinations of setup options that are available for the calculation affect the result. Here are some of the areas that will be covered:

- Flex time
- Overtime
- Breaks
- Switch codes
- Pay items
- Pay agreements
- Time and attendance calculation parameters
- Absence

The use of flex time

Periods of flex time are set up in the time profiles that are used in Time and attendance. There are two flex profile types: **Flex+** and **Flex-**. When a worker registers time in a Flex+ period, the worker's flex balance is increased by the hours that were worked. The worker doesn't receive any compensation for the hours that were worked during the Flex+ period. However, the worker can take time off during the Flex- periods and be compensated with the hours from his or her flex balance. Therefore, time off during the flex periods is considered an absence by the system.

Scenarios based on flex periods

The two scenarios that follow are based on a flex profile that represents a workday. For both scenarios, pay is calculated according to the flex period where the worker clocks in and out.

Flex profile for one workday

PROFILE TYPE	START	END	DAY
Over time	00:00 AM	06:00 AM	Monday
Flex+	06:00 AM	07:00 AM	Monday
Clock in	07:00 AM	07:00 AM	Monday
Standard time	07:00 AM	02:30 PM	Monday
Flex-	02:30 PM	03:30 PM	Monday
Clock out	03:30 PM	03:30 PM	Monday
Over time	03:30 PM	06:00 AM	Tuesday

Scenario 1: A worker registers clock-in during a Flex+ period and clock-out during a Flex- period

The worker's registrations for the day looks like this.

JOURNAL REGISTRATION TYPE	START	END
Clock in	06:30 AM	06:30 AM
Production job	06:30 AM	02:45 PM
Clock out	02:45 PM	02:45 PM

The worker's registrations for the day are calculated and transferred to pay on the **Approve** page (**Time and attendance > Review and approve > Approve**). After the registrations have been calculated, the result of the calculation can be viewed on the **Times** tab.

To understand this scenario, see the following fields.

FLEX +	FLEX -	TIME	PAY TIME
0.50	0.75	8.25	8.50

Calculation of Flex+

According to the flex profile, the time between 06:00 AM and 07:00 AM is a Flex+ period. Therefore, if the worker clocks in at 06:30 AM, he earns 0.5 hours. This amount of time is added to the worker's flex account.

Calculation of Flex-

According to the flex profile, the Flex- period starts at 02:30 PM and ends at 03:30 PM. Therefore, if the worker clocks out at 02:45 PM, the 45 minutes (0.75 hours) that remain in the Flex- period are registered as pay time, and the same amount of time is deducted from the worker's flex account. The 45 minutes are included in pay time because the worker will be granted pay for the remaining 45 minutes in the Flex- period. If the worker is absent during the Flex- period, the 45 minutes will be deducted from his flex account.

Calculation of Time

Time is calculated as the time between clock-in and clock-out, that is, 06:30 AM to 14:45 PM with equals 8.25 hours.

Calculation of Pay time

Pay time is the time that a worker is granted pay during. In this scenario, the worker is at work for 8.25 hours (**Time**). However, **Pay time** is calculated as 8.50 hours because the worker is granted pay during the Flex- period after he clocked out. The pay time equals the planned work hours because Flex+ time is added to the worker's flex account, not to the pay time. The absence time during the Flex- period is compensated for by the pay time and deducted from the worker's flex account.

TIME	REGISTRATION TYPE	PAY TIME (HOURS)
6:30 AM - 7:00 AM	Flex+	0
7:00 AM – 2:45 PM	Standard time	7.75
2:45 PM – 3:30 PM	Flex-	0.75 (Absence period)
	Total	8.50

Scenario 2: A worker works during the whole Flex- period and also works overtime

The worker's registrations for the day look like this.

JOURNAL REGISTRATION TYPE	START	END
Clock in	06:30 AM	06:30 AM
Production job	06:30 AM	05:00 PM
Clock out	05:00 PM	05:00 PM

After you've calculated the journal registrations on the **Approve** page, you can view the calculation result on the **Times** tab. To understand this scenario, see the following fields.

FLEX +	FLEX -	TIME	PAY TIME	PAY OVERTIME
0.50	0.00	10.50	10.00	1.50

Calculation of Flex+

According to the flex profile, the time between 06:00 AM and 07:00 AM is a Flex+ period. Therefore, if the worker clocks in at 06:30 AM, she earns 0.5 hours of Flex+ time on her flex balance.

Calculation of Flex-

Because the worker is working during the Flex- period, Flex- isn't calculated. Flex- is calculated only if the worker is absent during the Flex- period. From a payment perspective, if the worker works during the Flex- period, she is granted the pay rate that is defined for standard time. If the worker is absent during the Flex- period, the 45 minutes are deducted from her flex account.

Calculation of Time

Time is calculated as the time between clock-in at 06:30 AM and clock-out at 05:00 PM, or 10.50 hours.

Calculation of Pay time

In this scenario, the worker works 10.50 hours (Time). However, Pay time is calculated as 10.00 hours because the worker isn't granted pay during the Flex+ period.

Calculation of Pay overtime

TIME	REGISTRATION TYPE	PAY TIME (HOURS)
6:30 AM - 7:00 AM	Flex+	0
7:00 AM – 2:30 PM	Standard time	7.50
2:30 PM – 3:30 PM	Flex-	1.00
3:30 PM – 05:00 PM	Overtime	1.50
	Total	10.00

Generation of pay items

Worker registrations for the day can be transferred from the **Approve** page. During the transfer process, pay items and transferred registrations are generated. Pay items represent a breakdown of pay time into standard time, overtime, paid break time, and so on.

To open the list of pay items, select **Time and attendance > Review and approve > Approve**. Then select **Inquiry > Transferred registrations**.

The pay items are the basis for a worker's pay. You can generate a file that includes the information from the pay items and transfer that file to a payroll system.

As part of the transfer process, time and cost from production and project activities are transferred to production and project journals to account for the time and cost spend. The transferred registrations are the basis for time and cost price per hour for production orders and projects. You can open the transferred registrations by using the **Inquiry** menu on the **Approve** page.

For example, for scenario 2, the following pay items are generated.

WAGE TYPE	PAY TYPE	PAY UNITS	RATE	TOTAL COST
Standard time	1201	10.0	10	100
Overtime	1301	1.50	5	7.50
			Total	107.50

The pay item for standard time has a pay unit of 10 hours that covers standard time, Flex- time, and overtime. Standard time, Flex- time, and overtime are consolidated into one pay item because all the types are calculated as standard time, based on the default setting of a parameter on the **Calculation parameters** page (**Time and attendance > Setup > Calculation parameters**). The overtime is calculated on top of the standard time by using an additional rate of 5.

If you want to clearly distinguish standard time and overtime, so that the pay units for the pay types cover only the actual time spend on standard time and overtime, the pay units for standard time must be calculated as 8.50, and the pay units for overtime must be calculated as 1.50.

To configure the system to clearly distinguish standard time and overtime, you must exclude overtime from the standard time. You must also change the setup of the pay type for overtime so that the pay rate for overtime covers all payments for the hours that were spent on overtime.

Exclude overtime from the standard time

On the **Calculation parameters** page, select **Overtime** as the profile specification type, and set the **Pay time** option to **No**, as shown here.

REG. SPECIFICATION	PROFILE SPECIFICATION TYPE	CALCULATION		PAID	
Working time	Overtime	Standard time	Yes	Pay time	No
		Pay time	Yes	Pay overtime	Yes

After you adjust the calculation parameters, the following pay items are generated.

WAGE TYPE	PAY TYPE	PAY UNITS	RATE	TOTAL COST
Standard time	1201	8.50	10	85.0
Overtime	1301	1.50	15	22.50
			Total	107.50

NOTE

The calculation parameters have a recommended standard setting. In general, you should be careful when you change these parameters. To restore the recommended standard settings, on the **Calculation parameters** page, select **Restore values**.

Allow a deviation from the standard pay profiles

On the **Profiles** page (**Time and attendance > Setup > Time profiles > Profiles**), you can set up profile types that include switch codes and breaks.

Switch codes

You can use switch codes to allow workers to deviate from their profile type by changing a different profile type. For example, you can allow a worker to change from Flex+ time to overtime. A worker can add a switch code during registration, or you can assign the task of adding a switch code to the approver of the registrations.

Before a switch code can be used, you must define it as a type of indirect activity. You must then add the switch code to the time profile for the period where you want to allow a change of profile type. For example, follow these steps to create a switch code that allows the Flex+ period to be changed from 06:00 AM to 07:00 AM to overtime.

1. Create a switch code that is named **OTBCI (Convert flex to overtime before clock-in)**. Select **Time and attendance > Manage indirect activities > Indirect activities**.
2. In the **Switch code** column, add OTBCI to the Flex+ line in the time profile.
3. In the **Secondary** column, add the **Overtime** profile type.

Consider the following flex profile that represents a workday.

PROFILE TYPE	START	END	DAY
Over time	00:00 AM	06:00 AM	Monday
Flex+	06:00 AM	07:00 AM	Monday
Clock in	07:00 AM	07:00 AM	Monday
Standard time	07:00 AM	02:30 PM	Monday
Flex-	02:30 PM	03:30 PM	Monday
Clock out	03:30 PM	03:30 PM	Monday
Over time	03:30 PM	06:00 AM	Tuesday

Here are the worker's registrations for the day.

JOURNAL REGISTRATION TYPE	START	END
Clock in	06:30 AM	06:30 AM
Production job	06:30 AM	02:45 PM
Clock out	05:00 PM	05:00 PM

The following pay items are generated after the transfer.

WAGE TYPE	PAY TYPE	PAY UNITS	RATE	TOTAL COST
Standard time	1201	8.50	10	85.0
Overtime	1305	1.50	15	22.50
			Total	107.50

On the **Approve** page, undo the transfer, and then use the **Switch code** menu to apply the **OTBCI** switch code. When you transfer the registrations a second time, the following pay items are generated.

WAGE TYPE	PAY TYPE	PAY UNITS	RATE	TOTAL COST
Standard time	1201	8.50	10	80.0
Overtime	1305	2.00	15	30.0
			Total	107.50

NOTE

When you apply the switch code, overtime is increased by 0.5 hour, from 1.50 to 2.00. The 0.5 hour is the conversion of the Flex+ time that is registered, from 6:30 AM to 07:00 to overtime.

Breaks

Breaks from work affect the calculation of worker pay. Breaks are defined as a type of indirect activity. They can be defined as either **Paid**, to allow the break to add to the worker's pay, or **Unpaid**, to prevent the break from adding to the worker's pay. A break can also be defined as either **Planned** or **Registered**.

Planned breaks

If a company has a fixed break time, such as a fixed break for lunch, the break can be predefined in the time profile. In this case, the worker doesn't have to register the break on the job card pages. Instead, the break is automatically accounted for when the worker's registrations are calculated on the **Approve** page.

Registered breaks

If a company doesn't use planned breaks, workers can register breaks during the workday. Registered breaks can be used, for example, if a worker is working against a flex time profile that has no defined clock-in and clock-out times. Registered breaks are a type of indirect activity. The worker registers the break on the **Job card** terminal page or on the **Job card** device page. On both these pages, the user can select the type of break in a list of predefined break activities.

Paid and unpaid breaks

Break activities can be set up as **Paid** or **Unpaid**. A paid break is included in the calculation of pay time, and the system uses the pay type that is defined in the pay agreement for the **Break** registration type.

Example of a planned break

Consider the following time profile that includes an unpaid break for lunch.

PROFILE TYPE	START	END	DAY
Over time	00:00 AM	06:00 AM	Monday

PROFILE TYPE	START	END	DAY
Flex+	06:00 AM	07:00 AM	Monday
Clock in	07:00 AM	07:00 AM	Monday
Standard time	07:00 AM	12:00 PM	Monday
Break	12:00 PM	12:30 PM	Monday
Standard time	12:30 PM	02:30 PM	Monday
Flex-	02:30 PM	03:30 PM	Monday
Clock out	03:30 PM	03:30 PM	Monday
Over time	03:30 PM	06:00 AM	Tuesday

Here are the worker's registrations for the day.

JOURNAL REGISTRATION TYPE	START	END
Clock in	06:30 AM	06:30 AM
Production job	06:30 AM	02:45 PM
Clock out	05:00 PM	05:00 PM

After you've calculated the journal registrations on the **Approve** page, you can view the calculation result on the **Times** tab. To understand this scenario, see the following fields.

FLEX +	FLEX -	TIME	PAY TIME	NON-PAID BREAK TIME	PAY OVERTIME
0.50	0.00	10.50	9.50	0.5	1.50

NOTE

The system calculated 0.5 hours of unpaid break time, and that time isn't part of the pay time.

Example of a registered break

Consider the following time profile that doesn't include planned breaks.

PROFILE TYPE	START	END	DAY
Over time	00:00 AM	06:00 AM	Monday
Flex+	06:00 AM	07:00 AM	Monday
Clock in	07:00 AM	07:00 AM	Monday
Standard time	07:00 AM	02:30 PM	Monday

PROFILE TYPE	START	END	DAY
Flex-	02:30 PM	03:30 PM	Monday
Clock out	03:30 PM	03:30 PM	Monday
Over time	03:30 PM	06:00 AM	Tuesday

Here are the worker's registrations for the day.

JOURNAL REGISTRATION TYPE	START	END
Clock in	06:30 AM	06:30 AM
Production job	06:30 AM	05:00 PM
Break	12:03 PM	12:32 PM
Clock out	05:00 PM	05:00 PM

When the registrations are calculated, the time for the activities is calculated.

JOURNAL REGISTRATION TYPE	START	END	TIME
Clock in	06:30 AM	06:30 AM	
Production job	06:30 AM	05:00 PM	10.00
Break	12:03 PM	12:32 PM	0.50
Clock out	05:00 PM	05:00 PM	

NOTE

The time for the break runs in parallel with the time for the activity (a production job, in this example). This behavior is always used for break activities. When the registrations are calculated, the break time is subtracted from the activity time. In this case, the production job has a duration of 10.50 hours, but the time is calculated as 10 because 0.5 hours of break time are subtracted from the activity time.

After you've calculated the journal registrations on the **Approve** page, you can view the calculation result on the **Times** tab. To understand this scenario, see the following fields.

FLEX +	FLEX -	TIME	PAY TIME	NON-PAID BREAK TIME	PAY OVERTIME
0.50	0.00	10.50	9.50	0.5	1.50

If the planned break had been paid instead of unpaid, the calculation result would look like this.

FLEX +	FLEX -	TIME	PAY TIME	PAID BREAK TIME	PAY OVERTIME
0.50	0.00	10.50	10.00	0.5	1.50

Pay items and paid breaks

When you transfer registrations on the **Approve** page, pay items are generated. A separate pay item is generated for paid breaks.

The pay rate for a paid break is determined by the pay type that is set up in the pay agreements for the break. Instead of using a pay type, you can set up the cost price per hour on the break for a defined date interval.

Consider the following time profile.

PROFILE TYPE	START	END	DAY
Over time	00:00 AM	06:00 AM	Monday
Flex+	06:00 AM	07:00 AM	Monday
Clock in	07:00 AM	07:00 AM	Monday
Standard time	07:00 AM	02:30 PM	Monday
Flex-	02:30 PM	03:30 PM	Monday
Clock out	03:30 PM	03:30 PM	Monday
Over time	03:30 PM	06:00 AM	Tuesday

Here are the worker's registrations for the day.

JOURNAL REGISTRATION TYPE	START	END	TIME
Clock in	07:00 AM	07:00 AM	
Production job	07:00 AM	03:00 PM	7.5
Break (Paid)	12:00 PM	12:30 PM	0.5
Clock out	03:00 PM	03:00 PM	

For this example, the pay type for standard time is set to **1201**, and a pay rate of **10** is set up in the pay agreement. The paid break has a pay type of **1301** and a pay rate of **8**. When the registrations are transferred, the following pay items are generated.

WAGE TYPE	PAY TYPE	PAY UNITS	RATE
Standard time	1201	7.50	10
Flex-	1201	0.50	10
Break (Paid)	1301	0.50	8

How the cost of paid breaks is allocated to projects and production orders

The hourly cost on project activities and production jobs can be set up so that it's determined either by the pay rates that are calculated in Time and attendance or by the cost categories that are defined for the activities.

To set up the cost category, select **Production control > Setup > Manufacturing execution > Production order defaults**, and set the **Cost category** field to either **Yes** or **No**.

- **No** – Cost is calculated based on pay rates that are defined for Time and attendance registration types.
- **Yes** – Cost is calculated based on cost categories for production and project activities.

Cost calculation based on pay rates that are calculated in Time and attendance

The following example shows how the hourly cost is calculated when the cost is set up so that it's calculated based on pay rates.

The hourly cost rate that is used for production orders and projects is calculated during the transfer process. To view the hourly rate per activity, open the **Approve** page in Time and attendance, and then select **Inquiry > Transferred registrations**. You can find the hourly cost rate per registration on the **Cost prices** tab.

Consider the following registrations that use the same time profile as the previous example.

JOURNAL REGISTRATION TYPE	START	END	TIME
Clock in	07:00 AM	07:00 AM	
Process (Order: 4711)	07:00 AM	11:00 AM	4
Process (Order: 4712)	11:00 AM	03:00 PM	3.50
Break (Paid)	12:00 PM	12:30 PM	0.50
Clock out	03:00 PM	03:00 PM	

After the registrations are transferred, the following transferred registrations are generated.

REGISTRATION TYPE	TIME	COST PRICE PER HOUR
Clock-in	0.00	0.00
Process (Order: 4711)	4.00	10.00
Process (Order: 4712)	3.50	11.14
Break (Paid)	0.50	0.00
Clock out	0.00	0.00

The calculation of the cost price per hour for the paid break depends on a setting for the direct payroll costs. Select **Time and attendance > Setup > Time and attendance parameters**. On the **Cost price** tab, under **Direct payroll costs**, in the **Standard time** field, you can select **Yes**, **No**, or **Allocation**.

- **Yes** – This value is used for the preceding example. The cost is allocated to the production or project activity that runs in parallel with the paid break activity. In the example, this activity is the production job

for order 4712. As you can see, the cost price per hour for the paid break is 0 (zero), and it's allocated to the job that runs in parallel with the break.

The paid break has a duration of 0.5 hour, and the pay rate is 8. Therefore, the total cost for the paid break is 4. The total cost is then allocated to the 3.5-hour process job. Therefore, the paid break contributes 1.14 per hour to the cost ($4 \div 3.5 = 1.14$).

- **Allocation** – The paid break is equally distributed to the jobs that are registered for the day. If this value is used for the preceding example, the following transferred registrations are generated.

REGISTRATION TYPE	TIME	COST PRICE PER HOUR
Clock-in	0.00	0.00
Process (Order: 4711)	4.00	10.53
Process (Order: 4712)	3.50	10.53
Break (Paid)	0.50	0.00
Clock out	0.00	0.00

The total process time for the two production jobs is 7.5 hours, and the total cost of the paid break is 4. Therefore, the cost of the break is calculated as 0.53 ($= 4 \div 7.5$).

- **No** – The cost of the paid break doesn't increase the hourly cost of the process activities.

REGISTRATION TYPE	TIME	COST PRICE PER HOUR
Clock-in	0.00	0.00
Process (Order: 4711)	4.00	10.00
Process (Order: 4712)	3.50	10.00
Break (Paid)	0.50	0.00
Clock out	0.00	0.00

Absence

An absence code is used to register the period of a worker's absence. Like breaks and switch codes, an absence code is a type of an indirect activity. Absence time can be either planned or registered, and absence can be either legal or illegal. Examples of legal absence include a doctor's appointment, a seminar, or jury duty. Illegal absence is absence that has no good reason, such as when a worker is late for work. Usually, legal absence doesn't cause a deduction in a worker's pay, whereas illegal absence does cause a deduction.

Planned absence

You can create planned absence for workers on the **Create planned absence** page (**Time and attendance > Create planned absence**). There, the planned absence is registered as an absence job for a specified date and time interval.

The job is based on a query. Therefore, you can create planned absence for multiple workers, such as workers who belong to the same calculation group. If the planned absence is for a single worker, the registration can be

entered from either the **Attendance** page or the **Time registration workers** page.

- To enter an absence registration from the **Attendance** page, select **Time and attendance > Inquiries and reports > Attendance > Attendance**, and then select **Absence registration**.
- To enter an absence registration from the *Time registration workers* page, select **Time and attendance > Setup > Time registration workers**, and then, on the **Time** tab, under **Time assignment**, select **Absence registrations**.

You can use the **Planned absences** report to see an overview of planned absences for workers. To open this report, select **Time and attendance > Inquiries and reports > Absence reports > Planned absences**.

Registered absence

In general, workers are considered absent if they aren't at work for any period between their planned clock-in time and their planned clock-out time. If workers clock in later than planned, or if they clock out earlier than planned, they are prompted to select an absence code to indicate the reason for the absence. An absence code can be set up so that it's applicable to registration. Only applicable codes will be available for selection in the list.

Scenarios based on various combinations of work hour registrations

The following scenarios show the pay items and entries for approval that are generated for workers based on their registrations. All the scenarios are based on the following time profile.

PROFILE TYPE	START	END	DAY
Over time	00:00 AM	06:00 AM	Monday
Flex+	06:00 AM	07:00 AM	Monday
Clock in	07:00 AM	07:00 AM	Monday
Standard time	07:00 AM	02:30 PM	Monday
Flex-	02:30 PM	03:30 PM	Monday
Clock out	03:30 PM	03:30 PM	Monday
Over time	03:30 PM	06:00 AM	Tuesday

Scenario 1: The worker clocks in later than planned

The worker clocks in at 08:30 AM. Because his planned clock-in time is 07:00 AM, he is 1.50 hour late for work. Because the 1.50 hour is considered absence time, the worker is prompted to select an absence code. The worker leaves work at 03:30 PM, which is the planned clock-out time. When the worker's registrations are calculated and approved, the absence registration, together with the absence code that the worker selected at clock-in, appears for the time between 07:00 AM and 08:30 AM.

In the time profile, you can configure the **Clock-in** registration type so that there is a tolerance when workers are late for work. For example, if you set up a tolerance of 5, the worker is prompted for an absence code only if he clocks in later than 07:05 AM.

In this case, because the worker doesn't have a good reason for being late for work, he selects an absence code that is defined for illegal absence. An absence code is considered applicable to illegal absence if the setting for overtime deduction is enabled for the absence group that the absence code belongs to. To set the setting, select **Time and attendance > Setup > Groups > Absence groups**, and then select the **Deduct overtime** check box.

Here is how the worker's registrations for the day appear on the **Approve** page after calculation.

JOURNAL REGISTRATION TYPE	START	END	TIME
Absence (illegal - late for work)	07:00 AM	08:30 AM	1.5
Clock in	08:30 AM	08:30 AM	
Production job	07:30 AM	03:30 PM	7.0
Clock out	03:30 PM	03:30 PM	

Here is the resulting pay item after the registrations are transferred.

WAGE TYPE	PAY TYPE	PAY UNITS	RATE
Standard time	1201	7.00	10

Scenario 2: The worker clocks out before the planned clock-out time during a standard-time period

The worker clocks in at 07:00 AM and clocks out early at 01:00 PM. Because 01:00 PM is before planned clock-out at 03:30 PM, and 01:00 AM is in a standard-time period, the worker is prompted to select an absence code. The worker selects an absence code for a doctor's appointment, which is defined as legal absence. The pay rate for legal absence is defined in the pay agreements for the **Absence** registration type (**Time and attendance > Setup > Payroll > Pay agreements**).

Here is how the worker's registrations for the day appear on the **Approve** page after calculation.

JOURNAL REGISTRATION TYPE	START	END	TIME
Clock in	07:00 AM	07:00 AM	
Production job	07:00 AM	01:00 PM	4.0
Clock out	01:00 PM	01:00 PM	
Absence (legal – doctor's appointment)	01:00 PM	03:30 PM	3.5

Here is the resulting pay item after the registrations are transferred.

WAGE TYPE	PAY TYPE	PAY UNITS	RATE
Standard time	1201	7.50	10

Scenario 3: The worker clocks out before the planned clock-out time during a Flex- period

The worker clocks in at 07:00 AM and clocks out at 02:15 PM, which is in the planned Flex- period. The time between the actual clock-out time and the planned clock-out time isn't considered absence, and the worker isn't prompted to select an absence code. The amount is deducted from the worker's flex account, and the worker is granted pay during the remaining part of the Flex- period, from 02:15 to 03:30 PM.

Here is how the worker's registrations for the day appear on the **Approve** page after calculation.

JOURNAL REGISTRATION TYPE	START	END	TIME
Clock in	07:00 AM	07:00 AM	
Production job	07:00 AM	02:15 PM	7.25
Clock out	02:15 PM	02:15 PM	

Here is the resulting pay item after the registrations are transferred.

WAGE TYPE	PAY TYPE	PAY UNITS	RATE
Standard time	1201	8.50	10

Scenario 4: The worker clocks in late and clocks out after the planned clock-out time during an overtime period

The worker clocks in late at 09:30 AM and then, to compensate for his late attendance, he works overtime and clocks out at 05:00 PM. Because the worker came in late and compensated by working longer, the company doesn't want to grant the worker overtime pay for the hours that he worked between the planned clock-out at 03:30 PM and his actual clock-out at 05:00 PM, even though this period is defined as overtime in the time profile.

To handle this scenario, the absence code can be set up to reduce overtime hours by any hours of illegal absence that the worker has on the same day. Select **Time and attendance > Setup > Groups > Absence groups**, and select the **Deduct overtime** check box to deduct overtime from hours of illegal absence.

Here is how the worker's registrations for the day appear on the **Approve** page after calculation.

JOURNAL REGISTRATION TYPE	START	END	TIME
Absence (illegal - late for work)	07:00 AM	09:30 AM	1.5
Clock in	09:30 AM	09:30 AM	
Production job	09:30 AM	05:00 PM	7.5
Clock out	05:30 PM	05:30 PM	

If the **Deduct overtime** check box is selected for the selected absence code, the overtime payment is deducted by the hours that the worker was illegally absent. In this case, the following pay items are generated after the registrations are transferred.

WAGE TYPE	PAY TYPE	PAY UNITS	RATE
Standard time	1201	9.00	10
Overtime	1301	0.5	15

Here, the 1.5 hours of illegal absence, from 07:00 AM to 09:30 AM, deduct the 2.0 hours of overtime, from 03:30 PM to 05:30 PM. The result of the registration is 1.5 hours of standard time and 0.5 hours of overtime.

By contrast, if the **Deduct overtime** check box is cleared for the selected absence code, the overtime payment

is granted to the worker, even though he was late and had an illegal absence. In this case, the following pay items are generated after the registrations are transferred.

WAGE TYPE	PAY TYPE	PAY UNITS	RATE
Standard time	1201	7.50	10
Overtime	1301	2.0	15

Scenario 5: The worker clocks out before the planned clock-out time and can convert the absence period to a Flex- period

The following example shows how a worker's flex account can be reduced by converting the absence period to a Flex- period.

The worker clocks in at 07:00 AM and clocks out at 01:00 PM. She has reached an agreement with her supervisor that she can go home for the weekend if she deducts these hours from her flex account. When the worker clocks out at 01:00 PM, she is prompted to select an absence code, because the period of absence for the remaining part of the workday that is affected isn't in a planned Flex- period. To convert the remaining part of the workday to a Flex- period, the worker can select an absence code that is set up to reduce her flex account.

To reduce the balance of flexible hours for workers who register absence on a workday, select **Time and attendance > Setup > Groups > Absence groups**, and select the **Reduce flex** check box.

Here is how the worker's registrations for the day appear on the **Approve** page before calculation.

JOURNAL REGISTRATION TYPE	START	END	TIME
Clock in	07:00 AM	07:00 AM	
Production job	07:00 AM	01:00 PM	6.0
Clock out	01:00 PM	01:00 PM	

If the worker selects an absence code for illegal absence, here is how the resulting pay item will look after the registration is transferred.

WAGE TYPE	PAY TYPE	PAY UNITS	RATE
Standard time	1201	6.00	10

If the worker selects an absence code for legal absence, and the absence code is set up to reduce her flex account, here is how the resulting pay items will look after the registrations are transferred.

WAGE TYPE	PAY TYPE	PAY UNITS	RATE
Standard time	1201	8.50	10

In this case, the worker's flex balance is reduced by the hours between the actual clock-out time and the planned clock-out time (that is, the 2.5 hours from 01:00 PM to 03:30 PM).

NOTE

We don't recommend that you select both the **Deduct flex** check box and the **Deduct overtime** check box for an absence code, because this setup will deduct the illegal hours from the worker's overtime hours and at the same time reduce the worker's flex account.

Scenario 6: There is no planned absence for the day and no worker attendance for the day

If the worker doesn't show up for work on a workday, and there is no planned absence for the worker on that day, a default absence code is used for the calculation of the worker's registrations. To define default absence codes, select **Time and attendance > Time and attendance parameters**. You can then select an absence code in the following fields:

- Auto insert Flex-
- Auto insert absence

When the daily registrations are calculated for a worker who is enabled for flexible hours, the absence code that is specified in the **Auto insert flex-** field is used as a default absence code. If the worker isn't enabled for flexible hours, the absence code that is specified in the **Auto insert absence** field is used. If a company has a combination of workers who are enabled for flexible hours and workers who aren't enabled for flexible hours, both parameters must be set up.

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Absence registration in Time and attendance

2/18/2021 • 5 minutes to read • [Edit Online](#)

This topic describes the concepts for absence and explains how to handle absence in Time and attendance.

Absence that is based on regular work hours

Workers are considered absent for any hours that they don't work during their regular work hours. Regular work hours are defined in a worker's standard time profile.

For example, a worker is working on a day profile that has clock-in at 7:00 AM and clock-out at 3:00 PM. If the worker clocks in at 9:00 AM, he is considered absent from 7:00 AM to 9:00 AM on that day.

In this case, workers are prompted to enter a reason for their absence. They can specify a reason by selecting an absence code.

Absence codes

Absence codes define the various types of absence. Absence codes are defined by the company.

Various rules can be applied to absence codes. For example, an absence code can be configured to deduct or grant pay.

For example, a company defines a **Late** absence code that workers use if they come in late and don't have a good reason. The company also defines an **Internal course** absence code that workers use for time that they spend attending internal courses. These absence codes can be set up so that **Late** deducts from a worker's pay but **Internal course** doesn't deduct from a worker's pay.

You can set up automatic absence codes. These absence codes can be used to calculate a worker's time when no absence is registered. The worker's time profile determines whether the absence code for standard time or flex time is used.

Set up standard time and flex time

- Configure the parameters for standard time and flex time by using the **Auto insert absence** and **Auto insert Flex-** options on the **Time and attendance parameters** page.

Absence groups

Absence codes are grouped into absence groups. You use absence groups to group absence codes that have common characteristics. Examples include absence codes for a legal absence, or absence because of a doctor's appointment, jury duty, or a sick child.

Planned absence

If you know that a worker will be absent for a period, such as an upcoming vacation, you can use planned absence. You set up planned absence by configuring the absence code so that it considers the planned absence. When you set up a planned absence, you aren't prompted for an absence code during the absence period when user time registrations are calculated. Planned absence can be defined for a single worker, or you can define a batch job to bulk update the planned absence for workers.

Set up planned absence

1. Select **Human resources > Workers > Employees**, and select an employee.

2. Select **Time > Time assignments > Time Absence registration**, and set up the planned absence.

Interrupted planned absence

If you apply the **Interrupt** option when you set up a planned absence, the planned absence will be interrupted if the worker signs in during the planned absence period. The planned absence will be marked as **Interrupted** and won't have any effect on future calculations.

Set up a planned absence for interruption

1. Open the **Time Absence registration** page as described in the procedure for setting up planned absence.
2. Select **Interrupt**.

The **Interrupt** option applies when time is registered through the shop floor terminal or the shop floor device. The option doesn't apply if the registrations are entered on the calculation and approval pages, or on the **Electronic timecard** page.

Examples of the use of absence in a flex profile

The following three examples show how absence is calculated in a profile that has flex periods.

The examples use the following profile.

CLOCK-IN	STANDARD TIME	BREAK	STANDARD TIME	FLEX-	CLOCK-OUT	FLEX+
8 AM	9 AM to 11:30 AM	11:30 AM to 12 PM	12 PM to 3 PM	3 PM to 4 PM	4 PM	4 PM to 6 PM

Example 1: Signing out during a Flex- period

The worker clocks in at 8:00 AM and clocks out at 3:30 PM. In this case, because the worker clocks out during a Flex- period, no absence is calculated, and half an hour is deducted from the worker's flex balance.

Example 2: Signing out in during Standard time period

The worker clocks in at 8:00 AM and clocks out at 2:30 PM. In this case, because the worker clocks out during the Standard time period, absence is calculated from 2:30 PM to 4 PM, and an absence period of 1.5 hours is registered. An absence code for that period is required.

Example 3: Signing out during a Flex+ period

The worker clocks in at 8:00 AM and clocks out at 4:30 PM. In this case, because the worker clocks out during a Flex+ period, no absence is calculated, and half an hour is added to the worker's flex balance.

Absence in the calculation and approval process

Worker time registrations must be calculated and approved before they can be transferred to a payroll system as pay items.

An approver can change a worker's time registrations. The approver can even change any absence that the worker has registered. If the approver manually enters a time period that has an absence code, the absence code for that period isn't overridden by the default absence code from the Time and attendance parameters.

For example, a worker clocks in at 10 AM and selects an absence code that indicates that she is late. Later, the worker informs her supervisor that she had a doctor's appointment from 8 AM to 10 AM. A doctor's appointment should not cause a deduction in the worker's pay. Therefore, in this case, the supervisor can adjust the two hours of absence from 8 AM to 10 AM by manually entering an absence code that indicates illness for those two hours.

Calculate and approve absence

- Select **Time attendance** > **Review and approve** > **Approve or Calculate**.

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Flex groups

2/18/2021 • 8 minutes to read • [Edit Online](#)

Flexible working hours let companies minimize payments for overtime by offering workers extra time off during periods when the workload is low. This feature is relevant, for example, in segments that experience seasonal changes in workload.

You can use flex groups to set the following rules and principles for a worker's flexible hours:

- Rules for flex regulations
- Principle for calculating the worker's flex balance

Set up flexible working hours in flex groups

- Select **Time and attendance** > **Setup** > **Groups** > **Flex groups** to set up flex groups for flexible hours.

Associate workers with flex groups

- Select **Time and attendance** > **Setup** > **Time registration workers**.

Rules for flex regulations

You can use rules for flex regulations to define flex limits, or the minimum and maximum number of hours that are allowed in the worker's flex account. The flex limits are set up on the flex group. When the flex limits are exceeded, a worker's flex balance and pay can be adjusted.

If a worker's allowed flex minimum is exceeded (that is, if the number of hours in the flex account is below the specified minimum), you can use these methods to adjust the worker's flex balance by making a flex regulation:

- The worker's flex account can be adjusted to the specified allowed minimum, but without deducting the worker's pay for the number of hours that the flex account is below the allowed minimum.
- The worker's pay can be deducted for the number of hours that the flex account is below the allowed minimum. This deduction is done by generating pay items for a specific pay type that have a negative or positive pay unit.

If the worker's allowed flex maximum is exceeded, you can use these methods to adjust the worker's flex balance by making a flex regulation:

- The worker's flex account can be adjusted back to the specified allowed maximum, but without compensating the worker's pay for the number of hours that the worker worked above the allowed maximum.
- The number of hours that the worker worked above the allowed maximum can be converted to pay. This conversion is done by generating pay items for a specific pay type.

You can adjust a flex balance at the following times:

- When a payment file that is based on payroll data is exported by using the **Transfer pay** job. The payroll data is generated when you transfer the worker's registration from the **Approve** page.
- When the **Adjust flex balance** job is processed.

NOTE

Flex regulations don't occur during the daily approval and transfer of worker registrations on the **Approve** page.

Principle for calculating a worker's flex balance

The principle for calculating the hours that the worker's flex balance are adjusted by is set up on the flex group. Select **Time and attendance > Setup > Groups > Flex groups**.

The following two principles can be used:

- **Time** – The worker's flexible hours are calculated only from the worker's registered time for the day. When the worker's daily registrations are calculated, the number of Flex+ and Flex- hours for the day is calculated from the Flex+ and Flex- zones that are defined in the worker's time profile.
- **Pay types** – The worker's flexible hours are calculated based on earnings of the pay types for Flex+ and Flex- that are defined in the worker's pay agreement. The pay agreement is associated with the time registration worker. You might want to use pay types to manage flex accounts if, for example, you want to increase a worker's flex account by a specific factor in one or more flex zones.

Scenario 1: Adjusting a worker's pay and flex account because the allowed flex minimum is exceeded

A worker who can work flexible hours has a negative flex account.

- **Flex account:** -4

The worker is associated with a flex group that has the following configuration:

- **Flex minimum:** -0.5
- **Minimum pay type:** 1302
- **Pay type factor:** -1.00

As the difference between the worker's flex account and his allowed flex minimum indicates, the worker has exceeded his allowed flex minimum by 3.5 hours.

When the payroll administrator transfers the worker's pay data by running the **Transfer to pay** or **Flex adjustment** job, the following adjustments are made:

- The worker's flex account is adjusted by 3.5 hours. Therefore, the flex balance of -4.0 hours becomes adjusted to the worker's allowed flex minimum of -0.5 hours.
- A pay item for pay type 1302 is created. This pay item has a pay unit of -3.5 hours that will be deducted from the worker's pay. In this case, the pay unit is a negative number, because the positive adjustment of 3.5 hours is multiplied by the negative pay type factor of -1.0 that is defined on the flex group. This pay item will be part of the pay file that is generated by the **Transfer to pay** job.

Scenario 2: Adjusting a worker's pay and flex account because the allowed flex maximum is exceeded

A worker who can work flexible hours has a positive flex account.

- **Flex account:** 6

The worker is associated with a flex group that has the following configuration:

- **Flex maximum:** 2.0
- **Minimum pay type:** 1302
- **Pay type factor:** -1.0

As the difference between the worker's flex account and her allowed flex maximum indicates, the worker has exceeded her allowed flex maximum by 4.0 hours.

When the payroll administrator transfers the worker's pay data by running the **Transfer to pay** or **Flex adjustment** job, the following adjustments are made:

- The worker's flex account is adjusted by -4.0 hours. Therefore, the flex balance of 6.0 hours becomes adjusted to the worker's allowed flex maximum of 2.0 hours.
- A pay item for pay type 1302 is created. This pay item has a pay unit of 4.0 hours that will be added to the worker's pay. In this case, the pay unit is a positive number, because the negative adjustment of 4.0 hours is multiplied by the negative pay type factor of -1.0 that is defined on the flex group. This pay item will be part of the pay file that is generated by the **Transfer to pay** job.

Scenario 3: Managing a worker's flex balance based on pay types

As we explained earlier, flex accounts can be managed based either on the time that is registered in the Flex+ and Flex- zones that are defined the worker's time profile, or on the pay types that are defined in the worker's pay agreements. If pay types are used, a worker's flex account is adjusted by the pay items that are generated when you transfer the worker's registration from the **Approve** page. You might want to use pay types to manage flex accounts if, for example, you want to increase a worker's flex account by a specific factor in one or more flex zones.

This scenario uses the following flex profile that represents a workday.

PROFILE TYPE	START	END
Flex+	12:00 AM	08:00 AM
Clock in	08:00 AM	08:00 AM
Flex-	08:00 AM	09:00 AM
Standard time	09:00 AM	11:30 AM
Paid break	11:30 AM	12:00 PM
Flex-	12:00 PM	04:00 PM
Clock out	04:00 PM	04:00 PM
Flex+	04:00 PM	12:00 AM

In this case, you want to be able to manage the worker's flex balance based on pay types. Therefore, you must set the **Based on pay types** option to **Yes** on the worker's flex group.

To account for the flexible hours, you must also define a new pay type. For this scenario, the pay type is named **FlexCnt**.

PAY TYPE	DESCRIPTION
FlexCnt	Flex counter

Next, follow these steps to set up a pay type and add lines of the new type to a pay profile.

1. Select **Time and attendance > Setup > Groups > Flex groups**, and then select **New**.
2. In both the **Flex+** field and the **Flex-** field, specify the new pay type, **FlexCnt**.
3. Select **Time and attendance > Setup > Pay agreements**, and then select **Agreement lines**.

4. For **Monday**, for the **Flex+** profile type, add the following three lines.

PAY TYPE	DESCRIPTION	FROM TIME	TO TIME	MINIMUM	MAXIMUM	FACTOR
FlexCnt	Flex counter	12:00 AM	06:00 PM	00.00	00.00	1.00
FlexCnt	Flex counter	06:00 PM	12:00 AM	00.00	02.00	1.50
FlexCnt	Flex counter	06:00 PM	12:00 AM	02.00	06.00	2.00

NOTE

Each line is used for a different time interval and has a different factor. The flexible hours that the worker works in a time interval are multiplied by the factor for that line. For example, hours that are worked from 06:00 PM to 08:00 PM are multiplied by 1.50. The factor is specified in the **Factor** field on the **General** tab of the **Pay agreement lines** page.

The worker enters the following registrations for the day.

JOURNAL REGISTRATION TYPE	START	END
Clock in	07:00 AM	07:00 AM
Production job	07:00 AM	09:00 PM
Clock out	09:00 PM	09:00 PM

The amount that must be paid is calculated on the **Approve** page, based on the worker's registration. After the registration is calculated, you can view the result on the **Times** tab. For this scenario, you're interested in the following fields.

FLEX +	FLEX -	TIME	PAY TIME
6.00	0.00	13.50	08.00

The amount of Flex+ time is six hours, and the calculation is based on the flex zones in the time profile. This amount consists of one hour of Flex+ time from 07:00 AM to 08:00 AM and five hours of Flex+ time from 04:00 PM to 09:00 PM.

When you transfer the registrations, you will notice that the amount of Flex+ time is changed from 6.0 hours to 8.0 hours.

FLEX +	FLEX -	TIME	PAY TIME
8.00	0.00	13.50	08.00

This change occurs after the transfer because the flexible hours have been calculated based on pay types instead of time. The following table shows how the eight hours are calculated.

FROM	TO	TIME	FACTOR	FLEX ACCOUNT
07:00 AM	08:00 AM	1	1	1

FROM	TO	TIME	FACTOR	FLEX ACCOUNT
04:00 PM	06:00 PM	2	1	2
06:00 PM	08:00 PM	2	1.5	3
08:00 PM	09:00 PM	1	2	2
			Total	8

NOTE

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Troubleshoot discrete manufacturing

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This topic describes how to fix issues that you might encounter while you work with discrete manufacturing.

I receive the following error message: "Warehouse management processes are currently being used. If work lines are not yet registered, you can cancel the created work and any load or shipment lines, and then continue with the picking or shipping process."

Issue description

This issue occurs if you try to reserve or release work for a line, but the inventory transaction has a status of *Picked*, which indicates that the material has been picked.

Issue resolution

To fix this issue, follow one of these steps.

- Change the status of the production order back to *Estimated* or *Released*.
- Open the details page for the relevant production order. On the Action Pane, on the **Warehouse** tab, in the **Stop** group, select **Stop and unpick** to unpick all picked transactions. Then select **Remove stop** to process the production order.

Here is an explanation of the *Unpick* and *Stop* functions:

- **Unpick** – This function reverses the status of inventory transactions for bill of materials (BOM) lines and formula lines that have a status from *Picked* through *On order*. When work for raw material picking is completed, the status of the lines is set to *Picked*. This status prevents the production order from being reset to *Created* status. In this case, you can use the *Unpick* function to revert the transactions from *Picked* status and then reset the production order to *Created* status.
- **Stop** – This function sets a **Stopped** flag on the production order to prevent any status update on the order. You can find the **Stopped** flag on the **Warehouse** FastTab of the production order details page.

NOTE

- The buttons are visible only when the production order is created for items that are enabled for warehouse processes.
- The **Stop** group is visible only on the **Warehouse** tab on the Action Pane of the production order details page. It isn't visible on the **Warehouse** FastTab of the **Production orders** list page.

The matching resource name isn't updated after I change a worker name in the global address book.

Issue description

If you change a worker name in the global address book, the matching resource name isn't updated in the resource group master.

Issue resolution

This scenario isn't currently supported. To fix the issue, you must manually update the resource name.

When I create a new production order, I don't receive the following message: "Insert the active version of bill of material and route?"

Issue description

When you create a new production order, after you enter the item number, the **Site** and **Warehouse** fields are automatically set to the default site and warehouse that are defined on the **Default order settings** page for the finished goods item. Additionally, the active BOM number and route number are automatically entered. You don't receive the following message that prompts you for those values:

```
Insert active version for bill of material and route?
```

Issue resolution

You aren't prompted to insert BOM and route numbers if you select a product that a site and warehouse are defined for on the **Default order settings** page. You're prompted only if those values aren't defined for the selected product.

Production orders aren't shown on the Marking page.

Issue description

Some production orders aren't shown on the **Marking** page.

Issue resolution

Products that have the following configuration aren't available for marking. Therefore, they won't be shown on the **Marking** page:

- The products are defined as products of the *catch weight* type.
- They are enabled for the advanced warehouse processes.
- They are configured to be controlled by the *Standard cost* principle.

When I try to end a production order, I receive the following error message: "Calculating BOM consumptionCost value must be negative upon issue from inventory."

This issue was fixed in release 10.0.15.

When the status of a production order is changed from Reported as finished to End, I receive the following error messages: "Update conflict. The standard cost does not match with the financial inventory value after the update" and "A critical error has occurred in function InventCostMovement.checkVariance."

This issue occurs because the underlying data was changed by another process. The process will try to update the data up to five times. If the conflict still exists after five attempts, you will receive the following error messages:

```
Update conflict. The standard cost does not match with the financial inventory value after the update.
```

```
A critical error has occurred in function InventCostMovement.checkVariance.
```

This behavior is by design. To mitigate the issue, resume the batch job. It should finish running.

If the batch job consistently fails after you resume it, verify that the rounding precision for the ledger's default currency is compliant with the rounding that is applied to values in the InventSum table. If the rounding precision has been changed to a non-compliant value, you probably must change it back to a compliant value. Look for **ModifiedDateTime**. In this case, the value will typically show that the rounding precision was recently changed.

When I release to a warehouse, I receive the following error message: "Item RM could not be fully reserved. Ensure that the full quantity is available, or reserve the items manually if the Reservation field on the BOM line is set to Manual or Started. Could not release the order to warehouse because some materials could not be reserved." However, the status is updated to Released.

Issue description

If not all BOM line items are physically available when a production order is released, and the **Release to warehouse** policy is set to *Require full reservation* on the production order, you will receive the following error message:

Item RM could not be fully reserved. Ensure that the full quantity is available, or reserve the items manually if the Reservation field on the BOM line is set to Manual or Started. Could not release the order to warehouse because some materials could not be reserved.

Issue resolution

This behavior is by design and is working as expected.

When I try to end a production order and report as finished, I receive the following error message: "Total good quantity reported as finished for the production will be %1. Feedback for the last operation is 0.00 in total."

Issue description

When you try to post a report as finished journal on a production order, you receive the following error message:

Total good quantity reported as finished for the production will be %1. Feedback for the last operation is 0.00 in total.

Possible cause

This issue occurs if the quantities that were posted in the last operations were incorrect. For example, if production is started, but the quantity that must be started isn't allocated, the route card journal will be posted without any lines. To confirm the situation, open the production order, and then, on the Action Pane, on the **View** tab, select **Route card**.

Workaround

You can fix this issue by posting additional journals for the operations that the journals weren't correctly posted for. Restart the production order, and select to post the additional journals. This action won't start the production order, but it will post the journals. The route card should then show the quantities that were posted, and you should be able to end the production orders successfully.

Can I report a production order as finished while I report the error quantity, but not while I report the time or material quantity?

You can't report the error quantity on a production order unless you also report the good quantity. This scenario is **not** supported. The report as finished update will eventually fail when you try to end the production order, and you will receive the following error message:

Missing report as finished quantity.

Can I trace the serial numbers of finished goods against the serial numbers of consumed goods?

You can't trace the serial numbers of finished goods against the serial numbers of material that a production order consumes to make those finished goods. This scenario isn't currently supported. The workaround is to create production orders for a quantity of 1.

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Lean manufacturing overview

2/18/2021 • 4 minutes to read • [Edit Online](#)

This article provides an overview and description of the lean manufacturing features in Dynamics 365 Supply Chain Management.

Lean manufacturing offers tools that you can use to model lean operations. These tools support and promote the following concepts and business activities:

- Create a lean manufacturing foundation by modeling manufacturing and logistics processes as production flows.
- Implement a lean pull system by using kanbans to signal demand requirements.
- Monitor and maintain kanban jobs.

The lean manufacturing architecture consists of production flows, activities, and kanban rules. These structures are fully integrated with Supply Chain Management processes. You can use lean manufacturing in a mixed-mode manufacturing environment that combines various supply, production, and sourcing strategies. These strategies include production orders, batch orders for process industries, purchase orders, and transfer orders.

IMPORTANT

You can use Supply Chain Management to support the implementation of lean manufacturing with kanbans. However, a successful implementation of lean principles depends on the internal business processes that you use, and the actual production conditions and environment.

Modeling manufacturing and logistics processes as production flows

To create a lean manufacturing foundation, model the manufacturing and logistics processes as production flows. This activity consists of the following tasks:

1. Identify the processes for which you want to implement a lean replenishment strategy, and then model these processes as production flows. You can then analyze and streamline the processes. One of the goals of a lean implementation is to reduce waste by improving the flow of material and information.
2. Define a production flow as a sequence of activities that describes the flow of material. A transfer activity defines the movement of a product or products from one location to another. A process activity defines a value-added operation that is applied to a product.
3. Create a version of the production flow that defines the requirements for takt time. These requirements are used to calculate the cycle times of each activity in the production flow. You can create multiple versions of production flows, and then use these versions to improve processes.

Using kanbans to signal demand requirements

A pull system produces goods only when goods are needed. This practice reduces delivery lead times and excess inventory. You can use kanbans to plan, track, and process requirements that are based on production flows. To create a kanban framework, create kanban rules that define when kanbans are created, and how the requirements are fulfilled. You can create two types of kanban rules. Manufacturing rules create process kanban jobs, and withdrawal kanban rules create transfer kanban jobs. You can set up the following replenishment strategies:

- **Fixed quantity** kanban rules are related to a fixed number of handling units, which means that the numbers of active kanbans are constant. Whenever all the products from a Kanban are consumed and the handling

units are manually emptied, a new kanban of the same type is created. When you create fixed quantity kanban rules, you can calculate the optimal kanban quantities and the product quantities that are used. The calculation takes into account forecast, actual demand from open orders, lead time to replenish items, and historical demands.

- **Scheduled** kanban rules replenish requirements that are calculated by master planning. Master planning generates planned kanbans that can be firmed to kanbans.
- **Event** kanban rules replenish requirements that originate from sales order lines, production BOM lines, kanban lines, or minimum inventory settings. When event kanbans are generated, they are pegged to the source requirements.

When kanbans are created, one or more kanban jobs are generated based on the kanban flow activities that are defined in the kanban rules.

Monitoring and maintaining kanban jobs

Lean manufacturing provides visibility into the current status of manufacturing and logistics activities that are governed by the kanban rules. As a result, you can plan and prioritize the following tasks:

- Gain an overview of the current kanban job schedule.
- Plan and reschedule kanban jobs.
- Track and register the status of kanban jobs.

The following list describes the specialized kanban boards:

- Kanban job scheduling – Provides an overview of the kanban jobs. The board displays kanban jobs and their status for one or multiple work cells. The jobs are listed according to the planning periods (days or weeks) that are defined in the production flow model. The board also displays the capacity consumption for each planning period, so that you can monitor the scheduled load. You can change the status of kanban jobs, reschedule kanban jobs to different planning periods, and perform other tasks.
- Kanban board for transfer jobs – This board provides an overview of the current transfer jobs. You can update and register picking lists, start and complete transfer jobs, and perform other tasks.
- Kanban board for process jobs – This board is designed to support the normal production flow and give an overview of the current situation in one or multiple work cells. From this board Kanbans can be prioritized, picked, or manufactured. The board is also designed to support barcode scanning for the reporting of Kanbans.

Kanban jobs and integration with Supply Chain Management processes

Kanban jobs are fully integrated with current processes for inventory transactions in Supply Chain Management.

- You can perform picking activities to replenish material that is used to fulfill the requirements of kanban jobs.
- You can print kanban cards, circulating kanban cards, and picking lists to support the use of kanbans. These documents are used to represent, track, and register kanban jobs in the warehouse and on the production floor.
- You can register the picking and transfer activities in inventory by scanning bar codes.

In addition, lean manufacturing supports the purchasing and invoicing processes for services that are referenced by subcontracted activities.

- You can assign purchase agreement lines and services to subcontracted activities.
- You can create periodic purchase orders and receipt advices to support the purchase and invoicing of the services.

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Activity-based subcontracting

2/18/2021 • 9 minutes to read • [Edit Online](#)

This topic describes, in detail, how to use subcontracted activities in a production flow for lean manufacturing.

In Microsoft Dynamics 365 Supply Chain Management, there are two approaches for subcontracting: production orders and lean manufacturing. In the lean manufacturing approach, the subcontracting work is modeled as a service that is related to an activity of a production flow. A special type of cost group type that is named **Direct outsourcing** has been introduced, and the subcontracting services are no longer part of a bill of materials (BOM). The cost accounting of subcontracted work is fully integrated into the costing solution for lean manufacturing.

Production flows that involve subcontractors

The basic principle of a production flow doesn't change when activities are subcontracted. Material still flows between locations, process activities convert material to products, and transfer activities move material or products from one location to another. You can model locations and work cells as vendor-managed by assigning the vendor account to a warehouse or to a resource of a resource group.

Based on these capabilities, lean manufacturing doesn't require any specific features in order to support the flow of material and products. All possible scenarios that involve vendors as providers of production or transport services can be modeled based on the architecture of production flow and activities.

For example, a subcontractor works out of a supermarket that is located at the subcontractor. When handling units are emptied at the subcontractor, the kanban cards are returned to the assembly cell together with the next shipment. The supermarket at the subcontractor is then replenished. The transfers to and from the subcontractor can be modeled as explicit transfer activities to support a picking and shipment process. If an explicit registration isn't required in order to support the physical transport, the transfer activities can be omitted.

A subcontractor can be used to load balance the overall capacity of the production flow. For example, a production flow is modeled by using scheduled kanban rules. The planner uses the kanban scheduling board to schedule and load level both work cells on demand. The planner also monitors the consolidated supply schedule for the supermarket on the **Supply schedule** page. Multiple subcontractors can be modeled in one or multiple production flows, and there might be multiple kanban rules that can be used to supply the same product to the same location through different activities. The planner can convert kanbans to an alternative kanban rule to reschedule a kanban that was originally created for internal production to an alternative process. In fact, the subcontracted nature of the work cell has no impact on the production flow. The same working principle applies for two parallel internal work cells or for two subcontracted cells.

Like any other activity in a production flow, subcontracted activities can consume and supply inventoried, non-inventoried (work in process [WIP]), and semi-finished material and products. In all cases, the processes for scheduling and executing subcontracted activities are the same. Additionally, these processes are the same as the processes for internal work.

Purchase process for subcontracted activities (services)

The purchase process for subcontracted activities is based on the physical material flow that is registered by kanban job progress, for example, Start or Complete. The financial flow, for example, cost of subcontracted work, is a secondary flow that follows the physical flow. At the same time, the purchase process is an independent process that allows for manual adjustment of the purchase documents at every step. Here is the purchase

process for subcontracted activities:

1. Create a purchase agreement. The purchase agreement is created for the service and connected to the activity of the production flow.
2. Create a purchase order. A release purchase order can be created for the service, based on the scheduled kanban jobs. Jobs for the same service can be grouped to purchase order lines by day, week, or month. The purchase order lines can be created at any time after the kanban jobs are created. Purchase order lines can even be created after the fact. This option is usually selected if a subcontractor provides services without additional notice, based on the kanbans or kanban cards that the subcontractor receives. In this case, deviations between the purchase order and the invoice can be minimized.
3. Generate kanban cards, material, and a picking list to send to the subcontractor to prepare for processing. Based on the detailed modeling of the production flow, the preparation is done on the kanban board for process activities by using the picking list and the preparation function. Alternatively, the preparation is done on the kanban board for transfer jobs by using the picking list and start or completion. For inventoried material, both processes can be supported by a WMS-Picking and Shipment process. A bill of lading can be created on demand.
4. Generate kanban handling units and kanban cards. After processing, cards are returned from the subcontractor. Usually, the cards include a delivery note that specifies the physical material that has been shipped. A reference to the provided services isn't required. The arrival of the material or product at the customer is registered on the kanban board, depending on the kanban cards. (Either the kanban board for process activities or the kanban board for transfer jobs is used, depending on the modeled activities.).
5. Create a receipt advisory. The receipt advisory can be used to replace a packing slip document for the received services. Receipt advisories can be generated based on the completed kanban jobs for the subcontracting activity for a selected period. For each job receipt, advisories are created for the related purchase order line. The receipt advisory can be printed and sent to the subcontractor as confirmation of receipt.
6. Generate an invoice.

The process ends when the subcontractor is invoiced for a period. The invoice match is done against the receipt advisories that are created. Because the receipt advisories represent the exact physical receipt of material, the three-way matching is simplified.

Configuring activities for subcontracting

The following sections describe how to configure activities for subcontracting.

Subcontracted services

The payment item that is used in activity-based subcontracting must be a product that has the following properties:

- **Product type:** Service
- **Inventory model group:** Non stocked

This requirement enforces the use of the first in, first out (FIFO) inventory model. **Note:** Cost calculation of the products requires that the standard cost of the service be defined. A purchase agreement with the vendor is required. Otherwise, the service can't be used for activity-based subcontracting.

Subcontracted process activities

To configure a process activity as a subcontracted activity, follow these steps.

1. Configure a subcontracted work cell. To configure a work cell as subcontracted, you must create a resource of the **Vendor** type and associate it with the work cell (resource group). A runtime cost category of the **Direct outsourcing** cost group type should be assigned to the work cell. The cost categories for setup and quantity aren't required.

2. After a process activity is created and related to a subcontracted work cell, you must configure a service for the activity before the production flow version can be activated. You complete this step on the **Activity details** page. For activities that are associated with a subcontracted work cell, the **Service terms** FastTab is shown. On this FastTab, add a default service that is valid for all output items. If specific output items require different services or different service calculation parameters (for example, a different service ratio), you can add other services to the activity.

Subcontracted transfer activities

A transfer activity is configured as a subcontracted activity, depending on the **Freighted by** setting of the transfer activity. The following options are available:

- **Shipper** – The activity is subcontracted if the transfer from the warehouse is managed by a vendor (as defined by a property of the warehouse). All selected purchase agreements for services must have the same vendor ID as the warehouse.
- **Recipient** – The activity is subcontracted if the transfer to the warehouse is managed by a vendor (as defined by a property of the warehouse). All selected purchase agreements for services must have the same vendor ID as the warehouse.
- **Carrier** – The activity is subcontracted to any vendor that provides the service. To be valid, a carrier must be created for warehouse management and must have an assigned vendor account.

As for process activities, you must configure a default service for subcontracted transfer activities on the **Service terms** FastTab of the **Activity details** page.

Service quantity calculation

The whole purchase process is based on an item reference for a service. This item reference is measured in a unit of measure of a service. Services are usually measured either in the number of services (units) or in time. To calculate the service quantity, based on the registered completion of kanban jobs, you can use the following methods:

- **Calculation that is based on the number of jobs** – One kanban job equals n units of service, regardless of the product quantity that is supplied. In lean manufacturing, one job corresponds to one handling unit. This calculation method applies to all services that have a fixed price per handling unit. Therefore, this method usually applies to transfer activities. However, it can also apply to process activities that process whole handling units.
- **Calculation that is based on the product quantity** – The service quantity is relative to the product quantity that is scheduled/supplied. When the supplied product quantity is calculated, error quantities can be either included or excluded. This calculation method applies to all cases where the service price per unit of processed product is agreed upon.
- **Calculation that is based on the activity time** – The theoretical activity times are calculated, based on the processing time of the activity, the total processed quantity, and the throughput ratio of the processed product. This calculation method applies to services that are paid by the hour and have a variance in time per processed product.

Cost accounting of subcontracted services

When the receipt advisory or a vendor packing slip on a purchase order that was created for a production flow (in other words, a purchase order that was generated based on kanban jobs for subcontracted activities) is posted, the value of the receipt is accounted in the WIP accounts of the production flow. Deviations of invoices are also accounted to the production flow. A cost category for subcontracted work has been introduced. This cost category enable transparent tracking of the value of subcontracted work that is allocated to WIP and consumed per period.

The backflush costing for lean manufacturing at the end of a costing period calculates the actual variances of the products that are produced from the production flow during the costing period.

Modeling transfers as subcontracted activities

People often consider transport nonproductive and think that it adds no value. However, when the cost of subcontracting is compared to the cost of internal production, the cost of additional transport activities must be considered. A production flow that spans multiple locations and requires transport services should model the transport cost as part of the cost of supplying the products to the customer.

Activity-based subcontracting in lean manufacturing lets you integrate carriers and transport vendors that move material and products between the locations of a production flow. By modeling a transfer activity, you can assign a carrier or vendor. The transfer activities/job is based on a service and purchase agreement, and you can create purchase orders and receipt advisories, based on the actual transfer jobs. This functionality is the same as the functionality for subcontracted process activities.

Supply Chain Management now supports BOM calculation that includes transport services, the creation of related purchase orders, integrated receipt registration, and the integration of transport service costs into the production flow costing.

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Modeling a lean organization

2/18/2021 • 4 minutes to read • [Edit Online](#)

The article provides information about the key concepts in modeling a lean organization.

Typically, a lean manufacturing scenario is more than just a collection of unrelated kanban rules or material supply policies. The flow of material and products throughout work cells and locations for a specific production or supply scenario can be described as a sequence or small network of process or transfer activities. This sequence or network is known as a production flow.

Production flows in lean manufacturing

In production scenarios that are based on production orders, material is issued to a specific production order. During a sequence of operations that is based on a bill of materials (BOM) and routes, products are created and are finally received at the supplied location. The throughput time of production orders varies from minutes to weeks. All related cost, material, and labor are accumulated on the production order.

To reduce the delivery lead times and excess inventory between work centers that batch production causes, lean manufacturing introduces kanban replenishment and supermarkets in manufacturing and warehouse replenishment. Typically, these features disrupt the production of partially independent kanban cycles. The replenishment of a kanban for a semi-finished product is no longer triggered by an order for a finished product.

To re-establish a production and cost context for the various kanban scenarios that are proposed, activity-based production flows have been introduced as the backbone of lean manufacturing. All kanban rules refer to this predefined structure. The activity-based model supports the setup of a wide range of scenarios. However, this model doesn't add complexity for the shop floor workers, because all scenarios use the same activity-based user interface.

Semi-finished products (non-BOM levels)

Lean manufacturing integrates kanbans for inventoried products and semi-finished products in a single framework, and therefore offers a unified user experience for all cases. Because of this architecture, additional BOM levels no longer have to be introduced to enable kanbans to be used for semi-finished products. This architecture also helps reduce inventory transactions to a minimum.

Products and material in work in progress

The reduction of batch sizes to the ideal state of a single piece flow in lean manufacturing can cause a dramatic increase in inventory transactions if each picking process or kanban registration causes transactions for the consumed items. The production flow architecture allows for the transfer of material to the production flow, together with the withdrawal kanbans in storage or transport handling unit sizes. The value of the issued material is added to the work in progress (WIP) account that is related to the production flow. This behavior resembles the behavior for material that is issued to a production order. The same principle can be applied to products and semi-finished products. Unless these products are created, transferred, or consumed within a production flow, inventory transactions are optional. After the products are posted to inventory, the WIP account for the production flow is reduced by deducting by the related standard cost.

Value streams and value stream mapping

The architecture of Lean manufacturing is inspired by the five Lean principles that were formulated by Womack and Jones: Customer value, Value stream, flow, pull, and perfection. One approved method for implementing

lean manufacturing solutions in the physical world of manufacturing is value stream mapping (VSM). This method was introduced by Rother and Shook in their publication "Learning to See" at the Lean Manufacturing Institute.

The future-state value stream can be modeled as a production flow version. All processes of the value stream are modeled as process activities. Movements or transfers can be modeled as transfer activities if the transfer status must be registered, or if integration with inventory picking or consolidated shipments is required.

The value stream itself is modeled as an operating unit. Therefore, the value stream can be used as a financial dimension.

For more information about operating units, see [Create an operating unit](#).

Costing for lean manufacturing based on the production flow

The periodic consolidation of the cost for a production flow corrects the related WIP account and enables variances to be determined for the products that are supplied by the production flow.

Continuous improvement

To better support continuous improvement, the production flows are implemented in time-effective versions. Therefore, an existing production flow version, together with all related kanban rules, can be copied to a future version of the production flow. In addition, the future-state production flow can be modeled before it's validated and activated for production. To help guarantee a seamless material flow on the transition date and beyond, existing kanbans from old production flow versions are automatically related to the new version.

Simplicity

For the implementation of Lean manufacturing, we choose a production flow and activity approach that enables simple and complex production scenarios to be modeled in a single scalable architecture. A closer look at the activity concept reveals a new simplicity for those users who require it: the shop floor and logistics workers. By reporting against activity-based jobs instead of inventory transactions, a unified user interface for all lean manufacturing variants transfers the business complexity from the user interface to where it belongs: the production flow as the backbone of lean manufacturing.

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Operations resources

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Operations resources perform the activities of a project or a production process. They can be of different types, and can have different capabilities.

Operations resources

Operations resources are the machines, tools, workers, facilities, physical areas or vendors that perform the activities of a project or a production process. They can be of different types and can have different capabilities.

- **Vendor** – An external resource that performs project activities or production operations. An example is a subcontractor. By linking vendor resources to a vendor account, you can generate purchases for subcontractors, based on the bill of materials (BOM) lines or production lines.
- **Human resources** – A project or production worker that perform an activity, either alone or as an operator of a tool or a machine. If you're using the Human resources functionality, you can link human resources to a worker. The scheduling engine can then allocate the resources, based on the competencies that are defined for the corresponding worker.
- **Machine** – A machine or other production equipment that is required in production.
- **Tool** – An instrument or device that is typically used together with another resource to perform an activity in a project or in production.
- **Location** – A physical location of a specific size that is required in order to perform an activity. An example is an assembly area.
- **Facility** – A building or fixed structure that is required in order to perform an activity.

Calendars

A calendar can be assigned to an operations resource and describes the capacity (in hours) of that resource. The working times of the operations resource are determined by the calendar that is assigned to the resource group that the operations resource is part of. You can set an effective date and an expiration date for the assigned calendar. You can then assign more than one calendar to an operations resource. However, the dates of the assigned calendars can't overlap, and the operations resource can be assigned only one calendar at a time.

Note: If there are no effective working calendars for a resource group (for example, if the last assigned calendar or the only assigned calendar has expired), you can no longer access the operations resources that are assigned to the resource group for production planning and operations scheduling. You can also assign a calendar to a resource group to specify the working times for both the resource group and all the operations resources that are assigned to the resource group. The capacity of the resource group is calculated as the sum of the capacities of each operations resource that is assigned to that resource group. The calendar that is assigned to a resource group can change over time.

Resource capabilities

A capability is the ability of an operations resource to perform a particular activity. You can assign one or more capabilities to an operations resource. The scheduling engine will then allocate resources by matching the resource requirements of each activity to the capabilities of the available operations resources. Capabilities can be assigned to all types of operations resources (**Tool**, **Vendor**, **Machine**, **Human resources**, **Location**, or **Facility**). To assign capabilities to operations resources for a limited time, define a start date and an expiration date on the capability assignment. For more information, see [Resource capabilities](#).

Resource groups

A resource group is a set of operations resources that represents the granularity at which you want to schedule resources when you use the operations scheduling method. Therefore, resource groups typically correspond to the physical organization of work cells that is demarcated by yellow lines on the production shop floor. The resource group defines the site, production unit, and warehouse context for operations resources that are assigned to the group. When you assign an operations resource to a resource group, the resource can be scheduled at the site where the resource group is located. You don't have to assign the operations resources that you create to a resource group. However, an operations resource must be assigned to a resource group before it can be scheduled to perform work. An operations resource can be assigned to a resource group for a limited time. You can also assign an operations resource to multiple resource groups, so that you can then share the resource across sites. However, the effective dates and expiration dates can't overlap. In other words, you can't assign an operations resource to two resource groups at the same time. Changes in resource group assignments are effective only for new resource allocations. Capacity reservations for jobs, operations, and project hour forecasts that are already scheduled won't be affected. **Note:** When you assign operations resources of the **Vendor** type to a resource group, all operations resources that are assigned to that resource group must be of the **Vendor** type and must be linked to the same vendor account.

Production units

A production unit is an administrative unit that is a collection of resource groups. A production unit can contain multiple resource groups, but a resource group can be assigned to only one production unit. A production unit reflects the physical layout of production resources, and has no effect on transactions or how they are processed. You must associate a production unit with a site. You can also assign a picking warehouse and a storage warehouse to a production unit. You can use a production unit to consolidate and filter production-related data. For example, a shop floor manager can see an overview of the outstanding workload and the available capacity for a particular production unit. You can change the production unit that is assigned to a resource group. You can also delete a production unit. However, these changes to the production unit are effective only for new orders that are created after master scheduling is run. If you want to apply the production unit change to existing orders, you must make this change manually.

Resource scheduling

Operations resources are assigned to activities when a project or a production is scheduled. Two scheduling methods are available: operations scheduling and job scheduling. When you use operations scheduling, each operation or project activity is scheduled on the resource group that contains operations resources that match the resource requirements that are specified for the operation. If a specific operations resource is required for the operation, scheduling reserves capacity only on a specific operations resource in the group. Job scheduling is a more detailed form of scheduling than operations scheduling. It breaks down each operation into its individual tasks or jobs. These jobs are then assigned to the operations resources that will perform them. Scheduling reserves capacity on the resource groups, based on the operation times that are defined on the production route or project activities. If you're working with finite capacity, the schedule depends on the availability of the operations resources that are required in order to complete the activity. For operations scheduling, the capacity of the resource group is the sum of the available capacity of the operations resources that are part of that group. Capacity reservations that already exist for the operations resources are considered unavailable capacity. If there isn't enough available capacity for production, the production orders can be delayed or even stopped. On the **Resources** page, you can define several properties that control how capacity reservations are made:

- **Capacity** – Specify the operations resource's capacity per hour in terms of the capacity unit of measure.
- **Batch capacity** – Specify the maximum number of pieces that the operations resource can process per run.
- **Efficiency percentage** – Specify the efficiency that you expect from the operations resource. The efficiency percentage adjusts the throughput of the operations resource and affects the time that is reserved for the

resource. The lead times for the operations that use the operations resource are also adjusted accordingly. Here is the formula that is used for the calculation: $\text{Scheduling time} = \text{Time} \times 100 \div \text{Efficiency percentage}$. *Time* includes both the run time and setup time.

- **Operations scheduling percentage** – Specify the maximum percentage of capacity of the operations resource that you want to use in operations scheduling. To allow for flexibility in capacity during job scheduling, you should set this percentage to less than 100 percent.
- **Finite capacity** – Set this option to **Yes** if the operations resource should be scheduled based on the actual capacity that is available, and if existing capacity reservations should be considered. If this option is set to **No**, the operations resource is assumed to have infinite capacity, and the resource might therefore be overbooked.
- **Finite property** – Set this option to **Yes** if you want the operations resource to be scheduled based on the actual capacity that is available with respect to the required working time scheduling properties.
- **Exclusive** – Set this option to **Yes** if you don't want the operations resource to be available for another job or operation until the current production is completed. In this case, the operations resource can't be used even if there are gaps in the resource's run time.
- **Bottleneck resource** – Define the operations resource as a bottleneck resource. A bottleneck resource is scheduled by using finite capacity when the **Finite capacity** and **Bottleneck scheduling** options on the **Master plans** page are selected.

To schedule multiple operations resources at the same time to perform, for example, an operation in production, you must specify the requirements for the various resources by using primary and secondary operations. You can then also reserve multiple operations resources that have different capacity. The operations resource that are scheduled for the primary operation determine the duration of the activity.

Lean work cells

You can specify that a resource group is a lean work cell. The resource group can then be part of a production flow. By specifying a resource group as a lean work cell, you also prevent the resource group and the assigned operations resources from being allocated to the operations of a production order or a project hour forecast. For each resource group that acts as a lean work cell, you must specify the following information:

- **Calendar** – The working calendar of the work cell, which must have the property of a standard workday.
- **Input warehouse and location** – The default location that is used to pick material for an activity.
- **Output warehouse and location** – The default location where all output of the work cell is put.
- **Runtime cost category** – This category must be defined for the work cell if direct labor is tracked in costing.

When a resource group is used as a lean work cell, the capacity of the work cell is specified directly on the resource group. Therefore, you don't have to assign operations resources to the resource group. Only when the work cell is managed by a subcontractor, an operations resource of the **Vendor** type must be assigned to the work cell. If you assign an operations resource to a resource group that is marked as a work cell, the capacity of the work cell isn't affected.

Costing resources

When you define an activity such as a route operation or a project hour forecast, you can specify the requirement for a specific operations resource or resource group. However, you can also specify the requirement for an operations resource of a specific type, or an operations resource that has a specific capability or competency. For this reason, the actual resource assignment isn't made until the activity is scheduled and capacity is reserved. Therefore, on a route operation, you can specify that estimation and BOM calculation must be based on a specific operations resource. This operations resource is referred to as the costing resource. You can also transfer cost categories and operation times from the costing resource to the activity. When the operation is scheduled, estimation and BOM calculation are done by using the operations resource that is

actually scheduled.

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Define lean manufacturing work cells

2/18/2021 • 5 minutes to read • [Edit Online](#)

A work cell is a specific form of resource groups that can be used in lean manufacturing process activities. Work cells have input and output locations and a capacity definition based on a production flow model. To learn more about the basic concepts of lean manufacturing work cells and capacity calculations, see the white papers on Lean manufacturing. The demo data company used to create this procedure is USMF

Create a work cell.

1. Go to Organization administration > Resources > Resource groups.
2. Click New.
3. In the Resource group field, type a value.
 - The work cell ID is typically a systematic code and has to be unique for the legal entity.
4. In the Description field, type a value.
 - The description contains the name or title of the work cell.
5. In the Site field, click the drop-down button to open the lookup.
 - A work cell is located at one specific site. Both input and output warehouse and location have to be located on this site.
6. In the list, click the link in the selected row.
7. In the Production unit field, click the drop-down button to open the lookup.
8. In the list, click the link in the selected row.
 - Select a production unit that this work cell belongs to.
9. Select the Work cell check box.
 - To use a resource group as a lean work cell, the Work cell check box has to be selected. Note that this property cannot be changed after resource group is created.
10. In the Input warehouse field, click the drop-down button to open the lookup.
11. In the list, click the link in the selected row.
 - For accounting and material control, the material staged on the shop floor is typically allocated to a specific virtual warehouse. However, if you want to replenish the locations using warehouse work, they must be part of the receptive raw material warehouse.
12. In the Input location field, click the drop-down button to open the lookup.
13. In the list, click the link in the selected row.
 - Note that for a process activity, the input location can be overwritten in general or for a specific product or product variant by defining picking activities that feed to the process activity. The input locations of a work cell cannot be license plate controlled.
14. In the Output warehouse field, click the drop-down button to open the lookup.
15. In the list, find and select the desired record.
 - In multiple activity production flows or production lines, this is often the input warehouse of the next work cell or the sales or transit warehouse where a product is typically transferred to after the production process. Remember when modeling lean manufacturing processes, transport is usually waste, as is reporting transport.
16. In the list, click the link in the selected row.
17. In the Output location field, click the drop-down button to open the lookup.
 - In a production flow with multiple process activities this is often the input location of the next work cell.

18. In the list, find and select the desired record.
19. In the list, click the link in the selected row.
20. Expand or collapse the Operation section.
 - A Run time category must be provided to enable cost calculation and processing of lean kanban jobs.
21. In the Run time category field, click the drop-down button to open the lookup.
22. In the list, find and select the desired record.
 - The run time cost category is used in standard cost calculation and on backflush costing.
23. In the list, click the link in the selected row.
24. Expand or collapse the Calendars section.
25. Click Add.
26. In the Calendar field, click the drop-down button to open the lookup.
27. In the list, find and select the desired record.
 - Typically work cells of a given site use the same working time calendar. If work cells can have individual working times, you might need to create a specific working time calendar for the work cell. Note that the calendar should have a standard working time defined when used for a lean work cell, because the capacity definition is usually related to the standard working time of a work day.
28. In the list, click the link in the selected row.
29. Expand or collapse the Work cell capacity section.
30. Click Add.
31. In the Production flow model field, click the drop-down button to open the lookup.
32. In the list, find and select the desired record.
 - This procedure requires production flow model type Throughput, to show the definition of throughput capacity.
33. In the list, click the link in the selected row.
34. In the Capacity period field, select an option.
 - The options include: Standard workday - The capacity is expressed by the length of the standard workday of the working time calendar for the work cell. For each day, the actual working time is determined from the calendar and the effective available capacity is calculated based on that. Week - Allows a weekly capacity. There is no adjustment done by the actual working time. Month - Allows a monthly capacity. There is no adjustment done by the actual capacity. Typically, the standard workday is used for daily periods and the weekly capacity is used for weekly capacity periods.
35. In the Average throughput quantity field, enter a number.
 - Note that a lean operation is never set up for the maximum possible capacity in an ideal environment. Instead the capacity should always be defined for operations running under typical circumstances.
36. In the Unit field, click the drop-down button to open the lookup.
37. In the list, click the link in the selected row.
38. ResolveChanges the Unit.

Add a financial dimension

1. Expand or collapse the Financial dimensions section.
 - Note that financial dimensions defined on the production flow override the financial dimension of a given work cell. The financial dimensions that can be selected depend on the configuration of the financial dimensions of your system. The following steps correspond to the Demo data set in company USMF. When using different data, the steps might not be applicable.
2. In the CostCenter field, click the drop-down button to open the lookup.
3. In the list, find and select the desired record.
 - The dimensions that need to be selected on lean work cells depend on the implementation of financial dimensions in the accounting model for a specific legal entity.

4. In the list, click the link in the selected row.
5. In the ItemGroup field, click the drop-down button to open the lookup.
6. In the list, find and select the desired record.
7. In the list, click the link in the selected row.

Save

1. Click Save.

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Define lean schedule groups

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Lean schedule groups are defined to group and distinguish products in kanban scheduling. The grouping can be done as generic association per company or specific to a work cell. Each group has a color code assigned for visual indication in the kanban scheduling listpage. The demo data company used to create this procedure is USMF.

Define lean scheduling group

1. Go to Product information management > Lean manufacturing > Lean schedule groups.
2. Click New.
3. In the Schedule group field, type a value.
 - A schedule group can be defined as global group or specific to a work cell. In this simple example, we define a global group, and the work cell is kept empty. The settings of this group apply to all work cells that do not have specific schedule groups.
4. Select a color from the color selection.
 - The colors are used to highlight the jobs on the kanban schedule list page or the kanban process board.
5. In the list, mark the selected row.
6. In the list, click the link in the selected row.

Associate product

1. Associate a specific product
 - There are two ways to associate products to lean schedule groups, either as a specific product (Item relation type = Item) or as part of an item allocation key (item relation type = group).
2. In the Item relation type field, select Item
3. In the Item number field, type a value.
4. In the Throughput ratio field, enter a number.
 - The default Throughput ratio is 1, which means that the related products consume exactly the capacity specified in the process activities of the production flows. Throughput ratio > 1 defines a higher resource consumption, Throughput ratio < 1 defines a lower resource consumption. The ratio is used in the cost calculation and in the calculation of the kanban job consumption.

Associate item allocation key

1. Associate an item allocation key
 - Add an association to an item allocation key by using the Item relation type Group. Note that for this process, you need a forecast item allocation key defined in your data.
2. In the Item relation type field, select Group
3. In the Item allocation key field, click the drop-down button to open the lookup.
4. In the list, click the link in the selected row.

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Visual scheduling for lean manufacturing

2/18/2021 • 5 minutes to read • [Edit Online](#)

This topic provides information about the Kanban schedule board, which the production planner can use to control and optimize the production plan for kanban jobs.

This topic provides information about the Kanban schedule board, which the production planner can use to control and optimize the production plan for kanban jobs.

The Kanban schedule board lets the production planner control and optimize the production plan for kanban jobs. It makes the flow of kanban jobs transparent, and gives the production planner a tool that optimizes and adjusts the production plan for the lean manufacturing work cell.

Visual scheduling of kanban jobs

A kanban job can consist of one or many kanban jobs. There are two types of kanban jobs:

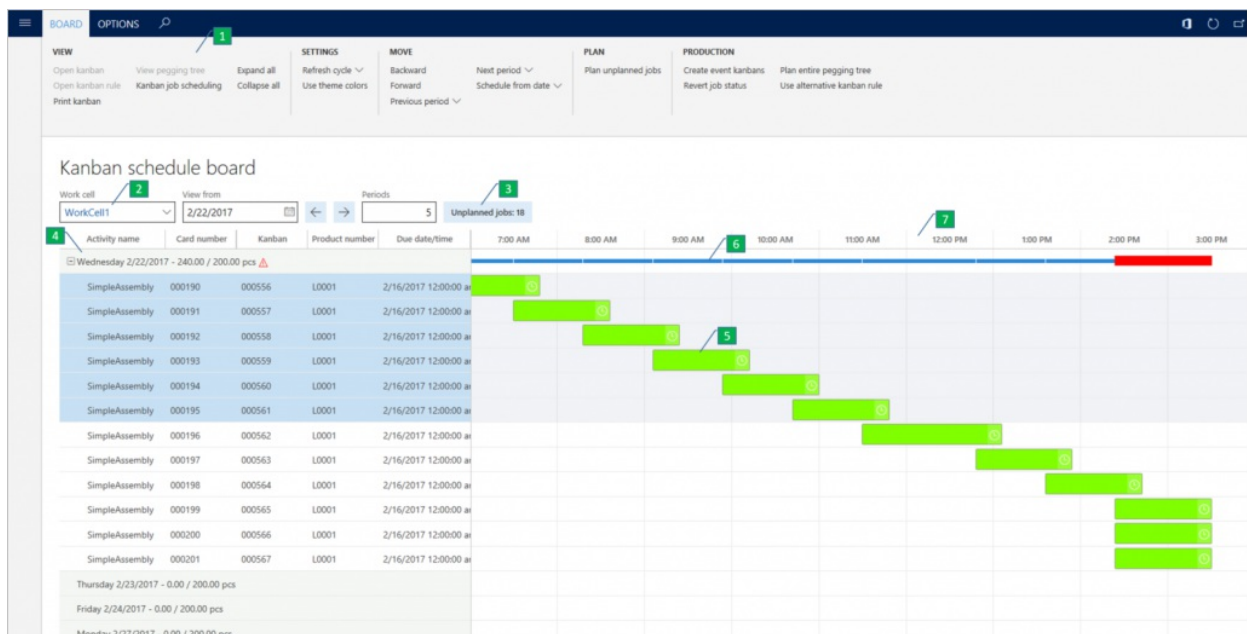
- Process
- Transfer

You can schedule only jobs of the **Process** type. The kanban job and its properties, such as the activity time, are defined in the production kanban flow. In the production kanban flow, the kanban job is also assigned to a work cell. The work cell's daily capacity is calculated based on the work cell capacity that is set on the resource group. It's adjusted by the daily working time in the related calendar. When a kanban job is scheduled, the job loads the capacity of the work cell. The Kanban schedule board provides the following main features:

- A graphical overview of the production plan in a lean work cell. This overview shows the planned kanban process jobs in the defined periods.
- A tool that lets you schedule unplanned kanban jobs and reschedule previously scheduled jobs.

Kanban schedule board

The **Kanban schedule board** page contains seven main elements, as shown in the following illustration.



1. Action Pane
2. Filter fields
3. Button for unplanned jobs
4. Period node
5. Kanban job
6. Capacity bar
7. Time scale

View the time scale

The board is divided into periods, each of which is represented as a node (4). The period nodes are listed on the vertical axis, and the horizontal axis represents a time scale (7) that shows the length of the period. A period has a length of either one day or one week. The period length is determined by the configuration of the work cell that is selected for the Kanban schedule board (2). For each period node, the Kanban schedule board indicates how much the scheduled kanban jobs are loading the period. There is also an indication of the maximum throughput for the period. If the scheduled throughput exceeds the maximum throughput, the period is considered as overloaded, and a red warning symbol appears. A scheduled kanban job appears in a period that has scheduled start and end times (5). The length of the job is equal to the activity time. Kanban jobs appear as overlapping in a period if their activity times exceed the task time of the work cell.

View job status

More information about a kanban job is available in the tooltip that appears when you hover the pointer over the job. A symbol provides information about the status of the job. For example, a clock symbol indicates that the kanban job is overdue.

Use colors to view the Kanban schedule board

To enhance the overview that the Kanban schedule board provides, you can use colors to distinguish kanban jobs. The color of a kanban job is configured in the lean schedule group, where you can aggregate the products that should be produced in the same sequence. The **Use theme colors** button on the **Board** tab of the Action Pane lets you switch between the application theme colors and the colors that are configured in the lean schedule group. For each period, a capacity bar (6) indicates how many of the available hours for the period have been loaded with kanban jobs. If the period is overloaded, the capacity bar appears thicker and in red. All these functions are available on the **Board** tab of the Action Pane (1) at the top of the **Kanban schedule board** page.

Plan unplanned jobs

You can schedule unplanned kanban jobs from the **Plan unplanned jobs** dialog box. To open this dialog box, click the **Unplanned jobs** button that shows the current number of unplanned jobs. Alternatively, click **Plan unplanned jobs** on the **Board** tab of the Action Pane. The dialog box shows a list of the unplanned kanban jobs for the work cell. You can use the **Filter** field to filter on all fields in the grid. For example, you can filter on kanban jobs for a specific product. After you have a filtered list of the jobs that you want to schedule, select them in the list, and then click **OK**. To use automatic planning to schedule the jobs, set the **Automatic planning** option to **Yes**. In this case, the jobs are scheduled into a period according to their due date. You can also schedule the jobs by period. Just select a period in the **Period** field. The following illustration shows an example of the **Plan unplanned jobs** dialog box.

The image shows two screenshots from a software interface. The left screenshot is the 'Kanban schedule board' for 'WorkCell1' on '2/22/2017'. It displays a grid of jobs with columns for 'Activity name', 'Card number', 'Kanban', 'Product number', 'Due date/time', and a time slot from 7:00 AM to 8:00 AM. The right screenshot is the 'Plan unplanned jobs' dialog, which is a table listing 18 jobs. The table has columns for 'Name', 'Card number', 'Kanban', 'Product number', 'Due date/time', and 'Job quantity'. Below the table are 'PLANNING SETTINGS' including 'Automatic planning' (set to 'No') and a 'Period' dropdown menu set to 'Wednesday 2/22/2017 - 240...'. 'OK' and 'Cancel' buttons are at the bottom right.

Name	Card number	Kanban	Product number	Due date/time	Job quantity
SimpleAssembly	000202	000568	L0001	2/16/2017 12:00:00 AM	20.00
SimpleAssembly	000203	000569	L0001	2/16/2017 12:00:00 AM	20.00
SimpleAssembly	000204	000570	L0001	2/16/2017 12:00:00 AM	20.00
SimpleAssembly	000205	000571	L0002	2/16/2017 12:00:00 AM	10.00
SimpleAssembly	000206	000572	L0002	2/16/2017 12:00:00 AM	10.00
SimpleAssembly	000207	000573	L0002	2/16/2017 12:00:00 AM	10.00
SimpleAssembly	000208	000574	L0002	2/16/2017 12:00:00 AM	10.00
SimpleAssembly	000209	000575	L0002	2/16/2017 12:00:00 AM	10.00
SimpleAssembly	000210	000576	L0002	2/16/2017 12:00:00 AM	10.00
SimpleAssembly	000211	000577	L0002	2/16/2017 12:00:00 AM	10.00
SimpleAssembly	000212	000578	L0002	2/16/2017 12:00:00 AM	10.00
SimpleAssembly	000213	000579	L0002	2/16/2017 12:00:00 AM	10.00
SimpleAssembly	000214	000580	L0002	2/16/2017 12:00:00 AM	10.00
SimpleAssembly	000215	000581	L0002	2/16/2017 12:00:00 AM	10.00
SimpleAssembly	000216	000582	L0002	2/16/2017 12:00:00 AM	10.00
SimpleAssembly	000217	000583	L0002	2/16/2017 12:00:00 AM	10.00
SimpleAssembly	000218	000584	L0002	2/16/2017 12:00:00 AM	10.00
SimpleAssembly	000219	000585	L0002	2/16/2017 12:00:00 AM	10.00

Sequence kanban jobs within the same period

You can change the sequence of one or more selected jobs within a period. This capability can be useful if you want to prioritize some jobs within the period. Alternatively, you might want to sequence jobs that have the same product attributes, to optimize job execution. You can change the sequence through a drag-and-drop operation, or by using the **Backward** and **Forward** menu items on the **Board** tab of the Action Pane.

Reassign kanban jobs across periods

Jobs can be reassigned from one period to another. This capability can be useful if a period is overloaded and you want to level the load to periods that have spare capacity. You can reassign jobs through a drag-and-drop operation, or by using the **Next period** and **Previous period** menu items on the **Board** tab of the Action Pane.

Open the Kanban schedule board

You can open the Kanban schedule board by using the menu item on the following pages:

- Production area page
- Kanban jobs scheduling page
- Production flow visualization page

Additional resources

[Kanban job scheduling for lean manufacturing](#)

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Kanban job scheduling for lean manufacturing

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This article provides information about visual control over kanban job scheduling and various ways to schedule kanban jobs.

The **Kanban job scheduling** page provides visual control over the schedules of lean manufacturing work cells. It gives an overview of all kanban jobs and provides multiple filtering capabilities. From this page, you can move to all other pages that are related to kanban configuration and execution.

Automatic scheduling of kanban jobs

Scheduling can be triggered automatically if you set the **Automatic planning quantity** parameter on the kanban rule. If you set **Automatic planning quantity** to 1, each kanban job is planned immediately when it's created. The result is a series of first pull, first serve operations. If you set **Automatic planning quantity** to a value that is more than 1, kanban jobs are grouped before they are planned.

This concept enables kanban sizes to be reduced below the actual economic batch sizes. For example, the economic batch size for a specific item (or item family) is 30. Instead of creating kanbans that use the product quantity, 30, you can configure the kanban rule so that it has a product quantity of 10 and an **Automatic planning quantity** value of 3. Although automatic planning schedules the kanban jobs for the work cell only when three unplanned jobs exist, it's fully transparent to the planner and the shop floor supervisor that two unplanned jobs might be awaiting execution. The planner or shop floor manager can then take those two jobs into production by manually planning them or creating additional kanbans.

Manual scheduling

For manual scheduling, Microsoft Dynamics AX 2012 introduced the kanban scheduling board. Manual scheduling can be combined with automatic scheduling. The kanban scheduling board lets you plan and unplan jobs, moved them in sequence, or move them from period to period. Jobs that are based on a kanban rule where the **Automatic planning** value is more than 0 can be manually unplanned. However, these jobs will be replanned when the next automatic planning event occurs (that is, when a new kanban is created). The following options are available for manual scheduling:

- **Schedule** schedules the selected jobs according to their due date. (This option resembles automatic planning.)
- **Schedule forward from date** tries to schedule the selected jobs according to their due date but constrains the result by using the specified earliest start date.
- **Backward** moves the selected scheduled jobs back in the sequence within the period.
- **Forward** moves the selected scheduled jobs forward in the sequence with the period.
- **Previous period** moves the selected scheduled jobs to the start or end of the previous period.
- **Next period** moves the selected scheduled jobs to the start or end of the next period.
- **Plan > Revert job status** lets you unschedule a scheduled job.

Lean scheduling groups

Each color represents a lean scheduling group. Lean scheduling groups can be freely defined as generic groups or as groups that belong to a single work cell. Items and dimensions can be freely assigned to the scheduling groups. For example, in a Painting cell, a schedule group can represent a color of the product. In work that is driven by specific tooling requirements, items might be grouped by tool requirement, and a packaging work cell

might group items by packaging template. The use of colors for lean scheduling groups is optional but recommended. It improves visibility into the status of the plan. For example, it's very easy to see which colors are produced on which day, and you can tell at a glance how this work can be optimized.

Work cell capacity and period capacity

The capacity of a lean work cell is always concurrent capacity. In other words, multiple jobs can be active in a work cell at the same time. The capacity can be tracked in two modes: throughput and hours.

Throughput

The capacity of a work cell is defined by the average throughput quantity of a reference period (standard workday, week, or month). The actual capacity per day or week is then calculated based on the working times of the calendar that is assigned to the work cell. The capacity that is loaded by job is the quantity of the job, adjusted by the throughput ratio of the item in the work cell.

Hours

The available capacity by day or week is defined by the calendar that is assigned to the work cell. The capacity that is loaded by job is the cycle time of the activity, adjusted by the quantity (default activity quantity versus actual job quantity) and the throughput ratio of the item in the work cell.

Period capacity FactBox

The **Kanban job scheduling** list page contains a FactBox that shows the available and booked period capacity for the selected work cell. Depending on the selected schedule periods in the production flow model, the periods show days or weeks.

Additional resources

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Job scheduling

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This article provides information about job scheduling, which is a more detailed form of scheduling than operations scheduling. You can use job scheduling to schedule individual jobs or shop orders, and to control the manufacturing environment.

You can use job scheduling to schedule individual jobs or shop orders, and to control the manufacturing environment. Job scheduling breaks down each operation into its individual tasks or jobs. These jobs are then assigned to the operations resources that will perform them. Job scheduling also lets you synchronize all jobs that are referenced by the selected job. You can specify a start date and time or end date and time for the job, and then run scheduling. The time that you specify can be the start time or the end time, depending on the scheduling direction. This functionality is useful when, for example, a job can be run only on one machine at a time, or when you want to optimize the job that is run for each resource.

Tasks in the job scheduling process

The job scheduling process includes the following tasks:

- Split operations into jobs.
- Schedule jobs, based on the dates and times for the resources that are specified for the related operation.
- Calculate start times and end times for each job. You can use finite capacity to make sure that there are no overlapping times.
- Determine which resources in the resource group to run the job on. This task requires that a resource group be specified for an operation. Job scheduling selects the resources or resource groups based on the shortest lead time, and also considers any previous reservations on the resources.
- Explode operations into jobs when you run job scheduling. The jobs are scheduled by date and time, according to the order that is specified by the production route. The setup of the operation determines the jobs that are exploded during the scheduling process. The route group that is assigned to the operation controls whether jobs are generated. A job is generated only if it has a specific duration. For example, a transport time job is generated if a transport time was specified for the selected operation.

Scheduling direction

You can schedule jobs either forward or backward.

- **Forward** – Use the forward scheduling direction to start the production as early as possible. This is also known as the push method, because the production is being pushed forward through the production process. The production is scheduled to start and end on the earliest possible dates.
- **Backward** – Use the backward scheduling direction to start the production as late as possible. This is also known as the pull method, because it's based on the date when the production must be completed. Backward scheduling counts backward to the latest possible date that the production can be started without missing its target deadline.

Finite capacity

You can schedule jobs by using finite capacity. When you use finite capacity, the capacity that is scheduled can't be larger than the capacity that is available for the resource. Available time is defined as the interval when the resource is available and there are no other reservations on capacity. Scheduling that is based on finite capacity makes sure that start times and end times for an operation on a specific date don't overlap. The resource

capacity that is already reserved is considered, and overlaps between the start times and end times are also considered. Finite capacity determines the amount of capacity that must be available for a resource in order to achieve optimal use of that resource. This determination is balanced against a calculation of the shortest possible lead time between operations.

Finite materials

Job scheduling that is based on finite materials makes sure that the required materials are available when the operation starts. The coverage rules for items define these limits. Scheduling uses requirement explosion to determine when the component items are available. If you schedule without setting finite materials, the system assumes that all items are available when they are required.

Finite properties

Job scheduling that is based on special properties requires that properties be specified for the operations on the production route. These properties must be fulfilled to reserve capacity.

References

Job scheduling schedules all productions that are referenced by the current production. If a production has one or more subproductions, the subproductions should be scheduled at the same time as the main production, because the main production can't be started until the related subproductions are completed.

Schedule resources

The scheduling engine examines combinations of resources to identify those combinations that can satisfy requirements. You can specify selection criteria by selecting one of the following values in the **Primary resource selection** field on the **Scheduling parameters** page:

- **Duration** – The scheduling engine selects the resource that has the shortest lead time. **Note:** Scheduling by duration can cause decreased performance when the same resource group contains many resources and secondary operations are used. You can schedule a maximum of 32 resources per operation. If you exceed this quantity, an Infolog message is displayed, and job scheduling doesn't find the best alternative resource.
- **Priority** – The scheduling engine selects the resource that has the highest priority if two or more resources have identical capabilities and levels. The resource that has the lowest numeric value in this field has the highest priority.

When job scheduling is run, the system plans the resources, based on the limitations that are defined in the resource parameters. You can control the capacity of the resources by using calendar settings. The system calculates loads for resources during the scheduling process. **Note:** For productions that use the operations scheduling function, you can run job scheduling after operations scheduling. If you aren't using operations scheduling, you can run job scheduling alone.

Maximum capacities for resources per job order

Resources are assigned to jobs through job scheduling. You can establish maximum capacities for resources per job order. For example, you can set up the system to schedule no more than 50 percent of total capacity for a production order. This setup gives you more control over the scheduling of resources on the job scheduling level. Therefore, it can help prevent issues if not enough capacity is available to perform simultaneous productions.

Resource efficiency

Job scheduling considers the efficiency percentages that are specified for the resources. Efficiency percentages

reduce or increase the time that is reserved for the resource. Therefore, lead time is also increased or decreased. The following formula is used for the calculation: $\text{Scheduling time} = \text{Time} \times 100 \div \text{Efficiency percentage}$ In this formula, *Time* includes both the run time and the setup time.

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Kanban transfer board support for barcode scanners

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The Kanban transfer board supports scanner input from a widget barcode scanner to Select, Start, Complete, and Empty a kanban job.

Registration modes

On the **Scanner registration** FastTab you can select the registration mode, which controls the action when you scan a kanban card number or manually type the number in the Kanban card number field.

SET REGISTRATION MODE	DESCRIPTION
Start	Registers a Kanban transfer job as in progress.
Complete	Registers a Kanban transfer job as completed.
Empty	Registers the material handling unit that is referenced by a Kanban card as empty.
Select	Registers a Kanban card number and automatically selects the referenced job in the Kanban list.

Registration mode Select

When you use a bar code reader to select a job, the display mode of the kanban board changes. In this mode, the following conditions apply:

- Only the scanned kanban job is displayed.
- The details of the selected job are displayed in the **Details** FastTab.
- The **Messages** FastTab displays messages only for the selected job.
- You can change the status of the job by using the functions that are available on the Action Pane. The Kanban transfer board continues to display only a single job during this time.
- You can update the information in the list of jobs manually by clicking **Refresh** (Shift+F5) on the Action Pane. After you refresh the information, the full results for the job filter are displayed again.

Job status and possible actions

The status of the selected job and the status of any pegged jobs for event kanbans, determine whether you can process the job further. The following table displays information about these statuses and tasks:

- The statuses that are available for jobs, or for the handling units that are referenced by the jobs.
- Each task that you can perform for the job.

JOB TYPE	JOB STATUS OR HANDLING UNIT STATUS	UPDATE PICKING LIST	START	UPDATE REGISTRATI ON	COMPLETE	EMPTY	CREATE EVENT KANBANS
Transfer	<ul style="list-style-type: none"> • Not plan ned • No peg ged jobs , or peg ged jobs are Co mpl eted 	Yes	Yes	Yes	Yes	No	Yes
Transfer	<ul style="list-style-type: none"> • Not plan ned • The peg ged job is not Co mpl eted 	Yes	No	Yes	No	No	No
Transfer	In progress	Yes	No	Yes	Yes	No	No
Transfer	Completed	No	No	No	No	Yes	No
Transfer or process	Empty	No	No	No	No	No	No
Transfer or process	A kanban card is not found	No	No	No	No	No	No
Transfer or process	A kanban card is found, but it is not assigned to a kanban	No	No	No	No	No	No

JOB TYPE	JOB STATUS OR HANDLING UNIT STATUS	UPDATE PICKING LIST	START	UPDATE REGISTRATI ON	COMPLETE	EMPTY	CREATE EVENT KANBANS
Process	<ul style="list-style-type: none"> • Not plan ned • Pre pare d • In pro gres s 	No	No	No	No	No	No
Process	Completed	No	No	No	No	No	No

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Production feedback

2/18/2021 • 2 minutes to read • [Edit Online](#)

This article provides information about production feedback, which gives workers feedback about production jobs. The article includes information about the various ways that production feedback can be updated.

Production feedback gives workers feedback about production jobs. It records time and material consumption on production orders, operation quantities and status, and errors that cause a job or operation to fail. Production feedback can be updated in journals that are related to production orders. The **Production job card** and **Production route card** journals are used to report time and quantities per job or operation. For reporting about the last job or operation, quantities on the finished product can be reported as finished. Production feedback can also be updated on the **Job card terminal** and **Job card device** pages. These pages enable production feedback to be updated on the shop floor and are part of the manufacturing execution functionality in the **Production control** module. The **Job card terminal** page has a configurable user interface that shows a list of the released jobs in a prioritized order for a selected work area. It also offers advanced options such as job bundling and team work. The **Job card device** page has a touch-optimized user interface. Production feedback on both pages is updated from the production journals.

NOTE

Can you tell us about your documentation language preferences? [Take a short survey.](#)

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Create a production flow version

2/18/2021 • 2 minutes to read • [Edit Online](#)

This procedure focuses on creating a new production flow version. For this procedure, the production parameters for lean manufacturing and the units of measurement for class time must be defined. You also need to define a value stream and a production group. To learn more about production flows and activities in lean manufacturing, see the white papers on Lean manufacturing for Microsoft Dynamics AX. The demo data company used to create this procedure is USMF.

Create a production flow

1. Go to Production control > Setup > Lean production flow > Production flows.
2. Click New.
3. In the Name field, type a value.
4. In the Description field, type a value.
5. In the Name field, click the drop-down button to open the lookup.
6. In the list, click the link in the selected row.
 - Select an operating unit of type value stream. A value stream is an operating unit that spans all activities and flows of the value stream. At this stage, operating units are limited to a legal entity and have no further functionality.
7. In the Production group field, click the drop-down button to open the lookup.
8. In the list, click the link in the selected row.
 - Select a production group for the production flow. Production groups allow the definition of material, labor, and WIP accounts for a production process. To associate the accounting context to a production flow, a production group must be selected.
9. Click Save.

Create a production flow version

1. Click Add.
2. In the Expiration date field, enter a date and time.
 - If required, define an Expiration date for the version. You can update it at any given time, even for active versions. You can use it to plan to phase out a version.
3. Click OK.
4. In the list, mark the selected row.
5. In the Unit field, type a value.
6. ResolveChanges the Takt unit.
7. In the Average takt time field, enter a number.
 - Define the Average takt time of the version. For the takt control of the production flow version, define a targeted average takt time. The takt is defined as quantity per time period. In the example, the takt time is 0.2 hours per 10 pieces. For a working time of 8 hours, this corresponds to a daily throughput capacity of 400 pieces.
8. In the Quantity per cycle field, enter a number.
 - Define the quantity per cycle related to the Average takt time.
9. Toggle the expansion of the Version details section.
10. In the Minimum takt time field, enter a number.

- Define the minimum takt time. The minimum takt time must be less than or equal to the average takt time.

11. In the Maximum takt time field, enter a number.

- The maximum takt time must be higher than or equal to the Average takt time.

12. In the Period for actual cycle time (days) field, enter a number.

- Enter the number of days in the Period for actual cycle time. The period for actual cycle time is the number of days that jobs are aggregated from the actual minute backwards to calculate the actual cycle time. The value can be changed at any time and is only used for the calculation of the actual cycle times.

13. Click Save.

NOTE

Can you tell us about your documentation language preferences? [Take a short survey.](#)

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Create process activities for lean manufacturing

2/18/2021 • 2 minutes to read • [Edit Online](#)

Create a process activity for lean manufacturing.

Prerequisites:

1. A production flow and version that is not active must be created.
2. A work cell must be created.

Find the production flow version

1. Go to Production control > Setup > Lean production flow > Production flows.
2. In the list, find and select the desired record.
3. In the list, click the link in the selected row.

Create a new activity

1. Click Activities.
 - Ensure that the selected production flow has a version in draft and select that version.
2. Click Create new plan activity.
3. Click Next.
4. In the Name field, type a value.
5. In the Name field, type a value.
 - Note that the name must be unique for a given production flow for all versions.
6. In the Process quantity field, enter a number.
 - Note that no matter what job quantity will be processed, this is the minimum quantity per job to calculate the labor cost. If job quantities deviate from this quantity, labor cost variance will be created.
7. Click Next.

Select the work cell

1. In the Work cell field, click the drop-down button to open the lookup.
2. In the list, click the link in the selected row.

Define the inventory updates

1. Select or clear the Update on hand receipt check box.
 - If Update On hand = No, you can define the activity to receive a semi-finished product (the activity does not reach the next BOM level). You can also select to consume semi-finished products.

Define the picking activities

1. Click Next.
2. In the list, mark the selected row.
 - A default picking activity is created for the input location of the selected work cell.
3. Click Add.
 - You can create additional picking activities for specific products, that are not staged at the work cell

input activity.

4. In the list, find and select the desired record.
5. In the Item number field, type a value.
6. In the Warehouse field, click the drop-down button to open the lookup.
 - With this definition, all materials consumed in the activity are picked from the default input warehouse and location except the item that is defined in the second picking activity. This item will be picked from a different warehouse and location.
7. In the list, find and select the desired record.
8. In the list, click the link in the selected row.
9. Select or clear the Register scrap check box.
10. Click Next.

Define the activity times

1. In the list, find and select the desired record.
 - The definition of a Runtime is required. The Runtime is used to calculate costs and the throughput times of the kanban jobs. Runtimes are not used to calculate capacity load and consumption, this is calculated by cycle time, derived from the production flow version task.
2. In the Time field, enter a number.
3. In the Unit field, type a value.
4. Select the Time unit.
5. In the Per quantity field, enter a number.
6. In the list, find and select the desired record.
 - Queue times are optional.
7. In the Time field, enter a number.
8. In the Unit field, type a value.
9. Select the Time unit.
10. In the Per quantity field, enter a number.
11. Click Next.
12. Click Finish.
13. Close the page.

NOTE

Can you tell us about your documentation language preferences? [Take a short survey.](#)

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Create transfer activities for lean manufacturing

2/18/2021 • 2 minutes to read • [Edit Online](#)

Create a transfer activity for lean manufacturing.

Prerequisites:

1. A production flow and version that is not active must be created.
2. The from and to warehouse and locations must be created. Optionally, the replenishing or the replenished work cell should be created.

Find the production flow version

1. Go to Production control > Setup > Lean production flow > Production flows.
2. In the list, find and select the desired record.
 - Note that the production flow must have a version in draft status.
3. In the list, click the link in the selected row.

Create a new activity

1. Click Activities.
 - Ensure that the selected production flow has a version in draft and select that version.
2. Click Create new plan activity.
3. Click Next.
4. In the Name field, type a value.
5. In the Activity type field, select 'Transfer'.
6. In the Process quantity field, enter a number.
7. Click Next.

Select the Work cells

1. In the Replenishing field, click the drop-down button to open the lookup.
 - To use the work cell output location as the from location in the transfer activity, select a work cell. The same can be done with the replenished work cell, which sets the target location of the transfer activity.
2. In the list, click the link in the selected row.

Define the inventory updates

1. In the Product type field, select an option.
 - Note that a transfer does not change the type of product. You can transfer finished products or semi-finished products (transfer between two activities of a production flow and possibly a kanban flow). When transferring finished products, you can select if picking or receiving results in an inventory transaction.

Define the transfer locations

1. Click Next.
2. In the Warehouse field, click the drop-down button to open the lookup.

3. In the list, find and select the desired record.
4. In the list, click the link in the selected row.
5. In the Location field, click the drop-down button to open the lookup.
6. In the list, click the link in the selected row.
7. In the Freight by field, select 'Shipper'.
 - Options include: Shipper - the organization operating the shipping warehouse, Recipient - the organization operating the receiving warehouse, Carrier - a third party vendor. If the operating organization is a vendor, the transfer activity requires a subcontracting agreement.
8. Click Next.

Define the activity times

1. In the list, find and select the desired record.
 - The definition of a Runtime is required. The Runtime is used to calculate cost and the throughput times of the kanban jobs. Runtimes are not used to calculate capacity load and consumption, which is calculated by cycle time, derived from the production flow version task.
2. In the Time field, enter a number.
3. In the Unit field, type a value.
4. Select the Time unit.
5. In the Per quantity field, enter a number.
6. In the list, find and select the desired record.
 - Queue times are optional.
7. In the Time field, enter a number.
8. In the Unit field, type a value.
9. Select the Time unit.
10. In the Per quantity field, enter a number.
11. Click Next.
12. Click Finish.
13. Close the page.

NOTE

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Validate a production flow and version

2/18/2021 • 2 minutes to read • [Edit Online](#)

This procedure shows how to create a new production flow and a first version for lean manufacturing. Prerequisites: The production parameters for Lean manufacturing and the units of measure for class time must be defined. You need to define a Value stream and a Production group. Refer to the white papers on Lean manufacturing to familiarize yourself with the concepts of production flows and activities. This procedure refers to the legal entity USMF in demo data. However, assuming that the legal entity is configured for Lean manufacturing, other legal entities can be used.

Create a production flow

1. Go to Production control > Setup > Lean production flow > Production flows.
2. Click New.
3. In the Name field, type a value.
4. In the Description field, type a value.
5. In the Name field, click the drop-down button to open the lookup.
6. In the list, click the link in the selected row.
 - A value stream is an operating unit that spans over all activities and flows of the value stream. At this stage, operating units are limited to a legal entity and have no further functionality.
7. In the Production group field, click the drop-down button to open the lookup.
8. In the list, click the link in the selected row.
 - Production groups allow the definition of material, labor, and WIP accounts for a production process. To associate the accounting context to a production flow, a production group must be selected.
9. Click Save.

Create a production flow version

1. Click Add.
2. In the Expiration date field, enter a date and time.
 - You can update the Expiration date of the version at any given time, even for active versions. Use the expiration of the version to plan for a phase out of a version.
3. Click OK.
4. In the list, mark the selected row.
5. In the Unit field, type a value.
6. Select the Takt unit.
7. In the Average takt time field, enter a number.
 - For the takt control of the production flow version, define a targeted average takt time. The takt is defined as quantity per time period. In the given example, the takt time is 0.2 hours per 10 pieces. For a working time of 8 hours, this corresponds to a daily throughput capacity of 400 pieces.
8. In the Quantity per cycle field, enter a number.
9. Expand or collapse the Version details section.
10. In the Minimum takt time field, enter a number.
 - The minimum takt time must be less than or equal to the average takt time.
11. In the Maximum takt time field, enter a number.
 - The maximum takt time must be higher than or equal to the Average takt time.

12. Enter a number of days in the Period for actual cycle time

- The period for actual cycle time is the number of days that jobs are aggregated from the actual minute backwards to calculate the actual cycle time. The value can be changed at any time and is only used for the calculation of the actual cycle times.

13. Click Save.

NOTE

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Activate a production flow version

2/18/2021 • 2 minutes to read • [Edit Online](#)

Before kanban jobs can be created and activities can be processed for a production flow version, you should activate the version. As a best practice, activate the version before its effective start date and time expire. To complete this task, you must have a production flow version that has the Draft status in order to activate the version.

Find and activate a production flow version

1. Go to Production flows.
2. In the list, find and select the desired record.
 - Select a production flow version that has Draft in the Plan status field.
3. In the list, click the link in the selected row.
4. In the list, find and select the desired record.
 - Select a production flow version that has Draft in the Plan status field.
5. Click Activate.
6. Click OK.

NOTE

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Create activity relation - Successor

2/18/2021 • 2 minutes to read • [Edit Online](#)

The flow of activities in a lean production flow is documented through activity relations. This recording shows how to create an activity relation.

Prerequisites:

- A production flow and version in draft mode.
- Two activities that follow each other in the production flow are created but not related.

Find the production flow version

1. Go to Production control > Setup > Lean production flow > Production flows.
2. In the list, find and select the desired record.
3. In the list, click the link in the selected row.
4. In the list, mark the selected row.
5. In the list, select a draft version.
 - Activity relations can be added to both draft or active versions of a production flow.

Open the activity overview

1. Click Activities.
 - Note that the form shows all activities of the production flow that are allocated to the Version of the production flows that you are working in.

Add a Successor

1. Click Add successor.
2. In the Activity field, click the drop-down button to open the lookup.
3. In the list, find and select the desired record.
4. In the list, click the link in the selected row.
5. Select the Constraint check box.
6. In the Constraint value field, enter a number.
 - The constraint time is the time to be scheduled between the scheduled end of the predecessor (due date and time) and the scheduled start of the successor.
7. In the Units field, type a value.
8. In the Cycle time ratio field, enter a number.
 - If both activities run at the same takt, the cycle time ratio should be 1. If the predecessor runs at the double speed of the successor, the ratio should be 2. The cycle time ratios are used to calculate the individual cycle times of the production flow activities.
9. Click OK.
10. Close the page.
11. Click the GridPanel tab.
12. Close the page.
13. Refresh the page.

NOTE

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Add a predecessor to a production flow activity

2/18/2021 • 2 minutes to read • [Edit Online](#)

In a production flow version, all activities must be sequenced. An activity can have one or multiple predecessors or successors.

This procedure shows how to associate a predecessor to an activity.

To perform this task, you need a production flow that has the Draft version with at least two activities that can be connected.

To learn more, read the white paper "Production flows and activities in lean manufacturing."

Find the production flow and version

1. Go to Production control > Setup > Lean production flow > Production flows.
2. In the list, find and select the desired record.
3. In the list, click the link in the selected row.
4. In the list, find and select the desired record.
5. Click Activities.

Select an activity and add a predecessor

1. In the list, find and select the desired record.
2. Click Add predecessor.
3. In the Activity field, enter or select a value.
4. In the Cycle time ratio field, enter a number.
 - The default cycle time ratio of an activity relation is 1. This assumes that both activities run at the same pace or takt time. If the predecessor runs at a higher pace (lower takt time), the ratio should be lower than 1, if the predecessor runs at a slower pace (higher takt time) the cycle time ratio is greater than 1.
5. Click OK.

NOTE

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Create a value stream

2/18/2021 • 2 minutes to read • [Edit Online](#)

Value streams are operating units, that group one or multiple production flows. To define a production flow, you first must define a value stream.

Open the form

1. Go to Production control > Setup > Lean production flow > Value streams.

Create a new value stream

1. Click New to open the drop dialog.
2. In the Name field, type a value.

Select a value stream manager

1. In the Manager field, click the drop-down button to open the lookup.
 - The value stream manager is defined to document the organization.
2. In the list, find and select the desired record.
3. In the list, click the link in the selected row.

Save and close

1. Click Save.
2. Close the page.
3. Refresh the page.

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Lean pegging from sales orders

2/18/2021 • 2 minutes to read • [Edit Online](#)

This procedure focuses on validating the pegging tree from a sales line where the item is produced with kanbans. After validating the pegging tree, all the kanban jobs are planned. This is useful for order scenarios where the order taker needs to ensure that production can start right away. The demo data company used to create this procedure is USMF. This procedure is intended for the advanced order taker working in a lean company.

Create a sales order for a kanban controlled item

1. Go to All sales orders.
2. Click New.
3. In the Customer account field, enter or select a value.
 - Use US-001.
4. Click OK.
5. In the Item number field, type 'L0001'.
6. Set Quantity to '30'.
 - It is important that the quantity is higher than 24 in order to trigger the event kanban rule.

Open a pegging tree

1. Click Product and supply.
2. Click View pegging tree.
 - Notice that the pegging tree shows all levels of the pegging needed for the sales order line. In this case, there are two levels of kanbans and all the required components.

Plan the pegging tree

1. In the tree, select 'Sales line 000832\Kanban 000558'.
2. Expand the Kanban jobs section.
 - Notice that the job status for the kanban job is Not planned.
3. Click Plan entire pegging tree.
 - This will plan all kanban jobs in the pegging tree, changing the Job status from Not planned to Planned.
4. Refresh the page.
 - Notice that the kanban Job status changed from Not planned to Planned.
5. In the tree, select 'Sales line 000832\Kanban 000558\Issue for L0001\Kanban 000559'.
 - The job for the second kanban is also planned, because the entire pegging tree is planned. Notice that the kanban job status is changed from Not planned to Planned.

NOTE

Can you tell us about your documentation language preferences? [Take a short survey.](#)

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Create a subcontracted work cell for lean manufacturing

2/18/2021 • 2 minutes to read • [Edit Online](#)

To model subcontracted work for lean manufacturing, you must create a work cell that is associated with the vendor that provides the work. A subcontracted work cell is linked to the vendor through the association of a resource of the Vendor type. If you play this recording in the USMF demo company, you can select vendor account ID 1002 and site 1.

Create a vendor resource

1. Go to Resources.
2. Click New.
3. In the Resource field, type a value.
4. In the Description field, type a value.
5. In the Type field, select 'Vendor'.
6. In the Vendor field, click the drop-down button to open the lookup.

Create the resource group

1. Go to Resource groups.
2. Click New.
3. In the Resource group field, type a value.
4. In the Description field, type a value.
5. In the Site field, click the drop-down button to open the lookup.
 - Select the site that the work cell should be allocated to. In theory, a site can represent a single site that is operated by a vendor. However, in most cases, subcontracted resources are just allocated to the site that orders the subcontracted work. Note that the input and output warehouses of subcontracted work cells must be on the same site.
6. In the Site field, type a value.
7. @SysTaskRecorder:_RequestClose
8. Select or clear the Work cell check box.
9. In the Input warehouse field, click the drop-down button to open the lookup.
 - Select the warehouse and location that are used to stage the material for the vendor-managed work cell. In many cases, the warehouse and location are modeled by using a separate warehouse per vendor and one location per work cell.
10. In the Input location field, click the drop-down button to open the lookup.
11. In the Output warehouse field, click the drop-down button to open the lookup.
 - Define the warehouse and location where the material is posted when the subcontracted activities of the work cell are posted. The warehouse and location can be at the vendor site if the vendor reports the kanban jobs. Alternatively, the warehouse and location can be the receiving location that is associated with the next step of the production flow.
12. In the Output location field, click the drop-down button to open the lookup.
13. Expand or collapse the Calendars section.
14. Click Add.

15. In the Calendar field, click the drop-down button to open the lookup.
 - Associate the working time calendar of the work cell with the resource group. For critical resources, we recommend that you define specific calendars that represent the exact working times and related capacities of the work cell or vendor site.
16. Expand or collapse the Resources section.
17. Click Add.
 - A subcontracted resource group must have an associated resource of the Vendor type that links the resource group to the vendor account.
18. In the Resource field, click the drop-down button to open the lookup.
 - Select or enter the vendor resource that you created in the previous sub-task.
19. Expand or collapse the Work cell capacity section.
20. Click Add.
 - A work cell must have a defined capacity. In this example, we create a throughput capacity of 100 pieces per standard workday.
21. In the Production flow model field, click the drop-down button to open the lookup.
22. In the Capacity period field, select an option.
23. In the Average throughput quantity field, enter a number.
24. In the Unit field, click the drop-down button to open the lookup.
25. ResolveChanges the Unit.

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Add a kanban quantity calculation policy to a kanban rule

2/18/2021 • 2 minutes to read • [Edit Online](#)

This procedure focuses on creating a kanban quantity calculation policy and adding it to a kanban rule to optimize the kanban size and quantities. The demo data company used to create this procedure is USMF. This procedure is intended for the value stream manager. This procedure is a prerequisite for creating the procedure Calculate kanban quantity suggestions.

Create a kanban quantity calculation policy

1. Go to Production control > Periodic tasks > Kanban quantity calculation > Kanban quantity calculation policies.
2. Click New.
3. In the Name field, type a value.
 - For example, type Speaker2016.
4. In the Master plan field, click the drop-down button to open the lookup.
5. In the list, find and select the desired record.
 - Select StaticPlan to calculate demand.
6. In the list, click the link in the selected row.
7. Click Save.
8. In the Minimum kanban quantity field, enter '1'.
 - This is the additional number of kanbans that is included in the kanban quantity calculation.
9. Set Safety factor to '1'.
 - This is the factor that is used to calculate additional quantity of safety stock.
10. In the Days ahead field, enter '30'.
 - This is the number of days prior to the kanban quantity calculation date that is included in the demand calculation.
11. In the Days behind field, enter '30'.
 - This is the number of days forward from the kanban quantity calculation date that is included in the demand calculation. The formula used for the calculation is shown with the actual values. For example, Kanban quantity = ((Average daily demand x lead time x 2.00) / Product quantity per handling unit) + 1
12. Close the page.

Add the kanban quantity calculation policy to a kanban rule

1. Go to Product information management > Lean manufacturing > Kanban rules.
2. In the list, find and select the desired record.
 - Select kanban rule 000020 for this procedure.
3. In the list, click the link in the selected row.
4. Toggle the expansion of the Kanban quantity calculation policies section.
5. Click Add.
 - Add the kanban quantity calculation policy that you have just created in the previous sub-task.
6. In the list, mark the selected row.

7. In the Name field, click the drop-down button to open the lookup.
8. In the list, click the link in the selected row.
 - Select the policy Speaker2016 that you have just created in the previous sub-task.

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Calculate kanban quantity suggestions

2/18/2021 • 2 minutes to read • [Edit Online](#)

This procedure focuses on optimizing the kanban size and quantities for a specific kanban rule by using the kanban quantity calculation. The demo data company used to create this procedure is USMF. This procedure is intended for the value stream manager. It is a prerequisite that you have completed the procedure Add a new kanban quantity calculation policy to a kanban rule.

Create a kanban quantity calculation

1. Go to Production control > Periodic tasks > Kanban quantity calculation > Calculate kanban quantity.
2. Click New.
3. In the Name field, type 'Speaker2016'.
4. In the Name field, click the drop-down button to open the lookup.
 - Select the policy that you have created in the procedure Add a new kanban quantity calculation policy to a kanban rule. For example, Speaker2016.
5. In the list, click the link in the selected row.
6. In the Rule active as of date field, set the date and time to '2012-12-17T08:00:00'.
 - This date serves as the basis for determining which fixed kanban rules are included in the kanban quantity calculation.
7. In the Fulfilled demand period start date field, set the date and time to '2012-11-17T09:00:00'.
 - The date from when past demand transactions are included to calculate the kanban quantity.
8. In the Fulfilled demand period end date field, set the date and time to '2012-12-17T07:59:59'.
 - The date until when past demand transactions are included to calculate the kanban quantity.
9. In the Demand period start date field, set the date and time to '2012-12-17T08:00:00'.
 - The date from when current demand transactions are included to calculate the kanban quantity.
10. In the Demand period end date field, set the date and time to '2013-01-16T07:59:59'.
 - The date until when current demand transactions are included to calculate the kanban quantity.

Generate kanban quantity proposal

1. Click Save.
2. Click Generate.
 - This generates a kanban quantity proposal line for the kanban rule 000020.

Run kanban quantity calculation

1. Click Calculate.
 - This calculates the kanban quantity proposal.
2. Click OK.
3. In the list, mark the selected row.
 - Notice the suggested kanban quantity is 2.

Change product quantity and calculate again

1. Set Product quantity to '5'.
2. Click Calculate.

3. Click OK.

- Notice that with a kanban quantity of 5, the suggestion is changed to a kanban quantity of 4.
- This is caused by the fact that with a lower product quantity, we need more kanbans to fulfill the demand.

Update kanban rule

1. In the Rule effective date field, enter a date and time.

- Set the 'Rule active as of date' to a date in the future. For example, today + one year.

2. Click Update.

3. Click OK.

4. Close the page.

Validate change on kanban rule

1. Go to Product information management > Lean manufacturing > Kanban rules.

2. In the list, click the link in the selected row.

- Select the kanban rule that was created in the previous sub-task. This should be the first kanban rule in the list sorted by number.

3. Toggle the expansion of the Details section.

- Notice the effective date, which means that this rule is not activated until this date.

4. Toggle the expansion of the Quantities section.

- Notice this is the default quantity that you entered on the kanban quantity calculation.
- Notice this is the fixed kanban quantity of 4 from the kanban quantity calculation.

5. Click the ListPanel tab.

NOTE

Can you tell us about your documentation language preferences? [Take a short survey](#).

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Change kanban rules for a process job

2/18/2021 • 2 minutes to read • [Edit Online](#)

This procedure focuses on changing the used kanban rule for a given kanban. This is useful to level load resources or in case of breakdown. The demo data company used to create this procedure is USMF. This procedure is intended for the planner, working at a lean manufacturing company, responsible for the value stream.

Copy kanban rule

1. Go to Kanban rules.
2. In the list, find and select the desired record.
 - Select Event Kanban rule 000022 for L0001.
3. Click Duplicate kanban rule.
4. Click OK.

Change kanban rule

1. Close the page.
2. Go to Kanban job scheduling.
3. In the list, mark the selected row.
 - Select line with Kanban 000177.
4. Click Use alternative kanban rule.
5. Click Next.
6. In the Kanban rule field, enter or select a value.
 - Select the kanban rule that was created earlier. This is the kanban rule with the highest number.
7. Click Finish.
 - Now the kanban job is using an another kanban rule. This can be useful to level load work cells.

NOTE

Can you tell us about your documentation language preferences? [Take a short survey.](#)

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Create a BOM line event kanban rule

2/18/2021 • 2 minutes to read • [Edit Online](#)

This task focuses on the setup needed to create an event kanban rule to ensure supply for production BOM lines in a mixed lean and classic production environment. The demo data company used to create this task is USMF. This task is intended for the process engineer or the value stream manager, as they prepare production of a new or modified product.

Create a new kanban rule

1. Go to Production control > Periodic tasks > Kanban quantity calculation > Kanban rules.
2. Click New.
3. In the Type field, select 'Withdrawal'.
 - The Withdrawal type is used to create transfer kanbans.
4. In the Replenishment strategy field, select 'Event'.
 - The Event strategy is selected to create the transfer of kanbans based on an event. Later in the task guide, we will trigger it by estimating a production order.
5. In the First plan activity field, enter or select a value.
 - Enter or select ReplenishSpeakerComponents. This transfer activity has receipt (output) warehouse and location 12, which means that material will be moved to location 12 in warehouse 12.
6. Expand the Details section.
7. In the Product field, enter or select M0001.
8. Expand the Events section.
9. In the BOM line event field, select 'Automatic'.
 - With the BOM line event field set to Automatic, kanban will be created to fulfill material needs for production order BOM lines.
10. Close the page.

Create and modify a new production order

1. Go to Production control > Production orders > All production orders.
2. Click New production order.
3. In the Item number field, enter or select a value.
 - Enter or select 'L0001'. We use item L0001 because item M0001 is included in the BOM for item L0001.
4. Click Create.
5. In the list, click the link in the row for L0001
6. Click BOM.
7. In the list, click the link in the selected row.
8. Click Edit.
9. In the Line type field, select 'Pegged supply'.
 - Pegged supply is selected to trigger the supply creation of a kanban.
10. Select No in the Resource consumption field.
 - Clearing the check box of Resource consumption lets us change the warehouse.
11. Expand the Inventory dimensions section.
12. In the Warehouse field, type '12'.

- Warehouse is set to 12 because this is the output warehouse for the withdrawal activity.
13. In the Location field, type '12'.
 - Location is set to 12 because this is the output location of the withdrawal activity.
 14. Close the page.
 15. Close the page.

Estimate the production order and view the kanban created

1. Click Estimate.
 - Estimating the production order will trigger the creation of the associated kanban to supply item M0001.
2. Click OK.
3. Close the page.
4. Close the page.
5. Go to Product information management > Lean manufacturing > Kanban rules.
6. In the list, click the link in the selected row.
 - Select the event kanban rule created for item M0001.
7. Expand the Kanbans section.
8. In the list, mark the selected row.
 - Notice the kanban created to supply M0001 for the estimated production order.
 - This is the last step!

NOTE

Can you tell us about your documentation language preferences? [Take a short survey.](#)

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Create a fixed quantity kanban rule for manufacturing

2/18/2021 • 2 minutes to read • [Edit Online](#)

This procedure focuses on the setup needed to create a fixed manufacturing kanban rule for triggering transforming activities, at a work cell, in a lean environment. The demo data company used to create this procedure is USMF. This procedure is intended for the Process Engineer or the Value Stream Manager, as they prepare production of a new or modified product.

Create new kanban rule

1. Go to Kanban rules.
2. Click New.
 - Notice that the default Type is Manufacturing and Replenishment strategy is Fixed. You do not have to change these parameters.
3. In the First plan activity field, enter or select a value.
 - This is the activity that will be performed for kanbans created based on this kanban rule. Select 'SpeakerTestAndPackaging'.
4. Expand the Details section.
5. In the Product field, enter or select a value.
 - Select L0050.
6. In the Unit of measure field, enter or select a value.
 - Select minutes.
7. In the Lead time field, enter a number.
 - Enter 5.

Set quantities

1. Expand the Quantities section.
2. Set Default quantity to '10'.
 - This is the quantity that will be transferred for each kanban.
3. Select the Product quantity variance check box.
 - With this, selected kanbans can be completed with a variance from the default quantity. To allow kanbans to be completed with a quantity from 8 to 12, set both variances to 2.
4. Set Variance below to '2'.
 - This will allow completing down to $10 - 2 = 8$
5. Set Variance above to '2'.
 - This will allow completing up to $10 + 2 = 12$
6. In the Fixed kanban quantity field, enter a number.
 - This is the amount of kanbans that should be active. In this case, 5 kanbans processing 10 each.
7. In the Alert boundary minimum field, enter '2'.
 - Used to keep track of the minimum amount of full kanbans that should be at the destination. For example, this is used on the kanban quantity overview.
8. In the Alert boundary maximum field, enter '4'.
 - Used to keep track of the maximum amount of full kanbans that should be at the destination. For

example, this is used on the kanban quantity overview.

9. In the Automatic planning quantity field, enter '1'.

- Setting this to 1 means that every kanban will be automatically planned. If we entered 3, the kanbans would not be planned until 3 empty kanbans are ready for planning. This is useful for grouping work and avoiding too much setup.

Create Kanbans

1. Expand the Kanbans section.

2. Click Save.

- The kanban rule needs to be saved before kanbans can be created.

3. Click Add.

- Note that there are no active kanbans, due to this the suggested 'Number of new kanbans' are 5. This is equal to the 'Fixed kanban quantity'.

4. Click Create.

- This will create 5 kanbans.
- Note that 5 kanbans, for 10 each, was created for this manufacturing kanban rule. This is the last step in this procedure.

NOTE

Can you tell us about your documentation language preferences? [Take a short survey.](#)

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Create a kanban rule using a kanban line event

2/18/2021 • 2 minutes to read • [Edit Online](#)

This procedure creates a kanban rule by using the kanban line event setting to trigger pull from a process activity. The kanban rule is triggered by a kanban process activity, with a quantity equal to or greater than 25 each. The demo data company used to create this task is USMF. This task is intended for the process engineer or the value stream manager, as they prepare production of a new or modified product in a lean environment.

Create a kanban rule

1. Go to Product information management > Lean manufacturing > Kanban rules.
2. Click New.
3. In the Replenishment strategy field, select 'Event'.
 - This generates kanbans directly from demand. It is used to set up rules that define a make-to-order scenario.
4. In the First plan activity field, enter or select a value.
 - Enter or select SpeakerAssemblyAndPolish. The first activity of a manufacturing kanban rule is a process activity in the production flow. When you select the activity, the validity dates of the activity are copied to the validity dates of the kanban rule.
5. Expand the Details section.
6. In the Product field, type 'L0001'.
7. Expand the Events section.
8. In the Kanban line event field, select 'Automatic'.
 - This generates event kanbans on demand. The field is used to configure kanban rules that replenish material that is required for a downstream process activity. When you select Automatic, the event kanbans are created with the demand. This setting is recommended if you expect to execute production on the same day.
9. Set Minimum event quantity to '25'.
 - Event kanbans are generated when the demand quantity is equal to or more than this field. This is useful if you want to produce an order quantity less than this field on one machine and more than this field on another machine.
10. Click Save.

Create sales order and trigger kanban chain

1. Go to Sales and marketing > Sales orders > All sales orders.
2. Click New.
3. In the Customer account field, enter or select a value.
 - Select Customer account US-003, Forest Wholesales.
4. Click OK.
5. In the Item number field, type 'L0001'.
 - L0001 is the item for which you created the kanban rule.
6. Set Quantity to '27'.
 - Because 27 is higher than the minimum quantity of 25 on the kanban rule, this will trigger an event kanban.
7. In the Site field, type '1'.

8. In the Warehouse field, enter or select a value.

- Select warehouse 13.

9. Click Save.

View the kanban generated by the kanban rule

1. Go to Product information management > Lean manufacturing > Kanban rules.

2. In the list, find and select the desired record.

3. Expand the Kanbans section.

- Notice that a kanban for 27 was created to process the activity based on the created kanban rule.
- This is the last step.

NOTE

Can you tell us about your documentation language preferences? [Take a short survey](#).

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Create a kanban rule using a minimum stock event

2/18/2021 • 2 minutes to read • [Edit Online](#)

This procedure focuses on the setup needed to create a kanban rule using a minimum stock event to ensure that a specific product is always available at a specific location. A kanban rule is created to transfer material to the location when the inventory level drops below 200 pieces. By running the Pegging event processing, the needed kanbans are created. The demo data company used to create this task is USMF. This task is intended for the process engineer or the value stream manager, as they prepare production of a new or modified product in a lean environment.

Create a new kanban rule

1. Go to Product information management > Lean manufacturing > Kanban rules.
2. Click New.
3. In the Type field, select 'Withdrawal'.
 - This type is used to create transfer kanbans.
4. In the Replenishment strategy field, select 'Event'.
 - The Event strategy is used to create the transfer kanbans based on an event. Later in the procedure, you will trigger transfer kanbans by using stock replenishment.
5. In the First plan activity field, enter or select a value.
 - Enter or select ReplenishSpeakerComponents. This transfer activity has receipt (output) warehouse and location 12, which means that materials will be moved to location 12 in warehouse 12.
6. Expand the Details section.
7. In the Product field, enter or select a value.
 - Select M0007.
8. Expand the Events section.
9. In the Stock replenishment event field, select 'Batch'.
 - This creates kanbans to fulfill material needs at the related location during Pegging event processing.

Set the minimum quantity for the item

1. Click to follow the link in the Product field.
2. Click to follow the link in the Item number field.
3. Expand the Product image FactBox.
4. On the Action Pane, click Plan.
5. Click Item coverage.
6. Click New.
7. In the list, mark the selected row.
8. In the Warehouse field, enter or select a value.
 - Set Warehouse to 12.
9. Set Minimum to '200'.

Run the batch event creation job

1. Go to Production control > Periodic tasks > Kanban job batch processing > Pegging event processing.
2. Click OK.

3. Go to Product information management > Lean manufacturing > Kanban rules.
4. In the list, click the link in the selected row.
 - Select the kanban rule that you created earlier.
5. Expand the Kanbans section.
 - Notice that a kanban was created to transfer the needed material to warehouse 12.

NOTE

Can you tell us about your documentation language preferences? [Take a short survey](#).

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Create a kanban rule for multiple activities

2/18/2021 • 2 minutes to read • [Edit Online](#)

This procedure shows how to create a kanban rule that includes multiple activities from a production flow. The demo data company used to create this task is USMF. This task is intended for the process engineer or the value stream manager, as they prepare production of a new or modified product in a lean environment.

Create a new kanban rule

1. Go to Product information management > Lean manufacturing > Kanban rules.
2. Click New.
3. In the Replenishment strategy field, select 'Scheduled'.
4. In the First plan activity field, enter or select a value.
 - Select SpeakerAssemblyAndPolish.
5. Select the Multiple activities check box.
 - The purpose is to include more than one activity in the kanban rule. You choose a path in the production flow when you select the last plan activity.
6. In the Last plan activity field, enter or select a value.
 - Select SpeakerTestAndPackaging. After you select the value, a page automatically opens. Select the kanban flow SpeakerAssemblyAndPolish > SpeakerTestAndPackaging. Click OK.
7. Expand the Details section.
8. In the Product field, enter or select a value.
 - Select Item L0006.

Create kanban and view jobs

1. Expand the Kanbans section.
2. Click Add.
3. In the Number of new kanbans field, enter '1'.
 - This will create one kanban.
4. Set Product quantity to '3'.
 - Kanban will process 3 products.
5. In the Due date/time field, enter a date and time.
 - You can enter Today.
6. Click Create.
7. Click Details.
 - Notice that the kanban has two process jobs from the production flow. The first one is SpeakerAssemblyAndPolish, and the second one is SpeakerTestAndPackaging.
 - This is the last step!

NOTE

Can you tell us about your documentation language preferences? [Take a short survey.](#)

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Create a new kanban rule by duplicating an existing kanban rule

2/18/2021 • 2 minutes to read • [Edit Online](#)

This procedure focuses on creating a duplicate of an existing kanban rule. This is useful if you want to create new kanban rules based on existing kanban rules. The demo data company used to create this procedure is USMF. This procedure is intended for the process engineer or the value stream manager as they prepare production for a changed production flow or a new replenishment rule.

Select a kanban rule

1. Go to Kanban rules.
2. In the list, find and select the desired record.
 - Select kanban rule 000017 for Product M0006.

Duplicate a kanban rule

1. Click Duplicate kanban rule.
 - When duplicating a kanban rule, it is possible to change type, dates, activities, and the product selection. Change the product for this procedure in the next step.
2. In the Product field, enter or select a value.
 - Select M0007.
3. Click OK.
 - Note that a duplicate of kanban rule 000017 is created.

NOTE

Can you tell us about your documentation language preferences? [Take a short survey.](#)

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Create a replacement kanban rule

2/18/2021 • 2 minutes to read • [Edit Online](#)

This procedure focuses on replacing an existing kanban rule with a new kanban rule on a specific date. This is useful when changes in the production flow or replenishment rules need to be coordinated and scheduled. The demo data company used to create procedure is USMF. This procedure is intended for the process engineer or the value stream manager when they prepare production for a changed production flow or a new replenishment rule. This task replaces kanban rule 000022 with a new rule and increases the maximum quantity from 48 to 100 for the new rule.

Select a kanban rule to replace

1. Go to Kanban rules.
2. In the list, find and select the desired record.
 - Select kanban rule 000022.

Create a replacement kanban rule

1. Click Replace kanban rule.
2. In the Effective date field, enter a date and time.
 - Select a date in the future, such as one week from now. This is the date and time when the new kanban rule becomes active and replaces the old kanban rule.
 - If the kanban rule changes the path in the production flow, another activity can be selected. In this procedure, we will keep the activity untouched.
3. Click OK.
 - Notice that a new kanban rule is created to replace kanban rule 000022.
 - The effective date is set according to the date chosen when you replace the kanban rule.
4. In the list, find and select the desired record.
 - Select the replaced kanban rule 000022.
 - Notice that the replaced kanban rule has the same date as the Expiration date because this is the date when it will expire.
5. In the list, select row 1.
 - Select the new kanban rule on top of the list. This is the kanban rule with the highest kanban rule number.
6. In the list, click the link in the selected row.
 - Click the kanban rule number to open the kanban rule.

Modify maximum quantity for the replacement kanban rule

1. Set Maximum quantity to '100'.
 - Expand the Quantities FastTab to see the Maximum quantity field. Changing the maximum quantity to 100 will allow up to 100 kanbans to be processed. This is the last step in this task.

NOTE

Can you tell us about your documentation language preferences? [Take a short survey](#).

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Create a sales event kanban rule

2/18/2021 • 2 minutes to read • [Edit Online](#)

This procedure focuses on the setup needed to create a kanban rule that is triggered during sales order creation. The event kanban rule replenishes requirements that originate from sales order lines. The demo data company used to create this procedure is USMF. It is intended for the process engineer or the value stream manager as they prepare production of a new or modified product.

Create a new kanban rule

1. Go to Kanban rules.
2. Click New.
3. In the Replenishment strategy field, select 'Event'.
 - Selecting Event means that the kanban rule is triggered by an event, for example, creation of a sales order line. This is applied to areas where each kanban should cover a specific demand.
4. In the First plan activity field, enter or select a value.
 - Select Final assembly.
5. Expand the Details section.
6. In the Product field, enter or select a value.
 - Select L0050.

Define an event

1. Expand the Events section.
2. In the Sales event field, select 'Automatic'.
 - By selecting the sales event Automatic, this kanban rule will be triggered automatically when a sales line matches the product and receipt location. In this procedure, it is product L0050 on warehouse 13.
3. Set Minimum event quantity to '50'.
 - With a minimum event quantity of 50, the kanban rule will only be triggered by events with a quantity of 50 or more.
4. Expand the Production flow section.
 - Notice that the Receipt location is warehouse 13. This means that this kanban rule will be triggered for this location.
 - In this example, a sales line for product L0050, with a quantity of 50 or more, on warehouse 13, will trigger this kanban rule.

Create sales line to trigger event kanban rule

1. Go to All sales orders.
 - A warning is shown when the kanban rule is saved, which means that kanbans will be created in real-time during sales order creation.
2. Click New.
3. In the Customer account field, enter or select a value.
 - For example, select US-003.
4. Click OK.
5. In the Item number field, type 'L0050'.

6. In the Site field, type '1'.
 - Select Site 1 because Warehouse 13 is on Site 1.
7. In the Warehouse field, enter or select a value.
 - Set Warehouse to 13.
8. Set Quantity to '75'.
 - Enter a quantity of 50 or greater, to trigger the created kanban rule.

Verify that kanban is created

1. Click Product and supply.
2. Click View pegging tree.
 - Notice that a kanban with the same quantity as the sales line is created. You can also see the material issues needed to produce L0050. This is the last step in this procedure.

NOTE

Can you tell us about your documentation language preferences? [Take a short survey.](#)

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Create a withdrawal kanban rule

2/18/2021 • 2 minutes to read • [Edit Online](#)

This procedure shows the setup that is needed to create a withdrawal kanban rule for transferring material in a lean environment. The demo data company used to create this procedure is USMF. This procedure is intended for the Process Engineer or the Value Stream Manager, as they prepare replenishment of new or modified material.

Create new kanban rule

1. Go to Kanban rules.
2. Click New.
3. In the Type field, select 'Withdrawal'.
 - The Withdrawal type is used for kanban rules to transfer material or goods.
4. In the First plan activity field, enter or select a value.
 - Select ReplenishSpeakerComponents. This activity is set up to move components from warehouse 11, location 11 to warehouse 12, and location 12.
5. In the Product field, enter or select a value.
 - Select M0007.
6. In the Lead time field, enter a number.
 - For example, 60.
7. In the Unit of measure field, enter or select a value.
 - For example, Minutes.

Set quantities for kanban

1. Set Default quantity to '5'.
 - This is the quantity that will be transferred for each kanban.
2. In the Fixed kanban quantity field, enter '2'.
 - This is the amount of kanbans that should be active. In this case, 2 kanbans transferring 5 each.
3. In the Alert boundary minimum field, enter '1'.
 - Used to keep track of the minimum amount of full kanbans that should be at the destination. For example, this is used on the kanban quantity overview.
4. In the Alert boundary maximum field, enter '2'.
 - Used to keep track of the maximum amount of full kanbans that should be at the destination. For example, this is used on the kanban quantity overview.

Create kanbans

1. Click Save.
 - The kanban rule needs to be saved before kanbans can be created.
2. Click Add.
 - Note that there are no active kanbans because the suggested 'Number of new kanbans' is 2, which is equal to the 'Fixed kanban quantity'.
3. Click Create.
 - This will create two kanbans.

- Note that 2 kanbans, for 5 each, was created for this withdrawal kanban rule. This is the last step in this procedure.

NOTE

Can you tell us about your documentation language preferences? [Take a short survey](#).

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Execute kanban process jobs

2/18/2021 • 2 minutes to read • [Edit Online](#)

This procedure focuses on executing kanban process jobs. The first job is completed with the expected quantity and has no errors. The second job is completed with errors. The demo data company used to create this procedure is USMF. This procedure is intended for the machine operator.

Select a kanban job

1. Go to Production control > Kanban > Kanban board for process jobs.
2. In the Work cell field, click the drop-down button to open the lookup.
3. Click the row with resource group 1250. This filters the Jobs list to display only the jobs for work cell 1250.
 - Mark the row that has the Planned job status.

Complete a job with expected quantity

1. Expand or collapse the Details section.
 - This section displays important information about card number, item number, quantity ordered, and activity name.
2. Expand or collapse the Production instructions section.
 - This section displays production instructions for the activity. The instructions can be text, pictures, drawings, and other documents.
3. Click Start.
 - Select a job that is not completed. Use status icons in the Job status field to view job status.
4. Click Complete.
 - The job is completed with the expected quality.

Complete a job with errors

1. Click Start.
 - When a job is completed, the next job on the list is selected automatically. This is why you don't need to select a job before you click Start.
2. On the Action Pane, click Manufacture.
3. Click Complete (details).
4. In the list, mark the selected row.
5. In the Error quantity field, enter a number.
6. In the Good quantity field, enter a number.
7. Click OK.

NOTE

Can you tell us about your documentation language preferences? [Take a short survey.](#)

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Move scheduled kanban jobs

2/18/2021 • 2 minutes to read • [Edit Online](#)

This procedure focuses on moving planned process kanban jobs to a different period. The demo data company used to create this procedure is USMF. This procedure is intended for the shop floor supervisor or production planner working with kanbans.

Select scheduled kanban jobs.

1. Go to **Production control > Kanban > Kanban job scheduling**.
2. In the **Work cell** field, click the drop-down button to open the lookup.
3. In the list, mark the selected row.
 - Select work cell 1250.
4. Click **Select**.
5. In the **Display job status** field, select **Scheduled**. This filters the job list to display only the scheduled kanban jobs.

Move kanban jobs to a different period.

1. In the list, find and select the desired record. Select a job that has the **Planned job** status, for example, a job scheduled on December 20, 2012 in the **Planned period** field. Then move the job to the previous period.
2. Click **Previous period**.
3. Click **End** to move the job to the end of the job list as the last job in the previous period.
4. In the list, find and select the desired record. Select a job that has the **Planned job** status, for example, a job scheduled on December 18, 2012 in the **Planned period** field. Then move the job to the next period.
5. Click **Next period**.
6. Click **Start** to move the job to the start of the job list as the first job in the previous period.

Move a job within a period.

1. In the list, find and select the desired record. Select a job that has the **Planned job** status, for example, the second job scheduled on December 19, 2012 in the **Planned period** field. Then move the job within the planned period.
2. Click **Forward**. Notice that the job is moved one line down on the list.
3. Click **Backward**. Notice that the job is moved one line up on the list.

NOTE

Can you tell us about your documentation language preferences? [Take a short survey](#).

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Prepare a process kanban job when materials are available for the work cell

2/18/2021 • 2 minutes to read • [Edit Online](#)

This task focuses on preparing a process kanban job when all materials are available for the work cell. The demo data company used to create this task is USMF. This task is intended for the machine operator.

1. Go to Kanban board for process jobs.
2. In the Work cell field, click the drop-down button to open the lookup.
3. In the list, click the link in the selected row.
 - Select work cell 1250 and click OK.
4. In the list, select row 4.
 - In the clean demo company, Kanban 000329 in row 4 is the first job that is not completed yet.
5. Toggle the expansion of the Picking list section.
 - Verify that the supply status is available for all items in the picking list.
 - If multiple jobs are selected, the picking list will show the sum of all items needed for the selected jobs.
6. Click Prepare.
 - The preparation process is now completed. The selected check box for all rows in the picking list indicates that the supply status is picked.

NOTE

Can you tell us about your documentation language preferences? [Take a short survey.](#)

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Prepare a process kanban job when materials are not available for the work cell

2/18/2021 • 2 minutes to read • [Edit Online](#)

This procedure focuses on preparing a process kanban job when some materials are not available for the work cell, therefore it's necessary to pick materials from the warehouse. The procedure "Prepare a process kanban job when materials are available" is a prerequisite for creating this procedure. This procedure is intended for the machine operator. The demo data company used to create this procedure is USMF.

1. Go to Production control > Kanban > Kanban board for process jobs.
2. In the Work cell field, click the drop-down button to open the lookup.
3. In the list, click the link in the selected row.
 - Select work cell 1250.
4. In the list, find and select the desired record.
 - Select Kanban 000356.
5. In the list, find and select the desired record.
 - In the list, deselect row 4. or Select row 4 if you haven't completed the task "Prepare a process kanban job when materials are available."
6. Toggle the expansion of the Picking list section.
 - The No entry icon in the supply status indicates that 48 ea of item P0002 are missing for the work cell.

Transfer materials to work cell

1. Toggle the expansion of the Transfer jobs section.
2. Use the Quick Filter to filter on the Item number field with a value of 'P0002'.
3. In the list, find and select the desired record.
4. Click Start.
 - Transfer is in progress.
5. Click Complete.
 - Item P0002 is now available in the picking list for the kanban job. This means that we can prepare the kanban with all the needed materials.
6. Click Prepare.
 - Notice that an icon in the Job status indicates that the job is now ready.

NOTE

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Remove a kanban job from the schedule

2/18/2021 • 2 minutes to read • [Edit Online](#)

This procedure focuses on removing a planned process kanban job from the schedule by reverting the job status to Not planned. The demo data company used to create this procedure is USMF. This procedure is intended for the shop floor supervisor or production planner.

Find a planned kanban job

1. Go to Production control > Kanban > Kanban job scheduling.
2. In the Work cell field, click the drop-down button to open the lookup.
3. In the list, click the link in the selected row.
 - Select work cell 1250.
4. Click Select.
5. In the Display job status field, select 'Scheduled'.

Remove the planned kanban job from the schedule

1. In the list, find and select the desired record.
 - Select a job that has the Planned status, for example, a job from December 19, 2012.
2. On the Action Pane, click Plan.
3. Click Revert job status.
4. Click OK.
 - This will revert the current job status from 'Planned' to 'Not planned' and remove it from the process board.

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Revert kanban job status

2/18/2021 • 2 minutes to read • [Edit Online](#)

This procedure focuses on reverting an incorrect kanban job status. This is useful in case the machine operator updates the wrong job, or sets the wrong status by mistake. In this procedure, a kanban job is registered as prepared by mistake, and the status is reverted. The demo data company used to create this procedure is USMF. This procedure is intended for the shop supervisor or machine operator working in a lean manufacturing company.

Open process board for the work cell

1. Go to Kanban board for process jobs.
2. In the Work cell field, enter or select a value.
 - Select work cell 1260.

Prepare kanban job

1. Click Prepare.
 - If you can't click Prepare because it is grayed out, make sure that the selected kanban job has status Planned, which is indicated by the empty kanban icon. If Prepare fails, make sure that all materials in the Picking list are available.
2. In the list, select the prepared job.
 - Select the first job that you have just prepared.
 - Notice that the jobs status is prepared, which is indicated with a triangle inside the kanban icon.

Revert the status of the prepared kanban job

1. In the list, mark the selected row.
 - Select the first job that was prepared.
2. On the Action Pane, click Manufacture.
3. Click Revert status.
 - You can use an alternative kanban rule when the following conditions are true: - The replenishment strategy is the same for both rules. - The version of the production flow is the same for both rules. - The product that is supplied is the same for both rules. - Any downstream activities that are configured for the last activity of the kanban rules must be the same for both rules. - The same supplied inventory dimensions must be configured for both rules. - The status of the handling unit must be Not assigned. - The configuration for event kanbans must be the same.
 - Ensure that the new status is Planned.
4. Click OK.
5. In the list, unmark the selected row.
 - Select the same job.
 - Notice that the job status for the kanban job is reverted to Planned, which is indicated by an empty kanban icon.

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Schedule kanban jobs

2/18/2021 • 2 minutes to read • [Edit Online](#)

This procedure focuses on scheduling process kanban jobs for a specific work cell. The procedure "Prepare a process kanban job when materials are not available" is a prerequisite for creating this procedure. The demo data company used to create this procedure is USMF. This task is intended for the shop floor supervisor and production planner working with kanbans.

Select kanban jobs for a work cell

1. Go to Production control > Kanban > Kanban job scheduling.
2. Expand the Period capacity fact box
 - Expand the Kanban FactBox.
3. In the Work cell field, click the drop-down button to open the lookup.
4. In the list, mark the selected row.
 - Select work cell 1250. This will filter the view to display only the jobs for work cell 1250.
5. In the list, click the link in the selected row.
6. Click Select.

Schedule a kanban job in the first available period

1. In the list, mark the selected row.
 - Select the first row in the list that has the Not planned status. The dotted icon in the Job status field indicates not planned.
2. Click Schedule.
 - This will schedule the kanban job in the first available period.
 - Notice that the kanban job is moved to the end of the list because it has been added to the period starting from today.
 - If the period starting from today is fully booked, the job will be moved to the first available period.

Schedule two kanban jobs for a specific day

1. In the list, select row 1.
 - You should see that the first row has the Not planned status in the Job status field.
2. In the list, select row 2.
 - You should see that the second row has the Not planned status in the Job status field. Now you have the first two jobs selected.
3. Click Schedule from date to open the drop dialog.
4. Check or uncheck the Override capacity shortage reaction box.
 - This option allows you to override the default capacity shortage reaction.
5. In the Capacity shortage reaction field, select 'Add to the requested period'.
 - This option will ensure that the job is added to the requested period, regardless if the work cell might be overloaded.
6. Click Schedule.
 - Notice that both jobs are added to the desired period.
 - In the Period capacity section, you can see the load for each period. The Consumption field shows the

scheduled consumption in this period. If the scheduled consumption is higher than the available capacity in this period, the overloaded consumption will be selected.

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Transfer materials with kanban jobs

2/18/2021 • 2 minutes to read • [Edit Online](#)

This procedure focuses on executing a withdrawal kanban job to transfer materials. The demo data company used to create this procedure is USMF. This procedure is intended for the warehouse worker.

Display transfer jobs

1. Go to Production control > Kanban > Kanban board for transfer jobs.
2. Expand or collapse the Filters section.
 - In the Filters section, you can specify what jobs you want to see by filtering on Production flow, Activity name, From warehouse and location, and To warehouse and location.
3. In the From warehouse field, type '11'.
4. In the To location field, type '12'.

Start a transfer job

1. In the list, deselect the selected row - if any.
2. In the list, select row 4.
 - Select the first job with status Not planned. Make sure this is the only job selected.
3. Click Start.
 - Notice that an icon indicates that the job is started.

Select a second transfer job and change quantity

1. In the list, find and select the desired record.
 - You can have multiple jobs selected, but for now select row 5.
2. In the list, find and select the desired record.
 - Make sure the job in the previous step is the only one selected. Deselect all other jobs.
3. Note the value in the Job quantity field to reference later
4. Set Job quantity to '30'.
 - Notice the warning! You are not allowed to transfer 30. According to the setup of the kanban rule, you can only transfer the original quantity.
5. Use the value noted previously in the Job quantity field
 - Set the Job quantity to the previous value.

Start the second transfer job

1. Click Start.
 - This will start the transfer of the job in row 5.

Complete both transfer jobs

1. In the list, select row 4.
 - Now two transfer jobs are selected on row 4 and row 5.
2. Click Complete.
 - This will complete the transfer of both jobs.

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Update kanban status

2/18/2021 • 2 minutes to read • [Edit Online](#)

When a kanban is emptied by mistake or a received kanban needs to be emptied, you need to update kanban status. The demo data company used to create this procedure is USMF. This procedure is intended for the shop supervisor.

Find the kanban.

1. Go to Production control > Kanban > Kanbans.
2. Open Handling unit status column filter.
3. Click Clear.
 - This resets the filters.
4. Use the Quick Filter to find records. For example, filter on the Card number field with a value of '000149'.

Change emptied status to received status

1. Click Reverse empty handling unit.
2. Click OK.
 - Notice that the Handling unit status is Received.

Change received status to emptied status

1. Click Empty kanban.
2. In the list, mark the selected row.
 - Notice that the Handling unit status is Emptied.

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Bills of materials and formulas

2/18/2021 • 7 minutes to read • [Edit Online](#)

This topic provides information about bills of materials (BOMs) and formulas, which are a central part of the definition of products and product variants. BOMs and formulas specify the required materials or ingredients for a specific product. Formulas also specify the co-products and by-products that are received in a specific production context.

Bills of materials

A bill of materials (BOM) defines the components that are required in order to produce a product. The components can be raw materials, semi-finished products, or ingredients. In some cases, services can be referenced in a BOM. However, BOMs typically describe the *material resources* that are required.

When it's combined with a route or production flow that describes the operations and resources that are required in order to build a product, the BOM forms the foundation for calculating the estimated cost of the product.

A BOM is an individual entity that is described by the following information:

- BOM ID
- BOM name
- The BOM lines that describe the components and ingredients
- The BOM versions, which define the product and period that the BOM can be used for

A single BOM describes a single level that is identified by a unique ID. Components might have their own BOMs that are referenced by BOM versions. You can display and edit the complete hierarchy of BOMs for a specific product in the BOM designer.

Formulas, co-products, and by-products

A formula is a subtype of BOM that is typically used for process manufacturing. In addition to components and ingredients, a formula describes co-products and by-products. In the actual version, the definition of co-products and by-products for the formula requires the formula version. A formula is typically defined for one specific finished product (a formula or planning item) that is defined in the formula version.

BOMs in the product lifecycle

In the product lifecycle, many types of BOM might be created for various reasons:

- **Sketching/Draft BOM** – This BOM gives a draft estimation of required materials in an early design phase and helps you do a rough estimate of cost and estimated product attributes. This BOM isn't usually used in enterprise resource planning (ERP).
- **Engineering BOM** – This BOM is typically used when you design products that are based on existing product portfolios. Engineering BOMs are structured to simplify the design process and group complex products into engineering modules. For simple products, it might be possible to use engineering BOMs for the actual production process. However, for other products, the engineering BOM must be converted to an actual production BOM. Engineering BOMs are typically represented by phantoms in the BOM hierarchy. Although engineering BOMs can be used for the planning and execution of manufacturing operations, this approach can lead to inefficiencies, especially in repetitive operations where many orders are created.
- **Planning BOM** – This BOM is used to do planning for material requirements. The demand of components and ingredients is calculated based on the demand of the finished products. Like costing BOMs, planning BOMs might represent a specific mix of material that is used in a period.

- **Production BOM** – This is the actual BOM that is used for a specific production. A production BOM must take into account the actual resources that are used to produce the product. When a production order, batch order, or kanban is created, the multiple levels of BOMs that are represented by phantoms are collapsed into one level and distributed over the operations for the order.
- **Costing BOM** – This BOM is used to calculate the estimated cost of a product. For example, you can use a costing BOM when standard cost is used or the estimated planned cost of a given product is calculated. Costing BOMs can refer to a specific mix of materials and resources that is expected to be used. Therefore, you can use the costing BOM to create a representative estimated cost for a period and help avoid variances over time.

The types of BOM that are actually used in an implementation depend on the implementation, and also on the business scenarios and requirements. In simple implementations, a planning BOM, production BOM, and costing BOM can be modeled as one BOM. In environments that have frequent engineering changes and multiple alternative routes, a larger set of BOM types will probably be required.

Approval of BOMs and formulas

Each BOM and formula can be separately approved or unapproved. Typically, approval of a BOM or formula occurs when the first relevant BOM version is approved. However, in some business scenarios, these approvals might be different steps in the process and might involve different process owners.

Note that, if a BOM is unapproved, all related BOM versions are also unapproved.

BOM and formula versions

To relate a specific BOM or formula to a product variant that can be produced, you must create a BOM version or formula version. The validity of BOM versions and formula versions can be constrained by period, quantity, site, specific product dimensions, and other criteria. Formula versions have additional important attributes, such as yield, co-product and by-product definitions, and the cost distribution instructions for the formula.

Approval of BOM and formula versions

Before a BOM version can be used in the planning or manufacturing process, it must be approved. When a BOM version is approved, the related BOM can also be approved, depending on the user's selection and authentication rights. Note that a BOM version can be approved only if the related BOM itself is approved.

Activation of the default BOM or formula version

To set a specific BOM or formula as the default BOM version or formula version that will be used by master planning or used to create production orders, you must activate the version. When a version is activated, the uniqueness of the version for the given constraints (for example, period, site, or quantity) is verified. You receive an error message if the version that you're trying to activate conflicts with a version that is already active. You must then either inactivate the conflicting version or modify the version constraints (usually the period) to prevent an ambiguous activation.

Product change with case management

The product change case for approval and activation of new or changed BOMs and BOM versions provides an easy way to see an overview of the BOM version constraints. You can also approve and activate all BOMs and formulas that are related to a specific change for one activation date.

Alternative BOM versions

Sometimes, the active BOM version or formula version should not be used in forecasts, sales, or a parent product. In this case, you can select a specific approved BOM as part of the requirement (forecast line, sales line, or BOM line) if an approved BOM version or formula version exists for the alternative BOM or formula.

When planned orders, production orders, or kanbans are created, the planner or shop floor supervisor can use any approved BOM version that is valid on the requested planned production date to plan for or produce a

specific product. The BOM version that is used doesn't have to be activated as the default BOM version.

BOM and formula lines

A BOM line is created for each material, service, or ingredient. The line defines the planned consumption of the specified product variant and also defines the various attributes that are related to the planned consumption.

BOM lines can have the following line types: **Item**, **Phantom**, **Pegged supply**, **Vendor**.

Item

Select the **Item** line type for materials or services that are directly consumed, and that don't require further explosion or pegged supply.

Phantom

Select the **Phantom** line type when you want to explode any lower-level BOM items that are contained on the BOM line. In Master scheduling, in planned cost calculation, or on estimation of a production order that uses BOM lines of the **Phantom** type, the parent BOM line that refers to a product variant that has a phantom BOM is replaced by the component items that are listed as BOM lines in that BOM, as determined by the applicable active BOM version of that product variant. If the product variant has an applicable active route, the operations of that route are merged into the parent route.

Note that phantoms are typically used to simplify the engineering process. Extensive use of phantom BOMs in many levels has an effect on performance, especially in highly repetitive manufacturing scenarios. To improve performance, you should avoid deep hierarchies of phantoms. Instead, use pre-exploded production BOMs and routes.

Pegged supply

Select the **Pegged supply** line type when you want to create a subproduction, a BOM line event kanban, or a direct purchase order for any product variant that the BOM line references. The subproduction, event kanban, or purchase order is created when you estimate the production order. The required item quantities are automatically reserved for the consuming production order.

Vendor

Select the **Vendor** line type if the production process uses a subcontractor, and you want a subproduction or purchase order to be created automatically for the subcontractor.

Note about subcontracted operations in a BOM: The service or work that is performed by the subcontractor must be created as service item that is tracked in inventory. You must attach the service item to the parent item as a BOM line. The route must contain an operation that is assigned to the subcontractor's operations resource.

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Formulas and formula versions

2/18/2021 • 6 minutes to read • [Edit Online](#)

A formula defines the materials, ingredients, and outcomes of a specific process in process manufacturing. Together with the corresponding route, the formula defines the whole process in process manufacturing. Formulas are used to plan and produce products in process manufacturing.

A formula consists of the ingredients and quantities that are required in order to produce a specific quantity of a formula item. Depending on the task that you perform, you can access formula functionality from Inventory and warehouse management or Product information management.

Formulas and formula lines

A formula consists of one or more formula lines that identify the ingredients or items that make up the formula. A formula line can contain Bill of materials (BOM) items, formula items, catch-weight items, purchased items, co-products, or by-products. Because many items are used in multiple products, an item can be used in more than one formula.

An example of a formula is the formula for a chocolate chip cookie. The ingredients for this formula use multiple lines, such as flour, sugar, eggs, butter, and chocolate chips. The formula for the chocolate chip cookie contains ingredients that are likely used in other formulas. While you make the chocolate chip cookies, there might be leftovers, such as crumbs, or some of the cookies might be overbaked or undercooked. These items can be set up as co-products or by-products, depending on the production operations.

When you create a formula line, you use the line type to indicate how the system should handle the line when you run master planning and produce batch orders. Each line type gives a different result. The following table describes the line types that you can select.

LINE TYPE	DESCRIPTION
Item	Select Item when the item is a raw material or a semi-finished item that is picked from inventory or when the item is a service.
Phantom	Select Phantom when you want to explode any lower-level formula items that are contained on formula lines. When you estimate the batch order, and the formula items are exploded, the component items are listed as formula lines on the batch order. Additionally, the corresponding routes are added to the production route. Formula items are exploded by using the current configuration. When you use the Phantom line type, you can handle production and measurement configurations that occur at different formula levels. If you select Phantom for a product on the Engineer FastTab of the Released product details page and then use this product in a formula, the line type of the formula line is changed to Phantom . You can't select Phantom for a catch-weight item, or for items where the production type is Co-product , By-product , or Planning item .

LINE TYPE	DESCRIPTION
Pegged supply	Select Pegged supply to create a batch order, production order, kanban, transfer order, or purchase order for the ingredient that is contained on the formula line. The related order is determined based on the default order settings and the production type of the ingredient, and is created when you estimate the batch order. The required ingredient quantities are reserved for the batch order.
Vendor	Select Vendor if the production process uses a subcontractor, and you want to create a sub-production or purchase order for the subcontractor. The service or work that the subcontractor performs must be created by using a formula item or service item. You can attach the item to the parent item as a formula line. The route must contain an operation that is assigned to the subcontractor's operations resource. This operation is attached to the formula line by using the Oper. No. field.

Formula versions

When you create a new formula, you must first create a formula version before you add the formula line items and their specific characteristics. Every formula must have at least one version. The **Approved** button on a formula version becomes available only after a version record has been successfully saved. Each formula version record is associated with one or many co-products and by-products that can be produced as you produce the finished product. Many products can be made from the same ingredients in different batch sizes, in multiples, or by using different yields. You can create as many versions of a formula as you require.

To manage multiple active formula versions, use effective date ranges or "from" quantity fields. Multiple active formula versions can exist only if the date range and "from" quantity don't overlap.

Unlike BOMs, where one BOM is often associated with many BOM versions, only one formula version typically exists per formula. Remember that only one formula version can be activated for the coverage dimensions and quantity for a given product. However, many formula versions might exist for other reasons, and you can manually select them when you create a batch order.

Approve and activate formulas and formula versions

Formulas and formula versions must be approved before they can be used for planning and production. Formulas are usually activated before they are used. However, during production, you can select a formula version that is approved, but that isn't activated.

To help secure a formula or formula version, you can set the **Block editing** and **Block removal of approval** parameters on the **Production control parameters** page.

If you select **Block editing**, and the formula is approved, no fields on the formula lines can be deleted or edited. However, if you remove the approval of the formula, you can delete and modify the formula lines. You can also create new formulas and new formula versions.

If you select **Block removal of approval**, you can't remove the approval of an approved formula or formula version. However, you can create new formulas and new formula versions, and you can remove the activation of the formula version.

You can add more levels of control by using the electronic signature functionality. When a user is set up so that an electronic signature is required at the time of formula approval, a **Signature** page appears when the formula is activated. The user must be authorized to sign electronically, and the certificate must be successfully validated

before the change can be committed. If the signature can't be authenticated, the approval or removal of approval is denied, and the change that initiated the approval or removal of approval is returned to its original state.

Use the Scalable feature

The Scalable feature is available only if all the item components in the formula are set to **Variable consumption**. The feature isn't available if item components are set to **Fixed consumption** or **Step consumption**. When the Scalable feature is used, if you change an ingredient in a formula, the quantity of the other ingredients that you select is adjusted. The size of the formula is also adjusted. Likewise, if you change the formula size, the quantity of all scalable ingredients is changed. This feature is intended specifically for formula creation and maintenance. It doesn't indicate whether the quantity of an ingredient will be scaled up or down on a batch order.

Use Step consumption

Step consumption eliminates the requirement that you must enter a quantity on the **Formula line** tab for an ingredient. Instead, Step consumption is configured so that it has a **From series** value and a **Quantity** value. The information from the Step consumption per series record that satisfies the quantity on the batch order is selected. Step consumption is useful when the consumption rate isn't linear with respect to the batch order size and only increases the requirement when a specific quantity threshold is met. To enable this feature for a new formula, under the **Consumption calculation** group, change the formula setting for the applicable ingredient from **Standard** to **Step**. You specify this consumption method on the **Setup** tab of the **Formula line** page.

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Operations resources

2/18/2021 • 9 minutes to read • [Edit Online](#)

Operations resources perform the activities of a project or a production process. They can be of different types, and can have different capabilities.

Operations resources

Operations resources are the machines, tools, workers, facilities, physical areas or vendors that perform the activities of a project or a production process. They can be of different types and can have different capabilities.

- **Vendor** – An external resource that performs project activities or production operations. An example is a subcontractor. By linking vendor resources to a vendor account, you can generate purchases for subcontractors, based on the bill of materials (BOM) lines or production lines.
- **Human resources** – A project or production worker that perform an activity, either alone or as an operator of a tool or a machine. If you're using the Human resources functionality, you can link human resources to a worker. The scheduling engine can then allocate the resources, based on the competencies that are defined for the corresponding worker.
- **Machine** – A machine or other production equipment that is required in production.
- **Tool** – An instrument or device that is typically used together with another resource to perform an activity in a project or in production.
- **Location** – A physical location of a specific size that is required in order to perform an activity. An example is an assembly area.
- **Facility** – A building or fixed structure that is required in order to perform an activity.

Calendars

A calendar can be assigned to an operations resource and describes the capacity (in hours) of that resource. The working times of the operations resource are determined by the calendar that is assigned to the resource group that the operations resource is part of. You can set an effective date and an expiration date for the assigned calendar. You can then assign more than one calendar to an operations resource. However, the dates of the assigned calendars can't overlap, and the operations resource can be assigned only one calendar at a time.

Note: If there are no effective working calendars for a resource group (for example, if the last assigned calendar or the only assigned calendar has expired), you can no longer access the operations resources that are assigned to the resource group for production planning and operations scheduling. You can also assign a calendar to a resource group to specify the working times for both the resource group and all the operations resources that are assigned to the resource group. The capacity of the resource group is calculated as the sum of the capacities of each operations resource that is assigned to that resource group. The calendar that is assigned to a resource group can change over time.

Resource capabilities

A capability is the ability of an operations resource to perform a particular activity. You can assign one or more capabilities to an operations resource. The scheduling engine will then allocate resources by matching the resource requirements of each activity to the capabilities of the available operations resources. Capabilities can be assigned to all types of operations resources (**Tool, Vendor, Machine, Human resources, Location, or Facility**). To assign capabilities to operations resources for a limited time, define a start date and an expiration date on the capability assignment. For more information, see [Resource capabilities](#).

Resource groups

A resource group is a set of operations resources that represents the granularity at which you want to schedule resources when you use the operations scheduling method. Therefore, resource groups typically correspond to the physical organization of work cells that is demarcated by yellow lines on the production shop floor. The resource group defines the site, production unit, and warehouse context for operations resources that are assigned to the group. When you assign an operations resource to a resource group, the resource can be scheduled at the site where the resource group is located. You don't have to assign the operations resources that you create to a resource group. However, an operations resource must be assigned to a resource group before it can be scheduled to perform work. An operations resource can be assigned to a resource group for a limited time. You can also assign an operations resource to multiple resource groups, so that you can then share the resource across sites. However, the effective dates and expiration dates can't overlap. In other words, you can't assign an operations resource to two resource groups at the same time. Changes in resource group assignments are effective only for new resource allocations. Capacity reservations for jobs, operations, and project hour forecasts that are already scheduled won't be affected. **Note:** When you assign operations resources of the **Vendor** type to a resource group, all operations resources that are assigned to that resource group must be of the **Vendor** type and must be linked to the same vendor account.

Production units

A production unit is an administrative unit that is a collection of resource groups. A production unit can contain multiple resource groups, but a resource group can be assigned to only one production unit. A production unit reflects the physical layout of production resources, and has no effect on transactions or how they are processed. You must associate a production unit with a site. You can also assign a picking warehouse and a storage warehouse to a production unit. You can use a production unit to consolidate and filter production-related data. For example, a shop floor manager can see an overview of the outstanding workload and the available capacity for a particular production unit. You can change the production unit that is assigned to a resource group. You can also delete a production unit. However, these changes to the production unit are effective only for new orders that are created after master scheduling is run. If you want to apply the production unit change to existing orders, you must make this change manually.

Resource scheduling

Operations resources are assigned to activities when a project or a production is scheduled. Two scheduling methods are available: operations scheduling and job scheduling. When you use operations scheduling, each operation or project activity is scheduled on the resource group that contains operations resources that match the resource requirements that are specified for the operation. If a specific operations resource is required for the operation, scheduling reserves capacity only on a specific operations resource in the group. Job scheduling is a more detailed form of scheduling than operations scheduling. It breaks down each operation into its individual tasks or jobs. These jobs are then assigned to the operations resources that will perform them. Scheduling reserves capacity on the resource groups, based on the operation times that are defined on the production route or project activities. If you're working with finite capacity, the schedule depends on the availability of the operations resources that are required in order to complete the activity. For operations scheduling, the capacity of the resource group is the sum of the available capacity of the operations resources that are part of that group. Capacity reservations that already exist for the operations resources are considered unavailable capacity. If there isn't enough available capacity for production, the production orders can be delayed or even stopped. On the **Resources** page, you can define several properties that control how capacity reservations are made:

- **Capacity** – Specify the operations resource's capacity per hour in terms of the capacity unit of measure.
- **Batch capacity** – Specify the maximum number of pieces that the operations resource can process per run.
- **Efficiency percentage** – Specify the efficiency that you expect from the operations resource. The efficiency percentage adjusts the throughput of the operations resource and affects the time that is reserved for the

resource. The lead times for the operations that use the operations resource are also adjusted accordingly. Here is the formula that is used for the calculation: $\text{Scheduling time} = \text{Time} \times 100 \div \text{Efficiency percentage}$. *Time* includes both the run time and setup time.

- **Operations scheduling percentage** – Specify the maximum percentage of capacity of the operations resource that you want to use in operations scheduling. To allow for flexibility in capacity during job scheduling, you should set this percentage to less than 100 percent.
- **Finite capacity** – Set this option to **Yes** if the operations resource should be scheduled based on the actual capacity that is available, and if existing capacity reservations should be considered. If this option is set to **No**, the operations resource is assumed to have infinite capacity, and the resource might therefore be overbooked.
- **Finite property** – Set this option to **Yes** if you want the operations resource to be scheduled based on the actual capacity that is available with respect to the required working time scheduling properties.
- **Exclusive** – Set this option to **Yes** if you don't want the operations resource to be available for another job or operation until the current production is completed. In this case, the operations resource can't be used even if there are gaps in the resource's run time.
- **Bottleneck resource** – Define the operations resource as a bottleneck resource. A bottleneck resource is scheduled by using finite capacity when the **Finite capacity** and **Bottleneck scheduling** options on the **Master plans** page are selected.

To schedule multiple operations resources at the same time to perform, for example, an operation in production, you must specify the requirements for the various resources by using primary and secondary operations. You can then also reserve multiple operations resources that have different capacity. The operations resource that are scheduled for the primary operation determine the duration of the activity.

Lean work cells

You can specify that a resource group is a lean work cell. The resource group can then be part of a production flow. By specifying a resource group as a lean work cell, you also prevent the resource group and the assigned operations resources from being allocated to the operations of a production order or a project hour forecast. For each resource group that acts as a lean work cell, you must specify the following information:

- **Calendar** – The working calendar of the work cell, which must have the property of a standard workday.
- **Input warehouse and location** – The default location that is used to pick material for an activity.
- **Output warehouse and location** – The default location where all output of the work cell is put.
- **Runtime cost category** – This category must be defined for the work cell if direct labor is tracked in costing.

When a resource group is used as a lean work cell, the capacity of the work cell is specified directly on the resource group. Therefore, you don't have to assign operations resources to the resource group. Only when the work cell is managed by a subcontractor, an operations resource of the **Vendor** type must be assigned to the work cell. If you assign an operations resource to a resource group that is marked as a work cell, the capacity of the work cell isn't affected.

Costing resources

When you define an activity such as a route operation or a project hour forecast, you can specify the requirement for a specific operations resource or resource group. However, you can also specify the requirement for an operations resource of a specific type, or an operations resource that has a specific capability or competency. For this reason, the actual resource assignment isn't made until the activity is scheduled and capacity is reserved. Therefore, on a route operation, you can specify that estimation and BOM calculation must be based on a specific operations resource. This operations resource is referred to as the costing resource. You can also transfer cost categories and operation times from the costing resource to the activity. When the operation is scheduled, estimation and BOM calculation are done by using the operations resource that is

actually scheduled.

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Resource capabilities

2/18/2021 • 4 minutes to read • [Edit Online](#)

This article provides information about resource capabilities. A capability is the ability of an operations resource to perform a particular activity. The article explains how capabilities and related concepts, such as proficiency level and priority, are used to select appropriate resources for an activity.

A capability is the ability of an operations resource to perform a particular activity. An operations resource can have more than one capability assigned to it, and a capability can be assigned to more than one resource. You can temporarily assign capabilities to resources by defining a start date and expiration date on the capability assignment. When the capability for a resource expires, the resource can't be scheduled for a project or a production that requires that capability. A capability that has expired can be renewed. You can delete capabilities, provided that they aren't on a route relation or on part of a production route of an active production order. In general, be careful when you delete capabilities. Instead, consider adjusting the expiration date on the resources that have the capability. Capabilities can be assigned to all types of resources: tool, vendor, machine, location, facility, or human resource.

Level

Multiple resources often have the same functional capability but at different levels of proficiency (for example, strength, processing speed, or accuracy). Therefore, when you assign a capability to a resource, you can specify a **Level** value. The level is a simple numeric value. If you specify that a capability is a resource requirement for a production route, you can also specify a **Minimum level needed** value for that capability. The scheduling engine then selects only resources that have the required capability at a level that is equal to or exceeds the minimum level that is specified in the resource requirement.

Priority

Operations resources that have the same capabilities can be assigned a priority. Then, if multiple resources have capabilities that satisfy the scheduling requirements at the required level, and have free capacity, the scheduling engine can select among those resources. If **Priority** is selected in the **Primary resource selection** field on the **Scheduling parameters** page, the resource that has the highest priority (the lowest numeric value in the **Priority** field) is selected first during scheduling.

Resource requirements

When you define resource requirements for a production route, you can specify one or more capabilities as requirements. During production scheduling, the capabilities that are defined in the resource requirements on the route operation are matched with the capabilities that are defined for the resources. Resources that have capabilities that satisfy the requirements are selected. If multiple resources have the same functional capability but different proficiencies (such as strength, processing speed, or accuracy), you can either define multiple capabilities or use the capability level to qualify the capability of the resource. Here is an example:

- On a route, the drilling process time is set to 10 units per hour, but the requirement itself is defined as Drilling.
- You have two drilling machines, M1 and M2.
- The Drilling capability is assigned to both resources, the M1 machine and the M2 machine.
- The M1 machine can drill two units per hour, and the M2 machine can drill 11 units per hour.

In this example, both machines can be selected by the scheduling engine, because both satisfy the basic

capability requirement (Drilling). However, the M1 machine can drill only two units per hour. Because this rate is much less than the 10 units per hour that are specified on the route, the M1 machine will cause production problems if it's selected. There are two ways to resolve this issue and make sure that the M2 machine is selected instead:

- Create two separate capabilities: Low-speed drilling and High speed drilling. Define Low-speed drilling as drilling that has a process time of one to nine units per hour. Define High-speed drilling as drilling that has a drilling process time of 10 to 19 units per hour. Then assign the M1 machine the Low-speed drilling capability, and assign the M2 machine the High-speed drilling capability. Finally, change the resource capability requirement on the route to High-speed drilling. The scheduling engine will then select the correct machine (M2).
- Use the capability level to qualify the Drilling capability that is assigned to the drilling machines. Specify that the M1 machine has the Drilling capability at a level of 2.0, and that the M2 machine has the Drilling capability at a level of 11.0. Then specify that 10.0 is the minimum level that is required for the Drilling capability requirement on the route. The scheduling engine will then determine that only the M2 machine satisfies the resource requirements.

Competencies for human resources

When you have operations resources of the **Human resources** type that are linked to workers in Human resources, you can also take advantage of the competencies of workers when you define the resource requirements for a production route. In other words, you can also specify requirements for specific skills, courses, certificates, or titles. The scheduling engine can then select resources that are linked to workers, and the selection will be based on the competencies of those workers. The competencies are set up in Human resources, not on the **Resource capabilities** page. When you define skills, courses, certificates, or titles as resource requirements, you must use the Human resources functionality and link each resource of the **Human resources** type to a corresponding worker. If you aren't using the Human resources functionality, you can define capabilities on the **Resource capabilities** page that resemble or duplicate the competencies from Human resources. However, the **Resource capabilities** page doesn't contain the functionality that is required in order to maintain skills, courses, certifications, or titles.

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Batch attributes

2/18/2021 • 2 minutes to read • [Edit Online](#)

This topic provides information about batch attributes. Batch attributes are characteristics of raw materials and finished products that make up inventory batches. The topic also explains how to assign batch attributes, and how you can search on them when you reserve batches.

Batch attributes are characteristics of raw materials and finished products that make up inventory batches. Batch attributes can vary, depending on factors such as environmental conditions, the quality of the raw materials that are used to produce the batch, or the outcome of the finished product. The number and types of batch attributes that are used can vary widely from one industry to another. Here are two examples that show how to use batch attributes:

- In the cheese industry, milk, which is one of the raw materials that are used to produce the cheese, can have attributes such as fat content and percentage weight. The cheese that is produced from the milk can have other attributes, such as moisture and age.
- In the steel industry, the iron that is produced might have attributes such as the percentages of magnesium content, silver content, and zinc content.

To better manage the number and types of attributes, you can use batch attribute groups. In this way, you don't have to add each attribute individually.

Assign batch attributes

You can assign batch attributes to individual products that are held in inventory batches, or you can assign them to products that are associated with specific customers. Before you can assign a batch attribute at the customer level, you must assign it at the product level. The product must have the batch dimension set to **Active** in the tracking dimension group. To assign a batch attribute to an individual product, use the product-specific page. If the attribute is specific to a product for a customer, use the customer-specific page. When you add an attribute to a product, you also define other parameters. Here are some examples:

- The minimum and maximum ranges for an attribute of the **Integer** or **Fraction** type.
- The tolerance actions for an attribute of the **Integer** or **Fraction** type. If the value of the attribute falls outside the minimum and maximum range, the action can be either a warning message or an error message.
- The target value for the attribute. This value is the optimal value of the attribute, and it applies to all attribute types.

You can access the pages for products that you select on the **Released products** page in Product information management. After you assign batch attributes to a product, you can add specific values to the attributes on the **Inventory batch attributes** page.

Reserve batches

You can search on batch attributes when you do batch reservations for a sales order to fulfill a customer's order, or when you pick and reserve batches for a production order. The search helps locate an inventory batch that contains the product that has the batch attribute that you want. After you locate the batch or batches, you can reserve the product to the originating inventory transaction line.

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Batch balancing

2/18/2021 • 9 minutes to read • [Edit Online](#)

This topic describes how the batch balancing process is supported.

For more information, watch a [video on batch balancing](#).

In the batch balancing process, the amount of ingredients to use in a production batch is calculated from the concentration of active ingredients in selected product batches.

Products that have an active ingredient

A product can be defined by its concentration of an active ingredient. The active ingredient of a product is modeled by using a product-specific batch attribute that has a minimum value, a maximum value, and a target level.

The target level of a batch attribute represents the estimated percentage of an active ingredient in a product. The minimum and maximum values represent the accepted deviation from the target level. They can be used, for example, as an accepted tolerance for batches at product receipt.

A product can have only one active ingredient. To specify the active ingredient of a product, you must first define a product-specific batch attribute. You then associate the attribute as a base attribute of the product.

On the product level, you must also specify how the level of the active ingredient for a batch of the product should be recorded: as part of the purchase receipt process or as part of a quality order process.

To associate a base attribute with a product, the following setup is required:

- The product must be batch-controlled. To make a product batch-controlled, you must assign a tracking dimension group to the product that has an active Batch dimension.
- The attribute that indicates the ingredient levels must be defined as a product-specific batch attribute for the product.

To look up and edit the actual value of the active ingredient for a batch:

1. Go to **Inventory management > Inquiries and reports > Tracking dimensions > Batches**.
2. Select a batch number from the grid.
3. On the Action Pane, open the **View** tab and then select **Inventory batch attributes**.

Ingredient types and how they interact in the batch balancing process

A formula line that is created can have one of these ingredient types:

- None
- Active
- Compensating
- Filler

The rest of this section provides examples that show how each ingredient type works. The examples are based on the following formula that has a total batch size of 100 liters.

INGREDIENT TYPE	ITEM NUMBER	FORMULA LINE QUANTITY	UNIT
None	A	20	Liter
Active	B	30	Liter
Compensating	C	10	Liter
Filler	D	40	Liter

The following table provides an overview of the results of each example.

ITEM NUMBER	INGREDIENT TYPE	ESTIMATED QUANTITY	BALANCED QUANTITY	ACTIVE QUANTITY	UNIT	BASE VALUE
A	None	20	20		Liter	
B	Active	30	25.71	9.00	Liter	30.00
C	Compensating	10	14.72		Liter	
D	Filler	40	39.57		Liter	

Active ingredients

When a product that has a base attribute is added to a formula line, it's referred to as an *active ingredient* of the formula. Batch orders that have formulas that include active ingredients can be used for the batch balancing process. For each ingredient in the formula, the batch balancing process estimates the amount that is required to produce the product. The estimate of amounts is based on the concentration of active ingredients in the selected batches.

Active ingredient example

Ingredient B has base attribute X and a target level of 30, and it's included in a formula that requires 30 liters of ingredient B for every 100 liters of the product. A batch order is created that has a batch size of 100 liters. The batch order is started, and during the batch balancing process, the user selects a batch of ingredient B that has a potency level of 35. Because the potency level of 35 is higher than the target level of 30, the balanced quantity of ingredient B is reduced by using the ratio of the potency value to the target level of the batch, which is multiplied by the estimated quantity. The calculation of the balanced quantity looks like this:

$$(30 \div 35) \times 30 \text{ liters} = 25.71 \text{ liters}$$

None ingredients

When you apply the batch balancing process when the **Ingredient type** is *None*, the estimated quantity and the balanced quantity of the formula line in the batch order are the same.

None ingredient example

Ingredient A is assigned to an ingredient of the *None* type and added to a formula for a finished product. The formula requires 10 liters of ingredient A for every 100 liters of the finished product. When a batch order requires 200 liters, both the estimated quantity and the balanced quantity of ingredient A are calculated as 20 liters.

Compensating ingredients

A compensating ingredient can either offset or complement the effect of the active ingredient in a product. Therefore, the quantity of a compensating ingredient that is consumed depends on the potency of the product:

- **Opposing effect** – If the amount of the active ingredient is more than anticipated, you must add less of the compensating ingredient.
- **Complementary effect** – If the amount of the active ingredient is less than anticipated, you must add more of the compensating ingredient.

The relation between an active ingredient and a complementary ingredient is set up on the **Compensating principle** page.

Follow these steps to set up relations between ingredients.

1. Select **Product information management > Bills and materials and formulas > Formulas**.
2. Open a formula line, and then select **Ingredients** to open the **Compensating principle** page.
3. Select the line that represents a compensating principle, and then select the active ingredient to compensate.

In the compensating principle, you also enter a positive or negative compensating factor to specify how much to compensate for, and whether the principle should be opposing or complementary. A positive factor indicates a complementary effect, and a negative factor indicates an opposing effect.

Compensating ingredient example

Ingredient B is an active ingredient that has base attribute X and a target level of 30. It's included in a formula that requires 30 liters of ingredient B for every 100 liters of the product. Ingredient C is a compensating ingredient, and a quantity of 10 is included in the same formula. A compensating factor of 1.10 is set up for the compensating principle. Therefore, the balanced quantity of the compensating ingredient will be reduced by the difference between the active ingredient's balanced quantity and the estimated required quantity multiplied by 1.10.

In the example for the *Active* ingredient type, the balanced quantity of the required active ingredient was calculated as 25.71, and the estimated required quantity was calculated as 30. In this case, the balanced quantity of the compensating ingredient will be calculated like this:

1. The difference between the estimated and the balanced quantity is determined:
 $25.71 - 30 = -4.29$
2. The result is multiplied by the compensating factor:
 $4.29 \times 1.10 = -4.72$
3. The estimated compensating quantity is reduced by -4.72 to determine the balanced compensating quantity:
 $10 - (-4.72) = 14.72$

Because 1.10 is a positive compensating factor, this compensating principle has a complementary effect. In this case, the active ingredient is more potent than anticipated. Therefore, more of the compensating ingredient is required.

Filler ingredients

A *filler ingredient* is a neutral ingredient that is used to reach the desired output quantity of the finished product. Adjustments to filler quantities are calculated based on variations in the active ingredient and the compensating ingredient compared to the standard quantity.

Filler ingredient example

You've formulated a product that includes ingredients A, B, C, and D for a formula size of 100 liters. You've calculated the balanced quantity of all the ingredient types except the *Filler* ingredient type that is used on one line. The balanced quantity of the filler ingredient is calculated as the difference between the batch size of 100 liters and the sum of ingredients A, B, and C:

$$100 - (20 + 25.71 + 14.72) = 39.57$$

The batch balancing process

The batch balancing process is performed from the **Batch balancing** page. Select **Cost management > Batch orders**, and then, on the **Process** tab, select **Batch balancing**. Batch balancing is available for batch orders that have a status of **Started**.

In general, batch balancing can be applied to batch orders if the formula has at least one formula line where the **Ingredient type** is *Active*. (For the exception to this rule, see the "Batch orders that aren't applicable for batch balancing" section later in this topic.)

The batch balancing process can be divided into two subprocesses:

1. Balance batch ingredients
2. Confirm and release the formula

Balance batch ingredients

In the Balance batch ingredients subprocess, the amount of ingredients to use for the production batch is calculated based on the selected batches that have active ingredients. As a rule, the calculation can be completed only if there is full coverage of all ingredients. You can't balance only part of the batch that the batch order is set up to produce.

NOTE

You can't save a calculation and then complete the batch balancing process later. If you close the **Batch balancing** page, you must repeat the calculation to complete the process.

Confirm and release the formula

After the ingredient quantities have been calculated, you can confirm and release the formula. The release process differs, depending on whether the products are enabled for the warehouse management processes:

- If a product is enabled for the warehouse management processes, the formula line is released to the warehouse according to the principles for the warehouse management processes. The formula line is released in quantities that match the balanced quantities, and it's released for the specific batches that are selected for the active ingredients.

NOTE

Formula lines can be released to warehouse only as part of the batch balancing process. Although there are other options for releasing materials for production to warehouse, those options can't be used for formula lines.

- If a product isn't enabled for the warehouse management processes, a production picking list is created for the product when you confirm and release the formula.

In a single formula, you can combine products that are enabled for the warehouse management processes and products that aren't enabled for the warehouse management processes. When the two types of products are included in one formula, the products that are enabled for the warehouse management processes are released to warehouse. For the products that aren't enabled for the warehouse management processes, a picking list is created when the formula is confirmed and released.

Batch orders that aren't applicable for batch balancing

There are two exceptions to the rule that batch orders are applicable for batch balancing if the formula has at least one formula line where the **Ingredient type** is *Active*.

1. If a formula contains an active ingredient for a product that is enabled for the warehouse management processes, but batch number is below location in the reservation hierarchy, the batch order isn't applicable

for batch balancing.

2. If the formula unit of measure is different from the inventory unit of measure of the active ingredient, the batch order isn't applicable for batch balancing.

A batch order that isn't applicable for batch balancing goes through the regular process cycle for batch orders.

NOTE

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Catch weight product processing with warehouse management

2/18/2021 • 15 minutes to read • [Edit Online](#)

Feature exposure

To use warehouse management to process catch weight products, you must use a license configuration key to turn on the functionality. Go to **System administration > Setup > License configuration**. Then, on the **Configuration keys** tab, expand **Trade > Warehouse and Transportation management**, and select the check box for **Catch weight for warehouse**.

NOTE

Both the **Warehouse and Transportation management** license configuration key and the **Process distribution > Catch weight** license configuration keys must also be turned on. To set the configuration keys for catch weight, you must also turn on the feature by using the **Feature management** workspace. The main feature that must be turned on is **Catch weight product processing with warehouse management**. Two related but optional features that you might want to turn on are **Inventory status changes for catch weight products** and **Use existing catch weight tags when reporting production orders as finished**.

After the license configuration key is turned on, when you create a released product, you can select **Catch weight**. You can also associate the released product with a storage dimension group that the **Use warehouse management processes** parameter is selected for.

Before you can use the product in Warehouse management, you must do some basic product-specific setup for catch weight:

- Define the nominal weight conversion between the catch weight unit (box) and the inventory unit (kilogram [kg]) as part of a unit conversion definition.
- Define the minimum and maximum weight tolerances as part of the catch weight unit setup.
- Set up a unit sequence group where the catch weight unit is defined as the lowest stock keeping unit (SKU).
- Set up a catch weight item handling policy.

For more information, see [Setting up and maintaining catch weight items](#).

Transaction adjustments

Because the weight of inventory when it comes into a warehouse can differ from the weight when the inventory is issued out of the warehouse, the catch weight product processing must adjust the inventory.

NOTE

Mobile device activity will trigger the transaction adjustments only if the Outbound weight variance method of the item's catch weight item handling policy is **Allow weight variance**.

Example 1

During a **Report as finished** production process, the inbound weight of a license plate that contains eight boxes of a catch weight product is captured as 80.1 kg. The license plate is then stored away in the finished

goods area, and during the storage period, some weight is lost into the air.

Later, as part of a sales order picking process, the weight of the same license plate is captured as 79.8 kg. Therefore, in the system, you now have a weight difference as part of the physical dimension set.

In this case, the system automatically adjusts the difference by posting a transaction for the missing 0.3 kg.

Example 2

In its definition, a product is set up to tolerate a minimum weight of 8 kg and a maximum weight of 12 kg for the **Box** catch weight unit.

You have two boxes of the product, and they have a registered weight of 16 kg. If a warehouse worker picks and weighs one of the boxes, and the weight is captured as 9 kg, the remaining box will weigh 7 kg. However, because 7 kg is below the minimum weight, the system does an automatic adjustment to increase the weight of the on-hand inventory by 1 kg.

To set up the accounts that these adjustments are posted to, go to **Cost management > Ledger integration policies setup > Posting**. Then, on the **Inventory** tab, define the following accounts:

- Catch weight loss account
- Catch weight profit account

Catch weight item handling policy

The catch weight item handling policy defines two primary warehouse management flows for the items: when the weight of the items is captured, and how it's captured.

You can define when the weight is captured for sales and transfer order processing. The weight can be captured during either of the following processes:

- **Picking** – The weight is captured during the initial pick work lines of order work.
- **Packing** – The weight is captured during manual packing. (You must send the items to a packing station.)

If the actual weight is captured at the packing station during the container packing processes, warehouse workers aren't prompted to capture the weight during picking work. Instead, the average weight of the physical inventory is used as the weight of the picked inventory that goes to the packing area. This concept also applies to catch weight items that are tracked by tags. For tag-tracked items, these parameters determine when the tag is captured. The tag can be captured either at picking time by using the mobile device or during manual packing.

NOTE

Because the **Packing** option causes inventory to be updated with the average picked weight, this could trigger a discrepancy that could cause a catch weight profit/loss adjustment and/or a difference between on-hand inventory weight and catch weight tag weight.

For internal warehouse management processes such as counting and adjustment corrections, you can define whether the weight should be captured. If it isn't captured, the nominal weight is used. Other options let you capture weight per catch weight unit and per counting quantity.

You can also define how the weight is captured. In one of the two main flows, catch weight tags are tracked and used to capture the weight. In the other flow, catch weight tags aren't tracked.

- **Yes** – The item uses catch weight tags. Each tag number represents one catch weight unit (box), and a weight and other information are associated with the tag. For outbound processes, the weight that is associated with the tag is used.
- **No** – The item doesn't use catch weight tags. The inbound and outbound weighing processes are based on

the actual weight that is captured during each process.

The process of tracking catch weight tags can be used for items that won't change weight during the storage period. The weight will be captured only during the inbound warehouse process. During the outbound process, the catch weight tags will just be scanned, and the weights that are associated with the tags will be used for the outbound transactional processing.

Another important parameter that is related to the processing of catch weight tags is **Catch weight tag dimension tracking method**. Tags can be either partially tracked or fully tracked. If a tag is partially tracked, it tracks product dimensions, tracking dimensions, and inventory status. If a tag is fully tracked, it tracks product dimensions, tracking dimensions, and **all** storage dimensions.

Additionally, when an item is tag-tracked, there is an **Outbound tag capturing method** parameter. You can set this parameter so that you're always prompted for the tag on outbound transactions from the mobile device. Alternatively, you can set the parameter so that you're prompted for tags only when they are required. For example, there are five catch weight tags in inventory on a given license plate, and you've indicated that you want to pick all five tags from the license plate. In this case, if the **Outbound tag capturing method** parameter is set to **Only prompt for tag when needed**, the five tags are automatically picked. You don't have to scan each tag. If the parameter is set to **Always prompt for tag**, you must scan each tag, even if all five tags are being picked.

NOTE

As a rule, tags are captured and updated only from the mobile device menu items. Nevertheless, there are a few scenarios where tags are captured somewhere else (for example, from the manual packing station). However, in general, the mobile device menu items should be used for all warehouse activity if tags are used.

How to capture catch weight

When catch weight tag tracking is used, a tag must always be created for every catch weight unit that is received, and every tag must always be associated with a weight.

For example, **Box** is the catch weight unit, and you receive one pallet of eight boxes. In this case, eight unique catch weight tags must be created, and a weight must be associated with each tag. Depending on the inbound catch weight tag, either the weight of all eight boxes can be captured, and the average weight can then be distributed to each box, or a unique weight can be captured for each box. When using the **Use existing catch weight tags when reporting production orders as finished** feature with the process enabled via a mobile device menu item, the inventory gets updated based on existing catch weight tag information. As a result, the warehouse app does not prompt for capturing the catch weight tag data as part of a production report as a finished operation.

When catch weight tag tracking isn't used, the weight can be captured for each dimension set (for example, for each license plate and tracking dimension). Alternatively, the weight can be captured based on an aggregated level, such as five license plates (pallets).

For the methods for capturing outbound weight, the **Per catch weight unit** option lets you specify that the weighing should be done for each catch weight unit (for example, per box). The **Per picking unit** option lets you specify that the weight should be captured based on the quantity that will be picked (for example, three boxes). Note that for the production line picking and internal movement processes, the average weight will be used if the **Not captured** option is used.

Multiple weight capturing methods are defined on the catch weight item handling policy. Each weight capturing method parameter is used by various transactions. The following table summarizes which parameters are used by which transactions.

METHOD	TRANSACTION
Outbound weight capturing method	Sales picking, Transfer picking
Production picking weight capturing method	Production picking, Production consumption
Movement weight capturing method	Movement
When to capture correction of weight	Adjustments, Counting
Counting weight capturing method	Counting
Warehouse transfer weight capturing method	Warehouse transfer

To prevent the warehouse management picking processes from capturing weights that cause catch weight profit/loss adjustments, you can use the Outbound weight variance method. The Outbound weight variance method applies during the following mobile device processes: sales picking, transfer picking, production picking, movements, counting, and warehouse transfers. You can use the **Restrict weight variance** option if the weight of the catch weight item doesn't fluctuate during warehouse storage, and if catch weight profit/loss adjustments aren't required. You can use the **Allow weight variance** option if the weight can fluctuate, and if catch weight profit/loss adjustments are required when a weight fluctuation is recorded.

Unsupported scenarios

Not all workflows support catch weight product processing with warehouse management. The following restrictions currently apply. They apply to all catch weight items, regardless of whether they are tagged.

Configuring catch weight products for warehouse management processes

- Only formula processing is supported for catch weight products (not bill of materials).
- Catch weight products can't be associated with a tracking dimension group by using the Owner dimension.
- Catch weight products can't be used as services.
- Catch weight products can be used as "stocked products" only as part the item model group.
- Catch weight products can't be used together with the functionality for tracking "Active in sales process."
- Catch weight products can't be used together with the functionality for capturing serial numbers. Therefore, products can't be transferred from a "blank" to a serial number as part of the picking/packing process.
- Catch weight products can't be used together with the functionality for registering serials before consumption.
- Catch weight products that are variant-enabled can't be used together with the functionality for converting variant units of measure.
- Catch weight products can't be marked as a commerce "product kit."
- Catch weight products can be used only with a unit sequence group that has catch weight handling units, and that has the catch weight unit as the lowest sequence.
- For catch weight products, the inventory unit can be converted to the catch weight unit only if the conversion produces a nominal quantity that is more than 1.
- The setup of bar codes for catch weight products doesn't support a variable weight setup.

Order processing

- The creation of advance ship notice (ASN/packing structures) doesn't support weight information.
- The order quantity must be maintained based on the catch weight unit.

Inbound warehouse processing

- Receiving license plates requires that weights be assigned during registration, because weight information isn't supported as part of the advance ship notice. When catch weight tag processes are used, the tag number must be manually assigned per catch weight unit.
- Inbound quality check work isn't supported for catch weight products. If configured, the quality check work will be skipped.

Inventory and warehouse operations

- Manual creation of quarantine orders isn't supported for catch weight products.
- Manual movement of inventory that is related to open work isn't supported for catch weight products.
- License plate loading to initialize warehouse stock isn't supported for catch weight products.
- Batch balancing processes aren't supported for catch weight products.
- Handling of negative physical inventory isn't supported for catch weight products.
- Inventory marking can't be used for catch weight products.

Outbound warehouse processing

- The functionality for cluster picking isn't supported for catch weight products.
- Pick and pack warehouse processing isn't supported for catch weight products.
- For catch weight products, work that is defined in a work template cannot be run automatically.
- For catch weight products, the system doesn't support manual packing station processing where packed container picking work is created after containers are closed.
- The functionality for pcs-by-pcs scanning isn't supported for catch weight products.

Production processing

- For catch weight products, only batch orders for formula products are supported.
- Kanban functionality isn't supported for catch weight products.
- For catch weight products, serial numbers can't be registered before consumption.
- The functionality for reversing license plates from production isn't supported for catch weight products.
- For catch weight products, reporting as finished can't be registered by serial number.

Transportation management processing

- Load building workbench processing isn't supported for catch weight products.
- Transport request lines aren't supported for catch weight products.

Other restrictions and behaviors for catch weight product processing with warehouse management

- During picking processes where the user isn't prompted to identify tracking dimensions, the weight assignment is done based on the average weight. This behavior occurs when, for example, a combination of tracking dimensions is used in the same location and, after a user processes picking, only one tracking dimension value is left in the location.
- When inventory is reserved for a catch weight product that is configured for warehouse management processes, the reservation is done based on the minimum weight that is defined, even if this quantity is the on-hand last handling quantity. This behavior differs from the behavior for items that aren't configured for warehouse management processes. There is one exception to this restriction. For production picking, when the last handling quantity of a catch weight product that is serial number-controlled is picked, the actual weight is used.
- Processes that use the weight as part of capacity calculations (wave thresholds, work maximum breaks, container maximums, location load capacities, and so on) don't use the actual weight of the inventory. Instead, the processes are based on the physical handling weight that is defined for the product.
- In general, Commerce functionality isn't supported for catch weight products.
- For catch weight products, inventory status can't be updated from **Warehouse status change**.

Catch weight tags

A catch weight tag can be created by using a warehouse app process, it can be manually created in the form, or it can be created by using a data entity process. If a catch weight tag is associated with an inbound source document line, such as purchase order line, the tag will be registered. If the line is used for outbound processing, the tag will be updated as shipped.

In addition to the restrictions that currently apply for catch weight products, tagged catch weight products have other restrictions that currently apply.

- All manual updates to inventory (that is, updates that aren't done using a mobile device) must include corresponding manual updates to the associated catch weight tags because these updates aren't done automatically. For example, manual adjustment journals will update inventory but not the associated catch weight tags.
- You must manually update catch weight tags to reflect replenishment work movements. This is because the system can't capture weights while processing replenishment work and therefore records the average weight instead.
- Mixed licensing place receiving isn't currently supported for tagged catch weight items.
- The processing of sales return order receiving can record catch weight tags. However, the process doesn't validate that the returned tag is the same tag that was originally shipped for a sales order.
- The mobile device menu item that has the **Register material consumption** activity code doesn't currently support recording catch weight tags.
- Although counting processes are supported for tagged catch weight items, they are limited. For example, you can use the mobile device options for counting tagged catch weight items, and the average weight is used. However, catch weight tags aren't automatically updated by the counting transaction. After the counting transaction is completed, the catch weight tags must be manually updated so that they reflect the inventory. If items that weren't originally in a location are counted into that location, the nominal weight is used.
- License plate consolidation doesn't currently support tagged catch weight items.
- Reverse work functionality isn't supported for catch weight items that are tag number-tracked.

NOTE

The preceding information about catch weight tags is valid only if the catch weight product has a catch weight tag dimension tracking method that is fully tracked (that is, if the **Catch weight tag dimension tracking method** parameter on the catch weight item handling policy is set to **Product dimensions, tracking dimensions and all storage dimensions**). If the catch weight item is only partially tag-tracked (that is, if the **Catch weight tag dimension tracking method** parameter on the catch weight item handling policy is set to **Product dimensions, tracking dimensions and Inventory Status**), additional restrictions apply. Because visibility is lost between the tag and inventory in this case, some additional scenarios aren't supported.

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Copy a formula

2/18/2021 • 2 minutes to read • [Edit Online](#)

This procedure focuses on creating a formula that includes the same ingredients as an existing formula, but with minor differences. To create the formula lines, you can use the Copy function to copy an existing formula that has most of the ingredients that you need. You can then make any necessary changes to the individual lines in the new version. By using the Copy function, you do not have to create multiple formulas that are almost identical. The demo data company used to create this task is USP2.

Create a formula

1. Go to Product information management > Bills of materials and formulas > Formulas.
2. Click New.
3. In the Formula field, type a value.
4. In the Name field, type a value.
 - Type a meaningful name for the formula.
5. In the Site field, click the drop-down button to open the lookup.
6. In the list, click the link in the selected row.
7. In the Item group field, click the drop-down button to open the lookup.
8. In the list, find and select the desired record.
9. In the list, click the link in the selected row.
10. Click Save.

Copy formula lines

1. On the Action Pane, click Formula.
2. Click Copy.
3. In the Item number field, click the drop-down button to open the lookup.
4. In the list, click the link in the selected row.
5. In the Formula version field, click the drop-down button to open the lookup.
6. In the list, click the link in the selected row.
7. Click OK.

Adjust copied formula lines

1. In the list, mark the selected row.
2. Click Delete.
3. Click Yes.

Approve formula

1. On the Action Pane, click Formula.
2. Click Approve formula.
3. In the Approved by field, click the drop-down button to open the lookup.
4. In the list, click the link in the selected row.
5. Click Select.

6. Click OK.

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Copy co-products from an existing formula version

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This procedure shows how to copy co-products from an existing formula version to a different formula version for a released product. It is a prerequisite that there is at least one formula version associated with co-products. The demo data company USP2 is used to create this procedure.

Find a released product

1. Go to Released products.
2. Click Show filters.
 - You are about to add the field Production type in the filter dialog box.
3. Click Add a filter field to add the field Production type.
 - In the next step, you need to manually enter Formula in the Production type field before you select Apply. This sets the filter on the list of released products.
4. Manually enter Formula in the Production type field.
5. Click Apply.

Select a released product

1. In the list, find and select the desired record.
2. Click Formula versions.
 - On the Engineering Action Pane, click Formula versions.

Copy co-products

1. On the Action Pane, click Formula version.
2. Click Co-products.
3. Click Copy.
4. In the Item number field, enter or select a value.
5. In the Formula version field, enter or select a value.
6. Click OK.
7. Close the page.

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Create a formula by copying from an existing formula

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This procedure shows how to quickly create a new formula by copying from an existing formula. You can use the demo data companies USMF, USP2, or USPI to create this procedure.

Create a new formula

1. Go to Formulas.
2. Click New.
3. In the Formula field, type a value.
4. In the Name field, type a value.
5. In the Site field, enter or select a value.
6. In the Item group field, enter or select a value.
7. Click Save.

Copy from an existing formula

1. Click Copy.
2. In the Item number field, enter or select a value.
3. In the Formula version field, enter or select a value.
4. Click OK.

Revise the copied formula

1. In the list, find and select the desired record.
2. Click Delete.
3. Click Yes.

Approve formula

1. Click Approve formula.
2. In the Approved by field, enter or select a value.
3. Click OK.
4. Close the page.

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Production parameters in Manufacturing execution

2/18/2021 • 7 minutes to read • [Edit Online](#)

This topic provides information about the setup of production parameters in Manufacturing execution.

The **Manufacturing execution** module is intended primarily for manufacturing companies. It can be used to register time and item consumption on production jobs or projects. Before you start to use Manufacturing execution for job registrations, you must set up various production parameters that define how and when registrations are posted during the production process. The settings of production parameters affect inventory management, production management, and cost calculation.

Before workers start to make registrations on production jobs, you should carefully consider all settings on the **Production parameters** page. Click **Production control > Setup > Manufacturing execution > Production order defaults**. If your company uses the multisite functionality, you might want to set up different production parameters for each site. The parameters for integration with the **Production** module are set up on the following tabs on the **Production parameters** page:

- **General** – General parameter settings for production jobs in Manufacturing execution.
- **Start** – Parameters that are used when production operations are started.
- **Operations** – Parameters that are applied to production operations and feedback about operations during the production process.
- **Report as finished** – Parameters that are used when items are reported as finished on the last operation of a production order.
- **Quantity validation** – Parameters that are used to validate start and feedback quantities on production orders.

Types of production jobs

On the **Operations** tab, you select which types of production jobs require registration on the **Job registration** page.

Typically, workers make registrations on setup jobs and process jobs. However, if job scheduling is applied, you can select other job types that workers must make registrations on when production orders are processed. For example, you can require registrations on transport jobs.

IMPORTANT

Make sure that you select all relevant job types. Otherwise, jobs might not be available for registration on the **Job registration** page. Your selections should match the selections in the **Job management** column on the **Setup** tab of the **Route groups** page (**Production control > Setup > Routes > Route groups**).

If **Job management** is selected on the route group, this job type is reported as finished on the production order when the job is reported as finished in Manufacturing execution. When all job types that **Job management** is selected for have been reported as finished on an operation, Manufacturing execution reports the operation as finished.

NOTE

Some job types can be manually reported through production journals. In this case, select **Job management** for the job type, but don't select the job type for registration on the **Operations** tab on the **Production parameters** page in Manufacturing execution.

BOM consumption and picking list journals

A consistent setup for bill of materials (BOM) consumption is important, because it helps guarantee that inventory management is efficient. For example, if BOM consumption parameters aren't set up correctly in Manufacturing execution, materials might be deducted from inventory two times or not at all.

On the **Production parameters** page, automatic BOM consumption is set up in three stages:

- At the start of a production. Set up this stage on the **Start** tab.
- During the production process when an operation is completed. Set up this stage on the **Operations** tab.
- When a production order is reported as finished. Set up this stage on the **Report as finished** tab.

For each stage, the **Automatic BOM consumption** field lets you select one of three methods for picking items for a production order:

- **Flushing principle** – This option is used in combination with an option that is defined for the BOM in the **Production** module. Click **Production control > Common > Production orders > All production orders**. On the **All production orders** page, select a production order in the list, and then, on the Action Pane, click **BOM**. On the **BOM** page, on the **Setup** tab, in **Flushing principle** field, select one of the following options:
 - **Start**
 - **Finish**
 - **Manual**
 - Blank (No option is selected.)
 - **Available at location**

In Manufacturing execution, if **Flushing principle** is selected in the **Automatic BOM consumption** field on the **Start** tab, all materials that are set to **Start** in the BOM are deducted from inventory when the operation is started. The **Available at location** option is used for products that are enabled for advanced warehouse processes. If you select this flushing principle, material is flushed when warehouse work for raw material picking is completed. Material is also flushed when a BOM line that uses this flushing principle is released to warehouse and the material is available at the production input location.

NOTE

If the **Flushing principle** field is set on the **Start** tab in Manufacturing execution, you must select the same principle on either the **Operations** tab or the **Report as finished** tab. This requirement helps guarantee that materials are deducted from inventory on BOMs that use **Finish** as a flushing principle on the production order. If the same flushing principle isn't selected on either the **Operations** tab or the **Report as finished** tab, materials might be deducted from inventory two times.

- **Always** – If you select this option for a stage, materials are always deducted from inventory at that stage. For example, materials for the production are deducted when the production order is started. This setting requires that **Never** be selected on the **Operations** and **Report as finished** tabs. This requirement

helps prevent items from being deducted from inventory two times.

- **Never** – If you select this option for a stage, no BOM consumption occurs at that stage. For example, if you select **Never** on all three tabs (**Start**, **Operations**, and **Report as finished**), materials must be manually deducted from inventory.

IMPORTANT

Carefully consider your setup of the production parameters, and make sure that the parameters that are selected on the various tabs of the **Production parameters** page don't contradict each other.

The following examples illustrate parameter settings that support various BOM consumption principles. The parameters are set up on the **Production parameters** page in Manufacturing execution.

Example 1: Backflushing on operations

Use the following settings if picking list journals and BOM item consumption should be generated when items are reported as finished on an operation.

TAB	FIELD	SETTING
Start	Update start on-line	Status or Status + quantity
Start	Automatic BOM consumption	Never
Operations	Automatic BOM consumption	Always
Report as finished	Automatic BOM consumption	Never
Report as finished	Update finished report on-line	Status + quantity

Example 2: Backflushing on production

Use the following settings if picking list journals and BOM item consumption should be generated when items are reported as finished on the production order.

TAB	FIELD	SETTING
Start	Update start on-line	Status or Status + quantity
Start	Automatic BOM consumption	Never
Operations	Automatic BOM consumption	Never
Report as finished	Automatic BOM consumption	Always
Report as finished	Update finished report on-line	Status + quantity

Example 3: Flushing principle

Use the following settings if picking list journals and BOM item consumption should be generated according to the flushing principle that is set for the BOM items.

TAB	FIELD	SETTING
Start	Update start on-line	Status + quantity
Start	Automatic BOM consumption	Flushing principle
Operations	Automatic BOM consumption	Flushing principle
Report as finished	Automatic BOM consumption	Never
Report as finished	Update finished report on-line	Status + quantity

Example 4: Deduction of materials during startup of a production order

Use the following settings if picking list journals and BOM item consumption should be generated when a production is started.

TAB	FIELD	SETTING
Start	Update start on-line	Status + quantity
Start	Automatic BOM consumption	Always
Operations	Automatic BOM consumption	Never
Report as finished	Automatic BOM consumption	Never
Report as finished	Update finished report on-line	Status or Status + quantity

Based on the selections that are described earlier in this section, picking list journals are posted at various stages of the production order process:

- When an operation is started
- When quantity feedback is reported on an operation
- When items are reported as finished on the production order

Example 5: Manual BOM consumption

You can use the following settings if materials should always be manually deducted from inventory. In this case, picking list journals aren't posted.

TAB	FIELD	SETTING
Start	Update start on-line	Status
Start	Automatic BOM consumption	Never
Operations	Automatic BOM consumption	Never
Report as finished	Automatic BOM consumption	Never
Report as finished	Update finished report on-line	Status

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Production setup requirements

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This article provides information about setup requirements before you can work with Production control.

Production control is integrated with features in other modules. This interconnectivity lets you change production orders and make sure that they are automatically updated in all other related processes and calculations in the system. The following setup processes are listed in the order that you should complete them in.

Required baseline setup in other modules

Information in other modules must be set up before you can work with Production control. This setup includes the following tasks:

- Set up general company information.
- Set up the general ledger.
- Define item groups.
- Set up ledger accounts for item groups.
- Set up the inventory item table in Inventory management.
- Create bills of materials (BOMs) and BOM versions in Inventory management.

Required calendar and resource setup

Before you use Production control, open Organization administration, and create and define the calendar and operations resources in the following order:

1. **Working time templates** – Set up working time templates to define the times that are available for production scheduling.
2. **Calendars** – Set up working time calendars to define the days of the year that are available for production scheduling.
3. **Resource groups** – Set up resource groups to group the operations resources, so that you can get an overview of any free capacity when you run scheduling. You don't have to set up resource groups before you set up operations resources. However, we recommend that you understand how to group resources when you set up Production control.
4. **Resources** – Set up operations resources to define the resources that are used to complete the production process and plan for capacity.

Required production parameters setup

Production control parameters – Set up basic production parameters to define how the system handles and processes production orders. Define how production orders are created, estimated, scheduled, and consumed. You can also select what kind of feedback you want and how cost accounting is done.

Required journal name identification

Production journal names – Specify the production journal names that are used to record and post transactions.

Setup if you use operations

Operations represent the specific activities that are completed to produce the finished product. **Note:** You must know the types of activities that are required in order to produce your item, and the order and priorities of those activities. You must also know which resources are involved, and how many.

1. **Operations** – Set up operations to represent the tasks that must be completed to produce the finished item.
2. **Relations** – Set up operation relations to establish detailed properties. To define operation relations, click **Relations** on the **Operations** page.

Setup if you use routes

If you're working with routes, operations must be defined for every production route that you set up. The route represents the path that the item takes from operation to operation, from the start of the production process to the end.

1. **Cost categories** – Set up cost categories to define the cost per hour of specified processes and setup times.
2. **Cost groups** – Set up cost groups to create and maintain different types of costing.
3. **Route groups** – Set up route groups to define parameters that are related to groups of routes. You must set up route groups before you can create production routes.
4. **Routes** – Set up production routes, and define default settings to control scheduling, costing, and pricing of route operations, and to control progress reporting.
5. **Route version** – Set up route versions to enable item variations in production.

Optional advanced settings

1. **Production groups** – Set up production groups to establish relationships between the production order and ledger accounts. The ledger accounts are used to post or group orders for reporting.
2. **Production pools** – Create production pools to group production orders so that you can process urgent production orders, or delete and post groups of orders.
3. **Properties** – Define properties to create special attributes that you can assign to your resources to control the order of productions. These attributes are connected to the working time template.

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Operations scheduling

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This topic provides information about operations scheduling. You can use operations scheduling to provide a general estimate of the production process over time.

You can schedule production at the operation level and the job level. Unlike job scheduling, operations scheduling doesn't explode the operations for the production route into jobs. If you want to include more detail in the scheduling, such as information about current capacity, you can run job scheduling after you run operations scheduling. You can also run job scheduling only. Job scheduling is typically used to schedule individual jobs on the shop floor for an immediate or short-term time frame.

Components of operations scheduling

The main components of operations scheduling are the scheduling direction, the capacity of resources, and materials optimization. By using operations scheduling, you can achieve the following goals:

- Control the planning method by scheduling forward or backward from a given date.
- Optimize the use of resources by scheduling productions based on the capacity of the resources. This approach also helps identify when alternative resources should be used.
- Optimize the use of materials by scheduling productions based on the availability of the required materials.
- Schedule and synchronize reference productions. The dates of the reference productions are adjusted when the production order's schedule is changed.

You must estimate the cost of a production order before you can run operations scheduling. If you haven't run an estimate, it's automatically run before operations scheduling is started. An operations schedule specifies the following information:

- The product that is planned for production
- The configuration of the product
- The quantities that are involved in the production
- The dates when the production will start and end
- The capacity reservations for the resources that perform the production activities

The setup time, process time, and run time are set for operations in the production. After you run operations scheduling, the status of the production order is **Scheduled**, and all operations are scheduled in the order that is specified by the production route. However, only the duration of the operation is considered. Start times and end times aren't scheduled.

Scheduling direction and date

The scheduling direction is fundamental to the scheduling process. Production can be scheduled forward or backward from any date, depending on timing and scheduling requirements.

- **Forward from the scheduling date** – You can schedule production to start as early as possible. Production can be started today, tomorrow, or on any date in the future. The production is scheduled forward in time to the earliest possible end date.
- **Backward from the scheduling date** – You can schedule production to start as late as possible. Backward scheduling is based on the date when the production must be completed. The schedule counts backward from that date to the latest possible date that the production can be started and still be completed on time.

Resource scheduling

When you run an operations schedule, each operation in the production route is scheduled for the resource that is specified for the operation. Additionally, the duration of each operation is specified on the production route. If a resource group is specified for an operation, the scheduling reserves capacity on the group. However, unlike job scheduling, operations scheduling doesn't select the specific resources in the group. If you're working with finite capacity, the schedule depends on the availability of the resources that are required in order to complete production. Operations scheduling follows the sequence of operations that is specified on the production route. The scheduling reserves capacity on the resource groups, based on the operation times that are defined on the production route. The sum of available capacity on the resources that are involved determines the capacity for the resource group. Capacity reservations that already exist for the resources are considered unavailable capacity. If there isn't enough available capacity for the production, the production orders can be delayed or even stopped. You can also specify the efficiency that you expect from the resources that are involved in the production. You specify the efficiency as a percentage on the resource. The efficiency percentage adjusts the throughput of the resource. This adjustment affects the time that is reserved for the resource. The lead times for the operations that use the resource are also adjusted accordingly.

Operations scheduling and master planning

The operations schedule also drives master planning and determines calculations for material requirements. Operations scheduling considers the following information:

- **Backlogged productions** – Products that are planned, released, or started
- **Material availability** – Inventory, subproductions, suppliers, and vendors
- **Capacity availability** – Resources that are required for production

NOTE

If you're using multi-threaded master planning and operations scheduling, finite capacity will not be considered.

Cancellations

When you run operations scheduling, you can cancel specific parts of the routing. These parts include the queue time, setup time, process time, overlap time, and transport times.

Finite materials

If you're working with finite materials, scheduling also depends on the availability of the materials that are required for production. If there aren't enough available components for the production, production can be delayed. You can base scheduling on the use of materials by specifying the materials that must be available for production. When you optimize on both resource capacity and the availability of materials, production is calculated according to these restrictions. A production order can't be scheduled to start until capacity and materials are available at the same time and in the required quantities.

Additional resources

[Operations scheduling options](#)

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Operations scheduling options

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This topic describes the options for operations scheduling. You can use operations scheduling to provide a general estimate of the production process over time.

Operations scheduling calculates the following information for a production order:

- Start and end dates are set for the production order and each operation.
- Resources are assigned to operations.

Several settings determine how production schedules are calculated. You define these settings on the **Operations scheduling** page. The following information describes the scheduling options.

Operations scheduling

Scheduling direction

The scheduling direction is fundamental to the scheduling process. A production can be scheduled forward or backward from any date, depending on timing and scheduling requirements.

- **Forward scheduling** – You can schedule a production to start as early as possible. The production can be started today, tomorrow, or on any specific date in the future. The production is scheduled to start on the earliest possible date and is planned forward in time to the earliest possible end date.
- **Backward scheduling** – You can schedule a production to start as late as possible. The schedule is based on the date when the production must be completed and counts backward to the latest possible date that the production can be started without missing its target deadline.

The following options are available:

- **Forward from today** – Schedule forward from the current date. (The current date is the system date.)
- **Forward from planned start** – Schedule forward from an earlier start date. If there is no previous scheduling, the scheduling direction is forward from the current date.
- **Forward from scheduling date** – Schedule forward from the date that is specified in the **Scheduling date** field. If you don't specify a scheduling date, the scheduling direction is forward from the current date.
- **Backward from delivery date** – Schedule backward from the delivery date that is specified for the production order. If you select this option, but no delivery date is specified, the delivery date is the current date.
- **Backward from planned end** – Schedule backward from a previously calculated end date. If there is no previous scheduling, the end date is the current date.
- **Backward from scheduling date** – Schedule backward from the date that is specified in the **Scheduling date** field. If you don't specify a scheduling date, the current date is used. Backward from scheduling date is calculated for the production order the last time that a requirement was calculated. If no date is specified for the production order, the current system date is used.
- **Backward from futures date** – Schedule backward from the futures date that was calculated for the production order the last time that a requirement was calculated. If no futures date is specified for the production order, the current system date is used.
- **As last scheduling** – For operations scheduling and job scheduling, the selected scheduling direction and date are saved. Therefore, you can select this option for subsequent scheduling. If there is no previous scheduling of the production order, scheduling is backward from the current system date.
- **Forward from tomorrow** – Schedule forward from the current date plus one day.

- **Forward from previous job** – This option is relevant only in job scheduling. If you select this scheduling direction for operations scheduling, the production order is scheduled forward from the current date. In job scheduling, scheduling is established for one job, and all other jobs for the production are scheduled based on that job.
- **Backward from previous job** – This option is relevant only in job scheduling. If you select this scheduling direction for operations scheduling, planned orders are scheduled backward from the current date. In job scheduling, scheduling is established for one job, and all other jobs for the production are scheduled based on that job.

Scheduling date

This date is used for the **Forward from scheduling date** and **Backward from scheduling date** scheduling directions. Scheduling is backward or forward from this date. For more information, see the previous section, "Scheduling direction."

Recalculate BOM levels

When you select **Recalculate BOM levels**, the selected bill of materials (BOM) levels will be recalculated to help guarantee the correct scheduling order.

Limitations

Finite capacity

Scheduling depends on the availability of the resources that are required in order to complete production. If there isn't enough capacity, production orders can be delayed or even stopped. If finite capacity is applied to operations scheduling, existing capacity reservations that are made on the resources are considered, and that capacity is seen as unavailable. The production order is scheduled based on the availability of capacity on the resources that are required. Operations scheduling uses the specified sequence of operations to determine the order of operations in the production route. Operations scheduling reserves capacity on the resource groups, based on the operation times that are defined on the production route. The capacity of the resource groups is the sum of available capacity on all the resources in the resource groups.

Finite material

Scheduling also depends on the availability of the materials that are required for production. Insufficient component availability can also cause production delays. Scheduling can also be based on the use of materials. Just specify the materials that must be available for production instead of the materials that aren't critical. This type of scheduling is known as scheduling with finite material. When you specify finite materials, production is scheduled based on whether materials are available. **Note:** When you optimize on both capacity and materials, production is calculated to meet both restrictions. The availability of capacity and materials is considered, and the production order's operations can't be scheduled to start until capacity and materials are available at the same time and in the required quantities. Select this check box if materials should be considered limited during scheduling. If the materials are limited, the material's coverage for that time will be considered. In other words, scheduling considers the futures dates that are calculated for the items. Scheduling reserves raw materials and explodes the current production. If scheduling occurs several times, only the first scheduling runs an explosion and makes reservations. If you make changes in the production BOM or route, the next scheduling runs an explosion. For the explosion, it's assumed that the materials are required on the same day. Because the production isn't scheduled at the time of the master schedule explosion, the current date is the best estimate of when the items will be available. The explosion then checks whether the items are available. If the items are available, the production requirement can be fulfilled. If the items aren't available by the current date, a planned order is generated, and an offset selection is made for the planned order. If automatic firming is set for the planned order, the planned order is firmed automatically for purchase or production. The production status is automatically changed to the status that is specified in the **Requested production status** field in the **Coverage groups** dialog box. If the check box is cleared, the materials are always considered available. Therefore, scheduling doesn't consider whether the materials are available at the time of requirement.

Finite property

Select this check box if the job scheduling should include property requirements.

Keep production unit

Select whether the scheduling engine should schedule only resources that are already specified on the production unit.

Keep warehouse from resource

Select whether the scheduling engine should schedule only resources that are associated with the input warehouse that is specified on the resource.

References

Schedule references

When references depend on production orders, they are also known as subproductions. Subproductions can be scheduled as part of the scheduling of a production order. Select this check box if the scheduling of subproductions should be based on the scheduling of the main production. In relation to the main production, overlying productions are scheduled forward, and underlying productions are scheduled backward. You can view production order references can be viewed in the **Reference level** field on the **Production orders** page.

Synchronize references

You can synchronize references with the production order. If this option is selected, the dates of the subproductions are moved and aligned when changes are made to the production order's schedule. If a production order has one or more subproductions, you might want to schedule the subproductions together with the main production. In this case, the main production can't be started until the related subproductions have been completed. Therefore, select this check box if the scheduling of subproductions should be based on the start and end times of the selected production. You can select this check box only if the **Schedule references** check box is also selected.

Cancellation

Cancel queue time

Select this check box to exclude queue time from the scheduling.

Cancel setup

Select this check box to exclude setup time from the scheduling.

Cancel process

Select this check box to exclude run time from the scheduling.

Cancel overlap

Select this check box to exclude overlap time from the scheduling.

Cancel transport

Select this check box to exclude transit time from the scheduling.

Set default

You can save the current values as default values. There are two options:

- Set as my default
- Set as default for everyone

Additional resources

Operations scheduling

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Job scheduling

2/18/2021 • 5 minutes to read • [Edit Online](#)

This article provides information about job scheduling, which is a more detailed form of scheduling than operations scheduling. You can use job scheduling to schedule individual jobs or shop orders, and to control the manufacturing environment.

You can use job scheduling to schedule individual jobs or shop orders, and to control the manufacturing environment. Job scheduling breaks down each operation into its individual tasks or jobs. These jobs are then assigned to the operations resources that will perform them. Job scheduling also lets you synchronize all jobs that are referenced by the selected job. You can specify a start date and time or end date and time for the job, and then run scheduling. The time that you specify can be the start time or the end time, depending on the scheduling direction. This functionality is useful when, for example, a job can be run only on one machine at a time, or when you want to optimize the job that is run for each resource.

Tasks in the job scheduling process

The job scheduling process includes the following tasks:

- Split operations into jobs.
- Schedule jobs, based on the dates and times for the resources that are specified for the related operation.
- Calculate start times and end times for each job. You can use finite capacity to make sure that there are no overlapping times.
- Determine which resources in the resource group to run the job on. This task requires that a resource group be specified for an operation. Job scheduling selects the resources or resource groups based on the shortest lead time, and also considers any previous reservations on the resources.
- Explode operations into jobs when you run job scheduling. The jobs are scheduled by date and time, according to the order that is specified by the production route. The setup of the operation determines the jobs that are exploded during the scheduling process. The route group that is assigned to the operation controls whether jobs are generated. A job is generated only if it has a specific duration. For example, a transport time job is generated if a transport time was specified for the selected operation.

Scheduling direction

You can schedule jobs either forward or backward.

- **Forward** – Use the forward scheduling direction to start the production as early as possible. This is also known as the push method, because the production is being pushed forward through the production process. The production is scheduled to start and end on the earliest possible dates.
- **Backward** – Use the backward scheduling direction to start the production as late as possible. This is also known as the pull method, because it's based on the date when the production must be completed. Backward scheduling counts backward to the latest possible date that the production can be started without missing its target deadline.

Finite capacity

You can schedule jobs by using finite capacity. When you use finite capacity, the capacity that is scheduled can't be larger than the capacity that is available for the resource. Available time is defined as the interval when the resource is available and there are no other reservations on capacity. Scheduling that is based on finite capacity makes sure that start times and end times for an operation on a specific date don't overlap. The resource

capacity that is already reserved is considered, and overlaps between the start times and end times are also considered. Finite capacity determines the amount of capacity that must be available for a resource in order to achieve optimal use of that resource. This determination is balanced against a calculation of the shortest possible lead time between operations.

Finite materials

Job scheduling that is based on finite materials makes sure that the required materials are available when the operation starts. The coverage rules for items define these limits. Scheduling uses requirement explosion to determine when the component items are available. If you schedule without setting finite materials, the system assumes that all items are available when they are required.

Finite properties

Job scheduling that is based on special properties requires that properties be specified for the operations on the production route. These properties must be fulfilled to reserve capacity.

References

Job scheduling schedules all productions that are referenced by the current production. If a production has one or more subproductions, the subproductions should be scheduled at the same time as the main production, because the main production can't be started until the related subproductions are completed.

Schedule resources

The scheduling engine examines combinations of resources to identify those combinations that can satisfy requirements. You can specify selection criteria by selecting one of the following values in the **Primary resource selection** field on the **Scheduling parameters** page:

- **Duration** – The scheduling engine selects the resource that has the shortest lead time. **Note:** Scheduling by duration can cause decreased performance when the same resource group contains many resources and secondary operations are used. You can schedule a maximum of 32 resources per operation. If you exceed this quantity, an Infolog message is displayed, and job scheduling doesn't find the best alternative resource.
- **Priority** – The scheduling engine selects the resource that has the highest priority if two or more resources have identical capabilities and levels. The resource that has the lowest numeric value in this field has the highest priority.

When job scheduling is run, the system plans the resources, based on the limitations that are defined in the resource parameters. You can control the capacity of the resources by using calendar settings. The system calculates loads for resources during the scheduling process. **Note:** For productions that use the operations scheduling function, you can run job scheduling after operations scheduling. If you aren't using operations scheduling, you can run job scheduling alone.

Maximum capacities for resources per job order

Resources are assigned to jobs through job scheduling. You can establish maximum capacities for resources per job order. For example, you can set up the system to schedule no more than 50 percent of total capacity for a production order. This setup gives you more control over the scheduling of resources on the job scheduling level. Therefore, it can help prevent issues if not enough capacity is available to perform simultaneous productions.

Resource efficiency

Job scheduling considers the efficiency percentages that are specified for the resources. Efficiency percentages

reduce or increase the time that is reserved for the resource. Therefore, lead time is also increased or decreased. The following formula is used for the calculation: $\text{Scheduling time} = \text{Time} \times 100 \div \text{Efficiency percentage}$ In this formula, *Time* includes both the run time and the setup time.

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Consolidated batch orders

2/18/2021 • 2 minutes to read • [Edit Online](#)

This article describes the concept of consolidated batch orders.

A bulk item that is produced is considered a parent item, whereas a packed item is considered a child item. The relation between the bulk item and the packed item is expressed in a bulk item conversion. This bulk item conversion is defined on the bulk item itself.

Packed items can be packaged into containers of either a single size or multiple sizes that are considered one unit. By consolidating the orders for a bulk item, you can see all the related batch orders in a single view that can help you determine any remaining work that must be completed.

A consolidated batch order can contain any combination of the following orders:

- A single bulk order and multiple packed orders
- Multiple bulk orders and multiple packed orders
- Multiple bulk orders and a single packed order
- Only packed orders

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Batch order lifecycle from create to start

2/18/2021 • 2 minutes to read • [Edit Online](#)

This procedure takes you through the first part of the life cycle of a batch order.

From creation, cost estimation, and over production job scheduling to the actual start of a batch order.

The demo data company used to create this procedure is USMF.

The prerequisites for running the procedure with another dataset are a released product with an active formula and route version.

Create a batch order

1. Go to All production orders.
2. Click New batch order.
3. In the Item number field, enter or select a value.
4. Click Create.
5. Use the Quick Filter to filter on the Production field with a value of 'b'.

View production formula and expected co-products

1. On the Action Pane, click Production order.
2. Click Formula.
3. Close the page.
4. Click Co-products.
5. Close the page.

Estimate the batch order

1. Click Estimate.
2. Click OK.
3. On the Action Pane, click Manage costs.
4. Click View calculation details.
5. Close the page.

Release the batch order

1. On the Action Pane, click Production order.
2. Click Release.
3. Click OK.

Schedule production jobs

1. On the Action Pane, click Schedule.
2. Click Schedule jobs.
3. Select No in the Finite capacity field.
4. Select No in the Finite material field.
5. Click OK.

6. On the Action Pane, click Production order.
7. Click All jobs.
8. Close the page.

Start the batch order

1. Click Start.
2. Click the General tab.
3. Select No in the Post picking list now field.
4. Click OK.
5. On the Action Pane, click View.
6. Click Picking list.
7. In the list, click the link in the selected row.
8. Close the page.
9. Close the page.
10. Click Route card.
11. In the list, click the link in the selected row.
12. Close the page.
13. Close the page.

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Sequence production jobs for process manufacturing

2/18/2021 • 2 minutes to read • [Edit Online](#)

This procedure uses paint products as an example to show how to sequence planned orders according to the priority of color and package size. The demo data company used to create this procedure is USPI. This procedure is intended for the production planner.

Run master planning for USPI

1. Go to Master planning > Master planning > Run > Master planning.
2. In the Master plan field, click the drop-down button to open the lookup.
3. In the list, click the link in the selected row.
 - Select MasterPlan.
4. Click OK.
 - This starts Master Planning, including the sequence process. This process can take a few minutes.

View planned orders for the paint products

1. Go to Master planning > Master planning > Planned orders.
2. Expand the Item details FactBox.
3. Expand the Schedule details FactBox.
4. In the Plan field, click the drop-down button to open the lookup.
5. In the list, find and select the desired record.
 - Select MasterPlan.
6. In the list, click the link in the selected row.
7. Use the Quick Filter to filter on the Item number field with a value of 'P300'.
 - Unlock to scroll to the right to see the order date and delivery date. Notice that these items have an order date of Today and the delivery dates for the planned orders are not sequenced after the priority of color and package size, as shown in the product name. You can hover over an item number to see the product name and priority.

Sequence planned orders for paint

1. Close the page.
2. Go to Master planning > Master planning > Sequenced planned orders.
3. Expand the Item details FactBox.
4. Expand the Schedule details FactBox.
 - Note: Here you see that the Start date/time for the planned orders are sequenced according to color and package size within a bucket period of 28 days. These periods are defined by a number in the field Campaign. The sequenced planned order form acts like the typical planned order form, and the production planner can firm the planned orders here.
5. Mark all rows.
6. Click Accept.
 - This will update the planned orders with the selected sequence action of either Postpone or Advance.

Verify the sequence of the planned orders

1. Close the page.
2. Go to Master planning > Master planning > Planned orders.
3. Expand the Item details FactBox.
4. Expand the Schedule details FactBox.
5. In the Plan field, click the drop-down button to open the lookup.
6. In the list, find and select the desired record.
 - Select MasterPlan.
7. In the list, click the link in the selected row.
8. Use the Quick Filter to filter on the Item number field with a value of 'P300'.
 - Notice that the orders now are sequenced according to the priority of color and size and the planned orders start at the earliest order date and delivery date. Validate the Order date column or the Start date in the Schedule details FactBbox.

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Material substitution in manufacturing

2/18/2021 • 3 minutes to read • [Edit Online](#)

This topic describes how to substitute materials during the production process.

There are three methods for substituting materials during the production process:

- By date, when one material is substituted for another after a specific date
- During master planning, when a material in a formula is substituted with a different material, because it's out of stock
- During production, when a material is unexpectedly out of stock and is substituted with a different material

Substituting material by date

Consider following scenario: A machine that a company is manufacturing contains a component that will expire from the vendor's catalog in two months. From the expiration date onward, the vendor will offer a new component that can be substituted for the old component. From and to validity dates can be set up on bill of materials (BOM) lines. For this example, you set up the old component to expire by entering the expiration date in the **To-date** field. Then, on the BOM, you set up the new, replacement component so that it's valid from the day after the old component expires. To do this, enter the start date in the **From-date** field.

Substituting material by planning

You can substitute materials during planning only when you're using formulas, not when you're using a BOM. Consider following scenario: A food manufacturing company is making a sauce from a formula that has 20 ingredients. One ingredient in the formula can be substituted by one of two other ingredients. However, because these two ingredients are more expensive than the preferred ingredient, substitution is used only if the preferred ingredient is out of stock. The material that can be substituted is called A, whereas the two materials that can replace it are called B and C. Material substitution by planning is controlled by the **Plan group** and **Priority** fields on the formula lines. For this example, you create formula lines for the three materials, and associate the formula lines with the same plan group. In the setup, the formula line for material A has the highest priority (lowest number), the formula line for material C has the lowest priority, and the formula line for material B has a priority that is between the priority of the other two lines. If you have demand for the finished item, master planning first determines whether the demand for material A can be covered. If the demand can't be covered, master planning looks at materials B and C, in order of priority. If material B is on hand, it will be used after a planned batch order is firmed for the formula. If none of the materials are on hand, master planning creates a planned order for material A. **Note:** When you set up formula lines in a plan group, you should specify a quantity only on the material that has the highest priority. This quantity will be used to calculate the demand of all materials in the plan, even the materials that have lower priority. You can't specify different quantities on lower-priority items in the plan group.

Substituting material during production

Consider the following scenario: A piece of metal plate is required for a welding operation. During the operation, a warehouse worker informs the machine operator that the plate is out of stock. However, it's decided that the plate can be substituted with a plate that is slightly thicker. That way, the operation can be finalized. Material can be added to the BOM for an open production order. If the production order has a status of **Started**, users are asked to re-estimate the order when they add a new item to the production BOM. After the material is added, a new picking list can be created for the new item. You don't have to add the new material to the production BOM. Instead, you can add it directly to the production picking list. Then, when the picking list is posted, the system

adds the material to the production BOM.

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Registration for manufacturing execution

2/18/2021 • 4 minutes to read • [Edit Online](#)

This topic describes key concepts and terms that you need to understand to configure and use manufacturing execution.

Manufacturing execution is intended to be used primarily by manufacturing companies. Workers can register time and item consumption on production jobs by using the **Job registration** page. All registrations are approved and are later transferred to the relevant modules. Continuous approval and transfer of registrations lets managers easily track actual costs on production orders.

Manufacturing execution and registration terminology

The following table contains terms that pertain to manufacturing execution and related registration tasks.

TERM	DESCRIPTION
Manufacturing execution	A function that is used to register time, material consumption, costs on production jobs, projects, and indirect activities. Registration is done in a manufacturing execution registration client.
Job list	On the Job registration page, workers are shown the list of jobs that they must perform on a specific resource, such as a machine. A worker can register time and item consumption on each job or task in the job list.
Job bundling	If a worker starts more than one job at the same time on the Job registration page, this is called job bundling. The time that is spent on bundled jobs can be allocated to the individual jobs in various ways by using allocation keys.
Pilot/assistant registrations	A worker can register as an assistant to a resource, and can create a small team where several workers work on the same production jobs. Resources that workers are connected to as assistants are called pilots. Only the pilot resource must make registrations. All assistants automatically get the same registrations. For example, if a machine acts as the pilot, workers who have registered as assistants to that machine can make registrations on the Job registration page, and both the machine and the workers who are connected as assistants will receive the same registrations.
Indirect activity	An activity or task that isn't directly related to a production job or a project, such as a department meeting, a cleaning job, or a maintenance job on the shop floor. Workers can make registrations on indirect activities, in the same way that they can register on production jobs and projects.

Registrations in manufacturing execution

Workers can make various types of registrations in manufacturing execution for work that is performed on production jobs. Depending on the system setup, workers might also be able to make registrations on project activities and nonproductive tasks, such as breaks, absences, and indirect activities. Here are the registration

types:

- **Clock-in/clock-out** (available with time and attendance) – Workers clock in when they arrive at work and clock out when they leave to go home.
- **Register on production jobs** – Workers can make registrations, such as starting a job and reporting feedback for a job, on the production jobs that appear in their job list. Workers can start several jobs at the same time. This is referred to as job bundling.
- **Register on inventory** – Workers can make registrations on materials that are used on the shop floor, but that aren't directly related to production jobs. Examples include grease, lubricants, or other materials that are used to keep machinery running. Registration is performed in an inventory journal.
- **Register on projects** (available with time and attendance) – Workers can make registrations, such as starting and finishing work on the projects or project activities that appear in their job list.
- **Register project fees and project items** (available with time and attendance) – Workers can register fees (expenses) that are associated with a project in a project fee journal, such as mileage and bridge toll. Workers can also register item consumption on projects. This is done in a project item journal.
- **Register as assistant to another worker** – If two or more workers will work together on a production job or a project, a worker can register as an assistant to a machine, or to another worker, who will then act as the pilot. The pilot can select another worker as the pilot, as required.
- **Register absence** (available with time and attendance) – Workers can register time on various absence codes that are set up. Absence can be indicated if a worker arrives late, requires absence during the work day, or leaves earlier than expected according to the standard work time profile.
- **Register breaks** (available with time and attendance) – During the work day, workers can register that they are leaving their workstation to take a break. Several break types can be set up. When a worker returns and logs on again, the system registers that the worker is back, and the break registration stops.
- **Register indirect activities** (available with time and attendance) – Indirect activities are nonproductive activities that workers might engage in during a workday, such as a department meeting, a team meeting, or a maintenance job that is performed on the shop floor. Workers can make registrations on the indirect activities that are set up.
- **Register overtime** (available with time and attendance) – Workers who have been asked to work longer hours can select whether the extra hours should be registered as flextime or overtime.

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Production feedback

2/18/2021 • 2 minutes to read • [Edit Online](#)

This article provides information about production feedback, which gives workers feedback about production jobs. The article includes information about the various ways that production feedback can be updated.

Production feedback gives workers feedback about production jobs. It records time and material consumption on production orders, operation quantities and status, and errors that cause a job or operation to fail. Production feedback can be updated in journals that are related to production orders. The **Production job card** and **Production route card** journals are used to report time and quantities per job or operation. For reporting about the last job or operation, quantities on the finished product can be reported as finished. Production feedback can also be updated on the **Job card terminal** and **Job card device** pages. These pages enable production feedback to be updated on the shop floor and are part of the manufacturing execution functionality in the **Production control** module. The **Job card terminal** page has a configurable user interface that shows a list of the released jobs in a prioritized order for a selected work area. It also offers advanced options such as job bundling and team work. The **Job card device** page has a touch-optimized user interface. Production feedback on both pages is updated from the production journals.

NOTE

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Time and attendance registration overview

2/18/2021 • 6 minutes to read • [Edit Online](#)

Time registration workers can enter different types of time registrations, for example, clock in, clock out, register indirect activities, and absence registration. This topic describes registrations, their calculation, approval, and the use of workflow to add structure and automated approval to the process of approving timesheets.

Registrations

In companies that use Time and attendance, workers must register the time that they spend at work, as well as their attendance. Some companies may only require workers to register clocking-in and clocking-out times. In other companies, workers may also be required to register time consumption on the actual activities they perform as well as the breaks they take. The intended users of Time and attendance are:

- Workers, who are required to register time and attendance at regular intervals, for example daily, weekly or bi-weekly.
- Supervisors, managers, and payroll officers who calculate, approve, and transfer worker registrations for further processing.

NOTE

If you run Time and attendance together with Manufacturing execution, all registrations on projects, project activities, indirect activities, absence codes, and overtime and flex time will be recorded and are used to calculate payroll in both modules.

Time registrations workers

To be able to register time and absence, workers must be set up as time registration workers in the company they are employed in.

After setup, the workers can enter different types of registrations.

- Clocking in- and out when arriving or leaving work.
- Time and item consumption on production jobs.
- Time used on a machine on the shop floor, if the machine has been defined as a resource.

NOTE

A worker can be automatically assigned the time registrations that are made on a particular machine on the shop floor, if the worker chooses to work as an assistant to the machine when he or she starts the production job.

- Time registrations on projects and project activities.
- Registering project fees and item consumption via the respective project fee journals and project item journals.
- Planned absence.
- Absence when arriving late to work or leaving earlier than planned.
- Work breaks, either manually registered or automatically calculated by the system.
- Indirect activities, which are non-productive activities a worker might engage in during a workday. Examples of these activities include meetings or cleaning their workspace.
- Overtime, which can be registered either as extra hours, flextime, or overtime.

Adding clock-out registrations

If a worker forgets to clock-out at the end of their workday, the missing registration can be added by running a batch job. The system will compare the clock-in time and the clock-out time according to the associated profile of the worker, and automatically insert the missing clock-out registration to match the profile's end time. Both the clock-in and clock-out registrations are vital for the subsequent calculation and approval of time registrations before they can be transferred to payroll.

Calculating registrations

When a registration worker is assigned a calculation group that typically relates to a specific team, shift, or work group. The team manager or supervisor typically validates the registrations made by the workers, and is therefore also the responsible person to run the calculation for the respective calculation groups on a daily basis. As part of the calculation process the team manager or supervisor is able to:

- Correct erroneous registrations. For example, change switch codes and adjust feedback on production jobs.
- Add missing registrations. For example, create clock-out registrations and create absence transactions.
- Delete incorrect registrations.

Because the registered time must match the worker's time profile prior to calculating the registrations, you must override the work time profile for any worker who has an exception to his standard work time profile. In the case, where the worker profile is day shift, and the worker has agreed to work a night shift with no overtime pay, the team manager or supervisor must override the default worker profile in order to calculate the working time at the standard night rate and not as overtime. The calculation will also display an error if an absence registration is missing. It must be added before the calculation can be completed.

Approving registrations

Just as you assign a calculation group to a time registration worker, you must assign an approval group as well. Typically the group will be specific to a team, shift, or work group. You must approve the time registrations that were calculated correctly – this means doing a calculation without errors – before pay items can be generated that afterward can be transferred to a payroll system. The payroll administrator will typically do the approval of registrations, and prior to the approval he is able to:

- Override pay agreements for individual workers.
- Add manual premiums.
- Enter additional information about absence registrations.

NOTE

If overtime has been calculated for specific workers, the overtime can be allocated to specific jobs during the day. This is relevant if job cost is calculated based on worker pay.

Approving registrations using workflow

You can set up a workflow approval process that automatically approves registrations which comply with workflow rules, leaving only deviations to be handled manually. If workflow approval is activated, the team manager or supervisor submits the calculated registrations for approval. The workflow process will generate the appropriate approvals and tasks, and then assign them to the right users and roles as identified in the workflow. There are two workflow approvals for time and attendance.

WORKFLOW	PURPOSE	REGISTRATION TYPE
Time and attendance days total	The workflow validates registrations against, for example, the expected number of work hours for the day.	
Time and attendance journal registration.	The workflow validates each registration type for the date of the registration.	Time and attendance • Clock-in • Clock-out • Absence • Break • Switch code • Project • Project activity • Indirect activity Production jobs • Queue before • Setup • Process • Overlap • Transport • Queue after • Start assistance • Stop assistance

Transferring approved registrations

After approval of the registrations you can transfer them to a periodic payroll job. A transferred registration is posted to an activity or job that it relates to, for example, a production order or a project. Payroll transactions are generated for each worker based on the registrations.

Reversing transferred registrations

The task of reversing transactions – rolling them back – can be done until the time when the payroll period's pay transfer is run. This means that payroll data has been transferred to an external file. When reversed, all registrations are withdrawn, and any transactions posted on production orders or projects are offset and neutralized.

NOTE

The external file can be imported into a payroll system.

Registrations in electronic timecards

Workers with job tasks that do not require immediate feedback, as is the case with production jobs, but who work on project activities, can benefit from using the electronic timecard. Electronic timecards offer the flexibility to enter registrations any time and in the best way for your business schedule – daily, weekly, or when a worker is in the office again after being away. To use electronic timecards or these workers, you must specify, Use timecard, in the worker details. Electronic timecards enable the worker to register:

- Date
- Registration type
- Job reference, such as project, indirect activity, or production order
- Job identification
- Time consumption
- Project fees
- Project items

NOTE

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Allocate time to jobs in a job bundle

2/18/2021 • 4 minutes to read • [Edit Online](#)

In Manufacturing execution, you can bundle jobs. You can then start multiple jobs at the same time on the Job list page.

If you bundle jobs, you must define how the total registered time for all the jobs should be allocated to each job. You define the allocation by selecting one of the following options in the **Bundle type** field on the **Allocation keys** page:

- **Estimation** – Time is divided among the jobs, based on the estimated time for the jobs.
- **Jobs** – Time is divided according to total jobs that are bundled and how much time was spent finishing all the jobs.
- **Net time** – Time is divided equally among the jobs that are in the bundle at any time.
- **Real time** – Actual job time is allocated. The cost can be calculated based on the actual payroll cost. **Note:** The **Real time** allocation key is available only if your company uses the payroll functionality in Time and attendance.

The following examples show the results of the various allocation keys.

Example scenario

Three jobs in your job queue must be completed. You start the first job, and then, while that job is in progress, you start the second and third jobs. Therefore, there is a bundle of three jobs. The following table shows the estimated production time for each job.

JOB	PRODUCTION TIME
Job 1	1 hour
Job 2	3 hours
Job 3	4 hours
Total	8 hours

The following table shows the actual work hours that are spent on each job.

JOB	START TIME	END TIME	BUNDLE TIME
Job 1	09:00	11:00	2 hours
Job 2	10:00	13:00	3 hours
Job 3	10:00	15:00	5 hours
Bundle	09:00	15:00	6 hours

The following sections describe the results of the calculated time for each allocation key.

Estimation allocation key

The following table illustrates the formula for calculating allocated time. Here is the formula: Time per job = Total bundle time × (Estimated job time ÷ Total estimated time)

JOB	FORMULA	ALLOCATED TIME
Job 1	$6 \times (1 \div 8)$ hours	0.75 hour
Job 2	$6 \times (3 \div 8)$ hours	2.25 hours
Job 3	$6 \times (4 \div 8)$ hours	3.00 hours

Jobs allocation key

The following table illustrates the formula for calculating allocated time. Here is the formula: Time per job = Total bundle time ÷ Number of jobs

JOB	FORMULA	ALLOCATED TIME
Job 1	$6 \div 3$	2 hours
Job 2	$6 \div 3$	2 hours
Job 3	$6 \div 3$	2 hours

Net time allocation key

The following table illustrates the formula for calculating allocated time. Here is the formula: Calculated time per reporting = Bundle time ÷ Number of jobs

	09:00–10:00 (1 HOUR)	10:00–11:00 (1 HOUR)	11:00–13:00 (2 HOURS)	13:00–15:00 (2 HOURS)	ALLOCATED TIME
Number of jobs in the bundle	1	3	2	1	Not applicable
Job 1	$1 \div 1 = 1$ hour	$1 \div 3 = 0.33$ hour	Not applicable	Not applicable	1.33 hours
Job 2	Not applicable	$1 \div 3 = 0.33$ hour	$2 \div 2 = 1$ hour	Not applicable	1.33 hours
Job 3	Not applicable	$1 \div 3 = 0.33$ hour	$2 \div 2 = 1$ hour	$2 \div 1 = 2$ hours	3.33 hours

Real time allocation key

If you want production costs to be calculated based on real costs, you must clear the **Cost category** option on the **Production order defaults** page. The following table illustrates the formula for calculating allocated time. Here is the formula: Actual time per job = Actual time in bundle

JOB	ACTUAL TIME
Job 1	2 hours
Job 2	3 hours
Job 3	5 hours

Consider the three jobs that are performed by a worker who has an hourly wage of USD 12.00. No overtime bonus or premium was earned in the time that was spent on the jobs. The worker worked on the three bundled jobs for a total of six hours. Therefore, the salary cost is $6 \times \text{USD } 12.00 = \text{USD } 72.00$. When you use real-time allocation, the cost per hour is recalculated by using the factor from the Net time formula. The actual time that was spent on each job is then transferred together with the corrected cost price per hour. In the example, six hours are spent, although 10 hours were allocated. The following table illustrates the formula for calculating cost. Here is the formula: $\text{Cost per hour} = (\text{Total bundle time per job (Net time)} \div \text{Actual time per job}) \times \text{Standard cost price per hour}$

JOB	CALCULATION OF CORRECTED COST PER HOUR	CORRECTED COST PER HOUR	ALLOCATED TIME	TOTAL COST OF JOB
Job 1	$(1.33 \div 2) \times \text{USD } 12.00$	USD 8.00	2 hours	USD 16.00
Job 2	$(1.33 \div 3) \times \text{USD } 12.00$	USD 5.33	3 hours	USD 16.00
Job 3	$(3.33 \div 5) \times \text{USD } 12.00$	USD 8.00	5 hours	USD 40.00

The corrected cost per hour and the job time are posted in a production journal. **Note:** If you select the **Cost category** option on the **General** tab on the **Production order defaults** page, the actual time for each job is transferred to a production journal, where the cost is applied to the cost category of the specific job.

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Calculate material consumption

2/18/2021 • 3 minutes to read • [Edit Online](#)

This article provides information about various options that are related to the calculation of material consumption.

The following options that are related to the calculation of material consumption are available on the **Setup** and **Step consumption** tabs on the **Line details** FastTab of the **Bill of materials** page.

Variable and constant consumption

In the **Consumption is** field, you can select whether consumption should be calculated as a constant quantity or a variable quantity. Select **Constant** if a fixed quantity or volume is required for the production, regardless of the quantity that is produced. Select **Variable**, which is the default setting, if the required amount of material in the finished goods is proportional to the number of finished goods that are produced.

Calculating consumption from a formula

In the **Formula** field, you can set up various formulas for calculating material consumption. If you use the default value, **Standard**, the consumption isn't calculated from a formula. The following formulas work together with the **Height**, **Width**, **Depth**, **Density**, and **Constant** fields:

- Height * Constant
- Height * Width * Constant
- Height * Width * Depth * Constant
- (Height * Width * Depth / Density) * Constant

Rounding up and multiples

Together, the **Rounding up** and **Multiples** fields let you round up the material consumption value. For example, you can round up the value according to the handling unit in which the raw material is picked for production. The following options are available in the **Rounding up** field: **Quantity**, **Measurement**, and **Consumption**.

Quantity

If you select **Quantity** as the rounding-up mechanism, the quantity must be a multiple of the specified quantity. For example, if whole numbers are required, select **1** in the **Multiples** field. Numbers are then rounded up to a quantity that is divisible by 1.

Measurement

Typically, you select **Measurement** as the rounding-up mechanism when the raw material comes in specific dimensions. For example, a piece of 2-meter metal tube is required for a finished good, and the metal tube is stored in 4.5-meter lengths. In this case, the **Measurement** rounding-up mechanism can be used to calculate how many metal tubes are required to produce a specific number of pieces of the finished good. For this example, the **Formula** field is set to **Height * Constant**. The **Height** field is set to **2** to indicate the length of the tube that is required for the finished good. The **Multiple** field is set to **4.5** to indicate that the tube is picked in lengths of 4.5 meters. Here is the calculation:

1. Number of multiples that are required for 10 pieces of the finished good: $10 \div 2 = 5$ pieces
2. Total consumption: $4.5 \times 5 = 22.5$ meters of metal tube

It's assumed that 0.5 meter of tube is scrapped for every five pieces of tube that are consumed.

Consumption

Typically, you select **Consumption** as the rounding-up mechanism when raw material must be picked in whole quantities of a specific handling unit of the product. For example, 2 quarts of paint are used to produce one piece of a finished good, and the paint is picked in 25-quart cans. In this case, the **Consumption** rounding-up mechanism can be used to round up consumption to whole numbers of 25-quart cans. Here is the calculation for the amount of paint that is required if 180 pieces of the finished good must be produced:

1. Paint that is required, excluding scrap: $180 \times 2 = 360$ quarts
2. Number of cans: $360 \div 25 = 14.4$, which is rounded up to 15
3. Paint that is required, including scrap: $15 \times 25 = 375$ quarts

Step consumption

Step consumption is used to calculate constant consumption in quantity intervals. If you select **Step consumption** in the **Formula** field on the **Setup** tab, you can add information about the steps on the **Step consumption** tab. The fixed consumed quantity can be set up in intervals of the produced quantity. For example, step consumption is set up as shown in the following table.

FROM SERIES	QUANTITY
0.00	10.0000
100.00	20.0000
200.00	40.0000

The bill of materials (BOM) quantity is 1, and the production quantity is 110. The formula for the consumption is From series (Quantity) = Consumption. Because the production quantity is 110, it falls into the "From 100 series." Therefore, the quantity is 20.

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Production posting

2/18/2021 • 3 minutes to read • [Edit Online](#)

This article provides information about different types of postings in the production process.

Production posting activities follow production processes that are described in the sections below.

Material consumption

Materials are registered as consumed during production when the production picking list journal is posted. This process generates issue transactions that deduct the on-hand inventory. In the production parameters, you can specify whether the value of raw materials that are in progress (work in process [WIP]) should be posted in the ledger. The value of raw materials that are in progress (WIP) is then posted to a dedicated Picking list account and a dedicated Picking list offset account.

Time consumption

The time that workers spend on production jobs is recorded in the Route card journal or the Job card journal. When these journals are posted, ledger posting to a dedicated account for resources that are in progress (WIP) is processed. This posting represents the value of the time that is spent on the production order. After the production order is registered as ended, the WIP accounts are settled.

Reporting finished goods and error quantities

When a production order is reported as finished, the quantity of the finished goods that have been completed is updated in Inventory management through the Report as finished journal. If you're using WIP accounting, which can be set up in the production parameters, a ledger journal is made to reduce the WIP accounts and increase the inventory of the finished goods. The journal uses the standard cost that is defined for the product.

Ending the production order

Before a production order is ended, actual costs are calculated for the quantity that was produced. All estimated costs of material, labor, and overhead are reversed and replaced with actual costs. The overall cost of the finished item is debited from the inventory Receipt account and credited to the inventory Issues account. If you select the **End job** check box when you run the cost calculation, the status of the production order is changed to **Ended**. This status prevents any additional costs from being unintentionally posted to a completed production order. You can specify that the value of error quantities that are reported during reporting as finished should be allocated to the good quantities that are reported as finished. Alternatively, you can specify that the value of error quantities should be posted to a dedicated scrap account.

Controlling the level of ledger posting

In the **Production control parameters**, you can use the **Ledger posting** field to set the level of ledger posting for production processes. The following values are available:

- **Item and resource** – Use the ledger accounts that are set up on the item groups for raw materials and finished goods. WIP for time consumption is taken from resource or resource group from the route operations.
- **Item and category** – Use the ledger accounts that are set up on the item groups for raw materials and finished goods. WIP for time consumption is taken from the cost categories that are associated with the route

operations.

- **Production groups** – Use the ledger accounts that are set up on the production groups for both material and time consumption. The production groups are associated with the released products and copied to the production orders when those orders are created. The posting on the production orders will then follow the production groups that are associated with the production order.

Note: If the standard method for calculating the cost of the finished item was used, the final transactions reflect this fact. If actual costs and the costs that are calculated by using the standard method differ, the difference is posted to the account that shows profit or loss.

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Troubleshoot process manufacturing

2/18/2021 • 2 minutes to read • [Edit Online](#)

This topic describes how to fix issues that you might encounter while you work with process manufacturing.

When I use the job card device to report a partial quantity on the last job in a production order, all the previous jobs on that order that have a status of In progress are automatically ended.

This behavior is by design. On the **Production order defaults** page, on the **Report as finished** tab, there is an option that is named **End-mark route**. If this topic is set to *Yes*, a route card journal is posted when a worker uses the job card device or job card terminal to report the last operation. This journal marks all the operations as completed and ends all the production jobs. When the **End-mark route** option is set to *Yes*, the system doesn't consider the job status that the worker selected when they reported the last operation. The system also doesn't consider whether the worker is reporting a full or partial quantity.

When I attempt a stock closing, I receive the following warning message: "No execution of Backflush costing calculation with a date %1 matching period end has been registered."

In releases before release 10.0.13, if you aren't using the lean production costing flow, you receive the following erroneous warning message during inventory closing:

You are about to execute an Inventory close with a date %1. No execution of Backflush costing calculation with a date %1 matching period end has been registered. Please remember to execute a Backflush costing calculation with a date of %1 matching period end. The valuation of inventories, cost of goods sold and variances might not be correct in Subledger or General ledger until this has been executed.

This issue has been fixed in release 10.0.13 and later. For more information, see [KB 4582468](#).

NOTE

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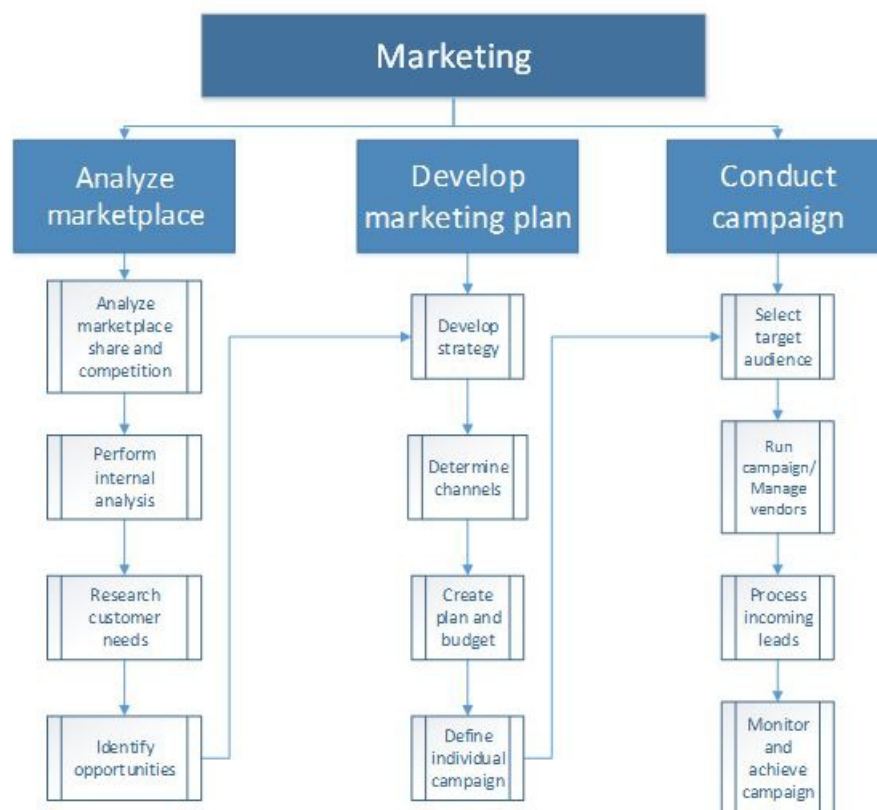
Sales and marketing overview

2/18/2021 • 7 minutes to read • [Edit Online](#)

You can use Sales and marketing to obtain, store, and use various types of data in the sales flow. This data includes the original sales initiative, future follow-up action, and additional sales.

Marketing

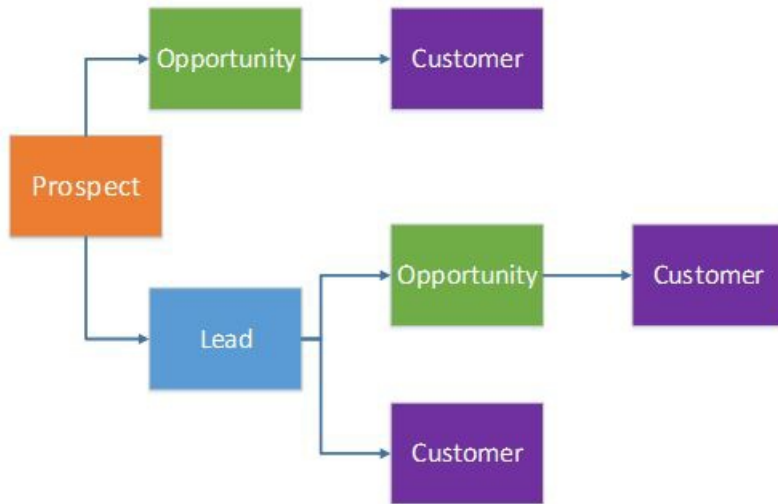
You use marketing campaigns and activities to find and build relationships with potential customers, so that initial interactions can develop into sales relationships. The following process flow shows the business process



for marketing.

Relationships

In sales and marketing, the initial interactions that you have with potential customers can occur in various situations. For example, you might find a prospective customer while you're attending a trade show, or you might have a possible lead with a customer after your organization runs a mass mailing campaign. It's very important that you understand the flow of a party's entity before that party becomes a customer. The following graphic shows the flow of entity relationships as a potential customer becomes an actual customer.

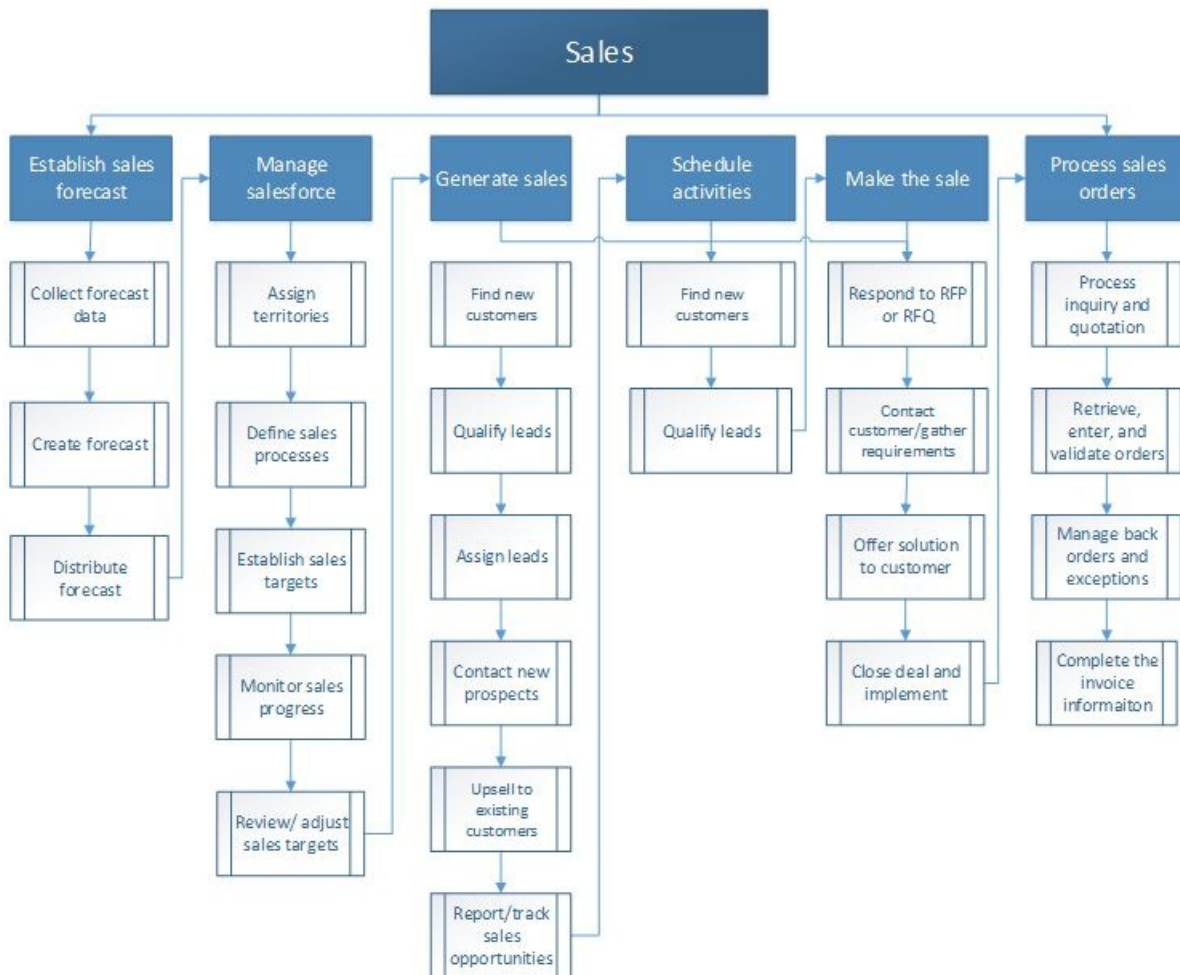


Campaigns

A campaign targets the contacts for prospects, leads, opportunities, and customers that have been selected to participate in the campaign. In Supply Chain Management, you can create several types of campaigns, such as telemarketing, mailing, and email campaigns, to maximize your customer potential. As your campaign progresses and you receive positive responses, you can begin the sales process with those recipients who have responded positively to the campaign.

Sales

You use the sales functionality to create quotations, up-sell and cross-sell to new and existing customers, create sales orders, and create sales invoices for customers. The following process flow shows the business process for sales.



Sales quotations

You create sales quotations to present customers an offer of the goods or services that you will be providing. A customer might request a quotation, or you might create a quotation in response to a request from a potential or existing customer. When the customer approves the sales quotation, you can convert it to a sales order.

Up-sell/cross-sell

Up-selling and cross-selling are techniques for selling products when an order is entered for a customer. In up-selling, another product is suggested instead of the current product. In cross-selling, a product is suggested in addition to the current product. When you set up product lists, you can create specific rules to indicate when a product should be suggested as a cross-sell or up-sell product.

Sales orders

When you create a new sales order, you must select the type of sales order to create. You have five options.

Note: After you create a sales order, any order type can be changed, except the **Items requirements** type if the sales order has a status of **Delivered**.

SALES ORDER TYPE	DESCRIPTION
Journal	Use this type as a draft for a sales order. This type has no effect on the stock quantities and doesn't generate item transactions.

SALES ORDER TYPE	DESCRIPTION
Subscription	Use this type for recurring orders. When the order is invoiced, the order status is automatically set to an open order. The delivered quantity that was invoiced and the remaining deliveries are updated. You can't use this sales order type if you're using the Warehouse management functionality.
Sales order	Use this type when a customer has placed or confirmed an order.
Returned order	Use this type when a customer returns an item. A return-item number (RMA number) is assigned automatically.
Item requirements	This type is created automatically when you make an item sale through a project.

Sales agreements

A sales agreement is a contract that commits the customer to buy a product in a specific quantity or for a specific amount over time, in exchange for special prices and discounts. The prices and discounts of the sales agreement overrule any prices and discounts that are stated in any trade agreements that exist. A sales agreement is valid for a defined period. The requested ship date that is specified for a sale on the **Sales order** page should be in the valid period. By default, a sales agreement is on hold. You can order from a sales agreement only when it's set to **Effective**.

Backorders

When you enter and validate orders, you might have to manage backorders and exceptions before the sale can be completed. Backorders are either purchase orders that haven't yet been delivered from a vendor or sales orders that haven't yet been delivered to a customer. It's important that you follow up on backorders. For example, if products are delayed from a vendor, you might have to change the date of delivery to a customer and then inform the customer of the delay. You can view backorders by item, customer, or vendor.

Viewing backorders by item

When you view backorders by item, you can follow up on the expected future flow of transactions for a specific item. For example, you can check the following information:

- The number of sales orders that are placed for an item
- Whether deliveries of the item from vendors are still missing
- Whether more items should be ordered, so that you can deliver all sales orders in a timely manner

By doing this check, you can respond to requests from customers about the timing of the item delivery. In addition, you can prioritize the sales backorders and split the items that are on-hand between the orders.

Viewing backorders by customer

When you view back orders by customer, you can view the status of the customer's remaining orders. This check is useful when you must respond to customers who are waiting for items that have been delayed.

Viewing backorders by vendor

When you view backorders by vendor, you can follow up on missing deliveries and expected dates of delivery. This check also helps you prioritize the backorders when products arrive from vendors and the sales orders must be picked for delivery.

Invoices

You can create three types of invoices during the sales process:

- Customer invoice
- Free text invoice
- Pro forma invoice

Customer invoice

A customer invoice is a bill that an organization gives to a customer in connection with a sale. You create this kind of customer invoice based on a sales order that includes a header and one or more lines for items or services. The customer invoice completes the sales order, packing slip, and sales invoice cycle.

You can post and print a single customer invoice, based on either a sales order or the packing slip and date. You can also post and print multiple customer invoices together, based on the packing slips and dates. When you post a single customer invoice by using the sales order, the **Invoiced remainder** quantity for each item is updated with the total of the invoiced quantities from the selected sales order.

If both the **Invoiced remainder** and **Deliver remainder** quantities for all items on the sales order are 0 (zero), the status of the sales order is changed to **Invoiced**. If the quantity of either field isn't 0, the status of the sales order isn't changed, and you can enter additional invoices. If you plan to post and print one or more customer invoices based on the packing slips, you must have already posted at least one packing slip for each sales order. The customer invoice is based on the packing slips and reflects the quantities that are listed.

You can create a customer invoice that is based on the packing slip line items that have been shipped to date, even if all the items for a particular sales order haven't yet been shipped. You might do this if, for example, your legal entity issues one invoice per customer per month to cover all the deliveries that you ship during that month. Each packing slip represents a partial or complete delivery of the items on the sales order.

When you post the invoice, the **Invoice remainder** quantity for each item is updated with the total of the delivered quantities from the selected packing slips. If the **Invoice remainder** and **Deliver remainder** quantities for all items on the sales order are 0 (zero), the status of the sales order is changed to **Invoiced**. If the quantity isn't 0, the status of the sales order isn't changed, and you can enter additional invoices. Inventory transactions are updated with the invoice number, and the status on the sales order line is changed to **Invoiced**.

Free text invoice

A free text invoice is an invoice that isn't related to a sales order. It contains order lines that include ledger accounts, free-text descriptions, and a sales amount. You can't enter an item number on this kind of invoice, and you must enter the appropriate sales tax information. A main account for the sale is indicated on each invoice line. The customer balance is posted to the summary account from the posting profile that is used for the free text invoice.

Pro forma invoice

A pro forma invoice is an invoice that is prepared as an estimate of the actual invoice amount before the invoice is posted. You can print a pro forma invoice for either a customer invoice or a free text invoice.

Additional resources

Blogs

You can find an overview of a sales process in the post [How sales work in Dynamics 365 for Finance and Operations](#).

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Order promising

2/18/2021 • 5 minutes to read • [Edit Online](#)

This topic provides information about order promising. Order promising helps you reliably promise delivery dates to your customers and gives you flexibility so that you can meet those dates.

Order promising calculates the earliest ship and receipt dates, and is based on the delivery date control method and transport days. You can select among four delivery date control methods:

- **Sales lead time** – Sales lead time is the time between creation of the sales order and shipment of the items. The delivery date calculation is based on a default number of days, and does not consider stock availability, known demand, or planned supply.
- **ATP (available-to-promise)** – ATP is the quantity of an item that is available and can be promised to a customer on a specific date. The ATP calculation includes uncommitted inventory, lead times, planned receipts, and issues.
- **ATP + Issue margin** – The shipping date is equal to the ATP date plus the issue margin for the item. The issue margin is the time that is required to prepare the items for shipment.
- **CTP (capable-to-promise)** – Availability is calculated through explosion.

NOTE

When a sales order is updated, the order promising information is only updated if the existing order promising date can't be fulfilled, as illustrated in the following examples:

- **Example 1:** The current order promising date is July 20, but due to increased quantity, you won't be able to deliver until July 25. Because the current date can no longer be met, order promising is triggered.
- **Example 2:** The current order promising date is July 20, but due to decreased quantity, it is now possible to deliver on July 15. However, because the current date can still be fulfilled, order promising is not triggered, and July 20 remains the order promising date.

ATP calculations

The ATP quantity is calculated by using the "cumulative ATP with look-ahead" method. The main advantage of this ATP calculation method is that it can handle cases where the sum of issues among receipts is more than the latest receipt (for example, when a quantity from an earlier receipt must be used to meet a requirement). The "cumulative ATP with look-ahead" calculation method includes all issues until the cumulative quantity to receive exceeds the cumulative quantity to issue. Therefore, this ATP calculation method evaluates whether some of the quantity from an earlier period can be used in a later period.

The ATP quantity is the uncommitted inventory balance in the first period. Typically, it's calculated for each period in which a receipt is scheduled. The program calculates the ATP period in days and calculates the current date as the first date for the ATP quantity. In the first period, ATP includes on-hand inventory minus customer orders that are due and overdue.

ATP is calculated by using the following formula:

ATP = ATP for the previous period + Receipts for the current period – Issues for the current period – Net issue quantity for each future period until the period when the sum of receipts for all future periods, up to and including the future period, exceeds the sum of issues up to and including the future period.

Notice that the ATP calculation does not include information around expiry date and beyond the ATP time fence

that the system expects when any quantity can be promised.

When there are no more issues or receipts to consider, the ATP quantity for the following dates is the same as the latest calculated ATP quantity.

If not all the dimensions that are used for an item are given when the ATP check is completed, they can still be specified on the issue and receipts. In this case, in the ATP calculation, the receipts and issues must be aggregated to the existing dimensions to reduce the number of receipt and issue lines that are used in the ATP calculation.

The ATP quantity that is shown is always greater than or equal to 0 (zero). If the calculation returns a negative ATP quantity (for example, if the quantity that was previously promised exceeds the available quantity), the quantity is automatically set to 0.

Example

The **ATP backward demand time fence** field controls how far back in time to look for delayed demand orders or inventory issues. The **ATP backward supply time fence** field controls how far back in time to look for delayed supply orders or inventory receipts. For example, if orders that are delayed by only seven days should be considered in the ATP calculation, both fields should be set to 7.

The **ATP delayed demand offset time** and **ATP delayed supply offset time** fields control when the delayed demand or supply will be considered in the ATP calculation. For example, if the delayed supply and demand should be considered in the ATP calculation the day after tomorrow, both fields should be set to 2. A value of 2 means that the quantity of an item on a delayed purchase order that should be considered in the ATP calculation will be seen as available two days after the current date.

For the following example, 7 is entered in the **ATP backward demand time fence** and **ATP backward supply time fence** fields, and 1 is entered in the **ATP delayed demand offset time** and **ATP delayed supply offset time** fields.

A purchase order for 200 pieces of a product that should have been received three days ago hasn't been received yet. Therefore, a sales order line for 75 pieces of the same product that should have been shipped yesterday hasn't been shipped.

A customer calls and wants to order 150 pieces of the same product. When you verify the availability of the product, you find that another purchase order for 100 pieces of the product will be delivered 10 days later.

You create a sales order line for the product and enter 150 as the quantity.

Because the delivery date control method is ATP, the ATP data is calculated to find the earliest possible ship date. Based on the settings, the delayed purchase order and sales order are considered, and the resulting ATP quantity for the current date is 0. Tomorrow, when the delayed purchase order is expected to be received, the ATP quantity is calculated as more than 0 (in this case, it's calculated as 125). However, 10 days from now, when the additional purchase order for 100 pieces is expected to be received, the ATP quantity becomes more than 150.

Therefore, the ship date is set to 10 days from now, based on the ATP calculation. Therefore, you tell the customer that the requested quantity can be delivered 10 days from now.

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Order entry deadlines

2/18/2021 • 4 minutes to read • [Edit Online](#)

This article provides information about order entry deadlines. An order entry deadline is a cut-off time that determines whether a customer order is treated (and fulfilled) as if it was received on the current day or the next day.

In many companies, only sales orders that are received before a certain time of day are treated as if they were received on that day. Any orders that are received after that time are treated as if they are received on the next business day. This cut-off time for orders is known as the order entry deadline.

Order entry deadlines are used as input for order promising. Therefore, they help you manage customer expectations about order deliveries. For example, customers can see that, if they place an order with you before a specific time, you will commit to shipping the goods on the same day. However, if they miss that deadline, they can expect the shipment only on the next business day. You set order entry deadlines based on your warehouse capabilities and shipping carrier schedules.

On the **Order entry deadlines** page, you set up order entry deadline times for all the days of the week. If orders are received after the specified times, they are treated as if they are received on the next day. By default, these times are set to 23:59 (that is, one minute before midnight at the end of the relevant day). You can change the default times so that they coincide with actual ship or receipt deadline times.

You can define order entry deadlines for a specific group of customers. For example, you might want a specific group of customers to have order entry deadlines that are later than those of other customers. In this case, you first define groups for order entry deadlines on the **Order entry deadline groups** page. You then assign the groups to customers on the **Customers** page.

If your company consists of several sites, you can set up order entry deadlines for each site. If the sites are located in different time zones, the order entry deadlines are set up in each site's time zone. However, when you work with sales orders and sales quotations, the order entry deadline is converted to your time zone on the **Available ship and receipt dates** page.

On the **Activate order entry deadline combinations** page, you define the combinations of sites and order entry deadline groups that are allowed.

Example: Order entry deadline

The order entry deadline on Tuesdays has been set to 16:00. On a particular Tuesday, at 17:00, you try to set the current date as the ship date. (Note that there is no lead time for this example.) If the **Delivery date control** check box is selected, you receive a warning that states that the date isn't valid. This warning appears on the **Available ship and receipt dates** page, where you can then select alternative dates.

Example: Different order entry deadlines per site

Your company consists of two sites. The sites are located in different time zones, as shown in the following table.

SITE A	SITE B
California	Florida
PST (Pacific Standard Time)	EST (Eastern Standard Time)

Sites A and B have defined the following order entry deadlines.

DAY OF THE WEEK	A: ORDER ENTRY DEADLINES (PST)	B: ORDER ENTRY DEADLINES (EST)
Monday	13:00	14:00
Tuesday	13:00	14:00
Wednesday	13:00	14:00
Thursday	13:00	14:00
Friday	13:00	14:00

You're an order processor in Utah, where the time zone is MST (Mountain Standard Time). Therefore, provided that you place orders with site A before 14:00 MST and place orders with site B before 12:00 MST, you meet the order entry deadlines for both sites.

The following table shows how the order entry deadlines for sites A and B are converted to MST time.

SITE A: PST	SITE A: MST	SITE B: EST	SITE B: MST
13:00	14:00	14:00	12:00

Note: If adjustment for daylight saving time is in effect, the order entry deadlines are adjusted accordingly.

Example: Same order entry deadline per site

Your company consists of two sites. The sites are located in different time zones, as shown in the following table.

SITE A	SITE B
California	Florida
PST (Pacific Standard Time)	EST (Eastern Standard Time)

Sites A and B have defined the following order entry deadlines.

DAY OF THE WEEK	PST AND EST
Monday	13:00
Tuesday	13:00
Wednesday	13:00
Thursday	13:00
Friday	13:00

You're an order processor in Utah, where the time zone is MST. Therefore, provided that you place orders with site A before 14:00 MST and place orders with site B before 11:00 MST, you meet the order entry deadlines for both sites.

The following table shows how the order entry deadlines for sites A and B are converted to MST time.

SITE A: PST	SITE A: MST	SITE B: EST	SITE B: MST
13:00	14:00	13:00	11:00

Note: If adjustment for daylight saving time is in effect, the order entry deadlines are adjusted accordingly.

Additional resources

[Delivery schedules](#)

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Delivery alternatives

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Sales order takers can use the **Delivery alternatives** page to discover alternative order fulfillment options.

The **Delivery alternatives** page layout gives an overview of all alternative options. It also lets order takers look beyond the current company for fulfillment opportunities. They can now view both intercompany opportunities and opportunities from external vendors. By sorting the options by delivery date, sales order takers can view an intelligent list of delivery alternatives. In addition, parameters help them better manage the suggested deliveries. Because transport time can affect delivery dates, sales order takers can explore the various transportation choices that carriers offer. Because detailed information is shown for each suggestion, order takers can make informed decisions directly from the **Delivery alternatives** page.

Open the Delivery alternatives page

You can open the **Delivery alternatives** page from the sales order line.

1. Select **Products and supply > Delivery alternatives**.
2. Select **Line details > Delivery > Delivery alternatives**.

You can also open the **Delivery alternatives** page by opening the **Sales order processing and inquiry** workspace, and then selecting **Orders and favorites > Delayed order lines > Delivery alternatives**

Note: You can open the **Delivery alternatives** page only if both the following conditions are met:

- All mandatory sales line information is filled in.
- The **Delivery date control** field is set to a value other than **None**.

Delivery date control methods

The delivery date control method determines how the system establishes delivery dates, how delivery alternatives are calculated, and what information is shown. Note that delivery date control takes calendars into consideration. Therefore, the following calendars can affect the suggested receipt date: Warehouse calendar, Transport calendar, Vendor calendar, and Customer calendar. The following table describes each method for delivery date control.

Method	Description
None	<ul style="list-style-type: none">• Delivery alternatives for sales lines aren't supported. This option turns off delivery date control.
Sales lead time	<ul style="list-style-type: none">• Delivery alternatives are calculated based on the predefined sales lead time. The transport days are calculated based on the mode of delivery.• Delivery alternatives include warehouses that have on-hand inventory, and supply/demand orders.

ATP	<ul style="list-style-type: none"> • Delivery alternatives are calculated based on available to promise (ATP) logic. The current availability and expected future availability are considered. The transport days are calculated based on the mode of delivery. • Delivery alternatives include warehouses that have on-hand inventory, and supply/demand orders.
ATP + Issue margin	<ul style="list-style-type: none"> • Delivery alternatives are calculated as for the ATP method, but the issue margin is included in the calculation.
CTP	<ul style="list-style-type: none"> • Delivery alternatives are calculated based on the capable to promise (CTP) logic. MRP explosion is used to determine availability. Note that, at a minimum, CTP offsets delivery dates to the sales lead time. The transport days are calculated based on the mode of delivery. • Delivery alternatives include suggestions for the following warehouses: <ul style="list-style-type: none"> ◦ Current warehouse ◦ Default warehouse ◦ All warehouses that have available on-hand inventory ◦ All warehouses that have supply orders ◦ All warehouses that have active bill of materials (BOM) versions

View information about delivery alternatives

This section describes the information about delivery alternatives that is available on each FastTab of the **Delivery alternatives** page.

The Product FastTab

This FastTab shows a summary of the product and details of the current sales line.

The Delivery alternatives FastTab

This FastTab shows a list of delivery alternatives that is sorted by receipt date. Above the list, you can select which options to base the suggestions on. You can also select the mode of delivery, which determines the transport days. The following options are available:

- **Include other product variants** - This option is available for products that have product variants. It will include delivery alternatives for other variants of the product. This option isn't available for CTP.
- **Include partial quantity** - By default, only suggestions that fulfill the full quantity of the sales line are included. Select this option to include suggestions that only partially fulfill the order line. This option is useful when the customer requests an earlier delivery date and accepts partial delivery.
- **Include later dates** - By default, only suggestions that are better (earlier) than the current dates on the sales line are shown. Select this option to include later dates. This option can be useful in situations where parameters other than the date have priority. For example, a specific vendor or warehouse might be preferred.
- **Mode of delivery** - Select the preferred mode of delivery to optimize transport time and cost. You will immediately see the effect on the suggested delivery alternatives. Therefore, it's easy to compare the alternatives.
- **Include procurement** - When procurement is selected, the suggested delivery alternatives include options

to procure from both external vendors and other companies in the enterprise (intercompany). The **Include procurement** option is supported for ATP and ATP + Issue margin delivery date control. Procurement options from the default purchase vendor for the product and all approved vendors for the product are included.

- For external vendors, the calculation is based on the purchase lead time.
- For intercompany, the calculation considers what is available from the sourcing company, based on delivery date control in the sourcing company.
- **Delivery type** (Relevant for procurement)
 - **Stock** - Products are shipped from the sourcing warehouse to the site/warehouse on the sales line. They are then shipped from that warehouse to the customer.
 - **Direct delivery** - Products are shipped directly from the sourcing warehouse to the customer.

The Availability information FastTab

Information on this FastTab is related to the delivery alternative line that is selected. The following information is shown, depending on the delivery date control for the sales line:

- **Sales lead time**
 - **Available today** - Show the current physical on-hand, physical reserved, and available physical inventory.
 - **Parameters** - Show the inventory unit and sales lead time.
- **ATP and ATP + Issue margin**
 - **Available today** - Show the current physical on-hand, physical reserved, and available physical inventory.
 - **Parameters** - Show the inventory unit and sales lead time.
 - **Future availability** - Show a graphical representation of current and future availability for the selected site and warehouse under **Delivery alternatives**. You can select the chart columns to see more detailed information about the future availability of the product. The slider shows a list of relevant demand and supply orders within the ATP time fence.
- **CTP**
 - **Available today** - Show the current physical on-hand, physical reserved, and available physical inventory.
 - **Parameters** - Show the inventory unit and sales lead time.
 - **Explosion** - Show a supply explosion of the selected delivery alternative. You can use **Setup** to change the fields and inventory dimensions that are shown in the explosion.

The Impact of selected alternative FastTab

This FastTab highlights the impact of the selected delivery alternative. If you select **OK**, the sales line is updated with the highlighted values in the **SELECTED** columns. Note that, if the quantity on the selected delivery alternative is less than quantity on the sales line, a delivery schedule is created, and the order line is split into two lines: one line for the selected quantity and one line for the remaining quantity. You can also update the commercial line so that it matches the schedule lines and affects the pricing.

Additional resources

[Order promising](#)

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Direct deliveries

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This article provides information about direct deliveries. Direct deliveries are deliveries that are sent directly from the vendor to your customer.

Direct deliveries save delivery time and reduce the costs that are associated with carrying inventory, because you don't hold the products in your warehouse before you ship them to the customer.

You can create direct deliveries from the **Sales order** page. First, create a sales order and order lines. Then, on the Action Pane, on the **Sales order** tab, select **Direct delivery**. Finally, specify the lines that must be handled as a direct delivery. A link is now created between the sales order lines for the direct delivery and the corresponding purchase order lines.

Note: If part of the ordered quantity has already been delivered, you must split the remaining quantity. Create a new line for the quantity that must be directly delivered, and subtract that quantity from the quantity on the original line. For example, if the original quantity was 15, and five have been delivered, you must create a new line for the remaining quantity, 10, and then reduce the original quantity by that amount.

After you create the direct delivery link between the sales order lines and the purchase order lines, you can update the sales order by using a packing slip. Run either a packing slip update or an invoice update from the purchase order. You must invoice-update the sales order from the **Sales order** page. An invoice update can't cause the quantity on the sales order to exceed the quantity that has been registered as received. For example, a sales order line has 10 pieces, but only five pieces from the sales order line have been updated by using a packing slip. If you select **All** in the **Quantity** list when you invoice-update the sales order, only those items that have been physically received, or updated by using a packing slip, are invoice-updated. The whole sales order line isn't updated.

Delivery date

When you update the **Requested receipt date** field on the sales order line, the **Delivery date** field on the corresponding purchase order line is also updated. Similarly, when you update the **Confirmed** field on the purchase order line, the **Confirmed receipt date** and **Confirmed ship date** fields on the corresponding sales order line are also updated.

Delivery address

Typically, the delivery address for a purchase order is the company's address. However, when you create a direct delivery, you enter the customer's address as the delivery address. If you change the delivery address on a purchase order line that has a delivery type of **Direct delivery**, the delivery address on the corresponding sales order line is also updated. Similarly, if you change the delivery address on the sales order line, the delivery address on the purchase order line is also updated.

Deleting order lines

If you try to delete a sales order line that has a delivery type of **Direct delivery**, a message box states that purchase order lines are attached to the line. If the sales order line has been partially delivered, you can't delete the sales order line or the purchase order lines that are attached to it.

Warehouse

When you create a direct delivery, the items that you sell never physically arrive at your warehouse. However, you must still specify a warehouse on the sales order line. Similarly, picking requirements might be specified on the item model group for the item. However, because the items never physically arrive at your warehouse, these requirements are ignored when the sales order is a direct delivery.

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Delivery schedules

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Delivery schedules allow you to track order line quantity when you are using multiple deliveries for a single sales order, sales quotation, or purchase order.

Use a delivery schedule when the total quantity on an order or quotation line must be delivered in multiple shipments. Individual shipments are represented by delivery lines. Two or more delivery lines make up one delivery schedule. The delivery lines can have different delivery dates, quantities, modes of delivery, and storage dimensions, such as site and warehouse.

Example of a delivery schedule

Total order (original order line)	600 chairs
Requested delivery schedule	100 chairs per month
Requested time frame for delivery	6 months, on the first day of each month

In this scenario, the customer requests delivery of 600 chairs in batches of 100 chairs over a period of six months. To keep track of the delivery requirements, you create a delivery schedule. On the delivery schedule page, you create six separate delivery lines. Each delivery line contains 100 chairs and indicates the delivery date for those 100 chairs. In this case, each line is offset on the first of the month for six consecutive months.

When you create a delivery schedule, the type of the original order line is automatically changed to **Order line with multiple deliveries**. A line of this type is referred to as a commercial line and is marked by an icon. The delivery line is marked by a different icon. If you change a quantity on a delivery line, the commercial line is updated to the total quantity of the delivery schedule. If a trade agreement has defined a total discount for the order, the delivery schedule ensures that your order is eligible for the total order discount, even when the order is split into separate deliveries.

Orders that have a delivery schedule are processed against the delivery lines. Processing includes the posting of packing slips, product receipts, and invoicing.

Document printouts of orders and quotations that have a delivery schedule show only the delivery lines. They don't show the original lines (commercial lines). **Note:** In addition, only the delivery lines are shown when you perform these actions:

- Post
- Copy pages
- Browse list pages and reports

When you confirm sales quotations, the resulting sales orders show the whole delivery schedule, even the order lines that have multiple deliveries. In addition, the whole delivery schedule is shown on all the major pages, such as sales orders, sales quotations, and purchase orders.

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Create delivery schedule

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This procedure demonstrates how to create a delivery schedule for a sales order. A delivery schedule is used when a quantity on an order or a quotation is requested to be delivered in multiple shipments. You can run this procedure in demo data company USMF or on your own data.

Create delivery schedule

1. Go to All sales orders.
2. Click New.
3. In the Customer account field, enter or select a value.
4. Click OK.
5. In the Item number field, enter or select a value.
6. In the Quantity field, enter a number that is bigger than 1.
7. Click Sales order line.
8. Click Delivery schedule.
 - The Delivery schedule page is the place where you can specify the number of shipments in which the total quantity of the order line will be delivered to the customer.
 - By default, the system copies the total quantity and other delivery details of the original sales line into the first delivery schedule line. In this example, we'll create a schedule for two shipments, with the second shipment's date offset by a week from the first one.
9. In the Quantity field, enter a number that is part of the total quantity.
10. Click New.
11. In the Quantity field, enter the remaining quantity.
12. In the Requested ship date field, enter a date a date that is one week ahead from the date of the first delivery line.
 - The two options on the Charges conversion FastTab control how you want the charges to be distributed across the delivery schedule lines, once they've been assigned to the original order line. If you select Copy gross amounts, the same charge amount is copied to each line. The Allocate to delivery lines option divides the charge equally across the delivery lines.
 - Only fixed charges can be divided, whereas variable charges will still be copied to the lines.
13. Move the cursor away from the second delivery line to update the page.
 - You can keep track of the total quantity that's allocated to the delivery schedule lines by looking at the Total and Remaining fields. When the remaining quantity is zero, the full quantity from the original line has been allocated to the schedule.
14. Click OK.
 - The delivery schedule has now been copied to the order lines.
 - The original order line, referred to as a Commercial line, has been converted to an Order line with multiple deliveries. It is marked with a distinct icon and acts as a header for the delivery lines.
 - The two new lines, referred to as delivery lines, make up one delivery schedule. The order will be processed against these lines and not the original line. If documents such as confirmation slips, picking lists, packing slips, or invoices are printed, only the delivery lines are shown.
 - The delivery lines can have different delivery dates, quantities, modes of delivery, and storage dimensions, such as site and warehouse. However, the product dimensions must always match the ones on the commercial line and can't be changed.

15. In the Quantity field, enter a number that's bigger than the current one.
16. Select the commercial line to see the effect of the quantity recalculation.
17. On the Action Pane, click Pick and pack.
18. Click Post packing slip.
19. Expand the Parameters section.
20. In the Quantity field, select 'All'.
 - Note that the packing slip will be created for the two delivery schedule lines and not the original order line.
21. Select Yes in the Print packing slip field.
22. Click OK.
23. Click Yes.
24. Close the page.

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Working with serialized items

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This topic explains how you can register serial numbers on packing slips or invoices during the sales process. This functionality is useful if a company wants to capture serial numbers for service and warranty purposes, but doesn't have to maintain serial numbers in inventory from receipt to issue.

Many companies just want to capture serial numbers for service and warranty purposes, and don't have to maintain serial numbers in inventory from receipt to issue. In these scenarios, you can register the serial numbers on the packing slips or invoices when products are sold. If products are later returned, you can trace each product to an invoice to determine whether you sold the product, and whether the service or warranty obligations are valid.

You must enable serial numbers for the sales process by selecting the **Active in sales process** option on the **Tracking dimension groups** page. The following events then occur in Supply Chain Management:

- On the **Serial numbers** FastTab, the **Serial number control** option is selected. When this option is selected, you must register one serial number for each item on the packing slip or invoice.
- All selections on the tracking dimension group for serial numbers are cleared, except the **Blank issue allowed** option. You can select the **Blank issue allowed** option to override the serial number control, and allow products to be packed and invoiced without registering serial numbers.

When do I register serial numbers during the sales process?

You can register serial numbers either on the packing slip for a sales order or on the invoice. When you prepare an invoice for a serialized item that was shipped together with a packing slip, you can select which serial numbers on the packing slip to invoice. The number of registered serial numbers must not exceed the quantity of items that were shipped. If you're creating a partial invoice, you can select fewer serialized items than were registered on the packing slip. When you print a packing slip or an invoice, the serial numbers that were registered are included.

Can I enter serial numbers by scanning them, or do I have to type them?

You can either scan or type serial numbers. When you use a scanner, the scan mode determines whether the serial numbers are added to or removed from the list of serial numbers on the invoice or packing slip. If you want to scan serial numbers by using, for example, a hand-held bar code scanner, configure the scanner to send an Enter or TAB command after the serial number. This command will indicate the end of the data stream. Otherwise, you must press Enter or TAB on the keyboard after you scan each serial number.

If I enable serial numbers for the sales process, do I have to register all serial numbers for all items?

The setup of the tracking dimension group that is assigned to the product determines whether serial numbers must be registered for all items on a packing slip or invoice. When you enable serial numbers for the sales process, the **Serial number control** option is automatically selected. You must then register one serial number, or register a blank registration for an unreadable number, for each item on the packing slip or invoice. If you don't want to require a serial number for each item, select the **Blank issue allowed** option on the tracking dimension group that is assigned to the item. You can then register fewer serial numbers than the quantity of items that are being shipped. If you register more serial numbers than the quantity of items that are being

shipped, you won't be able to post the packing slip or invoice.

Can I register serial numbers for partial invoices and partial shipments?

You can create partial invoices and packing slips for sales orders, and register only the serial numbers for the items that those invoices and packing slips include. If you want to create a partial invoice, and you have more than one packing slip for the sales order, you can include serial numbers from more than one packing slip. However, there can be only one packing slip that doesn't include all serial numbers. For example, if you have three packing slips, and each packing slip includes two serialized items, you can't create a partial invoice for one item from each packing slip.

What do I do when a serial number isn't readable?

If a serial number can't be read or scanned, you can create a blank line for the item by clicking **Not readable** on the **Serial numbers** page. If the serial number becomes available later, you can update the invoice or packing slip. For more information, see the next section, "Can I correct or change the serial numbers I have registered for a sales order?"

Can I correct or change the serial numbers that I have registered for a sales order?

Yes, you can correct serial numbers if the following conditions are met:

- **Invoices** – You can change the serial numbers for items that you haven't yet invoiced. The packing slip is then also updated. However, if a sales order line was corrected by registering a negative quantity, you can't change serial numbers for the sales order line.
- **Packing slips** – You can't partially correct a packing slip line that contains serialized items. You must reverse the full quantity for the line. If a packing slip has been canceled or corrected, you don't have to register the reversed serial numbers again when you create a new packing slip for the same serialized items. The numbers that were registered will be used.

Can I view the serial numbers that were shipped together with a specific packing slip, or that were included on an invoice?

Yes, you can run an inquiry on the packing slip journal line or invoice journal line to view a list of all serial numbers that were included in the document.

Can I view the serialized items that I have on hand?

No, you can't view the serialized items that you have on hand, because serial numbers aren't registered for items until the items are sold.

Can I register serial numbers for catchweight items?

No, you can't register serial numbers for catch-weight items during the sales process. Additionally, if a product is set up as a catch-weight item, you can't assign the product to a tracking dimension group that is set up to use serial numbers only during the sales process.

Can I register serial numbers at the retail POS?

Yes, the retail point of sale (POS) will prompt the user to enter a serial number when the user sells an item that is assigned a tracking dimension group that is set up to use serial numbers only during the sales process.

What security roles are required in order to register serial numbers during the sales process?

This functionality is available to all roles that can maintain sales packing slips and sales invoices. The following duties let workers correct serial numbers, and register blank entries for serial numbers that can't be read or scanned:

- Maintain serial number corrections
- Maintain registration of non-readable serial numbers

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Reserve the same batch for a sales order

2/18/2021 • 2 minutes to read • [Edit Online](#)

This article explains how to set up a product to allow reservation of inventory against a single batch of inventory.

Same batch reservation lets you reserve inventory for a sales order line against a single batch of inventory. For example, a customer who orders wallpaper can request that the whole order be filled from the same batch or lot, to avoid inconsistencies among the rolls. To set up a product to use same batch reservation, the following settings must be active in the item model group, tracking dimension group, and storage dimension group that you assign to the product:

- **Item model groups** – The item model group must have the **Same batch selection** and **Consolidate requirement** fields selected in the **Reservation** field group for inventory policies.
- **Tracking dimensions groups** – The tracking dimension group must have the **Coverage plan by dimension** field selected for the batch number.
- **Storage dimensions groups** – The storage dimension group must have the **Coverage plan by dimension** field selected for **Site** and **Warehouse**.

When you reserve inventory for a product on a sales order line that is set up for same batch selection, the system tries to reserve the ordered quantity from a single inventory batch. Any specific batch attribute requirements are also considered. If the quantity can't be filled from a single batch, the **Same batch reservation conflict** page appears. This page describes the issues and also the actions that you can take to continue with the reservation. The following conditions might prevent the batch from being reserved:

- The batch disposition code has **Block reservation** for sales flagged as **Blocked**.
- The batch has expired, based on the expiration date and any applicable customer sellable days. The item can still be considered for reservation if the item model group for the item is First Expiry First Out (FEFO) date-controlled, and if the best-before date is selected as the pick criterion.
- The batch doesn't have enough shelf-life days remaining, based on the expiration date and best-before date, plus any customer sellable days.

For items associated with a storage dimension group that has **Use warehouse management processes** enabled, you can reserve specific batch numbers by using a reservation hierarchy with the batch number inventory dimension defined above the location dimension. The **Batch reservation** page for sales and transfer order lines also lets you select and reserve multiple lines based on the available batch numbers. For more information about what to do if you are using a reservation hierarchy that has the batch number dimension below the location, see [Flexible warehouse-level dimension reservation policy](#).

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Sales orders mobile workspace

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This topic provides information about the **Sales orders** mobile workspace. This workspace helps you stay up to date about your sales orders anywhere and anytime.

This mobile workspace is intended to be used with the Finance and Operations mobile app.

Overview

The **Sales orders** mobile workspace lets you view detailed information about each sales order. This information includes the status of the order, contact information for the customer, and contact information for the order taker. The **Sales orders** mobile workspace provides an instant view of sales orders. You can view all sales orders, view sales orders by customer, or view information about a specific sales order.

The mobile workspace provides two views to help you analyze sale orders in depth.

View all sales orders

This view lists all sales orders.

- Use one of the following filters to select the sales orders to view:
 - Search by sales order
 - Search by customer account
 - Search by customer name
 - Search by status
 - Search by release status
 - Search by created date and time
- After you select sales orders, you can view the details of specific orders. Specifically, you can view the following information:
 - Customer name and address information
 - Various dates for the sales order, such as the requested ship date and the confirmed ship date
 - Contact information for the order taker
 - Customer contact information
 - Order lines
 - Shipments that show how and when a sales order was shipped

View orders for a customer

This view lists sales orders by customer.

- Use one of the following filters to view orders for a customer:
 - Search by name
 - Search by account
- After you select a customer, you can view the following information:
 - Customer name and group
 - Customer contact information
 - Customer sales orders and details about those sales orders:

- Customer name and address information
- Various sales order dates
- Contact information for the order taker
- Customer contact information
- Order lines
- Shipments that show how and when a sales order was shipped

Prerequisites

The prerequisites differ, based on the version of Microsoft Dynamics 365 that has been deployed for your organization.

Prerequisites if you use Supply Chain Management

If Supply Chain Management has been deployed for your organization, the system administrator must publish the **Sales orders** mobile workspace. For instructions, see [Publish a mobile workspace](#).

Prerequisites if you use Dynamics 365 for Operations version 1611 with platform update 3 or later

If Dynamics 365 for Operations version 1611 with platform update 3 or later has been deployed for your organization, the system administrator must complete the following prerequisites.

PREREQUISITE	ROLE	DESCRIPTION
Implement KB 4013633.	System administrator	KB 4013633 is an X++ update or metadata hotfix that contains the Sales orders mobile workspace. To implement KB 4013633, your system administrator must follow these steps. <ol style="list-style-type: none"> 1. Download the metadata hotfix from Microsoft Dynamics Lifecycle Services (LCS). 2. Install the metadata hotfix. 3. Create a deployable package that contains the SCM Mobile model, and then upload the deployable package to LCS. 4. Apply the deployable package.
Publish the Sales orders mobile workspace.	System administrator	See Publish a mobile workspace .

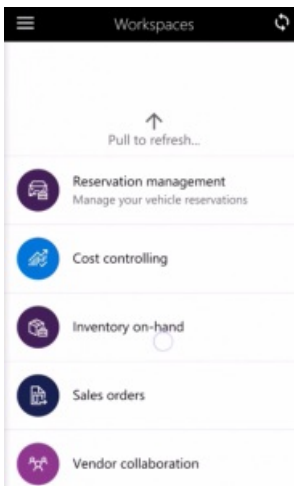
Download and install the mobile app

Download and install the Finance and Operations mobile app:

- [For Android phones](#)
- [For iPhones](#)

Sign in to the mobile app

1. Start the app on your mobile device.
2. Enter your Dynamics 365 URL.
3. The first time that you sign in, you're prompted for your user name and password. Enter your credentials.
4. After you sign in, the available workspaces for your company is shown. Note that if your system administrator publishes a new workspace later, you will have to refresh the list of mobile workspaces.



View information about sales orders for a customer by using the Sales order mobile workspace

1. On your mobile device, select the **Sales orders** workspace.
2. Select **View orders for a customer**.
3. Use account or customer name information to find the customer.
4. Select the customer.
5. Select **Contact information** or **Sales orders**. If you select **Sales orders**, a list of sales orders for the customer is shown.
6. Select **Sales order**. You can now view information about sales order lines, information about shipments, customer contact information, and contact information for the order taker.

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Ship orders as direct deliveries

2/18/2021 • 4 minutes to read • [Edit Online](#)

This topic demonstrates how to create a direct delivery for a sales order. You use direct delivery when you want to ship goods to the customer directly from your vendor, instead of shipping them to your own warehouse first. You can run this procedure in demo data company USMF or on your own data. To successfully complete the second sub-task "Create direct deliveries from the workbench", make sure that the item that you choose on the sales order has a default Vendor specified on the Purchase FastTab of the Released product master.

Set an individual order for direct delivery

1. Go to **Navigation pane > Modules > Accounts receivable > Orders > All sales orders**.
2. Select **New**.
3. Enter or select a value in the **Customer account** field, then select **OK**.
4. Enter or select values in the **Item number** and **Site** fields, then select **Save**.
5. On the Action Pane, select **Sales order**, then select **Direct delivery**. The Create delivery page lists all the open sales order lines as copied from the sales order. You can review the order details, and if required, you can modify details such purchase quantity and pricing terms before you create the direct delivery.
6. Select **Yes** in the **Include all** field.
 - If you want to generate a direct delivery for only a subset of the sales order lines, select these individually.
 - The **Vendor account** field may or may not already be populated with a vendor number. If the default vendor is set up for the product (on the associated Item coverage) then this vendor will be copied to the line. Otherwise, you must enter a vendor manually. In this example, we'll select a new vendor in the next step, even if one is already populated.
7. Enter or select a value in the **Vendor account** field, then select **OK**. The message informs you that the purchase order has now been created.
8. Expand the **Line details** section.
9. Select the **Delivery** tab and verify that the **Direct delivery** field is set to **Yes**.
10. On the Action Pane, select **General**.
11. Select **Related orders**.
12. Select the link in the **Purchase order** field.
13. Expand the **Line details** section and select the **Address** tab.
 - The delivery address for this purchase order line is the customer's delivery address and not your company's address.
 - If you change the delivery address on either the purchase order line or the originating sales order line, the address on the corresponding order line will be automatically updated.
14. Select the **Delivery** tab.
 - Like the sales order line, the associated purchase order line type is also set to Direct delivery.
 - The purchase order line's Delivery date and the Confirmed delivery date are set to the Requested receipt date and Confirmed receipt date of the originating sales order line respectively.
 - If you update any of these dates on either the purchase line or the sales line, the dates on the corresponding order will be automatically updated.
 - The purchase order that is set to deliver goods directly to the customer is linked to the originating sales order by means of a special association. This association imposes the rule that the packing slip update of the sales order can't be done from the sales order itself and must be done by using the

purchase order. However, customer invoicing must be carried out from the sales order.

15. On the Action Pane, select **Purchase**.
16. Select **Confirmation**.
17. Select **OK**.
18. On the Action Pane, select **Receive**.
19. Select **Product receipt**.
20. In the **Product receipt** field, type a value.
21. Select **OK**.
22. On the Action Pane, select **General**.
23. Select **Related orders** and highlight the desired record.
 - After the purchase order has been updated as received, or in other words, after the vendor has shipped the goods to your customer's address, the status of the originating sales order is automatically updated to Delivered.
 - The sales order can now be invoiced.
24. Select **OK**.
25. Close the page.
26. Select **OK**. Close the pages and return to the home page.

Create direct deliveries from the workbench

1. Go to **Navigation > Modules > Accounts receivable > Orders > All sales orders**.
2. Select **New**.
3. Enter or select a value in the **Customer account** field, then select **OK**.
4. Enter or select a value in the **Item number** and **site** fields.
5. Expand the **Line details** section, then select the **Delivery** tab. Instead of creating a direct delivery as part of the sales order processing as in the previous procedure, you can choose to hand over this task to a purchasing professional. To include the sales order line in the direct delivery handling process, you must mark the line for direct delivery.
6. Select **Yes** in the **Direct delivery** field.
 - If the item has already been set up for direct delivery by default, the field will automatically be set to Yes at the order line entry. You can set up an item for direct delivery on the Released product's master by setting the Direct delivery option to Yes and selecting a default Direct delivery warehouse.
 - Because the purchase order has not yet been created, the Direct delivery status is set to "To be direct delivered".
7. Select **Save**.
8. Close pages until you return to the home page.
9. Enter **Direct delivery** in the search bar.
 - The Direct delivery page acts as a workbench that provides the purchasing agent with an overview of all the sales order lines that are to be direct delivered and it allows them to create the respective purchase orders. In addition, they can view the open direct delivery orders and the confirmed orders on the Confirmation and Delivery tabs.
 - After you have created a direct delivery order, it automatically moved to the Confirmation tab. You can choose to confirm the order directly from this page. When the purchase is confirmed, it will automatically move to the Delivery tab, from which you can registered its receipt.

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Ship sales orders without warehousing

2/18/2021 • 2 minutes to read • [Edit Online](#)

This topic explains how to update a sales order when products are shipped to the customer. The guide is applicable to the fulfillment flow that is not set up for warehouse management (neither basic or advanced warehousing), and therefore does not require product picking to be registered before shipment. You can run this procedure on your own data or in demo data company USMF. In both cases, before you start this task, create a sales order for an inventoried product with a quantity of greater than 1. To avoid a posting error, you need to check that the product's on-hand quantity in the site and warehouse that you've selected on the order covers the order quantity.

Post packing slip for an order

1. In the navigation pane, go to **Modules > Sales and marketing > Sales orders > All sales orders**.
2. In the list, find and select the order you have created for this task.
3. On the Action Pane, select **Pick and pack**.
4. Select **Post packing slip**.
5. Expand or collapse the **Parameters** section.
6. In the **Quantity** field, select **All**.
 - Other options include **Deliver now** and **Picked**. If the order line is to be shipped partially and the **Deliver now** field on the order line contains a quantity, you would select **Deliver now**. If your organization's fulfillment flow includes picking as a separate process that is managed by and registered with a picking list, you would select **Picked**.
 - Check that the **Posting** option is set to **Yes**.
7. Set the **Print packing slip** option to **Yes**. The **Overview** tab contains a list of packing slips to be generated in this posting. If you are shipping an individual order, there will typically be one packing slip. However, if that order's lines are to be shipped from different sites, posting will automatically be split into the appropriate number of documents. This is a mandatory condition that cannot be changed. Similarly, the posting will also be split into multiple documents if the order's lines are to be shipped to different delivery addresses, and the shipping policy is set up to require a split.
8. On the **Lines** tab, select the row for the order line to be shipped.
9. In the **Update** field, enter a number lower than the original quantity.
10. Select **OK**.
11. Select **Yes**.
12. Close the page.
13. On the Action Pane, select **Options**.
14. Select **Change view**.
15. Select **Header view**.
 - If all of the lines on the order have been fully shipped, the order status changes from Open to Delivered.
 - In this example, the order line has been shipped partially. This is why the the order status remains Open.
 - The **Document status** field is set to Packing slip because at least one of the order lines have been shipped.
16. On the Action Pane, select **General**.
17. Select **Line quantity**.

18. Close the page.
19. On the Action Pane, select **Pick and pack**.
20. Select **Packing slip**. The **Packing slip journal** page contains all the packing slip documents that were generated for your order. You can review details of each document and print them, if you wish.

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Automatic allocation of charges

2/18/2021 • 9 minutes to read • [Edit Online](#)

Based on the customer that you're working with or the item that you're selling, you might want to apply specific additional charges. The *charges* feature in Microsoft Dynamics 365 Supply Chain Management helps you automatically allocate charges to purchase orders or sales orders.

Automatic charges, or auto charges, are automatically applied when you create a sales order or a purchase order. You can define auto charges for specific vendors, customers, groups of vendors, or items. You can also define auto charges that apply to all vendors, customers, or items.

Set up charges codes

To allocate charges, you must first define charges codes.

1. Follow one of these steps:

- For purchase orders: Go to **Accounts payable** > **Charges setup** > **Charges code**.
- For sales orders: Go to **Accounts receivable** > **Charges setup** > **Charges code**.

2. On the Action Pane, select **New** to create a charges code.

3. In the header of the new record, set the following fields:

- **Charges code** – Enter a code for the charges.
- **Description** – Enter a description of the charges.
- **Item sales tax group** – Select an item sales tax group, if applicable.
- **Prorate** – Set this option to *Yes* if you want to prorate your charges. This option is available only for sales orders.
- **Maximum amount** – Enter the maximum amount that is allowed for the charges code. This field is used to validate charges for vendor invoices. It's available only for purchase orders.

NOTE

To turn on the functionality for validating charges for purchase orders, go to **Accounts payable** > **Setup** > **Accounts payable parameters**. On the **Invoice validation** FastTab, in the **Invoice validation** section, set the **Enable invoice matching validation** option to *Yes*.

4. The **Posting** FastTab includes **Debit** and **Credit** sections. Set the following fields, depending on the ledger that you want to post the charges to:

- **Type** – Select the type of account that you're posting to (*Ledger, Customer, or Item*).
- **Posting** – Select the type of postings to create (such as *Broker fee* or *Customer settlement*).
- **Account** – Select the account to post the charge for.

5. On the Action Pane, select **Save**.

Create charge groups

Charge groups automatically allocate specific charges to a group of customers or vendors. The following subsections describe how to create and assign these charge groups.

Charge groups for purchase orders

To create charge groups for purchase orders, follow these steps.

1. Go to **Accounts payable > Charges setup > Vendor charges group**.
2. On the Action Pane, select **New** to add a row to the grid, and then set the following fields:
 - **Charges group** – Enter the name of the charge group.
 - **Description** – Enter a description of the charge group.
3. On the Action Pane, select **Save**.
4. Go to **Accounts payable > Vendors > All vendors**, and either open an existing vendor or create a new vendor.
5. On the **Purchase order defaults** FastTab, in the **Purchase order** section, set the **Charges group** field to the charge group that you just created.

Charge groups for sales orders

To create charge groups for sales orders, follow these steps.

1. Go to **Accounts receivable > Charges setup > Customer charge groups**.
2. On the Action Pane, select **New** to add a row to the grid, and then set the following fields:
 - **Charges group** – Enter the name of the charge group.
 - **Description** – Enter a description of the charge group.
3. On the Action Pane, select **Save**.
4. Go to **Accounts receivable > Customers > All customers**, and either open an existing customer or create a new customer.
5. On the **Purchase order defaults** FastTab, in the **Sales order** section, set the **Charges group** field to the charge group that you just created.

Define auto charges

After your charges codes are set up, follow these steps to define the auto charges.

1. Follow one of these steps:
 - For purchase orders: Go to **Procurement and sourcing > Setup > Charges > Automatic charges**.
 - For sales orders: Go to **Accounts receivable > Setup > Charges setup > Auto charges**.
2. In the list pane, in the **Level** field, select the level where your auto charge applies:
 - *Main* – Apply charges to the order header.
 - *Line* – Apply charges to the order lines.
3. Select an existing auto charge to edit it, or select **New** to define a new auto charge.
4. In the **Account code** list, select one of the following values to specify the scope of accounts that will be affected:
 - *Table* – Assign charges to a specific customer or vendor.
 - *Group* – Assign charges to a miscellaneous charges group.
 - *All* – Assign charges to all customers or vendors.
5. In the **Customer relation** or **Vendor relation** field, select a specific customer or vendor if you set the **Account code** field to *Table*. If you set the **Account code** field to *Group*, select a customer or vendor

charges group.

6. In the **Item code** field, select one of the following values to specify the scope of items that will be affected. You can select an item code only when you define auto charges at the line level.
 - *Table* – Assign charges to a specific item.
 - *Group* – Assign charges to an item charges group.
 - *All* – Assign charges to all items.
7. In the **Item relation** field, select a specific item if you set the **Item code** field to *Table*. If you set the **Item code** field to *Group*, select an item charges group.
8. **For sales orders only:** In the **Mode of delivery code** field, select one of the following values to specify the scope of delivery modes that will be affected:
 - *Table* – Assign charges to a specific mode of delivery.
 - *Group* – Assign charges to a mode of delivery group.
 - *All* – Assign charges to all modes of delivery.
9. **For sales orders only:** In the **Mode of delivery relation** field, select a specific mode of delivery if you set the **Mode of delivery code** field to *Table*. If you set the **Mode of delivery code** field to *Group*, select a mode of delivery group.
10. On the **Lines** FastTab, define the charges and the charges rates that will be used when the current auto charge is applied. You can use the toolbar on this FastTab to add as many lines as you require. For each line, set the following fields:
 - **Currency** – Select the currency that should be used to calculate the charge.
 - **Charges code** – Select the code for the charge.
 - **Category** – Select one of the following values:
 - *Fixed* – The charge is entered as a fixed amount on the line. Fixed charges can be used on charges both in the order header and on the order lines.
 - *Pcs* – The charge is based on the unit. These charges can be used only on order lines. They will appear when you calculate the order total.
 - *Percent* – The charge is entered as a percentage on the line. Percentage charges can be used on charges both in the order header and on the order lines.
 - *Intercompany percent* – The charge is entered as a percentage on the line for intercompany orders. Intercompany percentage charges can be used only on order lines.
 - *External* – The charge is calculated by a third-party service that is associated with one or more shipping carriers.
 - **Charges value** – Enter the charge value, based on the category that you selected.
 - **Charges currency code** – Specify a currency for the charge if you want to use a currency other than the currency that you specified in the **Currency** field. You can use a different currency only if the **Debit type** or **Credit type** field is set to either *Ledger account* or *Item* for the selected charges code.
 - **From amount** – Specify a starting amount to apply the auto charge to. In this context, the amount refers to the order total.
 - **To amount** – Specify the ending amount to apply the auto charge to. In this context, the amount refers to the order total.
 - **Sales tax group** – Specify a sales tax group.
 - **Site and Warehouse** – Specify a site and warehouse if charges should be applied only for a

specific site and warehouse.

- **Keep** – Select this check box to keep the charges transactions after invoicing is completed, so that the charge will be applied every time that you create a new invoice for the selected customer account.

11. **For sales orders only:** If you want to calculate tiered charges, see [Tiered charges on sales orders](#) for information.

Allocate charges from the header to a line

The following procedure shows how to allocate header-level charges to a line. Before you start this procedure, you should already have a header-level charge of the *fixed amount* type and an order where that charge is applied. Additionally, the order should already include at least one line item.

1. Open the purchase order or charge order.
2. On the Action Pane, follow one of these steps:
 - For purchase orders: On the **Purchase** tab, in the **Charges** group, select **Allocate charges**.
 - For sales orders: On the **Sell** tab, in the **Charges** group, select **Allocate charges**.
3. In the **Allocate charges to order lines** dialog box, set the following fields:
 - **Charges allocation** – Select one of the following values to specify how the charges should be allocated:
 - *Net amount* – Allocate charges according to each line amount relative to the total net amount.
 - *Quantity* – Allocate charges according to the number of units for each line relative to the total number of units.
 - *Per line* – Allocate charges equally among the total number of lines.
 - **Allocate charges to lines** – Select a value to specify whether charges should be allocated to all lines, to positive lines only, or to negative lines only.
 - **Allocate all** – Select this check box to allocate charges to order lines even if the charges code has a debit type other than *Item*.
 - **Received** – Select this check box to allocate charges only to received order lines.
 - **Stocked** – Select this check box to allocate charges to only inventoried order lines.
 - **Show selections and clear specific lines** – Select this check box to exclude specific lines from this allocation. When you select this check box, the **Choose lines to exclude from allocation** grid is opened. This grid includes only lines that match the criteria that are defined by the **Allocate charges to lines** and **Stocked** settings. For example, if you set the **Allocate charges to lines** field to *Positive lines* and select the **Stocked** check box, the grid shows only lines that are both positive and inventoried. In addition, the grid automatically filters out any lines that the full quantity has already been received for. While the grid is open, clear the **Include** check box for each line that should be excluded from allocation.
4. Select **Allocate** to apply your settings and close the dialog box.

IMPORTANT

When you work with the **Choose lines to exclude from allocation** grid, be sure to leave the grid open until you select **Allocate**. If you close the grid before you select **Allocate**, your settings in the grid will be lost. Therefore, charges will be allocated based on the criteria that you previously defined.

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Create a purchase order from a sales order

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This procedure shows you how to create a purchase order that is based on a sales order. The product's quantities on the purchase order are then designated to fulfill the demand of the originating sales order. Fulfilling sales demand this way is an alternative to a more comprehensive and optimized method of Distribution Requirements Planning. You can run this procedure in demo data company USMF or on your own data.

Create a purchase order from a sales order

1. Go to **Navigation pane > Modules > Sales and marketing > Sales orders > All sales orders**.
2. Click **New**.
3. In the **Customer account** field, click the drop-down button to open the lookup.
4. In the list, find and select the desired record.
5. Click **OK**.
6. In the **Item number** field, click the drop-down button to open the lookup.
7. In the list, find and select the desired record. If you're using USMF, you could select D0001.
8. In the **Quantity** field, enter a number.
9. Click **Add line**.
10. In the **Item number** field, click the drop-down button to open the lookup.
11. In the list, find and select the desired record. If you're using USMF, you could select T0020.
12. In the list, click the link in the selected row.
13. In the **Quantity** field, enter a number.
14. Click **Save**.
15. On the **Action Pane**, click **Sales order**.
16. Click **Purchase order**. The **Create purchase order** page lists all the open sales order lines which have been copied from the sales order. You can review the order details, and if required, you can modify selected details such purchase quantity and pricing terms, before you create the purchases.
17. Select the **Include all option**.
 - If you want to generate purchase orders for only a subset of the sales order lines, select these individually.
 - The **Vendor account** field may or may not already be populated with a vendor number. If the default vendor is set up for the product (on the associated Item coverage) then this vendor will be copied to the line. Otherwise, you must enter a vendor manually. In this guide, regardless of whether the **Vendor account** field already contains a value or not, the following steps instruct you to select a new vendor which is different for each line.
18. In the **Vendor account** field, click the drop-down button to open the lookup.
19. In the list, find and select the desired record.
20. In the list, click the link in the selected row.
21. Select the second order line.
22. In the **Vendor account** field, click the drop-down button to open the lookup.
23. In the list, find and select the desired record.
24. In the list, click the link in the selected row.
25. Click **Validate**.
26. Click **OK**. The message informs you that one or more purchase orders have been created. The system

generates a separate purchase order for each vendor that you specified for the sales order lines. This means that if several sales order lines are to be supplied by the same vendor, a single purchase order with multiple lines will be generated.

Review purchase orders created from sales orders

1. On the **Action Pane**, click **General**.
2. Click **Related orders**. The **Related orders** page lists all the orders that were created from the sales order. In this example, there are two purchase orders generated for two different vendors respectively.
3. Click to follow the link in the **Purchase order** field. Each purchase order line is associated with the sales order line that led to the purchase. The relation to the sales order is indicated on the **Product tab** in the **Line details** Fasttab, in the **Reference type**, **Reference number**, and **Reference lot** fields.
4. Expand or collapse the **Line details** section.
5. Click the **Product** tab.
 - The **Reference lot** guarantees that the costs from the current purchase are charged on the attached sales order.
 - You can navigate to the originating sales order by opening the link in the **Reference number** field.

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Create sales orders

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This procedure shows you how to create a sales order. You can use the procedure in demo data company USMF. Sales orders are typically created by a sales order processor.

Enter sales order header details

1. Go to **Navigation pane > Modules > Sales and marketing > Sales orders > All sales orders**.
2. Select **New**.
3. In the **Customer account** field, select the drop-down button to open the lookup.
4. In the list, find and select the customer record.
 - For this example, select customer number US-004.
5. Select **OK**.

Enter sales order line details

The products sold by your organization may come in variants differentiated by dimensions, such as configuration, color, size, and style. Also, products may be set up to use storage dimensions, such as site, warehouse, and pallet, and tracking dimensions, such as batch and serial numbers. When these dimensions are assigned, you must select the values for those dimensions on the order line. To improve order entry efficiency, you may want to add the respective dimension fields to the order grid.

1. Under the **Sales order lines** section, select the **Sales order line**.
2. Select **Dimensions**.

For this example, select the Color, Site and Warehouse dimensions. The dimensions you select here will appear in the sales order grid. If you want your selections to persist, set the **Save setup** option to Yes.

3. Select **OK**.
4. In the **Item number** field, select the drop-down button to open the lookup.
5. For this example, select item number T0004.
 - If the item is part of a sales category, the item name will automatically appear in the Sales category field.
 - If product dimension fields already contain a value, this is because the value was copied from the product record where it is defined as a default product dimension. You can change the default value at any time.
6. In the **Color** field, select the drop-down button to open the lookup.
7. In the list, find and select the desired record.
8. In the **Quantity** field, enter a number.
 - If the item is sold in different units than when it's purchased, produced, and stored, and a sales unit of measure is set on the product record, this value will be shown in the **Unit** field. You can change the value at any time.
 - If the **Site** field already contains a value, the value was copied from the order header or from the order settings that are associated with the product. You can change the value at any time. If the field is

empty, select a value.

- If the **Unit price** field already contains a value, the value was copied from a valid trade agreement, or from the product record. (The unit price can also originate from a sales agreement, but the process for creating sales orders from sales agreements is different to the one shown here.) If the field is empty, enter a value.
- The **Discount** field contains a discount amount per product unit. To calculate the total line discount amount, the discount value is multiplied by line quantity. If the **Discount** field already contains a value, the value was copied from a valid trade agreement. If the field is empty, and you want to give the customer a line discount, enter a value.
- The **Discount percent** field contains a percentage value by which the total line gross amount is to be reduced. If the **Discount percent** field already contains a value, it was copied from a valid trade agreement. If the field is empty, and you want to give the customer a line discount, enter a value.
- The **Net amount** field contains a value that is calculated based on the line's quantity and unit price adjusted by discounts. You can override the calculated value to a different one.

Review the order totals

1. On the **Action Pane**, select **Sales order**.
2. Select **Totals**.

The **Totals** page displays details about the entire order. This includes the subtotal amount, which is a sum of all line net amounts adjusted for eventual line discounts, the total invoice amount, which is a subtotal amount adjusted for eventual order-level discount, charges, and sales tax, the customer credit limit situation, and more. The invoice amount is the amount that will appear on the customer's invoice document.

3. Select **OK**.

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Manage order holds

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This procedure demonstrates how to place customer sales orders on hold, how to work with order hold checkouts, and how to remove order holds. An order might be placed on hold for a variety of reasons. For example, you might hold an order until a customer address or payment method can be verified or until a manager can review the customer's credit limit. While the order on hold, it cannot be processed by the warehouse for shipping.

You can run this procedure in demo data company USMF or on your own data.

Set up order holds

1. Go to **Navigation pane > Modules > Sales and marketing > Setup > Sales orders > Order hold codes**.
2. Click **New**.
3. In the **Hold code** field, type a value. For example, type 'Call back'.
4. In the **Description** field, type a value.
 - For example, Order held waiting for customer callback.
 - Optionally, select the **Remove reservations** check box to remove any physical reservations from the order when this hold code is added.
5. Click **Save**.

Place order on hold

1. Go to **Navigation pane > Modules > Sales and marketing > Sales orders > All sales orders**.
2. Click **New**.
3. In the **Customer account** field, enter or select a value.
4. Click **OK**.
5. In the **Item number** field, enter or select a value.
6. In the **Quantity** field, enter a number.
7. On the **Action Pane**, click **Sales order**.
8. Click **Order holds**.
9. Click **New**.
10. In the **Hold code** field, select the code you have created in the previous subtask.
11. Click **Save**.
12. Close the page.
13. Go to **Sales and marketing > Sales orders > All sales orders**.
14. In the list, mark the selected row. Orders that are currently on hold have the "Do not process" and "Hold" fields marked.
15. On the **Action Pane**, click **Pick and pack**.

Manage order holds

1. Go to **Sales and marketing > Sales orders > Open orders > Order holds**. **Order holds** page functions as a workbench where you can get an overview of all the current and processed holds, and handle them and associated sales orders.

2. In the list, mark the selected row.
3. On the **Action Pane**, click **Hold checkout**.
4. Click **Check out**.
5. In the list, unmark the selected row. The **Checkout out to** field now shows your user ID.
6. Click **Clear checkout**.
7. On the **Action Pane**, click **Clear hold**.
 - When you are ready to remove the hold and allow the order to proceed to the next fulfilment step, you must clear the hold. If the order requires no changes, you can run the Clear holds action. However, you can use the Clear and modify action if, when clearing a hold, the order has to be updated.
 - The **Clear and submit** action is only applicable when you use Call center functionality.
8. Click **Clear holds**. The hold has now been cleared from the order and removed from the list of Active holds. To see all the holds or their subset according to a specific status, change the value in the Show field.

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Confirm sales orders

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This procedure demonstrates how to confirm sales orders. You'll be shown how to confirm a single order, and how to confirm multiple orders at once. These tasks would typically be carried out by a sales order processor. You can use this procedure in demo data company USMF or on your own data. Before you start, make sure there are several open sales orders for the same customer. If you're using USMF, you can use customer US-027.

Confirm a single sales order

1. Go to **Navigation pane > Modules > Sales and marketing > Sales orders > All sales orders**.
2. In the list, find and select the order that you want to confirm.
3. Click the link on the sales order number to open the selected order.
4. On the **Action Pane**, click **Sell**.
5. Click **Confirm sales order**.
6. Expand the **Parameters** section. Make sure that the **Posting** option is set to 'Yes'.
7. Set the **Print confirmation option** to 'Yes'. The **Check credit limit** field specifies the method that's used to calculate a customer's remaining credit. By default, it's copied from the Accounts receivable parameters page. If you want to skip the credit limit check when confirming a specific sales order, set the **Check credit limit** to 'None'. However, you should be aware that even with if this field is set to 'None', the credit limit check will still be performed if the **Mandatory credit limit** option is selected on the customer master data.
8. Click **OK**.
9. Click **Yes**.
10. Close the page.
11. On the **Action Pane**, click **Options**.
12. Click **Change view**.
13. Click **Header view**. When an order is confirmed, the **Document status** is set to 'Confirmation'.
14. On the **Action Pane**, click **Sell**.
15. Click **Sales order confirmation**.
16. Close the page.

Confirm multiple sales orders at once

1. Go to **Sales and marketing > Sales orders > Order confirmation > Confirm sales order**.
2. Click **Select**.
3. In the list on the **Range** tab, find and select the record that references the **Customer account** field.
4. In the **Criteria** field, click the drop-down button to open the lookup.
5. In the list, find and select the customer account that has multiple orders which you want to mass confirm. If you're using USMF, you can select account US-027.
6. Click **OK**.
 - The **Overview** tab displays a list of the orders that match the query criteria. These will be included in the confirmation.
 - The **Summary update for** field in the **Parameters** section specifies the parameter by which multiple orders are to be summarized into one confirmation document. By default, the option is copied from the **Default values for summary update setting** on the **Accounts receivable parameters** page.
7. In the **Summary update for** field, select 'Order'. The minimum parameters that are required to create

summary updates are **Invoice account** and **Currency**. This means that summary updates that have different invoice accounts and different currencies are not allowed. Additional parameters can be set up in the **Summary update parameters** page which is accessible from the **Accounts receivable parameters** page.

8. In the **Sales order** field, click the drop-down button to open the lookup.
9. In the list, select the order number that you want to be the summary order.
10. Click **Arrange**.
11. Click **OK**.
12. Click **OK**.

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Troubleshoot sales orders

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This topic describes how to fix issues that you might encounter while you work with sales orders.

The tax information isn't updated if I change the location on a sales order header.

Issue description

If the site, warehouse, or delivery address is changed either on a sales order header or at the line level, the case tax information isn't automatically updated for the lines.

Issue resolution

This behavior is by design. The issue occurs because the delivery address, site, and warehouse aren't automatically changed at the line level either. You must update them manually.

If there are two trade agreements for the same period or overlapping periods, the same agreement line is always selected.

Issue description

If two trade agreements are defined for the same period or overlapping periods, the same trade agreement seems to be selected every time when you create sales order lines that contain those items.

Issue resolution

If there is more than one trade agreement for a given date, the trade agreement that has the lowest price is always selected. For more information, download the following white paper: [Trade agreements in Microsoft Dynamics AX 2012](#).

Can I link a purchase order to a sales order to fulfill demand?

You can create a purchase order from a sales order. For more information, see [Create a purchase order from a sales order](#).

I can't cancel or delete a return order or a sales order.

You can cancel only sales orders and return orders that are in a *Created* state. For more information, see [Cancel a return order](#).

When I try to cancel a sales order, I receive a "Reservations cannot be removed because there is work created which relies on the reservations" error.

Error code: WAX4661

If work is associated with a sales order, you can't cancel the sales order until the work is canceled and reversed. This requirement applies even if the work that is associated with the sales order is closed.

To fix this issue, follow these steps.

1. Cancel the work, and put inventory back into the desired location. Go to the relevant load of the sales order, and select either **Reduce picked quantity** on the load line or **Reverse work** on the Action Pane.

The work now has a status of *Canceled*, and new inventory movement work is automatically created and processed to put inventory back into the location that was described at the time of reversal.

2. Delete the load. The shipment is also deleted.
3. You should now be able to go to the sales order and cancel it.

I can't cancel an intercompany purchase order that is linked to a sales order.

Issue description

If you try to cancel an intercompany purchase order that is linked to a sales order, you might receive the following error message: "Quantity cannot be reduced because the remaining update quantity changes sign."

Issue resolution

This issue was fixed in Microsoft Dynamics 365 Supply Chain Management version 10.0.13. In that version and later versions, you can now cancel an intercompany purchase order that is linked to a sales order.

Can I restore an invoiced sales order that was deleted?

Issue description

An invoiced sales order was deleted by mistake, and you want to restore it or view its details.

Issue resolution

If the deleted sales order has already been invoiced, go to **Customer account > Transactions > Original document > View details**. Find the invoice that you're looking for, and select it to view its details. These details include the sales order reference. You should also be able to access the sales order details from that page.

The deadline of a sales order header can't be found in the SalesOrderHeaderV2Entity data entity.

The deadline field doesn't exist on the *SalesOrderHeaderV2Entity* entity.

I must delete orphaned sales order records.

To clean up orphaned sales order records, run the *Sales order deletion* periodic job by going to either of the following places:

- Sales and marketing > Periodic tasks > Clean up > Delete sales orders
- Retail and commerce > Retail and commerce IT > Clean up > Delete sales orders

Is there a way to calculate commissions on invoices that have already been posted?

Supply Chain Management doesn't currently support the calculation of commissions for posted invoices.

A bundle item isn't supported in an intercompany process.

The bundle item isn't available for the purchase order because, if you examine the sales order lines for the bundle item, you will notice that the quantity is 0 (zero) and the status is *Canceled*. This behavior is by design. The sales order buys only the components of the bundle item. It doesn't buy the bundle item itself.

If you must buy a bundle, consider whether you have to mark it as bundle item, because this functionality is designed for revenue recognition scenarios. For more information about bundle items, see [Bundles](#).

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Sales agreements overview

2/18/2021 • 8 minutes to read • [Edit Online](#)

This topic provides information about sales agreements. A sales agreement is a contract that commits the customer to buy products in a specific quantity or for a specific amount over time, in exchange for special prices and discounts.

A sales agreement is a contract that commits the customer to buy products in a specific quantity or for a specific amount over time, in exchange for special prices, special discounts, and other special terms, such as payment and delivery terms. The prices and discounts of the sales agreement override the prices and discounts that are stated in any trade agreements that exist.

The validity period of a sales agreement is defined by the **Effective date** and **Expiration date** fields on the agreement. A customer's sales order qualifies for the agreement terms if the requested ship date of the order is within the validity period. All sales order lines that are linked to a sales agreement contribute to fulfillment of that sales agreement.

You can create a sales order directly from a sales agreement by using the **Release order** action. Alternatively, you can select an effective sales agreement when you're taking orders (see the "Applying sales agreements in the ordering process" section of this article).

[Note!] In earlier versions, sales agreements were referred to as blanket sales orders.

Commitment types

Each line in a sales agreement expresses a commitment to sell something. In general, there are two categories of commitment:

- **Value commitment** – The customer agrees to buy products for a specific amount.
- **Quantity commitment** – The customer agrees to buy a specific quantity of products.

In addition, a contract can commit the customer to buy a specific product or products in a product category. By combining these two factors (value versus quantity, and specific products versus product categories), we get four types of commitment:

- **Product quantity commitment** – The customer agrees to buy a specific quantity of products. Lines that use this commitment type are defined by an item number, and by the quantity and unit that were agreed on. The **Amount** field isn't available.
- **Product value commitment** – The customer agrees to buy specific products for a specific amount. Lines that use this commitment type are defined by an item number and the amount that was agreed on. The **Quantity** and **Unit** fields aren't available.
- **Product category value commitment** – The customer agrees to buy products from a specific sales category for a specific amount. Lines that use this commitment type are defined by a sales category in the hierarchy of sales categories and an amount. The **Quantity** and **Unit** fields aren't available.
- **Value commitment** – The customer agrees to buy any product or products in any procurement category for a specific amount. The **Quantity** and **Unit** fields aren't available.

Lines in the same sales agreement can have different types of commitments.

Pricing terms for sales agreements

Pricing terms can vary, depending on the type of commitment. On a sales order that is linked to a sales agreement, the pricing terms from that sales agreement override any other pricing terms that apply based on trade agreements. The following table describes the price-related fields that are affected by each commitment type. "Yes" indicates that the field can be updated on an order line.

COMMITMENT TYPE	UNIT PRICE	PRICE UNIT	DISCOUNT PERCENT	CASH DISCOUNT AMOUNT
Product quantity commitment	Yes	Yes	Yes	Yes
Product value commitment			Yes	
Product category value commitment			Yes	
Value commitment			Yes	

Policies for sales agreements

The following policies affect the way that the link between a sales agreement commitment and the corresponding sales order lines works:

- **Max is enforced** – The total quantity or amount for all order lines can't exceed the quantity or amount that is specified on the related commitment.
- **Price and discount is fixed** – The price on an order line and the price on the related commitment can't differ. If the price is changed on the order line, the link to the commitment is broken. If the link is broken, the order line doesn't contribute to fulfillment of the commitment.
- **Minimum release amount and Maximum release amount** – If an amount is specified, a message is displayed if you make any change to an order line that causes the order line to differ from the related commitment.

Fulfillment calculations for sales agreements

The **Fulfillment** tab on the **Line details** FastTab on the **Sales agreements** page shows fulfillment quantities and amounts.

In the **Fulfillment** area, you can view the total quantities and amounts for all order lines that are linked to the specified sales agreement. You can also view the remaining amount or quantity that is required to fulfill the commitment.

In the **Agreement** area, you can view the quantities and amounts from the specified sales agreement. These quantities and amounts are the total quantities and amounts that were committed.

Confirmations and version history for sales agreements

When you confirm a sales agreement, the current version of the sales agreement is stored in a history table. If you change the sales agreement, you can confirm it again to store another version of the sales agreement in the history.

If you don't confirm a sales agreement, you can still use it to create sales orders. However, history information for the sales agreement isn't stored.

You can preview or print all revisions of the confirmations. You can then share the revisions with your customer

to obtain approval.

Applying sales agreements during the ordering process

If you don't release sales orders directly for a sales agreement, you can still link a sales agreement to an order during the order entry process. When you're creating a new sales order and select a sales agreement, the terms of that agreement, such as the payment terms, delivery terms, and delivery address, are applied to the order header, and the link between the agreement and the order is created. Then, on the order lines, when you can select products and categories that are specified in the sales agreement, the prices and discounts are copied from that agreement. The same sales order can include both lines that aren't related to a sales agreement and lines that have a commitment for a sales agreement.

Modifying sales orders that are linked to sales agreements

If you've created (released) a sales order against a sales agreement, some fields on that sales order lines can be modified only if you remove the link to the associated sales agreement lines. The following table lists some of these fields.

FIELD	DESCRIPTION
Requested ship date	If you change the requested ship date to a date that is earlier than the Effective date value on the sales agreement line, you must remove the link to the sales agreement line before you can save the changed ship date. If you change the requested ship date to a date that is later than the Expiration date value on the sales agreement line, you must remove the link to the sales agreement line before you can save the changed ship date.
CurrencyDiscount, percentDiscountUnit, pricePrice, unitNet amount	If you change the value in any of these fields, and if the Price and discount is fixed check box is selected on an associated sales agreement line, a message box prompts you to save the change. Click Yes to remove the link to the sales agreement line and recalculate the price. Click No to remove the link to the sales agreement line without recalculating the price.
Net amount	If you specify an amount that exceeds the amount that is specified on a sales agreement line where the Max is enforced check box is selected, a message box prompts you to save the changed amount. Click Yes to remove the link to the sales agreement line and recalculate the price. Click No to remove the link to the sales agreement line without recalculating the price.
Quantity	If you specify a quantity that exceeds the quantity that is specified on a sales agreement line where the Max is enforced check box is selected, a message box prompts you to save the changed quantity. Click Yes to remove the link to the sales agreement line and recalculate the price. Click No to remove the link to the sales agreement line without recalculating the price.

Returning an item that was ordered from a sales agreement

When a customer returns a product that was ordered from a sales agreement, Supply Chain Management can find and automatically update the related sales agreement commitment to reflect the change in quantity or

amount. By creating a return order that is based on the original sales order that is linked to a sales agreement, you establish a relation between the sales agreement commitment, the sales order line, and the return order invoice.

If you don't want to deduct the returned item quantity from the sales agreement commitment, you can use the **Remove link** control on the **Return order** page to remove the link between the return order and the sales agreement commitment. If you must reestablish the link later, click **Create link**.

Note: A return order can be linked to only one sales agreement. If a customer returns multiple products that were ordered from multiple sales agreements, you must create a new return order for each product and create a link to the corresponding sales agreement.

Automatic search for sales agreements

In some situations where sales orders are created indirectly, such as when you create a credit note or intercompany sales orders, you can control whether the system automatically searches for applicable sales agreements.

Financial dimensions on sales agreements

You can copy financial dimensions to either document headers or individual lines of a sales agreement. You can change the dimensions on an agreement header or agreement line at any time. In this case, the dimensions are automatically copied to the release header or release line of release orders.

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Enter sales agreements

2/18/2021 • 2 minutes to read • [Edit Online](#)

This topic explains how to create a sales agreement that commits one of your customers to buy a product for an agreed amount over time in exchange for special discounts. You can run this procedure in demo data company USMF or on your own data.

Set up sales agreement header

1. In the navigation pane, go to **Modules > Sales and marketing > Sales agreements > Sales agreements**.
2. Select **New**.
3. In the **Customer account** field, select the desired record from the drop-down menu.
4. In the **Sales agreement classification** field, select the desired record from the drop-down menu.
5. Expand the **General** section.
6. In the **Default commitment** field, select **Product value commitment**. A commitment type is a mandatory criterion that you must assign to the agreement to define how the agreement contract will be fulfilled. The four predefined types let you set up the customer's commitment target, expressed as a quantity or a value. The quantity commitment type can only be applied to a specific product, but the value-based types are applicable to sales of both specific and non-specific products.
7. In the **Expiration date** field, set the date to a future date when you want the agreement to expire.
8. Select **OK**.

Set up product value commitment lines

1. Select **Add line**.
2. In the **Item number** field, select the desired record from the drop-down menu. The type of commitment that you have chosen for the agreement affects the kind of information you can enter for the agreement lines. For example, for a value-based agreement you must specify the total net amount (in the agreed currency) for which the customer commits to buy goods from you. In this example the **Quantity** and **Unit** fields on the line are unavailable because you're creating an agreement for the customer to buy a specific value of a product.
3. In the **Net amount** field, enter the monetary amount that the customer has committed to buying.
4. In the **Discount percent** field, enter a percentage value that will apply to the customer's sales order lines that are linked to this agreement.
5. Expand the **Line details** section.
6. Select **Yes** in the **Max is enforced** field.
 - Selecting **Max is enforced** means that the total amount of all the sales order lines that use the commitment's special prices, discounts and/or payment terms must not exceed the amount specified on the commitment.
 - The minimum and maximum release amounts specify a range of values that must be sold on each sales order that uses the selected agreement.
7. Expand the **Sales agreement header** section. Unless the status of the agreement is set to **Effective**, sales orders cannot be associated with the agreement and can therefore not contribute to the fulfillment of that agreement. You can change the status manually at this stage. However, the status would normally be changed when you confirm the agreement for the customer.
8. On the Action Pane, select **Sales agreement**.

9. Select **Confirmation**. Make sure that the **Mark agreement as effective** option is set to **Yes**.
10. Select **Yes** in the **Print report** field.
11. Select **OK**.
12. Close the page. The agreement is now effective. You can start linking the customer's orders to the agreement to offset against the committed target.

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Fulfill sales agreements

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This procedure shows you how to fulfill a sales agreement by associating sales orders with it. You can run this procedure in demo data company USMF or on your own data. Before starting this guide, make sure you have an effective sales agreement of type "Product value commitment". Alternatively, you can run the task guide called "Create sales agreements".

Release a sales order from the agreement

1. Go to Sales and marketing > Sales agreements > Sales agreements.
2. In the list, open the agreement against which you want to release the order.
3. On the Action Pane, click Sales agreement.
4. Click Release order.
 - As the text on top of the Create release order page points out, the details required for the sales order lines will differ depending on whether the agreement is quantity- or value-based.
 - The agreement in this guide is of type "Product value commitment". This is why the Lines section of this page is blank. If the commitment was based on quantity, the line information would be copied from the agreement.
5. Click Create.
 - The message informs you that a sales order has been created. Since the order does not contain any lines, you must add order line details to complete the release process.
6. Close the page.
7. Close the page.
8. Go to Sales and marketing > Sales orders > All sales orders.
9. In the list, find and open the order that was created as the result of the order release in the previous task.
10. Click Add line.
11. In the Item number field, click the drop-down button to open the lookup.
12. In the Item number field, type or select the item that is specified on the associated sales agreement.
13. In the Quantity field, enter a number.
 - Make sure that you enter a quantity that brings the Net amount under the value of the associated sales agreement.
 - Notice that because the sales order is linked to the agreement, the negotiated discount percent is applied to the order line.
14. Click Update line.
15. Click Attached.
 - The Attached agreement page shows the ID and terms of the agreement from which the line is released.
16. Close the page.
17. On the Action Pane, click General.
18. Click Attached sales agreement.
19. Expand the Line details section.
20. Click the Fulfillment tab.
 - The Fulfillment tab shows a summary of all the sales order lines that are associated with this commitment, and their fulfillment state, as well as the amount or quantity that has not yet been

released.

21. Close the page.
22. Close the page.
23. Close the page.

Apply sales agreement in the order process

1. Go to Sales and marketing > Sales orders > All sales orders.
2. Click New.
3. In the Customer account field, click the drop-down button to open the lookup.
4. In the list, find and select the customer specified on the sales agreement.
5. In the list, click the link in the selected row.
6. Expand the General section.
7. In the Sales agreement ID field, click the drop-down button to open the lookup.
8. In the list, click the link in the selected row.
9. Click Yes.
10. Click OK.
11. In the list, mark the selected row.
12. In the Item number field, click the drop-down button to open the lookup.
13. In the Item number field, type or select the item that is specified on the associated sales agreement.
14. In the list, click the link in the selected row.
15. Click Save.
16. On the Action Pane, click Pick and pack.
17. Click Post packing slip.
18. Expand the Parameters section.
19. Select Yes in the Posting field.
20. Click OK.
21. Click OK.
22. On the Action Pane, click General.
23. Click Attached sales agreement.
24. Click the Fulfillment tab.

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Generate and process customer rebates

2/18/2021 • 5 minutes to read • [Edit Online](#)

This procedure demonstrates how to process customer rebates from claim generation to the point of passing them as accruals to Accounts receivable. It walks you through a specific example to explain how the various conditions on the rebate lines affect the final amounts that will be credited to the customer. You need to use the USMF demo data company, and carry out the following tasks before you start the guide: (1) Go to the Accounts receivable parameters page, and expand the Prices tab and then the Price details tab, and check that the Enable price details option is set to Yes. (2) Go to the Rebate agreements page and select the customer rebate agreement: USMF-000001. If the Workflow approval status field is not set to Approved, you need click Validation on the Action Pane to approve it.

Review a customer rebate agreement

1. Go to **Navigation pane > Modules > Sales and marketing > Customer rebates > Rebate agreements**.
 - The next few steps look at the conditions of agreement USMF-000001. This makes it easier to understand how the customer credit values are calculated later in the procedure.
 - The agreement is for an individual customer, in this example customer US-009.
 - Rebates are given to the customer when they purchase a specific product. In this case, the product has item number T0020.
 - The customer's sales performance, against which the rebate amounts are estimated, is to be accumulated on a weekly basis.
 - The setting for "Price taken from" is Gross, which means that line's sales amount on which basis the claim is estimated is not reduced by the line discount.
 - The Rebate line break type field shows the method for calculating rebates. In this case, the sales target against which the rebates are to be estimated is set to Quantity.
 - The agreement's lines specify the rebate amount type, the actual rebate value, and the thresholds. In this example, the customer will qualify for a rebate of 20 USD per unit sold, if their weekly purchases of the product fall within 1 to 50 units; and a rebate of 40 USD per unit sold, if they purchase above 50 units.
2. Close the page.

Generate rebate claims

1. Go to **Navigation pane > Modules > Sales and marketing > Sales orders > All sales orders**.
2. Click **New**. To mimic the way in which rebate claims would be generated, the next task is to create a sales order, where the product and quantity will qualify the customer in question for a rebate.
3. In the **Customer account** field, enter or select a value.
4. Click **OK**.
5. In the **Item number** field, enter or select a value.
6. Set **Quantity** to '40'.
7. Under the **Sales order lines** section, click **Sales order line**.
8. Click **Price details**. If you don't see this option, it's because you didn't set the **Enable price details option** to 'Yes' before you started the guide.
9. Expand the **Rebates** section. The **Rebates** tab lists all the rebate agreements that are applicable to the current order line and shows the estimated rebate amount. Note that the displayed amounts are only

indications of what future rebate claims may be. The actual rebate amounts may be different depending on: the total sales volume achieved by the customer under a periodic rebate agreement; whether the customer had returned all or partial quantities; and whether the applicable sales order was invoiced.

10. Close the page.
11. Click **Add line**.
12. In the **Item number** field, enter or select a value.
13. Set **Quantity** to '60'.
14. Click **Save**.
15. On the **Action Pane**, click **Invoice**.
16. Click **Invoice**.
17. Expand the **Parameters** section.
18. In the **Quantity** field, select 'All'.
19. Click **OK**.
20. Click **OK**.

Process rebate claims

1. Go to **Navigation pane > Modules > Sales and marketing > Customer rebates > Rebates**.
 - The Rebates page acts a workbench in which you can review, approve, and process rebate claims. You'll now process the claims that were created as a result of invoicing a sales order for customer US-009, who is the subject of the rebate agreement USMF-000001.
 - The first line represents a rebate claim for 800 USD, which is based on the sales of 40 units of product T0020, calculated at 20 USD per unit. This matches the conditions of the first quantity break in the rebate agreement.
 - The second claim is for 2,400 USD, which is based on the sales of 60 units of product T0020, calculated at 40 USD per unit, as per the second quantity break in the agreement.
 - Both claims are in the "To be calculated" state. This means that they are associated with an agreement that tracks the customer's sales performance on periodic basis and that they have to be re-calculated to account for the total sales volume within the respective period.
2. Click **Cumulate**.
3. In the **Customer** field, enter or select a value.
4. In the **Start date** field, select today's date.
5. Click **OK**. As a result of running the **Cumulate** function, the estimated claim amount has now been adjusted to account for the fact that the customer's total sales volume in the relevant period is higher than when the first rebate was generated. More specifically, because the total purchased quantity has reached 100 units, the customer now qualifies for 40 USD per unit (as per the agreement's second quantity break), or 400 USD of total rebate amount. The difference is recorded as a new claim "adjustment" for the additional 800 USD. The status of the rebate claims that were included in the Cumulate update are now set to Calculated.
6. In the list, mark all rows.
7. Click **Approve**.
8. Click **Process**.
9. In the **Customer** field, enter or select a value.
10. Click **OK**. A message shows that the rebate was processed successfully, and the status of the claims has been changed to Mark. This means that as a result of a Rebate accrual journal being posted:
 - The claims have now been transferred to the temporary customer balance as deductions.
 - The Rebate accrual account has been credited to represent the future liability towards the customer.
 - The Rebate expense account has been debited, in recognition of the cost incurred in connection with the sales.

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Process rebates for payment

2/18/2021 • 2 minutes to read • [Edit Online](#)

This procedure demonstrates how to convert approved and processed customer rebates to credit notes. You can use this guide in the USMF demo company. The precondition for this guide is to have one or more rebate claims which have a status of Mark. If you're using USMF you should run the "Generate and process customer rebates" guide before you start this guide.

Convert rebate claims to credit note

1. Go to All customers.
2. In the list, find and select the desired record.
3. In the list, click the link in the selected row.
4. On the Action Pane, click Collect.
5. Click Settle transactions.
6. Click Functions.
7. Click Rebate program.
 - The Rebate page lists the rebate claims that you have processed in the customer rebate workbench and that are in status Mark.
8. Click Edit.
 - Set checkmarks in the Mark field for the claims that you want to include into credit note.
9. Click Functions.
10. Click Create credit note.
 - A message appears to inform you that a journal has been posted (This is the Accounts receivable consumption journal, as specified in the Accounts receivable parameters page). This causes the real liability (credit) amount to be moved to the customer balance. This means that the customer's account has been credited, and the Rebate accrual account has been debited.
11. Close the page.
12. Click Cancel.
 - This refreshes the page so that you can see the updates.
13. On the Action Pane, click Collect.
14. Click Settle transactions.
 - Note that a transaction for negative amount, representing the total rebate amount, without invoice reference has been added to the customer balance.
15. Click Cancel.

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Look up applicable prices and discounts

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This procedure shows how to find the price and/or discount for a product which is currently valid for a specific customer, without creating a sales order. The procedure walks through a specific example, and you need follow the example using the USMF demo company in order to select the necessary values.

Find the applicable price

1. Go to Sales and marketing > Prices and discounts > Find prices.
2. In the Customer account field, click the drop-down button to open the lookup.
3. In the list, find and select customer US-001.
4. In the list, click the link in the selected row.
5. In the Item number field, type 'T0004'.
 - By default, the Quantity field is set to 1. However, if you know the size of the order that the customer intends to place for the product in question, then enter this value instead. This information is relevant if the trade agreements with the customer have quantity breaks, that is, the product's price depends on the minimum quantity purchased.
6. In the Date field, enter a date for when the customer expects to place an order.
 - The date can be today's date or any date in the future.
 - The system now returns the price that is valid for the selected product when bought by the selected customer on the selected date with a specified quantity. In this example, if the customer US-001 bought 1 unit of product T0004 today, they would be charged 350 CAD a unit. This price comes from an existing and active trade agreement with the customer. Other fields on the page provide more details about the product price and product cost (if set up on the product master), and calculated profitability.
 - If the Show related product variants option is selected, it means that there are additional trade agreements for product's variants.
7. Click the Show related product variants checkbox.
 - A list of the product variants is shown, with information about their dimensions.
8. In the list, mark the line representing color White.
 - Notice, that the product price is now different from the one displayed previously when it was not specified per dimension.
9. Click View sales prices.
 - The Price (sales) page displays all the trade agreements applicable to the product, including its variants.
10. Close the page.

Find the applicable discount

Make sure the Customer account field contains customer number US-001

1. In the Item number field, type 'T0012'.
 - Make sure the Quantity field is set to 1.
 - The following pricing details shown for product T0012 come from one or more trade agreements: The unit price is 1,000 CAD and the discount percentage is 5.
2. Set Quantity to '20'.

- The increased order quantity causes the line discount that will be offered to the customer to change from 5 to 7 percent.
- The Net amount is calculated based on the unit price, discount and the total quantity.

3. Click View line discount.

- There are two line discount agreements for product T0012, specifying a 5 percent discount for an order line quantity from 1 to 10, and 7 percent discount for order quantities above 10. Note that the discounts are applied to a group of products, in this example, Group code 01, of which product T0012 is a member.

4. Close the page.

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Price simulation

2/18/2021 • 7 minutes to read • [Edit Online](#)

This article provides information about price simulation for quotations. Price simulation helps you to evaluate the effect of deductions on the future sales price during the quotation process, before you commit to a specific price.

A price simulation for a quotation shows a new total amount, based on a proposed new price. A price simulation can also show a new amount for a specific line that is created in an existing quotation. You can enter a price simulation and apply it later. Alternatively, you can use the original quotation without a price simulation and make more changes as you work through the sales process with your customer.

A price simulation doesn't change the price in the quotation. If the price simulation is applied to a whole quotation, it's treated as a special discount on the quotation header. If the price simulation is applied to specific items, it's treated as a special discount on the quotation lines. The unit sales price on a quotation line that is created doesn't change when a price simulation is applied. Instead, a discount percentage that corresponds to the price reduction of the quotation line is applied. When a price simulation is applied, the unit sales price and the discount percentage are transferred to the quotation line or the quotation header.

[Note!] When you run a price simulation, only the current sales currency is used to create the simulation. However, when you view the quotation totals, you see a combination of the company currency and the sales currency.

Supplementary items that are added to quotation lines might trigger line discounts or multiline discounts. They might also trigger total discounts that change the contribution margins and contribution ratios of the quotation lines and the whole discount.

You can run multiple price simulations to track the effects of price adjustments on the targets of a quotation. By running these simulations, you can adjust the overall price of the quotation, or the price of one or more specific lines in the quotation, and then apply the price simulation that is most likely to help you close the sale.

When you create a quotation, you can set up an alert. Here are some of the ways that alerts are used:

- They can keep you informed about the status of quotations in the organization.
- They can trigger a review of a specific quotation or inform you when discount limits are exceeded.

Price simulation and discounts

To guarantee that discounts and prices are calculated correctly, be careful when you run price simulations on quotations that have discounts. Because all price simulations are treated as special discounts on the active quotation line or the whole quotation, you must track the differences in the discounts.

Types of discounts in trade agreements

Trade agreements in Supply Chain Management can have four types of price discounts. These discounts can be set up for different items, customers, or price groups, and they can be limited by date. To avoid miscalculations, you must consider trade agreements when you run price simulations. Here are the four types of discounts in trade agreements:

- **Sales price** – Separate sales prices can be specified for items. When quotation lines are created, the program searches for the correct sales price for an item and transfers it to the quotation lines. Therefore, a trade agreement that has this kind of discount doesn't affect the price simulation. The sales price that is used

in the quotation line reflects the trade agreement.

- **Line discount** – Special discounts are specified for items, depending on the quantity that is ordered. Line amounts are typically reduced by the line discount before a price simulation is run. Therefore, a trade agreement that has this kind of discount affects the price simulation.
- **Multiline discount** – If the combined quantities exceed the limit that you've defined, predefined combinations of ordered items trigger a discount on the whole order. Line amounts are typically reduced by the line discount before a price simulation is run. Therefore, a trade agreement that has this kind of discount affects the price simulation.
- **Total discount** – If the combined amounts exceed the limit that you've defined, predefined ordered items trigger a discount on the whole order. The total discount is generated by the quotation lines. However, because the total discount is applied to the quotation total as a discount, it reduces the total amount of the quotation. Therefore, a trade agreement that has this kind of discount affects the price simulation.

Quotation lines and trade agreements

When you create or adjust a quotation line, line discounts are automatically calculated. The relevant sales price is found for the item, based on the trade agreement.

Price simulation examples

The following examples use price simulation for quotation headers and single line items.

Price simulation for quotation headers

You create a quotation that has the following lines:

- 10 units of item BR-12 (cost price per unit: USD 9.52, sales price per unit: USD 15.32)
- 12 units of item BR-14 (cost price per unit: USD 7.48, sales price per unit: USD 13.75)

The following table shows the quotation lines.

	CALCULATION	RESULT
Sales quantity	10 units + 12 units	22 units
Sales value in USD	$(10 \times 15.32) + (12 \times 13.75)$	318.20
Cost value in USD	$(10 \times 9.52) + (12 \times 7.48)$	184.96
Contribution margin in USD	$318.20 - 184.96$	133.24
Contribution ratio	$[(318.20 - 184.96) \div 318.20] \times 100$	41.87%

You run a price simulation and apply a 15-percent total discount for the whole quotation, or the quotation header. The following table shows the new totals of the quotation after the price simulation is run.

	CALCULATION	RESULT
Sales quantity	10 units + 12 units	22 units
Old sales value in USD	$(10 \times 15.32) + (12 \times 13.75)$	318.20
Old cost value in USD	$(10 \times 9.52) + (12 \times 7.48)$	184.96
Old contribution margin in USD	$318.20 - 184.96$	133.24

	CALCULATION	RESULT
Old contribution ratio	$[(318.20 - (10 \times 9.52)) \div 318.20] \times 100$	41.87%
Price simulation of 15-percent total discount in USD	$(15 \times 318.2) \div 100$	47.73
New sales value in USD	$318.20 - 47.73$	270.47
New contribution margin in USD	$270.47 - 184.96$	85.51
New contribution ratio	$[(270.47 - 184.96) \div 270.47] \times 100$	31.61%

Price simulation for single line items

You create a quotation that has the following lines:

- 10 units of item BR-12 (cost price per unit: USD 9.52, sales price per unit: USD 15.32)
- 12 units of item BR-14 (cost price per unit: USD 7.48, sales price per unit: USD 13.75)

The following table shows the quotation lines.

	CALCULATION	RESULT
Sales quantity	10 units + 12 units	22 units
Sales value in USD for BR-12	10×15.32	153.20
Sales value in USD for BR-14	12×13.75	165.00
Cost value in USD for BR-12	10×9.52	95.20
Cost value in USD for BR-14	12×7.48	89.76
Contribution margin in USD for BR-12	$153.20 - 95.20$	58.00
Contribution margin in USD for BR-14	$165.00 - 89.76$	75.24
Contribution ratio in USD for BR-12	$[(153.20 - 95.20) \div 153.20] \times 100$	37.86
Contribution ratio in USD for BR-14	$[(165.00 - 89.76) \div 165.00] \times 100$	45.60
Total sales value in USD	$(10 \times 15.32) + (12 \times 13.75)$	318.20
Total cost value in USD	$(10 \times 9.52) + (12 \times 7.48)$	184.96
Total contribution margin in USD	$318.20 - 184.96$	133.24
Total contribution ratio	$[(318.20 - 184.96) \div 318.20] \times 100$	41.87%

You run a price simulation and apply a 10-percent total discount to the BR-12 units. The following table shows the new totals of the quotation after the price simulation is run for the single line item.

	CALCULATION	RESULT
Sales quantity	10 units + 12 units	22 units
Old sales value in USD for BR-12	10×15.32	153.20
Price simulation of 10-percent discount for BR-12	$(10 \times 15.32) \div 100$	15.32
New sales value in USD for BR-12	$(10 \times 15.32) - 15.32$	137.88
Sales value in USD for BR-14	12×13.75	165.00
Cost value in USD for BR-12	10×9.52	95.20
Cost value in USD for BR-14	12×7.48	89.76
New contribution margin in USD for BR-12	$137.88 - 95.20$	42.68
Contribution margin in USD for BR-14	$165.00 - 89.76$	75.24
New contribution ratio in USD for BR-12	$[(137.88 - 95.20) \div 137.88] \times 100$	30.95
Contribution ratio in USD for BR-14	$[(165.00 - 89.76) \div 165.00] \times 100$	45.60
New total sales value in USD	$[(10 \times 15.32) - 15.32] + (12 \times 13.75)$	302.88
Total cost value in USD	$(10 \times 9.52) + (12 \times 7.48)$	184.96
New total contribution margin in USD	$302.88 - 184.96$	117.92
New total contribution ratio	$[(302.88 - 184.96) \div 302.88] \times 100$	38.93%

The price simulation affects only the line that it's applied to and reduces the total for that line.

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Mass create sales quotations

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This procedure demonstrates how to efficiently create quotations offering a set of products or services that are to be sent to multiple customers. This mass quotation creation is based on quotation templates. You can run this procedure on your own data or in demo data company USMF.

Create a quotation template

1. Go to Sales and marketing > Setup > Quotations > Template groups.
2. Click New.
3. In the Group ID field, type an ID of your choice.
4. In the Description field, type a value.
5. Click Save.
6. Close the page.
7. Go to Sales and marketing > Sales quotations > All quotations.
8. Click New.
9. In the Account type field, select 'Customer'.
10. In the Customer account field, enter or select a value.
11. Click OK.
 - For a quotation to become a template you must carry out setup steps on the quotation header. This must be done before you add lines to the quotation.
12. On the Action Pane, click Options.
13. Click Change view.
14. Click Header view.
15. Expand the Setup section.
16. In the Group ID field, enter or select a value.
17. In the Template name field, type a value.
18. Select Yes in the Active field.
 - Only active templates can be used when you apply a template to a new sales quotation.
19. On the Action Pane, click Options.
20. Click Change view.
21. Click Line view.
22. In the Item field, enter or select a value.
23. In the Item field, type a value.
24. Close the page.
25. In the Discount percent field, enter a number.
26. Click Add line.
27. In the Item field, enter or select a value.
28. In the Item field, type a value.
29. Close the page.
30. In the Unit price field, enter a new price or change the current one.
31. Click Add line.
32. In the Item field, enter or select a value.
33. In the Item field, type a value.

34. Close the page.
35. In the Quantity field, enter a number.
36. In the Discount field, enter a number.
37. Click Save.

Apply the template to create a single quotation

1. Go to Sales and marketing > Sales quotations > All quotations.
 - Note that the quotation you have just created is marked as template.
2. Click New.
3. In the Account type field, select 'Customer'.
4. In the Customer account field, enter or select a value.
5. Expand the Template section.
6. In the Group ID field, enter or select a value.
7. In the Template name field, enter or select a value.
8. In the Calculation method field, select 'Based on template values'.
9. Click OK.
 - The new quotation has now been created, based on the data and terms of the template.
10. Close the page.
11. Close the page.

Apply the template to mass create quotations

1. Go to Sales and marketing > Sales quotations > Quotation update > Mass create quotations.
2. In the Account type field, select 'Customer'.
3. In the Group ID field, enter or select a value.
4. In the Template name field, enter or select a value.
5. In the Calculation method field, select 'Based on template values'.
6. Expand the Records to include section.
7. Click Filter.
8. In the Criteria field, set the filter to cover a range of customers you want to include in this mass quotation creation. Use the following format "Customer1..CustomerN".
 - For example, you could set the filter to: US-001..US-004
9. Click OK.
10. Click OK.
11. Go to Sales and marketing > Sales quotations > All quotations.
 - Verify that quotations have been created for all the customers specified in the mass update routine, as based on the selected template.

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Create and edit sales quotations

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This procedure demonstrates how to create and update a sales quotation. You can run this procedure on your own data or in demo data company USMF.

Create a sales quotation

1. Go to **Navigation pane > Modules > Sales and marketing > Sales quotations > All quotations**.
2. Click **New**.
3. In the **Account type** field, select 'Prospect'.
4. In the **Prospect** field, enter or select a value.
5. Expand the **General** section. Because you chose to create a quotation from the Sales and Marketing area, the type is automatically set to 'Sales quotation'. To create a quotation for a project you must access it from the **Project management and accounting** module.
6. Click **OK**. The fields and actions on the quotation lines are very similar to the ones on the sales order lines. Like sales orders, quotations can be created for a specific item or, when item number is not known or does not exist at the time of quotation creation, quotations can be created for a sales category.
7. In the **Item** field, enter or select a value.
8. In the **Site** field, type a value.
9. In the **Quantity** field, enter a number. If there are valid trade agreements for the item selected on the line, the applicable price and discounts will be automatically copied to the quotation line. Make sure that the Unit price field contains a value and you can also enter discount values if you want to.
10. Click **Save**.
11. On the **Action Pane**, click **Sales quotation**.
12. Click **Totals**.
13. Click **OK**.
14. Select the sales quotation line.
15. On the **Action Pane**, click **Quotation**.
16. Click **Price simulation**.
 - In the **Run price simulation** page you can experiment with adjusting the expected revenue or profitability of your quotation based on the desired unit price, discount amount, discount percentage, total amount, margin, or contribution ratio. When you are satisfied with the target figures, you apply the suggestion to the quotation line, and its price-related fields will be updated accordingly.
 - You can create as many price simulations as you wish. When you click **New**, the price conditions from the current quotation line are copied to the page. You can then modify values in any of the price-related fields to the target ones. A change in one of the fields will trigger recalculation in all the other fields. In order for the system to calculate the sales margin and contribution ratio, the product's unit cost has to be known. Use the Simulated prices tab for a detailed view of the original prices, proposed changes and their effect on the quotation totals. As a general rule, when a simulation that sets a new amount is applied to the quotation line, the system recalculates and enters a new value in the Unit price field. If the simulation is based on a new margin or a new contribution ratio, only the Net amount field is updated, and the Unit price is blank. In both cases, any discounts that were on the quotation line before simulation will be deleted.
17. On the **Action Pane**, click **Quotation**.
18. Click **Send quotation**.

19. Select 'Yes' in the **Print quotation** field.
20. Click **OK**. The report may take a minute to generate. Don't close the page until it does so.

Update a sales quotation

1. Go to **Navigation pane > Modules > Sales and marketing > Sales quotations > All quotations**.
2. On the **Action Pane**, click **Follow up**.
3. Click **Convert to customer**.
4. In the **Customer account** field, type a value.
5. Click **Check**. Make sure you see a message that the account number you typed in is free to use.
6. Click **OK**. The system has now created a new customer account for the prospect on the quotation.
7. Close the page.
8. On the **Action Pane**, click **Follow up**.
9. Click **Confirm**.
10. In the **Reason** field, enter or select a value.
11. Click **OK**.
12. On the **Action Pane**, click **General**.
13. Click **Sales orders**.
14. Close the page.

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Troubleshoot sales quotations

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This topic describes how to fix issues that you might encounter while you work with sales quotations.

I can't change the sales quantity of a sales quotation for a service item.

Issue description

If you try to set a sales quantity (**SalesQty** field) for an item of the *Service* type on a sales quotation line, you will receive the following message: "Update not allowed for field Quantity."

Issue resolution

You can't set a sales quantity for products that are service items. For example, if you offer a service to install an item, it doesn't make sense to record a quantity, because there is no physical item. There is only a service.

NOTE

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Sales returns

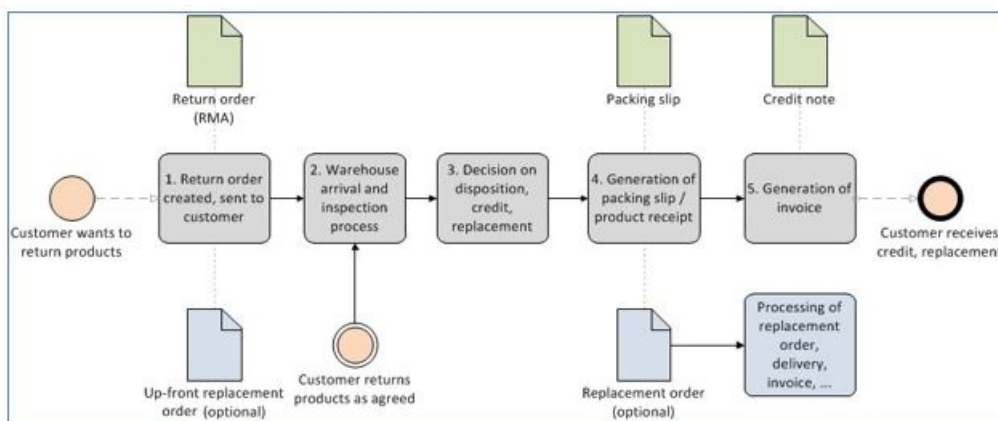
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This topic provides information about the process for return orders. It includes information about customer returns and their effect on costing and on-hand inventory quantities.

Customers can return items for various reasons. For example, an item might be defective, or it might not meet the customer's expectations. The return process starts when a customer issues a request to return an item. After the customer's request is received, a return order is created.

Return order process

The following illustration gives an overview of the return order process.



There are two types of return order process: physical return and credit only.

- **Physical return** – The return order authorizes the physical return of products.
- **Credit only** – The return order authorizes a customer credit but doesn't require that the customer physically return the products.

Physical return order process

1. **Create a return order.** Formally document the authorization for the customer to return any defective or unwanted products. The return order doesn't require that the company accept the returned products or provide a credit for the customer. If the return is accepted, you can authorize a replacement item to be sent before the defective item has been returned.
2. **Arrive at warehouse for inspection.** Complete an initial inspection and validation against the return order document. The return order also supports quarantine of the returned items for additional inspection and quality control.
3. **Determine disposition.** Finalize the inspection process, and decide what should be done with the returned products. As part of this step, decide whether you will credit the customer, reject the product return, or accept the product return, scrap the product, and then send a replacement product to the customer.
4. **Generate a packing slip.** Generate a packing slip, and commit the disposition decision that you made in step 3. Finalize the logistics processes.
5. **Generate an invoice.** Close the return order.

Credit only process

1. **Create a return order.** Formally document the authorization for the customer to receive a credit without returning the defective or unwanted products. The **Credit only** disposition code authorizes the decision to

credit the customer without physical return.

2. **Generate an invoice.** Generate the credit note, and then close the return order.

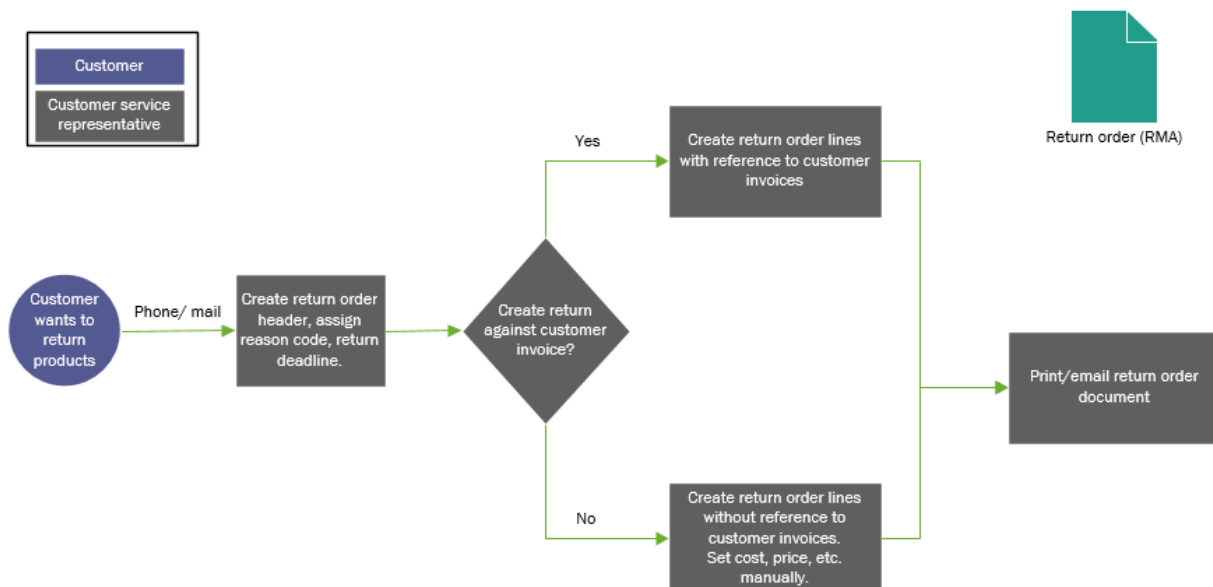
Return material authorization

Return Material Authorization (RMA) processing builds on sales order functionality. An RMA is registered as a return order, which is created as a sales order, and may have another sales order associated with it, called a replacement order. Both sales orders link to the originating RMA number.

- **Return order** – To register an RMA, you create a return order, which is a sales order that has the assigned type, **Returned order**. Any changes that you make to the RMA information is automatically updated in the sales order. Until the return order has the status **Open**, it will not appear in the list of sales orders. You use RMA to handle the arrival and receipt of the returned items, as well as to authorize a credit only disposition action (see section **Disposition codes and disposition actions**). All other follow-up processes must be handled in the sales order.
- **Replacement order** – When a replacement order must be shipped to the customer, the RMA can include a second associated sales order. You can manually create the replacement order for the RMA to support immediate shipment. Alternatively, the replacement order can be created automatically after the arrival, inspection, and receipt are completed for the RMA line item that has a disposition code that indicates replacement. The replacement order has the same functionality that is associated with a sales order. For example, you can use it to configure a custom product as the replacement item, create a production order to repair a returned item, create a direct delivery purchase order to send the replacement from a vendor, or support other purposes.

Create a return order

The return order process starts when a customer contacts your organization to return a defective or unwanted product and/or to be credited. After your organization accepts the return, the return is documented by a return order. This return order becomes the focal point of the internal processing of the returned product. The following illustration shows the procedure for creating a return order.



Create a return order header

When you create a return order, the information in the following table must be included.

FIELD	DESCRIPTION	COMMENTS
Customer account	A reference to the Customers table	You must provide an existing customer account.
Delivery address	The address that the item is returned to	By default, the organization's address is used. If a specific warehouse is selected on the header, the delivery address is changed to the delivery address of the warehouse. You can change this address on the Return order details page.
Site/warehouse	The site or warehouse that receives the returned product	The delivery address for the return order is determined based on the delivery address of the site or warehouse.
RMA number	The ID that is assigned to the return order	The RMA number is used as an alternate key throughout the return order process. The RMA number that is assigned is based on the RMA number sequence that is set up on the Accounts receivable parameters page.
Deadline	The last date that an item can be returned	The default value is calculated as the current date plus the period of validity. For example, if a return is valid for only 90 days from date when the return order is created, and the return order was created on May 1, the value in the field is 30-July . The period of validity is set on the Accounts receivable parameters page.
Return reason code	The customer's reason for returning the product	The reason code is selected in the list of user-defined reason codes. You can update this field at any time.

Create return order lines

After you complete the return header, you can create return lines by using one of the following methods:

- Manually enter the item details, quantity, and other information for every return line.
- Create a return line by using the **Find sales order** function. We recommend that you use this function when you create a return order. The **Find sales order** function establishes a reference from the return line to the invoiced sales order line, and retrieves line details such as item number, quantity, price, discount, and cost values from the sales line. The reference helps guarantee that, when the product is returned to the company, it's valued at the same unit cost that it was sold at. The reference also validates that return orders aren't created for a quantity that exceeds the quantity that was sold on the invoice.

[Note!] Return lines that have a reference to a sales order are handled as corrections to, or reversals of, the sale. For more information, see the "Post to the ledger" section, later in this topic.

Charges

Fees and charges can be added to the return order through one or more of the following methods:

- You can manually add charges to the return order header, the return order line, or both.
- Charges can be automatically added to the return order header as a function of the return reason code.
- Charges can be automatically added to the return order line, based on the disposition code of the line.

Charges are automatically added after a return reason code or disposition code is assigned to the line. If the reason code is changed later, the existing charge entry won't be removed, but a new charge entry might be added, based on the new reason code. When you add charges to return order lines, charges that are calculated as a percentage of the line or order value become negative when the line or line order is negative, unless the percentage is also a negative number. A charge that has a negative value represents a credit to the customer.

Return reason codes

By applying reason codes to returns, you can help make return patterns easier to analyze. Reason codes provide information about why a customer wants to return items. Some organizations have many reason codes. These organization might group the reason codes into reason code groups to gain a better overview and for accumulated reporting.

Disposition codes and disposition actions

An important step in the return order process is the assignment of a disposition code to the return order line as part of arrival registration. The disposition code determines the following information:

- **The financial implications** – Should the customer be credited for the returned items, and should any charges be added to the return order line?
- **The disposition of the returned item** – Should the item can be added back to inventory, should it be scrapped, or should it be returned to the customer?
- **The logistics of the returned item** – Should a replacement item be issued to the customer?

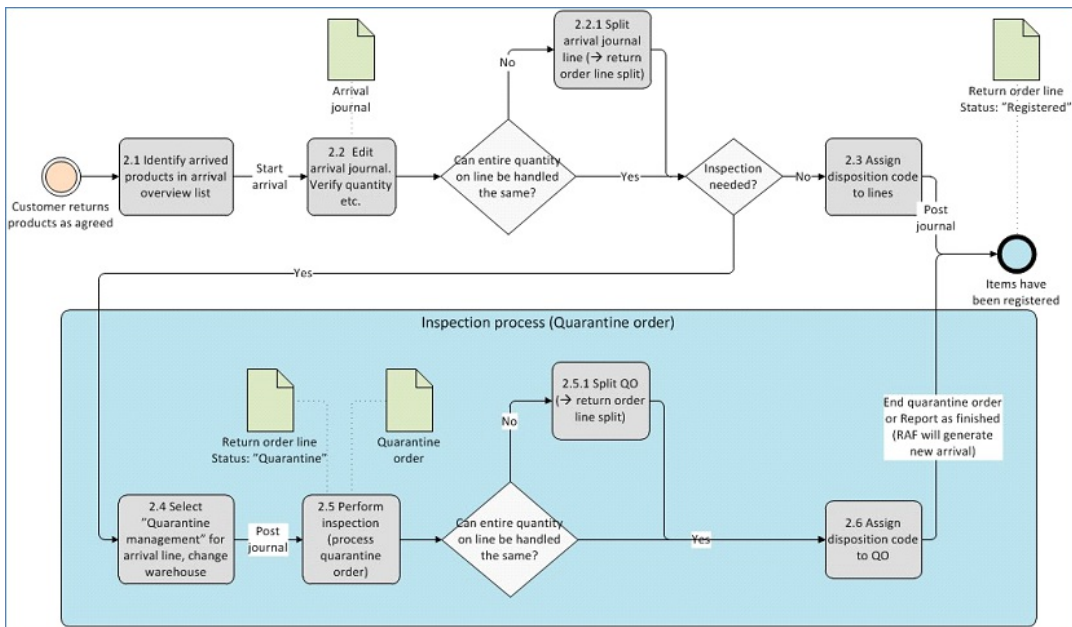
In addition to determining how the returned goods are disposed of, disposition codes can cause charges to be applied to the return line. They can also be used to group returns for statistical analysis. Disposition codes are defined as part of the setup of return orders. However, each disposition code must reference one of the built-in disposition actions. The following table lists the built-in disposition codes and their actions. **Important:** If an item should not be returned, but the customer should still be credited, assign the **Credit only** disposition code to the return line.

DISPOSITION CODE	FINANCIAL IMPLICATIONS	IMPLICATIONS FOR LOGISTICS
Credit only	<ul style="list-style-type: none"> • The customer is credited the sales price minus any fees or charges. • Loss from scrapping the item is posted to the ledger. 	<p>The item should not be returned. This disposition action is used for the following cases:</p> <ul style="list-style-type: none"> • There is sufficient trust among the parties. • The cost of returning the defective item is prohibitive. • The items can't be allowed back into inventory. Because of other conditions, a physical return isn't required.
Credit	<ul style="list-style-type: none"> • The customer is credited the sales price minus any fees or charges. • The inventory value is increased by the cost of the returned item. 	<p>The item is returned and is added back into inventory.</p>

DISPOSITION CODE	FINANCIAL IMPLICATIONS	IMPLICATIONS FOR LOGISTICS
Replace and credit	<ul style="list-style-type: none"> • The customer is credited the sales price minus any fees or charges. • Inventory value is increased by the cost of the returned item. • A separate sales order for a replacement is created and is handled separately. 	The item is returned and is added back into inventory.
Replace and scrap	<ul style="list-style-type: none"> • Customer is credited the sales price, less any fees or charges. • Loss from scrapping the item is posted to the ledger. • A separate sales order for a replacement is created and is handled separately. 	The item is returned and scrapped.
Return to customer	None, except any fees or charges.	The item is returned but is sent back to the customer after inspection. This disposition action might be used if the item has been deliberately damaged, or if the warranty has been voided.
Scrap	<ul style="list-style-type: none"> • The customer is credited the sales price minus any fees or charges. • Loss from scrapping the item is posted to the ledger. 	The item is returned or scrapped.

Arrival at the warehouse for inspection

Before you can physically receive returned items into inventory by posting a packing slip, the items must go through arrival registration and an optional inspection. The following illustration gives an overview of the arrival process. The sections that follow describe each step that is shown in the illustration.



The process has several other variations that aren't covered in this topic. Here are some of these variations:

- Don't use the **Arrival overview** list to create an Arrival journal. Instead, manually create the Arrival journal. Return orders will have **Sales order** as the reference.
- If you're using Warehouse management, generate pallet transports. The return line will have a status of **Arrived** during pallet transport.
- Register the arrival of the returned item directly from the return order line, by using the **Registration** function.

During the arrival process, returns are integrated with the general process for warehouse arrivals. The arrival process also supports the creation of quarantine orders for returned items that must undergo a separate inspection.

Identify products in the Arrival overview list

The **Arrival overview** page lists all the planned incoming arrivals.

[Note!] Arrivals from return orders must be processed separately from other types of arrival transactions. After you've identified an incoming package on the **Arrival overview** page (for example, by using the accompanying RMA document), on the Action Pane, click **Start arrival** to create and initialize an Arrival journal that matches the arrival.

Edit the Arrival journal

By setting the **Quarantine management** option to **Yes**, you can create a quarantine order for the return line. If a line has been sent to quarantine for inspection, you can't specify a disposition code.

If you set the **Quarantine management** option to **Yes** in the item's inventory model group, the **Quarantine management** option on the **Journal lines** page will be marked for the Arrival journal line and can't be changed. If the line is sent to quarantine, you must specify the appropriate quarantine warehouse.

If the arrival line isn't sent for inspection, the warehouse arrival clerk must specify the disposition code directly on the Arrival journal line and then post the Arrival journal. If the same disposition code should not be assigned to the whole quantity of the return line, or if the full quantity of the line hasn't been received, you must split the line. When you split an Arrival journal line, you also split the return line (**SalesLine**) and create a new lot ID. You can split the line by reducing the quantity of the Arrival journal line. When the journal is posted, a new return line is created that has a status of **Expected** for the remaining quantity. You can also split the line by clicking

Process the quarantine order

If the returned products are sent for inspection at the quarantine warehouse, any additional processing is completed in a quarantine order. One quarantine order is created for each arrival line that is sent to quarantine. The disposition code indicates the result of the inspection process.

You can split a quarantine order, just as you can split the Arrival journal. If you split the quarantine order, you cause a corresponding split of the return line. After the disposition code is entered, complete the quarantine order by using either the **End** function or the **Report as finished** function. If you select **Report as finished**, a new arrival is created in the designated warehouse. You can then process this arrival by using the **Arrival overview** page.

If the arrival originates from a quarantine order, you can't change the disposition code that is assigned during inspection. If you complete the quarantine order by using the **End** function, the lot is automatically registered. Sometimes, an item might be sent back from quarantine to the Shipping and receiving department. For example, the quarantine inspector might not know where to store the item in inventory. In this case, the corresponding packing slip must be updated to correctly register and act on the disposition code that is specified because of the quarantine.

Acknowledgment of receipt can be sent to the customer when the return line is registered. The **Return acknowledgement** report resembles the return order document. The **Return acknowledgement** report isn't journalized or otherwise registered in the system, and it isn't a required step in the return order process.

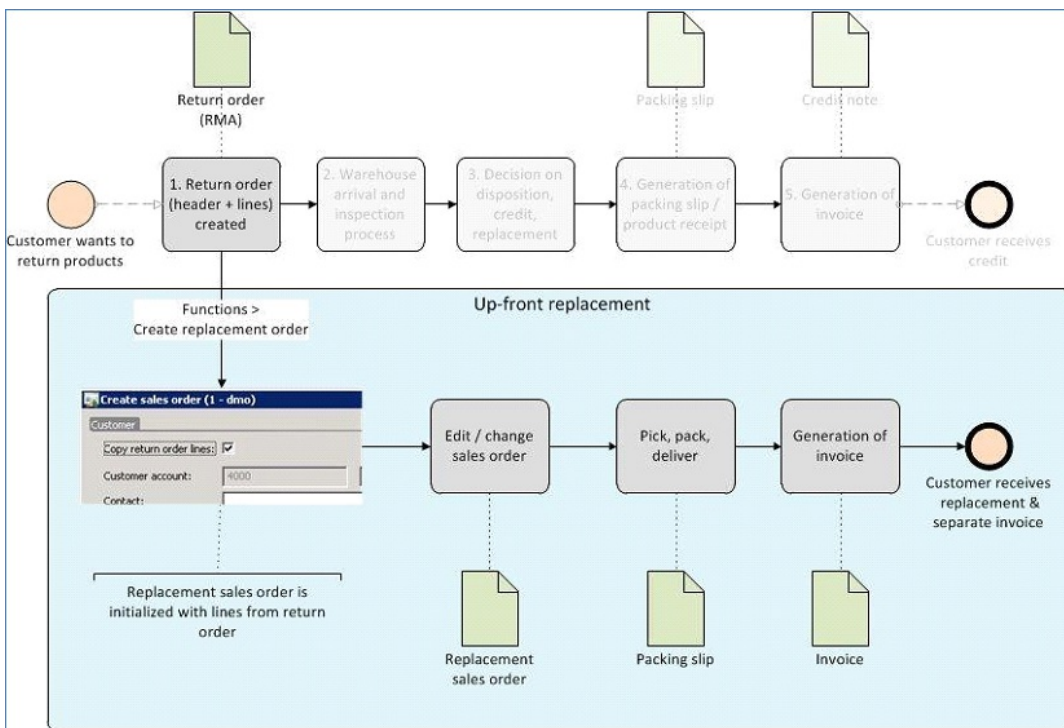
Replace a product

There are two methods for managing product replacement:

- **Up-front replacement** – Replace a product before the returned product is received from the customer.
- **Replacement by disposition code** – Automatically create a new replacement order line.

Up-front replacement

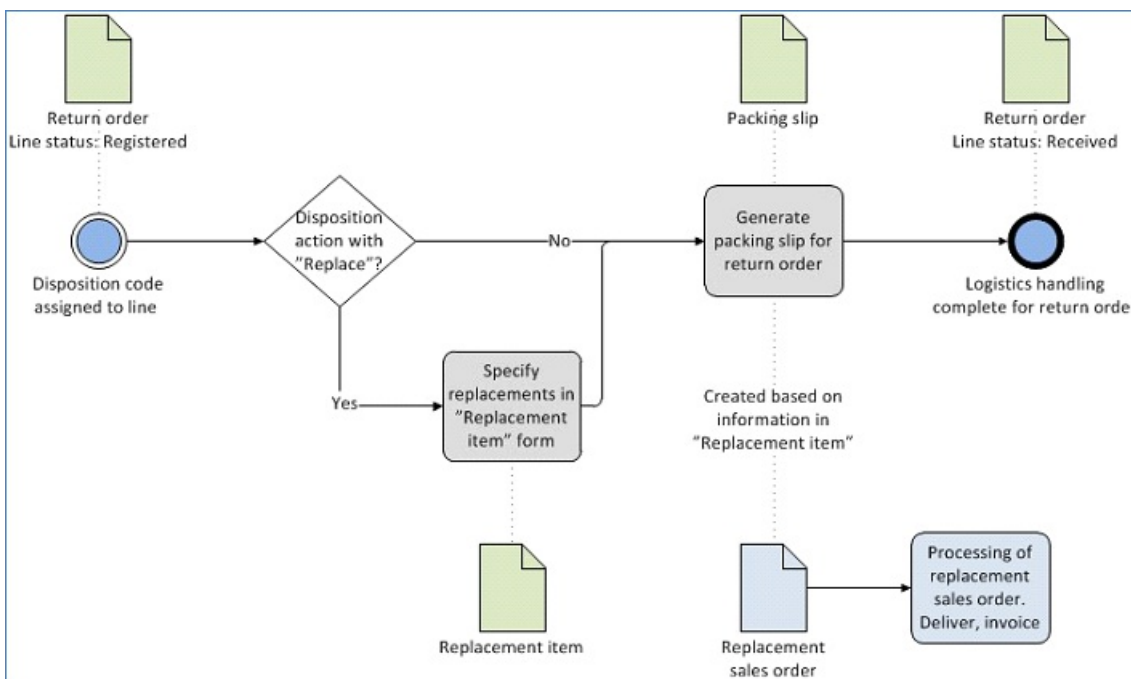
In up-front replacement, the replacement item can be delivered to the customer before the item is returned. This method is useful if, for example, the item is a machine part that can't be removed unless a spare part is available to take its place, or if you just want your customer to have the replacement product as soon as possible. The up-front replacement order is an independent sales order. The header information is initialized from the customer, and the line information is initialized from the return order. You can edit, process, and delete the replacement order independently of the return order. When you delete a replacement order, you receive a message that the order was created as a replacement order. The following illustration shows the process for up-front replacement.



The return order includes a reference to the replacement order. If an up-front replacement order is created for a return order before the defective item is returned, you can't select disposition codes for replacement after the defective item has been returned.

Replacement by disposition code

If you ship a replacement item to the customer, and you use the **Replace and scrap** or **Replace and credit** disposition action on the return order, use the process that is shown in the following illustration.



The replacement item will be delivered by using an independent sales order, the replacement sales order. This sales order is created when the packing slip for the return order is generated. The order header uses information from the customer that is referenced on the return order header. The line information is collected from the information that is entered on the **Replacement item** page. The **Replacement item** page must be filled in for lines that have disposition actions that start with the word "replace." However, neither the quantity nor the identity of the replacement item is validated or limited. This behavior allows for cases where the customer wants the same item but in a different configuration or size, and also cases where the customers wants a completely

different item. By default, an identical item is entered on the **Replacement item** page. However, you can select a different item, provided that the function has been set up.

[Note!] You can edit and delete the replacement sales order after it's created.

Generate a packing slip

Before returned items can be received into inventory, you must update the packing slip for the order that the items belong to. Just as the invoice update process is the update of the financial transaction, the packing slip update process is the physical update of the inventory record. In other words, this process commits the changes to inventory. In the case of returns, the steps that are assigned to the disposition action are implemented during the packing slip update. When you generate the packing slip, the following events occur:

- In the warehouse, the standard process is used to perform a physical receipt. Ledger postings are generated if the inventory model group (**Post physical inventory**) and the Accounts receivable parameters (**Post packing slip in ledger**) are set appropriately.
- Items that have been marked with a disposition action that contains the word "scrap" are scrapped, and the inventory loss is posted to the ledger.
- Items that have been marked with the **Return to customer** disposition action are received and delivered to the customer. These items have no net effect on inventory.
- A replacement sales order is created. This sales order is based on information on the **Replacement item** page.

You can generate the packing slip only for lines that have a return status of **Registered**, and only for the full quantity on the return line. If several lines on the return order have the **Registered** status, you can generate the packing slip for a subset of the lines by deleting the other lines from the **Post packing slip** page.

Partial returns are defined in terms of return order lines, not in terms of return order shipments. Therefore, if you receive the full quantity that is indicated on one return order line, but you receive nothing from the other lines on the return order, the delivery isn't a partial delivery. However, if a return order line requires that 10 units of an item be returned, but you receive only four units, the delivery is a partial delivery. If not all the expected return items have arrived, you can set the shipment aside and wait for the rest of the returned quantity to arrive. Alternatively, you can register and post the partial quantity. As part of the process for posting packing slips, you can associate the packing slip reference number from the customer's shipping documents with the order lines. This association is optional and is for reference only. It doesn't create any transactional updates.

In general, you can skip the packing slip process and go directly to invoicing. In this case, the steps that you would have performed during packing slip generation are completed during invoicing.

Generate an invoice

Although the **Return order** page contains the information and actions that are required in order to handle the special logistical aspects of the return order, you must use the **Sales order** page to complete the invoicing process. Your organization can then invoice return orders and sales orders at the same time, and the same person can complete the invoicing process, as required. To view the return order from the **Sales order** page, click the link for the sales order number to open the associated sales order. You can also find the return order on the **All Sales orders** page. Return orders are sales orders that have an order type of **Returned order**.

Credit correction

As part of the invoicing process, verify that any miscellaneous charges are correct. To cause the ledger postings to become corrections (Storno), consider using the **Credit correction** option on the **Other** tab of the **Posting invoice** page when you post the invoice/credit note.

[Note!] By default, the **Credit correction** option is activated if the **Credit note as correction** option on

the **Accounts receivable parameters** page has been enabled. However, we recommend that you not post returns with Storno.

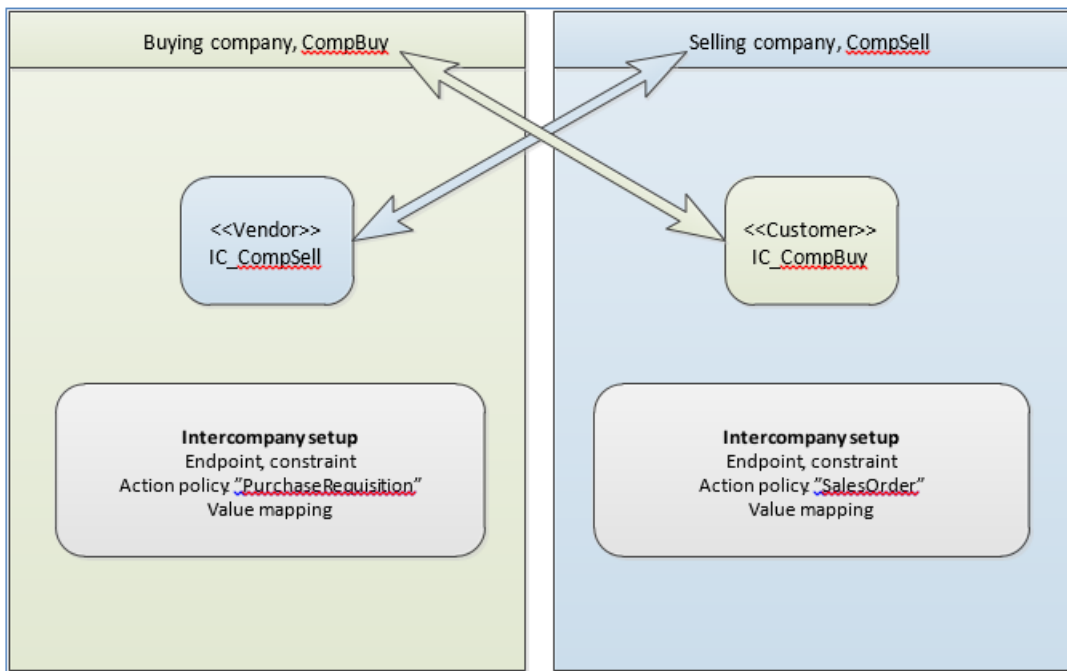
Create intercompany return orders

Return orders can be completed between two companies within your organization. The following scenarios are supported:

- Simple intercompany returns between two companies that participate in an intercompany relation
- An intercompany chain that is established when a customer return order is created in the selling company
- An intercompany chain that is established when a vendor return order is created in the buying company
- Direct delivery shipment returns between an external customer and two companies that participate in an intercompany relation

Setup

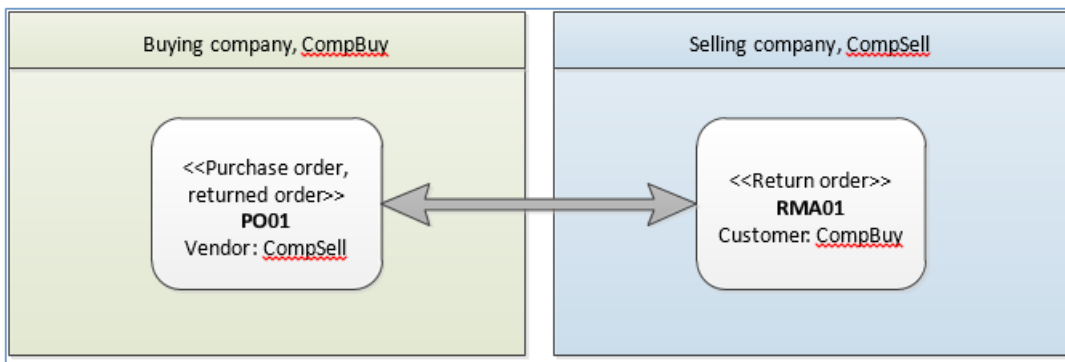
The following illustration the minimum setup that is required for two companies to participate in an intercompany relation and take advantage of intercompany trade.



In the following scenario, CompBuy is the buying company, and CompSell is the selling company. Usually, the selling company ships goods either to the buying company or, in direct delivery shipment scenarios, directly to the end customer. In CompBuy, the vendor IC_CompSell is defined as an intercompany endpoint that is associated with the company CompSell. At the same time, in CompSell, the customer IC_CompBuy is defined as an intercompany endpoint that is associated with the company CompBuy. The appropriate action policy details and value mappings must be defined in both companies. In a direct delivery shipment scenario, an intercompany return order, which is also an intercompany sales order, is created in the selling company. The RMA number of the intercompany return order can be picked from the RMA number sequence in CompSell, or it can be copied from the RMA number that is assigned to the original return order in CompBuy. The RMA number settings on the **PurchaseRequisition** action policy in CompBuy determine these actions. If the RMA number is synchronized, you should plan to mitigate the risk of number clashes if the two companies use the same number sequence.

Simple intercompany returns

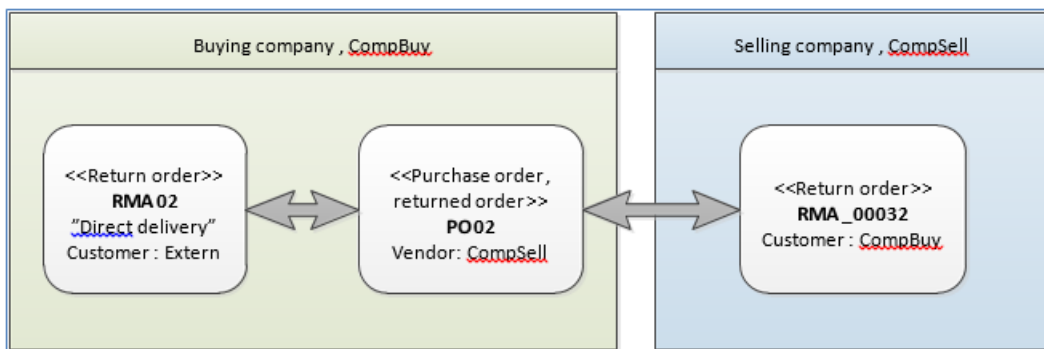
This scenario involves two companies in the same organization, as shown in the following illustration.



The order chain can be established when a vendor return order is created in the buying company or a customer return order is created in the selling company. The corresponding order is created in the other company and makes sure that the header and line information on the vendor return order reflects the settings on the customer return order. The return order that is established can either include or exclude the reference (**Find sales order**) to an existing customer invoice. The packing slips and invoices of the two orders can be processed individually. For example, you don't have to generate a packing slip for the vendor return order before you generate the packing slip for the customer return order.

Direct delivery shipment returns among three parties

This scenario can be established if a previous sale of the **Direct delivery** type has been completed, and if an invoice against the customer exists in the company that interacts with the customer. In the following illustration, the company CompBuy has previously sold and invoiced products to the customer Extern. The products were shipped directly from the company CompSell to the customer via an intercompany order chain.



If the customer Extern wants to return the products, a return order (RMA02) is created for the customer in the company CompBuy. To establish the intercompany chain, the return order must be marked for direct delivery. When you use the **Find sales order** function to pick the customer invoice to return, an intercompany order chain that consists of the following documents is established:

- **Original return order:** RMA02 (company CompBuy)
- **Purchase order:** PO02 (company CompBuy)
- **Intercompany return order:** RMA_00032 (company CompSell)

After the direct delivery intercompany chain is created, all physical handling and processing of the returns must occur in context of the intercompany return order, RMA_00032 in the company CompSell. The products can't be received in the company CompBuy. When a disposition code is assigned to the intercompany return order, it's synchronized with the original return order to allow for proper invoicing of the original order.

Post to the ledger

The ledger postings that are generated when the return order is invoiced are influenced by a few important settings and parameters:

- **Return cost price** – For inventory models other than **Standard cost**, the **Return cost price** parameter

determines the cost of the item when it's accepted back into inventory or scrapped. To calculate a correct valuation of inventory, it's important that you set the **Return cost price** parameter correctly. If you use the **Find sales order** function to create a return order line that has a reference to a customer invoice, the **Return cost price** value is equal to the cost price of the item that is sold. Otherwise, the cost price value comes from the item setup or can be entered manually.

- **Credit correction/Storno** – The **Credit correction** parameter on the **Posting invoice** page determines whether postings should be recorded as positive (DR/CR) entries or as correcting, negative entries.

In the examples that follow, the return cost price is represented as **Inv. Cost price**.

Example 1: The return order doesn't reference a customer invoice

The return order doesn't reference a customer invoice. The returned item is credited. The **Credit correction** parameter isn't selected when the return order invoice, or credit note, is generated.

Case 1	Qty	Unit price	Inv. Cost price	Line discount	Revenue		Discount		Consumption		Accounts receivable		Inventory issue	
					DR	CR	DR	CR	DR	CR	DR	CR	DR	CR
Sales order invoice	3	10	5	6%		30	1,8		15		28,2			15
Return order invoice	3	10	4	0%	30				12		30		12	

[Note!] The item master price is used as the default value for the **Return cost price** parameter. The default price differs from the cost price at the time of inventory issue. Therefore, the implication is that a loss of 3 has been incurred. Additionally, the return order doesn't include the discount that was given to the customer on the sales order. Therefore, an excessive credit occurs.

Example 2: Credit correction is selected for the return order

Example 2 is the same as example 1, but the **Credit correction** parameter is selected when the return order invoice is generated.

Case 2	Qty	Unit price	Inv. Cost price	Line discount	Revenue		Discount		Consumption		Accounts receivable		Inventory issue	
					DR	CR	DR	CR	DR	CR	DR	CR	DR	CR
Sales order invoice	3	10	5	6%		30	1,8		15		28,2			15
Return order invoice	3	10	4	0%		-30			-12		-30			-12

[Note!] The ledger postings are entered as negative corrections.

Example 3: The return order line is created by using the Find sales order function

In this example, the return order line is created by using the **Find sales order** function. The **Credit correction** parameter isn't selected when the invoice is created.

Case 3	Qty	Unit price	Inv. Cost price	Line discount	Revenue		Discount		Consumption		Accounts receivable		Inventory issue	
					DR	CR	DR	CR	DR	CR	DR	CR	DR	CR
Sales order invoice	3	10	5	6%		30	1,8		15		28,2			15
Return order invoice	3	10	5	6%	30		1,8		15		28,2		15	

[Note!] Discount and **Return cost price** are set correctly. Therefore, an exact reversal of the customer invoice occurs.

NOTE

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Register sales commissions

2/18/2021 • 2 minutes to read • [Edit Online](#)

This topic explains how sales commissions are calculated and registered. You can run this procedure in demo data company USMF or on your own data. Before starting this guide, run the guide called "Set up sales commission rules" to make sure that you have all the necessary commission calculation setup.

Take note of the customer and item numbers that you have chosen for the commission process and use them when asked to create a sales order in this guide.

Invoice a sales order that qualifies a salesperson for a commission

1. In the navigation pane, go to **Modules > Sales and marketing > Sales orders > All sales orders**.
2. Select **New**.
3. In the **Customer account** field, select the desired record from the drop-down menu.
4. Select **OK**.
5. On the Action Pane, select **Options**.
6. Select **Change view**.
7. Select **Header view**.
8. Expand the **Setup** section.
 - The value in the **Sales group** field represents a group with one or more sales representatives assigned to it. The people in the group are the ones who will receive commissions when the order is invoiced, as per predefined rates and distribution.
 - The value is copied from the Customer card, but you can change it if you wish.
 - The Sales group is also copied to the sales order line. You can change it so that it can differ from the one in the header and/or between lines.
 - The value in the **Commission group** field represents a group that you have created for one or more customers with the purpose of tracking commissions.
 - The value is copied from the Customer card, but you can change it if you wish.
9. On the Action Pane, select **Options**.
10. Select **Change view**.
11. Select **Line view**.
12. In the drop down menu of the **Item number** field, select the item you have set up for commissions.
13. In the **Quantity** field, enter a number. Take note of the line's Net amount. It represents the sales revenue, which in this example is the basis for commission calculation.
14. Select **Save**.
15. On the Action Pane, select **Invoice**.
16. Select **Invoice**.
17. Expand the **Parameters** section.

18. In the **Quantity** field, select **All**.
19. Select **Yes** in the **Posting** field.
20. Select **OK**, then select **OK** in the next pane. It may take a minute or so to post the transaction. Allow the processing to complete and don't close the page.

Review the registered sales commissions

1. On the Action Pane, select **Invoice**, then select **Invoice** again.
2. On the Action Pane, select **Invoice**, then select **Commission transactions**.
 - The **Overview** tab displays lines representing the commission amounts payable to sales representatives who are associated with the invoiced sales order. Let's review the details.
 - If you used the "Set up sales commission rules" guide to set up the **Commission sales** group, there are two sales people to receive a sales commissions, and the commission is split equally between them.
 - In this example, the total amount of the commission is calculated as a percentage of the sales revenue (the net amount of order line).
3. Close the page.
4. Select **Voucher**. You can review the voucher transactions for the commission amounts that have been posted to the predefined commission expense and commission payable accounts.

NOTE

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Set up sales commission rules

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This procedure shows you how to set up and enable sales commission calculation and tracking. The procedure shows how to create both customer and item commission groups, and then how to link a selected customer and product to the respective groups. Those groups are then used in the commission calculation setup to create a customer, item, and sales representatives combination that must be matched by the sales order to entitle the sales people to a commission. Creating customer and item commission groups are optional, as the calculation of commission can also be done for an individual customer and/or item. You can run this procedure in demo data company USMF or on your own data.

Set up commission groups and commission rates

1. Go to **Navigation pane > Modules > Sales and marketing > Commissions > Customer groups for commission**.
2. Select **New**.
3. In the **Group** field, type a value.
4. In the **Name** field, type a value.
5. Select **Save**.
6. Close the page.
7. Go to **Navigation pane > Modules > Sales and marketing > Commissions > Item groups**.
8. Select **New**.
9. In the **Group** field, type a value.
10. In the **Name** field, type a value.
11. Select **Save**.
12. Close the page.
13. Go to **Sales and marketing > Commissions > Sales groups**.
 - A Commission sales group specifies the employees in sales representative roles who are eligible to receive a commission when a customer associated with the relevant sales group buys certain items.
 - In the USMF demo data company, there is a sales group called "Sales reps US."
14. On the **Action Pane**, select **General**.
15. Click **Sales rep..** The Sales rep. page displays a list of the company's sales people who are associated with a specific commission group. You can assign multiple sales representatives to the same group and define their respective share of the total commission fee as a percentage value. The total commission share across all employees must not exceed 100.
16. In the list, mark the selected row.
17. Select **Edit**.
18. Set **Commission share** to '50'.
19. Click **New**.
20. In the **Name** field, click the drop-down button to open the lookup.
21. Use the **Quick Filter** to find records. For example, filter on the Name field with a value of 'Susan Burk'.
22. Click **Select**.
23. Set **Commission share** to '50'.
24. Click **Save**.
25. Go to **Sales and marketing > Commissions > Commission calculation**. In the **Commission**

calculation page, you define the commission rate that the employee is to receive for a sales transaction when it contains the pre-set combination of customer and product. As part of the commission rate setup, you must specify the commission calculation basis and whether it should include or exclude discounts. You can also enter a validity period for when the commission rate is active.

26. Click **New**.
27. In the **Item code** field, select 'Group'.
28. In the **Item relation** field, click the drop-down button to open the lookup.
29. In the list, find and select the group that you created earlier.
30. In the **Customer code** field, select 'Group'.
31. In the **Customer relation** field, click the drop-down button to open the lookup.
32. In the list, select the group that you set up earlier.
33. In the **Sales rep. relation** field, click the drop-down button to open the lookup.
34. In the list, find and select the desired record.
 - Keep the "Before line discount" option.
 - Keep the "Revenue" option as the basis for commission value calculation.
35. In the Commission percentage field, enter a number.
36. Click **Save**.

Setting up commission posting

1. Go to **Navigation pane > Sales and marketing > Commissions > Commission posting**.
Commission fees are payable to the employees and must therefore be set up to ensure correct financial posting to the appropriate accounts in the **General ledger**. This is done in the **Commission posting** page. Review the setup that is available for the current company. Typically, the commission amounts are posted to a dedicated expense account and are offset to a dedicated payable account. If you don't have the commission posting rules set up, the system will fail to complete invoicing of a sales order which has eligible commissions.
2. Close the page.

Assign a commission group to a customer and a product

1. Go to **Navigation pane > Modules > Sales and marketing > Customers > All customers**.
2. In the list, find and select the desired record.
3. In the list, click the link in the selected row.
4. Click **Edit**.
5. Expand the **Sales order defaults** section.
6. In the **Commission group** field, click the drop-down button to open the lookup.
7. In the list, select the group that you created earlier.
8. In the **Sales group** field, click the drop-down button to open the lookup.
9. In the list, find and select the desired record.
10. Click **Save**.
11. Go to **Navigation pane > Modules > Product information management > Products > Released products**.
12. Use the **Filter** to find records. For example, filter on the Item number field with a value of 'T0020 '.
13. In the list, click the link in the selected row.
14. Click **Edit**.
15. Expand the **Sell** section.
16. In the **Commission group** field, click the drop-down button to open the lookup.
17. In the list, select the commission group that you created earlier.

18. Select **Save**.

NOTE

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Customer portal for Dynamics 365 Supply Chain Management overview

2/18/2021 • 3 minutes to read • [Edit Online](#)

NOTE

Effective November 2020:

- Common Data Service has been renamed to Microsoft Dataverse. For more information, see [Power Automate Blog](#).
- Some terminology in Microsoft Dataverse has been updated. For example, *entity* is now *table* and *field* is now *column*. For more information, see [Terminology updates](#).

This topic will be updated soon to reflect the latest terminology.

What is the Customer portal?

Modern supply chain systems rely on integration. They require that inventory, customer demand, and sales departments be integrated instead of residing in separate silos. The Customer portal helps organizations that run Microsoft Dynamics 365 Supply Chain Management enhance this integration and more effectively keep their customers informed.

The Customer portal is a [Power Apps portals](#) template that lets companies create an externally facing business-to-business (B2B) website for scenarios that are related to sales order processing. The template uses [dual-write](#), Supply Chain Management, and Power Apps portals to enable external enterprise customers to view and create data from the company's Dynamics 365 environment.

The Customer portal template has all the customization capabilities that the portals feature of Power Apps offers. The template can easily be modified to represent the company's brand, add increased functionality, and change the user experience. All the functionality that the template offers out of the box can be modified as desired.

IMPORTANT

By itself, the template isn't expected to be completely functional. It just serves as an enabler for customers who want to create an externally facing website so that enterprise customers can engage with data from Supply Chain Management.

NOTE

The Customer portal documentation is directed at admins, customizers, and system integrators who will set up the Customer portal for a Supply Chain Management installation. It uses the terms *customer* and *user* to describe people who are customers of the organization that is running Supply Chain Management, and who will use the final portal itself.

Video

The [Overview of the Customer portal template in Dynamics 365 Supply Chain Management](#) video (shown above) is included in the [Finance and Operations playlist](#) available on YouTube.

Who should use it?

The Customer portal is designed for companies that run Supply Chain Management and have these characteristics:

- They want to build an externally facing website that communicates order processing information (such as order status or account information) directly from their Supply Chain Management system to their enterprise customers.
- They are transitioning from Dynamics AX 2012 to Supply Chain Management and previously used the [AX 2012 Customer self-service portal](#).

The following types of organizations are **not** good candidates for implementing the Customer portal:

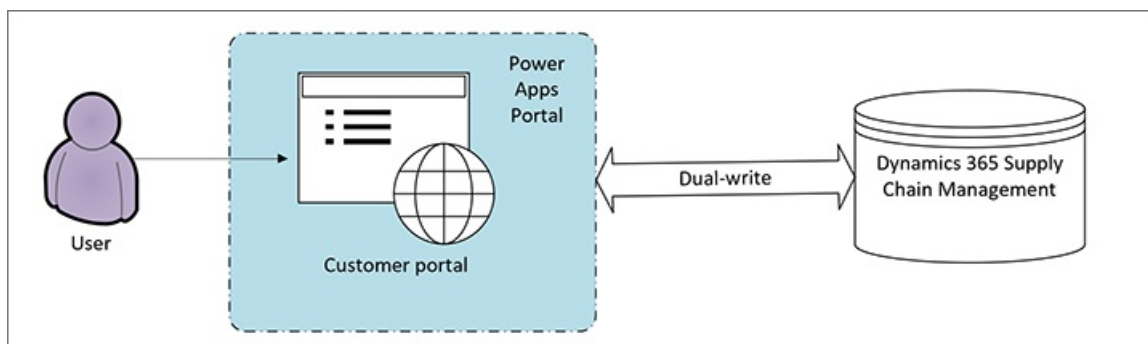
- Companies that want to build a website for non-enterprise customers. These companies should consider creating a [Dynamics 365 Commerce e-commerce website](#).
- Companies that are already using an existing Power Apps portals website for a similar purpose. These companies won't receive any additional benefits from the Customer portal. The Customer portal is delivered as a template that acts as a guide and a starting point for customers who want to "connect the dots" between dual-write, Supply Chain Management, and Power Apps portals. If you've already set up a website that serves this purpose, you might not gain much value from using the Customer portal template to re-provision that website.

How does it work?

The Customer portal is provided as a Power Apps portals template. It depends on Power Apps portals and dual-write.

[Power Apps portals](#) is a feature that lets users create an externally facing website that people from outside the organization can sign in to. Little to no coding is required to make portals. The Customer portal is one of many [Dynamics 365 portal templates](#) that are available from Microsoft.

[Dual-write](#) is an out-of-box infrastructure product that provides near-real-time interaction between customer engagements apps and Finance and Operations apps. Dual-write provides bidirectional integration between Finance and Operations apps and Microsoft Dataverse. Therefore, it provides an integrated user experience across the apps. The Customer portal depends on tables that are synced with dual-write. Before data from Supply Chain Management can be surfaced in the Customer portal, dual-write must be enabled for all the appropriate tables.



The Customer portal acts as a starting point for organizations that want to use Power Apps portals to build an externally facing website that uses data from their Supply Chain Management installation. It helps organizations connect dual-write, Supply Chain Management, and Power Apps portals.

NOTE

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Install, set up, and update the Customer portal

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NOTE

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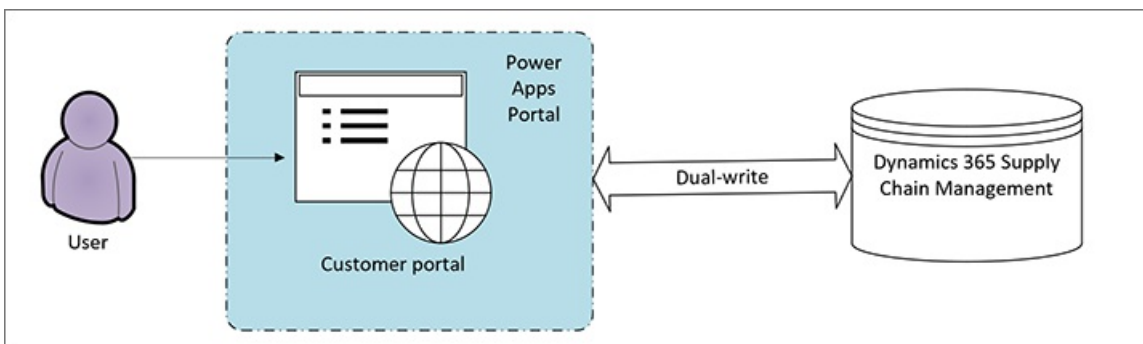
Licensing requirements

To implement the Customer portal, you must have the following licenses:

- **Power Apps portals** – This license is required to host the Customer portal. Portals are licensed based on usage. For more information, see the [Power Apps portals licensing requirements](#).
- **Dual-write** – You must have the necessary licenses to enable dual-write for Supply Chain Management tables. For more information, see the [system requirements for dual-write](#).

Dependencies on dual-write and Power Apps portals

The Customer portal depends on Power Apps portals and dual-write, as shown in the following illustration.



Unlike other features from Supply Chain Management, the Customer portal template resides in Power Apps portals. Therefore, the Customer portal is limited by the functionality and capabilities that are provided by Power Apps portals and the tables in dual-write.

Required setup to enable the Customer portal

After you've made sure that you have the required licenses, you can set up dual-write as described in the [dual-write initial synchronization instructions](#).

Be sure to enable the following table mappings in dual-write:

- Sales Order Header
- Sales Order Details
- Accounts
- Contacts

- [Products](#)

After this setup is completed, you can provision the Customer portal template.

Provision the Customer portal

Before you begin, make sure that you've already completed the [required setup](#). Then follow these steps to provision the Customer portal.

1. Go to make.powerapps.com.
2. Make sure that you're using the environment where you enabled dual-write.
3. On the **Create** tab, scroll down to the **Start from template** section, and select the template that is named **Customer Portal**.
4. Follow the on-screen instructions.

After provisioning is completed, you can access the Customer portal in the **Your apps** section of the **Home** page.

NOTE

If the dual-write solution isn't installed in the environment that you're working in, you will receive an error message, and the Customer portal won't be provisioned.

Update the Customer portal

More functionality might be added to the Customer portal later. Any changes that Microsoft makes to the underlying solution components will automatically appear in your environment. However, the website that is provisioned in your environment won't automatically reflect changes that are made to the configuration data. You will have to manually apply those changes by getting the code from the new template and merging it with the provisioned website.

Additional resources

To learn how you can set up and customize the Customer portal, you should start by reviewing the following documentation for the underlying technologies:

- [Power Apps portals documentation](#)
- [Dual-write documentation](#)

To effectively manage your portals, you must understand the Power Apps portals and Microsoft Dataverse lifecycle. For more information, see the following resources:

- [About portal lifecycle](#)
- [Upgrade a portal](#)
- [Migrate portal configuration](#)
- [Solution Lifecycle Management: Dynamics 365 for Customer Engagement apps](#)

NOTE

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Create and manage Customer portal users

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NOTE

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In the out-of-box implementation, there is no way for users to self-register for websites that are created by using the Customer portal. To sign in and use a website, users must be invited by the admin. Microsoft has intentionally blocked the ability of users to self-register.

Before a user can use a website, a contact record must be created for that user. This record indicates which customer account and legal entity the user belongs to. This information is essential for ensuring that the user can create and view sales orders.

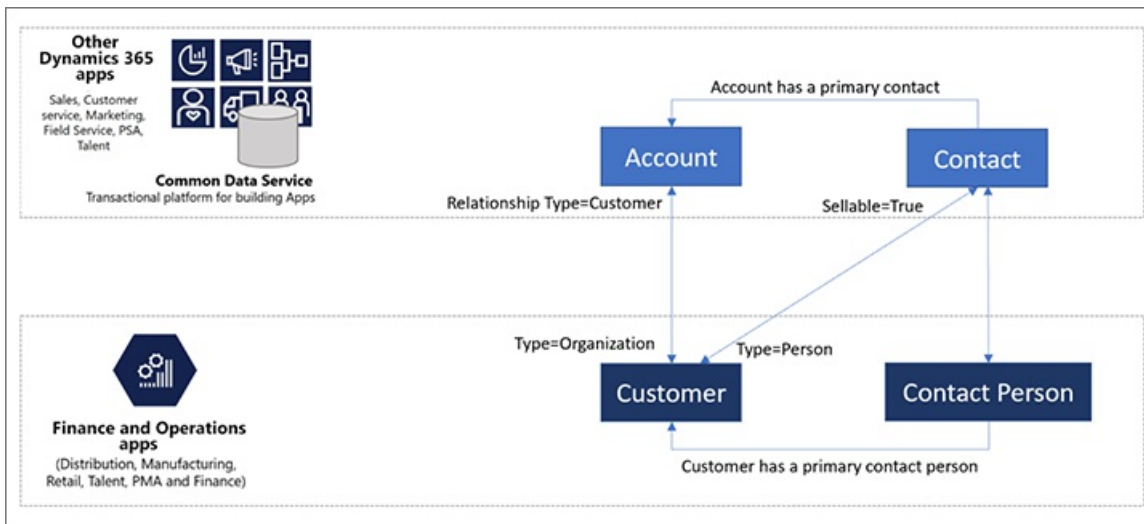
When users self-register, contact records are automatically created for them. Therefore, you can't ensure that a user selects the correct customer account and legal entity. On the other hand, the invitation process lets an admin assign the correct customer account and legal entity to the contact record before an invitation is sent. If you're thinking about customizing the solution so that users can self-register, be sure to consider the possible consequences.

Video

The [Invite customers to register and use your customer portal](#) video (shown above) is included in the [Finance and Operations playlist](#) available on YouTube.

Prerequisite setup

Contacts in Power Apps portals are stored as records in the **Contacts** table in Microsoft Dataverse. Dual-write then syncs these records to Microsoft Dynamics 365 Supply Chain Management as required.



Before you start to invite new customers, make sure that you've enabled the **Contact** table mapping in dual-write.

The invitation process

To invite an existing contact to the Customer portal, follow the steps in [Invite contacts to your portals](#) in the Power Apps portals documentation.

Before you invite a customer to join the Customer portal, make sure that the customer's [contact record](#) is available and set up in the following way:

1. Set the **Company** field to the legal entity that you want the customer to belong to in Supply Chain Management.
2. Set the **Account Number** field to the customer account number that you want the user to have in Supply Chain Management.

After a contact is created, you should be able to see it in Supply Chain Management.

For more information, see [Configure a contact for use on a portal](#) in the Power Apps portals documentation.

Out-of-box web roles and table permissions

User roles in Power Apps portals are defined by [web roles](#) and [table permissions](#). A few roles are defined for the Customer portal out of the box. You can create new roles, and you can modify or remove existing roles.

Out-of-box web roles

This section describes the web roles that are delivered with the Customer portal.

For more information about how to modify the out-of-box user roles, see [Create web roles for portals](#) and [Add record-based security by using table permissions for portals](#) in the Power Apps portals documentation.

Administrator

The administrator oversees and maintains the website. This person will provision and set up the Customer portal. The administrator maintains the IT and security aspects of the portal, and makes sure that everything runs smoothly. The administrator might also customize and/or change the portal by adding new functionalities, creating new roles, and more.

Customer representative

A customer representative works for a customer company and is responsible for managing the orders that the company places. The customer representative can see all the orders that have been placed for the company and the users who placed them. Additionally, the customer representative can see information about the overall account and which contacts can place orders on behalf of that account.

Authorized users

Authorized users can place orders and view the status of the orders that they have placed. However, they can't view the status of orders that other users in their company have placed.

Unauthorized users

Unauthorized users can't view any data. They can see only public information, such as terms and conditions, and details about the company that is running the Customer portal.

Example

The following table shows which sales orders the users in each web role can see in the system.

SALES ORDER	ADMINISTRATOR	CUSTOMER REPRESENTATIVE FOR CUSTOMER X	AUTHORIZED USER: JANE	AUTHORIZED USER: SAM	UNAUTHORIZED USER: MAY
Customer X Orderer: Jane	Yes	Yes	Yes	No	No
Customer X Orderer: Sam	Yes	Yes	No	Yes	No
Customer Y Orderer: May	Yes	No	No	No	No

NOTE

Even though both Sam and Jane are contacts who work for customer X, they can see only the orders that they themselves have placed and nothing else. Although May has an order in the system, she can't see that order in the Customer portal, because she is an unauthorized user. (Additionally, she must have placed the order through some channel other than the Customer portal.)

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Customize and use the Customer portal

2/18/2021 • 7 minutes to read • [Edit Online](#)

NOTE

Effective November 2020:

- Common Data Service has been renamed to Microsoft Dataverse. For more information, see [Power Automate Blog](#).
- Some terminology in Microsoft Dataverse has been updated. For example, *entity* is now *table* and *field* is now *column*. For more information, see [Terminology updates](#).

This topic will be updated soon to reflect the latest terminology.

This topic describes the different pages that are available in the Customer portal out of the box. It explains what the pages do and how you can customize them.

The Customer portal offers a few webpages and actions out of the box. The following site map provides an overview of those webpages and actions, and the roles that can perform the actions.



Typical customizations

The following topics will help you learn the basics about Power Apps portals and how you can customize portals:

- [Work with templates](#) – This topic provides a general overview of how Power Apps portals works and how you can do simple customizations of portals.
- [Manage portal content](#) – This topic explains how you can manage and customize the content that you surface in your portal.
- [Edit CSS](#) – This topic helps you make more complex customizations to the user interface (UI) of your portal.
- [Create a theme for your portal](#) – This topic helps you create a UI theme for your portal.
- [Create and expose portal content easily](#) – This topic helps you manage the underlying data and tables that you use for your portal.
- [Configure a contact for use on a portal](#) – This topic explains how to create and customize user roles, and how security and authentication work in Power Apps portals.
- [Configure notes for table forms and web forms on portals](#) – This topic explains how to add documents and additional storage to your portal.

- [Error handling for portal website](#) – This topic explains how to view portal error logs and store them in your Microsoft Azure Blob storage account.

Customize the order creation process

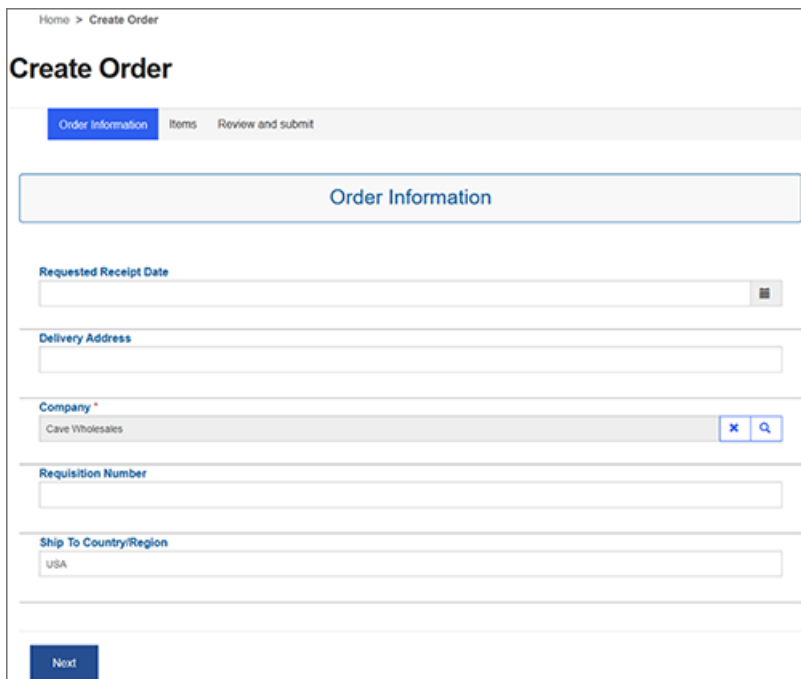
When a user submits an order by using the Customer portal, the order is automatically synced to the corresponding Dynamics 365 Supply Chain Management environment. Because the user is an external customer, some required information is intentionally hidden from him or her. This information will automatically be filled in when the form is submitted.

This section shows how you should set up contacts to avoid errors. It explains fields that are automatically set and how you can modify the value of those fields if you must.

The out-of-box order creation process

Here are the standard steps for submitting an order from the Customer portal.

1. On the home page, select the **Create order** tile to open the **Create Order** wizard.
2. On the **Order Information** page, set the following fields:
 - **Requested receipt date** – Specify the date of delivery.
 - **Delivery address** – Enter the address that the order should be delivered to.
 - **Company** – Select the name of the customer company. This field is automatically set for non-admin users.
 - **Requisition number** – Enter the requisition number of the order. This field isn't required.
 - **Ship to country/region** – Enter the country or region that the items will be delivered to. This field is automatically set for non-admin users.



The screenshot shows the 'Create Order' wizard in Dynamics 365. The breadcrumb is 'Home > Create Order'. The title is 'Create Order'. There are three tabs: 'Order Information' (selected), 'Items', and 'Review and submit'. Below the tabs is a section titled 'Order Information' containing several input fields: 'Requested Receipt Date' (with a calendar icon), 'Delivery Address', 'Company' (with a dropdown menu showing 'Cave Wholesales' and search icons), 'Requisition Number', and 'Ship To Country/Region' (with a dropdown menu showing 'USA'). At the bottom left is a blue 'Next' button.

3. Select **Next**.
4. On the **Items** page, select **Add Item**.

5. In the **Item Information** dialog box, set the following fields:

- **Product Name** – Find and select a product to add to the order.
- **Quantity** – Enter the quantity of the selected product.
- **Unit** – Specify the unit of measure (for example, **ea.**, **kgs**, or **box**).
- **Estimated net amount** – The value is calculated as the estimated price of the item × the quantity for the selected unit.

6. Select **Submit** to add the item to the order.

7. Repeat steps 4 through 6 until you've added all the items that you want to order.

8. When you've finished adding items, select **Next** on the **Items** page.

9. The **Order Information** page provides a summary of the order. Review the order contents and delivery details. If everything looks correct, select **Submit** to submit the order.

Create Order

Order Information ✓ Items ✓ Review and submit

Order Information

Requested Receipt Date
3/24/2020

Delivery Address
—

Company *
Cave Wholesales

Requisition Number
—

Ship To Country/Region
USA

Items

PRODUCTS

Existing Product ↑	Price Per Unit	Quantity	Unit	Amount
Active speaker		3.00000	ea	\$0.00

Previous Submit

Standard data setup

To help ensure a smooth user experience, the Customer portal automatically fills in values for several required fields. These values are based on information in the contact record of the customer who is submitting the order.

For each [contact row](#) that belongs to a customer who will use the Customer portal to submit orders, values must be specified for the following required fields. Otherwise, errors will occur.

- **Company** – The legal entity that the order belongs to
- **Potential customer** – The customer account that is associated with the order
- **Price list** – The custom price list for the customer
- **Currency** – The currency of the price
- **Ship to country/region** – The country or region that the items will be delivered to

The following fields are automatically set for the sales order table:

- **Language** – The language of the order (By default, the value is taken from the contact record.)
- **Ship to country/region** – The country or region that the items will be delivered to (By default, the value is taken from the contact record.)
- **Contact person** – The user who can be contacted for information about the order (By default, the value is taken from the contact record.)
- **Company** – The legal entity that the order belongs to (By default, the value is taken from the contact record.)
- **Potential customer** – The customer account that is associated with the order (By default, the value is taken from the contact record.)
- **Invoice customer** – The billing account of the order (The default value is the potential customer from the contact record.)
- **Sales order name** – The name of the sales order (The default value is **sales order**.)
- **Currency** – The currency of the price (By default, the value is taken from the contact record.)
- **Price list** – The custom price list for the customer (By default, the value is taken from the contact record.)
- **Delivery address description** – The delivery address of the sales order (The default value is **delivery address description**.)

Modify the order creation process

You can freely modify the appearance and UI of the Customer portal if you don't change the basic order creation process. If you want to change the order creation process, there are a few points that you must keep in mind.

Don't remove the following columns from the sales order table in Microsoft Dataverse, because they are required to create a sales order in dual-write:

- **Company** – The legal entity that the order belongs to
- **Name** – The name of the sales order
- **Currency** – The currency of the price
- **Price list** – The custom price list for the customer
- **Ship to country/region** – The country or region that the items will be delivered to
- **Potential customer** – The customer account that is associated with the order
- **Language** – The language of the order (Typically, this language is the language of the potential customer.)
- **Delivery address description** – The delivery address of the sales order

For items, the following columns are required:

- **Product** – The product to order
- **Quantity** – The quantity of the selected product
- **Unit** – The unit of measure (for example, **ea.**, **kgs**, or **box**)
- **Ship to country/region** – The country or region of delivery
- **Delivery address description** – The delivery address of the order

You must make sure that your Customer portal somehow submits values for all these columns.

If you want to add columns to the page, or remove columns, see [Create or edit quick create forms for a streamlined data entry experience](#).

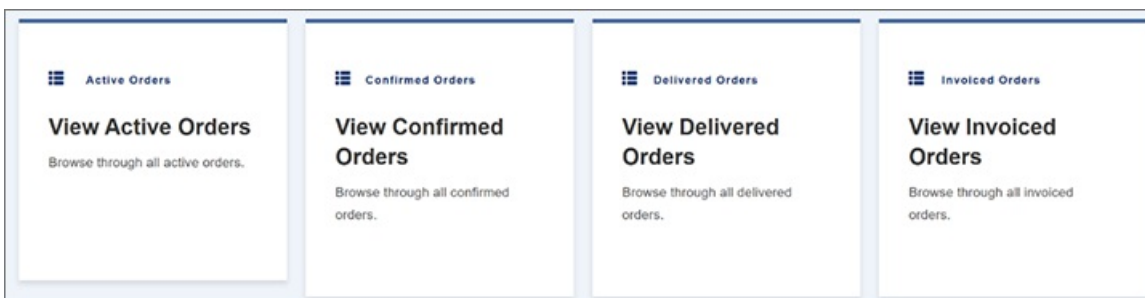
If you want to change how columns are preset and how values are set when the page is saved, see the following information in the Power Apps portals documentation:

- [Prepopulate field](#)
- [Set Value On Save](#)

Customize the home page

All the controls in the Customer portal are built-in Power Apps portals controls. You can customize them by following the steps in [Compose a page](#) in the Power Apps portals documentation.

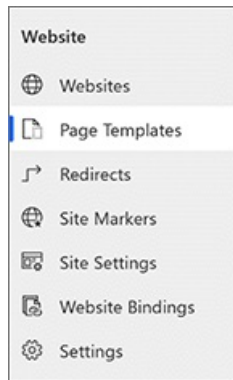
The only custom control that is included in the Customer portal template is used to create the tiles on the home page.



To modify the tiles, follow these steps.

1. Open the [Portal Management app](#).

2. In the navigation pane on the left, select **Page Templates**.



3. Select the page template that is named **Home**.

4. In the **Web Template** field, select the **Home** link to open the source code for that page.



5. You should now see all the source code for the home page and can modify it as you require.

Resources

To learn more about how you can set up and customize the Customer portal, see the following resources:

- [Power Apps portals documentation](#)
- [Dual-write documentation](#)
- [About portal lifecycle](#)
- [Upgrade a portal](#)
- [Migrate portal configuration](#)
- [Solution Lifecycle Management: Dynamics 365 for Customer Engagement apps](#)

NOTE

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Trade allowance management

2/18/2021 • 11 minutes to read • [Edit Online](#)

Trade allowance management helps companies manage sales promotion programs that offer "pay-for-performance" monetary rewards to customers that achieve volume and behavioral goals. The feature's capabilities are designed for companies that focus on comprehensive promote-to-profit processes, from promotion fund budgeting and allocation, to allowance contract setup, to claims creation and processing, to payment processing, to promotion effectiveness analysis.

This article will provide a broad overview of the Trade allowance management feature and will familiarize you with the typical set of tasks that are involved in managing a sales promotion program. Several types of users who have operational and decision making responsibilities are expected to use this functionality to achieve their respective goals:

- Allocating discretionary funds to the selected accounts, and setting up trade allowance agreements for promotions, based on bill-backs and one-off lump sum payments (for an agreed service)
- Running the negotiated promotion contracts through ongoing sales and generating bill-back claims
- Calculating, approving, and processing the generated claims, and passing them on to Accounts receivable (A/R) as deductions for payment settlement
- Reconciling the customer's short-pay with the deduction that is due
- Tracking use of the promotional fund, and evaluating program profitability and effectiveness

Audience and purpose

The information in this document is intended for business decision makers in enterprise companies, in positions such as purchase manager, chief financial officer (CFO), and accounting manager, who have the following responsibilities:

- High-level budgets and fund allocation
- Planning and analyzing sales promotions
- Managing staff that processes bill-back claims, runs payments based on merchandizing events, and settles short-pays and deductions

People in these roles are looking for ways to achieve these goals:

- Better use marketing promotional funds.
- Flexibly accommodate different types of promotion programs and allowances.
- Reduce the administrative burden and errors that are associated with monitoring promotion performance and processing claims.
- Improve cash flow forecasts by accruing for future liability.
- Have a quantified basis for ongoing and future negotiations with customers about promotions.

Promotional fund and Trade allowance agreement

A trade allowance agreement is an incentive program where pay-for-performance monetary rewards are offered to customers that achieve specific volume targets and/or behavioral goals. Promotional funds are budgeted expenditures. In that way, the promotional campaigns can be captured.

Promotional fund

Funds that are allocated to trade allowance agreements are recorded on the **Funds** page. To open the **Funds**

page, select **Sales and marketing > Trade allowances > Funds > Funds**.

Funds

Fund ID: Promo_Loyalty | Description: Loyalty promotion

General

Type: Discretionary | From date: 1/1/2014 | Fund budgeted: 1,000,000.00 | Usage: []

Status: Approved | To date: 12/31/2014 | Notes: []

Customers

Hierarchy: Loyalty customer > Loyalty > Desert Wholesales

FUND CUSTOMERS

- Promo_Loyalty
 - Desert Wholesales
 - Owl Wholesales
 - Sparrow Retail

	TOTAL FUND	CURRENT HIERARCHY LEVEL	ONE LEVEL UP
BUDGETED	1,000,000.00	300,000.00	1,000,000.00
DISTRIBUTED	1,000,000.00	0.00	1,000,000.00

Items

+ Add line | Add products | Remove | Display dimensions

Item number	Product name
T0020	TelevisionD30042*

On the **Funds** page, you can view the details of promotional funds.

The **General** FastTab shows the period that the fund is valid for and its budgeted amount. In order for the fund to be allocated to the promotion agreement, the **Status** field must have a value of **Approved**.

The **Customers** FastTab shows the customer hierarchy. To select the customers that the fund targets, drag them so that they are under **Fund customers**. This FastTab also shows how the total amount of the fund is distributed.

The **Items** FastTab shows the items that are included in the promotion.

Trade allowance agreement

After the fund definition is in place, the next step in promotion planning is to register promotion contracts (which are known as trade allowance agreements), allocate funds, and define performance goals for each merchandizing event.

Trade allowance agreements are recorded on the **Trade allowance agreements** page. To open the **Trade allowance agreements** page, select **Sales and marketing > Trade allowances > Trade allowance agreements**.

TRADE ALLOWANCE AGREEMENTS
TP000004

Lines Header | Internal approved

General ^

<p>TRADE ALLOWANCE</p> <p>Description TV promotion</p> <p>Details</p> <p>Currency USD</p>	<p>Marketing objective</p> <p>Owner Julia Funderbu... 000020</p> <p>DATES</p> <p>Trade allowance agreement period</p> <p>Order from 2/1/2014</p> <p>Order to 12/31/2020</p>	<p>Requested ship from</p> <p>Requested ship to</p> <p>Requested receipt from</p> <p>Requested receipt to</p> <p>Performance from</p> <p>Performance to</p>	<p>ANALYSIS</p> <p>Unit ea</p> <p>Base units 100.00</p> <p>Lift percent 100.00</p> <p>Calculated ship quantity 200.00</p> <p>Promotional ship quantity 200.00</p> <p>Trade allowance cost 40,000.00</p>
--	--	---	--

Customers v

Items v

Funds v

Select **Header** to switch to the Header view.

On the **General** FastTab, the **Order to** and **Order from** fields define the period when the agreement is valid. An approval status of **Internal approved** for the agreement indicates that the agreement isn't yet valid and can't be applied during sales order processing.

The **Analysis** section of the **General** FastTab contains important fields that define the quantities and costs that are used for promotion evaluation:

- The **Base units** field specifies the quantity of products that must be sold to the selected customers before the promotion is applied.
- The **Calculated ship quantity** value is calculated based on the **Lift percent** value, which is a planned target increase for this promotion.
- The **Trade allowance cost** field is calculated based on the quantities of the various events in the trade allowance agreement.

On the **Customers** FastTab, in the list on the left, you can select and view customer groups, which are set up as predefined hierarchies. You can then select the whole hierarchy or specific accounts as targets for the allowance agreement.

On the **Items** FastTab, as on the **Items** FastTab of the **Funds** page, products are added to the agreement to associate its sales with the allowance that was agreed on.

On the **Funds** FastTab, you can view the promotion funds that are associated with this contract. You can also view the contract's event cost allocation. An event cost allocation of 100 percent means that this promotion will be financed exclusively from one fund. Alternatively, a promotion agreement can draw on several funds, and can use equal or differential percentage allocation.

Lines

Next, select **Lines** to switch to the Lines view.

The **Merchandizing events** tab shows the types of events covered by an agreement. There are three types: bill back, lump sum and off-invoice.

When you select the merchandizing event and then select the **Amounts** tab, the details for the event are found.

Agreement lines

MERCHANDISING EVENTS ITEMS FUNDS **AMOUNTS**

IDENTIFICATION	PRICE	CUMULATE	CLAIMS
Calculation date type Created	Taken from Gross	Cumulate sales by Month	Payment type Customer deductions
Unit of measure rebate option Convert	Approval required Yes <input type="checkbox"/>	Period type	Yend account
Unit type Inventory unit	LIMITS	TAX	ACCOUNTS
Unit ea	Minimum quantity 1	Taxable No <input type="checkbox"/>	Rebate program ID Loyalty
	Minimum amount 0.00		Rebate program accrual account 200210
	Rebate line break type Quantity		Rebate program expense account 601700

In the **Trade allowance lines** section, you specify the quantity or amount ranges that the customer must achieve for definitions to obtain the rewards.

In the case of a merchandizing event of the **Bill back** type, the upper section the **Amounts** tab defines the rules that the bill back will be applied, generated, and paid under. For example, the rules may specify the following conditions for the bill back claim:

- It's based on the creation date of the sales order (the **Calculation date type** value is **Created**).
- It's calculated based on the sales order line's amount before discounts, not the net amount, which includes discounts (the **Taken from** value is **Gross**).
- It's based on the volume of the sold products, not the amount (the **Rebate line break type** value is **Quantity**).
- It's calculated per period of a month (the **Cumulate sales by** value is **Month**).
- It's settled as a deduction, not by using A/P (the **Payment type** value is **Customer deductions**).

In the case of a merchandizing event of the **Lump sum** type, the **Amounts** tab shows the quantity that will be paid to the customer in the form of a deduction when the customer achieves specific performance. An approval status of **Open** indicates that the lump sum hasn't yet been paid.

To apply the agreement to sales orders that meet the agreement's conditions, the agreement's status must be **Confirmed**.

Perform sales under the planned merchandising event and generate bill-back claims

When you create a sales order that has lines that fulfill the requirements of the agreement, you can view the related information on the **Sales order** page by selecting **Sales order line > View > Price details**.

On the **Price details** page, on the **Rebates** FastTab, the sales clerk can see a bill back from the valid trade allowance agreement (the rebate program ID is shown) and the total amount that is applied to the line. This amount is also shown in the **Rebate amount** field in the **Margin estimation** section of the **Price details** page.

When the sales invoice is posted, a corresponding bill-back claim is generated for each invoice line.

NOTE

To see the **Price details** page, on the **Accounts receivable parameters** page, on the **Prices** tab, select the **Enable price details** check box. |

Process claims and pass them as deductions to A/R

The next steps in the process for handling bill-backs are to review, calculate, and approve claims, and then convert them into deductions.

The Bill back workbench is where the promotion agreement owner periodically reviews and processes the claims that are generated. It's also where the A/R administrator converts the approved claims into deductions or regular payments, depending on the payment method for the claim.

On the **Bill back workbench** page, you can review the claim lines. If the claims are in **To be recalculated** status, they must be recalculated for any cumulative effect.

Recalculate claims

To recalculate the claims, on the Action Pane, select **Cumulate**. Then, in the **Cumulate rebates** dialog box, select the customer.

As a result of the recalculation, the program generates new claims for the amounts to adjust the original claims to the qualifying amount per unit. One adjustment claim is generated for each unique combination of a customer, an item, a currency, a unit of measure, inventory dimensions, financial dimensions, and a sales tax group. These adjustment claims have the same reference to the sales order and invoice number as the claims that are being adjusted (that is, the claims that were originally created from the sales document). Unlike the original claim, the adjustment claim doesn't have values in the fields that describe the original sales order line's amounts and quantity.

After the recalculation is completed, the status of the claims is changed to **Calculated**. To approve the claims, on the Action Pane, select **Approve**.

Process claims and pass them to A/R

The claims are now ready for A/R processing. To process them, on the Action Pane, select **Process**.

Upon processing the claims, the status has changed to **Mark** and indicates that a journal posting (the journal that is posted is the Rebate accrual journal, as specified in the A/R parameters) has caused the following events to occur:

- The claims have been transferred to the temporary customer balance as deductions.
- The rebate accrual account has been credited to represent the future liability for the customer.
- The rebate expense account has been debited to recognize the cost that was incurred in connection with the sales.

To complete the process, the A/R clerk must now handle the accrual deductions by transferring them to the customers balance as a credit note (liability).

To start the task, on the Action Pane of the **Customer** page, select **Collect > Settle transactions**. Then, on the **Settle transactions** page, select **Functions > Bill back program**. This rebate page shows all the bill-back claims that were previously processed.

If you want to create a credit note, select the **Mark** check box for all lines, and then select **Functions > Create credit note**.

Upon credit note creation, a journal is posted. (The journal that is posted is the AR consumption journal, as specified in the A/R parameters.) As a result, the real liability (credit) amount has been moved to the customer balance. Financially, this situation implies that the following events have occurred:

- The customer's receivable account has been credited.
- The rebate accrual account has been debited.

To approve a merchandising event of the **Lump sum** type, select the event on the **Trade allowance agreements** page, and then, on the **Amount** tab, select **Approve**.

Settle the deduction that is due and the customer short-pay by using the Deduction workbench

Often, in anticipation of bill-backs, customers choose to short-pay selected invoices. To prevent payment reconciliation issues in the future, the A/R clerk registers those short-pays as deductions when he or she records the actual customer payments. Then, on the Deduction workbench, those customer deductions can easily be settled against the claim amounts that are due from the company.

To register a customer's short-pay in the Payment journal, select **Accounts receivable > Payments > Payment journal**, and create a new payment journal. Then, on the Action Pane, select **Deductions**. On the **Deduction** page, you can create and track the amount that was short-paid.

The collection manager is now responsible for settling the open credit note transaction and the short-pay transaction against each other in the Deduction workbench.

To manage deductions, select **Sales and marketing > Trade allowances > Deductions > Deduction workbench**. The upper section of the page contains lines that represent the short-pays from the customer. The lower section of the page contains the customers open credit transactions.

To settle the deduction against the open transaction, mark the deduction line, and then, on the Open transactions tab, mark the line. On the Action Pane, click **Maintain > Match**.

The status of the originating claims is now set to **Completed**.

Analyze the effectiveness of the promotion and fund consumption

To get an overview of the program's key statistics and fund use, you can use several reports and analytical views that are available in Trade allowance management.

On the **Trade allowance activity** page, the **Overview** tab shows the main details of the trade allowance agreement. The other tabs show more specific details about the associated documents, payments, and other events that are related to the program.

The **Summary** tab shows the total quantity of products that have been sold under the promotion, the sales amount that has been invoiced, and the bill-backs and lump sums that have been paid.

The **Bill back credits** tab contains the details of individual bill-backs that have been credited to the customer.

To get a more analytical overview of the various performance measures for the promotion, you can use the Analysis view. To go to the Analysis view, click **Sales and marketing > Trade allowances > Trade allowance agreements**. On the Action Pane, click **Analysis**.

To get a more analytical overview of the various performance measures for the promotion, you can use the Analysis view. To go to the Analysis view, click **Sales and marketing > Trade allowances > Trade allowance agreements**. On the Action Pane, click **Analysis**.

NOTE

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Create a new trade agreement

2/18/2021 • 2 minutes to read • [Edit Online](#)

This procedure shows you how to create a trade agreement where you register a new product sales price that you've agreed with a specific customer. You can run this procedure in demo data company USMF or on your own data. If you're using your own data, before you start this guide you need to make sure that a Trade agreement journal name exists where the Default relation is set to "Price (sales)".

Create and post a new trade agreement journal

1. Go to **Navigation pane > Modules > Sales and marketing > Prices and discounts > Trade agreement journals**.
2. Click **New**.
3. In the **Name** field, click the drop-down button to open the lookup.
4. In the list, find and select the desired record.
5. On **Action Pane**, click **Lines**.
6. In the **Account code** field, select 'Table'.

In this example, you're updating the price for a specific customer, which means you need to choose Table. If you were updating the product's list price, you would select 'All', so that the new price is valid for all customers. If you were differentiating prices among different customer segments, then you would select Group. To select Group, you must have set up Customer price groups.

7. In the **Account selection** field, click the drop-down button to open the lookup.
8. In the list, find and select the desired record.
9. In the **Item code** field, select 'Table'.

When you are entering a trade agreement of type 'Price (sales)', you must only select 'Table' in the **Item code** field. This is because a price is an absolute value and cannot be same for all products or a group of products.
10. In the **Item relation** field, click the drop-down button to open the lookup.
11. In the list, select the product you want to include in the agreement. Make a note of which product you've selected.
12. In the **From** field, enter a minimum quantity.
 - If the customer has to order a minimum quantity before they can qualify for the new price, then you need to specify that quantity here.
 - Enter a value in the **To** field to specify the maximum quantity above which the agreement's price will not be valid. If you offer prices and discounts based on multiple quantity breaks, then specify each quantity bracket as a pair of minimum and maximum quantity in the **From** and **To** fields respectively.
13. In the **Amount in currency** field, enter a price.
14. Under the **Details** section, in the **From date** field, enter a date from which this agreement will be valid.
15. Click **Save**.

16. Click **Validate**.
17. Click **Validate selected lines**.
18. Click **OK**.
19. Click **Post**.
20. Click **OK**.

View trade agreements for a product

1. Go to **Navigation pane > Modules > Product information management > Products > Released products**.
2. In the list, find and select the product whose price you have just updated.
3. On the **Action Pane**, click **Sell**.
4. Click **View trade agreements**.

Review the details of the price trade agreement you have just created.

5. Close the page.

Additional resources

Whitepaper

For more information, download the following white paper (written to support AX2012, but still applies for Dynamics 365 Supply Chain Management)

- [Trade agreements](#)

Community blogs

- [Sales prices in Dynamics 365 for Finance and Operations](#)

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Service management overview

2/18/2021 • 2 minutes to read • [Edit Online](#)

Use **Service management** to establish service agreements and service subscriptions, handle service orders and customer inquiries, and to manage and analyze the delivery of services to customers. You can use service agreements to define the resources that are used in a typical service visit. You can also use service agreements to view how those resources are invoiced to the customer. A service agreement can also include a service level agreement that specifies standard response times, and offers tools to record the actual time.

You can create service orders to manage information about scheduled and unscheduled visits by a service technician to a customer site. Service orders include information such as:

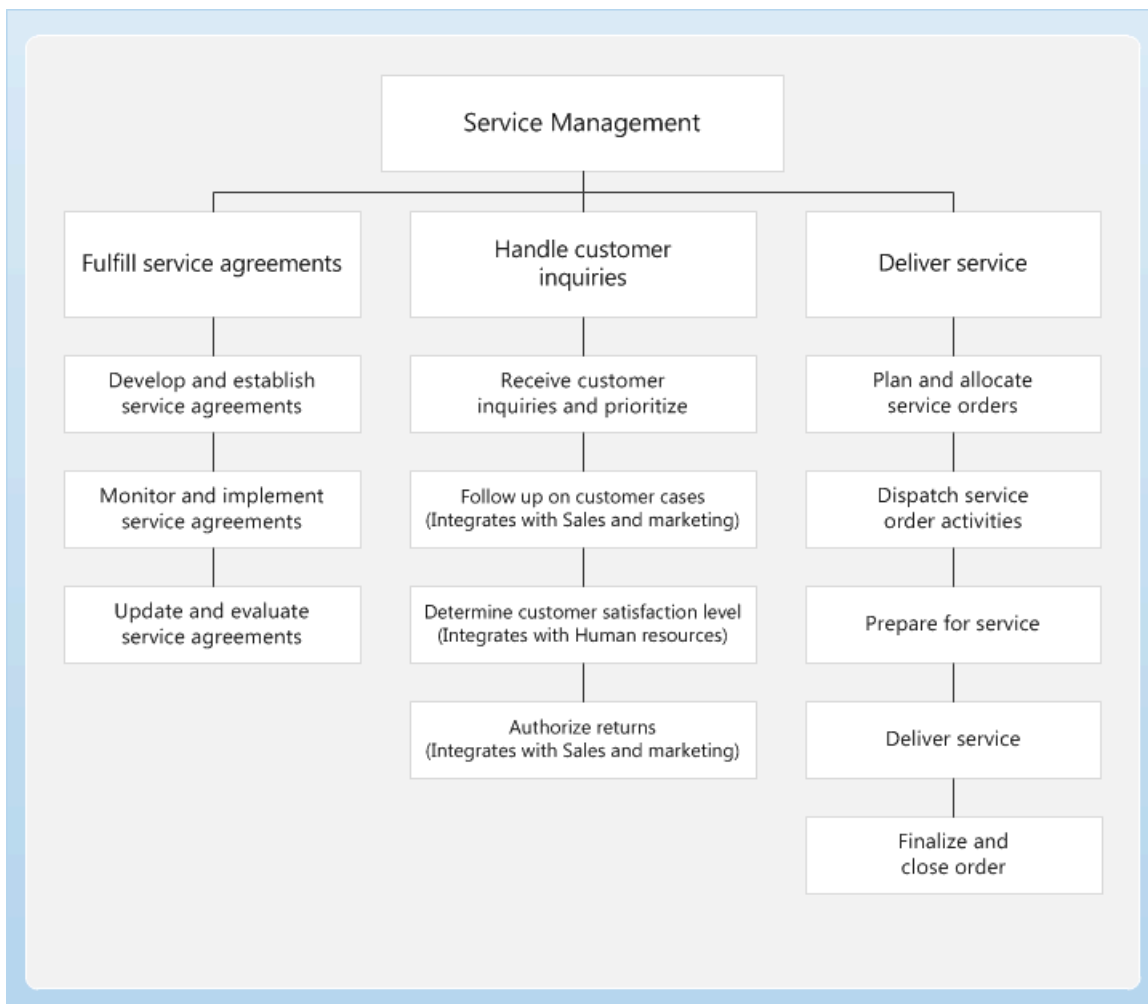
1. The hours of work that the service technician will perform
2. The type of service or repair
3. The item to repair, including details about the symptoms and diagnosis
4. Any expenses and fees related to the service or repair

You can receive, process, and dispatch service requests. After you have created a service order, you can use service stages to monitor progress and specify rules that control what actions are enabled in each stage. When a service order is complete, you can sign off on the order to confirm that it is complete, and then post the order to start the invoice process.

Use the reporting tools to monitor service order margins and subscription transactions, and print work descriptions and work receipts.

Business processes

The following diagram illustrates the high level business processes for **Service management**, and shows where service processes integrate with other modules.



Service management at a glance

IMPORTANT TASKS	PRIMARY PAGES	POPULAR REPORTS
Fulfill service agreements	Service agreements	Service order margin
Handle customer inquiries	Service orders	Work description
	Dispatch board	Transaction - subscription
		Subscription fee transactions

Integration of Service management

Service management can be integrated with the following modules:

- [Sales and marketing overview](#)
- [Human resources](#)

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Service agreements overview

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Service agreement groups are useful for sorting and filtering service agreements. Use service agreement groups to group service agreements by, for example, company size, geographical location, or industry type. Alternatively, you can use agreement groups to group service agreements by the level of service offered to a customer.

In the **Service agreement group** field in the **Service management parameters** page, you can define a default service agreement group. This group is suggested when you create a new service agreement.

Example

- You can group your service agreements according to the level of service offered.
- The three agreement groups you have set up in your company are Gold, Silver, and Bronze.
- A new service account manager has been employed in your company. The service manager is responsible for dealing with all clients in the Gold agreement group. You can filter agreement records on the Gold agreement group to find all of the agreements for which you must specify the new service manager as the person in charge.

Related topics

[Create service agreement groups](#)

NOTE

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Create service agreements

2/18/2021 • 2 minutes to read • [Edit Online](#)

This topic describes how to use features in the Service management and the Project management and accounting modules to create service agreements.

Create a service agreement from Service management

1. Navigate to **Service management**.
2. Select **Service agreements** to create a new service agreement line in the page header.
3. Select **New**. Enter a description, select a reference to a project in the **Project ID** field, and fill in the rest of the fields and lines for the service agreement. Select **Save**.
4. On the **Relations** tab, select **Service objects** or **Service tasks** to create service object relations or service task relations for the service agreement. The service objects and tasks that you have created relations for can be attached on the lines of the service agreement.
5. In the lower half of the page, create service agreement lines by copying lines from a service template, another service agreement, or manually creating the service-agreement lines.

NOTE

If you copy lines into the service agreement from another service agreement, you can indicate whether you also want to copy service object and service task relations. If you copy these relations, they are added to any existing relations on the service agreement. If you copy service-agreement lines from a service template, the service-object and service-task relations are automatically copied as service-object relations and service-task relations on the new service-agreement lines.

Create service agreement lines manually

1. From the **Service agreements** page, add a service agreement line in the lines grid.
2. Enter the appropriate information for the service agreement line.
3. Select **Save** to save the line, and then close the page.

Create a service agreement from Project

1. Select **Project management and accounting**.
2. Select **All projects**.
3. Select the project from the list.
4. On the **Action Pane**, select **Manage**. In the **New** Action group, select **Service** and select **Service agreement**.
5. Follow the steps in the section titled **Create a service agreement** as described earlier in this topic to enter the project reference.

Related topics

[Develop and establish service agreements overview](#)

NOTE

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Service intervals

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The service agreement interval indicates the frequency with which service order lines are created for service agreement lines when you create service orders automatically.

When you create service orders automatically, service order lines are created according to the interval that you have specified for the service agreement line from the start date of the agreement line.

If the **Interval** field of a service agreement line in the **Service agreements** page is blank, the line is a one-time event, and it is not used to create service orders repeatedly.

Example

This example illustrates how a service interval will affect service agreement lines and service order lines on a service order.

Create a service agreement

First, you create a service agreement and set the **Combine service orders** option to **By service agreement**.

1. Click **Service agreements**
2. On the **Action Pane**, on the **Service agreement** tab, in the **New** group, click **Service agreement** to create a new service agreement.
3. Enter a description, select a project in the **Project ID** field, and enter a date in the **Start date** field.
4. In the **Combine service orders** field, select **By service agreement**.

You have now created the following service agreement:

PROJECT	START DATE
Your project	The date you specified for the project. In this example, the current date is used.

Create a service agreement line

Next, you create a service agreement line that has the transaction type **Hour**.

To complete this part of the example, you must create a service interval of 10 days in the **Service intervals** page.

1. Select the service agreement that you just created.
2. On the **Lines** FastTab, click the **Add** button to create a new line in the lower pane of the **Service agreements** page.
3. In the **Transaction type** field, select **Hour**.
4. In the **Worker** field, select the worker who will deliver the service.
5. In the **Service interval** field, select the 10 days interval.

You have now created a service agreement line with the following information:

TRANSACTION TYPE	START DATE	SERVICE INTERVAL
Hour	The current date.	Every 10 days

TRANSACTION TYPE	START DATE	SERVICE INTERVAL
Worker	The worker who will perform the service.	

There is no time window specified for the line.

Create planned service orders

You can now create planned service orders and service order lines for the coming month.

1. In the **Service agreements** page, on the **Action Pane**, on the **Deliver** tab, click **Planned service orders**.
2. In the **Create service orders** page, enter the current date in the **From date** field and a date that is one month from the current date in the **To date** field.
3. Set the **Hour** slider to **Yes**.
4. Click **OK**.

Because there is no grouping on the service order (defined by the **By service agreement** option in the **Combine service orders** field), one service order line is created per service order.

Service orders created

Three service order lines have been created within the time frame that you specified in the **Create service orders** dialog box. You can view the service order lines in the **Service agreements** page (**Action Pane** > **Deliver** tab > **View** button).

Related topics

[Set up service intervals](#)

NOTE

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Set up service intervals

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Service interval indicates the frequency with which service order lines are created for service agreement lines when you create service orders.

1. Click **Service management > Setup > Service agreements > Service intervals**.
2. Create a new service interval.
3. Enter the ID and description of the service interval.
4. In the **Range** field, select the range.
5. In the **Frequency** field, type the frequency. The frequency is the factor by which you must multiply the range to obtain the interval for a service agreement.
6. Press **Alt+S** to save the service interval.

Example

You want to create a service interval of 10 days.

Create a 10-day service interval

1. Click **Service management > Setup > Service agreements > Service intervals**.
2. Create a new service interval.
3. Enter the ID and description of the service interval.
4. In the **Range** field, select **Daily**.
5. In the **Frequency** field, type 10.
6. Press **Alt+S** to save the service interval.

Related topics

[Service intervals](#)

NOTE

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Time windows

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You can use time windows to optimize the scheduling of service order lines. You can set up the system so that it automatically creates service orders. Based on the criteria specified by a time window, you can connect as many service order lines as possible to as few service orders as possible.

Time windows specify how far a service order line can move from its calculated date. The calculated date is the date when the service order line was scheduled to occur. The date is based on its interval setting and the service period that you defined in the **Create service orders** page. You define a time window by using the values in the following table.

METHOD	DESCRIPTION
Week	The date that the service order line can be moved to any open day in the same week as the initial calculated date.
Month	The date that the service order line can be moved to any open day in the same month as the initial calculated date. For example, the calculated date for a service order line is February 15, 2017. The service order line can be scheduled for any weekday between February 1 and February 28, 2017.
Manual	You define the maximum number of days before or after the initial calculated date that the service order line can be moved.

If you do not specify a time window for a service agreement line, the service order line that is derived from the service agreement must be on the exact date for which it was originally scheduled.

Related topics

[Create time windows](#)

NOTE

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Create time windows

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You can use time windows to optimize the scheduling of service order lines.

1. Click **Service management > Setup > Service agreements > Time window**.
2. Press **Alt+N** to create a new time window.
3. In the **Time window** field, enter a name for the time window.
4. In the **Description** field, enter a description for the time window.
5. In the **Method** field, select the method to be autocreated. If the method is of the **Manual** type, specify the number of days before or after the calculated date that the service order line can be moved.

Related topics

[Time windows](#)

NOTE

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Create a service template group

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You can use service template groups to sort and filter service templates.

1. Click **Service management** > **Setup** > **Service agreements** > **Service template groups**.
2. Create a new service template group.
3. Enter the group ID, a description, and a parent service template group, if there is one.
4. Save the service template group.
5. Set the **Tree control** slider to **Yes** to open the tree view and view the service template groups either as a hierarchy in a tree view or as an overview.

NOTE

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Service tasks overview

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Use service tasks to describe the task to be completed during a service order. Both technicians and customers can see this information.

You create service tasks in the **Service tasks** page, and you associate service tasks with a specific service agreement or service order by creating service task relations. Every time that you create a service task relation, you can create the following:

- Internal notes for the task, such as detailed technical requests for the task that are important for the technician to know.
- External notes that the customer can see. These might provide a less technical explanation of the task that is being completed, according to the agreement between the customer and the service company.

When you have set up a service task relation between a service task and a service order or service agreement, you can specify this service task when you create service order lines or service agreement lines for the current service order or service agreement.

When you generate service orders from a service agreement, you can use the service tasks that are assigned to each service agreement line to group service order lines into service orders.

Create a service task

1. Click **Service management > Setup > Service tasks**.
2. Create a new line.
3. Enter the service ID and description.

Example

A technician must complete two jobs on a gearbox (service object GB-1234) at a customer site. A service agreement is created for the customer, and several transactions are associated with the jobs. The service agreement and service agreement lines for the two jobs are as follows:

Service agreement

PROJECT	SERVICE AGREEMENT	DESCRIPTION	GROUP
9012	000008_001	Inspection and routine replacement – GB-1234	Premium

Service agreement lines

DESCRIPTION	TRANSACTION TYPE	SERVICE OBJECT	SERVICE TASK
Inspection and cleaning	Hour	GB-1234	I/C - GB1234
Travel	Expense	GB-1234	I/C - GB1234
Materials	Item	GB-1234	I/C - GB1234

DESCRIPTION	TRANSACTION TYPE	SERVICE OBJECT	SERVICE TASK
Routine replacement	Hour	GB-1234	RR - GB1234
GR-1	Item	GB-1234	RR - GB1234
GR-5	Item	GB-1234	RR - GB1234

The service agreement lines for the two jobs have two service tasks attached to them. The service tasks determine the transactions that belong to each job. In the first case, service task I/C - GB1234 identifies all the service agreement lines that are involved in the inspection and cleaning of object GB-1234. In the second case, service task RR - GB1234 identifies all the service agreement lines that are involved in completing a routine replacement job.

The service task relations that connect the service tasks to the specific agreement are as follows:

Service tasks

SERVICE TASK	DESCRIPTION	INTERNAL NOTE	EXTERNAL NOTE
I/C - GB1234	Inspection of gearbox GB-1234	Visual and mechanical inspection and cleaning of gearbox GB-1234	Routine inspection of gearbox
RR - GB1234	Routine replacement of parts in GB-1234	Routine service replacement of GR-1 and GR-5 components (for gearboxes manufactured before 2002, also replace GR-2 component)	Routine replacement of parts

Group service orders

When you create service orders automatically, you can use service tasks as grouping criteria. To group service orders by service tasks, define on the service agreement that service orders that are based on the service agreement should be grouped by service task ID as their initial grouping criteria.

Group by service task

1. Click **Service management > Common > Service agreements > Service agreements**.
2. On the **Setup** tab, select **By service task** in the **Combine service orders** field.

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Create service task relations

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You can associate service tasks with service agreements or service orders in order to describe the service task to be completed for the agreement or order. This information is available to service technicians and customers.

Create a relation with a service agreement

1. Go to **Service management > Common > Service agreements > Service agreements**.
2. Select an existing service agreement, or create a new service agreement.
3. On the Action Pane, select the **Service tasks** button.
4. On the **Service tasks** form, select **New** to create a new line, and then select a service task from the **Service task** list to attach the service task to the service agreement.
5. On the **Description** tab, enter any internal or external note descriptions in the free text fields.
6. Close the form to save the record.

Repeat this procedure until you have created all the necessary service task relations for the service agreement. You can now specify these service tasks for any attached agreement lines.

A service tasks relation that is created on a service agreement is available from all service orders that are attached to the service agreement.

Create a relation with a service order

1. Go to **Service management > Common > Service orders > Service orders**.
2. Select an existing service order, or create a new service order.
3. On the Action Pane, select the **Service tasks** button.
4. From the **Service tasks** form, select **New** to create a new line, and then select a service task from the **Service task** list to attach the service tasks to the service order.
5. On the **Description** tab, enter any internal or external note descriptions in the free text fields.
6. Close the form to save the record.

Repeat this procedure until you have created all the necessary service task relations for the service order. You can now select the service task for which you have created the relation when you create service order lines.

Service task relations that are created on a service order are available on the specific service order.

See also

[Service tasks overview](#)

NOTE

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Service objects overview

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Service objects are a customer's assets and products for which you can perform a service. Depending on the type of service you provide, objects can be tangible or intangible:

- Tangible objects are things, such as a machine or a building, on which you can perform a physical service task.

A tangible service object can also be an inventory item that you create in the Released product details form. Depending on the inventory dimension group that you attach to the item, you can create a service object to a level of detail that includes the item serial number. This is useful when you must keep track of the exact item that the service object represents.

A tangible service object can also be an item that is not directly related to a company's direct production or supply chain. For example, a tool kit that is used for repairs in a service order can be a service object that is not included in inventory. In this case, you don't register it as an inventory item.

- Intangible objects are nonphysical things, such as a set of accounts or a legal document, on which you can perform a service task.

Example of an intangible service object

Company A maintains the financial records for several small companies. One of Company A's clients is the local football team, for which Company A does the weekly bookkeeping and annual audit of the club's accounts. The club's accounts are set up in the Service objects form and specified as the object in the service agreement. There are two service agreement lines for the object. Line 1 is weekly bookkeeping with a weekly interval assigned to the line, and line 2 is the annual audit with a yearly interval assigned to it.

Related topics

[Create service objects](#)

NOTE

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Create service task relations

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You can associate service tasks with service agreements or service orders in order to describe the service task to be completed for the agreement or order. This information is available to service technicians and customers.

Create a relation with a service agreement

1. Go to **Service management > Common > Service agreements > Service agreements**.
2. Select an existing service agreement, or create a new service agreement.
3. On the Action Pane, select the **Service tasks** button.
4. On the **Service tasks** form, select **New** to create a new line, and then select a service task from the **Service task** list to attach the service task to the service agreement.
5. On the **Description** tab, enter any internal or external note descriptions in the free text fields.
6. Close the form to save the record.

Repeat this procedure until you have created all the necessary service task relations for the service agreement. You can now specify these service tasks for any attached agreement lines.

A service tasks relation that is created on a service agreement is available from all service orders that are attached to the service agreement.

Create a relation with a service order

1. Go to **Service management > Common > Service orders > Service orders**.
2. Select an existing service order, or create a new service order.
3. On the Action Pane, select the **Service tasks** button.
4. From the **Service tasks** form, select **New** to create a new line, and then select a service task from the **Service task** list to attach the service tasks to the service order.
5. On the **Description** tab, enter any internal or external note descriptions in the free text fields.
6. Close the form to save the record.

Repeat this procedure until you have created all the necessary service task relations for the service order. You can now select the service task for which you have created the relation when you create service order lines.

Service task relations that are created on a service order are available on the specific service order.

See also

[Service tasks overview](#)

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Attach inventory items to service objects

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This topic explains how to attach an inventory item to a service object. When you attach an item to a service object, you can control and report the service activities that are performed for the item.

Before you can attach items to service objects, you must create the items in the **Released product details** form.

Use the following steps to attach an inventory item to a service object:

1. Click **Service management > Setup > Service objects > Service objects**.
2. In the **Item number** field, select the item to attach to the service object.
3. Save the service object.

The item is now attached to the service object, and any inventory dimensions specified for the item are also copied to the service object.

See also

[Service objects overview](#)

NOTE

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Service object groups

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Object groups are useful for sorting and filtering the data about objects for reports and statistics. For example, you can group objects by geographical location or by type.

Group by geographical location

You can use this grouping method to show where the various different objects that your company services are located. Grouping objects by geographical location can also be useful if, for example, you must identify the objects that your company already provides services for in a particular country/region.

Example

A customer from Belgium calls your service center and wants to create a service agreement for an object, ABC. You have attached an object group for geographical location, Belgium, to all objects that are serviced in Belgium. By using this group as a filter, you can quickly search to see whether you already have a record for ABC in the program, or whether you must set up a new object.

Group by type

You can use this grouping method to show the types of objects that your company services. Grouping objects by type can also be useful if, for example, you want to create a new object based on similar objects that already exist in the program.

Example

A customer calls and wants to set up a service agreement for an air conditioning machine, HIJ. You do not already have a record for this machine. However, you have set up an object group titled Air Conditioners, and you have attached this group to all air conditioning objects. Therefore, you can quickly search for and identify all other air conditioning machines and use the template information from these objects to create service agreement lines for HIJ. By using object groups in this manner, you can quickly set up new objects and determine the service tasks that must be performed on them.

Create service object groups

Create groups that you can assign service objects to. Service objects are inventory items and other products for which services are performed. By grouping service objects, you can create reports for similar and related service objects. For example, a service object group might consist of two service objects: One service object is a kit, and the second service object is the service to install the kit.

To create service object groups, follow these steps:

1. Click **Service management > Setup > Service objects > Service object groups**.
2. Click **New** to create a new service object group.
3. Enter a unique name for the service object group and, optionally, a description.

You can assign service objects to the group by using the **Service objects** form.

See also

[Create service objects](#)

NOTE

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Set up template to represent objects at customer site

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Use this procedure to set up a template that represents objects at a customer site.

1. Click **Service management > Common > Service agreements > Service agreements**.
2. Double-click a service agreement, or click **Service agreement** to create a new service agreement.
3. Click the **Setup** tab.
4. Click **Service objects** to attach a template bill of materials (BOM) to the service agreement.
5. In the **Service objects** form, select a service object, and then click **Functions > Attach template BOM**.
6. In the **Select template BOM** form, select a template BOM in the **Template BOM** field, and then click **OK**.
7. In the **Service objects** form, click **Designer** to modify the template BOM so that the BOM represents the objects that you want.
8. Close the forms to save your changes.

See also

[Manage template BOMs on object relations](#)

NOTE

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Service object relations

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You can create service object relations between a service object and a service agreement or service order. When you create a relation, you attach the service object to the service agreement or service order.

After the relation is created, you can attach the service object to any lines on the service agreement or service order.

Template BOMs

You can also specify a template BOM for the object relation. The template BOM is a bill of materials for the object on which you perform service. If you replace a component part of the service object during a service visit, you can register this change in the service BOM by using the Service objects form.

Example

You create a service agreement for servicing two elevators at a customer site. The service agreement has the identifier ID SAL-001.

The elevators are set up in the Service objects form as objects, EL-S/1000 and EL-L/1000.

You attach the service objects, EL-S/1000 and EL-L/1000, to the service agreement.

You want to register changes in the BOM for the service object as you replace component parts of the object, so you attach a service BOM to the service object relation, as described in the following table.

SERVICE OBJECT	RELATION – SERVICE AGREEMENT	SERVICE BOM
EL-S/1000	ID SAL-001	BOM-EL-S/1000
EL-L/1000	ID SAL-001	BOM-EL-L/1000

Because there are service object relations for the agreement, you can now create service agreement lines with these objects, as shown in the following table.

TRANSACTION TYPE	CATEGORY	SERVICE OBJECT
Hour	Inspection	EL-S/1000
Hour	Gear box cleaning	EL-S/1000
Item	Cleaning materials	EL-S/1000
Hour	Inspection	EL-L/1000
Hour	Gearbox cleaning	EL-L/1000
Item	Cleaning materials	EL-L/1000

On a service visit, you have to replace the gearbox for elevator EL-S/1000. To replace a component part of the

object, you can access the BOM Designer by using the service object relation that you set up for the current service agreement.

Access the BOM Designer by using a service object relation

1. Service agreements
2. Double-click a service agreement, or click Service agreement to create a service agreement.
3. Click the Setup tab.
4. Click Service objects to attach a template BOM to the service agreement.
5. In the Service objects form, click Designer to open the Designer form to modify the template BOM.

Automatically created service orders

If you automatically create service orders for a service agreement, the service object relations in the agreement are also created in the service orders.

NOTE

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Create service object relations

2/18/2021 • 2 minutes to read • [Edit Online](#)

This topic describes how to create service object relations for a service agreement and a service order. When you create a service object relation, you associate the service object to a service agreement or service order. When a customer requests service for an item that is a service object, you can select the service object from the list of service object relations.

Create a service object relation for a service agreement

Use the following steps to create a service object relation for a service agreement:

1. Click **Service management > Common > Service agreements > Service agreements**.
2. In the **Service agreements** list, select an existing service agreement, or click **New** to create a new service agreement.
3. In the **Service agreements** form, on the **Action Pane**, on the **Service agreement** tab, in the **Relations** group, click **Service objects**.
4. In the **Service objects** form, click **New**, and then select a service object for this service agreement.
5. To assign a template bill of materials (BOM) to the service agreement, click **Functions**, and then select **Attach template BOM**. In the **Select template BOM** form, in the **Template BOM** field, select a template.

Create a service object relation for a service order

Use the following steps to create a service object relation for a service order:

1. Click **Service management > Common > Service orders > Service orders**.
2. In the **Service orders** list, select an existing service order, or create a new service order.
3. In the **Service orders** form, on the **Action Pane**, on the **Service order** tab, in the **Relations** group, click **Service objects**.
4. In the **Service objects** form, click **New**, and then select a service object for this service order.
5. To assign a template BOM to the service agreement, click **Functions**, and then select **Attach template BOM**. In the **Select template BOM** form, in the **Template BOM** field, select a template.

See also

[Service objects overview](#)

[Service object relations](#)

[Template BOMs](#)

NOTE

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Template BOMs

2/18/2021 • 4 minutes to read • [Edit Online](#)

A template bill of materials (BOM) provides you with a standardized list of components for service objects that are serviced regularly. The components that are listed in the template BOM represent the individual subcomponents of the service object. By applying a template BOM to a service object, you can keep a record of the subcomponents that have been replaced on the service object.

To apply a template BOM to a service agreement or a service order, you attach it to a service object relation.

NOTE

You can apply only one template BOM to a service object.

Create a template BOM

The following table contains information about the various methods that you can use to create a template BOM.

METHOD	DESCRIPTION
Production	The template BOM is based on a production order. This option is applicable only if you operate in a production environment. The benefit is that you have a current, detailed listing of the components that make up an item.
Item BOM	The template BOM is based on an item BOM. The item BOM, unlike the production BOM, is a static list of the components that make up an item.
Existing template	The template is based on an existing template BOM.
Manual	If you know what spare parts are typically replaced on a service object, you can create your template BOM manually. This method helps make sure that the components that are included in the template reflect the actual requirements of your workplace.

Apply the template BOM to a service agreement or service order

You can apply a template BOM to a service agreement, a service order, or both. The service agreement usually covers a long-term relationship with a customer. The history of replacements that is recorded in the service BOM is useful data to have for the service agreement.

You can also apply a template BOM to a service order to record the history of the service that has been performed on a service object.

Copy the history of a service BOM

You can copy the history of a service BOM line from one service agreement to another service agreement. By copying the service history between service agreements, you can preserve the record of replacements for an item.

Example

You have set up a three-year service agreement for a customer's car. During that period, the customer becomes accustomed to the good service that the company provides. Therefore, after the agreement expires, the customer wants to set up a new one. You are now able to negotiate a more favorable agreement for the company. Because the record of replaced components might be useful in the future, you copy the history of the service BOM to the new agreement.

Modify the template BOM

If a template BOM has not been attached to a service object, you can modify or delete lines in it. After the template BOM is attached to a service object, you can modify only the local version of the BOM. If you want to duplicate the setup of a local version of a template BOM, you can create a new template BOM based on the local version. For more information, see [Modify a Service BOM](#).

If you replace an item in the BOM, you can register the replacement on the BOM line in the BOM designer. Optionally, you can create a service order line for the replacement object. If you create a service order line, you can invoice the replacement item. If you do not create a service order line for a replacement, the replacement registration is kept to track the history of the service object.

Change how information on the BOM line is displayed

You can change the way that information on the BOM line is displayed for all template and service BOMs. The changes are applied to all template BOMs and service BOMs. This includes those that are attached to service objects.

Set up number sequences for template BOMs

To use template BOMs, you must set up two number sequences. Set up one number sequence for the template BOM and one for the BOM history line number.

NOTE

Number sequences are used to allocate identifiers to records that require them. Before you can assign a number sequence to a template BOM or a BOM history line number, you must set up number sequences codes.

Set up number sequences

1. On the **Number sequences** list page, create number sequences for template BOMs and the BOM history line number.
2. Click **Service management > Setup > Service management parameters**.
3. Click **Number sequences**, and then select a number sequence code for the number sequence references that you created in the **Number sequences** form.
4. Close the form to save your changes.

NOTE

The BOM history line number is used by the system to associate the transactions in the BOM history with a service agreement or service order. The number is not displayed in the user interface.

See also

[Create a template BOM](#)

[Manage template BOMs on object relations](#)

[Modify a Service BOM](#)

NOTE

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Create a template BOM

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You can create a template BOM by using any of the following methods. For all methods, the **From date** and **To date** fields are optional and for information only.

Create a template BOM manually

1. Go to **Service management > Setup > Service objects > Template BOMs**.
2. Select **New** to open the **Create template BOM** form.
3. Under **Copy BOM lines from reference**, select the **Manual** option.
4. In the **Item number** field, enter an item of the type **BOM**.
5. In the **Name** field, enter a name for the template.
6. In the **From date** and **To date** fields, enter a date interval in which the template BOM is active.
7. Select **OK**.

A new, blank template BOM is created.

Create a template BOM based on another template BOM

1. Select **Service management > Setup > Service objects > Template BOMs**.
2. Select **New** to open the **Create template BOM** form.
3. Under **Copy BOM lines from reference**, select the **Template BOM** option.
4. In the **Reference number** field, select an existing template BOM to copy to your new template BOM.
5. In the **Name** field, enter a name for the template.
6. In the **From date** and **To date** fields, enter a date interval in which the template BOM is active.
7. Select **OK**.

A new template BOM is created by using lines that correspond to the lines in the original template BOM.

Create a template BOM based on an item BOM

1. Select **Service management > Setup > Service objects > Template BOMs**.
2. Select **New** to open the **Create template BOM** form.
3. Under **Copy BOM lines from reference**, select **BOM**.
4. In the **Reference number** field, select a BOM version. An item of the type BOM is copied to the **Item number**.
5. In the **Name** field, enter a name for the template.
6. In the **From date** and **To date** fields, enter a date interval in which the template BOM is active.
7. Select **OK**.

A new template BOM is created by using lines that correspond to the lines of the BOM listed in **Bills of materials**.

Create a template BOM based on a production BOM

1. Select **Service management > Setup > Service objects > Template BOMs**.
2. Select **New** to open the **Create template BOM** form.
3. Under **Copy BOM lines from reference**, select **Production**.
4. In the **Reference number** field, select a production BOM.
5. In the **Name** field, enter a name for the template.
6. In the **From date** and **To date** fields, enter a date interval in which the template BOM is active.
7. Select **OK**.

A new template BOM is created by using lines that correspond to the lines of the BOM listed in **BOM**.

See also

[Template BOMs](#)

NOTE

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Attach templates to service objects

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A template bill of materials (BOM) can be attached to a service object relation. The service object relation can then be associated with either service orders or service agreements.

1. Click **Service management > Setup > Service objects > Service objects**.
2. Select a service object.
3. Click **Service agreements** or **Service orders** to display the service agreements or service orders that the service object has been associated with.
4. Select a service agreement or a service order, click **Functions**, and then click **Attach template BOM**.
5. Select the template BOM to attach to the object.

TIP

To move an attached BOM to another service object or to delete an attached BOM, in the **Service objects** form, click **Functions**, and then click **Move service BOM** or **Delete service BOM**.

See also

[Create service objects](#)

NOTE

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Reason codes for service orders

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You can use reason codes to help explain the status of a service order when the stage of a service order is updated. For example, if you cancel a service order, you can select a reason code for the cancellation.

To view information about reason codes that are used to track the progress of service orders, run the Service order progress report. This report lists all service orders, regardless of their stage, and the reason codes that are specified when a service order stage is updated.

Turn reason codes on or off

Reason codes are optional. You can decide whether to require a reason code when you update a service order to a specific service stage.

1. Click **Service management > Setup > Service orders > Service stages**.
2. In the **Service stages** form, select a service stage, and then select the **Reason** check box for the service stage.
3. Close the form to save your changes.

See also

[Set up service order stages](#)

NOTE

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Service order stages

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You can set up stages for a service order to define the tasks that must be completed, the order in which they are completed, and the workers who are responsible for completing them. By defining the stages for a service order and assigning them to workers, you can control the flow of a service order through the tasks that various people perform in the service organization. The sequence of stages must include an initial stage.

You can also define the actions that are permitted at each stage. For example, if you clear the **Post** check box for all stages except the final stage, you prevent any service orders from being posted before the service orders are processed through the complete sequence of stages.

Branching in service order stages

When you set up a service stage, you can create multiple options, or branches, to select from for the next service stage. All the branches that you create are available to select from when the initial stage is completed. For example, you set up **Planning** as an initial stage. You create two stages named **In process** and **Cancel**, and then select **Planning** as the parent for them. You assign the **Planning** stage to sales order. When the planning stage for the sales order is completed, you can select the **In process** stage if the sales order is ready to work on, or you can select the **Cancel** stage if the sales order is canceled.

See also

[Set up service order stages](#)

[Change the service order stage](#)

NOTE

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Set up service order stages

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1. Go to **Service management** > **Setup** > **Service orders** > **Service stages**.
2. Select **New** to create a new record.
3. In the **Service stage** and **Description** fields, specify a service stage ID and description.
4. Select the appropriate parameters for the stage.
5. Select the parent stage for the current stage or leave the **Parent** field blank if the stage is the initial stage in the stage setup.

NOTE

You cannot modify the **Parent** field after you save the stage. Instead, you can delete the record and create the record again with a different selection in the **Parent** field.

Also, you can only create one stage with a blank **Parent** field. That is, only one initial stage is permitted.

NOTE

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Create reason codes

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1. Go to **Service management** > **Setup** > **Service orders** > **Stage reason codes**.
2. Select **New** to create a new reason code.
3. Select **Save** to save the reason code.

When you are prompted for a reason code to explain why you are updating a stage of the service order, you can select any of the reason codes that you create here.

NOTE

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Service level agreements overview

2/18/2021 • 2 minutes to read • [Edit Online](#)

A service level agreement (SLA) is an agreement between a service company and a service customer. In a SLA, the customer agrees to a minimum response time based on when the service company records the issue and when the issue is resolved.

A SLA enforces a standard level of service that is offered to customers, and also makes it transparent to a service company when a service job should be completed.

Any number of SLAs can be created to offer service customers different levels of service.

Create a service level agreement

1. Click **Service management > Setup > Service agreements > Service level agreements**.
2. Type a name for the service level agreement in the **Service level agreement** field.
3. Type the time that you want to allow for completion of service calls that are attached to the service level agreement. Then select a calendar if you want to base the service level agreement on a specific calendar.

Apply a service level agreement

The SLA is applied directly to a service agreement.

Service orders that you create manually and attach to a service agreement that has an SLA are measured against that SLA.

Service orders that you create automatically are not attached to an SLA.

Apply the service level agreement to the service agreement

1. Click **Service management > Common > Service agreements > Service agreements**. Select the service agreement that you want to apply the SLA to, and then click **Edit** on the **Action Pane**.
2. In the **Service level agreement** field, select the SLA that you want to assign.

Apply the service level agreement to the service agreement group

1. Click **Service management > Setup > Service agreements > Service agreement groups**.
2. In the **Service level agreement** field, select the SLA that you want to assign.

Track time on a service order against an SLA

When you create a new service order for a service agreement that an SLA is assigned to, the time interval for the delivery of the service is initiated, and the system starts to track the delivery time. Additionally, you can set the following options:

- You can start and stop time recording on the service order to register the total amount of time that is spent on service orders.
- You can monitor compliance with the time interval that is set in the service level agreement.

- You can define reason codes that must be set if the time interval of the service level agreement is exceeded.

See also

[View compliance with service level agreements](#)

NOTE

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Subscription sales prices

2/18/2021 • 3 minutes to read • [Edit Online](#)

When you create a subscription, the sales price is derived from the sales price setup that was created in the **Sales price (subscription)** form.

In the **Sales price (subscription)** form, you can create sales prices for a specific subscription or you can create sales prices that apply more broadly. For a sales price to be applied to a subscription, the period code and the currency of the subscription must be identical to the period code and the currency of the sales price.

If the period code and currency are identical for the subscription and the sales price, subscription sales prices are selected on the basis of the priorities listed in the following table. A blank cell in the table indicates an empty field and an X indicates a value that is equal to the value in the subscription from which the transaction is generated.

PRIORITY	CATEGORY	PROJECT ID	SUBSCRIPTI ON	SALES CURRENCY	PERIOD CODE
1	X	X	X	X	X
2		X	X	X	X
3	X		X	X	X
4			X	X	X
5	X	X		X	X
6		X		X	X
7	X			X	X
8				X	X

When a subscription fee is created, the sales price with the greatest level of detail, as noted in the table above, is selected as the subscription sales price.

Update and index subscription sales prices

You can update the subscription sales price by updating the base price or the index. You can update by a percentage or to a new value.

Subscription fee sales prices

When you create a subscription fee, the sales price is based on the sales price setup of the subscription. You can

either use the base price from the subscription price setup or create indexed sales prices.

Example

You want to set up subscription sales prices of EUR 500 for a new project 9030. In the **Sales price (subscription)** form, you create a subscription sales price line as indicated in the following table.

VALID FROM	CATEGORY	PROJECT	SUBSCRIPTION	PERIOD CODE	SALES CURRENCY	SALES PRICE
28-08-2006		9030		Month	EUR	500

Note that the **Category** and **Subscription** fields are empty.

You then create the following subscriptions.

SERVICE SUBSCRIPTION	PROJECT	SUBSCRIPTION GROUP	CATEGORY	CURRENCY	PERIOD CODE
00020_135	9030	Sub1	SubCat1	EUR	Monthly
00021_135	9030	Sub1	SubCat2	EUR	Monthly

Now you create subscription fees for both subscriptions in the subscription group Sub1:

1. Click **Service management > Setup > Service subscriptions > Subscription groups**.
2. In the **Subscription groups** form, click **Function > Create subscription fee**.
3. In the **Create subscription fee** form, enter the appropriate information. For more information, see [Create subscription fee transactions](#).

Subscription fees that have a sales price of EUR 500 are created for both subscriptions, as shown in the following table.

PROJECT DATE	SERVICE SUBSCRIPTION	PROJECT	CATEGORY	START DATE	END DATE	SALES CURRENCY	SALES PRICE
28-08-2006	00020_135	9030	SubCat1	01-01-2007	31-03-2007	EUR	500
28-08-2006	00021_135	9030	SubCat2	01-01-2007	31-03-2007	EUR	500

Later, you decide that you want to specify sales prices for the category SubCat1 for project 9030. Therefore, you create a new sales price line that has a sales price of EUR 550 for the combination of project 9030 and fee category SubCat1. There are now two subscription sales price lines for project 9030, as shown in the following table.

VALID FROM	CATEGORY	PROJECT	SUBSCRIPTION	PERIOD CODE	CURRENCY	SALES PRICE
28-08-2007		9030		Month	EUR	500
28-08-2007	SubCat1	9030		Month	EUR	550

You repeat the procedure described above to create subscription fees for both subscriptions in the subscription group Sub1. The following table shows the transactions that are created for each subscription that is attached to the subscription group.

PROJECT DATE	SUBSCRIPTION	PROJECT	CATEGORY	START DATE	END DATE	SALES CURRENCY	SALES PRICE
28-07-2007	00020_135	9030	SubCat 1	01-01-2008	31-03-2008	EUR	550
28-07-2008	00021_135	9030	SubCat 2	01-01-2008	31-03-2008	EUR	500

In the first transaction for subscription 00020_135, the sales price of EUR 550 derives from the subscription sales price that is set up for the combination of the specific project and category. In the second transaction for subscription 00021_135, the sales price of EUR 500 is used as the project subscription sales price because there is no price set up for the combination of project 9030 and category SubCat2.

See also

[Update and index subscription sales prices](#)

NOTE

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Subscription groups

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Subscriptions share the following information, which is defined for the subscription group:

- Number sequence code for the subscription, if any.
- The invoicing period for which subscription transactions are created. For example, if the **Invoicing** period code in the **Subscription groups** form is set to **Quarterly**, transactions for all subscriptions that are attached to the subscription group are created on a quarterly basis.
- How frequently the subscription is to be accrued, if at all.

You can also complete the following tasks for all subscriptions that are attached to the subscription group:

- Create subscription transactions.
- Update the base price or the index for the subscriptions.
- Post accrued revenue for subscription transactions.

See also

[Subscription groups \(form\)](#)

[Set up subscription groups](#)

NOTE

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Set up subscription groups

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1. Go to **Service management > Setup > Service subscriptions > Subscription groups**.
2. Select **New** to create a new subscription group.
3. In the **Subscription group** field, enter a name for the new subscription group.
4. In the **Invoicing** field, select an invoicing frequency for the subscription. The invoicing frequency is indicated by a period code that is set up in the **Period types** form.
5. To accrue revenue for subscription transactions, select the **Accrue revenue** check box, and then in the **Accrual** field, select a frequency. The accrual frequency is based on a period code that is set up in the **Periods** form.

See also

[Subscription groups \(form\)](#)

[Subscription groups](#)

NOTE

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Use stage reason codes

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You use a reason code to indicate why a service level agreement (SLA) has been canceled, or why a service order has exceeded the time limit that is you define in the SLA.

You can also specify that a reason code is required when an SLA is canceled, or when the time limit exceeds the time that is specified in the SLA for the service order.

If you have specified that a reason code is required, you must enter a reason code in the following situations:

- When a service order is moved to a stage that stops time recording against the SLA for the service order.
- When the service order is signed off.
- When time recording is manually stopped.

Set up reason codes

1. Click **Service management > Setup > Service orders > Stage reason codes**.
2. In the **Stage reason codes** form, click **New** to create a new reason code.
3. In the **Stage reason code** field, enter a unique stage reason code.
4. In the **Description** field, enter a description of the stage reason code.
5. Close the form to save your changes.

Require reason codes when a service level agreement is canceled

1. Click **Service management > Setup > Service management parameters**.
2. In the **Service management parameters** form, click the **General** link, and then select the **Reason code on canceling** check box.

Require reason codes when the a service order exceeds the time limit that is set by the service level agreement

1. Click **Service management > Setup > Service management parameters**.
2. In the **Service management parameters** form, click the **General** link, and then select the **Reason code on exceeding time** check box.

See also

[Start and stop time recording on a service order](#)

NOTE

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Integration for service agreements and projects

2/18/2021 • 2 minutes to read • [Edit Online](#)

When you work with service agreements and service agreement lines, you use data that is set up in the following areas in **Project management and accounting**.

Project prices

The cost and the sales price for a service agreement transaction are derived from the cost price setup that applies to the project that is attached to the service agreement. Cost and sales prices can be set up by project, employee, and category.

Project validation

The projects, employees, and categories that are available for selection on a service agreement line can be limited by the validation setup in **Project management and accounting**. By using the validation setup, you can combine employees, projects, and categories for control access.

Project line properties

A line property is entered automatically for a service agreement line.

Line properties are created in the **Line properties** form in **Project management and accounting**. The line property that is entered on a service agreement is attached to the project that is selected for the service agreement and inherited subsequently by the service agreement line.

Default offset accounts

If you enter an expense transaction, a default expense offset account is selected automatically for the transaction. The default expense account is set up for the project that is attached to the current service agreement.

Project categories

The categories that are available for service agreement lines are set up in the **Project categories** form in **Project management and accounting**.

NOTE

Categories that have the **Active in journals** check box selected on the **Project** tab in the **Project categories** form are available for selection. However, if the **Inactive categories** check box is selected on the **Journals** tab in the **Project management and accounting parameters** form, all categories are available for selection.

Project parameters

If the **Terminated workers** field on the **Journals** tab in the **Project management and accounting parameters** form is selected, you can select inactive employees and active employees in the **Service agreements** and **Service orders** forms.

Also, you can enable the **Start time** and **End time** fields on the **Project** tab in the **Service orders** form to enter starting and ending times on service order lines.

Enable the starting and ending time feature for service orders

1. Click **Project management and accounting > Setup > Project management and accounting parameters**.
2. Click the **Journals** tab, and then select the **Show start/end times** check box.
3. Click **Project management and accounting > Setup > Journals > Journal names**.
4. Select the journal name that is attached to the service order.
5. Click the **General** tab, and then select the **Show start/end times** check box.

NOTE

Select the journal name for the service order in the **Hour** field on the **Journals** tab in the **Service management parameters** form.

NOTE

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Repair management

2/18/2021 • 3 minutes to read • [Edit Online](#)

For repair management you can group problems systematically. This is to help with the suggestion of solutions that have been successful in the past.

You set up symptoms, diagnosis, and resolution settings. All these can later be applied when you receive a similar item for repair. You can also set up repair stages that can follow the progress of a repair issue.

Setting up repair management

Use the following setup forms to enter information that will be used to specify the symptoms, the diagnosis, and the resolution, of the repair.

- **Service management > Setup > Repair > Conditions.**
- **Service management > Setup > Repair > Symptom areas.**
- **Service management > Setup > Repair > Diagnosis areas.**
- **Service management > Setup > Repair > Resolutions.**
- **Service management > Setup > Repair > Repair stages.**

Symptoms and conditions

Symptoms are how the customer characterizes the problem. Symptoms include the customer observations that indicate the need for repair.

You can set up symptom areas, symptom codes, and conditions. The symptom area covers the area of malfunction, and the symptom code covers the malfunction symptom. The condition describes the situation or environment that is present when the problem occurs.

Example

A computer is brought in for repair because the hard drive fails after an extended period of use. The hard drive failure causes a blue screen error. The technician who receives the computer enters the following symptoms and conditions:

1. The symptom area is the hard drive
2. The symptom code is the blue screen error
3. The condition is that the hard drive fails after extended use

Diagnosis and resolutions

The diagnosis and resolution fields are statements from the repair perspective. These are the steps that a technician went through to investigate the problem.

The diagnosis area covers the operation that must occur to solve the issue. The diagnosis code is how the problem was handled, and the resolution could be that the item was repaired, replaced, or the order was canceled by the customer. For example, if the computer is repaired, the diagnosis area could be "defective part," the diagnosis code could be "new video card installed," and the resolution could be "replaced."

Repair stages

Repair stages state the progress of the repair process. The repair stage has a **Finished** sign-off parameter that indicates that the repair line has been completed, and the finishing date and time has been recorded.

Applying repair management

To apply repair management to an item, the item must be set up with a service object relation on a service order. From the service order you can then create a repair line with information about the current issue. On the repair line you define the service object that is in repair and information about symptoms, diagnosis, and execution. You can also create a note for the repair line.

You can create repair lines for each step in the repair process.

Create a repair line on a service order

1. Go to **Service management > Common > Service orders > Service orders**.
2. Select the service order with the service object that needs repair.
3. Select **Repair > Repair lines** to open the **Repair lines** form.
4. Select **New** to create a new line.
5. Select a service object. You can select any service object that has been set up with an object relation on the service order.
6. Select any of the preset symptoms, diagnosis, and execution values that are relevant in the repair line and then select the **Note** tab to create a note on the repair line, if needed.
7. Select **Save** to save the new repair line. The **Created date and time** field in the **General** tab of the **Repair lines** form is updated with the time of saving.

Tracking progress and resolving a repair issue

You can set the repair stages of a repair line to track the progress of the repair.

When a repair issue is resolved, you can close the repair line. Set the repair stage to a stage with a **Finished** property enabled. The current date and time is registered as the finish time on the line.

Close a repair line for a resolved issue

1. Open the **Repair lines** form. Follow the procedure earlier in this topic to create a repair line.
2. Select the repair line with the repair issue that you want to close.
3. In the **Repair stage** field, select a stage with the **Finished** property enabled.

NOTE

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Customer returns overview

2/18/2021 • 2 minutes to read • [Edit Online](#)

Create and use return reason codes and disposition codes to support the process for returning products.

Use a return reason code to describe the reason that the customer wants to return an item. You can assign a reason code in the **Create return orders** form.

Assign a disposition code when an item is received or during the physical inspection of a returned item. You can use disposition codes to describe the condition of the item. You can also use disposition codes to indicate whether additional action is required for the transaction. For example, create disposition codes for the following actions:

- Scrap the returned item and provide a replacement item to the customer.
- Return the item to inventory and credit the customer for the cost of the item.
- Repair the item and return it to the customer.

See also

[Set up return reason codes](#)

[Set up disposition codes](#)

NOTE

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Set up disposition codes

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You can set up disposition codes to specify how to process an item that is returned by a customer. For example, create a disposition code named **Repair and return** to indicate that the returned item will be repaired and then returned to the customer. For more examples of disposition codes that are typically used for items that are returned by customers, see [Specify how to dispose of returned items](#).

You can also set up a reason code to help explain why an item was returned. For more information about reason codes, see [Set up return reason codes](#).

1. Go to **Sales and marketing > Setup > Sales orders > Returns > Disposition codes**.
2. Select **New** to create a new disposition code.
3. Enter a unique, descriptive name, select an action, and enter a description for the disposition code.
4. If you want to associate any customer charges with this disposition code, select the **Charges** button to open the **Set up charges** form.
5. If you want to define any external codes to match with the company's own disposition codes, select the **External codes** button to open the **External codes** form.

See also

[Customer returns overview](#)

[Disposition codes \(form\)](#)

[Auto charges \(form\)](#)

[External codes \(form\)](#)

NOTE

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Set up return reason codes

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Set up return reason code groups

1. Go to **Sales and marketing > Setup > Sales orders > Returns > Return reason code groups**.
2. Select **New** to create a line for a new return reason code group.
3. In the **Return reason code group** field, type an identifier for this group.
4. In the **Description** field, type a brief phrase to explain how this group will be used.

Set up return reason codes

This procedure helps you set up return reason codes that you can use to indicate why a product was returned by the customer.

1. Go to **Sales and marketing > Setup > Sales orders > Returns > Return reason codes**.
2. Press CTRL + N to create a new return reason code line.
3. In the **Return reason code** field, enter text to identify this code.
4. In the **Description** field, enter text to describe the return reason code.
5. Use the **Return reason code group** drop-down list to add the code to a return reason code group.

See also

[Return reason code groups \(form\)](#)

[Return reason codes \(form\)](#)

NOTE

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Specify how to dispose of returned items

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When you handle a return order, you must specify a reason return code to identify why the product is being returned. You must also specify a disposition code and a disposition action to determine what should be done with the returned product itself.

A disposition code can be applied when you create the return order, register item arrival or packing-slip update an item arrival, and end a quarantine order.

You can define any disposition codes that you need in order to support the business processes. The following table provides a set of typically used codes to assign return-item disposition.

DISPOSITION TYPE	COMMON CODE	DESCRIPTION
Disposal	SC	Scrap/Destroy
Disposal	DC	Donate to Charity
Disposal	TD	Third-Party Disposal
Disposal	SL	Salvage
Disposal	TS	Third-Party Sale (Secondary Markets)
Repair/Modify	RW	Rework
Repair/Modify	RF	Remanufacture/Refurbish
Repair/Modify	MD	Modify
Repair/Modify	RP	Repair
Repair/Modify	RV	Return to Vendor
Other	AI	Use as is
Other	RS	Resale
Other	EX	Exchange

Other	MS	Miscellaneous

For each disposition code that you define, you must select a disposition action. The disposition action determines the physical and financial implications of the disposition codes. For example, the disposition action determines the physical handling of the returned item, the financial effect of the returned item, and if a replacement item must be sent to the customer. You can define an unlimited number of disposition codes according to your business needs, but there are only six predefined disposition actions that you can select from. The following table provides the disposition actions and their definitions.

DISPOSITION ACTION	DESCRIPTION
Credit	Return the item to inventory and credit the customer.
Credit only	Credit the customer without requiring or expecting the item to be returned.
Scrap	Scrap the item and credit the customer.
Replace and credit	Return the item to inventory, create a replacement order, and credit the customer.
Replace and scrap	Scrap the item, create a replacement order, and credit the customer.
Return to customer	Reject the returned item and return it to the customer.

Select a disposition code for a quarantine order

1. Click **Inventory management > Periodic > Quality management > Quarantine orders**.
2. For an existing quarantine order, select an action from the **Disposition code** field on the **Overview** tab.

See also

[Quarantine order \(form\)](#)

[Disposition codes \(form\)](#)

NOTE

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Work with customer service overview

2/18/2021 • 2 minutes to read • [Edit Online](#)

Customer service supports professional, service-based companies and manufacturing service organizations.

Customer service includes the following functionality:

- Key processes for service management, such as service agreements, service orders, and return management
- An advanced setup for repair management that includes tracking of repairs and versioning for bills of materials (BOMs)
- Support for employee roles, such as service manager, dispatcher, and service technician or service consultant
- Service subscriptions, which can generate periodic streams of revenue that are independent of the frequency of service
- Service-level agreements that support a differentiated customer base

The topics in this section provide an overview of the Customer service business process and each business process component. They also list the forms that are associated with each business process component, and they discuss the tasks that are associated with each business process component.

NOTE

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Fulfill service agreements overview

2/18/2021 • 2 minutes to read • [Edit Online](#)

This topic provides an overview of the tasks to fulfill service agreements. The topic also lists the forms that are associated with each business process component and discusses the tasks that are associated with each business process component.

Forms for the Fulfill service contracts business process components

The following table lists the forms that support the Fulfill service contracts business process components. The table entries are organized first by task, and then alphabetically by the name of the form.

NOTE

To open some of the forms in the following table, you must enter information or parameter settings.

BUSINESS PROCESS COMPONENT TASK	FORM NAME	USAGE
Develop and establish agreement	Service agreements	Create and maintain service agreements.
	Subscription	Create and maintain service subscriptions.
Monitor and implement agreement	Change service stage	Select the next stage in the workflow for a service order.
	Service orders	Create and maintain service orders.
Update and evaluate contract	Cancel service level agreement	Cancel the service level agreement on a service order.
	Cancel service orders	Cancel service orders, or reverse the Canceled status of service orders.
	Index subscription	Update the base prices and indexes for subscriptions.

NOTE

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Develop and establish service agreements overview

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Service agreements let you define the resources that are used in a typical service visit and how those resources are invoiced to the customer.

Every service agreement is attached to a project through which transactions are posted and invoiced. However, you can also invoice service order transactions directly through the project without first having to connect the service order to a service agreement. You might decide to do this if the service order is for a one-time-only service visit and the need for processing the service transactions quickly outweighs the need for maintaining detailed service-agreement information about the customer over a period of time.

Service agreement

In each service agreement, you must specify a project, a service-agreement ID, and a service-agreement group. The service-agreement group can be used to sort and organize service agreements.

A service agreement header contains settings that apply to all attached agreement lines:

- Whether the service agreement is suspended. If the service agreement is suspended, you cannot generate service orders from the service agreement.
- The duration of the service agreement.
- How service-order lines are to be combined into service orders.
- Whether the service agreement is a template.

In the service-agreement header, you also set up all the service objects and service tasks that can be used with the service agreement by entering the specific service tasks or service objects that are to be attached to the various lines of the agreement.

From the service-agreement header, you can also copy service-agreement lines or service-template lines into the current service agreement.

You can suspend service agreements and stop individual service agreement lines.

If you select the **Suspended** check box on a service agreement, you cannot:

- Create service orders automatically or manually from the service agreement.

If you select the **Stopped** check box on a service agreement line, you cannot:

- Create service orders automatically or manually from the service agreement line.
- Copy the service agreement line into another service agreement or service order.

NOTE

If a service agreement is suspended, all the attached lines are stopped, regardless of their individual status.

Service-agreement lines

Each service-agreement line describes in detail the content of the proposed service work. The lines contain the following settings:

- The transaction type and the description of the transaction type.
- The employee who performs the service work.
- The objects on which service must be performed for the service agreement.
- The frequency with which work is performed and associated item, expense, and fee transactions are registered.
- The time window within which service-order lines can be grouped into a service order.
- The service tasks that are used to group sets of agreement lines together into work tasks and to summarize for service technicians and customers what service task is to be provided.
- Whether a line is stopped. If a line is stopped, you cannot create service orders for that individual line.
- Project settings, such as the category and the line property.

Related topics

[Create service agreements](#)

NOTE

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Create service agreements

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This topic describes how to use features in the Service management and the Project management and accounting modules to create service agreements.

Create a service agreement from Service management

1. Navigate to **Service management**.
2. Select **Service agreements** to create a new service agreement line in the page header.
3. Select **New**. Enter a description, select a reference to a project in the **Project ID** field, and fill in the rest of the fields and lines for the service agreement. Select **Save**.
4. On the **Relations** tab, select **Service objects** or **Service tasks** to create service object relations or service task relations for the service agreement. The service objects and tasks that you have created relations for can be attached on the lines of the service agreement.
5. In the lower half of the page, create service agreement lines by copying lines from a service template, another service agreement, or manually creating the service-agreement lines.

NOTE

If you copy lines into the service agreement from another service agreement, you can indicate whether you also want to copy service object and service task relations. If you copy these relations, they are added to any existing relations on the service agreement. If you copy service-agreement lines from a service template, the service-object and service-task relations are automatically copied as service-object relations and service-task relations on the new service-agreement lines.

Create service agreement lines manually

1. From the **Service agreements** page, add a service agreement line in the lines grid.
2. Enter the appropriate information for the service agreement line.
3. Select **Save** to save the line, and then close the page.

Create a service agreement from Project

1. Select **Project management and accounting**.
2. Select **All projects**.
3. Select the project from the list.
4. On the **Action Pane**, select **Manage**. In the **New** Action group, select **Service** and select **Service agreement**.
5. Follow the steps in the section titled **Create a service agreement** as described earlier in this topic to enter the project reference.

Related topics

[Develop and establish service agreements overview](#)

NOTE

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Service subscriptions

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Subscriptions are based on a time-and-materials project. You can create subscriptions from a project, from the **Service subscriptions** page, or by using a service subscription group.

For each subscription, you can create an optional number of subscription fees. The subscription fees are the transactions that you invoice to the customer.

A period code indicates the extent of the subscription fee period, or the intervals at which the subscription should be invoiced.

The period code is defined in the service subscription group. It is defined for the subscriptions through the service subscription group. Any new subscription fee that you create has a suggested start date. This is the start date of the period, if it is the first period that is created, or the end of the previous period, if it is the second or later period.

NOTE

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Service templates

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You can define a service agreement as a template and copy the lines of the template later into another service agreement or into a service order.

Example

A customer for whom you provide service has identical service elevators at five different locations.

You want to set up five service agreements for the customer, one for each site. To limit repetitive setup work, and to make sure that the setup information in the service agreements is identical, you create a service agreement and specify it as a template for the service work on the elevators.

You can now copy the template lines into the five new service agreements, so that each service agreement is populated with the lines from the template.

Create a template

When you create a service template, you create a service agreement, create the required lines on it, and attach the service agreement to a service-template group.

NOTE

A service agreement can be defined as a template only if it has no service orders attached to it. Also, no service orders can be generated from a service agreement that is defined as a template.

Copy template lines

You can copy template lines from a service template into another service agreement or into a service order.

When you copy template lines into your service orders or service agreements, your template groups are displayed in a tree view in which each group can be expanded. This display lets you view each template and template line.

It is easier to determine the service-template lines that you want to copy if you have grouped the templates under names that reflect the use of the templates.

Related topics

[Copy service templates lines](#)

NOTE

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Copy service templates lines

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Template information can be copied to either a service agreement or a service order.

Copy service template lines into a service agreement

1. Click **Service agreements**.
2. Double-click a service agreement to open the **Service agreements** page.
3. Click **Template lines** to open the **Copy service template lines** page.
4. On the **Tree control** tab, expand the tree, find the template that contains the lines that you want to copy to the service agreement, and then select the service template.
5. On the **Lines** tab, select the **Select** check box for the service template lines that you want to copy.
6. Click **OK**.
7. Close the pages to save your changes.

The service template lines are now copied to the service agreement, together with the attached service object and service task relations.

Copy service template lines into a service order

1. Click **Service orders**.
2. Double-click a service order to open the **Service orders** page.
3. Click **Copy > Copy template lines** to open the **Copy service template lines** page.
4. On the **Tree control** tab, expand the tree, find the template that contains the lines that you want to copy to the service order, and then select the service template.
5. On the **Lines** tab, select the **Select** check box for the service template lines that you want to copy.
6. Click **OK**.
7. Close the pages to save your changes.

The service template lines are now copied to the new service order, together with the attached service object and service task relations.

Related topics

[Service templates](#)

NOTE

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Change the service order stage

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Follow these steps to move a service order to the next stage in the service workflow or revert it to a previous stage.

1. Click **Service management** > **Common** > **Service orders** > **Service orders**.
2. Select the service order, and then click the **Dispatch** tab.
3. On the **Action Pane**, click either **Next stage** or **Previous stage**.
4. In the **Change service stage** form, select the appropriate stage.

NOTE

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Manage template BOMs on object relations

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Attach a template BOM to a service object

1. Click **Service management > Common > Service agreements > Service agreements**.
2. Double-click the service agreement in which you want to attach a template BOM to an object relation.
3. Click **Setup > Service objects**.
4. In the **Service objects** form, select the object to attach a template BOM to, and then click **Functions > Attach template BOM**.
5. In the **Select template BOM** dialog box, select a template BOM, and then click **OK**.
6. Close the forms to save your changes.

Delete a service BOM from a service object

1. Click **Service management > Common > Service agreements > Service agreements**.
2. Double-click the service agreement in which you want to delete a service BOM from an object relation.
3. Click **Setup > Service objects**.
4. In the **Service objects** form, select the object that has the service BOM to delete, and then click **Functions > Delete service BOM**.
5. Close the forms to save your changes.

Move the service BOM history from one service agreement to another

1. Click **Service management > Common > Service agreements > Service agreements**.
2. Double-click the service agreement to move a service BOM from.
3. Click **Setup > Service objects**.
4. In the **Service objects** form, select the object that has the service BOM to move, and then click **Functions > Move service BOM**.
5. In the **Select service object relation** form, select the service object relation to move the service BOM to, and then click **OK**.
6. Close the forms to save your changes.

Modify the information displayed for a BOM line

1. Click **Service management > Setup > Service objects > Template BOMs**.
2. Select a template BOM, and then click **Designer**.
3. Click the **Setup** tab. In the **BOM** area, select the check boxes for the information to display on the BOM lines of your service BOMs and template BOMs.

4. Close the forms to save your changes.

See also

[Delete a service BOM](#)

NOTE

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Delete a service BOM

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1. Click **Service management** > **Common** > **Service agreements** > **Service agreements**. Select the service agreement that you want to delete a service bill of materials (BOM) from.
2. On the **Action Pane**, click **Service objects**.
3. In the **Service objects** form, select the service object that you want to delete a service BOM from. Click **Functions**, and then select **Delete service BOM**.
4. Click **Yes**.

NOTE

If you have not applied a template BOM, the service BOM can be deleted from the **Template BOMs** form. If you have applied a template BOM, the service BOM cannot be deleted by using this method.

See also

[Template BOMs](#)

[Manage template BOMs on object relations](#)

NOTE

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Indexed sales prices

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You set up the index for a subscription sales price when you create a subscription fee.

In the **Create subscription fee** form, set the **Get pricing from** field to **Indexed base price**, and then multiply the base price by the percentage in the **Percent price change** field to get the sales price of the subscription transaction.

For example, if the base price is EUR 1,000, and the index is 110, the sales price is EUR 1,100.

See also

[Create subscription fee transactions](#)

NOTE

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Reduce the days on subscription fees

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To reduce the number of days of an existing subscription fee, you can create a new transaction in which you remove the period of time that should no longer be part of the subscription fee interval.

Reduce the days on a subscription fee

1. Click **Service management > Common > Service subscriptions > All service subscriptions**.
Select the service subscription, and on the Action Pane, click **Subscription fees**
2. In the **Subscription type** field, select **Reduction days**.
3. Use the **From date** field and the **To date** fields to define the date interval of the subscription fee that you want to remove from the subscription fee period, and then click **OK**.

To view the transaction that was created, in the **Subscription** form, click **Fee transactions**.

Example

If a subscription transaction period runs from January 1 to January 31, and you want to reduce the period by 10 days, create a new transaction in which the reduction period is January 1 to January 10. (The reduction period could also be January 5 to January 15, or any other ten day period).

Also, if the **From date** on the reduction period is January 21 (31 minus 10), you could set the **To date** to any date after January 31, and 10 days will still be removed from the fee transaction period.

See also

[Reduction days example](#)

NOTE

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Reduction days example

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You have created a subscription transaction for a customer's maintenance subscription, as described in the following table.

FROM DATE	TO DATE	SUBSCRIPTION	SUBSCRIPTION TYPE	PROJECT	CATEGORY	SALES CURRENCY	SALES PRICE
March 01, 2011	March 31, 2011	NR-2	Regular	9013	SubCat 2	EUR	200.00

The customer reports that it does not need service coverage for two days (March 10 and March 11). You agree to reduce the subscription by these two days.

You create a new transaction of the **Reduction days** type, as described in the following table.

FROM DATE	TO DATE	SUBSCRIPTION	SUBSCRIPTION TYPE	PROJECT	CATEGORY	SALES CURRENCY	SALES PRICE
March 10, 2011	March 11, 2011	NR-2	Reduction days	9013	SubCat 2	EUR	-12.90

When the transactions for March 2011 are invoiced, the sales price of EUR 200 is reduced by EUR 12.90. The chargeable amount for the subscription transaction is therefore EUR 187.10, and two transactions are invoiced at a total of EUR 187.10.

See also

[Reduce the days on subscription fees](#)

NOTE

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Update and index subscription sales prices

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1. Click **Service management** > **Common** > **Service subscriptions** > **All service subscriptions**.
2. Select the subscription to update the index or base price for.
3. Click **Index**. In the **Change** field, indicate how to update the base price or index, and whether the update must use a percentage or a new value. You can select from the following options:
 - **Index by a percentage**
 - **Index to**
 - **Base price by percentage**
 - **Base price to**
4. Click **OK**.

The base price or index of the subscription is updated with the specified value.

See also

[Index subscription \(class form\)](#)

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Fulfill service agreements overview

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This topic provides an overview of the tasks to fulfill service agreements. The topic also lists the forms that are associated with each business process component and discusses the tasks that are associated with each business process component.

Forms for the Fulfill service contracts business process components

The following table lists the forms that support the Fulfill service contracts business process components. The table entries are organized first by task, and then alphabetically by the name of the form.

NOTE

To open some of the forms in the following table, you must enter information or parameter settings.

BUSINESS PROCESS COMPONENT TASK	FORM NAME	USAGE
Develop and establish agreement	Service agreements	Create and maintain service agreements.
	Subscription	Create and maintain service subscriptions.
Monitor and implement agreement	Change service stage	Select the next stage in the workflow for a service order.
	Service orders	Create and maintain service orders.
	Cancel service level agreement	Cancel the service level agreement on a service order.
	Cancel service orders	Cancel service orders, or reverse the Canceled status of service orders.
	Index subscription	Update the base prices and indexes for subscriptions.

NOTE

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Start and stop time recording on a service order

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Use this procedure to start and stop time recording for a service order for which a service level agreement is defined.

Start time recording

1. Click **Service management > Common > Service orders > Service orders**.
2. Click the **Service order** tab. On the **Action Pane**, in the **Service level agreement** group, click **Start**.
3. Enter the date and time that the time recording should be started.

Stop time recording

1. Click **Service management > Common > Service orders > Service orders**.
2. Click the **Service order** tab. On the **Action Pane**, in the **Service level agreement** group, click **Stop**.
3. Enter the date and time that the time recording should be stopped.
4. Select **Add a revocation reason**, and select a reason code in the **Stage reason code** list to provide a reason for stopping the time recording.

NOTE

If **Reason code on exceeding time** is selected in the **Service management parameters** form, you must provide a reason code before you can stop the time recording.

See also

[Start SLA time recording \(form\)](#)

[Stop SLA time recording \(form\)](#)

NOTE

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View the start time and duration of a service order

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You can view when the work on the service order was started and when the service order is going to be completed.

You can also view when the time recording for a service order was started and stopped. When a service order is stopped, the time at which the service order must be completed is postponed.

View the start time for a service order

1. Click **Service management > Common > Service orders > Service orders**. Select and double-click an order to open the details form.
2. On the **General** tab, view the time that the work was started for a service order in the **Start time** field.

View the time remaining to complete a service order

1. Click **Service management > Common > Service orders > Service orders**. Select and double-click an order to open the details form.
2. On the **General** tab, view the time remaining to complete a service order in the **Latest completion time** field.

View the start time and stop time recording entries for a service order

1. Click **Service management > Common > Service orders > Service orders**. Select and double-click an order to open the details form.
2. On the **Action Pane**, click the **Dispatch** tab > **Time recording** to open the **SLA time recording** form and view the time recording entries for the service order.

See also

[Service orders \(form\)](#)

NOTE

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View stage reason codes

2/18/2021 • 2 minutes to read • [Edit Online](#)

View and modify the list of stage reasons for a service order. Use stage reasons to indicate the reason for the status of a service order. For example, you can create a **Canceled** stage that is assigned a reason code of **Canceled by the customer**.

- Click **Service management > Common > Service orders > Service orders**. Open a service order.
- In the **Service orders** form, on the **Action Pane**, on the **Dispatch** tab, click **Stage reasons**.
- On the **Stage reasons** form, click **New** to create a new stage reason code.

See also

[Stage reasons \(form\)](#)

NOTE

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View compliance with service level agreements

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View compliance with a service level agreement

1. Click **Service management** > **Common** > **Service orders** > **Service orders**. Select a service order and double-click to open the details form for the order.
2. On the **General** tab, in the **Compliance** field, view the percentage of time that was spent on the service order compared to the time frame specified in the service level agreement.

TIP

If the value in the **Compliance** field is larger than 100, the time limit of the service level agreement has been exceeded.

See also

[Service level agreements overview](#)

NOTE

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Customer returns overview

2/18/2021 • 2 minutes to read • [Edit Online](#)

Create and use return reason codes and disposition codes to support the process for returning products.

Use a return reason code to describe the reason that the customer wants to return an item. You can assign a reason code in the **Create return orders** form.

Assign a disposition code when an item is received or during the physical inspection of a returned item. You can use disposition codes to describe the condition of the item. You can also use disposition codes to indicate whether additional action is required for the transaction. For example, create disposition codes for the following actions:

- Scrap the returned item and provide a replacement item to the customer.
- Return the item to inventory and credit the customer for the cost of the item.
- Repair the item and return it to the customer.

See also

[Set up return reason codes](#)

[Set up disposition codes](#)

NOTE

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Return cost price and return lot ID

2/18/2021 • 5 minutes to read • [Edit Online](#)

The cost of products that are returned to inventory is calculated by using the current cost of the products. However, you might want the cost of the returned products to equal the cost of the products at the time when you sold the products to the customer. You can do this by using the **Return lot ID** field on the **Line details** FastTab in the **Sales order** form.

For example, consider the following scenario. You invoice a customer. Then, the customer returns the delivered products to you. You return the products to stock. In this case, when you credit the customer for the returned products, the cost of those products is calculated by using the current cost of the products. However, if you use the **Return lot ID** field, the cost of the returned products is calculated by using the cost on the invoice of the original sale to the customer.

To use a cost other than the current cost for returns from a customer, use one of the following methods.

Method 1: Manually enter the return cost price

By default, when you add items to a return order, the items are returned to inventory at the current cost price. To specify a different return cost price, follow these steps.

1. Click **Sales and marketing > Common > Return orders > All return orders**.
2. On the **Action Pane**, in the **New** group, click **Return order**.
3. In the **Create return order** form, select a customer account, and then click **OK**.
4. In the **Return order - RMA number: %1, %2** form, select an item, and then enter a negative quantity in the **Quantity** field.
5. Click the **Line details** FastTab.
6. On the **General** tab, enter a value in the **Return cost price** field. This value is used when the goods are returned to inventory. If you do not enter a value, the current cost price is used when the goods are returned to inventory.

Method 2: Automatically generate the cost price based on the customer invoice line

This is the preferred method to use to create return lines. To use the cost of the products at the time when you sold the products to the customer, create a return order and specify a sales line to return.

1. Click **Sales and marketing > Common > Return orders > All return orders**.
2. On the **Action Pane**, in the **New** group, click **Return order**.
3. In the **Create return order** form, select a customer account, and then click **OK**.
4. In the **Return order - RMA number: %1, %2** form, on the **Action Pane**, click **Find sales order**.
5. In the **Find sales order** form, select the invoice line to return, and then click **OK**.

On the **Line details** FastTab, on the **General** tab, the **Return lot ID** field displays the value from the original sales line. Additionally, the **Return cost price** field displays the cost value from the original sales line.

Cost calculation example

When you use the **Return lot ID** field on a return order line to specify the return cost price, the cost on the return order line is used. If you run the inventory close or recalculation functionality, the cost is adjusted on the original sales line. The cost on the return order line is automatically adjusted to reflect the same cost per piece.

1. Create and release a product that is named Test. In the **Released product details** form, specify the following information:
 - a. On the **Manage costs** FastTab, in the **Item group** field, select the **Parts** group.
 - b. On the **General** FastTab, in the **Item model group** field, select **DEF**.
 - c. On the **Purchase** FastTab, in the **Price** field, type 10.00 as the cost price of the item.
 - d. On the **Action Pane**, click **Dimension groups**. In the **Storage dimension group** field, select **Site and Warehouse only**. In the **Tracking dimension group** field, select **No active tracking dimensions**.
2. Create a purchase order for 10 pieces of the Test item at 6.00 per piece, and then post an invoice for the purchase order.

Create a second purchase order for 10 pieces of the Test item at 8.00 per piece, and then post an invoice for the purchase order.
3. Post an invoice for a sales order to sell five pieces of the Test item.

In this case, the sales order line is costed at 35.00 (5 pieces * 7.00 average cost per piece).
4. Create a return order for the customer. In the **Find sales order** form, select the invoice line, and then click **OK**.
5. In the **Return order - RMA number: %1, %2** form, verify that a return order is generated to return the Test item. The quantity of the return order is set to -5.00.

The **Return lot ID** field displays a lot ID. This lot ID is taken from the original sales order of the item that was sold to the customer. The **Return cost price** field displays the cost price from the original sales line.
6. Register the receipt of the returned items.
7. Post a packing slip for the returned items.
8. Post an invoice for the return order. On the **All sales orders** list page, select a sales order for which **Returned order** is the order type.
9. Open the **Inventory transactions** form. Verify that the return is costed at 7.00 per piece by using the value in the **Return cost price** field, for a total of 35.00 in the **Cost amount** field. You can open the **Inventory transactions** form from the **Return order - RMA number: %1, %2** form. In the **Lines** grid, click **Inventory > Transactions**.
10. In Inventory and warehouse management, use the **Closing and adjustment** form to run the **3. Close** procedure.

This action adjusts the cost on the original sales line that was costed at -35.00 (5 pieces * 7.00) to -30.00 (5 pieces * 6.00). This is because the inventory model group uses First in, First out (FIFO), and 6.00 per piece is the FIFO cost from the first purchase order. Additionally, the action adjusts the cost on the return sales line to match the cost per piece on the original sales line. Therefore, the cost of the return line is adjusted from 35.00 to 30.00.

NOTE

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Cancel a return order

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You can cancel a return order, instead of deleting it, when you want to save a record of the planned return.

NOTE

Only return orders that have a **Created** status can be canceled. Return orders with an **Open** or **Closed** status cannot be canceled.

1. Click **Sales and marketing > Common > Return orders > All return orders**.

–or–

Click **Sales and marketing > Common > Return orders > Created return orders**.

2. Select the return order to cancel.

3. Click **Cancel order**.

NOTE

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Create an item replacement order

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Item replacement orders are usually created after a product is returned and inspected. However, when an item must be replaced before it has been returned, or when the original item will not be returned, you can create an item replacement order immediately after you create a return order.

Create a replacement order after you receive an item that is returned

1. Click **Sales and marketing > Common > Return orders > All return orders**.
2. Create a new return order, or select a returned order from the list to open the **Return order - RMA number: %1, %2** form.
3. Click **Return line**, and then select **Replacement item**.
4. Select the item to replace the returned item with. Enter the item specifications, and then click **Apply**.
5. Click **Packing slip** to generate the packing slip for the return order. A sales order is generated for the replacement item that you selected.

After the sales order is created for the replacement item, sales agreements are automatically searched and if there is an applicable sales agreement, it is applied to the sales order.

Create a replacement order before you receive an item that will be returned

1. Click **Sales and marketing > Common > Return orders > All return orders**.
2. Create a new return order, or select a return order from the list to open the **Return order - RMA number: %1, %2** form.
3. Click **Find sales order** if you want to identify the sales order for the returned item. Complete the **Find sales order** form and then click **OK** to close the form and return to the **Return order - RMA number: %1, %2** form. The sales order line for the returned item is copied to the return order.
4. Click **Replacement order** to open the **Create sales order** form.
5. Select the **Copy return order lines** check box to transfer details from the return order you selected on the **Return order - RMA number: %1, %2** form to this sales order.
6. Enter or modify details, as required.

If you identified the sales order in step 3, and if the sales order line for the returned item is linked to a sales agreement, the identifier of the applicable sales agreement for the item replacement order will be automatically displayed in the **Sales agreement ID** field.

7. Click **OK** to close the **Create sales order** form and open the **Sales order** form, where you can continue to enter information for the new sales order. Any applicable return order lines will be copied to the new sales order.

If the identifier of the sales agreement is automatically displayed in the **Sales agreement ID** field, then the sales agreement has been linked to the sales order header for the item replacement order. If there is an applicable commitment in the sales agreement that has not been fulfilled yet, and the sales order is

created before the sales agreement expires, a link is established between the sales agreement line and the sales order line. Therefore, information from the sales agreement, such as item price, is copied to the new sales order line.

NOTE

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Delete a return order

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Use the **Delete return order** form to delete multiple return orders.

1. Click **Sales and marketing > Periodic > Clean up > Delete return orders**.
2. Click **Select** to open the **Sales update** form.
3. Specify the criteria, and then click **OK** to return to the **Delete return order** form. Return orders that have been created in the legal entity are displayed, based on the specified criteria.
4. Select the return order line to delete, and then click **OK**.
5. Click **Yes** to delete the return orders.

NOTE

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Pass returned items on to inspection

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When registering a returned item, you may determine that an item should be sent for inspection before it is returned to inventory or disposed of in some other way.

1. Click **Inventory management > Journals > Item arrival > Item arrival**.

-or-

Click **Inventory management > Journals > Item arrival > Production input**.

2. On the **Location journal** form, register the receipt of an item as usual.

NOTE

For information about registering the receipt of returned items, see [Register the receipt of returned items](#)

3. On the **Default values** tab, in the **Mode of handling** area, select the **Quarantine management** box.

This will prompt the system to create a quarantine order, and the person or department that performs inspections will respond to this order using the **Quarantine order** form.

See also

[Take returned items through inspection](#)

[Specify how to dispose of returned items](#)

NOTE

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Post arrival journal for returned products

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To process a return, first validate the return quantity, update the quantity field in the item arrival journal. Then select a disposition code or indicate that the returned items have to be inspected. After completing these steps, you can post the item arrival journal for the return order.

1. Click **Inventory management > Periodic > Arrival overview**.
2. In the **Setup name** filter, select **Return order**.
3. If the list of receipts is long, use the fields in the **Range** area to narrow the list.
4. Locate the line of the return order that you want to post, select its **Select for arrival** box, and then click **Start arrival**.
5. Click **Journals > Show arrivals from receipts** to open the **Location journal** form.

TIP

To view detailed information, select a journal, and then click **Lines**.

6. Make any necessary updates, and then click **Post**.

After the journal is posted, the returned items are registered in inventory, and the **Return orders** form indicates that the items have arrived at the warehouse.

See also

[Location journal \(form\)](#)

NOTE

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Receive partial deliveries of returned items

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Partial deliveries are defined in terms of return order lines, not return order shipments.

This means that if you receive the full quantity that is indicated on one return order line, but you receive nothing from the other lines in the return order, the delivery is not a partial delivery. However, if a return order line requires 10 units of a particular item to be returned, but you receive only four, it is a partial delivery.

If a return shipment contains less than the full quantity of a return order line, you can set the shipment aside and wait for the rest of the returned quantity to arrive, or you can register and post the partial quantity.

Register and post a partial quantity

1. After you select a return order for arrival on the **Arrival overview - Warehouse: %1, Dock: %2, Journal name: %3** form, click **Start arrival** to create the arrival journal, and then click **Journals > Show arrivals from receipts** to open the **Location journal** form.
2. Select the line of the journal that you want to work with, and then click **Lines** to open the **Journal lines, locations** form.
3. Select the line of the item number for which only a partial quantity has arrived, and then click **Functions > Split** to open the **Split** form.
4. In the **Split quantity** field, enter the quantity for the total number of items that have been received, and then click **OK**.
5. On the **Journal lines, locations** form, select the line for the quantity of items that has arrived, and then click **Post**. You can post the line for the additional quantity after the items have arrived.

NOTE

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Receive returned items

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When a return shipment arrives, you match it to a return order that has already been created.

Depending on company policies, the items in the return shipment can be sent to quarantine for additional inspection or they can be returned to inventory.

See also

[Register the receipt of returned items](#)

[Post arrival journal for returned products](#)

[Take returned items through inspection](#)

NOTE

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Register the receipt of returned items

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There are two methods for registering the receipt of returned items. The first method is a warehouse receiving process that uses the **Arrival overview** form. The second uses the **Registration** form.

Register the receipt of returned items in the Arrival overview form

You can use the **Arrival overview** form to identify a return shipment by its Return Material Authorization (RMA) number. If a journal name is defined on the **Setup** tab, and journal lines that correspond to the lines selected on the **Arrival overview** form exist, a new journal header is created when you click **Start arrival**.

1. Click **Inventory management > Periodic > Arrival overview**.
2. In the **Setup name** field, select **Return order**, and then click **Update**.

TIP

You can use the **Range** fields to narrow the search results. You can type or select the RMA number in the **RMA number** field for an exact result. To define and save a set of filters that will restrict which incoming arrivals are displayed, click the **Setup** tab. The available filters include types, warehouses, and docks.

WARNING

Return orders cannot be mixed with other arrival types in the **Arrival overview** form. Therefore, the reference will always be sales order, but no sales order ID will be specified on the journal header.

3. In the **Receipts** grid, locate the line that matches the item being returned, and then select the check box in the **Select for arrival** column.
4. To exclude certain lines from the return receipt, such as items from the original order that were not included in the return shipment, clear the associated **Select for arrival** check boxes in the **Lines** table in the lower part of the form.
5. Click the **Start arrival** button to create an arrival journal.

NOTE

You can select multiple return orders and include them all in a single arrival process. Each return order line will be copied into a corresponding item arrival journal line.

NOTE

You can also manually create an arrival journal by using the **Item arrival** form.

6. Click **Inventory management > Journals > Item arrival > Item arrival**.
7. Select the arrival journal that you just created and then click **Lines** to open the **Journal lines, locations** form.

8. On the **General** tab, adjust the number in the **Quantity** field, if it is required, and then assign a disposition code in the **Disposition code** field.

Alternatively, you can select the **Quarantine management** check box to have the returned items sent through an inspection process in the context of a quarantine order.

NOTE

If you send the returned items through quarantine, you cannot specify a disposition code.

9. Click the **Validate** button.
10. If there are no errors in the validation process, click **Post**.

Register the receipt of returned items in the Registration form

As an alternative to using the **Arrival overview** form, you can use the **Registration** form to register the arrival of returned items.

1. Click **Sales and marketing > Common > Return orders > All return orders**. Create a new return order or open the return order from the list. On the **Lines** FastTab, select the return order line. Click **Update line**, and then click **Registration**.
2. Assign a disposition code in the **Disposition code** field, and then click **OK**.

NOTE

It is not possible to send the item for inspection as a quarantine order using the **Registration** form.

3. In the **Transactions** grid, select the transaction to be registered.
4. In the **Register now** grid, click **Add**. Repeat the previous two steps until all of the returned items appear in the **Register now** grid.
5. Click **Post all**.

See also

[Arrival overview \(form\)](#)

NOTE

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Take returned items through inspection

2/18/2021 • 2 minutes to read • [Edit Online](#)

1. Click **Inventory management > Periodic > Quality management > Quarantine orders**.
2. Locate the order line that corresponds to the returned item that you are inspecting.

NOTE

A quarantine order can be associated with just a single item number. If 10 items that have different item numbers are returned in a single shipment and sent to quarantine, 10 individual quarantine orders are created.

3. After examining the item, make a selection in the **Disposition code** field to indicate what should be done with the item and how to handle the related financial transaction. Examples include returning the item to stock and refunding the customer, scrapping the item and sending a replacement to the customer, or returning the item to the customer without credit.

NOTE

If multiple returned items in a single item number batch cannot be assigned the same disposition code, you must split the quarantine order (**Functions > Split**) to assign a different disposition code to each sub-batch.

4. When you are finished with the inspection, click **Report as finished** to release the returned items and create an item arrival journal entry. The person or department that receives the items then processes the journal for the items to be returned to inventory.

–or–

End the quarantine order, and move the items back into inventory directly by using one of the **Inventory** functions.

5. Close the form to save your changes.

See also

[Specify how to dispose of returned items](#)

NOTE

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Packing slip updates for returns

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Before returned items can be received into inventory, the packing slip for the order to which they belong must be updated. Just as the invoice update process is the update to the financial transaction, the packing slip update process is the physical update of the inventory record, which means that it commits the changes to inventory. In the case of returns, the steps that are assigned to the disposition action are implemented during the packing slip update.

The packing slip update can be processed in either the item arrival journal or the return order.

As part of the process for posting packing slips, the packing slip reference number from the customer's shipping documents can be associated with the order lines. This association is optional and for reference only. It does not create any transactional updates.

If not all of the expected return items have arrived, you should include only the quantity that has been received in the packing slip update. Leave the remaining items on the order until the rest of the return shipment has arrived.

If an item is sent back from quarantine to the Shipping and Receiving department, such as when the quarantine inspector does not know where to store the item in inventory, the corresponding packing slip must be updated to correctly register and act on the disposition code that is specified as a result of the quarantine.

When you update a packing slip for a returned item that is from a sales agreement, the sales agreement commitment for that item is automatically updated to reflect the change in the quantity or the amount.

See also

[Perform invoice updates for returns](#)

NOTE

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Perform invoice updates for returns

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A return order is a type of sales order that is marked as a returned order. Therefore, the **All sales orders** list page is used to generate invoices for return orders instead of the **Return orders** form. This functionality supports the business processes of organizations that choose to have return orders and sales orders invoiced at the same time and by the same person.

Because the invoice for a returned item is for a negative amount, it is called a credit note.

When you set up the invoice update for batch processing, the sales order of type **Returned order** must have a return line status of **Received**, which indicates that the order's packing slip has been updated.

Post an invoice for a return order

1. Click **Accounts receivable > Common > Sales orders > All sales orders**.
2. Select a sales order for which **Returned order** is displayed in the **Order type** field.
3. On the Action Pane, on the **Invoice** tab, in the **Generate** group, click **Invoice**.
4. On the **Parameters** tab, select the **Posting** check box.
5. Review information in the form and make any changes that are needed.
6. Click **OK**. The credit note is posted.

See also

[Packing slip updates for returns](#)

NOTE

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Service orders

2/18/2021 • 4 minutes to read • [Edit Online](#)

A service order represents a visit that a service technician makes to a customer site on a specific date. Each service order consists of one or more service order lines. Service order lines represent the hours of work that must be performed by the service technician, and the related items, expenses, and fees.

You can attach tasks and objects to a service order line. You can then group service order lines by task or by object. You can also attach items that are listed in inventory to service order lines.

Create service orders

You can create service orders based on a service agreement and the lines that are contained in that agreement. However, you can create service orders that are associated with a service agreement only in the period that is specified in the agreement. For example, if a service agreement is valid for the 2011 calendar year, you can create service orders for the agreement from January 1, 2011, and December 31, 2011.

You can also create service orders individually, without associating them with an agreement. These service orders can be used to handle unscheduled or one-time service visits. For example, in the month of March, your customer wants service to be performed on two machines, in addition to the machines that are specified in the service agreement. For this task, you create service orders but do not associate them with an agreement.

NOTE

To create service orders that are not associated with a service agreement, you must select the **Allow without service agreement** check box in the **Service management parameters** form.

Scenario

The following scenario describes another situation where it is useful to create a service order that is not associated with a service agreement.

The company dispatcher receives a call requesting emergency service on an elevator. There is no time to set up a service agreement and a project for the service. Therefore, the dispatcher creates a service order directly in the **Service orders** form, attaches the service order to an existing project, and creates the service order lines. The dispatcher also creates a task or object relation for an existing service order, to record work that is not related to the service agreement. For more information, see [Create service orders manually](#) and [Create service task relations](#).

Monitor the progress of service orders

To monitor the progress of a sales order through the different teams and work processes, you can set up a system of stages and reason codes for service orders. For each stage, you can specify the actions that are allowed. For more information, see [Create reason codes](#).

Example

A service order is approved by the dispatcher. The dispatcher updates the stage of the service order and specifies a reason code that indicates that the service order has been released to the service technician. The technician goes to the customer site and performs the service.

Specify item requirements for service orders

You can specify the inventory items that are required for service orders. However, the service order must be associated with a project. Item requirements for service orders are processed through a project.

Example

The service orders that are created from the service agreement are processed by the dispatcher. For the first service order, the dispatcher realizes that the service technician requires an important spare part that is not in the on-hand inventory. Therefore, the dispatcher creates an item requirement for the spare part directly from the service order.

Move and post lines

A service technician returns from a service visit, and then modifies and updates the service order lines. During the service visit, the technician performed a service job that was scheduled for the next service visit. Therefore, the technician moves the lines from the next service visit to the current service visit. The technician then posts the service order. For more information, see [Move service order lines](#).

Cancel service orders

One of the other service orders that was generated for the month of January becomes obsolete, because the job is canceled. Therefore, the service dispatcher cancels the service order. For more information, see [Cancel service orders](#).

Post from projects

At the end of each week, the dispatcher wants to post all service orders that are attached to a specific project. Therefore, the dispatcher locates the relevant project in the **Projects** form and posts the service orders that have been completed. For more information, see [Post service orders \(class form\)](#).

Delete service orders

During the second half of the year, your customer decides that the service visits are too infrequent. You must create a new, more frequent series of service visits for the remaining time on the service agreement. Therefore, you must delete the existing service orders and create new service orders. For more information, see [Delete service orders](#).

See also

[Service orders \(form\)](#)

NOTE

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Automatically create service orders

2/18/2021 • 2 minutes to read • [Edit Online](#)

You can generate service orders that are based on a service agreement for the valid period of the service agreement.

The service orders that you generate from a service agreement are all attached to the service agreement.

Service orders are generated automatically from the following settings:

- The service agreement interval that is set up in the service agreement lines. The service agreement interval indicates the frequency that service-order lines are created. For more information, see [Service intervals](#).
- The period that you specify to define the service period in the **From date** and **To date** fields in the **Create service orders** form. For more information, see [Create service orders automatically](#).
- The **Combine service orders** option on the service agreement header. This option defines whether service order lines generated from a service agreement, combines service orders according to employee, service task, service object, or service agreement. For more information, see [Combine service orders](#).
- The **Time window** option on the service agreement line. The time window defines how far a service order line can move with regard to its calculated date. For more information, see [Time windows](#).

NOTE

If the day that is specified for a service order is not open in the calendar that you have selected in the **Service management parameters** form, a message will indicate that there is a calendar conflict. You can safely ignore the message; the service order will be created, even though the day is closed on the calendar.

Example 1

The service agreement lasts from January 1, 2012 until December 31, 2012. If the service period that you specify in the **Create service orders** form is from November 1, 2012 until February 1, 2013, service orders are created from November 1, 2012 until December 31, 2012.

Example 2

The service agreement lasts from January 1, 2012 until December 31, 2012. Two service agreement lines are attached to the service agreement. The first service agreement line has a starting date on January 2, 2012 and an ending date on March 1, 2012. The second service agreement line has a starting date on April 1, 2012 and an ending date on December 31, 2012. You specify a period in the **Create service orders** form that is from October 1, 2012 until December 31, 2012. Therefore, service orders are generated only for the second agreement line, because the starting date and ending date of the first agreement line are before the period that you specified for the service order.

NOTE

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Service status and progress field interaction

2/18/2021 • 2 minutes to read • [Edit Online](#)

In the **Service orders** form, the **Progress** field on the service order header reflects the status of the whole service order, and the **Status** reports the status of individual service order lines.

PROGRESS	LINE 1 STATUS	LINE 2 STATUS	LINE 3 STATUS
In process	Created	Created	Created
In process	Canceled	Created	Created
In process	Created	Canceled	Posted
Canceled	Canceled	Canceled	Canceled
Posted	Posted	Posted	Posted
Posted	Posted	Canceled	Canceled

The progress of a service order is in process if all lines have the status **Created**; it is still in process if some of the lines have a status of **Canceled** or **Posted**.

If all lines in a service order are marked as **Posted**, the progress of the status order is **Posted**. If some lines are **Posted** and some are **Canceled**, the progress is still **Posted**.

NOTE

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Create service orders automatically

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You can create service orders for one service agreement or for several service agreements. When they are created, you can view your service orders in the **Service orders** form.

Service orders are created only for the valid period of the service agreement. If the interval that you specify in the **Create service orders** form is before the starting date or after the ending date of the service agreement, service orders are created only for the part of the interval that is within the service agreement dates.

When you create service orders manually or automatically from the service agreement line, the service order must be in the time interval that is defined by the starting and ending dates for the line, unless you do not specify an ending date on the line.

Create service orders automatically for a service agreement

1. Click **Service management > Common > Service agreements > Service agreements**.
2. Select a service agreement.
3. Click the **Deliver** tab, and then click **Planned service orders**.
4. Specify dates in the **From date** and **To date** fields to define the service period.
5. Select the **Show InfoLog** check box to display a list of the service orders that are created.
6. Select transaction types in the **Include transaction types** field group. The transaction types represent the lines that are created in the service agreement, and each transaction type that you select generates several service orders, depending on the service interval that is specified on the service agreement line.
7. To create any service orders that are missing from continuous series of service orders, select the **Continuous** check box.
8. Click **OK**.

Create service orders automatically for several service agreements

1. Click **Service management > Periodic > Service orders > Create service orders**.
2. Click **Select** to make selections to add or remove criteria to use to create service orders.
3. Click **OK**.

See also

[Service orders](#)

[Automatically create service orders](#)

NOTE

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Create item requirements for service orders

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You can create a service order to track and manage services that you provide to your customers. If you need to reserve specific items for a service order, you can create inventory item requirements for it. An item requirement can be immediately consumed from inventory, or it can initiate a production order for the item.

By using an item requirement instead of an item transaction, you can plan for delivery just before the item is actually used, create a purchase order, include the item in the trade-agreement framework, and include the item requirement in production planning.

Item requirements for service orders are processed through a project. To create an item requirement on a service order, the service order must be assigned to a project. After you create an item requirement for a service order, you can view the item requirement in the **Projects** form for the selected project.

Create an item requirement for a service order

1. Click **Service management > Common > Service orders > Service orders**.
2. Select the service order that you want to create an item requirement for.
3. On the **Action Pane**, on the **Dispatch** tab, click **Item requirement**.
4. In the **Item requirements** form, enter information for the required item. For more information about the specific fields, see [Item requirements \(form\)](#).

Create an item requirement for a service agreement

1. Click **Service management > Common > Service agreements > Service agreements**.
2. Open the service agreement for which you want to create an item requirement.
3. On the **Lines** FastTab, click **Add** to create a new line.
4. In the **Transaction type** field, select **Item**.
5. In the **Item setup** field, select **Item requirement**.
6. In the **Item number** field, select the item that is required for the service agreement.
7. On the **Line details** FastTab, on the **Product dimensions** tab, in the **Site** field, select the inventory site for the item.
8. To create a service order from the agreement line, on the **Lines** FastTab, click **Create service orders**, and then enter the relevant information in the **Create service orders** form.

See also

[Create service orders automatically.](#)

NOTE

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Service order item requirements

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You can create a service order to track and manage services that you provide to your customers. If you need to reserve specific items for a service order, you can create inventory item requirements for it. An item requirement can be immediately consumed from inventory, or it can initiate a production order for the item.

By using an item requirement instead of an item transaction, you can plan for delivery just before the item is actually used, create a purchase order, include the item in the trade-agreement framework, and include the item requirement in production planning.

Item requirements for service orders are processed through a project. To create an item requirement on a service order, the service order must be attached to a project.

As soon as an item requirement is created for a service order, it can be viewed from **Project** in the individual service order or through the **Sales order** form.

View an item requirement from a service order

1. Click **Service management > Common > Service orders > Service orders**.
2. Click **Dispatch**, and then click **Item requirement** to open the **Item requirements** form.
3. Click the **Project** tab, and check the **Service order** field to see the service orders of the item requirement.

Delete service orders with item requirements

If an item requirement is created on a service order, you cannot delete the service order. You must delete the item requirement before you can delete the service order.

1. Click **Service management > Common > Service orders > Service orders**.
2. Click **Dispatch**, and then click **Item requirement** to open the **Item requirements** form. This form lists the item requirements that are created on the service order.
3. Select the item requirement to delete, and then click **Delete**.

–or–

1. Click **Project management and accounting > Common > Projects > All projects**.
2. Open the project that has the service order in which an item requirement is created.
3. In the **Projects** form, in the right pane, click **Item requirements**. The **Item requirements** form lists the item requirements that are associated with the selected project.
4. Select the item requirement to delete, and then click **Delete**.

See also

[Item requirements \(form\)](#)

NOTE

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Subscription workflow overview

2/18/2021 • 2 minutes to read • [Edit Online](#)

You are the subscriptions administrator for a light company that offers subscriptions for lighting rig maintenance. A customer contacts your company to purchase a yearly subscription for lighting rig maintenance.

Setting up subscriptions

To set up a subscription, you must first create a subscription group for the new service agreement or verify that a subscription group exists. If a subscription group exists, you must set it up to invoice the customer yearly and to accrue sales revenue every month of the year. For more information about how to set up subscriptions, see [Set up subscription groups](#).

After the subscription group is created, you can create the subscription. For more information about how to create service subscriptions, see [Create service subscriptions from a subscription group](#).

Create and modify subscription transactions

After you set up the subscription, you create the subscription fee transaction for the first invoicing period, which is one year. The transactions are of the **Regular** type. Therefore, you can only create subscription transactions where the from date and the to date correspond to periods that were previously created in the **Period types** form. For more information about fee transactions, see [Create subscription fee transactions](#).

After you set up the subscription for your customer, you remember that they have negotiated a 10 percent discount on all list prices for service offerings. Therefore, you must reduce the price of the transaction fee that you created.

Later in the day, your customer contact calls to say that, although they still want the service agreement for the lighting rig, they plan to introduce a new lighting rig later in the year. Therefore, they only need maintenance coverage until October 2013. To reduce the number of months for the customer's subscription, you create a new subscription fee transaction of the **Reduction days** type. For more information about how to reduce days, see [Reduce the days on subscription fees](#).

Invoice and accrue subscription transactions

You have now finished setting up the subscription, and you are ready to invoice your customer for it. For more information about how to invoice subscriptions, see [Invoice subscription transactions](#).

Two days later, your customer calls to say that the subscription should be invoiced in U.S. dollars, not Euros. Therefore, you create a credit note, and you also create a new subscription transaction in the correct currency. For more information about how to credit subscription transactions, see [Credit subscription transactions](#).

At the end of each month, one month's revenue can be accrued from the customer's subscription to the profit and loss account and the WIP accounts. For more information about how to accrue revenue for subscriptions, see [Accrue subscription revenue](#).

NOTE

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Combine service orders

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When you create service order lines automatically in the **Service agreements** form, you can choose one of the following options to specify how you want to group them:

- **By service agreement**
- **By service task**
- **By employee**
- **By service object**

Example

You create a service agreement that has a start date on 03-31-2007. In the **Combine service orders** field, you specify **By service object**. You then create the following service agreement lines:

AGREEMENT LINE NUMBER	TRANSACTION TYPE	DESCRIPTION	INTERVAL	SERVICE OBJECT	START DATE
1	Hour	SAL1	Weekly	X-1	04-01-2007
2	Hour	SAL2	Biweekly	X-2	04-01-2007
3	Hour	SAL3	Weekly	X-2	04-01-2007

You do not specify time windows for any of the service agreement lines. Therefore, the service order lines will not move from the calculated day on which they fall.

Next, you generate service order lines from the **Create service orders** form from 04-01-2007 until 04-30-2007.

In total, 10 service orders are created. Because the combined setting that you selected was **By service object**, all service orders that are created have only service order lines with one specific service object. Service order lines that are generated from the service agreement and have the same service date and object are combined on the same service order.

NOTE

In this example, the calendar that is specified in the **Service management parameters** form has no closed days.

Additional grouping of service order lines into service orders occurs according to any time window that you specify on the service agreement lines.

See also

[Create service orders automatically](#)

NOTE

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Create service subscriptions from a subscription group

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1. Select **Service management** > **Setup** > **Service subscriptions** > **Subscription groups**.
2. Select a subscription group.
3. Select the **Service subscriptions** button.
4. Select **New** to create a new subscription. The subscription group field displays information from the subscription group in the **Subscription** form.
5. Enter information in the remaining fields.
6. Close the form to save your changes.

NOTE

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Project attached to service agreement

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You can attach service agreements to projects of every type except the **Time project** type.

You register and post all service order transactions through the project that you attach to the service agreement. You specify the journals in which these transactions are registered and posted on the **Journals** link in the **Service management parameters** form.

NOTE

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Create service subscriptions from a project

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You can create a service subscription from a project in **Project management and accounting**.

1. Click **Project management and accounting** > **Common** > **Projects** > **All projects**. Open the project that you want to create a subscription for.
2. On the **Projects** form, on the **Action Pane**, on the **Manage** tab, click **Service** > **Service subscription**.
3. On the **Subscription** form, in the **Service subscription** field, enter a unique identification number. The project number is entered automatically into the subscription for the selected project.
4. Enter the remaining information in the form.

You can now create subscription transactions for the subscription.

NOTE

If you have set up a number sequence for the subscription group, a subscription ID is generated automatically for the subscription when you specify the subscription group.

See also

[Subscription sales prices](#)

NOTE

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Service activities

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Create service activities to define and maintain tasks in a service order. A service order can include one or more service activities to be performed by a worker.

Service activities are defined in the **Activity types** form. (Click **Sales and marketing** > **Setup** > **Activities** > **Activity types**.) After you set up activities, you can add them to service orders automatically based on the related service agreement, or you can manually add activities when you add lines to a service order.

You can view the status of service activities in the **Dispatch board** form. You can also reassign activities from one worker to another worker in that form.

See also

[Dispatch board \(form\)](#)

NOTE

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Dispatch board

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A dispatch board is the central location from which you can view the status of activities in a service order. You can perform the following tasks in a dispatch board:

- Filter and view service activities in a certain date range.
- Identify the priority of a service activity, and distinguish among service priority levels based on a color scheme that you set up.
- Review the workers that are assigned to a dispatch team.
- Modify the service times and assigned technicians for a service activity.
- Review the list of service activities that have not been dispatched.

For information about how to perform specific tasks in a dispatch board, see the topics in the **See also** section.

See also

[Set up service activity types](#)

[Set up a preferred technician](#)

NOTE

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Set up service activity types

2/18/2021 • 2 minutes to read • [Edit Online](#)

1. Click **Sales and marketing** > **Setup** > **Activities** > **Activity types**.

–or–

Click **Organization administration** > **Setup** > **Activities** > **Activity types**.

2. In the **Activity types** form, press CTRL + N to add a new activity type line.

3. In the **Type** field, enter a name for the activity type.

4. In the **Description** field, enter text to describe this activity type.

5. Close the form to save your changes.

See also

[Activity types \(form\)](#)

[Dispatch board](#)

NOTE

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Set up a preferred technician

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You can select any worker as a preferred technician for a service agreement or service order. However, it is a good idea to add the worker to the appropriate dispatch team so that the worker is included on the **Dispatch board**.

Assign employee to a dispatch team

1. Click **Human resources > Common > Workers > Workers**. Double-click a worker to open the worker details page. On the **Action Pane**, click **Setup > Dispatch team** to open the **Dispatch workers** form.
2. In the **Dispatch team** field, select the team to assign the worker to.

Assign a preferred technician to a service agreement

1. Click **Service management > Common > Service agreements > Service agreements**. Double-click a service agreement to open the details form.
2. On the **General** tab, select the **Preferred technician** field, and then select a member of the appropriate dispatch team as the preferred technician for the service agreement.

Assign a preferred technician to a service order

1. Click **Service management > Periodic > Dispatch board**.

NOTE

In the **Dispatch board** form, specify a date range for dispatch activities to view. Also, specify whether to display closed activities and whether to limit the dispatch activity list to teams that you belong to or are authorized to monitor. Click **OK** to open the **Dispatch board**.

2. Select the line of the service activity to modify.
3. On the **Related** tab, use the **Worker** list to assign a member of the appropriate dispatch team as the preferred technician for the service call.

See also

[Develop and establish service agreements overview](#)

[Create service orders manually](#)

[Service agreements \(form\)](#)

NOTE

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Set up dispatch teams

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This topic describes how to create a dispatch team. After you create a dispatch team, you can assign workers to the team. When you create a service order, you can then relate a member of a dispatch team to an activity in the service order.

1. Click **Service management > Setup > Dispatch teams**.
2. In the **Dispatch teams** form, click **New** to create a new team.
3. In the **Dispatch team** field, enter a unique name for the dispatch team.
4. In the **Owner** field, select the employee who is responsible for this team.

NOTE

You can select only employees in this field. You can't select vendors.

5. Optional: In the **Description** field, enter a brief description for this dispatch team.

NOTE

You can assign a worker to this dispatch team in the **Worker** form. For more information about how to assign a worker to a dispatch team, see [Dispatch workers \(form\)](#).

NOTE

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Prioritize service orders

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1. Click **Service management** > **Periodic** > **Dispatch board**.
2. Click **Advanced** to display the Gantt chart at the top of the form and the tabs in the lower pane.
3. Expand each dispatch team list.
4. Select the color-coded graphic that represents a service activity.
5. On the **All** tab, **Team** tab, **Undispatched** tab, or **Related** tab, change the selection in the **Priority** field.
6. Click **Save**.

See also

[Dispatch board](#)

[View the status of service orders](#)

NOTE

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View the status of service orders

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You can use the **Dispatch board** form to view the status of service activities in service orders.

More information about service orders

The form also provides tools to track the flow of service orders and includes additional details to help you evaluate the urgency of a service order, such as the service agreement and service level agreement that it is associated with.

In order to help you quickly gauge the urgency of a service order, the Gantt chart supports the use of colors. Colors are used to distinguish the priority of a service call. By default, these colors are red for high priority, yellow for typical priority, and green for low priority.

TIP

You can change the colors on the **Dispatching** tab in the **Service management parameters** form.

See also

[Prioritize service orders](#)

[Monitor service activities](#)

[Dispatch board \(form\)](#)

NOTE

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Monitor service activities

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The **Dispatch board** form provides an at-a-glance status update for the various scheduled service activities, and tools for tracking the general flow of service orders in your company.

TIP

To view details about a service activity, select it in the Gantt chart at the top of the **Dispatch board** form, right-click, and then click **Information**.

By using the tools in this form, you can sort service orders by date, priority, or type of service activity, view the priority levels that are assigned to service orders, and review which activities are assigned to individual service orders.

If you must redistribute service activity assignments, you can move the graphical representation of a service activity to assign it to a different employee or a different date and time.

Example

While monitoring the day's service activity, you notice that John, a service technician, is running behind schedule on assigned service calls. You also notice that the last call in his list must be completed by the end of the day to meet service level agreement requirements. By using the drag-and-drop functionality of the Gantt chart, you can reassign that service call to Meg, who has completed her own service calls ahead of schedule.

Open the Dispatch board form

Click **Service management** > **Periodic** > **Dispatch board**.

See also

[Prioritize service orders](#)

[View the status of service orders](#)

[Dispatch board \(form\)](#)

NOTE

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Reassign activities

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This topic describes how to reassign service activities from one worker to another worker. You can reassign service activities from one worker to another worker even if those workers are assigned to different dispatch teams.

Use the following steps to reassign an activity to another worker:

1. Click **Service management** > **Periodic** > **Dispatch board**.
2. In the **From date** and **To date** fields, enter dates to define the time period to view activities for.
3. Select whether to view closed activities and dispatch information for related teams, and then click **OK**.
4. In the **Dispatch board** form, click **Advanced** to display only the Gantt chart at the top of the page. Click **Simple** to display the Gantt chart and the tabs in the form.
5. Expand each dispatch team list.
6. Use either of the following steps to reassign an activity:
 - Select a color-coded graphic that represents the service activity to reassign. Press the SHIFT key, and then move the color-coded graphic to the row for another employee.
 - On the **All** tab, **Team** tab, **Undispatched** tab, or **Related** tab, in the **Worker** field, enter the name of the worker who is replacing the current worker for the activity.

See also

[Service activities](#)

[Dispatch board](#)

NOTE

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Reverse changes in a dispatch board

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This topic describes how to reverse unsaved modifications that you make in a dispatch board. For example, you assign a worker to a service activity, save the information, and then later decide to assign a different worker to the service activity. You modify the worker in the dispatch board, and then, before saving the change, learn that the worker just assigned is not available. You can reverse the unsaved modification so that the original worker is reassigned to the service order.

Use the following steps to reverse unsaved changes in a dispatch board:

1. Click **Service management > Periodic > Dispatch board**.
2. In the **Dispatch board** form, enter relevant information in the fields, and then click **OK**.
3. To reverse the most recent change that is not saved, click **Undo**.
4. To reverse a series of changes that are not saved, continue clicking **Undo** until each change that you want to discard is reversed.

See also

[Dispatch board](#)

[Service activities](#)

NOTE

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View undispatched service orders

2/18/2021 • 2 minutes to read • [Edit Online](#)

This topic describes how to view activities in a service order that don't have a worker assigned to them from a dispatch team.

1. Click **Service management** > **Periodic** > **Dispatch board**.
2. In the **Dispatch board** window, enter the start date and end date for the period to view dispatch activity for.
3. Optional: Select whether to include closed activities and related teams in the results.
4. Click **OK** to view the results.

NOTE

In the **Dispatch board** form, the **Advanced** view is automatically displayed. In this view, the Gantt chart at the top of the page and the tabs at the bottom of the page are displayed. Click **Simple** to display only the Gantt chart.

5. To view a list of service orders that don't have a dispatch team assigned, click the **Undispatched** tab.

See also

[Dispatch board \(form\)](#)

[Service activities](#)

[Dispatch board](#)

[Reassign activities](#)

NOTE

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Modify a Service BOM

2/18/2021 • 2 minutes to read • [Edit Online](#)

You can record the history of an element in a service BOM. Every time that you update a BOM line, a history line is created in the **History** pane. The history line shows the current state of the BOM line.

Update a service BOM element

1. Click **Service management > Common > Service agreements > Service agreements**.
2. Click **Edit** to open the **Service agreements** details form.
3. On the **Action Pane**, click **Service objects** to open the **Service objects** form.
4. Select the object to update a BOM line for, and then click **Designer**.
5. In the **Designer** form, select the BOM line to update, and then click **Edit BOM line**.

NOTE

On the **Setup** tab, select the **Edit when adding** check box if you want the **Edit BOM line** form to open when you drag a line into the service BOM.

6. In the **Quantity** field, enter the quantity.
7. If you want to create a service order line for the replacement item, which can then be invoiced, select the **Create service order line** check box.
8. Click **OK** to close the form.

Delete a service BOM line

1. Click **Service management > Common > Service agreements > Service agreements**.
2. Click **Edit** to open the **Service agreements** details form.
3. On the **Action Pane**, click **Service objects** to open the **Service objects** form.
4. Select the object to delete a service BOM line from, and then click **Designer**.
5. In the **Designer** form, select the BOM line to delete, and then click **Delete BOM line**.

See also

[Template BOMs](#)

NOTE

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Credit subscription transactions

2/18/2021 • 2 minutes to read • [Edit Online](#)

Credit subscription transactions

1. Click **Service management** > **Common** > **Service subscriptions** > **All service subscriptions**.
2. Select the subscription attached to the subscription transaction for which you want to create a credit note.
3. Select the **Analyze** tab, and then click the **Fee transactions** button on the Action Pane.
4. From the **Fee transactions** form, select the transaction for which you want to create a credit note.
5. Click **Functions** > **Select for credit note**.
6. From the **Select for credit note** form, select the transaction that you want to credit and then click **OK**.

NOTE

When you create the credit note, make sure that you select **Credit notes**. This is found in the **Invoicing method** list in the **Create invoice** dialog box.

If the **Reverse accruals on crediting** field in the **Service management parameters** form is set to **Manual**, you have to reverse each accrued revenue transaction individually before you create a credit note proposal for the transaction.

See also

[Invoice subscription transactions](#)

NOTE

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Create subscription fee transactions

2/18/2021 • 2 minutes to read • [Edit Online](#)

1. Click **Service management** > **Common** > **Service subscriptions** > **All service subscriptions**.
2. On the **All service subscriptions** list page, select the subscription for which you want to create a subscription fee transaction.
3. On the **Action Pane**, on the **Subscription** tab, click **Subscription fees**.
4. On the **Create subscription fee** form, enter the appropriate information in the fields.
5. Click **OK**.

NOTE

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Accruing subscriptions

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With service subscriptions, you manually accrue revenue in the periods following the date when you invoiced a fee transaction.

Accrual periods are created for the invoice period that you set up for the subscription fee, and the accrual periods are based on the period code of the subscription.

You can accrue and reverse accrued revenue.

Reverse accruals of credit amounts

If you credit invoiced subscription amounts, you can use two methods to reverse the accrual amounts:

- You can reverse each accrued revenue transaction individually before you create the credit note proposal for the transaction. This is the manual method. (manual)
- You can have the accrued amounts reversed on the date where the credit note is posted or on the original posting date of the accrual.

For more information, see [Subscription parameters \(form\)](#).

Setup requirements

To accrue revenue, make sure that the following data requirements are met:

Account setup

The **WIP - subscription** and the **Accrued revenue - subscription** accounts must be set up in the **Project** module.

When you post accrued revenue, the **WIP - subscription** account is debited with the accrual amount, and the **Accrued revenue - subscription** account is credited with the accrual amount.

Set up accounts for accrual of subscription revenue

1. Click **Project management and accounting > Setup > Posting > Ledger posting setup**.
2. Click the **Revenue accounts** tab, and select **WIP - subscription** or **Accrued revenue - subscription** to set up the accounts.

Subscription group setup

To be able to accrue revenue for subscriptions, the **Accrue revenue** check box must be selected. This is found on the **Subscription groups** form for the group that is attached to the subscription. Click **Service management > Setup > Service subscriptions > Subscription groups**.

Enable revenue accrual on a subscription group

1. Click **Service management > Setup > Service subscriptions > Subscription groups**.

Periods

You must set up an invoicing period code. Unless you want to accrue revenue in the same time intervals as you use for invoicing, you must also set up an accrual period.

The following table provides an overview of which accrual periods can be set up for each invoicing period:

INVOICING PERIOD	ACCRUAL PERIOD
Years	<ul style="list-style-type: none">• Years• Quarter• Month• Day
Quarter	<ul style="list-style-type: none">• Quarter• Month• Day
Month	<ul style="list-style-type: none">• Month• Day
Week	<ul style="list-style-type: none">• Day
Day	<ul style="list-style-type: none">• Day

Setting up the invoicing period is a mandatory part of the overall subscription group setup. You can decide whether to also set up an accrual period for the subscription group. If you set up an accrual period for the subscription group, this period is suggested in the **Period code** field. This field is found in the **Accrue subscription revenue** form, when you accrue subscription revenue. However, the accrual period is optional information about the subscription group.

NOTE

Use the following path to open the **Accrue subscription revenue** form. Click **Service management > Periodic > Service subscriptions > Accrue subscription revenue**.

Transactions

You can control the number of ledger transactions that are created when you post accrued revenue. On subscriptions, define if the ledger transactions should be created as a total or per line.

Specify the level of posting details to display for accrued transactions

1. Click **Project management and accounting > Setup > Project management and accounting parameters**.
2. On the **Financial** tab, in the **Invoice** field, select **Total** or **Line**.

See also

[Accrue subscription revenue](#)

NOTE

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Move service order lines

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1. Click **Service management** > **Common** > **Service orders** > **Service orders**.
2. Double-click the service order that contains the lines that you want to move to another service order.
3. In the **Service orders** form, on the Action Pane, click the **Move lines** button.
4. In the **Move service order lines** form, in the **Service order** field, select the service order that you want to move the lines to.
5. Select the **Delete empty service order** check box to delete the service order that you moved the service order lines from.
6. Click **OK**.

NOTE

You can move service order lines only between service orders that are attached to the same service agreement.

See also

[Service orders](#)

NOTE

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Cancel service orders

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You can cancel a service order or service order line from the service order itself, or you can cancel multiple service orders by running a periodic job.

NOTE

Service orders cannot be canceled if the stage of the service order does not allow cancellation, if the service order has item requirements, or if the service order has already been posted.

Cancel a service order in the Service orders form

1. Click **Service management > Common > Service orders > Service orders**. Select the service order, and on the Action Pane, click **Cancel order**.

Cancel a service order line

1. Click **Service management > Common > Service orders > Service orders**. Double-click the service order that contains the line you want to cancel.
2. Select the service order line that you want to cancel, and then click **Cancel order line** to change the status of the line to **Canceled**.

TIP

To reverse the cancellation of a service order line and change the status back to **Created**, click **Revoke cancel**.

Cancel multiple service orders

1. Click **Service management > Periodic > Service orders > Cancel service orders**.
2. Click the **Select** button.
3. In the **Inquiry** form, in the **Criteria** column, select the service orders that you want to cancel.
4. Click **OK** to close the **Inquiry** form.
5. Select the **Show Infolog** check box to generate an Infolog that lists the canceled service orders.
6. Select the **Revoke cancel** check box if you want to reverse the **Canceled** status of a service order.
7. Click **OK**.

The selected service orders are either canceled or their progress status of **Canceled** has been reversed to **In process**.

NOTE

If you select the **Revoke cancel** check box, service orders with a progress status of **Canceled** are reversed and service orders with a progress status of **In process** are not canceled.

NOTE

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Create service orders manually

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You can create service orders manually by using a service agreement or by using the **Service orders** form. You can also create a service order from a project.

TIP

You can use automated processes to create service orders.

Create a service order manually from a service agreement

1. Select **Service management > Common > Service agreements > Service agreements**.
2. Select a service agreement or create a new service agreement.
3. Select the **Deliver** tab and in the **Create** group select **Planned service orders** to open the **Create service orders** form.

Create a service order manually in the Service orders form

1. Select **Service management > Common > Service orders > Service orders**.
2. Select **New** to create a new service order.
3. Create service order lines for the service order.

NOTE

If the **Allow without service agreement** check box in the **Service management parameters** form is selected, you can post the transactions from the service order lines without attaching the service order to a service agreement. If the check box is cleared, you must attach the manually created service order to a project before posting the service order lines.

Create a service order from a project

1. Go to **Project management and accounting > Common > Projects > All projects**.
2. In the **Projects** form, on the **Action Pane**, select the **Manage** tab > select **Service > Service orders**.
3. Follow the previous procedure to create a service order manually in the **Service orders** form. The **Project ID** field displays the project reference.

NOTE

If the **Allow without service agreement** check box in the **Service management parameters** form is selected, you can post the transactions from the service order lines without attaching the service order to a service agreement. If the check box is cleared, you must attach the manually created service order to a project before posting the service order lines.

Create a service order from the Sales order form

You can create a service order from the **Sales orders** form by using the **Create a new service order based on the sales order** wizard.

1. Go to **Sales and marketing > Common > Sales orders > All sales orders**.
2. Open the relevant sales order.
3. On the **Sales order** tab, select **Service order** to start the **Create a new service order based on the sales order** wizard.
4. Select **Next >**, and then complete the following steps on the **Select agreement for service order** page:
 - Use the **Service agreement** field to select the service agreement with which the new service order should be associated.
 - Optional: Use the **Project ID** field to associate this service order with a particular project.
5. Select **Next >**, and then complete the following steps on the **Create service order** page:
 - Enter a date and time for the service call to begin in the **Preferred service time** field.
 - Optional: Modify the text in the **Description** field. By default, this field contains the description of the service agreement that you selected on the previous page.
 - In the **Responsible** field, select the ID of the employee who is responsible for the agreement, and if you know what it is, enter the ID of the customer's preferred technician for the service call.
 - In the **Contact ID** field, select the person in the customer's company who should be contacted regarding this service order.
6. Select **Next >**, and then select **Finish**.

See also

[Service orders](#)

[Create service orders automatically](#)

[Create service orders \(class form\)](#)

NOTE

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Accrue subscription revenue

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1. Click **Service management** > **Periodic** > **Service subscriptions** > **Accrue subscription revenue**.
2. In the **Period code** field, select a period code. Revenue is posted for all subscription fee transactions that have the selected period code.
3. In the **Posting date** field, enter a posting date, and then click **OK**.

NOTE

You cannot post accrued revenue until the fee transactions are invoiced.

NOTE

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Delete service orders

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1. Click **Service management** > **Periodic** > **Service orders** > **Delete service orders**.
2. On the **Delete service orders** form, click **Select** to specify the criteria to select the service orders to be deleted, and then click **OK**.
3. Select the **Show Infolog** check box to generate an Infolog that displays the deleted service orders.
4. Click **OK**.

NOTE

If you do not specify any criteria to select the service orders, all service orders are deleted. However, when you exit the **Delete service orders** form, you will have the option to delete all service orders.

Also, you can only delete service orders with a stage that lets you delete them.

See also

[Service orders](#)

NOTE

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Invoice subscription transactions

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1. Click **Service management** > **Common** > **Service subscriptions** > **All service subscriptions**.
2. Select a service subscription and then click **Edit** or click **Subscription** to create a service subscription.
3. Click **Analyze** > **Fee transactions**.
4. Select the fee transaction or fee transactions to invoice, and then click **Functions** > **Invoice proposal** to open the **Invoice proposals** form.
5. Click **Create invoice** and enter the appropriate parameters in the **Create invoice** form.
6. Click **OK** to create the invoice proposal in the **Invoice proposals** form.
7. Verify the contents of the invoice, click **Post invoice** to open the **Post invoice** form to post the invoice. You can also print the invoice from the **Post invoice** form.

NOTE

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Transportation management overview

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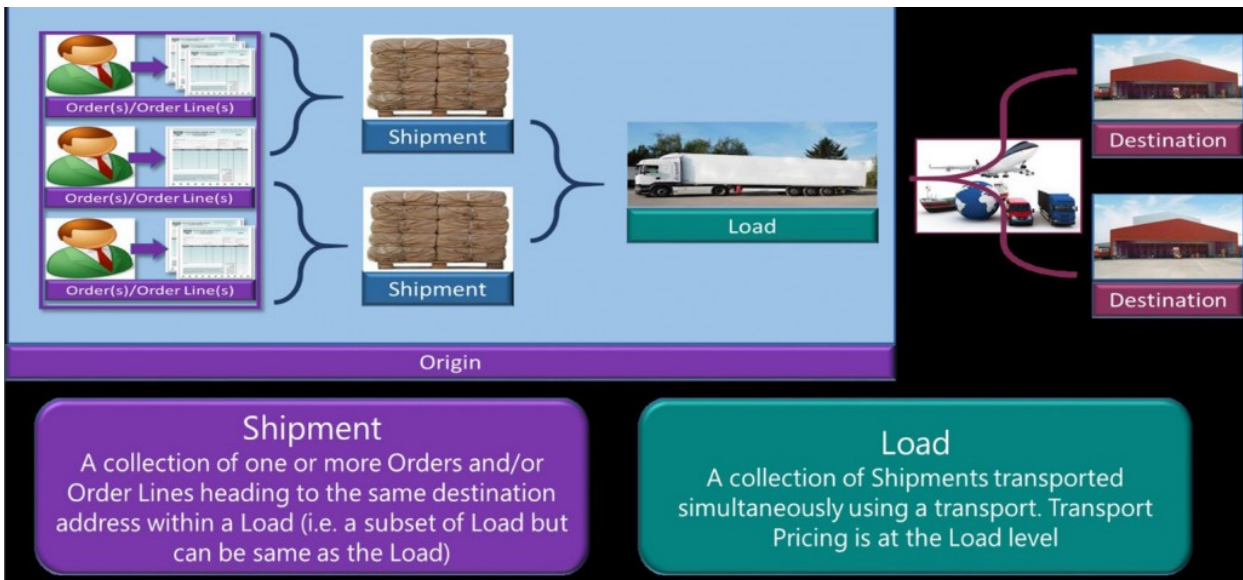
This topic gives an overview of the transportation management functionality in Supply Chain Management.

Transportation management lets you use your company's transportation, and also lets you identify vendor and routing solutions for inbound and outbound orders. For example, you can identify the fastest route or the least expensive rate for a shipment. The following table describes the main scenarios for using Transportation management.

SCENARIO	HOW TRANSPORTATION MANAGEMENT CAN HELP
Use external logistics providers for transportation activities.	Use Transportation management for inbound and/or outbound transportation.
The company's own fleet is available for delivery/pickup, and delivery charges are passed on to customers.	For the outbound processes, you can use Transportation management to determine the transportation charges and pass them on to customers. However, the carrier invoice reconciliation process isn't required.
The company's own fleet is available for delivery/pickup, but delivery charges aren't passed on to customers, because product prices include transportation.	A lot of the Transportation management functionality isn't required. However, you can use Transportation management to determine the transportation rates and adjust the sales price accordingly.
Logistics service is provided by another legal entity in the same company.	<ul style="list-style-type: none">You can use Transportation management by treating the other legal entity like any other shipping carrier. You can't automate the economic transactions between legal entities. Therefore, you must handle these transactions manually (for example, by creating a purchase order).In the legal entity that provides the logistics services, Transportation management can be used to determine transportation rates.

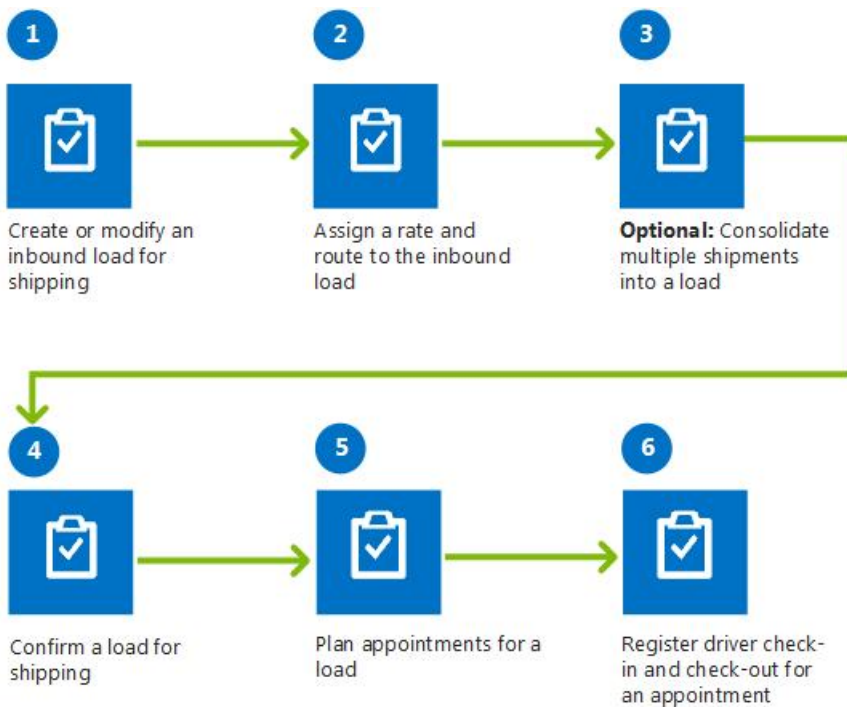
Planning transportation in Supply Chain Management

In Transportation management, transportation planning can be based either on orders or on the shipments that are created based on those orders. The shipments always exist at some point in time but aren't required for transportation planning. Transfer orders are part of the outbound scenario and can be planned together with sales orders.



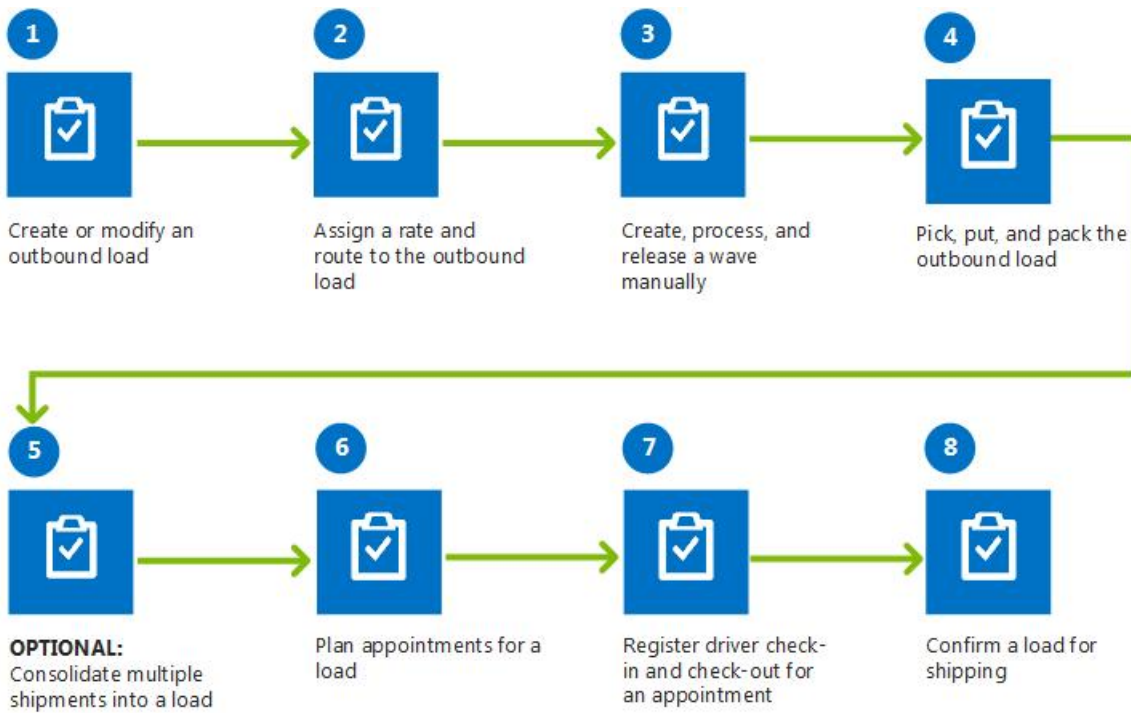
Inbound transportation

When you order items from a vendor, and the items must be delivered to your warehouse, you might want to arrange the transport of the items yourself. You can use Supply Chain Management to plan the transportation and receipt of the inbound load. The following illustration shows the business process flow for planning transportation for an inbound load.



Outbound transportation

You can plan and process an outbound load to ship specific items from a company's warehouse to a customer. You can use Supply Chain Management to plan the transportation and shipping of an outbound load. The following illustration shows the business process flow for planning and processing outbound loads for shipping.



Load building

Supply Chain Management provides a load building strategy that is named the Volume-based load building strategy. This strategy lets you use the maximum values that are specified for height and weight in the load template, or you can override the settings by entering new values. To use this strategy, select it in the **Load building strategy** field on the **Setup** FastTab on the **Load building workbench** page. In addition, you can add your own load-building strategies by creating a new class in the Application Object Tree (AOT).

NOTE

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Transportation management engines

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Transportation management engines define the logic that is used to generate and process transportation rates in Transportation management.

A transportation management engine calculates tasks, such as the carrier's transportation rate. The engine system lets you change calculation strategies at runtime, based on data in Supply Chain Management. A transportation management engine resembles a plug-in that is related to a particular carrier contract.

What engines are available?

The following table shows the transportation management engines that are available.

TRANSPORTATION MANAGEMENT ENGINE	DESCRIPTION
Rate engine	Calculates rates.
Generic engine	Simple auxiliary engines that are used by other engines that do not require data from Supply Chain Management, for example, an apportionment engine. Apportionment engines are used to reduce the final costs of transportation to specific orders and lines, based on dimensions, such as volume and weight.
Mileage engine	Calculates the transportation distance.
Transit time engine	Calculates the time that is required to travel from the start to the end destination.
Zone engine	Calculates the zone based on the current address and calculates the number of zones that must be crossed in order to travel from address A to address B.
Freight bill type	Standardizes the freight invoice and the freight bill lines and is used for automatic freight bill matching.

What engines must be configured to rate a shipment?

To rate a shipment using a specific carrier, you must configure multiple transportation management engines. The **Rate engine** is required, but other transportation management engines may be required to support the **Rate engine**. For example, the **Rate engine** can be used to retrieve data from the **Mileage engine** to calculate the rate based on mileage between the source and the destination.

What's required to initialize a transportation management engine?

A transportation management engine requires that you set up initialization data in order to function in a specific way. The setup can include the following types of data:

- References to other transportation management engines. For details, see the configuration example in this section.

- References to .NET types that are used by the transportation management engine.
- Simple configuration data.

In most cases, you can click the **Parameters** button in the transportation management engine's setup forms to configure the initialization data. **Example of the configuration of a rate engine that references a mileage engine** The following example shows the setup that is required for a rate engine that is based on the .NET engine type Microsoft.Dynamics.Ax.Tms.Bll.MileageRateEngine and references a mileage engine.

PARAMETER	DESCRIPTION
<i>RateBaseAssigner</i>	The .NET type that interprets the rate base assignment data for a particular schema. The syntax of the parameter value consists of two segments delimited by a vertical bar (
<i>MileageEngineCode</i>	Mileage engine code that identifies the mileage engine record in the database.
<i>ApportionmentEngine</i>	Generic engine code that identifies the apportionment engine in the database.

How is metadata used in transportation management engines?

Transportation management engines that rely on data that is defined in Supply Chain Management can use different data schemas. The transportation management system enables different transportation management engines to use the same generic physical database tables. To make sure that run-time interpretation of engine data is correct, you can define metadata for the database tables. This reduces the cost of building new transportation management engines because additional table and form structures are not required in Operations.

What can be used as search data in rate calculations?

The data that you use when you calculate rates is controlled by the metadata configuration. For example, if you want to search for rates based on postal codes you must set up metadata based on the lookup type of a postal code.

Do all engine configurations require metadata?

No, transportation management engines that are used to retrieve the data that is required for rate calculation from external systems don't need metadata. The rate data for these engines can be retrieved from external transportation carrier systems, usually through a web service. For example, can use a mileage engine that retrieves data directly from Bing maps so that you don't need a metadata for this engine.

NOTE

The transportation management engines that are delivered with Supply Chain Management rely on data that is retrieved from the application. Engines that connect to external systems are not included with Operations. However, the engine-based extensibility model lets you build extensions using Visual Studio Tools.

How do I configure metadata for a transportation management engine?

Metadata for transportation management engines is configured differently for the different types of engines.

TRANSPORTATION MANAGEMENT ENGINE	METADATA CONFIGURATION
Rate engine	Requires a Rate base type . The rate base type contains metadata for the rate base data and the rate base assignment data. The structure of rate base metadata is determined by the type of rate engine. The structure of the rate base assignment metadata is determined by the type of rate base assigner that is associated with that rate engine. You set up the rate base type of a rate engine on the Rate engine page and on the Rate master page.
Zone engine	Requires metadata to be set up directly on the zone master.
Transit time engine and Mileage engine	Retrieves the metadata directly from the mileage engine's configuration setup form.

Example of metadata for a rate engine The transportation management engine requires identification of the origin address, the destination state and country/region, and the start and end point of the shipment. By using these requirements, the metadata would look like the data in the following table. The table also includes information about what type of input data is required.

- Define this information in **Transportation management > Setup** on the **Rate base type** page.

SEQUENCE	NAME	FIELD TYPE	DATA TYPE	LOOKUP TYPE	MANDATORY
1	Origin postal code	Assignment	String	Postal Code	Selected
2	Destination state	Assignment	String	State	
3	Destination start postal code	Assignment	String	Postal Code	Selected
4	Destination end postal code	Assignment	String	Postal Code	Selected
5	Destination country	Assignment	String	Country/region	

NOTE

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Create a new transportation management engine

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This topic describes how to create a new transportation management engine in Dynamics 365 Supply Chain Management.

Transportation management (TMS) engines define the logic that is used to generate and process transportation rates in Transportation management. Supply Chain Management provides several different engine types that calculate different parameters, such as rates, transit times, and the number of zones that will be crossed during transit. This article explains how to use the Microsoft Visual Studio development environment together with Supply Chain Management development tools to create and deploy a new TMS engine, and then how to set up the engine in Operations. For more information about the engines, see [Transportation management engines](#).

Create a new TMS engine

This section explains how to create a class library that has a TMS engine implementation, and how to reference it from a Supply Chain Management model.

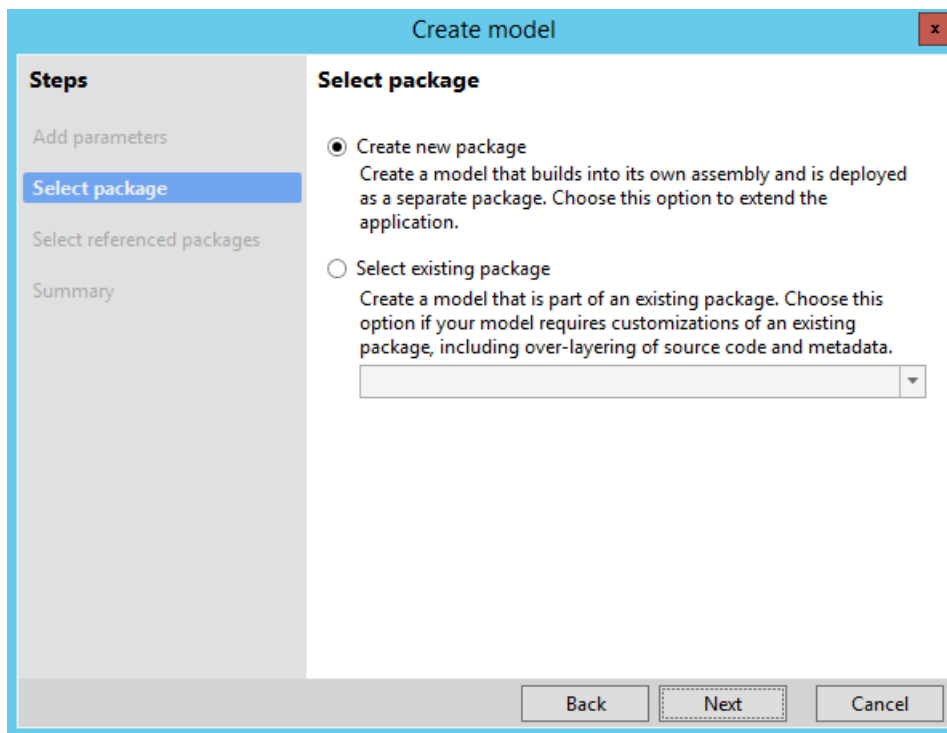
1. To deploy your new engines, you must have a model that will contain the engines. On the **Dynamics 365 > Model Management** menu, click **Create model** to create a new model. On the first page of the **Create model** wizard, name the model **TMSEngines**.

The screenshot shows the 'Create model' wizard interface. On the left, a 'Steps' sidebar lists 'Add parameters', 'Select package', 'Select referenced packages', and 'Summary'. The 'Add parameters' step is currently selected and highlighted. The main content area is titled 'Add parameters' and contains the following fields:

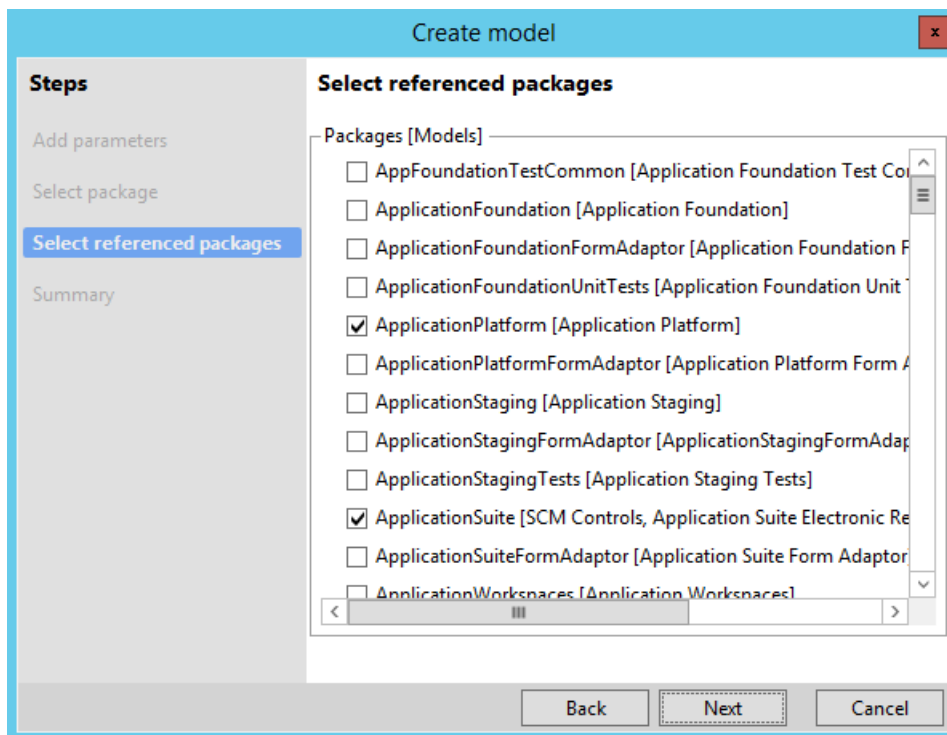
- Model name:** TMSEngines
- Model publisher:** TMSEnginesPublisher
- Layer:** usr (with a dropdown arrow)
- Version:** 1.0.0.0
- Model description:** (empty text area)
- Model display name:** TMSEngines

At the bottom of the wizard, there are three buttons: 'Back', 'Next' (which is highlighted with a dashed border), and 'Cancel'.

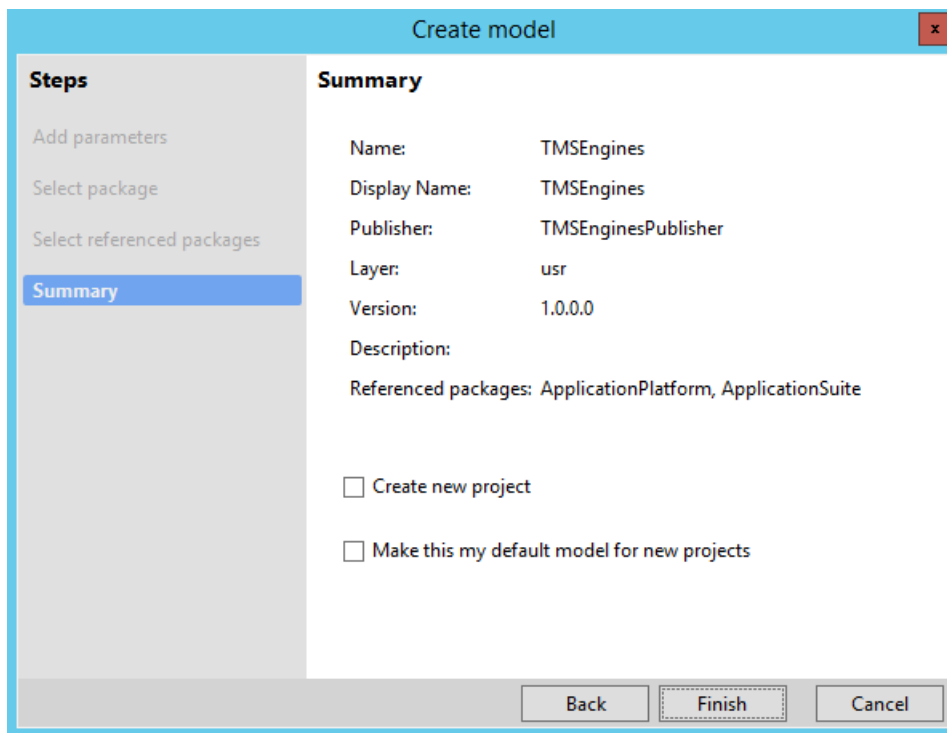
2. On the next page, select **Create new package**.



3. On the next page, select the **ApplicationSuite** model to reference. (The **ApplicationPlatform** model is preselected.)



4. On the next page, click **Finish** to confirm the creation of a new model.



5. In a new solution, create a new Supply Chain Management project, and name it **TMSThirdParty**. In the project properties, set the project's model to **TMSEngines**.
6. Add a new C# class library to your solution, and name it **ThirdPartyTMSEngines**.
7. In the ThirdPartyTMSEngines project, add references to Supply Chain Management–specific assemblies:
 - Application assemblies that enable X++ types to be referenced. These assemblies can be found in the following locations. [Packages root] is the path of the location where all the deployed assemblies are placed, such as C:\Packages.

```
[Packages root]\ApplicationPlatform\bin\Dynamics.AX.ApplicationPlatform.dll
[Packages root]\ApplicationFoundation\bin\Dynamics.AX.ApplicationFoundation.dll
[Packages root]\ApplicationSuite\bin\Dynamics.AX.ApplicationSuite.dll
```

- Framework assemblies that enable access to data, LINQ, and auxiliary functions. All these assemblies can be found in [Packages root]\bin.

```
Microsoft.Dynamics.ApplicationPlatform.Environment.dll
Microsoft.Dynamics.AX.Data.Core.dll
Microsoft.Dynamics.AX.Framework.Linq.Data.AdoNet.dll
Microsoft.Dynamics.AX.Framework.Linq.Data.dll
Microsoft.Dynamics.AX.Framework.Linq.Data.Interface.dll
Microsoft.Dynamics.AX.Framework.Linq.Data.Msil.dll
Microsoft.Dynamics.AX.Server.Core.dll
Microsoft.Dynamics.AX.Xpp.AxShared.dll
Microsoft.Dynamics.AX.Xpp.Support.dll
```

- The core TMS assembly (which contains engines) and the TMS base assembly (which contains helpers, constants, data transfer class definitions, and so on). These assemblies can be found in the following locations.

```
[Packages root]\ApplicationSuite\bin\Microsoft.Dynamics.AX.Tms.dll
[Packages root]\ApplicationSuite\bin\Microsoft.Dynamics.AX.Tms.Base.dll
```

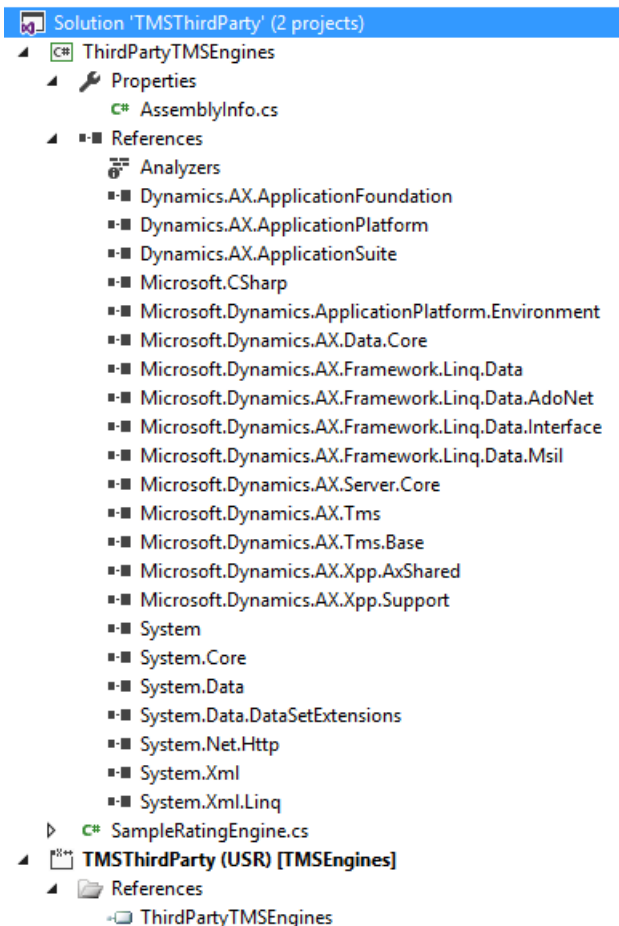
8. Rename the C# class that is automatically generated in the ThirdPartyTMSEngines project to

SampleRatingEngine.

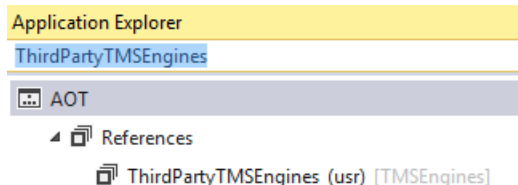
- Implement the engine. Because we are creating a rate engine in this example, we inherit from the base class for rate engines. The base class implements most of the rate engine interface (**TMSFwkIRateEngine**). We just have to implement the rate method. To keep this example simple, we will make this method register a hard-coded rate of 100. You can create engines that implement any of the engine interfaces, such as **TMSFwkIAccessorialEngine**. All the engine interfaces are defined in X++.

```
namespace ThirdPartyTMSEngines
{
    using Dynamics.AX.Application;
    using Microsoft.Dynamics.Ax.Tms.Base.Data;
    using Microsoft.Dynamics.Ax.Tms.Base.Utility;
    using Microsoft.Dynamics.Ax.Tms.Bll;
    using System.Xml.Linq;
    public class SampleRatingEngine : BaseRateEngine
    {
        public override RatingDto rate(TmsTransactionFacade transactionFacade, XElement shipment,
TMSRateMasterCode rateMasterCode)
        {
            XElement re = shipment.RetrieveOrCreateRatingEntity(this.RatingDto);
            re.AddRate(TmsRateType.Rate, 100);
            return this.RatingDto;
        }
    }
}
```

- Build the solution.
- Add a new reference to the TMSThirdParty project. The reference should point to the ThirdPartyTMSEngines project. When you've finished, your solution should look like this.



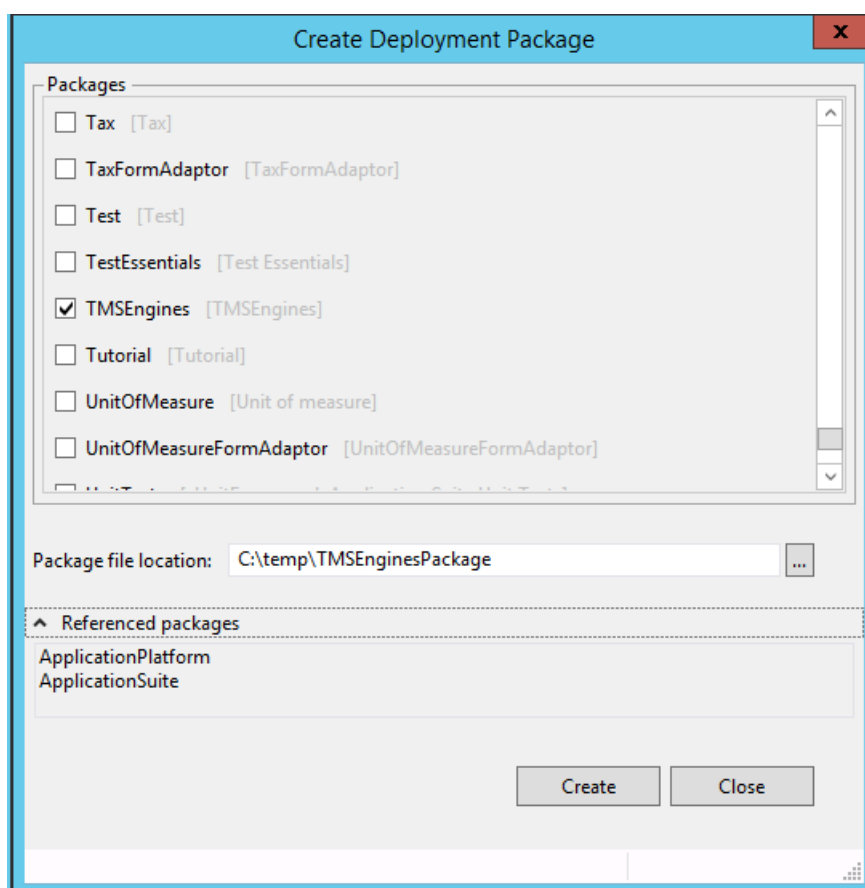
- Build the solution. Verify that the new library appears in the **References** node in Application Explorer.



Deploy the TMS engine as a package

One way to deploy third-party TMS engines is through a deployment package. This approach is recommended in a production environment. In a development environment, you can manually copy the assemblies, as described in the next section, "Set up a TMS engine in Supply Chain Management." To deploy the engine as a package, follow these steps.

1. On the **Dynamics 365 > Deploy** menu, click **Create Deployment Package**.
2. In the **Create Deployment Package** dialog box, select the TMSEngines model, and enter the path where you want to store your package files.



3. You can now deploy the package to the target environment. For a tutorial, see [Install a deployable package](#).

Set up the TMS engine in Supply Chain Management

This section explains how to set up Supply Chain Management to use a TMS engine, and shows how the new engine that we have created is used in rate shopping. The example in this section uses the USMF demo data company.

1. Create a new engine as described in the "Create a new TMS engine" section.
2. Build your solution.
3. Copy the resulting assembly into the binary location of the Supply Chain Management server,

[AOSWebRoot]bin. **Note:** This step is relevant only in a development environment. In a production environment, you should deploy through a deployment package. For instructions, see the previous section, "Deploy the TMS engine as a package."

- In Supply Chain Management, on the **Rate engines** page, create a new rating engine. The engine should point to the engine assembly that is produced by building the engine class library and the engine class that you implemented.

Rate engines

Filter

Rate engine ↑	Name	Rating metadata ID	Engine assembly	Engine class
Sample	Sample Engine	▼	ThirdPartyTMSEngines.dll	ThirdPartyTMSEngines.SampleRatingEngine

- Create a shipping carrier that uses the Sample rate engine. Because our engine doesn't use any data, you don't have to assign a rate master.

Shipping carriers

Shipping carrier: SampleCarrier | Name: Sample carrier | Mode: Ground ▼

Overview

Activate shipping carrier: Yes | Tracking URL: | Transportation tender type: None ▼ | Pro number sequence: ▼

Website URL: | Vendor: ▼ | SCAC: | Activate carrier rating: No

Services

+ New Delete

✓	Carrier service	Name	Load template ID	Transportation method	Mode of delivery	External code
✓	Default	Default	▼	Ground	▼	Sampl-Defa

Addresses

Rating profiles

+ New Delete Rate master Transit time engine

✓	Rating profile ↑	Name	Site	Warehouse	Rate engine	Rate master
✓	Default	Default	▼	▼	Sample	▼

- On the **Rate route workbench** page, click **Rate shop**. You should see a rate of 100.00 from SampleCarrier, as shown in the following screen shot. In this example, we are rate shopping for a route from warehouse 24 to customer US-004. However, but because the rate is hard-coded, you will always see a rate of 100.00.

Rate route workbench

Criteria

Route Results

Add to an existing route Assign View exception details

Hide Exceptions

✓	Route guide	Route plan	Shipping carrier	Carrier service	Mode	Total rate ↑	Customer rate	Shipper rate	Currency
			SampleCarrier	Default	Ground	100.00	100.00	100.00	USD

Tips and tricks

- If you're using development tools for Supply Chain Management, it's useful to add a new project to your solution. If you set this project as your startup project and start a debugging session, you can debug both

X++ and C# code in the same debugging session.

- Every time that you change and recompile your ThirdPartyTMSEngines project, you must manually copy the resulting assembly to the binary location or deploy through a deployment package. Otherwise, you might run by using a stale assembly.
- After you execute TMS-specific operations in Supply Chain Management, the Internet Information Services (IIS) worker process might lock the ThirdPartyTMSEngines assembly so that the assembly can't be updated. In this case, restart the w3svc process.

NOTE

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Associate a fuel index with a carrier as an accessorial charge

2/18/2021 • 2 minutes to read • [Edit Online](#)

This guide shows how to create an accessorial assignment, carrier accessorial charge, accessorial master for fuel surcharge, and associate a carrier fuel index with a carrier. You need to have set up a carrier fuel index before you run this guide. You can use the "Set up a carrier fuel index" guide to do this. These setup tasks are typically done by a Logistics manager. The demo data used to create this procedure is USMF.

Create an accessorial master

1. Go to Transportation management > Setup > Rating > Accessorial masters.
2. Click New.
3. In the Accessorial master field, type a value.
4. In the Name field, type a value.
5. Click Save.

Create a carrier accessorial charge

1. Go to Transportation management > Setup > Rating > Carrier accessorial charges.
2. Click New.
3. In the Carrier accessorial ID field, type a value.
4. In the Shipping carrier field, click the drop-down button to open the lookup.
5. In the list, find and select the desired record.
 - In this example, choose Truck Carrier.
6. In the list, click the link in the selected row.
7. In the Carrier service field, click the drop-down button to open the lookup.
8. In the list, click the link in the selected row.
9. In the Accessorial master field, click the drop-down button to open the lookup.
10. In the list, find and select the desired record.
 - In this example, choose the newly created Accessorial master.
11. Click Save.

Create an accessorial assignment

1. Click Accessorial assignments.
2. Click New.
3. In the Name field, type a value.
4. Toggle the expansion of the Criteria section.
 - In the criteria, you can choose to always apply the fuel surcharge or for this example choose that it only applies within a certain region.
5. In the ZIP/postal code from field, type a value.
6. In the ZIP/postal code to field, type a value.
7. Toggle the expansion of the Calculation section.
 - In the calculation section you can specify how to calculate the fuel surcharge. This calculation depends

on the Accessorial unit that you chose as the base for your calculation.

8. In the Accessorial fee type field, select 'Fuel surcharge'.
9. In the Accessorial unit field, select 'Mileage'.
10. In the Region field, click the drop-down button to open the lookup.
11. In the list, click the link in the selected row.
12. Click Save.

Update the carrier rating profile

1. Go to Transportation management > Setup > Carriers > Shipping carriers.
2. In the list, find and select the desired record.
3. Toggle the expansion of the Rating profiles section.
4. Click Edit.
5. In the Carrier fuel index field, click the drop-down button to open the lookup.
6. In the list, click the link in the selected row.
7. Click Save.

NOTE

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USMCA certification of origin

2/18/2021 • 7 minutes to read • [Edit Online](#)

This feature lets you print the certification of origin documents required by the United States-Mexico-Canada Agreement (USMCA).

The *USMCA certification of origin document* contains the minimum data elements required for declaration. Some data elements can be pre-filled before printing while others must be filled in manually after printing. To obtain preferential tariff treatment, the document must be completed and in the possession of the importer at the time the declaration is made. The document may be completed by the importer, exporter, or producer.

You can print the document for a single shipment from the **All shipments** list page or from the **Shipment details** page.

The document is only accessible when the country on the primary address for the legal entity is the United States.

Depending on the document print selection, the document can be pre-filled with data from your system. It is possible to change or add data to the printed document by exporting the printed document to an editable format, such as Microsoft Word. After export, you can apply any required changes before a declaration is made.

Turn on the USMCA feature

Before you can use the USMCA feature, it must be turned on in your system. Admins can use the [feature management](#) settings to check the status of the feature and turn it on. In the **Feature management** workspace, the feature is listed in the following way:

- **Module:** *Transportation management*
- **Feature name:** *USMCA certification of origin document*

Document content

The USMCA certification of origin document contains the following data elements:

- Address elements
- Role of the certifying party
- Single shipment
- Invoices
- Blanket period
- Item details
- Certifier signature
- Number of pages

For more information about each of these elements and how their values are found, see the remaining sections in this topic.

Print a USMCA certification of origin document

To print a USMCA certification of origin document for a shipment, do the following:

1. Do one of the following:

- Go to **Transportation management > Shipments > All shipments** and select the shipment you want to print the document for.
 - Open the **Shipment details** page for the shipment you want to print the document for (there are several ways to get here, including from the **All shipments** page).
2. On the Action Pane, open the **Shipments** tab and, from the **Print** group, select **USMCA certificate of origin**.
 3. The **Certificate or origin** dialog box opens. Make the settings described in the following subsections and then select **OK** to generate the document.
 4. A preview of the document opens. Use the commands provided on the Action Pane to print or export the document as needed.

Certifying party

Use the **Certifying party** drop-down list to identify the type of party that is printing the document. Specify whether the certifying party is the *Exporter*, *Exporter and Producer*, *Producer*, or *Importer*, or leave it blank if the certifying party is none of these. The option you select determines what is printed in the address sections of the document.

The **Certifying party** that you choose will be included in the printed document.

The document can be printed for both inbound and outbound shipments. Select *Importer* as **Certifying party** for inbound shipments only.

The following table describes the types of information that are included in the document based on the **Certifying party** that you choose.

CERTIFYING PARTY	DESCRIPTION
<i>[Blank]</i>	<p>Adds the following details to the document:</p> <ul style="list-style-type: none"> • Certifier details: Uses the address details for the shipping warehouse, if available; otherwise it uses the shipping site address, if available; otherwise it uses the address of the legal entity (company) selected in Supply Chain Management. • Exporter details: Blank • Producer details: Blank • Importer details: Blank
<i>Exporter</i>	<p>Adds the following details to the document:</p> <ul style="list-style-type: none"> • Certifier details: Uses the address details for the shipping warehouse, if available; otherwise it uses the shipping site address, if available; otherwise it uses the address of the legal entity (company) selected in Supply Chain Management. • Exporter details: Uses the address details for the legal entity. • Producer details: Blank • Importer details: Uses the invoice account for the related sales order.

CERTIFYING PARTY	DESCRIPTION
<i>Exporter and Producer</i>	<p>Adds the following details to the document:</p> <ul style="list-style-type: none"> • Certifier details: Uses the address details for the shipping warehouse, if available; otherwise it uses the shipping site address, if available; otherwise it uses the address of the legal entity (company) selected in Supply Chain Management. • Exporter details: Uses the address details for the legal entity. • Producer details: Uses the address details for the legal entity. • Importer details: Uses the invoice account for the related sales order.
<i>Importer</i>	<p>Adds the following details to the document:</p> <ul style="list-style-type: none"> • Certifier details: Uses the address details for the shipping warehouse, if available; otherwise it uses the shipping site address, if available; otherwise it uses the address of the legal entity (company) selected in Supply Chain Management. • Exporter details: Blank • Producer details: Blank • Importer details: Uses the address details for the legal entity.
<i>Producer</i>	<p>Adds the following details to the document:</p> <ul style="list-style-type: none"> • Certifier details: Uses the address details for the shipping warehouse, if available; otherwise it uses the shipping site address, if available; otherwise it uses the address of the legal entity selected in Supply Chain Management. • Exporter details: Blank • Producer details: Uses the address details for the legal entity. • Importer details: Blank

Has various producers

The **Certifying party** drop-down list controls the text to be used for the producer details in the document.

Choose one of the following:

- *Various producers* - Prints the text "Various" in the producer details.
- *Available upon request* - Prints the text "Available upon request by the importing authorities" in the producer details.

When the **Certifying party** is set to *Exporter and Producer* or *Producer*, then the **Has various producers** setting is overruled, and the producer address details will be the same as the certifier.

Blanket period

Use the **Blanket period from** and **Blanket period to** settings to establish a blanket period, during which the document will cover multiple shipments of identical goods, even though the document is printed for only one shipment. You can set the blanket period dates without any constraints, and it will be added to the document. You can also leave these settings blank or set them in the past.

Is single shipment

In the **Certificate of origin** dialog box, set **Is single shipment** to one of the following:

- *Yes* - Adds "Single Shipment: Yes" next to the invoice number.
- *No* - Adds nothing.

Other information included in the document

In addition to the optional elements that you select using the **Certificate of origin** dialog box, the USMCA certification of origin document will include the information and custom fields summarized in the following subsections. Some of this information must be entered manually after you generate the document.

Invoice number

The IDs of sales invoices related to shipments are printed on the document irrespective of the blanket period. Invoice numbers are printed irrespective of the **Is single shipment** selection.

Item details

The document provides several sections that list specific item details, which are:

- **SKU number**: Prints the item number of the released product.
- **Description**: Prints either the description or name for the released product. If a description in the user's language exists, then this is printed. If no such description exists, then the name in the user's language is printed. If that name doesn't exist, then the item name is printed.
- **Harmonized System (HS) Tariff Classification**: Prints the Harmonized Tariff Schedule associated to the product. You can set up these schedules by going to **Transportation Management > Setup > Transportation standard > Harmonized Tariff Schedules**.
- **Origin criterion**: You must manually enter data in this section the first time you release the document.
- **Country of origin**: Prints the country of origin, which you apply by going to **Product information management > Setup > Product compliance > Country of origin** (see also [Country of origin](#)). The ISO code for the country of origin is printed based on the country/region of destination in the shipment delivery address and the item. If no country of origin data has been set up, then this value reverts back to the setting found at **Released product > Foreign trade > Origin**. If still no country of origin data is found, then you must manually enter the country of origin after generating the document.

Certifier signature and date

You must enter this manually after generating the document.

Consists of number of pages

The user signing the certification must manually enter the number of pages (for verification) after generating the document.

Page numbers

Current page and number of pages printed at the bottom of the document.

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Create a bill of lading

2/18/2021 • 2 minutes to read • [Edit Online](#)

This topic describes how to create a bill of lading when using warehouse management processes.

A bill of lading is a legal document between the company that ships the items and the carrier. The document accompanies the shipped items, and it serves as a receipt of shipment when the items are delivered at the destination. If you're using warehouse management, there are two ways to generate a bill of lading:

- Create the report manually, using the **Bill of lading** page.
- Generate the report from the **Load planning workbench**.

If you generate the bill of lading from the **Load planning workbench**, the load status must be **Shipped**. If there's more than one shipment in the load, a bill of lading is created for each shipment. After a bill of lading has been created you can make changes to it on the **Bill of lading** page.

Master bill of lading

If there's more than one shipment in the load, you can generate a master bill of lading. This has the same layout and information as a bill of lading, but contains the summarized content for all the shipments. If the **Create a master bill of lading when there's more than one shipment on a load** option is set to **Yes** on the **Transportation management parameters** page, a master bill of lading is automatically generated if you create a bill of lading from the **Load planning workbench**, and there's more than one shipment. You can also get a list of the bills of lading by clicking **Related information** > **Bill of lading**. If you're creating bills of lading manually, you can create a master bill of lading on the **Bill of lading** page.

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Plan freight transportation routes with multiple stops

2/18/2021 • 3 minutes to read • [Edit Online](#)

This article describes the various elements that you use to plan transportation routes in Dynamics 365 Supply Chain Management.

You can use route plans and route guides for complex transportation routes that have multiple stops. If the same route will be used on a regular basis, you can set up a scheduled route.

Route plans

A route plan contains route segments that provide information about the stops that are visited on the route and the carriers that are used for each segment. You must define the stops on the route as hubs. A hub can be a vendor, a warehouse, a customer, or even just a reloading place where you change carrier. For each segment, you can define "spot rates" for various charges. Here are some examples:

- Charges for travelling to the given segments
- Charges for a picking up the goods
- Charges for dropping off the goods

Each route plan must be associated with a route guide.

Route guides

A route guide defines the criteria for matching a load to a specific route plan. For example, you can specify an origin hub and a destination hub, limits for the container volume or weight, and a shipping carrier, service, or group. Route guides are available on the **Rate route workbench** page, where loads can be matched to routes either manually or automatically. If the route guide is for a scheduled route, it's also available on the **Load building workbench** page.

Scheduled routes

A scheduled route is a predefined route plan that has a schedule for the shipping dates. Scheduled routes and non-scheduled routes differ in the way that loads are assigned to them. If you assign a non-scheduled route by using the Rate route workbench, only the load and the route guide are validated. If you assign a scheduled route, the dates and addresses from the orders and the hubs, and the date on the route plan, are also considered. You don't have to use the Rate route workbench page to manually assign loads to a scheduled route. Instead, you can use the Load building workbench to suggest that loads be built based on the customer addresses and delivery dates from sales orders for a given scheduled route. For scheduled routes, the route plan will have fixed origin and destination hubs. Typically, the shipping carrier and service will be the same for all segments, but they can differ. The destination hubs are created by using the postal codes of the customers that are visited on the route. Several route schedules can be defined for one route plan. The route plan must be associated with a route guide. However, for scheduled routes, the plan can be associated with only one route guide. The route schedule is used only to create the actual routes on the **Route schedule** page. You can use the default load template when you propose loads on the Load building workbench.

Load building workbench

The Load building workbench uses the customer addresses and delivery dates from sales orders, and the scheduled routes that are available, to propose a load. By default, the values from the route are entered on the workbench. However, you can select a "from" date that is earlier than the "from" date on the route. When a load is proposed, the delivery address and delivery date of all open sales orders are checked. If the postal code of the delivery address matches the postal code of a hub in the route plan, and if the delivery date is within the range that is selected in the criteria, the sales order is proposed for the load. The capacity of the load template is also considered. Only one load is proposed at a time. If you have a sales order that isn't included, you might have to use a different load template (for example, a load template for a bigger truck or container) or plan an extra delivery.

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Plan loads using hub consolidation overview

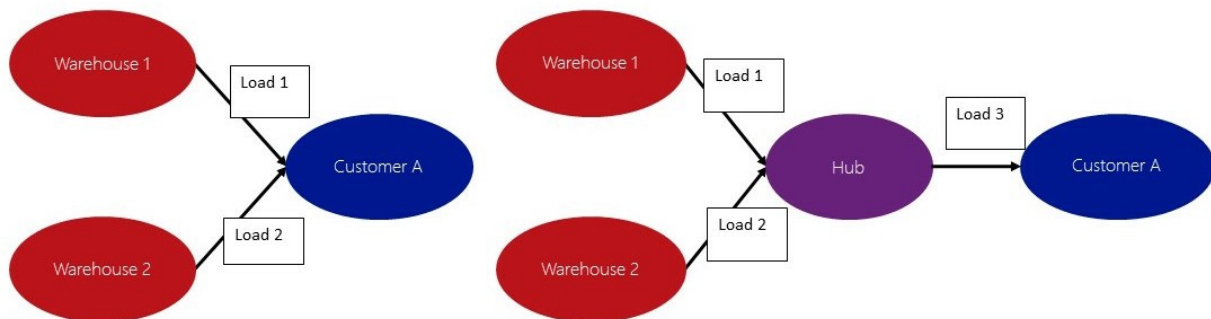
2/18/2021 • 2 minutes to read • [Edit Online](#)

This article describes the feature for consolidating shipments in a hub when you deliver goods from different warehouses to the same customer, or when you receive goods from multiple vendors in the same warehouse.

It can be useful to consolidate shipments in a hub when you deliver goods from different warehouses to the same customer, or when goods are delivered from multiple vendors to the same warehouse.

Building loads

Before you can use hub consolidation, you must enable the **In transit planning** option on the **Transportation management parameters** page. You must also create the hubs where consolidation will occur. The following diagram shows an example of hub consolidation. In this case, sales orders from different warehouses are going to the same customer. The basic loads are created based on sales orders in the usual way, by using the **Load planning workbench** page. To consolidate the two loads in a hub before they are delivered to the customer, on the **Load planning workbench** page, in the **Transportation** field, select **Hub consolidation**. When you select the correct hub for each load, the loads will have the hub as the "drop off" destination. You will also have two "transportation request lines" in the **Supply and Demand** section on the **Load planning workbench** page. You can then add these two lines to a new load. This new load will have both sales order lines, and will also have the hub as the "pick up" address and customer A as the "drop off" destination. The three loads are then ready to be rated and routed like any other load. You can select whatever shipping carrier the system suggests for each load.



You can also use the same method to consolidate loads for multiple transfer orders. In this case, customer A in the preceding diagram is a warehouse. Alternatively, you can consolidate loads for multiple purchase orders, where the loads are delivered from different vendors to the same warehouse. You can have more than one consolidation hub, and can consolidate in multiple hubs for more loads that come from different warehouses. After you build your basic loads and use the hub consolidation option, you build the new loads by using the consolidated transportation request lines. You then rate and route your loads.

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Plan loads and shipments using the Load planning workbench

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This topic shows how to use the load planning workbench to create a load for a sales order. As a prerequisite we'll create the sales order first. This procedure is part of the daily work for the transportation coordinator. The demo data company used to create this procedure is USMF.

Create a sales order

1. Go to the **Navigation pane > Modules > Accounts receivable > Orders > All sales orders**.
2. Select **New**.
3. In the **Customer account** field, select the drop-down button to open the lookup.
4. Select account **US-004**.
5. Select **OK**.
6. In the **Item number** field, select the drop-down button to open the lookup.
7. Select item **A0001**. **A0001** is enabled for transportation management.
8. In the **Site** field, select the drop-down button to open the lookup, then select an item.
9. In the **Quantity** field, enter a number.
10. In the **Warehouse** field, type '24' for this example. This warehouse is enabled for transportation management and advanced warehouse management.
11. Select **Save**.
12. Close the page.

Create a new load

1. Go to the **Navigation pane > Modules > Transportation management > Planning > Load planning workbench**.
2. Select the **Sales lines** tab. Now you'll build the load for the sales order that you just created. Loads can be built based on supply and demand from purchase orders, transfer orders, and sales orders.
3. On the Action Pane, select **Supply and demand**.
4. Select **To new load**.
5. In the **Load template ID** field, select the drop-down button to open the lookup. The Load template defines maximum measurements for weight and volume of the entire load. For example, the load template might represent the size of a container or truck. Select an item.
6. Select **OK**.

Rate and route the load

1. Select **Rating and routing**.
2. Select **Rate route workbench**.
3. Select **Rate shop**.
4. In the list, find and select the desired record.
5. Select **Assign**.
6. Close the page.

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Include container weight and volume on load

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The functionality for including the container weight and volume on a load gives a clear representation of the total weight and volume of containers and items that are going on a load.

A load contains a single shipment or multiple shipments, and these shipments contain distinct items that belong to a single sales order or multiple sales orders. The items are stored inside a container, and containers are loaded on a load. Items that are outside a container can also be part of a load. Based on these conditions, the system calculates values for the weight and volume on the load by considering the weight and volume of both containers and items.

If the calculated values aren't precise, you can adjust them by entering the actual values for the weight and volume on the load. The values for the weight and volume are used in transportation management processes. For example, the values are used in the rate route workbench, where they help define the rate and route for loads, and they are also used for transportation tenders and driver check-in.

Where it applies

The functionality for including the container weight and volume on a load applies in transportation management processes, such as the rate route workbench, transportation tenders, and driver check-in.

How it is set up

The number of containers that should be considered for a load is calculated based on the weight and volume of the container, and on the percentage of the container is used.

- To set the weight and volume for a container, click **Warehouse management > Setup > Containers > Container types**.
- To set the container utilization percentage, click **Warehouse management > Setup > Containers > Container groups**, and then enter a value in the **Container utilization percentage** field.

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Reconcile freight manually

2/18/2021 • 2 minutes to read • [Edit Online](#)

1

This procedure shows how to reconcile freight manually. This is typically done by a transportation coordinator. You can use this procedure in the USMF demo data company.

Select a load to reconcile

1. Go to Transportation management > Planning > Load planning workbench.
2. Clear the Hide shipped and received check box.
3. In the list, select the load that has load ID 00006.

Create a carrier invoice

If you reconcile freight manually and don't receive carrier invoices automatically, you can create an invoice based on the freight bill.

1. Click Related information.
2. Click Freight bill details.
3. Click Generate freight bill invoice.
4. In the Invoice field, type a value.
5. Click OK.

Reconcile the invoice

When you reconcile a carrier invoice and a freight bill, this is done line by line.

1. Click Match freight bills and invoices.
2. Expand the Invoice details section.
3. Expand the Unmatched freight bill details section.
4. In the list, mark the selected row.
5. Click Match.
6. Expand the Matched freight bill details section.

Submit the invoice for approval

1. Click Submit for approval.
2. Close the page.
3. Clear the Hide approved check box.
4. Click Vendor invoice journals.
5. Click to follow the link in the Reference journal number field.
6. Click Lines.

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Reconcile freight in transportation management

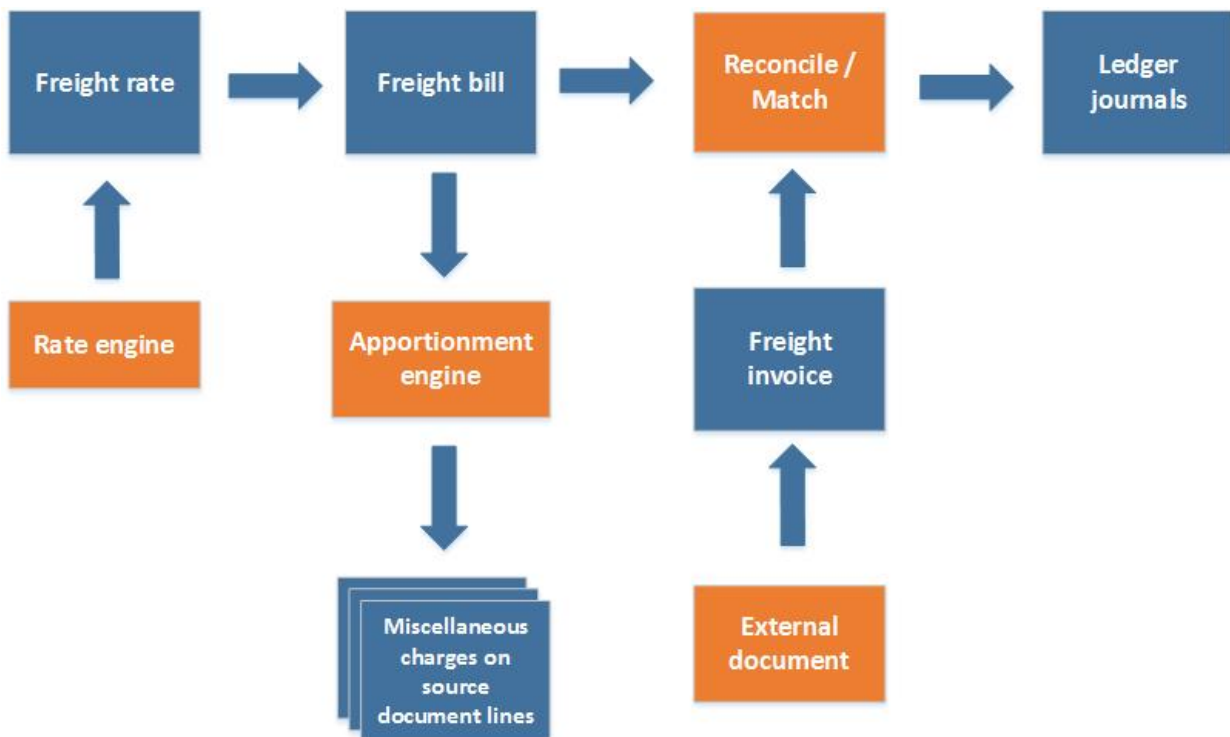
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This topic describes the freight reconciliation process.

Freight reconciliation can be done manually, or it can be set up to occur automatically. To use automatic freight reconciliation, you must set up an audit master where you can define criteria that determine which freight bills are matched automatically.

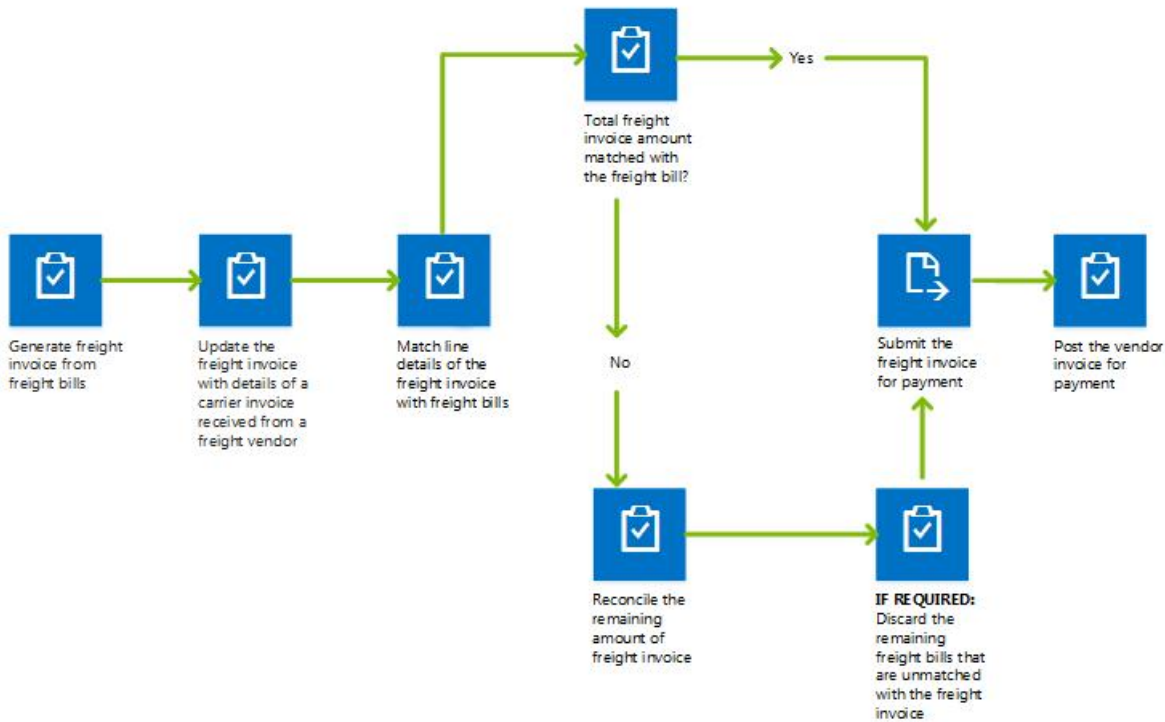
The freight reconciliation process

Freight rates are calculated by the rate engine that is associated with the relevant shipping carrier. When a load is confirmed, a freight bill is generated, and the freight rates are transferred to it. The freight rates are apportioned as miscellaneous charges to the relevant source document (purchase order, sales order, and/or transfer order), depending on the setup that is used for the regular billing process. The freight reconciliation process (which is also known as the matching process) can start as soon as the freight invoice arrives from the shipping carrier. The invoice can be received electronically or on paper. If the invoice is received on paper, you can generate an electronic invoice by using the freight bill as a template.



Manual reconciliation

If you're reconciling freight manually, you must match each invoice line with the freight bill line or lines for the load that is being invoiced. You do this matching on the **Freight bill and invoice matching** page. If the amount on the invoice line doesn't match the freight bill amount, you must select a reconciliation reason for the difference. If there are multiple reasons for reconciliation, you can split the unmatched amount across them. The reconciliation reason determines how the difference amounts are posted in the general ledger. When the reconciliation of the whole invoice amount is accounted for, it's submitted for approval, and then the journal is posted. The following illustration shows how to generate a freight invoice and do freight reconciliation.



Automatic reconciliation

To use automatic reconciliation, you must specify the schedule for reconciliation, and the invoices and shipping carriers to use. The matching of the invoice lines and freight bills is done according to the setup of the audit master and freight bill type. After you run the automatic reconciliation, you must handle any invoices that the system can't match. You must then process these invoices manually before you can post all the invoices for payment.

Match freight bills with freight invoices using automatic or manual reconciliation

Matching is the process of finding the freight bills that correspond to each freight invoice. This can be done by matching the invoice lines one-by-one (manual matching), or by matching all available invoices at once (auto matching).

Auto matching

When matching multiple freight invoices to the same freight bill, the process for auto matching works as follows:

1. All freight invoices not matched are sorted by amount, with largest amount first.
2. The freight invoices are matched one-by-one, until the freight bill has no positive amount remaining.
3. Depending on the setup of the audit master and the remaining amount on the freight invoices, the remaining amount is set.

Manual matching

All freight bills with positive amounts will be available for matching. Similar to auto matching, the user will only be able to match freight invoices with negative amounts to freight bills not fully matched.

Example

Suppose that you have a freight bill (FB) for an amount of 1500 and you have created three freight invoices for the freight bill with one invoice line for each invoice with following settings:

- Original freight bill (FB): Amount 1500
- Invoice 1 (Inv1): Amount 1000
- Invoice 2 (Inv2): Amount 600
- Invoice 3 (Inv3): Amount -100

Automatic matching result

Auto matching will execute in following order:

1. Sort all freight invoices descending by amount: Inv1 -> Inv2 -> Inv3.
2. Match Inv1 with FB. Inv1 has 1000 matched and FB has 500 amount remaining, so the status is set to *Partially matched*.
3. Match Inv2 with FB. Inv2 has 500 matched and FB has 0 remaining, so the status is set to *Fully matched*.
4. Because FB is now fully matched, Inv3 won't be processed.

Manual matching result

For manual matching, the results vary depending on the order of the matching, as illustrated in the following example cases.

Manual matching case 1

One way to do manual matching for this example is to proceed as follows:

1. Match FB with Inv1. FB has 500 amount remaining, so the status set to *Partially matched*.
2. Match Inv2 with FB. Inv2 has 500 matched and FB has 0 remaining, so the status is set to *Fully matched*.
3. When manually matching Inv3, you won't find any unmatched freight bills.

This case is essentially the same as auto matching

Manual matching case 2

Another way to do manual matching for this example is to proceed as follows:

1. Match Inv3 with FB. Now FB has amount remaining 1600, which is the same as subtracting negative 100 on top of 1500. Both FB and Inv3 have a matched quantity of -100.
2. Match Inv1 and Inv 2 with FB one after another. FB is fully matched.

As this example shows, matching freight invoices with negative amounts should only be done manually. This will ensure that it is always possible to match the freight invoices with negative amounts to a freight bill not fully matched because that enables you to control the matching sequence.

NOTE

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Register driver check-in and check-out for an appointment

2/18/2021 • 2 minutes to read • [Edit Online](#)

This procedure shows how to register a driver check-in and a driver check-out. This is typically done by a transportation coordinator. You can use this procedure in the USMF demo data company. Before you start, there must be an appointment set up for a load. To create an appointment, you can run the "Set up an appointment for a load" procedure as a prerequisite.

Select an appointment

1. Go to Transportation management > Planning > Dock appointment scheduling > Driver check-in and check-out.
2. Select an appointment.

Register driver check-in

1. Click Driver check-in.
2. In the Trailer number field, type a value.
3. In the Driver name field, type a value.
4. In the Driver license field, type a value.
5. Click OK.

Register driver check-out

1. Click Driver check-out.
2. Click OK.

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Transportation management discounts

2/18/2021 • 2 minutes to read • [Edit Online](#)

Transportation management lets you set up discounts to be applied on top of the transportation price calculated by the rating engine. You can specify each discount either as a percentage of charges or as a fixed amount.

To set up discounts for transportation management, go to **Transportation management > Setup > Rating > Discounts**.

You can choose whether to pass the discount on to your customer (by setting the discount type to customer) or to retain it in the company (by setting the discount type to shipper). This lets you define a setup in which you earn a margin on the calculated freight charges.

You can set up multiple qualifiers for each discount, such as carrier, carrier service, delivery terms, customer, destination, and more.

NOTE

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Transportation management miscellaneous charges

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As with all miscellaneous charges, transportation-generated charges must be associated with a charge code. Otherwise, they won't be added back to the order as a miscellaneous charge. The **Charges code** determines how the charge is accounted for in relation to the order and order line where it is added.

Go to **Transportation management > Setup > Rating > Miscellaneous charges** to define the qualifying criteria that determine when a specific **Charges code** is applied to a charge.

You should have at least one setup for each relevant **Charges module** setting (*Customer* and *Vendor*) where the **Miscellaneous charge type** is set to *None*. If this is missing, the miscellaneous charge will *not* be added to the order.

NOTE

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Transportation management modes and methods

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The transportation management mode represents the type of transport that the carrier uses for freight deliveries, such as less than load (LTL), truckload (TL), or parcel. The transportation method represents the form of transport that the carrier uses for freight deliveries, such as air, ground, ocean, or rail.

Modes and transportation methods are used in several contexts. Only modes are used in route plans, while both modes and transportation methods are used when setting up shipping carriers and carrier services. No explicit relationship or hierarchy exists between modes and transportation methods.

Create a mode

To create a mode, follow these steps:

1. Go to **Transportation management > Setup > Carriers > Mode**.
2. Select **New** to create a new mode.
3. Enter a unique ID and a descriptive name for the mode.
4. Close the page.

Create a transportation method

To create a transportation method, follow these steps:

1. Go to **Transportation management > Setup > Carriers > Transportation methods**.
2. Select **New** to create a new transportation method.
3. Enter a unique ID and descriptive name for the transportation method.
4. Close the page.

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Transportation management number sequence

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Use the **Number sequences** page in the transportation management module to set up various pro numbers. Pro numbers are used by carriers to organize and track the progress of each shipment.

Create a number sequence for a pro number

To create a number sequence for a pro number, do the following:

1. Go to **Transportation management > Setup > Carriers > Number sequences**.
2. Select **New** to create a new number sequence.
3. Enter a unique ID and descriptive name for the number sequence.
4. In the **Number sequence type** field, *Pro number* is the only option.
5. In the **Check digit** field, *Check digit* is the only option and is set up as a generic engine.
6. On the **Sequence** FastTab, provide information about the sequence.
7. Close the page.

Link a number sequence to a shipping carrier

To link a number sequence to a carrier, do the following:

1. Go to **Transportation management > Setup > Carriers > Shipping carriers**.
2. Select a shipping carrier.
3. Select **Edit**.
4. On the **Overview** FastTab, select an option in the **Pro number sequence** field.
5. Close the page.

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Transportation management statuses

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Set up master codes for transportation statuses to interpret codes that are provided by your shipping carriers. This lets you integrate with shipping carriers to provide a status. The transportation status that you provide for a transportation master status code can help you track the status of a load, shipment, or container. The specific transportation status for a load, shipment, or container can only be updated through data integration and not manually through the user interface.

Create a transportation status

To create a transportation status, follow these steps:

1. Go to **Transportation management > Setup > Transportation status masters**.
2. Select **New** to create a transportation status master.
3. In the **Transportation status master** field, enter a unique code for the transportation status.
4. In the **Transportation type** field, select either *Shipping carrier* or *Hub* as the type of transportation.
5. Enter a name and transportation status.
6. Close the page.

Map a transportation status to a carrier status

To map a transportation status to a carrier status, follow these steps:

1. Go to **Transportation management > Setup > Carriers > Carrier transportation status**.
2. Select **New** to map a code from a shipping carrier to a transportation status master code.
3. Select the unique ID for the shipping carrier and the carrier service.
4. Select the transportation status code that you want to map to the selected shipping carrier's code.
5. Enter the external code that is used by the shipping carrier.
6. Close the page.

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Transportation management zone master

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Transport management lets you divide geographic locations into zones. Dividing locations into zones can help to:

- **Simplify transportation pricing** – Zone-wise pricing can be simpler than individual location-based pricing, especially when transportation locations are scattered.
- **Optimize load planning** – By consolidating loads by zones.
- **Optimize route planning** – By assigning specific route plans to specific zones.

You define zones based on the metadata field values (such as country, zip code range, or carrier service) that qualify each zone. Zone definitions aren't required if your transportation pricing doesn't employ a zone concept.

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Carrier groups

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A carrier group is a collection of shipping carriers and carrier services. Each carrier group specifies the preferred sequence for the shipping carriers and carrier services that belong to it.

When multiple shipping carriers and carrier services exist for the same route segment, you can specify a carrier group instead of a specific shipping carrier and carrier service in the route plan or route guide.

Create a carrier group

1. Go to **Transportation management > Setup > Carriers > Carrier group**.
2. Select **New**.
3. In the **Carrier group** field, enter a unique identifier (ID) for the group.
4. In the **Name** field, enter a descriptive name for the group.
5. On the **Details** FastTab, add a row, and select a shipping carrier and a carrier service for it. Repeat this step until you've added as many carriers as you require for the group.
6. Close the page.

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Load building workbench

2/18/2021 • 2 minutes to read • [Edit Online](#)

The load building workbench lets you apply load building strategies when you create loads.

Create a load building strategy

You use load building strategies to automatically build loads. This capability can be beneficial in the following situations:

- If you regularly ship a specific set of products, load strategies help save time, because you don't have to build the same load every time.
- If you want to avoid half-full loads to maximize efficiency, load strategies can help fill each load as much as possible.

A load building strategy class that is named `TMSLoadBuildingVolumeStrategy` provides a load building strategy that is named *Volume-based load building strategy*. This strategy lets you use the maximum values that are specified for height and weight in the load template, or you can override the settings by entering new values. This strategy is the only strategy that is included out of the box. (However, you might have some custom strategies.)

To use the out-of-box *Volume-based load building strategy* strategy, select it in the **Load building strategy** field on the **Load building workbench** page (**Transportation management > Planning > Load building workbench**).

To create a load building strategy, follow these steps.

1. Go to **Transportation management > Setup > Load building > Load building strategies**.
2. On the Action Pane, select **Generate class list** to make sure that you have the latest versions of all available classes.
3. On the Action Pane, select **New**.
4. Enter a unique name for the strategy, select the load building strategy class for it, and enter a description.
5. On the Action Pane, select **Save**.
6. On the Action Pane, select **Parameters**.
7. On the **Load building strategy parameters** page, select **Volume capacity** in the list, and then, in the **Value** field, enter the percentage of the load's total volume capacity that should be applied for the new load building strategy.
8. Select **Weight capacity** in the list, and then, in the **Value** field, enter the percentage of the load's total weight capacity that should be applied for the new load building strategy.
9. Close the **Load building strategy parameters** page.
10. Close the **Load building strategies** page.

You can now assign the load building strategy to a load building template. Alternatively, you can use it directly in the load planning workbench.

Use a load building strategy in the load building workbench

1. Go to **Transportation management > Planning > Load building workbench**.
2. Follow one of these steps:

- Select a strategy in the **Load building strategy** field.
 - If you've defined a load building template and assigned the load building strategy to it, on the Action Pane, on the **Manage templates** tab, select **Apply template**. Then, in the **Apply load building template** drop-down dialog box, select a template in the **Load building template name** field.
3. On the **Load templates sequence** FastTab, select one or more [load templates](#). The workbench will try to fit the load into these types of containers, in the sequence that is specified here. Typically, you should put the smallest containers at the top of the list to ensure that the smallest possible container is selected first.
 4. On the Action Pane, select **Propose loads**.
 5. Review the proposed loads and proposed load lines.
 6. On the Action Pane, select **Create loads** to create loads that are based on the source document lines on the **Proposed load lines** FastTab.
 7. Close the **Load building workbench** page.

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Load templates

2/18/2021 • 2 minutes to read • [Edit Online](#)

When you create a new load, you can assign a load template. The load template contains information about equipment, and about measures such as the height, width, depth, and volume of the load.

This topic describes how to set up load templates, and how to associate a load template with a new load.

Set up a load template

1. Go to **Transportation management > Setup > Load Building > Load template**.
2. On the Action Pane, select **New** to add a new template or **Edit** to edit an existing template.
3. In the row for the new or existing template, set the following fields:
 - **Load template ID** – Enter a unique identifier (ID) for the load template.
 - **Equipment** – Select the equipment that should be used to ship the load.
 - **Load height, Load width, and Load depth** – Enter the dimensions of the load.
 - **Max. allowed load volume and Max. allowed load weight** – Enter the maximum allowed volume and weight of the load.
 - **Maximum allowed gross weight** – Enter the maximum allowed gross weight of the load. A load's gross weight includes both its tare weight and its loading weight.
 - **Maximum number of freight pieces allowed** – Enter the maximum number of freight pieces that the load can contain.
 - **Stack load on floor** – Select this check box to use floor loading. In a floor loading scenario, boxes are stacked floor to ceiling and wall to wall inside the container, to maximize capacity.
4. On the Action Pane, select **Save**.

Associate a load template with a new load

1. Go to **Transportation management > Planning > Load planning workbench**.
2. In the upper part of the page, select one of the following tabs, depending on the type of source document that you're creating a load for: **Shipments, Sales lines, Transfer lines, or Purchase order lines**.
3. Select the specific document to plan the load for.
4. On the Action Pane, on the **Supply and demand** tab, in the **Add** group, select **To new load**.
5. In the **Load template** dialog box, in the **Load template ID** field, select the template to apply.
6. Select **OK** to apply the template.

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Rating profiles

2/18/2021 • 2 minutes to read • [Edit Online](#)

A rating profile resembles a logistics contract (but not a legal contract). It's used to determine transportation tariffs for loads.

Each rating profile is unique to a shipping carrier. In the profile, you associate the shipping carrier with a rate master. The rate master defines the rate base assignment and the rate base. The rate base determines the rate of the carrier.

You can set up a rating profile by using a generic page that shows an overview of all existing rating profiles. Alternatively, you can set up a rating profile directly from the shipping carrier. In both cases, the information that you set up for the rating profile is the same.

Create or edit a rating profile on the Rating profiles page

On the **Rating profiles** page, you can review all available rating profiles. You can also edit existing profiles and create new profiles.

1. Go to **Transportation management > Setup > Rating > Rating profile**.
2. On the Action Pane, select **New** to add a new rating profile to the grid, or select **Edit** to edit an existing profile.
3. In the row for the new or existing rating profile, set the following fields:
 - **Rating profile** – Enter a unique identifier (ID) for the rating profile.
 - **Name** – Enter a descriptive name for the rating profile.
 - **Shipping carrier** – Select a shipping carrier. The rating profile that you're setting up will also be shown on the **Shipping carriers** page for the selected carrier.
 - **Site and Warehouse** – Select a site and warehouse.
 - **Rate engine** – Select the rate engine for the rating profile.
 - **Rate master** – Select the rate master for the rating profile. You can use the rate master to define a rate base type and a rate base. For more information, see [Set up rate masters](#).
 - **Transit time engine** – Select the transit time engine for the rating profile.
 - **Carrier fuel index** – Select the carrier fuel index for the rating profile.
 - **Effect start date and time** and **Effective end date and time** – Define the period when the rating profile should be active.
4. On the Action Pane, select **Save**.

Create a rating profile directly on the Shipping carriers page

1. Go to **Transportation management > Setup > Carriers > Shipping carriers**.
2. Select a shipping carrier in the list.
3. On the **Rating profiles** FastTab, select **New** to create a rating profile.
4. Set the fields for the new rating profile. These fields correspond to the fields on the **Rating profiles** page, as described in previous section of this topic.

NOTE

Profiles that are created on the **Shipping carriers** page are also shown on the **Rating profiles** page.

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Set up a carrier fuel index

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This guide shows how to create a fuel index region, a fuel index and a carrier fuel index. The fuel index region specifies which region the fuel index should apply to, and the fuel index specifies a fuel price for a particular period of time. To reflect the change in fuel prices over time, you can associate multiple fuel indexes with a carrier. These tasks are normally done by a transportation coordinator. You can use this procedure in demo data company USMF or using your own data.

Create a fuel index region

1. Go to Transportation management > Setup > Fuel indexes > Fuel index regions.
 - First you have to create the different regions, where you operate and calculate different fuel surcharges.
2. Click New.
3. In the Region field, type a value.
4. In the Name field, type a value.
5. Click Save.

Create a fuel index

1. Go to Transportation management > Setup > Fuel indexes > Fuel indexes.
 - For the regions you have set up you need to enter the current prices for the fuel.
2. Click New.
3. In the Region field, click the drop-down button to open the lookup.
4. In the list, click the link in the selected row.
5. In the Price per gallon field, enter a number.
6. In the Effective start date and time field, enter a date and time.
7. Click Save.

Create a Carrier fuel index

1. Go to Transportation management > Setup > Fuel indexes > Carrier fuel indexes.
2. Click New.
3. In the Carrier fuel index field, type a value.
4. In the Description field, type a value.
5. Click New.
6. In the Effective start date and time field, enter a date and time.
7. In the PPG From field, enter a number.
 - In this example, you can set PPG From field to 1.95.
8. In the PPG To field, enter a number.
 - In this example you can set the PPG To field to 2.
9. In the Percentage field, enter a number.
 - In this example you can set the percentage to 3.
10. In the Currency field, click the drop-down button to open the lookup.
11. In the list, find and select the desired record.

12. In the list, click the link in the selected row.

13. Click Save.

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Set up a transportation tender

2/18/2021 • 2 minutes to read • [Edit Online](#)

This procedure shows how to set up a transportation tender. This is typically done by a transportation coordinator. You can use this procedure in the USMF demo data company.

Select a route

1. Go to Transportation management > Planning > Load planning workbench.
2. Clear the Hide shipped and received check box.
3. Select the line with Load ID 00006.
4. Click Rating and routing.
5. Click Routes.

Create the transportation tender

1. Click Transportation tenders.
2. Click New.
3. Expand the General section.
4. In the Requested rates field, enter a number.
5. Click Save.
6. Click Update status.
7. Click Submit.
8. Select a route.

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Set up accessorial assignments

2/18/2021 • 2 minutes to read • [Edit Online](#)

This procedure shows how to set up an accessorial assignment. This is typically done by a transportation coordinator. Before you use this guide you need to run the "Set up hub accessorial charges and accessorial masters" guide.

Set up Accessorial assignment

1. Go to Transportation management > Setup > Rating > Accessorial assignments.
2. Click New.
3. In the Name field, type a value.
4. Toggle the expansion of the Details section.
5. In the Hub field, click the drop-down button to open the lookup.
6. In the list, select the Hub that you created an accessorial master for when you ran the "Set up hub accessorial charges and accessorial masters" guide.
7. In the Hub accessorial ID field, click the drop-down button to open the lookup.
8. In the list, click the link in the selected row.
9. Toggle the expansion of the Criteria section.
 - In the Criteria section you can choose the exact criteria for when the charge should apply, based on the different values offered here.
10. Set the Always apply option to Yes.
11. In the Accessorial assignment level field, select an option.
12. Toggle the expansion of the Calculation section.
13. In the Accessorial fee type field, select 'Flat'.
 - The Accessorial fee type determines how to calculate the actual charge. In this example it's a flat charge.
14. In the Accessorial fee field, enter a number.
15. Click Save.

NOTE

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Set up an appointment for a load

2/18/2021 • 2 minutes to read • [Edit Online](#)

This procedure shows how to set up and plan a dock appointment for a load. This is typically done by a transportation coordinator. You can use this procedure in the USMF demo data company.

Select the load

1. Go to Transportation management > Planning > Load planning workbench.
2. Clear the Hide shipped and received check box.
3. In the list, select the load that has a status of Shipped.
4. Click Transportation.
5. Click Appointment scheduling.

Create an appointment

1. Click New.
2. In the Appointment rule field, enter or select a value.
3. Click Save.
4. Click Update status.
5. Click Firm.
6. Click Save.
7. Close the page.

NOTE

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Set up automatic freight reconciliation

2/18/2021 • 2 minutes to read • [Edit Online](#)

This procedure shows how to set up data for automatic freight reconciliation. This is typically done by a warehouse manager. You can use this procedure in demo data company USMF.

Set up the freight bill type

1. Go to Transportation management > Setup > Freight reconciliation > Freight bill type.
 - The freight bill type defines how freight bills and carrier invoices should be matched.
2. Click New.
3. In the Freight bill type field, type a value.
4. In the Engine assembly field, type 'Microsoft.Dynamics.Ax.Tms.dll'.
 - This is the standard Transportation management matching engine code library.
5. In the Engine class field, type 'Microsoft.Dynamics.Ax.Tms.Bll.GenericNormalizer'.
 - This is the standard Transportation management matching engine class.
6. Click New.
7. In the Description field, choose the value that should match on the freight bill and the carrier invoice.
8. In the Match required field, select 'Yes'.
 - If you set this field to Yes this means that the value selected in the Description field needs to match on both the freight bill and the carrier invoice. If you set it to No, the field can be blank on one of these.
9. Click Save.

Set up the freight bill type assignment

1. Close the page.
2. Go to Transportation management > Setup > Freight reconciliation > Freight bill type assignments.
 - The freight bill type assignment is used to specify which freight bill type is used for a particular carrier.
3. Click New.
4. In the Mode field, enter or select a value.
5. In the Shipping carrier field, enter or select a value.
6. In the Freight bill type field, select the freight bill type that you created earlier.
7. Close the page.

Set up the audit master

1. Go to Transportation management > Setup > Freight reconciliation > Audit master.
 - The audit master defines the tolerance limits for automatic freight reconciliation. It specifies by how much the monetary amounts on the freight bill and the carrier invoice can differ and still allow reconciliation to occur. It also defines how to handle discrepancies.
2. Click New.
3. In the Audit master ID field, type a value.
4. In the Shipping carrier field, select the same shipping carrier as you did earlier.
5. In the Freight bill type field, select the freight bill type that you created earlier.
6. Expand the Tolerance section.
7. In the Minimum tolerance level field, enter a number.

8. In the Maximum tolerance level field, enter a number.
9. Expand the Result section.
10. In the Overpayment reason code field, enter or select a value.
 - If the monetary amounts differ on the freight bill and the carrier invoice, the overpayment and underpayment reason codes specify the accounts that the difference should be registered on, as long as the difference is within the tolerance levels.
11. In the Underpayment reason code field, enter or select a value.
12. Close the page.

NOTE

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Set up hub accessorial charges and accessorial masters

2/18/2021 • 2 minutes to read • [Edit Online](#)

This procedure shows how to create an accessorial master for a hub and use that master to create a hub accessorial charge. The procedure uses the USMF dataset. This set up will typically be done by a transportation coordinator.

Set up a hub master

1. Go to Transportation management > Setup > Rating > Accessorial masters.
2. Click New.
3. In the Accessorial master field, type a value.
4. In the Name field, type a value.
5. In the Accessorial type field, select 'Hub'.
6. Click Save.
7. Close the page.

Set up a hub accessorial charge

1. Go to Transportation management > Setup > Rating > Hub accessorial charges.
2. Click New.
3. In the Hub accessorial ID field, type a value.
4. In the Hub field, click the drop-down button to open the lookup.
5. In the list, find and select the desired record.
6. In the Hub position field, select an option.
 - You can either create the charge as a pickup or drop-off. Depending on your selection the charge will be applied to the corresponding transportation segment on your route.
7. In the Accessorial master field, click the drop-down button to open the lookup.
8. In the list, click the link in the selected row.
 - Select the master you just created.
9. Click Save.
10. Close the page.

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Set up rate masters

2/18/2021 • 3 minutes to read • [Edit Online](#)

This procedure shows you how to set up a rate master. The logistic manager usually sets up rate masters, depending on the contracts signed with the carriers. In this scenario you will set up a rate master for an air carrier. The demo data company used to create this procedure is USMF.

Set up break master

1. Go to **Transportation management > Setup > Rating > Break master**. Break masters are used to define the pricing structure and its breakpoints. The pricing structure uses tiered pricing that is based on physical dimensions.
2. Select **New**.
3. In the **Break master** field, enter a value.
4. In the **Name** field, enter a value.
5. In the **Data type** field, select the data type.
6. In the **Comparison** field, enter the kind of comparison requested (using operators).
7. In the **Break unit** field, enter the break unit.
8. In the **Details** section, create as many breaks as needed for the pricing structure.
9. Select **Save**.

Set up rate master

1. Go to **Transportation management > Setup > Rating > Rate master**.
2. Select **New**.
3. In the **Rate master** field, type a value.
4. In the **Name** field, type a value.
5. In the **Rating metadata ID** field, select the drop-down button to open the lookup. The rating metadata ID will determine the data needed for the rate master, as it defines the metadata expected by the transportation management engine using this rate master.
6. For this example, select the P2P option. This is already defined in the demo data.
7. In the list, select the link in the selected row.
8. Select **Save**.

Set up rate base

1. Select **Rate base**.
 - The rate base determines the rate of the carrier, and can be used to set up a tariff structure as it structures the rates in the breakpoints defined in the break master.
2. Select **New**.
3. In the **Rate base** field, type a value.
4. In the **Name** field, type a value.
5. In the **Break master** field, select the drop-down button to open the lookup.
 - Break masters are used to define the pricing structure and its breakpoints. The pricing structure uses tiered pricing that is based on physical dimensions.
6. For this example, use weight. This is already defined in the demo data.

7. In the list, select the link in the highlighted row.
8. Expand the **Details** section.
9. Select **New**.
10. In the **Drop-off Postal Code From** field, type "30301".
11. In the **Drop-off Postal Code To** field, type "30318".
12. In the **Drop-off Country Region** field, type "USA".
13. In the **<1.00 Lbs** field, type "100".
 - Insert the rate per pounds if the total weight of the load is less than 1 pound.
14. In the **<5.00 Lbs** field, type "300".
 - Insert the rate per pounds if the total weight of the load is less than 5 pounds.
15. In the **<20.00 Lbs** field, type "500".
 - Insert the rate per pounds if the total weight of the load is less than 20 pounds.
16. In the **<100.00 Lbs** field, type "1000".
 - Insert the rate per pounds if the total weight of the load is less than 100 pounds.
17. In the **<1,000.00 Lbs** field, type "3000".
 - Insert the rate per pounds if the total weight of the load is less than 1000 pounds.
18. Select **Save**.
19. Close the page.

Assign rate base

1. Expand the **Rate base assignments** section.
2. Select **New**.
 - You can have several rate base assignments for each rate master. This makes it possible to create several different price points for each carrier depending on destinations, services, or different rate bases. In this procedure you will only create one rate base assignment.
3. In the **Name** field, type a value.
4. In the **Rate base** field, select the drop-down button to open the lookup.
5. In the list, select the link in the highlighted row.
6. In the **Service** field, select the drop-down button to open the lookup.
7. In the list, find and select the desired record.
8. In the list, select the link in the highlighted row.
9. In the **Pick-up Postal Code** field, type "98052".
 - Specify which postal code this rate base assignment should be valid from.
10. In the **Pick-up Country Region** field, type "USA".
11. Select **Save**.

NOTE

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Set up shipping carriers

2/18/2021 • 2 minutes to read • [Edit Online](#)

This topic shows how to set up a shipping carrier and define details such as service, shipment mode, transportation tender, transportation constraints, and shipping rate. A transportation coordinator can then assign a shipping carrier to an inbound or outbound load.

Create a new shipping carrier

1. Go to **Navigation pane > Modules > Transportation management > Setup > Carriers > Shipping carriers**.
2. Select **New** on the Action Pane.
3. In the **Shipping carrier** field, type a value.
4. In the **Name** field, type a value.
5. In the **Mode** field, select an option from the drop-down menu.

Fill in the general information for the shipping carrier

1. Toggle the expansion of the **Overview** section.
2. Check or uncheck the **Activate shipping carrier** checkbox.
3. In the **Vendor account** field, select an option from the drop-down menu. Select the vendor account to assign the shipping carrier to.
4. In the **Transportation tender type** field, select an option. Select **Manual** to use the Transportation Tender page, or select **EDI** to update the tender by using Electronic Data Interchange (EDI).
5. Check or uncheck the **Activate carrier rating** checkbox.

Create the necessary services for the shipping carrier

1. Toggle the expansion of the **Services** section.
2. Select **New**.
3. In the **Carrier service** field, type a value.
4. In the **Name** field, type a value.
5. In the **Transportation method** field, select an option from the drop-down menu.

Set up the address for the carrier (optional)

1. Toggle the expansion of the **Addresses** section.
2. Select **New**.
3. In the **Name or description** field, type a value.
4. In the **Country/region** field, select an option from the drop-down menu.
5. In the **ZIP/postal code** field, select an option from the drop-down menu.
6. In the **Street** field, type a value.
7. Select **OK**.

Set up the rating profile for the shipping carrier

1. Toggle the expansion of the **Rating profiles** section.

2. Select **New**.
3. In the **Rating profile** field, type a value.
4. In the **Name** field, type a value.
5. In the **Site** field, select an option from the drop-down menu.
6. In the **Warehouse** field, select an option from the drop-down menu.
7. In the **Rate engine** field, select an option from the drop-down menu. Select the Rate engine that is in accordance with the contract that you have with the carrier.
8. In the **Rate master** field, select an option from the drop-down menu.
9. In the **Transit time engine** field, select an option from the drop-down menu.
10. Select **Save**.

NOTE

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Set up transportation constraints for an item

2/18/2021 • 2 minutes to read • [Edit Online](#)

This procedure will set up a transportation constraint to prevent a selected item from being transported through a selected hub. This task would typically be carried out by a Transportation coordinator. You can use this procedure in the USMF demo data company or on your own data.

Create an item constraint

1. Go to Constraints.
2. Click New.
3. In the Item constraint field, type a value.
4. In the Name field, type a value.
5. In the Site field, enter or select a value.
6. In the Warehouse field, enter or select a value.
7. In the Item number field, enter or select a value.
8. In the Hub field, enter or select a value.
9. In the Constraint action field, select an option.
10. Click Save.
11. Close the page.

NOTE

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Warehouse management overview

2/18/2021 • 2 minutes to read • [Edit Online](#)

The Warehouse management module lets you manage warehouse processes in manufacturing, distribution, and retail companies. This module has a wide range of features to support the warehouse facility at an optimal level, at any time. Warehouse management is fully integrated with other business processes such as transportation, manufacturing, quality control, purchase, transfer, sales, and returns.

Get started

To start working with Warehouse management, you need to complete the setup of the general warehouse parameters to support the business processes of your company.

- Go to the **Warehouse management parameters** page under **Warehouse management > Setup** to set up general warehouse parameters.

You must configure components for inbound and outbound warehouse process workflows according to business requirements. The most important components that you must configure are wave templates, work templates, work pools, and location directives.

- [Warehouse configuration overview](#)
- [Control warehouse work by using work templates and location directives](#)
- [Set up mobile devices for warehouse work](#)
- [Set up a location directive for purchase order put-away](#)
- [Set up a work template for purchase orders](#)

Warehouse management processes

- Integrated support for source documents for sales orders, returns, transfer orders, production orders, and kanban
- Flexible, inbound and outbound material workflow support based on queries
- Full integration with the Manufacturing and Transportation offerings
- Full control of location stocking limits and location volumetrics
- Inventory properties controlled by inventory status
- Full batch and serial item support
- Various item receiving capabilities
- Multiple picking strategies
- Out-of-the-box support for the next generation of barcode scanners
- Pallet/container types for warehouse processes
- Advanced counting capabilities
- Label printing and label routing with Zebra ZPL support
- Business intelligence integration into Power BI
- Manual and automatic movement of inventory
- Fully-integrated quality control (QMS)
- Full traceability of workers' material handling
- Outbound wave processing
- Manual packing and automatic containerization support

- Cluster picking
- Simple cross docking

Additional resources

What's new and in development

Go to the [Microsoft Dynamics 365 Roadmap](#) to see what new features have been released and what new features are in development.

Blogs

You can find opinions, news, and other information about Warehouse management and other solutions on the [Microsoft Dynamics 365 blog](#).

NOTE

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Warehouse handling of inbound loads for purchase orders

2/18/2021 • 35 minutes to read • [Edit Online](#)

This topic describes the warehouse handling process for inbound loads for purchase orders.

For each inbound load, your system should already include a related sales order, and it might also contain a related load specification and/or transportation plan. For more information about how to create and manage inbound loads, see [Business process: Planning transportation for inbound loads](#).

Overview: How inbound loads are created, registered, and received

The following illustration shows the typical flow for handling inbound loads that have purchase order quantities when they arrive at your warehouse.



1. The vendor confirms the purchase order.

The process begins when a purchase order is entered into the system and then delivered to a vendor, who confirms the order. The purchase order must exist before you can create an inbound load record.

However, you can create the inbound load even if the order hasn't been confirmed. For more information, see [Approve and confirm purchase orders](#).

2. An inbound load record is created to plan the arrival and its contents.

The inbound load record represents a vendor shipment of one or more purchase orders. The load is expected to arrive at the warehouse as one physical transportation unit (such as a truckload). The inbound load record is used for planning purposes and lets the logistics coordinator track the load's progress from the vendor. It's also used to register order line quantities and manage progress through warehouse operations, such as arrival and put-away work. Loads can be created either automatically or manually, and they can be based on either a purchase order or an advanced shipment notice (ASN) from the vendor. For more information, see [Create or modify an inbound load](#).

3. The vendor confirms load dispatch.

When the vendor dispatches the load, the logistics coordinator at the receiving warehouse confirms the load shipment. If the receiving company is using the **Transportation management** module, inbound shipment confirmation will trigger other load management processes that are associated with the inbound loads. For more information, see [Confirm a load for shipping](#).

4. The load arrives at the warehouse, and workers register quantities.

When a truckload arrives at the warehouse receiving dock, warehouse workers register the load quantities. When the **Warehouse management** module is used, workers do the registration by using mobile devices. For more information, see [Product receipt against purchase orders - registration](#) and the [Register item quantities that arrive on an inbound load](#) section.

5. Registered load quantities are posted against purchase orders.

After the load quantities have been registered as arrived, those quantities must be product receipt–posted to the company's inventory ledger to record the physical stock increase. For more information, see [Product receipt against purchase orders - product receipt](#) and [Post registered product quantities against purchase orders](#).

Register item quantities that arrive on an inbound load

Microsoft Dynamics 365 Supply Chain Management supports several operational approaches to recording the arrival of ordered products. Therefore, you can configure the system to match your specific business requirements. This section describes how to register incoming item quantities by using a mobile device when advanced warehouse management is turned on in the system. However, there is an alternative flow that is based on using the item arrival journal instead of a mobile device. For more information about that flow, see [Register items for an advanced warehousing enabled item using an item arrival journal](#).

When an inbound load first arrives at the warehouse, warehouse workers must register the item quantities that are included in the shipment. Typically, they use handheld scanners. This workflow is available only if the following items are present in the system:

- **An inbound load record that describes the item quantities that are expected in the shipment**

Typically, the vendor confirms the inbound load record before the shipment arrives at the warehouse. Therefore, the load has a status of *Shipped*. However, warehouse workers can also register items quantities for loads that have a status of *Open* or *Received*.

- **A mobile device menu that is configured to support load receiving**

The [warehouse app](#) for mobile devices supports the following work creation processes:

- Load item receiving
- Load item receiving and put away
- Mixed license plate receiving, where the **Source document line identification method** field for the mobile device menu item is set to *Load item receiving*. For more information, see [Mixed license plate receiving](#).
- Mixed license plate receiving and put away, where the **Source document line identification method** field for the mobile device menu item is set to *Load item receiving*. For more information, see [Mixed license plate receiving](#).

NOTE

Regardless of the process, the system will generate work to take quantities that are registered in the receiving location and put them away in the regular storage location. When the *Load item receiving and put away* or *Mixed license plate receiving and put away* process is used, the worker who registered the load quantity will also be instructed by the device to do the put-away work as part of the registration task. By contrast, for the *Load item receiving* and *Mixed license plate receiving* processes, the assumption is that put-away work will be done separately from the registration task.

- **A work template that defines pick and put work for incoming loads**

This item is related to the previous items. You must have at least one work template for the *Purchase order* work order type, and it must contain a set of pick/put work types.

The mobile device guides the warehouse receiving clerk through the flow for load quantity registration. At a minimum, this flow includes the following steps for each load ID:

1. Enter the load ID.
2. Enter the item number for a received item.

3. Enter the quantity of that item number that is received.
4. Enter the license plate number for the item's initial location, if the system isn't set up to generate this number automatically.
5. Tap **OK**.

After the worker completes these steps, the system makes the following updates on the appropriate entities, provided that the purchase order line quantity arrived on one load and all load quantities have been registered:

ENTITY	UPDATES	NOTE
Load	The Work created quantity field on the load line is updated to show the registered quantity.	The Load status value remains <i>Shipped</i> or <i>Open</i> if no shipment confirmation has been run for the load. If at least one line of put-away work has been started, it's changed to <i>In process</i> .
Inventory transaction of a purchase order that associated load quantities have been registered for	The following fields are updated: <ul style="list-style-type: none"> • The Receipt field is set to <i>Registered</i>. • The Location field is updated with the receiving dock location code. (This code is specified in the Default receipt location field for each warehouse.) • The License plate field is updated with the license plate number that was entered or generated during the registration. • The Load ID field is updated with the number of the load that the quantity has been registered against. (See the note.) 	The ability to link between the purchase order inventory transaction and the quantities that are registered against the load was introduced in version 10.0.9 as an optional feature that was named <i>Associate purchase order inventory transactions with load</i> . This feature is especially beneficial for operational flows where a single order of purchased goods is delivered as multiple loads, or when a load contains quantities for multiple purchase orders.
Warehouse put-away	Work is created based on a work template, to instruct the worker to move the registered quantities from the receiving location to a regular storage location.	The choice of the storage location is controlled by the Put location directive. If no location directive has been defined, the put away location on the work is empty.

Note that warehouse workers can register the receipt of a purchase order with one or more associated loads without using the *Load item receiving* process. The following methods are available:

- **On the mobile device:** Use the *Purchase order line receiving* and *Purchase order line receiving and put away* processes. (If more than one load exists for the purchase order line quantity, the worker can't use the *Purchase order line receiving* process. Instead, the worker will be instructed to use the device action that is associated with the *Load item receiving* process.)
- **On the client:** Use the item arrival journal.
- **On the client:** Use the **Registration** action that can be accessed from the purchase order line.

NOTE

If the purchase order receipt is registered by using any of the preceding methods, no link is created between the purchase order inventory transaction and the load, even when the *Associate purchase order inventory transactions with load* feature is turned on. One exception to this rule is when you use the **Purchase order line receiving** option, and only one load has a status other than *Received* for the order line.

Handle discrepancies during registration of inbound load quantities

Warehouse workers can do a partial load quantity receipt registration. Each partial load quantity receipt then creates a separate inventory transaction that has a receipt status of *Registered* for the registered quantity, and the lot ID refers to the originating purchase order line.

Load under-receiving

When a load arrives, if the item quantities are less than the quantities that are stated on the load record, warehouse receiving personnel can work directly in the client to acknowledge this discrepancy by reducing the quantity on the load line so that it matches the actual quantity that arrived and was registered.

Load over-receiving

Over-receiving occurs when a load arrives, and the item quantities exceed the expected load line quantity. You can control whether and to what degree over-receiving is allowed during load registration.

Use the **Load over receipt** field for the relevant mobile device menu items to control what occurs when a warehouse worker tries to register an overdelivery. This field is available for mobile device menu items that use the following types of work creation processes:

- Load item receiving
- Load item receiving and put away
- Mixed license plate receiving (when the **Source document line identification method** field is set to *Load item receiving*)
- Mixed license plate receiving and put-away (when the **Source document line identification method** field is set to *Load item receiving*)

The following table explains the options that are available for the **Load over receipt** field.

VALUE	DESCRIPTION
Allow	Workers can register the receipt of quantities that exceed the remaining unregistered quantity for a selected load, but only if the total registered quantity doesn't exceed the quantity of the purchase order line that is associated with the load (after adjustment for the overdelivery percentage).

VALUE	DESCRIPTION
Block	<p>Workers can't register the receipt of quantities that exceed the remaining unregistered quantity for a selected load (after adjustment for the overdelivery percentage). A worker who tries to do register the receipts will receive an error and won't be able to continue until he or she registers a quantity that is equal to or less than the remaining unregistered load quantity.</p> <p>By default, the value of the overdelivery percentage on a load line is copied from the associated purchase order line. When the Load over receipt field is set to <i>Block</i>, the system uses the overdelivery percentage value to calculate the total quantity that can be registered for a load line. However, that value can be overwritten for individual loads as required. This behavior becomes relevant during receiving flows where some or all of the excess quantity that represents the order line overdelivery percentage is distributed disproportionately across multiple loads. Here is an example scenario:</p> <ul style="list-style-type: none"> • There are multiple loads for one purchase order line. • The purchase order line has an overdelivery percentage that is more than 0 (zero). • Quantities have already been registered against one or more loads without taking the overdelivery percentage into account. • The overdelivery quantity arrives on the last load. <p>In this scenario, a mobile device can be used to register the excess quantity for the last load only if the warehouse supervisor increases the overdelivery percentage for the relevant load line from the default value to a value that is large enough so that the full overdelivery can be registered with the final load.</p>
Block for closed loads only	Workers can over-receive load line quantities for open loads, but not for loads that have a status of <i>Received</i> .

NOTE

The default value of the **Load over receipt** field is *Allow*. When this value is used, the behavior matches the standard behavior that was available before the *Over receipt of load quantities* feature was introduced in version 10.0.11.

Put away the registered quantities

When registration is completed on the mobile device, the *Quantity receipt registration* action updates the inventory and warehouse records to indicate that the quantities are now in the receiving dock location and available for reservation. However, a company's warehouse operations typically require that the quantities be moved from the receiving dock to the regular warehouse storage, so that the subsequent picking processes can occur. Instructions for the put-away are captured in the put-away work that is automatically generated when the inbound load is registered as received.

When the warehouse worker has completed the put-away work, the system records and tracks the result by updating updates several entities, as summarized in the following table.

ENTITY	UPDATES	NOTE
Load	<p>The following fields are updated:</p> <ul style="list-style-type: none"> • The Load status value is changed to <i>In process</i>. • The Work status value is changed to <i>100.00% of work completed</i>. 	The Load status value is changed to <i>In process</i> when the worker starts the put-away task for at least one line of put-away work.
Inventory transactions of work that associated quantities have been put away for	The Receipt and Location fields, and other relevant fields, are updated to reflect the movement from the receiving location to the storage location.	The Receipt state value of the purchase order inventory transaction remains <i>Registered</i> .
Warehouse put-away	The Work status value is changed to <i>Closed</i> .	

Post registered product quantities against purchase orders

After inbound product quantities are registered in the system, they become available for reservation in connection with sales and other outbound and internal operations. However, the system doesn't yet update the inventory (interim) accounts. This update can occur only when the operations team posts the registered product receipts.

To open a page where they can post a product receipt, members of the operations team can follow any *one* of these steps:

- Open the relevant load record, and then select the **Product receipt** action.
- Go to **Warehouse management > Periodic tasks > Update product receipts**, and then, in the **Load ID** field, specify the load to post.
- Open the relevant purchase order, and then select the **Product receipt** action.
- Go to **Procurement and sourcing > Purchase orders > Receiving products > Posting product receipt job**.

The **Product receipt** action that is available on the **Load** page (and on the equivalent page for the update job, the **Update product receipts** page) can update product receipt quantities only on purchase order quantities that have a status of *Registered*. However, the **Product receipt** action that is available on the **Purchase order** page can include quantities in both processing statuses (*Ordered* and *Registered*). It can also control the scope of product receipt posting through additional parameters, such as *Receive now quantity* and *Registered quantity and services*.

Only orders that have a status of *Confirmed* can be product receipt–posted. For non-confirmed purchase orders, the **Product receipt** action will appear as unavailable.

Post registered quantities from the Load page

To product receipt–post registered quantities from the **Load** page, the following prerequisites must be in place:

- The load must have at least one quantity unit that has a status of *Registered*.
- The load status must be *Shipped*.
- The purchase order that is associated with the load must have a status of *Confirmed*.

NOTE

If the load status hasn't been set to *Shipped*, the system will automatically confirm the load before it runs the product receipt update. (The load status is set to *Shipped* when a user registers the load's inbound shipment.)

To product receipt–post the arrival registrations that are associated with a selected load, the worker selects the **Product receipt** action on the **Load** page. The page that is opened has the following key details:

- The **Quantity** field in the **Parameters** section on the **Settings** tab shows the *registered quantity*. No other options are available here.
- The grid on the **Overview** FastTab lists all the purchase orders that are included in the selected load.
- The grid on the **Lines** FastTab lists all the order lines that have a registered quantity.

NOTE

Quantities for order lines that appear on the **Line** tab are calculated differently, depending on whether the *Allow multiple product receipt per load* feature is available and turned on in your version of Supply Chain Management.

VERSION	CALCULATION
Versions before version 10.0.10, and newer versions where the <i>Allow multiple product receipt per load</i> feature isn't turned on	The line quantity is the total of all registered quantities <i>for that purchase order line</i> , regardless of whether registration was done over multiple loads, independently of the load, from a mobile device, or from the client.
Version 10.0.10 and later, where the <i>Allow multiple product receipt per load</i> feature is turned on	The line quantity is the total of all registered quantities <i>for the load record</i> that the Product receipt posting action was initiated from.

When the user selects **OK** to confirm product receipt posting, the system does the following key updates on appropriate entities.

ENTITY	UPDATES
Inventory transaction of the purchase order for which line quantities have been included in the posting scope	The following fields are updated (but note that there are also multiple other updates): <ul style="list-style-type: none"> • The Receipt field is set to <i>Received</i>. • The Physical date field is updated with the date of the posting.
Load that the user posted the product receipt from	Updates to the loads will depend on the version that is used and the setting of the Allow multiple product receipt per load field. The rules are described in the table that appears later in this section.

The **Allow multiple product receipt per load** field lets companies choose an inbound load receiving policy. Depending on their operational flows, companies might choose to allow or disallow multiple product receipt postings for the same load. We recommend that the logistics manager set the **Allow multiple product receipt per load** field to one of the following values:

- **No** – Select this value if warehouse receiving clerks always register all order quantities that arrive with each load within a designated time frame. If any load quantities aren't registered, the system assumes that they didn't arrive or were not on the load, and therefore should not be considered part of the load. The product receipt posting that is run from a load uses the same assumption. In addition to product receipt–updating all

the registered quantities (its main function), it declares the load complete and closed for additional processing. In this case, all load line quantities are automatically updated to the registered quantities, load lines that have no registered quantities are deleted, and the load status is changed to *Received*.

- **Yes** – Select this value if warehouse receiving clerks require more time to register all the quantities on the load that arrived, but, in the meantime, you must product receipt–post the quantities that have already been registered. In this case, the logistics manager will want to keep a load open even after the product receipt posting job is run, so that remaining load quantities can be registered and product receipt–updated to the ledger on an ongoing basis.
- **Prompt** – Select this value if your load receiving practices are mixed, and a decision is required each time that product receipt posting is run.

The following table summarizes the effects of the **Allow multiple product receipt per load** setting.

ALLOW MULTIPLE PRODUCT RECEIPT PER LOAD	LOAD QUANTITY	LOAD STATUS	NOTE
When this field isn't available (versions before 10.0.10)	<p>The load quantity is set so that it equals the registered quantity.</p> <p>If the load quantity is updated to 0 (zero), which means that no registration has been done, the load line is deleted.</p> <p>If there are no load lines on the load, the load is deleted.</p>	<i>Received</i>	If multiple loads exist for the order line's registered quantity, only the status of the load that the receipt was posted from is updated to <i>Received</i> .
No	<p>The load quantity is set so that it equals the registered quantity that is associated with the load ID.</p> <p>If no load ID is recorded for the inventory transaction, the behavior matches the behavior in versions before 10.0.10.</p>	<i>Received</i>	
Yes	No updates	<i>Received</i> , if the total registered load quantity is equal to or more than the load quantity	
Yes	No updates	<i>Shipped</i> or <i>In process</i> , if the total registered load quantity is less than the load quantity	

After the **Load status** field is set to *Received*, no more product receipt postings can be done for that load. However, the worker can register the remaining order quantity against the received load under the following conditions. (For more information, see the [Load over-receiving](#) section earlier in this topic.)

- The version of Supply Chain Management is older than version 10.0.11.
- The *Over receipt of load quantities* feature is turned on, and the **Load line quantity over receipt** field on the mobile device menu item for the load item receiving action is set to *Allow*.

To product receipt–post additional registered load quantities against a load that has a status of *Received*, the user must run the posting action from the associated purchase order.

Post registered quantities from the Purchase order page

To product receipt–post registered quantities from the **Purchase order** page, the user completes the following tasks before he or she selects the **Product receipt** action:

- Set the **Quantity** field in the **Parameters** section on the **Settings** tab to *Registered quantity*.
- In the **Product receipt** field, enter the numbers of the purchase orders that are included in the posting.

NOTE

The line quantity that will be included in the posting scope is the total of all registered quantities for the order line, regardless of whether quantity registration has been done over multiple loads, independently of the load, from a mobile device, or from the client. The same rule applies when product receipt posting is run from a load, if it's done where the **Allow multiple product receipt per load** field either isn't available or isn't enabled.

When the user selects **OK** to confirm product receipt posting, the system does the following key updates on appropriate entities.

ENTITY	UPDATES
Inventory transaction of the purchase order for which line quantities have been included in the posting scope	<p>The following fields are updated (but note that there are also multiple other updates):</p> <ul style="list-style-type: none"> • The Receipt field is set to <i>Received</i>. • The Physical date field is updated with the date of the product receipt posting action.
Load	<p>Updates to the loads depend on whether the Allow multiple product receipt per load field is available and enabled. The rules are described in the next table.</p>

The following table summarizes the effects of the **Allow multiple product receipt per load** setting.

ALLOW MULTIPLE PRODUCT RECEIPTS PER LOAD	LOAD QUANTITY	LOAD STATUS	NOTE
When this field is either disabled or unavailable (in versions before 10.0.10)	No updates	No updates are done. (The status remains <i>Open</i> , <i>Shipped</i> , or <i>In process</i> .)	Because the product receipt posting is initiated from a purchase order, the updating logic doesn't have information about the association between the registered quantities within its scope and the loads that the registration was recorded against. Therefore, it can't select the load for the status update.

ALLOW MULTIPLE PRODUCT RECEIPTS PER LOAD	LOAD QUANTITY	LOAD STATUS	NOTE
Enabled	No updates	<p>One of the following actions occurs:</p> <ul style="list-style-type: none"> The status is changed to <i>Received</i> if the total received and purchased quantities of the purchase order inventory transactions are more than or equal to the quantity of the load that they are associated with. The status remains <i>Open, Shipped, or In process</i> if the previous condition isn't met for all the lines in the load. 	

Select the appropriate product receipt posting option for your logistics operations

As was previously described, the system offers two product receipt posting options. The options can be accessed in the following places:

- On the **Load** page, or from the **Warehouse management > Periodic tasks** menu as an update job
- On the **Purchase order** page, or from the **Procurement and sourcing > Purchase orders > Receiving products** menu as an update job

Companies that use loads to plan and manage transportation and warehouse handling of their inbound orders are advised to use the following functions, which are designed to work with loads:

- Load item receiving** actions on their warehouse mobile devices, to register the product quantity arrival against the load
- Product receipt posting** actions that are initiated from a load, to update the inventory ledger

NOTE

Other quantity registration and product receipt posting functions can be used to support the corresponding inbound operational processes. However, if you use them interchangeably with or instead of the dedicated load-focused functions, you might compromise the data accuracy of the load records and therefore the seamlessness of the load management flows.

Example scenarios

Prepare your system to run the sample scenarios

To work through the sample scenarios that are described in this section, you must first make sure that all the required features are turned on in your system. The required demo data must also be available in the system.

Turn on the required features

These scenarios require the *Multiple product receipt postings per load* feature and its prerequisite feature.

Admins can turn on those features by following these steps.

1. Open the **Feature management** workspace. (For complete details about how to find and use this workspace, see [Feature management overview](#).)
2. Turn on the *Associate purchase order inventory transactions with load* feature, which is listed in the following way:
 - **Module:** *Warehouse management*
 - **Feature name:** *Associate purchase order inventory transactions with load*
3. Turn on the *Multiple product receipt postings per load* feature, which is listed in the following way:
 - **Module:** *Warehouse management*
 - **Feature name:** *Multiple product receipt postings per load*

Enable sample data

To work through these scenarios by using the specified sample records and values, you must be using a system where the standard demo data is installed. You must also select the **USMF** legal entity before you begin.

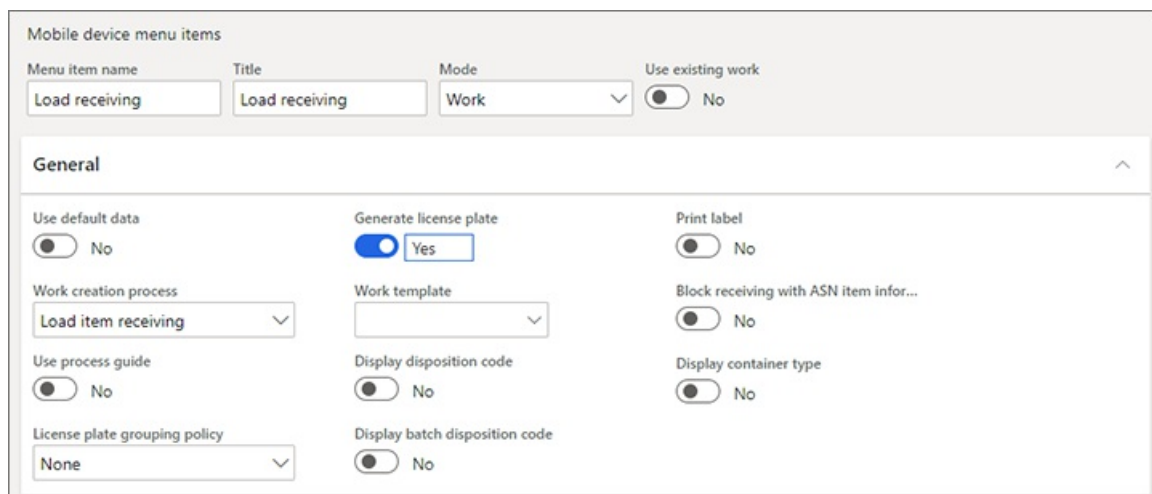
Add a menu item for receiving load items when a mobile device is used

Before warehouse receiving clerks can use a mobile device to register inbound inventory that is linked to a load, you must create a mobile device menu item for that purpose.

In this section, you will create a mobile device menu item and add it to an existing menu. A warehouse worker can then select the menu item in the warehouse app.

1. Go to **Warehouse management > Setup > Mobile device > Mobile device menu items**, and make sure that your mobile device menu includes a menu item that has the following settings:
 - **Mode:** *Work*
 - **Work creation process:** *Load item receiving*
 - **Generate license plate:** *Yes*

You can leave all other settings at their default values.



Menu item name	Title	Mode	Use existing work
Load receiving	Load receiving	Work	<input type="radio"/> No

General		
Use default data	Generate license plate	Print label
<input type="radio"/> No	<input checked="" type="radio"/> Yes	<input type="radio"/> No
Work creation process	Work template	Block receiving with ASN item infor...
Load item receiving		<input type="radio"/> No
Use process guide	Display disposition code	Display container type
<input type="radio"/> No	<input type="radio"/> No	<input type="radio"/> No
License plate grouping policy	Display batch disposition code	
None	<input type="radio"/> No	

For more information about how to set up mobile device menu items, see [Set up mobile devices for warehouse work](#).

2. After you've finished setting up the menu item, go to **Warehouse management > Setup > Mobile device > Mobile device menu**, and add it to the menu structure for your mobile devices.

Example scenario 1: Register a load where some items are missing

This scenario shows how to register quantities for an inbound load where not all the expected quantities are present. It then shows how to post the product receipt for the purchase order.

Create a load to plan receipt of a purchase order

In this procedure, you will manually create a purchase order and an associated load. You will then update the load to simulate that it has been shipped from the vendor (which updates the load status). Warehouse planners can then filter loads by **Load status** to find expected incoming loads.

1. Go to **Procurement and sourcing > Purchase orders > All purchase orders**.
2. Select **New**.
3. In **Create purchase order** dialog box, set the **Vendor account** field to *1001*.
4. Select **OK** to close the dialog box and create the purchase order.
5. The new purchase order already includes a line under **Purchase order lines**. Set the following values for this line:
 - **Item number:** *A0001*
 - **Warehouse:** *24*
 - **Quantity:** *10*
6. On the Action Pane, on the **Purchase** tab, select **Actions > Confirm**. The order status is now *Confirmed*.
7. On the Action Pane, on the **Warehouse** tab, select **Actions > Load planning workbench**.
8. On the **Load planning workbench** page, on the Action Pane, on the **Supply and demand** tab, select **Add > To new load**.
9. In the **Load template assignment** dialog box, set the **Load template ID** field to *20' Container*.
10. Select **OK** to close the dialog box and return to the workbench.
11. In the **Loads** section, select **Load ID** to open the newly created load.
12. Review the load header and line details, and notice the following points:
 - On the **Load FastTab**, the **Load status** field is set to *Open*.
 - In the **Load lines** section, there is a single line where the **Quantity** field is set to *10* and the **Work created quantity** field is set to *0* (zero).

Invalid	Order number	Shipment ID	Item number	Overdelivery	Undelivery	Quantity	Unit	Work created quantity	Unit	Packing quantity	Ready to ship	Reference	Direction	Product name
<input checked="" type="checkbox"/>	0000102	USMF-000005	A0001	0.00	0.00	10.00	Pcs	0.00	Pcs	1.00	2/18/2020 12:00:00 AM	Purchase order	Inbound	HDMI 6' Cables

13. On the Action Pane, on the **Ship and receive** tab, select **Confirm > Inbound shipment**. Notice that the **Load status** has changed to *Shipped*.
14. Make a note of the **Load ID** value, so that you can use it in the next procedure.

Register receipt of the quantities that arrived on the load

When the load arrives at the warehouse receiving dock, a receiving clerk registers the load quantities on a mobile device.

1. Use your mobile device to sign in to warehouse 24. (In the standard demo data, sign in by using *24* as the user ID and *1* as the password.)

2. Select the *Load item receiving* menu item that you created for this scenario.
3. Follow the data entry instructions on the screen to enter the following values. (The order might vary, depending on the mobile device or emulator that you're using.)
 - **Load** – Enter the load ID that you created in the previous procedure.
 - **Item** – Enter *A0001*, which is the item that is expected for this load.
 - **Qty** – Enter *9* as the actual quantity that is present on the load. Note that this quantity is less than the expected quantity.
4. Continue to go through the workflow, leaving all other fields blank or set to their default values, until your device informs you that the work is completed.

The load receiving task is now completed, and the receiving clerk can move on to his or her next task. However, warehouse receiving personnel will eventually review the load record and will be able to see that the received quantity was less than the expected quantity. They will then complete the following procedure by using the web client.

1. Go to **Warehouse management > Loads > All loads**.
2. In the list, find the load that you just received. (You might have to select the **Show closed** check box to include the inbound loads that have a load status of *Shipped*.) Then select the link in the **Load ID** column to open the load.
3. In the load record, notice that the **Load status** value remains *Shipped*, but the **Work created quantity** value on the load line has changed to *9*.
4. Go to **Procurement and sourcing > Purchase orders > All purchase orders**.
5. In the list, find the purchase that you just received, and then select the link in the **Purchase order** column to open the order.
6. On the **Purchase order lines** FastTab, select **Inventory > View > Transactions**.
7. Review the details of the two purchase order transactions. (You might have to personalize the **Inventory transactions** page to see the **Load ID** field to the grid.) You should see two transactions:
 - The transaction that has a receipt in *Registered* status represents the registration quantity of *9* that was run against a specific load by using the mobile device. The **Load ID** is associated with the transaction in question.
 - The transaction that has a receipt in *Ordered* status represents the remaining unregistered order line quantity of *1*.

Product receipt–post the registered load quantities against purchase orders

In this procedure, you will product receipt–post the inventory that you registered for a load. As a result, the received inventory and its related costs will be added to the company's general ledger.

1. Go to **Warehouse management > Loads > All loads**.
2. In the list, find the load that you received. (You might have to select the **Show closed** check box to include the inbound loads that have a load status of *Shipped*.) Then select the link in the **Load ID** column to open the load.
3. On the Action Pane, on the **Ship and receive** tab, select **Receive > Product receipt**. If you're prompted to confirm the action, select **Yes**.
4. In the **Posting product receipt** dialog box, on the **Lines** FastTab, inspect the grid. You should see the purchase order line for which the quantity has been registered against the selected load.

NOTE

In versions where the *Multiple product receipt postings per load* feature isn't available or isn't enabled, the default quantity that is shown in the **Load lines** grid will be the total quantity that has been registered across all loads that are associated with the purchase order line.

5. On the **Overview** FastTab, inspect the **Product receipt** field in the grid. Notice that it's set to a number that includes the ID of the selected load.
6. Select **OK** to post the product receipt and close the **Posting product receipt** dialog box.
7. You're returned to the load details. Notice the following points:
 - The **Load status** field is now set to *Received*.
 - On the load line, the **Quantity** value for the load has changed from *10* to *9* pcs to match the registered quantity, but the **Work created quantity** value remains *9*.

If the purchasing team doesn't expect the vendor to deliver the remaining order quantity of 1, it can close the order by updating the line's delivery remainder to *0*. However, if it's soon found that the missing piece arrived on the original load, warehouse personnel can perform one of the following actions:

- Register the quantity against the same load. In this case, the **Load status** field will be reset to *Shipped*, and the **Work created quantity** value will be updated to *10*. This choice is available only in the following situations:
 - The *Over receipt of load quantities* feature isn't available or isn't enabled.
 - The *Over receipt of load quantities* feature is available and enabled, and the **Load line quantity over receipt** field is set to *Allow*.
- Add the quantity to a new or existing load, and process it in the usual way.
- Register and/or receive the quantity in a way that doesn't involve load handling.

Example scenario 2: Register quantities that arrive on multiple inbound loads where some items are missing

In this scenario, an inbound shipment that is related to a single purchase order line will be split into two loads. For example, a purchase order line might be split into multiple loads because of physical load constraints on weight and/or volume.

This scenario also shows how to process multiple product receipt postings for the same load. You will register quantities that arrive on multiple inbound loads, but the quantities won't match the expected quantities. The cost updates that occur via the product receipt posting will be done multiple times for the same load.

Set up load receiving policies

In this procedure, you will enable multiple product receipt postings from the same load.

1. Go to **Warehouse management > Setup > Warehouse management parameters**.
2. On the **Loads** tab, set the **Allow multiple product receipt per load** field to *Yes*.

Create two loads to plan receipt of a purchase order

In this procedure, you will create a purchase order and two loads. You will then manually update each load to simulate that it has been shipped by the vendor (which updates the load status). Warehouse planners can then filter loads by **Load status** to find expected incoming loads.

You will also learn how to set the purchase order line so that you can receive a quantity that is 20 percent more than the quantity that is specified for the line.

1. Go to **Procurement and sourcing > Purchase orders > All purchase orders**.

2. Select **New**.
3. On the **Vendor** FastTab, set the **Vendor account** field to *1001*, and then select **OK**.
4. Your new purchase order is opened and includes a blank line in the **Purchase order lines** grid. Set the following values for this order line:
 - **Item number:** *A0001*
 - **Warehouse:** *24*
 - **Quantity:** *10*
5. On the **Line details** FastTab, on the **Delivery** tab, set the **Overdelivery** field to *20*.
6. On the Action Pane, on the **Purchase** tab, select **Actions > Confirm**. The order status is now *Confirmed*.
7. On the Action Pane, on the **Warehouse** tab, select **Actions > Load planning workbench**.
8. On the **Load planning workbench** page, on the Action Pane, on the **Supply and demand** tab, select **Add > To new load**.
9. In the **Load template assignment** dialog box, set the **Load template ID** field to *20' Container*. On the **Details** tab, change the **Quantity** value from *10* to *5* to partially add the purchase order line quantity.
10. Select **OK** to apply your settings and close the dialog box.
11. Repeat steps 8 through 10 to create a second load. This time, the **Quantity** field should already be set to *5*.
12. On the **Load planning workbench** page, in the **Loads** grid, select the **Load ID** value for the first load that you created. The **Load details** page appears and shows the selected load. Follow these steps:
 - a. On the Action Pane, on the **Ship and receive** tab, select **Confirm > Inbound shipment**.
 - b. Notice that the **Load status** value has changed to *Shipped*.
 - c. Select the close button to return to the **Load planning workbench** page.
13. Repeat the previous step for the second load that you created.
14. Make a note of the two **Load ID** values that appear in the **Loads** grid.

Register partial receipt of the quantities that arrived on the first load and post the registered load quantities

When loads arrive at the warehouse receiving dock, a receiving clerk registers the load quantities on a mobile device. The registered inventory that is linked to a load is then cost-updated in the company's general ledger by posting the purchase order product receipt, based on the load.

This procedure shows how a receiving clerk will register load quantities on a mobile device.

1. Use your mobile device to sign in to warehouse 24. (In the standard demo data, sign in by using *24* as the user ID and *1* as the password.)
2. Select the *Load item receiving* menu item that you created for this scenario.
3. Follow the data entry instructions on the screen to enter the following values. (The order might vary, depending on the mobile device or emulator that you're using.)
 - **Load** – Enter the first load ID that you created in the previous procedure.
 - **Item** – Enter *A0001*, which is the item that is expected for this load.
 - **Qty** – Enter *3*. Note that this quantity is less than the expected quantity. For this scenario, imagine that you, as the receiving clerk, don't have time to register all quantities for this load. Later in this procedure, you will register the remaining pieces by repeating this step and setting the **Qty** field to *2*.
4. Continue to go through the workflow, leaving all other fields blank or set to their default values, until your device informs you that the work is completed.

5. In the web client, go to **Warehouse management > Loads > All loads**.
6. In the list, find the load that you just received, and select the **Load ID** value to open the load. Notice that the **Load status** value remains *Shipped*, but the **Work created quantity** value on the load line has changed to 3.
7. On the Action Pane, on the **Ship and receive** tab, select **Receive > Product receipt**. If you're prompted to confirm the action, select **Yes**.
8. In the **Posting product receipt** dialog box, review but don't change the values that are shown, and then select **OK**.
9. You're returned to the **Load details** page for your selected load. Notice the following points:
 - The **Load status** field remains set to *Shipped*.
 - On the load line, the **Quantity** value for the load remains 5 pcs, which is the original load quantity, and the **Work created quantity** value remains 3.
10. Complete the registration of the remaining quantity on this load by repeating this procedure. However, in step 3, set the **Qty** field to 2.

The receiving task for the first load is now completed. Two product receipt journals have been created, one for each of the two product receipt updates that you ran.

Register receipt of the quantities that arrived on the second load and account for the overdelivered quantity

For this scenario, the receiving clerk will inbound-register a quantity that exceeds the quantity that exists on the load. Over-receiving will be permitted because the system is set up to allow overdelivery.

1. Use your mobile device to sign in to warehouse 24. (In the standard demo data, sign in by using 24 as the user ID and 1 as the password.)
2. Select the *Load item receiving* menu item that you created for this scenario.
3. Follow the data entry instructions on the screen to enter the following values. (The order might vary, depending on the mobile device or emulator that you're using.)
 - **Load** – Enter the second load ID that you created earlier.
 - **Item** – Enter *A0001*, which is the item that is expected for this load.
 - **Qty** – Enter 7, which is the remaining quantity that the vendor is authorized to deliver as part of total purchase order quantity of 12 (where 10 is the original order quantity, and 2 is the allowed overdelivery quantity of 20 percent). Remember that 5 pcs have already been registered against the first load.

The second load has now been updated with the quantity of 7 and can be product receipt–updated based on this quantity.

NOTE

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Register items for an advanced warehousing enabled item using an item arrival journal

2/18/2021 • 3 minutes to read • [Edit Online](#)

This procedure shows you how to register items using the item arrival journal when you are using advanced warehouse management processes. This would usually be done by a receiving clerk.

You can run this procedure in demo data company USMF, or on your own data. You need to have a confirmed purchase order with an open purchase order line before you start this guide. The item on the line must be stocked, and it must not use product variants, and must not have tracking dimensions. And the item needs to be associated with a warehouse management process enabled storage dimension group. The warehouse that's used must be enabled for warehouse management processes and the location that you use for receiving must be license plate controlled. If you're using USMF, you can use company account 1001, Warehouse 51, and item M9200 to create your PO.

Make a note of the number of the purchase order that you create, and also note the item number and the site that you used for your purchase order line.

Create an item arrival journal header

1. Go to Item arrival.
2. Click New.
3. In the Name field, type a value.
 - If you are using USMF, you can type WHS. If you're using other data, the journal whose name you choose has to have the following properties: Check picking location must be set to No, and Quarantine management must be set to No.
4. In the Number field, type a value.
5. In the Site field, type a value.
 - Select the site that you used for your purchase order line. This will serve as a default value, which will default to all lines in the journal. If you used warehouse 51 in USMF, choose site 5.
6. In the Warehouse field, type a value.
 - Select a valid warehouse for the site that you've selected. This will serve as a default value, which will default to all lines in the journal. If you're using the example values in USMF, select 51.
7. In the Location field, type a value.
 - Select a valid location in the warehouse that you've selected. The location has to be associated with a location profile, which is license plate controlled. This will serve as a default value, which will default to all lines in the journal. If you're using the example values in USMF, select Bulk-008.
8. Right-click on the drop-down arrow in the License plate field and then select View details.
9. Click New.
10. In the License plate field, type a value.
 - Make a note of the value.
11. Click Save.
12. Close the page.
13. In the License plate field, type a value.
 - Enter the value of the license plate that you just created. This will serve as a default value, which will default to all lines in the journal.

14. Click OK.

Add a line

1. Click Add line.
2. In the Item number field, type a value.
 - Enter the item number that you used on the purchase order line.
3. In the Quantity field, enter a number.
 - Enter the quantity that you want to register.
 - The Date field determines the date on which the on-hand quantity of this item will be registered in the inventory.
 - The lot ID will be populated by the system if it can be uniquely identified from the information provided. Otherwise you will have to add this manually. This is a mandatory field, which links this registration to a specific source document line.

Complete the registration

1. Click Validate.
 - This checks that the journal is ready to be posted. If the validation fails you will need to fix the errors before you can post the journal.
2. Click OK.
 - After you clicked OK, check the message. There should be a message saying that the journal is OK.
3. Click Post.
4. Click OK.
 - After you have clicked OK, check the message bar. There should be a message saying that the operation completed.
5. Close the page.

NOTE

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Register items for a basic warehousing enabled item using an item arrival journal

2/18/2021 • 2 minutes to read • [Edit Online](#)

This procedure shows you how to register items using the item arrival journal when you are using "basic warehousing" in the Inventory management module. This would usually be done by a receiving clerk. You can run this procedure in demo data company USMF with the example values that are shown. If you are not using USMF, you need to have a confirmed purchase order with an open purchase order line before you start this guide. The item on the line must be stocked. And the item needs to be associated with a storage dimension group, where site and warehouse are active.

Create item arrival journal header

1. Go to Inventory management > Journal entries > Item arrival > Item arrival.
2. Click New.
3. In the Name field, type a value.
 - If you are using USMF, you can type WHS. If you're using other data, the journal whose name you choose has to have the following properties: cheque picking location must be set to No, and Quarantine management must be set to No.
4. In the Packing slip field, type a value.
 - This is the packing slip ID from the packing slip issued by the vendor. Add a unique number.
5. In the Number field, In the Number field, select the purchase order..
6. Click OK.

Add lines to item arrival journal

1. Click Functions.
2. Click Create lines.
 - The lines can be entered manually into this journal or created automatically. This will show you how to create this automatically.
3. Check or uncheck the Initialize quantity checkbox.
 - This will initialize the quantity on the journal lines with the quantity not registered from the purchase order line.
4. Click OK.

Post the journal

1. Click Post.
2. Click OK.

Generate the product receipt

1. Click Functions.
2. Click Product receipt.
3. Click OK.

NOTE

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Cross-dock products from receiving warehouse to stores

2/18/2021 • 2 minutes to read • [Edit Online](#)

This procedure walks through the steps to create and process a Cross-dock to distribute products from the receiving location of a purchase order to one or many stores. The user can define multiple configurations and have the system suggest how to distribute the products, or manually enter where the products are distributed to and how much gets distributed to each store. The procedure doesn't include setup of data that can be used in the Cross-dock, such as replenishment rules, organizational hierarchies, and store weights. The procedure uses the USRT demo company.

1. Go to All purchase orders.
2. Select a purchase order in the list and click the link to open the order.
3. On the Action Pane, click Retail and Commerce.
4. Click Cross docking.
5. Click Edit.
 - The category can be used to filter the items in the Lines section.
6. In the list, find and select the desired record.
7. In the Cross docking quantity field, type a value to specify how much of the quantity being purchased of the selected product should be distributed.
8. In the Additional cross docking quantity field, enter a value to specify the quantities to distribute for the available products being purchased
9. In the Distribution field, enter 'Location weight'.
 - You can select the other types to use different rules for the distribution.
10. In the Replenishment hierarchy field, select a value.
11. Select Yes in the Respect assortments field.
12. Click Calculate quantities.
13. Click Create order.
14. Click Yes.
15. In the list, find and select a warehouse that received products
16. Click Order to view the orders that got created for the selected warehouse

NOTE

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Set up a location directive for purchase order put-away

2/18/2021 • 4 minutes to read • [Edit Online](#)

This topic explains how to set up a simple location directive. The example that's shown creates a location directive to be used to determine where to put items that have been received for a purchase order. You can play this task guide with the data mentioned using demo data company USMF. Pre-conditions: You need to create a disposition code. In this procedure we use a disposition code called Relabel. If you're creating a location directive in your own data, you need to have set up advanced warehouse management for your warehouse and items. This procedure is intended for the warehouse manager.

1. In the navigation pane, go to **Modules > Warehouse management > Setup > Location directives**.
2. In the **Work order type** field, select **Purchase orders**.

Create a location directive header

1. Select **New**.
2. In the **Sequence number** field, enter a number. This is the sequence in which the location directive is processed for the selected work type. You can also modify the sequence, if needed.
3. In the **Name** field, type a value. This is the unique identifier for this directive.
4. In the **Work type** field, select **Put**. Select the type of work to be performed. For directive with work order type Purchase order, **Put** is the only supported value.
5. In the **Site** field, type a value.
6. In the **Warehouse** field, type a value. Leave the Directive code blank. Directive codes are used to link a work order line of type Put to a specific directive. For purchase orders, the location of the last work order line of type Put is resolved before the work template is determined. Therefore it is not possible to connect the last line of a work template to a specific directive.
7. In the **Disposition code** field, type a value. The Disposition code limits the use of the location directive, so the location directive is only used if the warehouse worker enters this specific value during registration of the item using a mobile device.
8. Select **Save**.

Edit the query for directive

1. Select **Edit query**. The use of this directive is already limited to be used for items registered in the warehouse that you specified, and with the disposition code that you specified. You can add other constraints using the query.
2. Select **OK**.

Add directive lines

1. Select **New**. This is the sequence in which the location directive lines are processed for the selected work type. You can also modify the sequence, if needed.
2. In the **From quantity** field, enter a number. This is the lowest quantity that this directive line is valid for.
3. In the **To quantity** field, enter a number.
4. In the **Unit** field, type a value. The unit the From quantity and To quantity is expressed in. If you leave this field blank the inventory unit from the item is used.

5. In the **Locate quantity** field, select an option.
 - None, or license plate quantity: The quantity registered on each license plate.
 - Unitized quantity: The entire quantity that's been registered.
 - Remaining quantity: The quantity that is yet to be registered from the purchase order line.
 - Expected quantity: The total quantity that is specified on the purchase order line.
6. Check or uncheck the **Restrict by unit** checkbox. If you select this option, and specify the unit on the **Restrict by unit** page, only items with that unit of measurement can be put into the location. For example, if the unit of measurement is PL (pallets), only items in pallets can be put into the specified location.
7. Check or uncheck the **Allow split** checkbox. This allows the directive to split the quantity across multiple locations.
8. Select **Save**.

Restrict the directive line to a specific unit

1. Select **Restrict by unit**. This button is only available when you press **Save** after you have selected the **Restrict by unit** check box.
2. In the **Unit** field, type a value.
3. Close the page.

Add a location directive action line

1. Select **New**. This is the sequence in which the location directive action lines are processed for the selected work type. You can also modify the sequence, if needed.
2. In the **Name** field, type a value. This is the unique identifier for this directive action.
3. In the **Fixed location usage** field, select an option.
 - Fixed and non-fixed locations: All non-fixed locations are valid as well as the product's own fixed location, within the range specified in the query.
 - Only fixed location for the product: Fixed locations for the product are valid, and all product variants share the same set of fixed locations.
 - Only fixed location for the product variants: Only fixed locations specified for each product variant are valid.
4. In the **Strategy** field, select an option. Work orders of type Purchase order support the following strategies:
 - None: the item is placed at the first location that's found.
 - Consolidate: The item is placed in a location where similar items are already available.
 - Empty location with no incoming work: the item is placed in the first empty location that's found. A location is considered to be empty if it has no physical inventory and no expected incoming work.
5. Select **Save**.

Edit the query for directive action line

1. Select **Edit query**.
2. Select **Add**.
3. In the **Field** field, type `location profile ID`. In this example, we'll restrict the possible locations using a location profile ID.
4. In the **Criteria** field, type a value.
5. Select **OK**. You can continue to add directive lines and directive actions until you have covered all the possible scenarios in your warehouse.

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Set up a work template for purchase orders

2/18/2021 • 2 minutes to read • [Edit Online](#)

This topic describes how to set up a simple work template to be used when putting away received items. Work templates determine the set of instructions presented to the warehouse worker on a mobile device when moving items from the receiving area. You can use this procedure with the data mentioned in demo data company USMF. Before you start this guide, create a work pool ID. In this example, a work pool ID called Inbound is used. This procedure is intended for the warehouse manager.

1. In the navigation pane, go to **Modules > Warehouse management > Setup > Work > Work templates**.
2. In the **Work order type** field, select **Purchase orders**.

Create a work template header

1. Select **New**.
2. In the **Sequence number** field, enter a number. This is the sequence in which the work templates are evaluated. You can modify the sequence, if needed.
3. In the **Work template** field, type a value. This is the unique identifier for this template.
4. In the **Work template description** field, type a value.
 - The **Valid** option will not be checked until you've completed all the information that's needed by the template and have then selected **Save**.
 - A work order of type **Purchase order** cannot be automatically processed, so leave the **Automatically process** option set to **No**.
5. In the **Work pool ID** field, type a value. Work pool IDs allow you to organize work into groups. The value that you set here will be the default value for any work that's created using this template.
6. In the **Work priority** field, enter . This indicates the importance of the work, and the value that you set here will be the default for any work created using this template.
7. Select **Save**. You must save the work template header before the **Edit Query** button becomes available.

Set up the query for the work template

1. Select **Edit query**. We'll set a limitation that the template can only be used within a specific warehouse.
2. Select **Add**.
3. In the **Field** field of the new row, type .
4. In the **Criteria** field, type a value.
5. Select **OK**.
6. Select **Yes**.

Set work template details

1. Select **New**.
2. In the **Work type** field, select **Pick**.
3. In the **Work class ID** field, type . The work class that you set here will be the default on all work lines of type Pick that are created using this template. The work class cannot be overridden from the work order lines. Work classes are used to direct and/or limit the type of work order lines a warehouse worker can process on a mobile device.

4. Select **New**.
5. In the **Work type** field, select **Put**.
6. In the **Work class ID** field, type a value. The pick and put instructions are a set. Each pick/put set must have the same work class. Use the same work class that you provided for the pick instruction.
7. Select **Save**. Note that the **Valid** checkbox is now checked.

NOTE

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Location product dimension mixing

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Location product dimension mixing is location profile functionality that helps improve location management when product variants or products that have dimensions are used, such as in the fashion industry. It lets you decide whether configurations, colors, styles, and sizes can be mixed for a specific location profile, or whether just one of these dimensions or a combination of them can be put to the same location.

Turn on the Location product dimension mixing feature

Before you can use location product dimension mixing, the feature must be turned on in your system. Admins can use the [Feature management](#) workspace to check the status of the feature and turn it on if it's required. There, the feature is listed in the following way:

- **Module:** *Warehouse management*
- **Feature name:** *Location product dimension mixing*

Setup

Every location in the warehouse needs to have a location profile associated with it that describes the properties of the location. Therefore, all locations that use the same location profile will be able to allow product dimension mixing after it has been set up.

Configure location profiles to allow product dimension mixing

1. Go to **Warehouse management > Setup > Warehouse > Location profiles**.
2. In the list of location profiles, select **BULK**.
3. On the Action Pane, select **Edit**.
4. On the **General** FastTab, set the **Enable location product dimension specific mixing** option to *Yes*.

NOTE

You can set this option to *Yes* only if the **Allow mixed items** option is set to *No*.

5. On the **Allowed product dimension mixing** FastTab, set the **Size** option to *Yes*. In the scenario that is described in this topic, mixing can be done only for products that have different **Size** dimensions. However, other options are also available.
6. Select **Save**.

Create a new product master and product variants

1. Go to **Product information management > Products > Product masters**.
2. On the Action Pane, select **New** to create a product master.
3. In the **New product** dialog box, set the following values:
 - **Product type:** *Item*
 - **Product subtype:** *Product master*
 - **Product number:** *B0001*

- **Product name:** *B0001 Size*
- **Product dimension group:** *Size*
- **Configuration technology:** *Predefined variant*

4. Select **OK**.

5. On the **Product details** page, on the **General** FastTab, set the following values:

- **Generate variants automatically:** *Yes*
- **Size group:** *CASUALDHIR*

6. To view the predefined variants, on the Action Pane, select **Product variants**.

The **Product variants** page appears and shows a list of variants from the configuration of the size group.

Release products to the USMF company

1. On the Action Pane, select **Release products**.

2. On the **Select products to release** page, confirm that product number *B0001* is in the list, and then select **Next**.

3. Select **Next** to confirm the product variants to release.

4. On the **Select companies to release to** page, select *USMF*, and then select **Next** to confirm the selection.

5. On the **Confirm selection** page, select **Finish** to complete the release.

You receive an "Operation completed" message.

Update a released product in the USMF company

1. Make sure that you're signed in to the **USMF** company.

2. Go to **Product information management > Products > Released products** to finish creating the released product.

3. Find and select item number *B0001* to open the **Released product details** page.

4. On the Action Pane, select **Edit**.

5. On the **General** FastTab, make sure that the **Item model group** field is set to *FIFO*.

6. On the Action Pane, on the **Product** tab, in the **Set up** group, select **Dimension groups**.

7. Set the following values:

- **Storage dimension group:** *Ware*
- **Tracking dimension group:** *None*

8. Select **OK**.

9. On the Action Pane, on the **Product** tab, in the **Set up** group, select **Reservation hierarchy**.

10. Set the **Reservation hierarchy** field to *Default*, and then select **OK**.

11. On the **General** FastTab, in the **Administration** section, notice that your selections have been updated.

12. On the **Purchase** FastTab, in the **Price** field, enter *10*.

13. On the **Manage costs** FastTab, in the **Item group** field, enter *Audio*.

14. On the **Purchase** FastTab, in the **Price** field, enter *10*.

15. On the **Warehouse** FastTab, in the **Unit sequence group ID** field, enter *ea*.

16. Select **Save**.

Create a location directive

1. Go to **Warehouse management > Setup > Location directives**.

2. In the left pane, in the **Work order type** field, select *Purchase orders*.

3. In the list, select the location directive that is named *24 PO Direct*.

4. On the **Location Directive Actions** FastTab, select **New** to add a line to the grid.

5. On the new line, set the following values:

- **Sequence number:** *1*

The new line should be in front of the previously existing line. To make the change, use the **Move up** and **Move down** buttons on the toolbar, or change the existing line's **Sequence number** value to *2*.

- **Name:** *Put to BULK Location profile*
- **Fixed location usage:** *Fixed and non-fixed locations*
- **Allow negative inventory:** *Clear this check box (=No)*
- **Batch enabled:** *Clear this check box (=No)*
- **Strategy:** *None*

6. While the new line is still selected, select **Edit query** above the grid.

7. In the query dialog box, on the **Range** tab, select **Add** to add a line to the grid.

8. On the new line, set the following values:

- **Table:** *Locations*
- **Derived table:** *Locations*
- **Field:** *Location profile ID*
- **Criteria:** *BULK*

9. Select **OK**.

10. On the **Location directives** page, on the Action Pane, select **Save**.

NOTE

On the **Location Directive Actions** FastTab **Strategy** field, if you use the *Consolidate* location strategy, the setup of the **Allowed product dimension mixing** FastTab on the **Location profiles** will be overridden, and items will be put to the same location even if this behavior isn't allowed by the setup.

Create a mobile device menu item

1. Go to **Warehouse management > Setup > Mobile device > Mobile device menu items**.

2. On the Action Pane, select **New** to create a menu item to use for sorting.

3. In the header, set the following values:

- **Menu item name:** *PO line receiving*
- **Title:** *PO line receiving*

- **Mode:** *Work*
 - **Use existing work:** *No*
4. On the **General** FastTab, set the following values:
- **Work creation process:** *Purchase order line receiving and putaway*
 - **Generate license plate:** *Yes*
5. Select **Save**.

Configure the mobile device menu

1. Go to **Warehouse management > Setup > Mobile device > Mobile device menu**.
2. In the list of menus, select **Inbound**.
3. On the Action Pane, select **Edit**.
4. In the **Available Menus And Menu Items** list, find and select the **PO line receiving** menu item.
5. Select the right arrow button to move the **PO line receiving** menu item to the **Menu Structure** list. In this way, you add your new menu item to the selected menu.
6. Select **Save**.

Scenario

This demo scenario shows how two different product variants can be put to the same location when the location profile doesn't allow for mixed items, but the *Location product dimension mixing* feature is enabled. In this case, you will use the **Size** variant as the criterion.

Before you begin, make sure that there are empty locations in warehouse *24* that use the *BULK* location profile.

Create a purchase order

You will create a purchase order that has three lines: two lines for the same product number but different **Size** variants, and a third line for a different product that has no variants.

1. Go to **Accounts payable > Purchase orders > All purchase orders**.
2. On the Action Pane, select **New**.
3. In the **Create purchase order** dialog box, set the following values:
 - **Vendor account:** *1001*
 - **Warehouse:** *24*
4. Select **OK**.
5. The purchase order is created, and a new line is added on the **Purchase order lines** FastTab. Make a note of the purchase order number.
6. On the new line, set the following values:
 - **Item number:** *B0001*
 - **Size** *L*
 - **Quantity:** *2*
7. Select **Add line** above the grid to add a second purchase order line, and set the following values:
 - **Item number:** *B0001*
 - **Size** *XL*
 - **Quantity:** *2*
8. Select **Add line** to add a third purchase order line, and set the following values:
 - **Item number:** *A0001*

- **Quantity:** 1

1. Select **Save**.

Receive purchase order lines in the warehouse app

1. Sign in to the warehouse app as a user who is enabled for warehouse 24.
2. Select the **Inbound** menu.
3. Select **PO Line receiving**.
4. Select the **PONUM** field, and then enter the purchase order number.
5. Confirm your entry by selecting the confirm button (✓) at the bottom of the page.
6. Enter the line number from the purchase order that is being received. Select the **LINENUM** field, and then use the number pad to enter 1.
7. Confirm your entry.
8. Enter the quantity to receive. Select the plus sign (+) button two times to increase the value in the **Qty** field to 2.
9. Register your entry by selecting the button (✓) at the bottom of the page, and then confirm your entry by selecting the button (✓) again.
10. View the information on the **Purchase orders: Put** page. This page shows the work that has been created for the put-away (Work 1).

The location where the received item will be put away, the license plate, the item, the size, and the quantity of the **PO Line receiving** task that you just completed are shown.
11. Confirm the put-away work.
12. Repeat the steps 4 through 11 for the purchase order line 2. However, in step 8, specify a quantity of 1.

New put-away work (Work 2) is created for the same location as Work 1.
13. Repeat the steps 4 through 11 again for purchase order line 2. In step 8, specify the remaining quantity of 1.

New put-away work (Work 3) is created for the same location as Work 1 and Work 2. This behavior occurs because the *Consolidate* location directive strategy is used, and the **Allowed product dimension mixing** FastTab on the *Bulk Location profiles* setup allows the **Size** variant to be mixed on a location.
14. Repeat the steps 4 through 11 for purchase order line 3. In step 8, specify a quantity of 1 for item number *A0001*.

New put-away work (Work 4) is created for a different location than the location that is used for purchase order lines 1 and 2. This behavior occurs because the location profile doesn't allow for mixed products, but it does allow for mixed dimensions of the same product master.
15. Select the Menu button at the top of the page (sometimes referred to as the hamburger or the hamburger button), and then select **Cancel** to exit **PO Line receiving**.

TIP

You can repeat this scenario, but this time, set *Size - No* under the **Allow product dimension mixing** FastTab on the *BULK Location profiles*, so that none of the product dimensions can be mixed. In this case, when you receive the purchase order, each product variant will be put to a new location.

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Putaway clusters

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Putaway clusters offer a way to pick multiple license plates at the same time and then take them for putaway in different locations. This process is often referred to as a *milk run*. Putaway clusters can be very useful for retail businesses, where license plates typically aren't full pallets of inventory.

Turn on the cluster putaway feature

Before you can use this feature, it must be turned on in your system. Admins can use the [Feature management](#) workspace to check the status of the feature and turn it on if it's required. There, the feature is listed in the following way:

- **Module:** *Warehouse management*
- **Feature name:** *Cluster putaway feature*

Setup for the example scenario

Cluster profiles

The putaway cluster profile determines where an item will go, based on the location that is assigned to the item at the time of receipt. If different clusters are required, different putaway clusters should be created, one for each mobile device menu item.

1. Go to **Warehouse management > Setup > Mobile device > Cluster profiles**.

2. On the Action Pane, select **New**.

3. In the **Header** view, set the following values:

- **Putaway cluster profile ID:** *Cluster putaway*
- **Putaway cluster profile ID Name:** *Cluster putaway*
- **Cluster type:** *Putaway*
- **Sequence number:** Accept the default value.

4. Select **Save** to make the required fields on the **General** FastTab available.

5. On the **General** FastTab, set the following values:

- **Cluster assignment timing:** *At receipt*

This field defines whether the putaway cluster should be assigned immediately when the inventory is received, or whether it should be sorted later.

- **Cluster assignment rule:** *Manual*

This field defines whether the cluster assignment should be determined automatically by the system or manually by the user.

- **Directive code:** Leave this field blank.

- **Putaway cluster locate:** *Receipt*

The following values are available:

- **Receipt** – A location is found immediately during receipt.

- **Cluster close** – A location is found when the cluster is closed.
- **User directed** – A location is found when the license plate is picked from the cluster for putaway. In this case, no location is specified when the putaway work is created. During the putaway itself, the user must scan the license plate or work ID to initiate the put step. The system then finds the put location again and tells the user where to put the picked quantity.

- **Putaway cluster per user:** *No*

This field defines whether each cluster should be unique per user when clusters are automatically assigned. It's available only when the **Cluster assignment rule** field is set to *Automatic*.

- **Unit restriction:** Leave this field blank.

This field defines the unit that must be received for the profile to be valid. If it's left blank, all units are valid.

- **Work unit break:** *Individual*

This field defines whether all inventory should be consolidated (by using the cluster ID and the license plate) onto one license plate when a cluster is closed, and whether it should be put away as a single license plate or separately on the license plates that were received. This field is unavailable when the **Putaway cluster locate** field is set to *Receipt*.

- **Cluster persists as Parent License Plate:** *No*

If this option is set to *Yes*, when the put step is completed, the cluster ID will become a parent license plate, and all items on the cluster ID will be linked to that parent license plate.

6. On the **Cluster sorting** FastTab, you can define putaway sorting criteria. Select **New** on the toolbar to add a line, and then set the following values:

- **Sequence number:** Accept the default value.
- **Field name:** *WMSLocationId*

This field defines the field that this line should use as a sorting criterion.

- **Sorting:** *Ascending*

This field defines whether sorting should be done in ascending or descending order.

7. On the **Cluster work template** FastTab, select **New** on the toolbar to add a line, and then set the following values:

- **Work order type:** *Purchase orders*
- **Work template:** *61 PO Direct*

8. On the Action Pane, select **Save**, and then select **Edit query**.

9. In the **Cluster putaway** dialog box, on the **Range** tab, select **Add** to add a second line to the query. Then update the query lines as shown in the following table.

TABLE	DERIVED TABLE	FIELD	CRITERIA
Work	Work	Warehouse	<i>61</i>
Work	Work	Work ID	Leave this field blank.

10. Select **OK** to save the query and close the dialog box.

11. On the Action Pane, select **Save**, and close the page.

IMPORTANT

Fields in the cluster profile that appear dimmed when **Generate cluster ID** is set to *Yes* are unavailable and won't be considered when this feature is used.

Mobile device menu items

Two new mobile device menu items are available for this feature. The **Receive and sort cluster** menu item is used to sort the received inventory into a putaway cluster upon receipt. The **Cluster putaway** menu item is used to put the cluster away after it has been assigned.

Receive and sort cluster

Create a new mobile device menu item for receiving inventory and sorting into a cluster. This menu item will create inbound work after inventory is received, which indicates that the receiving menu item will be used for putaway clusters.

NOTE

The **Receive and sort cluster** menu item can be used with the following receiving menu items:

- Purchase order line receiving
- Purchase order item receiving
- Load item receiving

1. Go to **Warehouse management > Setup > Mobile device > Mobile device menu items**.

2. On the Action Pane, select **New**.

3. In the **Header** view, set the following values:

- **Menu item name:** *Receive and sort cluster*
- **Title:** *Receive and sort cluster*
- **Mode:** *Work*
- **Use existing work:** *No*

4. On the **General** FastTab, set the following values:

- **Work creation process:** *Purchase order item receiving*
- **Generate license plate:** *Yes*
- **Assign putaway cluster:** *Yes*

NOTE

The **Assign putaway cluster** option is available only for the one-step *Work creation process* activity for receiving.

Accept the default values for the remaining fields.

5. On the Action Pane, select **Save**.

Cluster putaway

Create a new mobile device menu item for putting the cluster away after it has been assigned.

1. Go to **Warehouse management > Setup > Mobile device > Mobile device menu items**.

2. On the Action Pane, select **New**.

3. In the **Header** view, set the following values:

- **Menu item name:** *Cluster putaway*
- **Title:** *Cluster putaway*
- **Mode:** *Work*
- **Use existing work:** *Yes*

4. On the **General** FastTab, set the **Directed by** field to *Cluster putaway*. Accept the default values for the remaining fields.

5. On the **Work classes** FastTab, set up the valid work class for this mobile device menu item:

- **Work class ID:** *Purchase*
- **Work order type:** *Purchase orders*

6. On the Action Pane, select **Save**.

Mobile device menu

Add the menu items that you just created to the inbound menu of the mobile app.

1. Go to **Warehouse management > Setup > Mobile device > Mobile device menu**.
2. On the Action Pane, select **Edit**.
3. In the menu list, select **Inbound**.
4. In the **Available menus and menu items** list, find and select **Receive and sort cluster**.
5. Select the right arrow button to move the selected menu item to the **Menu structure** list.
6. Use the up arrow or down arrow button to move the menu item into the desired position in the menu.
7. On the Action Pane, select **Save**.
8. Repeat steps 4 through 7 to add the remaining menu items:
 - Assign cluster
 - Cluster putaway

Example scenario

This scenario simulates putaway cluster processing.

Create a purchase order

1. Go to **Accounts payable > Purchase orders > All purchase orders**.
2. On the Action Pane, select **New**.
3. In the **Create purchase order** dialog box, set the following values:
 - **Vendor account:** *1001*
 - **Warehouse:** *61*
4. Select **OK**.

The **All purchase orders** page appears.

5. On the **All purchase orders** page, on the **Purchase order lines** FastTab, use the **Add line** button to add the following lines:

- Purchase order line 1:
 - **Item number:** *A0001*

- **Quantity:** 10
- Purchase order line 2:
 - **Item number:** A0002
 - **Quantity:** 20
- Purchase order line 3:
 - **Item number:** M9215
 - **Quantity:** 30

6. On the Action Pane, select **Save**.

7. Make a note of the purchase order number.

Receive inventory and put it away from the mobile device

Receive and sort the inventory into a cluster

1. Sign in to the warehouse app as a user who is set up for warehouse 61.
2. On the main menu, select **Inbound**.
3. On the **Inbound** menu, select **Receive and sort cluster**.
4. In the **Ponum** field, enter the purchase order number.
5. Select **OK** (the check mark button).
6. Select the **Item** field, enter item number A0001, and then select **OK**.
7. Select the **Qty** field, enter 10 by using the number pad, and then select the check mark button.
8. On the **Qty** task page, select **OK** (the check mark button) to confirm the quantity that you entered.
9. On the **Item** task page, select **OK** to confirm that item A0001 was entered.
10. Select the **Cluster ID** field, and enter a value to assign an ID for the cluster that you're creating.

The ID that you enter here will be used when the two remaining items on the purchase order are received.

11. Select **OK**.

The **Ponum** task page appears and shows a "Work completed" message.

Item A0001 has now been received into the *RECV* location and assigned to the cluster ID that you entered in step 10.

12. Repeat steps 4 through 11 to receive the remaining two items from the purchase order and assign them to the cluster ID:
 - A quantity of 20 for item A0002
 - A quantity of 30 for item M9215

Close the cluster

Before the items in the cluster can be put away, the cluster must be closed.

1. In Supply Chain Management, go to **Warehouse management > Work > Outbound > Work clusters**.
2. On the **Work clusters** page, in the **Work cluster** section, search the **Cluster ID** field for the cluster ID that you entered earlier.
3. If the cluster isn't shown, it might already have been closed. To determine whether the cluster was closed,

select the **Show closed work** check box, and search for the cluster ID that you entered earlier. Then follow one of these steps:

- If the cluster has been closed, skip the remaining steps of this procedure, and move on to the next procedure, [Put the cluster away](#).
- If the cluster hasn't been closed, follow the remaining steps of this procedure to manually close the cluster. Then move on to the next procedure.

4. In the **Work cluster** section, select the cluster ID that you entered earlier.

5. On the Action Pane, select **Close cluster**.

After the cluster has been closed, it's no longer shown in the **Work cluster** section (unless the **Show closed work** check box is selected).

Put the cluster away

1. Sign in to the warehouse app as a user who is set up for warehouse *67*.

2. On the main menu, select **Inbound**.

3. On the **Inbound** menu, select **Cluster putaway**.

4. Select **Cluster ID**, and enter the cluster ID that you entered earlier for the closed cluster.

5. Select **OK**.

The **Cluster putaway: Pick** page appears. It shows the cluster ID, the picking location, the items (the value *Multiple* will be shown), and the total quantity in the cluster that must be picked.

6. Select **OK**.

The **Cluster putaway: Put** page appears. The **Put** instructions identify the cluster ID, the put location, the items, the total quantity, and the license plate IDs for the items that have been received on the cluster.

You have the standard options to override or pass this step.



7. Select **OK** to confirm the putaway of the cluster.

A "Cluster completed" message is shown.

Notes and tips

For cases where the cluster ID becomes the parent license plate for a nested pallet, the put position is automatically given when the cluster ID is scanned. No further license plate must be scanned, even if license

plate generation is set to manual.

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Quality check

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The *Quality check* feature lets warehouse workers do quick spot checks for quality while they receive items to the inbound dock area. These spot checks are beneficial when workers inspect packaging or other easily recognizable parts of an item. The feature guides workers to take a quick look to see whether anything is obviously faulty or damaged before they stock the inventory in its putaway location.

This feature is an alternative to the standard quality check process. It offers more flexibility and faster processing.

When you use this feature, the arrival and quality check occur in the following way:

1. When a shipment arrives, a warehouse worker registers the arrival. The worker also scans a license plate to register the location.
2. The worker does a quick quality check and records the result (pass or fail) for that license plate.
3. One of the following actions occurs:
 - If the quality check is passed, the license plate is accepted and guided to a receiving location, as usual.
 - If the quality check is failed, the license plate is rejected, and existing putaway work for it is redirected to an alternate location for further inspection. A new quality order is created. To view the quality order that is created from the failed quality check, go to **Inventory management > Periodic tasks > Quality management > Quality orders**.

This process can also be set up so that all scanned license plates are immediately diverted to the quality check location.

Turn on the Quality check feature

Before you can use the *Quality check* feature, it must be turned on in your system. Admins can use the [feature management](#) settings to check the status of the feature and turn it on if it's required. In the **Feature management** workspace, the feature is listed in the following way:

- **Module:** *Warehouse management*
- **Feature name:** *Quality check*

Set up the feature for the example scenario

This section provides guidelines and an example that shows how to set up the *Quality check* feature and prepare sample data for the example scenario that is provided later in this topic.

Make sample data available

To work through the [example scenario](#) by using the sample records and values that are specified here, you must be on a system where the standard [demo data](#) is installed. Additionally, you must select the **USMF** legal entity before you begin.

Quality check template

The quality check template defines the rules for doing quick spot checks for quality at the time of receiving.

1. Go to **Warehouse management > Setup > Work > Quality check template**.

2. Select **New** to add a template to the grid.
3. Set the following values to define the new template:

- **Quality check template name:** *Dock check*

Enter a name that identifies the policies applied for this template.

- **Acceptance policy:** *Prompt user*

Specify whether users should be prompted to accept or reject the quality of the inventory while they process the work, or whether the quality should automatically be rejected. The available options are *Auto reject* and *Prompt user*.

- **Quality processing policy:** *Create quality order*

Select the policy that should be used when the quality of the inventory is rejected. The following options are available:

- *Create work only* – Just create work to facilitate inventory movement.
- *Create quality order* – Create a quality order to facilitate quality tests.

- **Test group:** *Enclosure*

Specify the test group that should be used in the quality order that is created. Test groups are set up in the **Inventory management** module.

Leave the **Destructive text** option turned off for the test group. This option defines whether the sample will be destroyed as part of the tests in the test group. If a destructive test is used, the system generates an inventory transaction when a quality order is created for an item. The new inventory transaction predicts the inventory reduction for the test quantity. The inventory reduction occurs when the quality order is completed through the validation step. The inventory transaction is identified as a quality order.

Work class – Quality check

Work classes are used to direct and/or limit the type of work order lines that warehouse workers can process on a mobile device.

1. Go to **Warehouse management > Setup > Work > Work classes**.

2. Select **New** to create a work class.

3. In the header, set the following values:

- **Work class ID:** *QC Check*

Enter a name that identifies the work class.

- **Description:** *QC Check*

Enter a short description that indicates what the work class is used for.

- **Work order type:** *Quality in quality check*

Select the type of work order that is created by the work class. When you set up quality control work, always select *Quality in quality check*.

4. On the **Valid put location types** FastTab, leave the **Location type** field blank.

If you select a location type, you limit the locations where items can be put after they are picked. This field is used when a location directive tries to resolve the location, or when a warehouse worker manually specifies the location for the mobile device menu item.

For more information about work classes and how to create them, see [Create a work class](#).

Work template

Work templates let you define the work operations that must be performed in the warehouse. Typically, warehouse work operations consist of a pair of actions: a warehouse worker picks on-hand inventory up in one location and then puts the picked inventory down in another location. A work template for quality control defines the work operations for doing quality checks.

Purchase orders

1. Go to **Warehouse management > Setup > Work > Work templates**.
2. In the header, set the **Work order type** field to *Purchase orders*.
3. On the Action Pane, select **Edit**.
4. Select a work template that should include a quality check step. In the **Overview** section, in the **Work template** field, select *51 PO Receipt*.
5. In the **Work template details** section, notice that the grid has two existing lines: one for *Pick* and one for *Put*.
6. In the **Work template details** section, select **New** to add a row for quality control to the grid. Notice that the **Line number** field for the new line is set to *3*.
7. On the new line, set the following values. Accept the default values for the remaining fields.

- **Work type:** *Quality check*
- **Work class ID:** *Purchase*
- **Quality check template name:** *Dock check*

Select the unique ID for the work class. You use this value to configure the menu items on the mobile device and the types of work that those menu items can process.

8. On the Action Pane, select **Save** to save your work so far.

You receive an informational message that states, "Invalid - Quality check must come directly after a pick." Therefore, you must change the **Line number** value for the line that you just added.

9. Follow these steps to change the **Line number** value for the new line:
 - a. In the **Work template details** section, select the line where the **Work type** field is set to *Quality check*.
 - b. Select the **Move up** or **Move down** button to move the *Quality check* line so that it's after the *Pick* line.
10. On the Action Pane, select **Save**.

Quality in quality check

Next, create a work template for the quality check.

1. In the header of the **Work templates** page, change the value of the **Work order type** field to *Quality in quality check*.
2. On the Action Pane, select **New** to add a row to the grid in the **Overview** section.
3. In the new row, set the following values:
 - **Work template:** *51 Quality Check*

Enter a name for the template.

- **Work template description:** *51 Quality Check*

4. On the Action Pane, select **Save** to make the **Work template details** section available.
5. While the new template is still selected in the **Overview** section, select **New** in the **Work template details** section to add a row to the grid there.

6. In the new row, set the following values:

- **Work type:** *Pick*
- **Work class ID:** *QC Check*

Select the name of the [work class](#) that you created earlier for quality control work.

7. In the **Work template details** section, select **New** again to add another row.

8. In the new row, set the following values:

- **Work type:** *Put*
- **Work class ID:** *QC Check*

Select the name of the [work class](#) that you created earlier for quality control work.

9. On the Action Pane, select **Save**.

For more information about work templates, see [Control warehouse work by using work templates and location directives](#)

Location directive – Quality failures

Location directives are rules that help identify pick and put locations for inventory movement. For example, in a sales order transaction, a location directive determines where the items will be picked and where the picked items will be put. You must configure a location directive rule to define how failed quality checks will be handled.

1. Go to **Warehouse management > Setup > Location directives**.
2. In the left pane, set the **Work order type** field to *Purchase orders* to work with location directives of that type.
3. On the Action Pane, select **New** to create a location directive for quality checks.

4. In the header, set the following values:

- **Sequence number:** Accept the default value.
- **Name:** *51 To Quality*

5. On the **Location directives** FastTab, set the following values. Accept the default values for the remaining fields.

- **Work type:** *Put*
- **Site:** *5*
- **Warehouse:** *51*

6. On the Action Pane select **Save** to save your directive and make the **Lines** FastTab available.

7. On the **Lines** FastTab, select **New** to add a line to the grid.

8. On the new line, set the following values. Accept the default values for the remaining fields.

- **From quantity:** *1*
- **To quantity:** *1000000*

9. On the Action Pane, select **Save** to save the new line and make the **Location directive actions** FastTab

available.

10. While the new line is still selected on the **Lines** FastTab, select **New** on the **Location directive actions** FastTab to add a row to the grid there, so that you can set up an action for the line.
11. In the new row, set the **Name** field to *Quality*. Accept the default values for the remaining fields.
12. On the Action Pane, select **Save** to make the **Edit query** button on the **Location directive actions** FastTab available.
13. While the line that you just added is still selected on the **Location directive actions** FastTab, select **Edit query** to open a dialog box where you can edit the query for the action.
14. On the **Range** tab, select **Add** to add a row to the query.
15. In the new row, set the following values:
 - **Table:** *Locations*
 - **Derived table:** *Locations*
 - **Field:** *Location*
 - **Criteria:** *QMS*The *QMS* location is a warehouse location for quality.
16. Select **OK** to close the dialog box.
17. You must now change the sequence of purchase order location directives for warehouse *51*. Save the new *51 To Quality* location directive, refresh the page, and select the location directive in the list. Then use the **Move up** and **Move down** buttons on the Action Pane to put the location directive for warehouse *51* in the following order. (Before you select **Move up** or **Move down**, you must select a location directive in the list.)
 - a. 51 To Quality
 - b. 51 PO Direct
 - c. 51 QMS

Mobile device menu items

Configure a menu item so that mobile devices can perform the **Quality Check** function.

Purchase putaway

1. Go to **Warehouse management > Setup > Mobile device > Mobile device menu items**.
2. In the list, select the **Purchase put-away** menu item.
3. On the Action Pane, select **Edit**.
4. In the **Work classes** section, select **New** to add a row to the grid.
5. In the new row, set the following values:
 - **Work class ID:** *QC Check*
Enter the name of the [work class](#) that you created earlier for quality control work.
 - **Work order type:** *Quality in quality check*
6. On the Action Pane, select **Save**.

Purchase order line receiving

1. Go to **Warehouse management > Setup > Mobile device > Mobile device menu items**.
2. On the Action Pane, select **New**.

3. In the header, set the following values:

- **Menu item name:** *PO line receiving*
- **Title:** *PO line receiving*
- **Mode:** *Work*
- **Use existing work:** *No*

4. On the **General** FastTab, set the following values. Accept the default values for the remaining fields.

- **Work creation process:** *Purchase order line receiving and put away*
- **Generate license plate:** *Yes*
- **Work template:** *51 PO Receipt*

5. On the Action Pane, select **Save**.

Add the menu item to a mobile device menu

1. Go to **Warehouse management > Setup > Mobile device > Mobile device menu**.

2. In the left pane, select the **Inbound** menu.

3. On the Action Pane, select **Edit**.

4. In the **Available menus and menu items** column, select the new **PO line receiving** menu item.

5. Select the right arrow button to move **PO line receiving** to the **Menu structure** column.

6. In the **Menu structure** column, select **PO line receiving**, and then select the up arrow or down arrow button to move the menu item to the desired position on the mobile device menu.

7. On the Action Pane, select **Save**.

Example scenario

After you've made all the previously described sample data available and set it up, you can work through this scenario to try out the *Quality check* feature. The values that are shown in this scenario assume that you're working with the standard demo data, that you selected the **USMF** legal entity, and that you prepared the sample records that are described earlier in this topic. This scenario also serves as an example that shows how the feature can be used in a production setting.

Create a purchase order

1. Go to **Procurement and sourcing > Purchase orders > All purchase orders**.

2. On the Action Pane, select **New**.

3. In the **Create purchase order** dialog box, set the following values:

- **Vendor account:** *104*
- **Warehouse:** *51*

4. Select **OK** to close the dialog box and open the new purchase order.

5. On the **Purchase order lines** FastTab, the grid contains a new, blank line. On this line, set the following values:

- **Item number:** *M9203*
- **Quantity:** *3*
- **Unit:** *PL*

6. On the Action Pane, select **Save**.

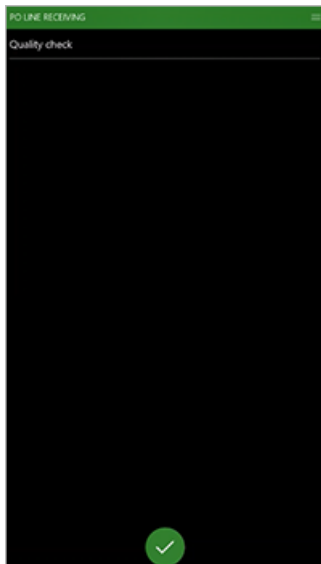
Process quality check receiving

After the purchase order has been created, it can be received by using the **PO line receiving** menu item and the functionality of the *Quality check* feature.

Receive pallet 1

1. Sign in to the warehouse app as a user for warehouse *51*. (Enter *51* as the user ID and *1* as the password.)
2. Go to **Inbound > PO line receiving**.
3. In the **PONUM** field, enter the purchase order number.
4. Confirm the purchase order number.
5. In the **LINENUM** field, enter the number of the purchase order line that is being received. Because the order has only one line in this scenario, you will enter *1* in the **LINENUM** field for each receiving step.
6. Confirm the line number.
7. In the **QTY** field, enter the quantity to receive. Because the purchase order is for three pallets (*PL*) in this scenario, and there are three receiving steps, you will enter *1* in the **QTY** field for each receiving step.
8. Confirm the quantity.

The **Quality check** page that appears has no entry fields. It has only the confirmation (check mark) button at the bottom and the Menu button (☰) at the top. (The Menu button is sometimes referred to as the hamburger or the hamburger button.) To expedite the quality check process, when the pallet passes the quality check, the user just confirms the **Quality check** page.



9. Select the confirmation button to pass the quality check for pallet 1 from line 1.

The **Purchase orders: Put** page that appears shows details of the put work:

- **LOC:** The system determined location
This location is the designated putaway location for purchase order receiving.
- **LP:** The system-generated License plate ID
- **Item:** *M9203*
- **Qty:** *1 PL: 100 ea*

The item description is also shown.

10. Confirm the putaway work.

On the **Task** page for purchase order line receiving, you receive a "Work Completed" message. The **LINENUM** field is available so that you can start to receive the next pallet.

Receive pallet 2

For this scenario, pallet 2 will be rejected.

1. In the **LINENUM** field, enter *1*, and confirm the line number.
2. The **QTY** field is now available. Enter *1*, and confirm the quantity.

The **Quality check** page appears. For this receipt, the pallet will be rejected for quality, and it will be put into the *QMS* quality location.

3. Select the Menu button (☰) at the top of the page, and then, on the menu, select **Reject**.
4. On the **Task** page that appears, enter **QMS** as the *Put* location to send the pallet to for further inspection.

The **Quality in quality check: Put** page that appears shows details of the put work:

- **LOC:** *QMS*

This location is the designated putaway location for rejected quality receiving.

- **LP:** The system-generated License plate ID
- **Item:** *M9203*
- **Qty:** *1 PL: 100 ea*

The item description is also shown.

5. Confirm the putaway work.

On the **Task** page for purchase order line receiving, you receive a "Work Completed" message. The **LINENUM** field is available so that you can start to receive the next pallet.

You've now completed the quality check and created a quality order for the rejected pallet. To view the order that was created, go to **Inventory management > Periodic tasks > Quality management > Quality orders**.

Quality order testing can now be processed. Quality testing isn't covered in this topic.

For more information about quality management, see [Quality management overview](#)

Receive pallet 3

For this scenario, pallet 3 will be accepted.

1. In the **LINENUM** field, enter *1*, and confirm the line number.
2. The **QTY** field is now available. Enter *1*, and confirm the quantity.

The **Quality check** page appears. For this receipt, the pallet will be accepted for quality, and it will be put into a bulk putaway location.

3. Select the confirmation button to pass the quality check.

The **Purchase orders: Put** page that appears shows details of the put work:

- **LOC:** The system determined location

This location is the designated putaway location for purchase order receiving.

- **LP:** The system-generated License plate ID
- **Item:** *M9203*
- **Qty:** *1 PL: 100 ea*

The item description is also shown.

4. Confirm the putaway work.

On the **Task** page for purchase order line receiving, you receive a "Work Completed" message. The **LINENUM** field is available so that you can start to receive the next pallet.

5. Select the Menu button (☰) at the top of the page, and then, on the menu, select **Cancel** to return to the menu.

You can now close the mobile app.

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Troubleshoot inbound warehouse operations

2/18/2021 • 2 minutes to read • [Edit Online](#)

This topic describes how to fix common issues that you might encounter while you work with inbound warehouse operations in Microsoft Dynamics 365 Supply Chain Management.

I receive the following error message: "Quality order %1 has been generated. Cluster profile could not be found please check your configuration."

Issue description

This error message is related to a receiving process where quality management (QMS) is turned on. Depending on the configurations in your environment, additional details about the transaction that is generating the error message might help fix the issue.

Issue resolution

First, review the [cluster picking](#) setup, and make sure that your cluster profiles are set up correctly. You can't use a mobile device menu item for cluster picking unless cluster profiles are set up. Depending on your environment, you might also have to review other related configurations.

Mixed license plate receiving doesn't work for any disposition code except Credit.

Issue description

When the **Action** field for a disposition code is set to *Credit* or *Scrap*, you can use only the [Mixed license plate receiving](#) menu item to process returned items.

Issue resolution

Microsoft has evaluated this issue and has determined that it's a feature limitation. Currently, only [disposition codes](#) where the **Action** field is set to *Credit* or *Scrap* are supported for mixed license plate receiving.

When I run the Update product receipts periodic task, unconfirmed purchase orders are confirmed.

Issue description

After you run the *Update product receipts* periodic task, the system automatically confirms unconfirmed purchase orders that have an inventory transaction status of *Registered*.

Issue resolution

A new inbound load handling feature, *Over receipt of load quantities*, fixes this issue. To turn on this feature, go to [Feature management](#), and turn on the following features (in the order that they are listed in):

1. Associate purchase order inventory transactions with load
2. Over receipt of load quantities

For more information, see [Post registered product quantities against purchase orders](#).

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Flexible warehouse-level dimension reservation policy

2/18/2021 • 37 minutes to read • [Edit Online](#)

When an inventory reservation hierarchy of the "Batch-below[location]" type is associated with products, businesses that sell batch-tracked products and run their logistics as operations that are enabled for the Microsoft Dynamics 365 Warehouse Management System (WMS) can't reserve specific batches of those products for customer sales orders.

In a similar way, specific license plates can't be reserved for products on sales orders when those products are associated with the default reservation hierarchy.

This topic describes the inventory reservation policy that lets these businesses reserve specific batches or license plates, even when the products are associated with a "Batch-below[location]" reservation hierarchy.

Inventory reservation hierarchy

This section summarizes the existing inventory reservation hierarchy.

The inventory reservation hierarchy dictates that, as far as storage dimensions are concerned, the demand order carries the mandatory dimensions of site, warehouse, and inventory status, whereas the warehouse logic is responsible for assigning a location to the requested quantities and reserving the location. In other words, in the interactions between the demand order and the warehouse operations, the demand order is expected to indicate where the order must be shipped from (that is, what site and warehouse). The warehouse then relies on its logic to find the required quantity in the warehouse premises.

However, to reflect the operational model of the business, tracking dimensions (batch and serial numbers) are subject to more flexibility. An inventory reservation hierarchy can accommodate scenarios where the following conditions apply:

- The business relies on its warehouse operations to manage picking of quantities that have batch or serial numbers after the quantities have been found in the warehousing storage space. This model is often referred to as *Batch-below[location]*. It's typically used when a product's batch or serial number identification isn't important to the customers who place the demand with the selling company.
- If batch or serial numbers are part of a customer's order specification, and they are recorded on the demand order, the warehouse operations that find the quantities in the warehouse are constrained by the specific requested numbers and aren't allowed to change them. This model is referred to as *Batch-above[location]*.

In these scenarios, the challenge is that only one inventory reservation hierarchy can be assigned to each released product. Therefore, for the WMS to handle tracked items, after the hierarchy assignment determines when the batch or serial number should be reserved (either when the demand order is taken or during the warehouse picking work), this timing can't be changed on an ad-hoc basis.

Flexible reservation for batch-tracked items

Business scenario

In this scenario, a company uses an inventory strategy where finished goods are tracked by batch numbers. This company also uses the WMS workload. Because this workload has well-equipped logic for planning and running warehouse picking and shipping operations for batch-enabled items, most of the finished items are associated with a "Batch-below[location]" inventory reservation hierarchy. The advantage of this type of operational setup

is that decisions (which are effectively reservation decisions) about which batches to pick and where to put them in the warehouse are postponed until the warehouse picking operations start. They aren't made when the customer's order is placed.

Although the "Batch-below[location]" reservation hierarchy serves the company's business goals well, many of the company's established customers require the same batch that they previously purchased when they reorder products. Therefore, the company is looking for flexibility in the way that the batch reservation rules are handled, so that, depending on the customers' demand for the same item, the following behaviors occur:

- A batch number can be recorded and reserved when the order is taken by the sales processor, and it can't be changed during warehouse operations and/or taken by other demands. This behavior helps guarantee that the batch number that was ordered is shipped to the customer.
- If the batch number isn't important to the customer, the warehouse operations can determine a batch number during picking work, after sales order registration and reservation have been done.

Allowing reservation of a specific batch on the sales order

To accommodate the desired flexibility in the batch reservation behavior for items that are associated with a "Batch-below[location]" inventory reservation hierarchy, inventory managers must select the **Allow reservation on demand order** check box for the **Batch number** level on the **Inventory reservation hierarchies** page.

Name	Reservation hierarchy level	Allow reservation on demand order
Site	1	<input type="checkbox"/>
Warehouse	2	<input type="checkbox"/>
Inventory status	3	<input type="checkbox"/>
Location	4	<input type="checkbox"/>
License plate	5	<input type="checkbox"/>
Batch number	6	<input checked="" type="checkbox"/>

When the **Batch number** level in the hierarchy is selected, all dimensions above that level and up through the **Location** level will be automatically selected. (By default, all dimensions above the **Location** level are preselected.) This behavior reflects the logic where all dimensions in the range between the batch number and location are also automatically reserved after you reserve a specific batch number on the order line.

NOTE

The **Allow reservation on demand order** check box applies only to reservation hierarchy levels that are below the warehouse location dimension.

Batch number and **License plate** are the only levels in the hierarchy that are open for the flexible reservation policy. In other words, you can't select the **Allow reservation on demand order** check box for the **Location** or **Serial number** level.

If your reservation hierarchy includes the serial number dimension (which must always be below the **Batch number** level), and if you've turned on batch-specific reservation for the batch number, the system will continue to handle serial number reservation and picking operations, based on the rules that apply to the "Serial-below[location]" reservation policy.

At any point, you can allow batch-specific reservation for an existing "Batch-below[location]" reservation hierarchy in your deployment. This change won't affect any reservations and open warehouse work that were created before the change occurred. However, the **Allow reservation on demand order** check box can't be

cleared if inventory transactions of the **Reserved ordered**, **Reserved physical**, or **Ordered** issue type exist for one or more items that are associated with that reservation hierarchy.

NOTE

If an item's existing reservation hierarchy doesn't allow batch specification on the order, you can reassign it to a reservation hierarchy that does allow batch specification, provided that the hierarchy level structure is the same in both hierarchies. Use the **Change reservation hierarchy for items** function to do the reassignment. This change might be relevant when you want to prevent flexible batch reservation for a subset of batch-tracked items but allow it for the rest of the product portfolio.

Regardless of whether you've selected the **Allow reservation on demand order** check box, if you don't want to reserve a specific batch number for the item on an order line, default warehouse operations logic that is valid for a "Batch-below[location]" reservation hierarchy will still apply.

Reserve a specific batch number for a customer order

After a batch-tracked item's "Batch-below[location]" inventory reservation hierarchy is set up to allow reservation of specific batch numbers on sales orders, sales order processors can take customer orders for the same item in one of the following ways, depending on the customer's request:

- **Enter order details without specifying a batch number** – This approach should be used when the product's batch specification isn't important to the customer. All existing processes that are associated with handling an order of this type in the system remain unchanged. No additional considerations are required on the part of users.
- **Enter order details and reserve a specific batch number** – This approach should be used when the customer requests a specific batch. Typically, customers will request a specific batch when they are reordering a product that they previously purchased. This type of batch-specific reservation is referred to as *order-committed reservation*.

The following set of rules is valid when quantities are processed, and a batch number is committed to a specific order:

- To allow reservation of a specific batch number for an item under the "Batch-below[location]" reservation policy, the system must reserve all dimensions up through location. This range typically includes the license plate dimension.
- Location directives aren't used when picking work is created for a sales line that uses order-committed batch reservation.
- During warehouse processing of work for order-committed batches, neither the user nor the system is allowed to change the batch number. (This processing includes exception handling.)

The following example shows the end-to-end flow.

Example scenario: Batch number allocation

For this example, demo data must be installed, and you must use the **USMF** demo data company.

Set up an inventory reservation hierarchy to allow batch-specific reservation

1. Go to **Warehouse management > Setup > Inventory > Reservation hierarchy**.
2. Select **New**.
3. In the **Name** field, enter a name (for example, **BatchFlex**).
4. In the **Description** field, enter a description (for example, **Batch below flexible**).
5. In the **Selected** field, select **Serial number** and **Owner**, and then select the left arrow button to move them to the **Available** field.

6. Select **OK**.
7. In the row for the **Batch number** dimension level, select the **Allow reservation on demand order** check box. The **License plate** and **Location** levels are automatically selected, and you can't clear the check boxes for them.
8. Select **Save**.

Create a new released product

1. Set the product's three master data parameters by using these values:
 - In the **Storage dimension group** field, select **Ware**.
 - In the **Tracking dimension group** field, select **Batch-Phy**.
 - In the **Reservation hierarchy** field, select **BatchFlex**.
2. Create two batch numbers, such as **B11** and **B22**.
3. Add item quantities to on-hand stock by using the following values.

WAREHOUSE	BATCH NUMBER	LOCATION	LICENSE PLATE	QUANTITY
24	B11	BULK-001	None	10
24	B11	FL-001	LP11	10
24	B22	FL-002	LP22	10

Enter sales order details

1. Go to **Sales and marketing > Sales orders > All sales orders**.
2. Select **New**.
3. On the sales order header, in the **Customer account** field, enter **US-003**.
4. Add a line for the new item, and enter **10** as the quantity. Make sure that the **Warehouse** field is set to **24**.
5. On the **Sales order lines** FastTab, select **Inventory**, and then, in the **Maintain** group, select **Batch reservation**. The **Batch reservation** page shows a list of batches that are available for reservation for the order line. For this example, it shows a quantity of **20** for batch number **B11** and a quantity of **10** for batch number **B22**. Note that the **Batch reservation** page cannot be accessed from a line if the item on that line is associated with "Batch-below[location]" reservation hierarchy unless it is set up to allow batch-specific reservation.

NOTE

To reserve a specific batch for a sales order, you must use the **Batch reservation** page.

If you enter the batch number directly on the sales order line, the system will behave as though you entered a specific batch value for an item that is subject to the "Batch-below[location]" reservation policy. When you save the line, you will receive a warning message. If you confirm that the batch number should be specified directly on the order line, the line won't be handled by the regular warehouse management logic.

If you reserve the quantity from the **Reservation** page, no specific batch will be reserved, and the execution of warehouse operations for the line will follow the rules that are applicable under the "Batch-below[location]" reservation policy.

In general, this page works and is interacted with in the same way that it works and is interacted with for items that have an associated reservation hierarchy of the "Batch-above[location]" type. However, the

following exceptions apply:

- The **Batch numbers committed to source line** FastTab shows the batch numbers that are reserved for the order line. The batch values in the grid will be shown throughout the fulfillment cycle of the order line, including the warehouse processing stages. By contrast, on the **Overview** FastTab, regular order line reservation (that is, reservation that is done for the dimensions above the **Location** level) is shown in the grid up to the point when warehouse work is created. The work entity then takes over the line reservation, and the line reservation no longer appears on the page. The **Batch numbers committed to source line** FastTab helps guarantee that the sales order processor can view the batch numbers that were committed to the customer's order at any point during its lifecycle, up through invoicing.
 - In addition to reserving a specific batch, a user can manually select the batch's specific location and license plate instead of letting the system automatically select them. This capability is related to the design of the order-committed batch reservation mechanism. As was mentioned earlier, when a batch number is reserved for an item under the "Batch-below[location]" reservation policy, the system must reserve all dimensions up through location. Therefore, warehouse work will carry the same storage dimensions that were reserved by the users who worked with the orders, and it might not always represent the item storage placement that is convenient, or even possible, for picking operations. If order processors are aware of the warehouse constraints, they might want to manually select the specific locations and license plates when they reserve a batch. In this case, the user must use the **Display dimensions** functionality on the page header, and must add the location and license plate in the grid on the **Overview** FastTab.
6. On the **Batch reservation** page, select the line for batch **B11**, and then select **Reserve line**. There is no designated logic for assigning locations and license plates during automatic reservation. You can manually enter the quantity in the **Reservation** field. Notice that, on the **Batch numbers committed to source line** FastTab, batch **B11** is shown as **Committed**.

000810 : BATCH_BELOW_FLEX								
Batch reservation								
Reference	Number	Item number	Unit symbol	Physical reserved	Ordered reserved	On order		
Sales order	000810	Batch_below_flex	ea	10.00				
Batch numbers committed to source line								
Batch number	Committed							
B11	10.00							
Overview								
Site	Warehouse	Batch number	Inventory status	Physical inventory	Physical reserved	Available physical	Available for reservation	Reservation
2	24	B11	Available	20.00	10.00	10.00	10.00	10.00
2	24	B22	Available	10.00		10.00	10.00	

NOTE

Reservation of the quantity on a sales order line can be done across multiple batches. Likewise, reservation of the same batch can be done against multiple locations and license plates (if license plates are enabled for the locations).

Reservation of a specific batch for the quantity on a sales order line can also be partial. For example, the total quantity of 100 units can be reserved so that a specific batch is committed to 20 units, whereas 80 units are reserved at the site and warehouse levels for any available batch. In this case, the WMS will handle picking operations by using two separate work lines.

7. Go to **Product information management > Products > Released products**. Select your item, and then select **Manage inventory > View > Transactions**.

Reference	Number	Issue	Quantity	Unit	Site	Warehouse	Location
Sales order	000810	Reserved physical	-10.00	ea	2	24	
Order-committed reservation	000810	Reserved physical	-10.00	ea	2	24	BULK-001

8. Review the item's inventory transactions that are related to the sales order line reservation.
 - A transaction where the **Reference** field is set to **Sales order** and the **Issue** field is set to **Reserved physical** represents the order line reservation for the inventory dimensions above the **Location** level. According to the item's inventory reservation hierarchy, those dimensions are site, warehouse, and inventory status.
 - A transaction where the **Reference** field is set to **Order-committed reservation** and the **Issue** field is set to **Reserved physical** represents the order line reservation for the specific batch and all inventory dimensions above it. According to the item's inventory reservation hierarchy, those dimensions are batch number and location. In this example, the location is **Bulk-001**.
9. On the sales order header, select **Warehouse > Actions > Release to warehouse**. The order line is now waved, and a load and work are created.

Review and process warehouse work that has order-committed batch numbers

1. On the **Sales order lines** FastTab, select **Warehouse > Work details**.

The work that handles the picking operation for batch quantities that are committed to the sales order line has the following characteristics:

- To create work, the system uses work templates but not location directives. All the standard settings that are defined for work templates, such as a maximum number of pick lines or a specific unit of measure, will be applied to determine when new work should be created. However, the rules that are associated with location directives for identifying pick locations aren't considered, because the order-committed reservation already specifies all the inventory dimensions. Those inventory dimensions include the dimensions at the warehouse storage level. Therefore, the work inherits those dimensions without having to consult location directives.
- The batch number isn't shown on the pick line (as is the case for the work line that is created for an item that has an associated "Batch-above[location]" reservation hierarchy.) Instead, the "from" batch number and all other storage dimensions are shown on the work line's work inventory transaction that is referenced from the associated inventory transactions.

USMF-000119 : 1.0000000000

Work inventory transactions

Overview **Inventory dimensions**

FROM INVENTORY DIMENSIONS	TO INVENTORY DIMENSIONS
Configuration <input type="text"/>	Configuration _____
Size _____	Size _____
Color _____	Color _____
Style _____	Style _____
Site 2	Site 2
Warehouse 24	Warehouse 24
Batch number B11	Batch number _____
Location BULK-001	Location _____
Serial number _____	Serial number _____
Inventory status Available	Inventory status Available
License plate _____	License plate _____
Owner _____	Owner _____

- After work is created, the item's inventory transaction where the **Reference** field is set to **Order-committed reservation** is removed. The inventory transaction where the **Reference** field is set to **Work** now holds the physical reservation on all the quantity's inventory dimensions.

Warehouse operations can proceed to handle execution of the work in the usual manner. However, the instructions on the mobile device will instruct the worker to pick a specific batch number. In warehouse environments where locations are license plate–controlled, after a worker reaches a location that stores the same batch on multiple license plates, he or she can pick from any license plate that isn't already reserved (for example, by another order-committed reservation or work that originates from a reservation of that type.)

If it turns out to be impractical to pick from the location that is specified on the work line, the warehouse operators can use one of the following actions to redirect picking of the specific batch from a more convenient location:

- The standard **Override location** action on a mobile device (provided that the warehouse worker's **Allow pick location override** setting is enabled)
- The **Change location** action on the **Work list details** page.

2. On the mobile device, finish picking and putting the work.

The quantity of **10** for batch number **B11** is now picked for the sales order line and put in the **Baydoor** location. At this point, it's ready to be loaded onto the truck and dispatched to the customer's address.

Flexible license plate reservation

Business scenario

In this scenario, a company uses warehouse management and work processing, and handles load planning at the level of individual pallets/containers outside Supply Chain Management before work is created. These containers are represented by license plates in the inventory dimensions. Therefore, for this approach, specific

license plates must be pre-assigned to sales order lines before picking work is done. The company is looking for flexibility in the way that the license plate reservation rules are handled, so that the following behaviors occur:

- A license plate can be recorded and reserved when the order is taken by the sales processor, and it can't be taken by other demands. This behavior helps guarantee that the license plate that was planned is shipped to the customer.
- If the license plate isn't already assigned to a sales order line, warehouse personnel can select a license plate during picking work, after sales order registration and reservation are completed.

Turn on flexible license plate reservation

Before you can use flexible license plate reservation, two features must be turned on in your system. Admins can use the [feature management](#) settings to check the status of the features and turn them on if they are required. You must turn on the features in the following order:

1. **Feature name:** *Flexible warehouse-level dimension reservation*
2. **Feature name:** *Flexible order-committed license plate reservation*

Reserve a specific license plate on the sales order

To enable license plate reservation on an order, you must select the **Allow reservation on demand order** check box for the **License plate** level on the **Inventory reservation hierarchies** page for the hierarchy that is associated with the relevant item.

Name	Description
FlexibleLP	Flexible LP reservation

Hierarchy		
Name	Reservation hierarchy level	Allow reservation on demand order
Site	1	<input type="checkbox"/>
Warehouse	2	<input type="checkbox"/>
Inventory status	3	<input type="checkbox"/>
Location	4	<input type="checkbox"/>
License plate	5	<input checked="" type="checkbox"/>

You can enable license plate reservation on the order at any point in your deployment. This change won't affect any reservations or open warehouse work that were created before the change occurred. However, you can't clear the **Allow reservation on demand order** check box if open outbound inventory transactions that have an issue status of *On order*, *Reserved ordered*, or *Reserved physical* exist for one or more items that are associated with that reservation hierarchy.

Even if the **Allow reservation on demand order** check box is selected for the **License plate** level, it's still possible *not* to reserve a specific license plate on the order. In this case, the default warehouse operations logic that is valid for the reservation hierarchy applies.

To reserve a specific license plate, you must use an [Open Data Protocol \(OData\)](#) process. In the application, you can do this reservation directly from a sales order by using the **Order-committed reservations per license plate** option of the **Open in Excel** command. In the entity data that is opened in the Excel add-in, you must enter the following reservation-related data and then select **Publish** to send the data back to Supply Chain Management:

- Reference (Only the *Sales order* value is supported.)
- Order number (The value can be derived from the lot.)
- Lot ID
- License plate
- Quantity

If you must reserve a specific license plate for a batch-tracked item, use the **Batch reservation** page, as described in the [Enter sales order details](#) section.

When the sales order line that uses an order-committed license plate reservation is processed by warehouse operations, location directives aren't used.

If a warehouse work item consists of lines that equal a complete pallet and have license plate-committed quantities, you can optimize the picking process by using a mobile device menu item where the **Handle by license plate** option is set to *Yes*. A warehouse worker can then scan a license plate to complete a pick instead of having to scan the items from the work one by one.

The screenshot shows the 'Mobile device menu items' configuration page. At the top, there are fields for 'Menu item name' (Sales Picking - by LP), 'Title' (Sales Picking - handl...), 'Mode' (Work), and a 'Use existing work' toggle set to 'Yes'. Below this is a 'General' section with four options: 'Directed by' (User directed), 'Use process guide' (No), 'Generate license plate' (No), and 'Handle by license plate' (Yes).

Because the **Handle by license plate** functionality doesn't support work that covers multiple pallets, it's better to have a separate work item for different license plates. To use this approach, add the **Order-committed license plate ID** field as a work header break on the **Work template** page.

NOTE

For the order-committed work creation process, an "order-committed inventory dimension" value will be assigned to the picking work lines, and it won't be possible to view the license plate value directly. Only the *User directed* process is supported when setting up a mobile device menu item.


Example scenario: Set up and process an order-committed license plate reservation

This scenario shows how to set up and process an order-committed license plate reservation.

Make demo data available

This scenario refers to values and records that are included in the standard demo data that is provided for Supply Chain Management. If you want to work through the scenario by using the values that are provided here, be sure to work on an environment where the demo data is installed. Additionally, set the legal entity to **USMF** before you begin.

Create an inventory reservation hierarchy that allows for license plate reservation

1. Go to **Warehouse management > Setup > Inventory > Reservation hierarchy**.
2. Select **New**.
3. In the **Name** field, enter a value (for example, *FlexibleLP*).
4. In the **Description** field, enter a value (for example, *Flexible LP reservation*).
5. In the **Selected** list, select **Batch number**, **Serial number**, and **Owner**.
6. Select the **Remove** button  to move the selected records to the **Available** list.
7. Select **OK**.
8. In the row for the **License plate** dimension level, select the **Allow reservation on demand order** check box. The **Location** level is automatically selected, and you can't clear the check box for it.
9. Select **Save**.

Create two released products

1. Go to **Product information management > Products > Released products**.
2. On the Action Pane, select **New**.

3. In the **New released product** dialog box, set the following values:
 - **Product number:** *Item1*
 - **Item number:** *Item1*
 - **Item model group:** *FIFO*
 - **Item group:** *Audio*
 - **Storage dimension group:** *Ware*
 - **Tracking dimension group:** *None*
 - **Reservation hierarchy:** *FlexibleLP*
4. Select **OK** to create the product and close the dialog box.
5. The new product is opened. On the **Warehouse** FastTab, set the **Unit sequence group ID** field to *ea*.
6. Repeat the previous steps to create a second product that has the same settings, but set the **Product number** and **Item number** fields to *Item2*.
7. On the Action Pane, on the **Manage inventory** tab, in the **View** group, select **On-hand inventory**. Then select **Quantity adjustment**.
8. Adjust the on-hand inventory of the new items as specified in the following table.

ITEM	WAREHOUSE	LOCATION	LICENSE PLATE	QUANTITY
Item1	24	FL-010	LP01	10
Item1	24	FL-011	LP02	10
Item2	24	FL-010	LP01	5
Item2	24	FL-011	LP02	5

NOTE

You must create the two license plates and use locations that allow for mixed items, such as *FL-010* and *FL-011*.

Create a sales order and reserve a specific license plate

1. Go to **Sales and marketing > Sales orders > All sales orders**.
2. Select **New**.
3. In the **Create sales order** dialog box, set the following values:
 - **Customer account:** *US-001*
 - **Warehouse:** *24*
4. Select **OK** to close the **Create sales order** dialog box and open the new sales order.
5. On the **Sales order lines** FastTab, add a line that has the following settings:
 - **Item number:** *Item1*
 - **Quantity:** *10*
6. Add a second sales order line that has the following settings:
 - **Item number:** *Item2*
 - **Quantity:** *5*
7. Select **Save**.

8. On the **Line details** FastTab, on the **Setup** tab, make a note of the **Lot ID** value for each line. These values will be required during reservation of specific license plates.

NOTE

To reserve a specific license plate, you must use the **Order-committed reservations per license plate** data entity. To reserve a batch-tracked item on a specific license plate, you can also use the **Batch reservation** page, as described in the [Enter sales order details](#) section.

If you enter the license plate directly on the sales order line and confirm it to the system, warehouse management processing won't be used for the line.

9. Select **Open in Microsoft Office**, select **Order-committed reservations per license plate**, and download the file.
10. Open the downloaded file in Excel, and select **Enable editing** to enable the Excel add-in to run.
11. If you're running the Excel add-in for the first time, select **Trust this Add-in**.
12. If you're prompted to sign in, select **Sign in**, and then sign in by using the same credentials that you used to sign in to Supply Chain Management.
13. To reserve an item on a specific license plate, in the Excel add-in, select **New** to add a reservation line, and then set the following values:
 - **Lot ID:** Enter the **Lot ID** value that you found for the sales order line for *Item 1*.
 - **License plate:** *LP02*
 - **ReservedInventoryQuantity:** *10*
14. Select **New** to add another reservation line, and set the following values:
 - **Lot ID:** Enter the **Lot ID** value you found for the sales order line for *Item 2*.
 - **License plate:** *LP02*
 - **ReservedInventoryQuantity:** *5*
15. In the Excel add-in, select **Publish** to send the data back to Supply Chain Management.

NOTE

The reservation line will appear in the system only if publishing is completed without errors.

16. Go back to Supply Chain Management.
17. To review the item's reservation, on the **Sales order lines** FastTab, on the **Inventory** menu, select **Maintain > Reservation**. Notice that, for the sales order line for *Item 1*, inventory of *10* is reserved, and for the sales order line for *Item 2*, inventory of *5* is reserved.
18. To review inventory transactions that are related to the sales order line reservation, on the **Sales order lines** FastTab, on the **Inventory** menu, select **View > Transactions**. Notice that there are two transactions that are related to the reservation: one where the **Reference** field is set to *Sales order* and one where the **Reference** field is set to *Order-committed reservation*.

NOTE

A transaction where the **Reference** field is set to *Sales order* represents the order line reservation for inventory dimensions that are above the **Location** level (site, warehouse, and inventory status). A transaction where the **Reference** field is set to *Order-committed reservation* represents the order line reservation for the specific license plate and location.

19. To release the sales order, on the Action Pane, on the **Warehouse** tab, in the **Actions** group, select **Release to warehouse**.

Review and process warehouse work with order-committed license plates assigned

1. On the **Sales order lines** FastTab, on the **Warehouse** menu, select **Work details**.

As when reservation is done for a specific batch, the system doesn't use location directives when it creates the work for the sales order that uses license plate reservation. Because the order-committed reservation specifies all the inventory dimensions, including the location, location directives don't have to be used, because those inventory dimensions are just entered in the work. They are shown in the **From inventory dimensions** section on the **Work inventory transactions** page.

NOTE

After the work is created, the item's inventory transaction where the **Reference** field is set to *Order-committed reservation* is removed. The inventory transaction where the **Reference** field is set to *Work* now holds the physical reservation for all the quantity's inventory dimensions.

2. On the mobile device, finish picking and putting the work by using a menu item where the **Handle by license plate** check box is selected.

NOTE

The **Handle by license plate** functionality helps you process the whole license plate. If you must process part of the license plate, you can't use this functionality.

We recommend that you have separate work generated for each license plate. To achieve this result, use the **Work header breaks** feature on the **Work template** page.

License plate *LPO2* is now picked for sales order lines and put to the *Baydoor* location. At this point, it's ready to be loaded and dispatched to the customer.

Exception handling of warehouse work that has order-committed batch numbers

Warehouse work for picking order-committed batch numbers is subject to the same standard warehouse exception handling and actions as regular work. In general, the open work or work line can be canceled, it can be interrupted because a user location is full, it can be short-picked, and it can be updated because of a movement. Likewise, the picked quantity of work that has already been completed can be reduced, or the work can be reversed.

The following key rule is applied to all these exception handling actions: the batch number that was reserved for the customer can never be replaced with a different batch number, but its storage dimensions (location and license plate) can be changed through either a manual update by the user or an automatic update by the system. The automatic update is based on the same random assignment of storage dimensions that applied when a specific batch was automatically reserved but no storage dimensions were specified.

Example scenario

An example of this scenario is a situation where previously completed work is being unpicked by using the **Reduce picked quantity** function. This example assumes that you've already completed the steps that are described in [Example scenario: Batch number allocation](#). It continues from that example.

1. Go to **Warehouse management > Loads > Active loads**.
2. Select the load that was created in connection with the shipment of your sales order.
3. From the **Load order lines** FastTab, select **Reduce picked quantity**.
4. On the **Reduce picked quantity** page, in the **Move to location** field, select FL-001.
5. In the **Move to license plate** field, select LP33.
6. In the grid, in the **Inventory quantity to unpick** field, enter 10.
7. Select **OK**.

Here are the results of the unpicking action:

- The status of the previously closed work is set to **Canceled**.
- New work of the **Inventory movement** type is created for the unpicked quantity of 10 for batch number **B11**. This work represents the movement from the **Baydoor** location to license plate **LP33** in location **FL-001**. The status is set to **Closed**.
- The system re-reserves the batch number that was originally ordered, and assigns the location and license plate IDs. (This process is equivalent to running the **Reserve line** function for the order line for a given batch number). As a result, batch **B11** is shown as committed on the **Batch numbers committed to source line** FastTab of the **Batch reservation** page, and the **Reservation** field contains a quantity of 10 for batch number **B11**. Additionally, the **Location** field is set to **FL-001**, and the **License plate** field is set to **LP11**. (You can add these fields to the grid if they aren't visible.)

The following tables provide an overview that shows how the system handles order-committed batch reservation for specific warehouse actions. To interpret the content in the tables, assume that each warehouse action is run in the context of existing warehouse work that originates from an order-committed batch reservation, or that execution of each warehouse action affects work of that type.

NOTE

In these tables, the "Batch quantity is available" column indicates whether a batch quantity is available in addition to the quantity that is either already reserved for the current order-committed reservations or already reserved by the warehouse work that originates from reservations of that type.

Override the pick location on the open work

KEY SETUP PARAMETER	BATCH QUANTITY IS AVAILABLE	KEY USER STEPS	WAREHOUSE WORK	ORDER-COMMITTED BATCH RESERVATION
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KEY SETUP PARAMETER	BATCH QUANTITY IS AVAILABLE	KEY USER STEPS	WAREHOUSE WORK	ORDER-COMMITTED BATCH RESERVATION
<p>The Allow pick location override option is enabled on the worker.</p>	Yes	<ol style="list-style-type: none"> 1. Select the Override location menu item on the warehouse app when you start picking work. 2. Select Suggest. 3. Confirm the new location that is suggested based on batch quantity availability. 	<p>On the current work, the following actions occur:</p> <ul style="list-style-type: none"> • The location on the pick line is updated to the new location. (If the location is license plate-controlled, a random license plate is assigned to the work inventory transaction, and the worker can pick from any license plate that has available quantity.) • If the quantity is found on more than one license plate in the new location, the original pick line is split into multiple lines to match each license plate. 	Not applicable
	No	<ol style="list-style-type: none"> 1. Select the Override location menu item on the warehouse app when you start picking work. 2. Manually enter a location. 	The Override location action isn't possible. It fails, and an error is thrown.	Not applicable

Full button – Split a work line because of overflow on the user location

KEY SETUP PARAMETER	BATCH QUANTITY IS AVAILABLE	KEY USER STEPS	WAREHOUSE WORK	ORDER-COMMITTED BATCH RESERVATION
The Allow splitting of work option is enabled on the mobile device menu item.	Not applicable	<ol style="list-style-type: none"> 1. Select the Full menu item on the warehouse app when you process picking work. 2. In the Pick Qty field, enter a partial quantity of the required pick to indicate the full capacity. 	<ul style="list-style-type: none"> • On the current work, the quantity is updated to the remaining quantity that must be picked. • New work for the picked quantity is created and closed. 	Not applicable

Reduce the picked quantity of completed work (from a load)

KEY SETUP PARAMETER	BATCH QUANTITY IS AVAILABLE	KEY USER STEPS	WAREHOUSE WORK	ORDER-COMMITTED BATCH RESERVATION
Not applicable	Yes	<ol style="list-style-type: none"> 1. Open the Reduce picked quantity page from the load line. 2. Enter the full quantity to unpick. 3. Select a "move to" location/license plate. 	<ul style="list-style-type: none"> • Work that is associated with the load line is canceled. • New work for the inventory movement is created and closed. 	The quantity is re-reserved for the same batch. The system randomly assigns a location and license plate (if the location is license plate-controlled) where the quantity is available.
	No	See the previous row.	See the previous row.	The quantity is re-reserved for the same batch, and for the same location and license plate (if the location is license plate-controlled) that were entered during unpicking.

Move an item within a warehouse

NOTE

This warehouse action is applicable only to movement of the **Work creation process** type, not to movement by template.

KEY SETUP PARAMETER	BATCH QUANTITY IS AVAILABLE	KEY USER STEPS	WAREHOUSE WORK	ORDER-COMMITTED BATCH RESERVATION
The Allow movement of inventory with associated work option is enabled on the worker.	Yes	<ol style="list-style-type: none"> 1. Start a movement on the warehouse app. 2. Enter "from" and "to" locations. 	<ul style="list-style-type: none"> • On all existing work that is affected by the move, the pick location is updated to the new "to" location. • New work for the inventory movement is created and closed. 	All existing reservations that are affected by the quantity movement from the given location are re-reserved for the same batch. The system randomly assigns a location and license plate (if the location is license plate-controlled) where the quantity is available.
	No	See the previous row.	See the previous row.	All existing reservations that are affected by the quantity movement from the given location are re-reserved for the same batch, and for the new "to" location and license plate (if the location is license plate-controlled).

Reverse the picked quantity of completed work (from a load or a wave)

KEY SETUP PARAMETER	BATCH QUANTITY IS AVAILABLE	KEY USER STEPS	WAREHOUSE WORK	ORDER-COMMITTED BATCH RESERVATION
Not applicable	Yes	<ol style="list-style-type: none"> 1. Open the Reverse work page. 2. On the request page, select the Leave items at current location option. 	All work that is associated with the load is canceled.	The quantity is re-reserved for the same batch. The system randomly assigns a location and license plate (if the location is license plate-controlled) where the quantity is available.
	No	See the previous row.	See the previous row.	The quantity is re-reserved for the same batch, and for the location and license plate where the quantity was left upon reversal.

KEY SETUP PARAMETER	BATCH QUANTITY IS AVAILABLE	KEY USER STEPS	WAREHOUSE WORK	ORDER-COMMITTED BATCH RESERVATION
	Yes	<ol style="list-style-type: none"> 1. Open the Reverse work page. 2. On the request page, select the Assign items to this location option. 	<ul style="list-style-type: none"> • The current work is canceled. • New work for the inventory movement is created and closed. 	The quantity is re-reserved for the same batch. The system randomly assigns a location and license plate (if the location is license plate-controlled) where the quantity is available.
	No	See the previous row.	See the previous row.	The quantity is re-reserved for the same batch, and for the location and license plate that the quantity was assigned to upon reversal.
	Yes/No	<ol style="list-style-type: none"> 1. Open the Reverse work page. 2. On the request page, select the Move items to this location option. 	Reversal isn't supported.	Not applicable
	Yes/No	<ol style="list-style-type: none"> 1. Open the Reverse work page. 2. On the request page, select the Move items based on location directives option. 	Reversal isn't supported.	Not applicable

Short-pick a quantity – Register the quantity as physically not found at the location/license plate while you perform picking work

KEY SETUP PARAMETER	BATCH QUANTITY IS AVAILABLE	KEY USER STEPS	WAREHOUSE WORK	ORDER-COMMITTED BATCH RESERVATION
<p>A work exception of the Short pick type is set up, where Item reallocation = None, Adjust inventory = Yes, and Remove reservations = No.</p>	Yes	<ol style="list-style-type: none"> 1. Select the Shortpick menu item on the warehouse app when you run picking work. 2. In the Pick Quantity field, enter 0 (zero). 3. In the Reason field, enter No reallocation. 	<ul style="list-style-type: none"> • The current work is closed, and the picked quantity is 0 (zero). • An inventory transaction of the Counting type and the Sold issue type is created to represent the adjustment. 	<p>The quantity is re-reserved for the same batch. The system randomly assigns a location and license plate (if the location is license plate-controlled) where the quantity is available.</p>
	No	See the previous row.	<ul style="list-style-type: none"> • The short-picking action fails, and an error is thrown. • The current work remains open. 	Not applicable
<p>A work exception of the Short pick type is set up, where Item reallocation = None, Adjust inventory = Yes, and Remove reservations = Yes.</p>	Yes	<ol style="list-style-type: none"> 1. Select the Shortpick menu item on the warehouse app when you run picking work. 2. In the Pick Quantity field, enter 0 (zero). 3. In the Reason field, enter No reallocation. 	<ul style="list-style-type: none"> • The current work is closed, and the picked quantity is 0 (zero). • An inventory transaction of the Counting type and the Sold issue type is created to represent the adjustment. 	<p>All existing reservations that are affected by the quantity adjustment in the short-picked location are re-reserved for the same batch. The system randomly assigns a location and license plate (if the location is license plate-controlled) where the quantity is available.</p>
	No	See the previous row.	See the previous row.	<p>All existing reservations that are affected by the quantity adjustment in the short-picked location are removed.</p>

KEY SETUP PARAMETER	BATCH QUANTITY IS AVAILABLE	KEY USER STEPS	WAREHOUSE WORK	ORDER-COMMITTED BATCH RESERVATION
<p>A work exception of the Short pick type is set up, where Item reallocation = Manual, Adjust inventory = Yes, and Remove reservations = No/Yes. Additionally, the Allow manual item reallocation option is enabled on the worker.</p>	<p>Yes</p>	<ol style="list-style-type: none"> 1. Select the Shortpick menu item on the warehouse app when you run picking work. 2. In the Shortpick Quantity field, enter 0 (zero). 3. In the Reason field, select Short Picking with manual reallocation. 4. Select the location/license plate in the list. 	<ul style="list-style-type: none"> • On the current work, the following actions occur: <ul style="list-style-type: none"> ◦ The pick line is closed, and the picked quantity is 0 (zero). ◦ The put line is canceled. ◦ A new pick line is created. It uses the location/license plate that the user selected. ◦ A new put line is created. • An inventory transaction of the Counting type and the Sold issue type is created to represent the adjustment. 	<p>Not applicable</p>

KEY SETUP PARAMETER	BATCH QUANTITY IS AVAILABLE	KEY USER STEPS	WAREHOUSE WORK	ORDER-COMMITTED BATCH RESERVATION
<p>A work exception of the Short pick type is set up, where Item reallocation = Manual, Adjust inventory = Yes, and Remove reservations = No. Additionally, the Allow manual item reallocation option is enabled on the worker.</p>	No	<ol style="list-style-type: none"> 1. Select the Shortpick menu item on the warehouse app when you run picking work. 2. In the Shortpick Quantity field, enter 0 (zero). 3. In the Reason field, select Short Picking with manual reallocation. 	The short-picking action fails, and an error is thrown.	Not applicable
<p>A work exception of the Short pick type is set up, where Item reallocation = Manual, Adjust inventory = Yes, and Remove reservations = Yes. Additionally, the Allow manual item reallocation option is enabled on the worker.</p>	No	<ol style="list-style-type: none"> 1. Select the Shortpick menu item on the warehouse app when you run picking work. 2. In the Shortpick Quantity field, enter 0 (zero). 3. In the Reason field, select Short Picking with manual reallocation. 4. Select the location/license plate in the list. 	<ul style="list-style-type: none"> • On the current work, the following actions occur: <ul style="list-style-type: none"> ◦ The pick line is closed, and the picked quantity is 0 (zero). ◦ The put line is canceled. • An inventory transaction of the Counting type and the Sold issue type is created to represent the adjustment. 	All existing reservations that are affected by the quantity adjustment in the short-picked location/license plate are removed.

KEY SETUP PARAMETER	BATCH QUANTITY IS AVAILABLE	KEY USER STEPS	WAREHOUSE WORK	ORDER-COMMITTED BATCH RESERVATION
A work exception of the Short pick type is set up, where Item reallocation = Automatic, Adjust inventory = Yes/No , and Remove reservations = Yes/No .	Not applicable	<ol style="list-style-type: none"> 1. Select the Shortpick menu item on the warehouse app when you run picking work. 2. In the Shortpick Quantity field, enter 0 (zero). 3. In the Reason field, select Short Picking with automatic reallocation. 	Short-picking that involves automatic reallocation isn't supported.	Short-picking that involves automatic reallocation isn't supported.

Change the inventory status

NOTE

This warehouse action can be performed from multiple entry points. The example that is shown here uses **Inventory status change** action on the **On-hand by location** page.

KEY SETUP PARAMETER	BATCH QUANTITY IS AVAILABLE	KEY USER STEPS	WAREHOUSE WORK	ORDER-COMMITTED BATCH RESERVATION
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KEY SETUP PARAMETER	BATCH QUANTITY IS AVAILABLE	KEY USER STEPS	WAREHOUSE WORK	ORDER-COMMITTED BATCH RESERVATION
<p>On the Warehouse tab, in the Warehouse record, the Remove reservations and markings field is set to Reservations or Markings and reservations.</p>	<p>Yes</p>	<ol style="list-style-type: none"> 1. Select a specific location. 2. Select a line that has a specific item, location, and license plate (if the location is license plate-controlled). 3. Select Inventory status change. 4. Set the Inventory status field to Blocking. 	<p>Inventory status changes aren't allowed for quantities that are reserved for work.</p>	<ul style="list-style-type: none"> • The quantity is re-reserved for the same batch. The system randomly assigns a location and license plate (if the location is license plate-controlled) where the quantity is available. • Two inventory transactions of the Inventory status change type are created to represent the change in the inventory status dimension. • An inventory transaction of the Inventory blocking type and the Reserved physical issue type is created to represent the reservation of the blocked quantity.

KEY SETUP PARAMETER	BATCH QUANTITY IS AVAILABLE	KEY USER STEPS	WAREHOUSE WORK	ORDER-COMMITTED BATCH RESERVATION
	No	See the previous row.	Inventory status changes aren't allowed for quantities that are reserved for work.	<ul style="list-style-type: none"> • The reservation is removed. • Two inventory transactions of the Inventory status change type are created to represent the change in the inventory status dimension. • An inventory transaction of the Inventory blocking type and the Reserved physical issue type is created to represent the reservation of the blocked quantity.
On the Warehouse tab, in the Warehouse record, the Remove reservations and markings field is set to None .	Yes	<ol style="list-style-type: none"> 1. Select a specific location. 2. Select a line that has a specific item, location, and license plate (if the location is license plate-controlled). 3. Select Inventory status change. 4. Set the Inventory status field to Blocking. 	Inventory status changes aren't allowed for quantities that are reserved for work.	The quantity is re-reserved for the same batch. The system randomly assigns a location and license plate (if the location is license plate-controlled) where the quantity is available.
	No	See the previous row.	Inventory status changes aren't allowed for quantities that are reserved for work.	Inventory status changes aren't allowed.

Limitations

- The flexible warehouse-level dimension reservation functionality doesn't support the following features:
 - Catch weight management
 - Physical negative inventory
 - Reservation against ordered supply
 - Transfer orders and raw material picking
- The container consolidation rule for packing by directive unit has limitations. For order-committed reservations, we recommend that you not use container build templates where the **Pack by directive unit** field is enabled. In the current design, location directives aren't used when warehouse work is created. Therefore, only the lowest unit in the unit sequence group (the inventory unit) is applied during the containerization wave step.

NOTE

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Troubleshoot reservations in warehouse management

2/18/2021 • 2 minutes to read • [Edit Online](#)

This topic describes how to fix common issues that you might encounter while you work with warehouse reservations in Microsoft Dynamics 365 Supply Chain Management.

I receive the following error message: "Reservations cannot be removed because there is work created which relies on the reservations."

Issue description

You can't unreserve inventory on a sales line, because there is open work against the line.

Issue resolution

Investigate whether open packing group work exists to bring the item from a packing station to another location (such as *Baydoor*). Review the records on the **Work creation history log** and **Work details** pages to determine what is physically reserving the inventory, and then complete or delete the work to free up the reservation.

I receive the following error message: "Inventory quantity -%1 could not be updated due to insufficient inventory transactions for item %2...."

Issue description

This issue can occur if the system can't update an inventory quantity because there aren't enough inventory transactions that have the specified dimensions. Here is the full text of the full error message:

```
Inventory quantity -%1 could not be updated due to insufficient inventory transactions for item %2 with dimensions Size=%3, Color=%4, Additions=%5, Site=%6, Warehouse=%7, Location=%8, Inventory status=Available, License plate=%9, Batch number=%10 for reference ID %11 on Lot ID %12.
```

Issue resolution

Make sure that no inventory transactions are physically reserving the quantity. For example, these transactions might open quality orders, inventory blocking records, or output orders.

I receive the following error message: "Physical on-hand...cannot be reserved because only 0.00 are available in the inventory."

Issue description

This issue can occur if the system can't update an inventory quantity because there aren't enough inventory transactions that have the specified dimensions. Here is the full text of the full error message:

```
Physical on-hand Site=%1, Warehouse=%2, Inventory status=Available, Batch number=%3, Owner=%4: %5 cannot be reserved because only 0.00 are available in the inventory.
```

Issue resolution

This issue is probably caused by open work. Either complete the work or receive without work creation. Make sure that no inventory transactions are physically reserving the quantity. For example, these transactions might be open quality orders, inventory blocking records, or output orders.

I receive the following error message: "To be assigned to wave, load lines must specify the dimensions above the location. To assign these dimensions, reserve and recreate the load line."

Issue description

When you use an item that has a "batch above" reservation hierarchy (with the **Batch number** dimension placed *above* the **Location** dimension), the **Release to warehouse** command on the **Load planning workbench** page for a partial quantity doesn't work. You receive this error message, and no work is created for the partial quantity.

However, if you use an item that has a "batch below" reservation hierarchy (with the **Batch number** dimension placed *below* the **Location** dimension), you can release a load from the **Load planning workbench** page for a partial quantity.

Issue resolution

This behavior is by design. If you put a dimension above the **Location** dimension in the reservation hierarchy, it must be specified before the release to the warehouse. Microsoft has evaluated this issue and has determined that it's a feature limitation during releases to the warehouse from the load planning workbench. Partial quantities can't be released if one or more dimensions above **Location** aren't specified.

For more information, see [Flexible warehouse-level dimension reservation policy](#).

NOTE

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Partial shipment of a transport load

2/18/2021 • 2 minutes to read • [Edit Online](#)

By setting up partial shipment of loads, you can handle loads where the capacity can't be determined until all the sales lines have been added to a load. The process can then be finalized when the exact pallet count is known. Therefore, you don't have to decide which pallets will be assigned to which transport until the moment when a transport is being physically loaded out of the staged inventory.

This feature offers an alternative to the enforcement of a more rigid structure, where you must determine which pallets will be assigned to which transport before picking work or loading work can be created. Instead, users can configure individual loads for a partial shipment confirmation. The transport loading processes for those loads can then occur. Therefore, the transportation planning department can plan loads without having to consider the capacity of individual transports.

At the time of loading, workers can define a new transport load that a pallet can be loaded to. Alternatively, they can identify an existing transport load. This data can be recorded via a mobile device. Therefore, several warehouse workers can load inventory from the same loads or different loads onto the same truck. The loads can then be fully or partially shipped.

NOTE

In order to load inventory from a load to a specific transport load and partially ship the load, work must be generated by using a loading class in a work template. Ordinary picking work of the **Picking** type can't be loaded to a transport load such as a truck.

Set up transport loads for partial shipment

The setup for partial shipment of loads consists of the following two procedures.

Set the loading strategy

You must enable partial loading by setting the loading strategy. You can set the loading strategy after you've created a load.

1. Select **Warehouse management > Loads > All loads**.
2. Select a load, and then click **Header**.
3. In the **Loading strategy** field, select **Partial load shipping allowed**.

Create a menu item for loading of transport loads

You must create a new menu item that enables transport loads to be loaded. A transport load lets you group work lines from one load or multiple loads. Everything that is added to the transport load can then be shipped by using a mobile scanner.

1. Select **Warehouse management > Setup > Mobile device > Mobile device menu items**.
2. Select **New**, and then, in the **Mode** field, select **Work**.
3. Set the **Use existing work** option to **Yes**.
4. On the **General** tab, in the **Directed by** field, select **Transport loading**.
5. To enable shipment confirmation on a mobile scanner, in the **Allowed ship confirmation type** field, select **Transport load**.

Confirm shipment of a transport load from the client

This setup lets you confirm a transport load that includes a full load or a partially loaded load to be shipped.

1. Select **Warehouse management** > **Loads** > **Transport loads**.
2. On the Action Pane, on the **Ship and receive** tab, in the **Confirm** group, select **Transport**.

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Batch release of partially reserved transfer orders

2/18/2021 • 2 minutes to read • [Edit Online](#)

The functionality for batch release of partially reserved transfer orders lets you partially release transfer orders to a warehouse by using a batch job. Because you have the option to release a partial quantity, you don't have to wait for the whole order quantity to be available in the warehouse before you release an order.

The release of orders to a warehouse is an advanced warehouse management process. This process involves activities, such as picking, packing, and shipping, that a warehouse worker can perform by using a mobile device.

Where it applies

For this functionality, transfer orders are released to a warehouse by using a batch job. This functionality is useful when you don't have enough inventory in the warehouse, but you still want to transfer items from one warehouse to another.

How it is set up

Specify fulfillment criteria for transfer orders and sales orders

Before an order can be partially released to a warehouse in a batch, the fulfillment criteria must be met. These fulfillment criteria are determined by the fulfillment policy.

Fulfillment policies for transfer orders and sales orders are specified at the company level. Depending on the setup of the fulfillment policy, the release of orders in a batch will be accepted or rejected. The orders will then be processed accordingly.

- To create fulfillment policies for transfer orders and sales orders, click **Warehouse management > Setup > Release to warehouse > Fulfillment policy**, and then create a fulfillment policy by entering a name and a description.
- To specify a fulfillment rate, a value type, and the message that is shown if the fulfillment policy is violated, click **Warehouse management > Setup > Release to warehouse > Fulfillment policy**, and then set the **Fulfillment rate**, **Value type**, and **Fulfillment violation message** fields.

Set the fulfillment policies for transfer orders and sales orders

- To set the fulfillment policies for transfer orders, click **Inventory management > Setup > Inventory and warehouse management parameters > Transfer orders > Warehouse management**, and then select a transfer order fulfillment policy.
- To set the fulfillment policies for sales orders, click **Accounts receivable > Setup > Accounts receivable parameters > Warehouse management**, and then select a sales order fulfillment policy.

Allow release in a batch and specify the quantity that should be release in a batch

A batch job is used to release orders to a warehouse in a batch. The parameters that distinguish the orders that should be run in a batch job are set on the batch job itself.

The **Quantity** parameter specifies whether the whole quantity or the physically reserved quantity should be released in the batch. The **Allow release of partially released orders** parameter determines whether orders

in the batch should be accepted or rejected if they were partially released earlier.

- To set the **Quantity** and **Allow release of partially released orders** parameters for transfer orders, click **Warehouse management > Release to warehouse > Automatic release of transfer orders**.
- To set the **Quantity** and **Allow release of partially released orders** parameters for sales orders, click **Warehouse management > Release to warehouse > Automatic release of sales orders**.

NOTE

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Troubleshoot partial releases and partial shipments

2/18/2021 • 2 minutes to read • [Edit Online](#)

This topic describes how to fix common issues that you might encounter while you work with partial releases and partial shipments in Microsoft Dynamics 365 Supply Chain Management.

The release status of a sales order remains Partially released even after the sales order is invoiced.

Issue description

A sales order is a delivery order, but one or more items on it have a different mode of delivery. After the order is invoiced, it still has a release status of *Partially released*.

For example, a sales order has two items: one for delivery and one for pickup. Both the delivery and the pickup have been done. Therefore, both lines have been invoiced. However, the release status is still shown as *Partially released*, which is misleading.

Issue resolution

The release status applies only to order lines where the items are enabled for warehouse management. Therefore, the release status remains *Partially released* in this scenario. Microsoft has evaluated this issue and has determined that it's a feature limitation. An extension could be added as part of the packing slip and invoicing process to update the release status.

NOTE

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Set up cluster picking

2/18/2021 • 3 minutes to read • [Edit Online](#)

This topic describes how to enable workers to use their mobile devices to group picking work into clusters, so that they can pick items from a single location for multiple work orders at the same time. This is called *cluster picking*.

About cluster picking

After work orders are released to the warehouse, the worker can use a mobile device to assign the orders to a cluster. The cluster will organize the picking work for the worker. When a work order is assigned to a cluster, the worker must use cluster picking to perform the picking work for the order. The worker cannot use other picking methods. If a work order is assigned to a cluster by mistake, the worker must break the cluster and then re-create it.

If needed, a worker can pass a cluster to another worker. This changes the cluster status to Passed. When the worker uses a mobile device to indicate that the picking and put away work is completed, the shipment or load must be confirmed in the client.

Enable cluster picking

To enable cluster picking, you must set up the following:

- **Cluster profiles** – Specify whether to automatically generate cluster IDs, the number of positions to use, when to break clusters, and how to sequence and verify the picking work.
- **Work templates** – Define how to create the picking work for cluster picking.
- **Location directives** – Specify where to pick items from, and where to put them.
- **Mobile device menu items** – Configure a mobile device menu item to use existing work that is directed by cluster picking. You must then add the menu item to a mobile device menu so that it is displayed on mobile devices.
- **Warehouse management parameters** – Specify the number sequence to use if you want to generate identifiers for clusters.

Set up a cluster profile

To set up a cluster profile, follow these steps:

1. Click **Warehouse management > Setup > Mobile device > Cluster profiles**.
2. Click **New** to create a new profile.
3. Click **Create cluster** and, under **Cluster sorting**, click **New** to set up the sorting criteria for the cluster. The sorting criteria control the order in which the worker will perform the picking work. You can add as many criteria as needed.
4. In the **Sequence number** field, enter a number to define the order in which the sorting criteria are processed.
5. In the **Field name** field, select the field that will determine the sorting. For example, if you select the **WMSLocationId** field, the work will be sorted by location.

6. In the **Sorting** field, select one of the following options.

OPTION	DESCRIPTION
Ascending	Picking work is sequenced in ascending order based on the sorting criteria. For example, if you use the WMSLocationId field as sorting criteria, and your location IDs are 1, 2, 3, and 4, you will pick from location 4 first.
Descending	Picking work is sequenced in descending order based on the sorting criteria. For example, if you use the WMSLocationId field as sorting criteria, and your location IDs are 1, 2, 3, and 4, you will pick from location 1 first.

Item confirmation

When cluster picking is applied, item confirmation is crucial to verify the items that are added to clusters. You can verify items in cluster picking during the cluster picking process. The setup is based on the product bar code setup.

Set up item verification with cluster picking

1. On a mobile device menu item, open the setup form for work confirmation: **Warehouse management > Warehouse management > Setup > Mobile device > Mobile device menu items**.
2. From the mobile device menu item, open **Work confirmation setup**. The **Product confirmation** option allows you to verify each piece of inventory from the mobile device when scanned.

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Cluster position full

2/18/2021 • 10 minutes to read • [Edit Online](#)

The *Cluster position full* feature offers an alternative to more rigid enforcement of work break rules when cluster picking is used, because it enables a larger margin of error in the volumetric constraints of containers or totes. In a common scenario, not all items on a work order fit into a selected container. Warehouse workers who are cluster picking have few options in this scenario: they must either change to a larger container size or work with their supervisor to come up with a different solution.

This feature introduces the ability to run the **Full** button on one of the work units in a cluster. In older versions, this option was available only for regular order picking, not for cluster picking. However, this feature differs from the standard **Full** button in that it cancels the remaining work. It doesn't suggest that the user add another bin to the same cluster, and it doesn't automatically create new work.

Turn on the Cluster position full feature

Before you can use this feature, it must be turned on in your system. Admins can use the [feature management](#) settings to check the status of the feature and turn it on. In the **Feature management** workspace, the feature is listed in the following way:

- **Module:** *Warehouse management*
- **Feature name:** *Cluster position full*

Setup

This section provides guidelines, and an example that shows how to set up and use the *Cluster position full* feature.

Make sample data available

To work through the [example scenario](#) by using the sample records and values that are specified here, you must be on a system where the standard [demo data](#) is installed. Additionally, you must select the **USMF** legal entity before you begin.

You can also use the example scenario as guidance for working with this feature on a production system. However, in that case, you must substitute your own values for the settings that are described here.

Cluster profiles

You must specify whether cluster IDs are automatically generated, how many positions are used, when clusters are broken, and how the picking work is sequenced and verified.

1. Go to **Warehouse management > Setup > Mobile device > Cluster profiles**.
2. In the list pane, select the **Create Cluster** record.
3. On the **General** FastTab, verify the following values:
 - **Generate cluster ID:** *Yes*
 - **Activate positions:** *Yes*
 - **Number of positions:** *2*
 - **Position name:** *Numeric*
 - **Break cluster at:** *Put*
 - **Sort verification type:** *Position scan*

4. In the **Cluster sorting** FastTab. The grid should be blank (that is, it should contain no lines).

Work templates

You must define how the picking work for cluster picking is created.

1. Go to **Warehouse management > Setup > Work > Work templates**.
2. At the top of the page, set the **Work order type** field to *Sales orders*.
3. Make sure that the following work templates from the demo data are listed. If they aren't available, you won't be able to complete the scenario.
 - 61 SO Stage
 - 61 SO Cluster pick

Location directives

You must specify where items are picked from and where they are put.

1. Go to **Warehouse management > Setup > Location directives**.
2. In the list header, set the **Work order type** field to *Sales orders*.
3. Make sure that the following sales order directives from the demo data are listed. If they aren't available, you won't be able to complete the scenario.
 - 61 Cluster pick
 - 61 SO Pick order

Mobile device menu items

You must configure a mobile device menu item to use existing work that is directed by cluster picking. In the mobile device menu item for cluster picking, the **Allow splitting of work** parameter must be turned on, and the *SO Pick* work class must be added.

1. Go to **Warehouse management > Setup > Mobile device > Mobile device menu items**.
2. In the list pane, select the **Cluster Pick Create** record.
3. Select **Edit** in the Action pane.
4. On the **General** FastTab, set the following values:
 - **Directed by:** *Cluster picking*
 - **Generate license plate:** *Yes*
 - **Allow splitting of work:** *Yes*
 - **Cluster profile ID:** *Create Cluster*Accept the default values for all other fields.

5. On the **Work classes** FastTab, add the following two lines, as required:
 - Line 1 (usually present in demo data):
 - **Work class ID:** *Sales*
 - **Work order type:** *Sales orders*
 - Line 2 (probably not present in demo data):
 - **Work class ID:** *SO Pick*
 - **Work order type:** *Sales orders*
6. Go to **Work confirmation setup** in the Action pane.

7. Select **Edit**.
8. Enter the following values on the line in grid.
 - **Work type** - *Pick*
 - **Product confirmation** - *Select the check box*
9. Select **Save** in the Action pane and close the page.

Create picking work

Before you can start cluster picking, you must create some outbound work. The cluster profile that you created earlier specifies two cluster positions. Therefore, at least two work IDs must be created for sales order picking. For this scenario, transactions will occur in warehouse *61*, and they will use items *L0101* and *T0100*. The demo data should have enough on-hand inventory of these items. Make sure that you have enough inventory to complete the transactions.

Create sales order 1

1. Go to **Sales and Marketing > Sales orders > All sales orders**.
2. Select **New** to create sales order 1.
3. In the **Create sales order** dialog box, set the following values:
 - **Customer account**: *US-010*
 - **Warehouse**: *61*
4. Select **OK**.
5. The new sales order is opened. On the **Sales order lines** FastTab, add a line that has the following settings:
 - **Item number**: *T0100*
 - **Quantity**: *5*
6. On the **Line details** FastTab, on the **Delivery** tab, set the **Confirmed ship date** field to today's date.
7. On the **Sales order lines** FastTab, add a second line that has the following settings:
 - **Item number**: *L0101*
 - **Quantity**: *20*
8. On the **Line details** FastTab, on the **Delivery** tab, set the **Confirmed ship date** field to today's date.
9. For each line that you just added, follow these steps to reserve inventory:
 - a. Select the line to reserve.
 - b. On the **Sales order lines** FastTab, select **Inventory > Reservation**.
 - c. On the **Reservation** page, on the Action Pane, select **Reserve lot** to reserve the inventory.
 - d. Close the **Reservation** page.
10. On the Action Pane, on the **Warehouse** tab, select **Release to warehouse**.

When the release is completed, you receive informational messages that show the wave and load IDs that were created.

Create sales order 2

1. Go to **Sales and Marketing > Sales orders > All sales orders**.
2. Select **New** to create sales order 2.
3. In the **Create sales order** dialog box, set the following values:

- **Customer account:** *US-011*
 - **Warehouse:** *61*
4. Select **OK**.
 5. The new sales order is opened. On the **Sales order lines** FastTab, add a line that has the following settings:
 - **Item number:** *L0101*
 - **Quantity:** *20*
 6. On the **Line details** FastTab, on the **Delivery** tab, set the **Confirmed ship date** field to today's date.
 7. On the **Sales order lines** FastTab, add a second line that has the following settings:
 - **Item number:** *T0100*
 - **Quantity:** *2*
 8. On the **Line details** FastTab, on the **Delivery** tab, set the **Confirmed ship date** field to today's date.
 9. For each line that you just added, follow these steps to reserve inventory:
 - a. Select the line to reserve.
 - b. On the **Sales order lines** FastTab, select **Inventory > Reservation**.
 - c. On the **Reservation** page, on the Action Pane, select **Reserve lot** to reserve the inventory.
 - d. Close the **Reservation** page.
 10. On the Action Pane, on the **Warehouse** tab, select **Release to warehouse**.

When the release is completed, you receive informational messages that show the wave and load IDs that were created.

Get work IDs and license plate numbers

Two work IDs should have been created, each of which has two pick lines. Follow these steps to find the work IDs and license plate assignments.

1. Go to **Warehouse management > Work > Work details**.
2. In the **Overview** grid, search the **Order number** column for the two sales orders that you just created. For each sales order, make a note of the corresponding work ID.
3. Select the row for each sales order to show related information in the **Lines** grid. Make a note of the location that each item will be picked from.
4. Go to **Inventory management > Inquiries and reports > On-hand list**.
5. On the Action Pane, select **Dimensions** to open the **Dimension display** dialog box.
6. Make sure that the **License plate**, **Warehouse**, and **Item number** check boxes are selected, and then select **OK**.
7. In the **Filter** pane, set the following filters:
 - **Item number – is one of** – *L0101* and *T100*
 - **Warehouse – begins with** – *61*
8. Make a note of the **License plate** values that are shown.

Example scenario

Mobile device flow execution – Work confirmation setup for the product

1. Sign in to the warehouse app as a user in warehouse *61*.

2. Go to **Outbound > Cluster pick create**.

The **TASK: Assign work to Cluster** page appears.

3. Enter the work ID for sales order 1 to assign it to cluster position 1.

4. Select **OK** (check mark symbol).

5. Enter the work ID for sales order 2 to assign it to cluster position 2.

6. Select **OK** (check mark symbol).

The **TASK: Cluster Pick Create: Pick** page appears and shows *Item L0101 2 PL*.

Because the cluster profile set the number of positions to 2, the system automatically directs you to the first consolidate pick: two pallets (PL) of item *L0101*.

At any time during the following steps, you can select the **Details** tab to view additional information about the task, such as the picking location.

1. Set the **ITEM** field to *L0101*. This confirms the item number, which is required for this menu item (you configured this earlier by selecting **Work confirmation setup** from the **Mobile device menu item** page when you created this menu item).

2. Enter the license plate number that is associated with the item in the location that is being picked. You will pick two pallets.

3. Set the **LP** field to *LP_PICK_01*.

4. Select **OK** (check mark symbol).

The **TASK: Sort: Cluster Pick Create** page appears. Here, you will sort the two picked pallets into a pick position. This position might be a tote or container that is used to separate the picked inventory by sales order.

5. View the details that are shown for the item (*L0101*) and quantity (*20 ea*) that will be sorted into position 1 (for sales order 1).

6. Set the **POSITION NA** field to *1*.

7. Select **OK** (check mark symbol).

8. View the details that are shown for the item (*L0101*) and quantity (*20 ea*) that will be sorted into position 2 (for sales order 2).

9. Set the **POSITION NA** field to *2*.

10. Select **OK** (check mark symbol).

The **TASK: Cluster Pick Create: Pick** page appears and shows *Item T0100 7 ea*.

In this scenario, position 1 can't accept the full quantity of items that must be picked to fulfill sales order 1. A position must be marked as full. In this scenario, you will do a partial pick of the second item. The second item will be partially picked for position 1, and new work will be created to pick the remaining quantity to fulfill the order.

1. Select the Menu button (sometimes referred to as the hamburger or the hamburger button), and then select **Position full**.

2. Identify the position that is full, and select *1*.

3. Select **OK** (check mark symbol).

4. Enter the pick quantity that can still be picked into position 1. The system can determine which item number is being picked.
5. Enter 2.
6. Select **OK** (check mark symbol).
7. Confirm the item number to complete the pick of the remaining item into position 2.
8. Set the **ITEM** field to *T0100*.
9. Select **OK** (check mark symbol).
10. Enter the license plate that the item is being picked from by setting the **LP** field to *LPREPL04*.
11. Select **OK** (check mark symbol).
12. View the details that are shown for the item (*T0100*) and quantity (2 ea) that will be sorted into position 2 (for sales order 2).
13. Set the **POSITION NA** field to 2.
14. Select **OK** (check mark symbol).
15. View the details that are shown for the item (*T0100*) and quantity (2 ea) that will be sorted into position 1 (for sales order 1).
16. Set the **POSITION NA** field to 1.
17. Select **OK** (check mark symbol).

The **TASK: Cluster Pick Create: Put** page appears.

In this scenario, the cluster pick has been completed, and the user is directed to put away the picked items from position 1 and position 2 into staging location *STAGE01*.

1. Review the information on the page. It shows that a total quantity of 44 will be put to the staging location.
2. Select **OK** (check mark symbol).

You receive a "Cluster Completed" message.

You can now use the **Sales Picking** menu item to pick the remaining quantity. You can then use the **Sales loading** menu item to move the items from the staging location to the loading dock.

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System-directed cluster picking

2/18/2021 • 9 minutes to read • [Edit Online](#)

Cluster picking is a piece picking process that lets you pick items for multiple orders at the same time by clustering them into pick clusters. You then have to visit the pick location only one time. Typically, this functionality is used with small order picking or quantities that are less than case quantities.

When system-directed cluster picking is set up, you can cluster-pick work headers, based on a system-generated cluster. The system cluster-picks orders up to the number of positions that is specified in the cluster profile. Therefore, you can pick multiple orders at the same time without having to manually create a cluster.

System-directed cluster picking offers an alternative to manual cluster building, where a cluster profile is used to create a cluster. Several setup-related lines must be defined in the cluster profile before it's used:

- **Number of positions** corresponds to the number of orders that will be put on a cluster. Therefore, it corresponds to the number of totes.
- **Break cluster** determines when the cluster should be broken.
- **Generate cluster ID** controls whether the cluster ID will be generated by the system or entered by the user.
- **Sort verification type** determines whether position verification is required.

A new mobile device menu item is used for system-directed cluster picking. The **Cluster profile ID** must be specified for the selected **Directed by** option. Additionally, the system-directed work sequence queries can group orders based on company-specific criteria. Therefore, you can further optimize the assignment of work orders by specifying customized sorting criteria using the system-directed work sequence queries.

When system-directed cluster picking is enabled, warehouse workers are presented with a cluster where picking orders have been preassigned to cluster positions. Therefore, workers can start to pick an item for multiple work orders by visiting the pick location only one time. The picking process for system-directed cluster picking is the same as the process for user-directed cluster picking.

Enable the System-directed cluster picking feature

Before you can use this feature, it must be enabled on your system. Administrators can use the [feature management](#) page to check the feature status and enable it if needed. Here, the feature is listed as:

- **Module** - Warehouse management
- **Feature name** - System directed cluster picking

This feature also requires enabling a dependent feature. The dependent feature is:

- **Module** - Warehouse management
- **Feature name** - Organization-wide system directed work sequencing

Set up system-directed cluster picking

Create cluster profiles

Cluster profiles control how the system creates each cluster. If different clusters are required, a different cluster profile should be created for each mobile device menu item.

1. Go to **Warehouse management > Setup > Mobile device > Cluster profiles**.
2. Select **New**.

3. In the **Cluster profile ID** field, enter **2 Position**.
4. In the **Name** field, enter **2 Position**.
5. On the **General** FastTab, enter the following information:
 - **Generate cluster ID** - Select **Yes**. This option determines whether the cluster ID is automatically created by the system, or whether the user will create it at the start of picking.
 - **Activate positions** - Select **Yes**. This option determines whether the position names are automatically generated based on the position name setup. If this option is set to **No**, the license plate ID for the position is used.
 - **Number of positions** - Select **2**. This field determines the maximum number of positions that the cluster can have (that is, the maximum number of boxes, totes, and so on).
 - **Position name** - Select **Numeric** so that positions are named by using continuous numbers. If you select **Alphabetical**, the positions are named in alphabetical order.
 - **Break cluster at** - Select **Put**. This field determines when the cluster is broken.
 - **Sort verification type** - Select **Position scan**. This field determines whether the put-to-position step is verified.
6. On the **Cluster sorting** FastTab, you define sorting criteria by creating a new line and enter the following information:
 - **Sequence number** - Select **1**. This field determines the sequence that the system sorts by. A value is entered automatically, but you can change it if needed.
 - **Field name** - Enter **WMSLocationId**. This field determines the field that the line uses for sorting criteria.
 - **Sorting** - Select **Ascending**. This field defines whether the sorting is done in ascending or descending order.

Create a mobile device menu item

To create a new mobile device menu item for system-directed cluster picking and link the cluster profile ID to the mobile device menu item, follow these steps.

1. Go to **Warehouse management > Setup > Mobile device > Mobile device menu items**.
2. Select **New**.
3. In the header section, enter the following information:
 - **Menu item name** - SD Cluster
 - **Title** - SD Cluster
 - **Mode** - Work
 - **Use existing work** - Yes
4. On the **General** FastTab, enter the following information:
 - **Directed by** - System directed cluster picking
 - **Generate license plate** - Yes
 - **Cluster profile ID** - 2 Position
5. On the **Work classes** FastTab, set up the valid work class for this mobile device menu item by setting the following fields:
 - **Work class ID** - Sales
 - **Work order type** - Sales orders
6. In the **Mobile device menu items** Action Pane, select **System directed work sequence queries** and follow these steps to specify a new system-directed work sequence query:

- Select **New** in the Action Pane.
- **Sequence number** - 1
- **Description** - Work priority – Work ID

7. On the Action Pane select **Edit query**

8. Select the **Sorting** tab

9. Select **Add** to add a new line, then enter the following:

- **Table** - Work
- **Derived table** - Work
- **Field** - Work priority
- **Search direction** - Ascending

10. Select **Add** to add a second line, then enter the following:

- **Table** - Work
- **Derived table** - Work
- **Field** - Work ID
- **Search direction** - Ascending

11. The system will now sort work IDs in the cluster, first by work priority and then by work ID.

Set up a mobile device menu

1. Go to **Warehouse management > Setup > Mobile device > Mobile device menu**.
2. Add the **SD Cluster** menu item that you just created to a Mobile device menu.
3. Select the **Outbound** menu.
4. Select **Edit** from the Action Pane.
5. Scroll until you find **SD Cluster**.
6. Select **SD Cluster**, the arrow pointing to the **Menu Structure** list will be enabled.
7. Select the **arrow** button to move the **SD Cluster** menu item into the **Outbound** menu structure.
8. Select **SD Cluster** from the **Menu Structure** list, then select the **UP** or **DOWN** arrows to move the menu item into the desired position on the mobile device menu.

Scenario

Create picking work

Before you can set up system-directed cluster picking, you must create eligible outbound work. The cluster profile that you created earlier specifies two cluster positions. Therefore, you must create at least two work IDs. In this scenario you will create two sales orders, reserve inventory, release the sales orders to the warehouse, and then manually process the wave.

1. Go to **Sales and Marketing > Sales orders > All sales orders**.
2. Select **New** in the Action Pane to create the first sales order.
 - The **Create sales order** menu opens, enter the following information:
 - On the **Customer** FastTab, enter **Customer account - US-004**.
 - On the **General** FastTab, enter **Warehouse - 62**.
 - Select **OK** to close the menu and create the sales order.
 - On the **Sales order lines** FastTab, select **Add line** if a new line is not automatically added and enter the following:
 - **Item number** - A0001
 - **Quantity** - 1
 - Select **Add line** to add a second line.

- **Item number** - A0002
 - **Quantity** - 3
 - Reserve inventory for both of the lines that you just created.
 - Select **Line 1**.
 - On the **Sales order lines** Action Pane, select **Inventory**, and then select **Reservation** from the list.
 - On the **Reservation** form, select **Reserve lot** to reserve the inventory.
 - Close the **Reservation** form when the reservation is completed.
 - Repeat these steps to reserve inventory for **Line 2**.
3. Select **New** in the Action Pane to create the second sales order
- The **Create sales order** menu opens, enter the following information:
 - On the **Customer** FastTab, enter **Customer account** - US-005.
 - On the **General** FastTab, enter **Warehouse** - 62.
 - Select **OK** to close the menu and create the sales order
 - On the **Sales order lines** FastTab, select **Add line** if a new line is not automatically added and enter the following information:
 - **Item number** - A0001
 - **Quantity** - 4
 - Select **Add line** to add a second line.
 - **Item number** - A0002
 - **Quantity** - 2
 - Reserve inventory for both lines that you just created.
 - Select **Line 1**.
 - On the **Sales order lines** Action Pane, select **Inventory**, and then select **Reservation** from the list.
 - On the **Reservation** form, select **Reserve lot** to reserve the inventory.
 - Close the **Reservation** form when the reservation is completed.
 - Repeat these steps to reserve inventory for **Line 2**.
 - Close the sales order and return to the **All sales orders** list page.
4. Find the two sales orders you just created (you may need to refresh the page). In the table, select both sales orders using the section check mark.
- In the **All sales orders** Action Pane, select the **Warehouse** tab.
 - In the **Actions** group, select **Release to warehouse** to release both sales orders to the warehouse.
5. When the release to warehouse process is completed, an informational message will be displayed.
- Shipments will be created for each sales order.
 - A wave will be created and both shipments will be assigned to the wave. Make note of the **Wave ID**.
6. Go to **Warehouse management > Outbound waves > Shipment waves > All waves**.
- In the **All waves** list find and select the **Wave ID** that you created in the previous step.
 - In the Action Pane, select the **Wave** tab,
 - In the **Wave** group, select **Process** to process the wave and create **Work**.
 - Informational messages will be generated when processing has been completed, indicating that work has been created and the wave has been posted.
7. **Optional:** Go to **Warehouse management > Work > Work details** to view the work created. Two different work IDs are created. Each work ID has two pick lines.

Run the mobile device flow

1. Sign in to the mobile device for a user in warehouse 62.

2. On the **Main Menu**, select **Outbound**.
3. On the **Outbound** menu, select **SD Cluster** to initiate the pick.
 - A cluster is created, and the two work IDs that you created earlier are attached. If you created more than two work IDs, only the first two are added to the cluster. Notice that the work IDs are added to the cluster in ascending order, as you specified in the query setup.

NOTE

The new cluster is automatically created only if enough additional work IDs were previously created. Otherwise, the following message is shown: "Not enough work can be found for cluster."

- After you select the menu, the first pick screen appears. The system aggregates all matching pick lines from the two work IDs and directs you to visit the pick location one time, so that you can satisfy both orders by using one pick. This process is done in the same way as the process for user-directed cluster picking.
4. Confirm the first picking location and item by selecting **OK**.
 - The quantity of the pick will be the total of the item displayed on the sales orders in the cluster.
 5. Enter the position name (Numeric or Alphabetical) to confirm that the item quantity picked for the position were put in the correct position.
 6. Repeat this process until all item quantities have been picked and put in the correct position.
 7. The last step on the mobile device is to **Put** the cluster in the final location. Select **OK**
 - When the put operation is confirmed, the cluster is closed and broken, based on the value that you set for the **Break cluster at** field in the cluster profile. Work IDs are also closed.
 8. A "Cluster complete" message is shown on the mobile device.

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Set different dimensions for packing and storage

2/18/2021 • 4 minutes to read • [Edit Online](#)

Some items are packed or stored in such a way that you may need to track physical dimensions differently for each of several different processes. The *Packaging product dimensions* feature lets you set up one or several types of dimensions for each product. Each dimension type provides a set of physical measurements (weight, width, depth, and height), and establishes the process where those physical measurement values apply. When this feature is enabled, your system will support the following types of dimensions:

- *Storage* - Storage dimensions are used along with location volumetrics to determine how many of each item can be stored in various warehouse locations.
- *Packing* - Packing dimensions are used during containerization and the manual packing process to determine how many of each item will fit in various container types.
- *Nested packing* - Nested packing dimensions are used when the packing process contains multiple levels.

Storage dimensions are supported even when the *Packaging product dimensions* feature isn't enabled. You set these up using the **Physical dimension** page in Supply Chain Management. These dimensions are used by all processes where the packing and nested packing dimensions aren't specified.

Packing and *nested packing* dimensions are set up using the **Physical product dimensions** page, which is added when you enable the *Packaging product dimensions* feature. This topic provides a scenario that illustrates how to use this feature.

Turn on the packaging product dimensions feature

Before you can use this feature, it must be turned on in your system. Admins can use the [Feature management](#) workspace to check the status of the feature and turn it on if it's required. There, the feature is listed in the following way:

- **Module:** *Warehouse management*
- **Feature name:** *Packaging product dimensions*

Example scenario

Set up the scenario

Before you can run the example scenario, you must prepare your system as described in this section.

Enable demo data

To work through this scenario using the demo records and values that are specified here, you must be on a system where the standard [demo data](#) is installed. Additionally, you must select the *USMF* legal entity before you begin.

Add a new physical dimension to a product

Add a new physical dimension for a product by doing the following:

1. Go to **Product information management > Products > Released products**.
2. Select the product with **Item number** *A0001*.
3. On the Action Pane, open the **Manage inventory** tab and, from the **Warehouse** group, select **Physical product dimensions**.
4. The **Physical product dimensions** page opens. On the Action Pane, select **New** to add a new dimension to the grid with the following settings:

- Physical dimension type - *Packing*
- Physical unit - *pcs*
- Weight - *4*
- Weight unit - *kg*
- Depth - *3*
- Height - *4*
- Width - *3*
- Length - *cm*
- Volume unit - *cm3*

The **Volume** field is automatically calculated based on your **Depth**, **Height**, and **Width** settings.

Create a new container type

Go to **Warehouse management > Setup > Containers > Container types** and create a new record with the following settings:

- Container type code - *Short Box*
- Description - *Short Box*
- Maximum net weight - *50*
- Volume - *144*
- Length - *6*
- Width - *6*
- Height - *4*

Create a container group

Go to **Warehouse management > Setup > Containers > Container groups** and create a new record with the following settings:

- Container group ID - *Short Box*
- Description - *Short Box*

Add a new line to the **Details** section. Set the **Container type** to *Short Box*.

Set up a container build template

Go to **Warehouse management > Setup > Containers > Container build templates** and select **Boxes**. Change the **Container group ID** to *Short Box*.

Run the scenario

After you have prepared your system as described in the previous section, you are ready to run the scenario as described in the next section.

Create a sales order and create a shipment

In this process you will create a shipment based on the item *packing* dimensions, for which the height is less than 3.

1. Go to **Sales and marketing > Sales orders > All sales orders**.
2. On the Action Pane, select **New**.
3. In the **Create sales order** dialog box, set the following values:
 - Customer account: *US-001*
 - Warehouse: *63*
4. Select **OK** to create the sales order and close the dialog box.
5. The new sales order is opened. It should include a new, empty line in the grid on the **Sales order lines**

FastTab. On this line, set the following values:

- **Item number:** *A0001*
- **Quantity:** *5*

6. On the **Sales order lines** FastTab, select **Inventory > Reservation**.
7. On the **Reservation** page, on the Action Pane, select **Reserve lot** to reserve the inventory.
8. Close the page.
9. On the Action Pane, open the **Warehouse** tab and select **Release to warehouse** to create work for the warehouse.
10. On the **Sales order lines** FastTab, select **Warehouse > Shipment details**.
11. On the Action Pane, open the **Transportation** tab and select **View containers**. Confirm that the item was containerized into the two *Short Box* containers.

Place an item into storage

1. Open the mobile device, sign in to warehouse 63 and go to **Inventory > Adjust In**.
2. Enter **Loc** = *SHORT-01*. Make a new license plate with **Item** = *A0001* and **Quantity** = *1 pcs*.
3. Select **OK**. You will receive the error "Location SHORT-01 failed because item A0001 does not fit in location's specified dimensions." This is because the *Storage* type dimensions of the product are larger than the dimensions specified on the location profile.

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Set up containerization

2/18/2021 • 4 minutes to read • [Edit Online](#)

This topic describes how to automate the containerization of loads in Warehouse management. Automated containerization creates containers and the picking work for shipments when a wave is processed and work lines can be split into quantities that fit the containers. This helps warehouse workers to pick the items directly into the chosen container. Compared to the manual packing process, tasks such as creating containers, assigning items, and closing containers are automated by the system. This procedure uses the USMF demo company and is performed by a Warehouse manager.

Set up a wave template

1. In the navigation pane, go to **Modules > Warehouse management > Setup > Waves > Wave templates**.
2. Select **New**.
3. In the **Wave template name** field, type a value.
4. In the **Wave template description** field, type a value.
5. In the **Site** field, enter or select a value.
6. In the **Warehouse** field, enter or select a value.
7. Expand the **Methods** section. The **Selected methods** pane lists the methods for the selected wave template type. The wave template must include the containerize method.
8. In the **Wave step code** field, type a value. Enter a Wave step code for the added method, which can be any code. It's possible to add the method more than once and assign different wave step codes. To do this, select **Repeatable for this method** in the **Wave process methods** page.
9. Select **Save**.
10. Close the page.

Set up a container type

1. In the navigation pane, go to **Modules > Warehouse management > Setup > Containers > Container types**. You can define your containers in the **Container types** page. You can configure the physical dimensions of containers including tare weight, maximum weight, maximum volume, length, width, and height. In this example, we have three different sizes of boxes.
2. Select **New**.
3. In the **Container type code** field, type a value.
4. In the **Tare weight** field, enter a number.
5. In the **Maximum weight** field, enter a number.
6. In the **Volume** field, enter a number.
7. In the **Length** field, enter a number.
8. In the **Width** field, enter a number.
9. In the **Height** field, enter a number.
10. In the **Description** field, type a value.
11. Select **Save**.
12. Repeat steps 2-11 two more times to make three total container types.
13. Close the page.

Set up a container group

1. In the navigation pane, go to **Modules > Warehouse management > Setup > Containers > Container groups**.
2. On the Action Pane, select **New**. You can set up logical groups of container types. For each group, you can specify the sequence in which to pack the containers and the percentage of the containers to fill. The size dimensions of the item is used to determine whether it will fit in a container. The container that is closest to the size dimensions of the item is used. If you have multiple container types in a group, we recommend that you arrange the sequence by size, so that the largest container is first, number 1 in the sequence, and the smallest container is last.
3. In the **Container group ID** field, type a value that you created earlier.
4. In the **Description** field, type a value.
5. Repeat steps 2-4 for all three container types you created earlier.
6. Select **Save**.
7. Close the page.

Set up a container build template

1. In the navigation pane, go to **Modules > Warehouse management > Setup > Containers > Container build templates**.
2. Select **New**. The container build template is based on which of the containerization processes are performed. Each container build template defines one containerization process that will be used by a wave template. The **Edit query** option allows you to define the conditions on which the selected template will be processed. For example, you may want to only run containerization for specific customers, products, or warehouses or you can add the corresponding query ranges to the template. The **Wave step code** field is how a container build template is linked to steps in a wave template. When a wave is executed, it determines which container build template(s) are used to initiate containerization. The Base query type field determines what to pack and what to base the filter query on.
3. In the **Container template ID** field, type a value.
4. In the **Container group ID** field, enter or select a value.
5. In the **Wave step code** field, type a value.
6. Select the **Allow split picks** check box.
7. Select **Save**.
8. Select **Container mixing constraints**. Mixing logic breaks allows you to set up rules for packing allocation lines in containers. For example, if you add the **Item number field**, when items are assigned to containers, a new container will be created when there is a new item number. This will prevent workers from packing allocations lines for two different customers in the same container.
9. Select **New**.
10. In the **Table** field, select an option.
11. In the **Field Select** field, enter or select a value.
12. Select **OK**.

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Batch and license plate confirmation

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Batch confirmation allows you to confirm that the correct batch is being picked from the mobile device. On the initial pick of work for batch above-items only, where batch above indicates that batch ranges higher than location in the search hierarchy, you must verify that the batch that is picked matches the batch on the work line.

License plate confirmation allows you to confirm that the correct license plate is being picked from the mobile device. When picking work from a stage location, you must verify that the license plate that is picked matches the license plate that is associated with the work. If the work is started by scanning a license plate, this confirmation step will be skipped.

Where it applies

Confirmation applies in the following scenarios:

- Batch confirmation applies to the initial picks of work for batch above-items.
- License plate confirmation applies to picks from stage locations.

IMPORTANT

Replenishment is not supported for license plate confirmation. When executing replenishment work, no license plate confirmation step is created.

Set up batch and license plate confirmation

You can configure batch and license plate confirmation from the mobile device menu items.

1. From the mobile device menu items, enter the work confirmation setup.
2. Select the option for either batch or license plate confirmation. Both options are available for work type picks that do not have automatic confirmation enabled.

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Enable license plate label printing

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This topic shows how to enable the automatic printing of a Serial shipping container code (SSCC) label after the last item is picked from inventory in a sales picking work process. You can run this procedure in demo data company USMF. If you're run it using your own data, you need to have a number sequence set up for license plates. You need to set up a label printer before you begin this task. Go to Organization administration > Setup > Network printers. On the Action Pane, click Options, and then click the Download document routing agent installer button. Run the installer and make sure that you have a working network printer set to Active before you continue with the procedure.

Set up the GS1 company prefix

1. Go to **Navigation pane > Modules > Warehouse management > Setup > Warehouse management parameters**.
2. In the **GS1 company prefix** field, enter the 7 numbers for your GS1 company number.
3. Select **Save**.
4. Close the page.

Setup the SSCC license plate number sequence

1. Go to **Navigation pane > Modules > Organization administration > Number sequences > Number sequences**.
2. In the **Area** field, select an option.
3. In the **Reference** field, select an option.
4. In the **Company** field, type a value.
5. Expand the **Segments** section.
6. Select **Edit**.
7. In the **Segments** table, select the first row
8. Select **Remove**.
9. Select **Remove**.
10. Select **Save**.
11. Close the page.

Create the document route layout

1. Go to **Navigation pane > Modules > Warehouse management > Setup > Document routing > Document routing layouts**. Enable the SSCC layout.
2. Select **New**.
3. In the **Layout ID** field, type a value.
4. In the **Description** field, type a value.
5. Select **Insert at end of text**.
6. Select **Save**.
7. Close the page.

Set up the document routing

1. Go to **Navigation pane > Modules > Warehouse management > Setup > Document routing > Document routing**.
2. In the **Work order type** field, select an option.
3. Select **New**.
4. In the **Warehouse** field, type a value.
5. In the **Name** field, type a value.
6. Select **New**.
7. In the **Layout ID** field, enter or select a value.
8. In the **Name** field, enter the printer name that you want to use.
9. Select **Save**.
10. Close the page.

Create mobile device menu

1. Go to **Navigation pane > Modules > Warehouse management > Setup > Mobile device > Mobile device menu items**.
2. Select **New**.
3. In the **Menu item name** field, type a value.
4. In the **Title** field, type a value.
5. In the **Mode** field, select an option.
6. Select **Yes** in the **Use existing work** field.
7. Select **Yes** in the **Generate license plate** field.
8. Expand the **Work classes** section.
9. Select **New**.
10. In the **Work class ID** field, type a value.
11. Select **Save**.
12. Close the page.
13. Go to **navigation pane > Modules > Warehouse management > Setup > Mobile device > Mobile device menu**.
14. In the tree, select the menu item that you created before.
15. Select **Edit**.
16. Select the arrow to add the menu item to the menu.
17. Select **Save**.
18. Close the page.

Update a work template

1. Go to **Navigation pane > Modules > Warehouse management > Setup > Work > Work templates**.
2. Select **Edit**.
3. Select **New**.
4. In the **Work type** field, select **Print**.
5. In the **Work class ID** field, enter or select a value.
6. Select **Move up**.
7. Select **Save**.
8. Close the page.

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Create transfer orders from the warehouse app

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This feature lets warehouse workers create and process transfer orders directly from the warehouse app. The warehouse workers start by selecting the destination warehouse and then they can scan one or more license plates using the app to add license plates to the transfer order. When the warehouse worker selects **Complete order**, a batch job will create the required transfer order and order lines based on the on-hand inventory registered for those license plates.

Enable the create transfer orders from Warehouse app feature

Before you can use this feature, both it and its prerequisites must be enabled on your system. Administrators can use the [feature management](#) page to check the feature status and enable it if needed.

1. First enable the [Process warehouse app events](#) feature, which is listed in [feature management](#) as:
 - **Module** - Warehouse management
 - **Feature name** - Process warehouse app events
2. Then enable the *Create transfer orders from the warehouse app* feature, which is listed as:
 - **Module** - Warehouse management
 - **Feature name** - Create and process transfer orders from the warehouse app
3. To automate the processing of the outbound shipments, you must also enable the [Confirm outbound shipments from batch jobs](#) feature. This feature is listed as:
 - **Module** - Warehouse management
 - **Feature name** - Confirm outbound shipments from batch jobs

Set up a mobile device menu item to create transfer orders

Here are general guidelines for setting up a mobile device menu item for creating a transfer order. Depending on your business requirements for the level of automation to be set when users create transfer orders from the floor, different configurations will be enabled. The scenario in this document will describe one such configuration.

1. Go to **Warehouse management > Setup > Mobile device > Mobile device menu items**.
2. Select **New** to add a new menu item. Then make the following settings to get started:
 - **Menu item name** - Assign a name as it should appear in Supply Chain Management.
 - **Title** - Assign a menu name as it should be presented to workers in the warehouse app.
 - **Mode** - Set to *Indirect* (this warehouse app will not create work).
 - **Activity code** - Set to *Create transfer order from license plates* to enable the warehouse workers to create a transfer order based on one or more scanned license plates.
3. Use the **Transfer order line creation policy** setting to control how transfer order lines will be created by this menu item. The lines will be created/updated based on the on-hand inventory registered for the scanned license plates. Choose one of the following values:
 - **No reservation** - The transfer order lines will not be reserved.
 - **License plate guided with line reservation** - The transfer order lines will be reserved and use the License plate guided strategy option, which stores the relevant license plate IDs associated with the order lines. Located license plate ID values can therefore be used as part of the work creation process

for the transfer order lines.

4. Use the **Outbound shipment policy** setting to add more automation to the outbound transfer order shipment process, as needed. When a worker selects the **Complete order** button, the app creates the *Complete order* warehouse app event, which will save the value you choose here in the **Outbound shipment policy** field for each line in the current transfer order. Later, when the event queue is processed by a batch job to create the transfer order, the value stored in this field can be read by the batch job, and may therefore control how that job processes each line. Choose one of the following:

- **None** - No automated processing is done.
- **Release to warehouse** - Automates the release to warehouse process.
- **Ship confirm** - Automates the ship confirmation process.
- **Release and ship confirm** - Automates both the release to warehouse and ship confirmation processes.

Add the mobile device menu item to a menu

1. Go to **Warehouse management > Setup > Mobile device > Mobile device menu**
2. Select **Edit**.
3. Select an existing menu following selection of the new menu item under **Available menus and menu items**. Add the menu item by selecting the right-arrow button.

Create a transfer order based on license plates

The warehouse app has a simple process for creating transfer orders based on license plates. To do this, the worker does the following using the warehouse app:

1. Create the transfer order and identify the destination warehouse.
2. Identify each license plate to be shipped.
3. Select **Complete order**.

NOTE

It is possible for multiple workers to assign license plates intended for the same transfer order by using the **Select transfer order** button to select an existing, unprocessed, transfer order number from the warehouse app event queue. For information about how to find the transfer order number values, see [Inquire the warehouse app events](#).

Example scenario

This scenario provides an overview of the process for getting transfer orders created and automatically processed based on the on-hand inventory registered on the selected license plates.

To work through this scenario using the values suggested, you must work on a system with demo data installed and select the *USMF* legal entity before you begin.

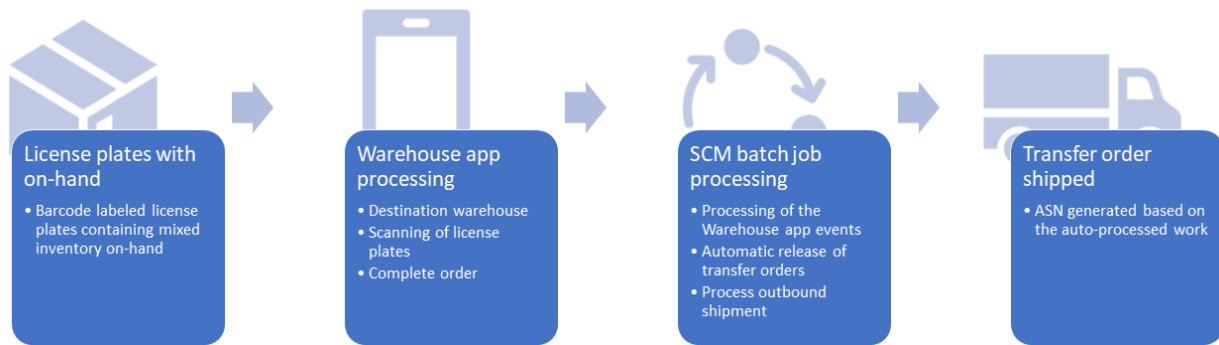
This scenario assumes that you have already enabled both the [Create and process transfer orders from the warehouse app feature](#), and the [warehouse app event processing](#) capability.

In addition to setting up the create transfer order in the mobile device menu items, additional templates, location directives, and batch jobs must also be set up and enabled.

Example Scenario blueprint

You are a retailer and have multiple license plates, each containing a mix of items placed at a specific location within one of your warehouses (*Warehouse 51*). You would like to enable the process that allows workers to create a transfer order to another warehouse (*Warehouse 61*) for a collection of scanned license plates. You will

automatically ship-update the transfer order as soon as the last license plate for the order has been identified.



Create a mobile device menu item for creating transfer orders

This section explains how to create a new mobile device menu item for creating transfer orders. Set the **Mode** to *Indirect* and the **Activity code** to *Create transfer order from license plates*.

1. Go to **Warehouse management > Setup > Mobile device > Mobile device menu items**.
2. Select **New**.
3. In the **Menu item name** field, enter the name *Create TO*.
4. In the **Title** field, enter the description *Create TO*.
5. In the **Mode** field, select *Indirect*.
6. In the **Activity code**, select *Create transfer order from license plates*.
7. In the **Order line creation policy**, select *License plate guided with line reservation*.
8. In the **Outbound shipment policy**, select *Release and ship confirm*.
9. Go to **Warehouse management > Setup > Mobile device > Mobile device menu**.
10. Select **Edit**.
11. Select the existing **Inventory** menu and then select the new menu item under **Available menus and menu items**. Add the menu item into to **Inventory** menu by selecting the right-arrow button.

Set up work templates to auto process and break work by located license plate

This section explains how to enable a work template to automatically process the work created by the template when a wave is released.

1. Go to **Warehouse management > Setup > Work > Work templates**.
2. In the **Work order type** field, select *Transfer issue*.
3. Select **New** to create a new work template.
4. In the **Work template** field, enter *51 Auto process LP*.
5. In the **Work template description** field, enter *51 Auto process LP*.
6. Select the **Automatically process** check box. This must be selected in order for any automation steps to be processed.
7. In the demo data, there already exists a work template *51 Transfer*, edit the **Sequence number** field so that the new work template has a lower sequence number than the existing work template *51 Transfer*.
8. Select **Save** in the toolbar to enable the **Work Template Details** FastTab.
9. In the **Work Template Details** FastTab, select **New** in the toolbar. You will add two lines.
10. In the **Work type** field, select *Pick*.
11. In the **Work class ID** field, select *TransfOut*.
12. Select **New** in the **Work Template Details** toolbar.
13. In the **Work type** field, select *Put*.
14. In the **Work class ID** field, select *TransfOut*.
15. Select **Save** to enable the **Directive code** field.

16. On the **Work type** *Put* line, select **Directive code** *Baydoor*. Make sure this new work template gets the lowest **Sequence number**.
17. In the toolbar, select **Edit query** to open the query editor.
18. In the **Range** tab, select **Add**.
19. On the line added, in **Field** select *Warehouse*.
20. In the **Criteria** field, select *51*.
21. Select the **Sorting** tab.
22. Select **Add** and set **Field** to *Located license plate ID*. Selecting this field will enable the toolbar button **Work header breaks**.
23. Select **OK** followed by **Yes** to reset the grouping and return to the **Work templates** page.
24. Select **Work header breaks** and enable the **Group by this field** for the **Located license plate ID** and close.

NOTE

Not all setup can be auto processed, for example, catch weight items and the use of mixed tracking dimensions.

Set up location directives for the license plate guided strategy

This section explains how to set up a location directive pick process to use the **License plate guided** strategy.

1. Go to **Warehouse management > Setup > Location directives**.
2. Select **Edit**.
3. In the navigation list header, select the **Work order type** *Transfer issue*.
4. In the navigation list, select the existing location directive *51 TO Pick*.
5. In the **Lines** FastTab, select the **Allow split** checkbox.
6. In the **Location Directive Actions** FastTab select **New** to add a new action line.
7. In the **Name** field, enter *LP Guided*.
8. In the **Strategy** field, select *License plate guided*. This action needs the lowest sequence number.
9. Select **Save** in the toolbar.
10. Select the **Refresh** page icon from the toolbar.
11. In the **Location Directive Actions** FastTab, select the line *TOPick*.
12. In the **Location Directive Actions** toolbar, select **Move down** to change the sequence number to be greater than the sequence number for the *LP Guided* action just created.

NOTE

The License plate guided strategy will try to reserve and create picking work against the locations holding the requested license plates that have been associated with the transfer order lines. But if this isn't possible and you still would like to create picking work, you should fall back to another location directive action strategy, and perhaps also search for inventory in another area of the warehouse, depending on your business process needs.

Set up a batch job to process warehouse app events

This section explains how to set up a scheduled batch job to process warehouse app events.

1. Go to **Warehouse management > Periodic tasks > Process warehouse app events**.
2. In the dialog box, enable **Batch processing** under the **Run in background** section.
3. Select **Recurrence** and set up the batch job to process based on the interval needed for your business.
4. Select **OK** to return to the main dialog.
5. Select **OK** in the main dialog to add the job to the batch queue.

Set up a batch job to release transfer orders automatically

This section explains how to set up a scheduled batch job to release the transfer orders that have been marked as "ready to release".

1. Go to **Warehouse management > Release to warehouse > Automatic release of transfer orders**.
2. In the dialog box, expand the **Records to include** section.
3. Select **Filter** under the **Records to include** section.
4. In the **WHSTransferAutoRTWQuery** query page, **Range** tab, select **Add** to add a new line to the query.
5. In the new line **Table** field, select the drop-down menu and select the table **Transfer line release to warehouse**.
6. In the **Field** drop-down menu, select **Outbound shipment policy**.
7. In the **Criteria** field, select **Release and ship confirm**.
8. In the line where **Field** is set to *From warehouse*, in the **Criteria** field, select *51*.
9. Select **OK** to return to the main dialog box.
10. Expand the **Run in the background** section to set up batch processing.
11. Enable **Batch processing** under the **Run in background** section.
12. Select **Recurrence** and set up the batch job to process based on interval needed for your business.
13. Select **OK** to return to the main dialog.
14. Select **OK** in the main dialog to have the batch job added to the batch queue.

Set up the "Process outbound shipment" batch job

This section explains how to set up a scheduled batch job to run the outbound shipment confirmation for loads ready to ship related to transfer order lines that are "ready to ship".

1. Go to **Warehouse management > Periodic tasks > Process outbound shipments**.
2. Expand the **Records to include** section.
3. Select **Filter**.
4. In the **WHSLoadShipConfirm** query, select the **Joins** tab.
5. Expand the table hierarchy so that **Loads** and **Load details** have been expanded.
6. Select the **Load details** table.
7. Select the **Add table join** button.
8. In the list of table relations, filter or search on the **Relation** column for *Transfer order lines (Reference)*.
9. Focus on the table relation in the list then press the **Select** button.
10. Select the **Transfer order lines** table.
11. Select the **Add table join** button.
12. In the list of table relations, filter or search on the **Relation** column for *Invent Transfer Additional Fields (Record-ID)*.
13. Focus on the table relation in the list then press the **Select** button.
14. Select the **Range** tab.
15. In the **Range** query tables, you will set up three query criteria ranges. Select the **Add** button to add a line.
16. Add a range for the table **Loads**. Set **Field** to *Load status* and set **Criteria** to *Loaded*.
17. Add another range for the table **Invent Transfer Additional Fields**. Set **Field** to *Outbound shipment policy* and set **Criteria** to *Release and ship confirm*.
18. Add another range for the table **Load details**. Set **Field** to *Reference* and set **Criteria** to *Transfer order shipment*.
19. Select **OK** to return to the main dialog box.
20. Expand the **Run in the background** section.
21. Enable **Batch processing**.
22. Select **Recurrence** and set up the batch job to process based on interval needed for your business.

23. Select **OK** to return to the main dialog.
24. Select **OK** in the main dialog to have the batch job added to the batch queue.

NOTE

For more information, see [Confirm outbound shipments from batch jobs](#).

Processing the example for "Create transfer order from the warehouse app"

Add on-hand on a license plate

As a starting point for this scenario you will need to have a license plate containing physical available inventory on hand.

ITEM	WAREHOUSE	INVENTORY STATUS	LOCATION	LICENSE PLATE	QUANTITY
A0001	51	Available	LP-010	LP10	1
A0002	51	Available	LP-010	LP10	2

Add physical inventory on hand quantities by using the following values:

NOTE

You will need to create the license plate and use locations that allow you to carry mixed items, like LP-010.

Create and process transfer orders from the warehouse app

1. Open the app and sign in as user *51*. Current user warehouse will be *51*.
2. Select the menu item **Create TO** from the menu location you added it to during setup.
3. Start the creation of a transfer order by entering the destination warehouse (To warehouse) in the **Warehouse** field, enter *61*. The new transfer order will be going from current warehouse *51* (From warehouse) to the destination warehouse *61*.
4. Select **OK**.
5. Scan a license plate ID in the **License plate** field. Enter the license plate of the inventory added in an earlier step, *LP10*.
6. Select **OK**.
7. Select the menu button and then select **Complete order** to finalize the warehouse app transfer order creation.

For the mentioned example, two **Warehouse app events** (*Create transfer order* and *Complete transfer order*) are used.

Inquire the warehouse app events

You can view the event queue and events messages generated by the warehouse app by going to **Warehouse management > Inquiries and reports > Mobile device logs > Warehouse app events**.

The *Create transfer order* event messages will receive the status *Waiting*, which means that the **Process warehouse app events** batch job will not pick up and process the event messages. As soon as the event message updates to status *Queued*, the batch job will process the events. This will happen at the same time as the creation of the *Complete transfer order* event (when a worker selects the **Complete order** button on the warehouse app). When the *Create transfer order* event messages has been processed, the status is updated to

Completed or *Failed*. When the *Complete transfer order* status is updated to *Completed*, all the related events are deleted from the queue.

Because the **Warehouse app events** for the creation of transfer order data will not be processed by the batch job before the messages are updated to status *Queued*, you will need to look up the requested transfer order numbers as part of the **Identifier** field. The **Identifier** field is in the header of the **Warehouse app events** page.

As part of the warehouse event processing, the creation of the transfer order line might fail. In this case, the state of the event message is updated to *Failed* and you can use the **Batch log** information to learn why and take action to correct any problems.

Typical issues could be related to missing setup for the process, like a missing transit warehouse for the *Create transfer order* event. In an example like this, you would add a transit warehouse to the shipping warehouse and use the **Reset** option to change the status for all the warehouse app event messages from *Failed* to *Queued*, which means that the batch job will process the event messages again after the correction of the setup data.

Within production environments, the exceptions would be more process related, such as having a requested license plate, which at the batch job processing time is empty and thereby no transfer order lines are created. This failed event message can either be removed by using the **Delete** option or you can add the needed physical on-hand on the license plate and use the **Reset** option for all the related event messages.

For more information, see [Warehouse app event processing](#).

Follow up on the example scenario processing

During this scenario, the following occurred:

1. Using the warehouse app, you selected a menu item that uses the activity code **Create transfer order from license plates**.
2. The app prompted you to select the destination warehouse for the transfer order. The source warehouse is always the one you currently are signed into as a Worker.
3. On the selection of the destination warehouse, the system reserved an ID number for the upcoming transfer order (based on the transfer-order number sequence defined on your system) but didn't create the transfer order yet.
4. When you scanned the license plate *LP10* containing on-hand inventory that should be moved to the new warehouse, a **Warehouse app event** was added to the events queue to be processed later. The warehouse event contained message details about the scan, including the intended transfer-order number.
5. On the warehouse app when the **Complete order** button is selected, a new warehouse app event, **Complete transfer order**, is created and the related existing event, **Create transfer order**, changed status to **Queued**.
6. On the back end, the **Process warehouse app events batch job** picked up the **Queued** event and collected the on-hand related to the scanned license plate. Based on the on-hand the actual transfer order record and associated lines got created. The job also populated the **Outbound shipment policy** field for the transfer order with the value based to configured *Release and ship confirm* and linked the license plate against the lines for the **License plate guided** strategy.
7. Based on the transfer order line **Outbound shipment policy** field value the **Automatic release of transfer orders batch job** query now resulted in releasing the transfer order to the shipping warehouse. And due to the setup for the used **Wave template**, **Work template**, and **Location directives** the work got auto processes resulting on the **Load status** got updated to *Loaded*.
8. The **Process outbound shipment batch job** is executed for the load, resulting in the transfer order being shipped and the Advance Shipment Notice (ASN) is generated.
9. The timing of all these events is dependent on the **Recurrence** settings for the batch jobs created.

Frequently asked questions

Mobile device menu item setup

Why can't I see "Create transfer order from license plate" in the menu item work activity drop-down list?

The feature *Create and process transfer orders from the warehouse app* must be enabled. For more information, see [Enable the create transfer orders from Warehouse app](#).

Warehouse app processes

Why can't I see the menu button "Complete order"?

You must have at least one license plate assigned to the transfer order.

Can several warehouse app users add license plates to the same transfer order at the same time?

Yes, several warehouse workers can scan license plates into the same transfer order.

Can the same license plate be added to different transfer orders?

No, a license plate can only be added to one transfer order at the time.

After having selected the "Complete order" button, can I then add more license plates for that transfer order?

No, you can't add more license plates to a transfer order that has a **Complete transfer order** warehouse app event.

How can I find existing transfer orders to be used via the "Select transfer order" button in the warehouse app, if the order has not yet been created in the backend system?

Currently, you can't look up transfer orders in the app, but you can find the transfer order numbers on the [Warehouse app events](#) page. For more information, see [Inquire the warehouse app events](#).

Can I manually select the transfer order number to be used from the warehouse app?

Only autogenerated transfer order numbers via number sequences are supported.

Background processing

How should I clean up records in my warehouse app events queue message tables?

You can view and maintain this on the [Warehouse app events](#) page. For more information, see [Inquire the warehouse app events](#).

Why is the transfer order "Receipt date" not updated according to my "Delivery date control" setup?

The transfer orders are created without using the **Delivery date control** capabilities.

Can I use a license plate having physical negative inventory on hand?

The feature only supports positive physical on-hand quantities. Make sure that you have positive physical on-hand quantities at the warehouse and inventory status level before assigning license plates to a transfer order.

NOTE

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Piece picking confirmation

2/18/2021 • 2 minutes to read • [Edit Online](#)

Piece picking allows you to confirm each piece of inventory through picking or counting work on a mobile device. For picks, you can confirm the quantity of work to be processed up to the quantity that is specified on work to be picked. For counting work, you can scan the inventory that you are counting and track the total amount.

When you enable piece picking, product confirmation is automatically selected. For work-type picks, a maximum number of pieces is enabled. This allows you to set a maximum to the number of pieces that must be confirmed during the work process. The maximum quantity is based on the current work unit that is being processed. The counting work type does not allow a maximum.

You can also use the quantity and unit of measure (UOM) that is associated with a scanned bar code. This will work for receiving on inbound flows including mixed license plate receiving, purchase order item, transfer order item, and load item. It also works for piece picking where scanning the bar code will add the quantity to the total number of confirmed pieces converting between the UOM on the bar code and the work unit. If, when counting the UOM on the bar code, it is confirmed that the quantity is allowed for counting on the sequence group, the quantity will be added to the total count.

Where it applies

Piece picking works for all counting work and for the initial pick for any type of work. Piece picking does not apply if the item is controlled by serial numbers or if it is a production or kanban pick from a license plate (LP) location and the item is set to staging.

Set up piece picking

1. On a mobile device menu item, open the setup form for work confirmation: Warehouse management > **Warehouse management** > **Setup** > **Mobile device** > **Mobile device menu items**.
2. From the mobile device menu item, open Work confirmation setup.

The following options become available for selection when the work type is pick or counting.

OPTION	DESCRIPTION
Piece picking confirmation	Available for pick and counting work types. Product confirmation is automatically selected. Allows you to confirm each piece of inventory from the mobile device.
Maximum number of pieces	Available for pick work if piece picking confirmation is enabled. Sets a limit to the number of pieces that you must confirm.

NOTE

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Packing materials and fees

2/18/2021 • 6 minutes to read • [Edit Online](#)

Packing material fees are paid to a recycling company at specific intervals. An amount is paid, per unit of weight, for each material that a packing unit consists of. Although packing material fees are calculated and reported, no ledger transactions are posted, because the fees aren't considered taxes that must be paid to an authority.

Packing material weights and fees are calculated for sales order lines and purchase order lines.

You can define one or more packing units for a single item, a group of items (packing group), or all items. A packing unit consists of the packing materials, their weights, and the number of items that are included in the packing unit. A packing material code is assigned to each type of packing material that is defined. Based on the packing material code, you can specify a price for a specific period. The packing material fee is calculated based on this information.

NOTE

Even if your company doesn't pay packing material fees, you can use the functionality to calculate statistics for the weights of packing materials.

Set up packing material allocation

Before you can calculate packing material weights, packing material fees, or both, you must turn on the calculation and define which materials and fees apply to which items.

1. Go to **Inventory management > Setup > Inventory and warehouse management parameters**.
2. On the **General** tab, in the **Packing material** section, set the **Calculate packing material fees** option to **Yes**.
3. Go to **Inventory management > Setup > Packing material > Packing groups**, and create all the packing groups that you use. All the items in a packing group will use the same packing material allocation. If you don't use packing groups, you can skip this step.

TIP

After you've created your packing groups, can assign a group to each product as you require. Go to **Product information management > Products > Released products**, select a product, and then, on the **Manage inventory** FastTab, in the **Packing group** field, select the appropriate packing group.

4. Go to **Inventory management > Setup > Packing material > Packing material codes**, define each type of packing material that you use, and specify the unit that the packing material is consumed in when you prepare shipments.
5. Go to **Inventory management > Setup > Packing material > Packing material fees**, and set a fee for each type of packing material that you just defined. Fees are calculated based on the price per unit that is consumed.
6. To allocate packing materials to items, go to **Inventory management > Setup > Packing material > Packaging material allocation**, and create allocations. You can create as many allocations as you require. You can allocate packing materials for individual items, groups of items (packing groups), or all

items, depending on how detailed your allocations should be.

For each allocation that you create, follow these steps.

a. On the **General** FastTab, set the following fields:

- **Item code** – Select the scope of the allocation:
 - **Table** – Create an allocation for a single specific item.
 - **Group** – Create an allocation for all the items that belong to a packing group that is defined on the **Packing groups** page.
 - **All** – Create an allocation for all items.

NOTE

Usually, you should make all your allocations at the same level (**Table**, **Group**, or **All**). If you use more than one level, the most specific matching allocation will be used for each item. (The **Table** level takes precedence over the **Group** level, and both those levels take precedence over the **All** level.)

- **Item relation** – If you're allocating for a single item, select the item. If you're allocating for a group of items, select the packing group. If you're allocating for all items, leave this field blank.
- **Configuration, Size, Color, and Style** – Enter values for these dimensions as you require, to further define the item that you're allocating for.
- **Packing unit** – Select the unit that the item is packaged in when the packing material is used. This unit might differ from the unit that the item is purchased and stored in.
- **Packing unit factor** – Enter the conversion factor that is used to convert from the inventory unit to the packing unit. (The conversion uses the formula $Packing\ units = Item\ units \times Packing\ unit\ factor$.)

b. On the **Packing material** FastTab, add a line for each piece of packing material that is required for the current allocation. On each line, specify the type of material (as defined on the **Packing material codes** page) and the amount of it that is consumed for each shipped unit of the current item.

Packing units on sales order lines

After you've [turned on the calculation for packing material fees and set up your allocations](#), the system verifies that packing units are specified for each item that is added to a sales order. It then calculates any fees that are required. When an item is added to a sales order, one of the following steps occurs:

- **If a packing allocation applies to the item:** The system updates the sales order line with the specified packing unit and the packing unit quantity. (The packing unit quantity is calculated by using the formula $Packing\ unit\ quantity = Ordered\ quantity \div Number\ of\ items\ in\ the\ selected\ packing\ unit$.)
- **If no packing allocation applies to the item:** You can manually enter a packing unit and a packing unit quantity on the sales order line.

You can also change the packing unit and the packing unit quantity when you post the sales order line. This capability is relevant if the sales order line is only partly delivered or partly invoiced.

When you invoice the sales order, the system creates packing material transactions. Packing material transactions contain the weights of the packing materials for the sales line. You can modify the transactions after you invoice them. You can then create new transactions.

Packing units on purchase order lines

The system doesn't create packing material transactions for purchase order lines. Instead, you manually create transactions for invoiced purchase order lines on the **Packing material transactions** page.

Set up license numbers for customers that are charged packing material fees

If the sales orders for a specific customer should include charges for the packing materials that are used for each order, follow these steps.

1. Go to **Accounts receivable > Customers > All customers**.
2. Select the customer that should be charged for packing materials.
3. On the **Invoice and delivery** FastTab, set the following fields:
 - In the **Sales tax** section, in the **Packing duty license number** field, enter the company's license number.
 - In the **Packing material fee** section, in the **License number** field, enter the company's license number.

Now, when you create and invoice a sales order that includes one or more items that use packing materials, the invoice will show the packing material fees.

For customers that should not pay packing material fees, follow these same steps, but clear the license numbers from the **Packing duty license number** and **License number** fields. Invoices for customers that don't pay packing material fees show the weights of the packing materials, but they don't show the fees.

To generate a report that shows all the packing material fees that your company will owe for a specific period, go to **Inventory management > Inquiries and reports > Packing material reports > Packing material fee calculation**, specify a range of dates, and then select **OK**.

Print packing material weights on invoices

You can print packing material weights on an invoice and indicate who pays the related fees. The weights are summarized by packaging code.

1. Go to **Accounts receivable > Setup > Accounts receivable parameters**.
2. On the **Updates** tab, on the **Invoice** FastTab, set the **Print packing material weight** option to **Yes**.

NOTE

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Set up manual packing (February 2016 & May 2016)

2/18/2021 • 3 minutes to read • [Edit Online](#)

The packing process allows you to validate and pack products into containers. In this process, warehouse workers pick products from the storage locations and move them to a packing station where they check the item quantities and types, and assign them to appropriate containers. When a container is fully packed, they can close it and move it to the outbound docks, and the products are ready to ship. This procedure uses the USMF demo company. This procedure is for the February 2016 & May 2016 versions of Dynamics 365 for Operations only.

Set up location profiles

1. Go to Warehouse management > Setup > Warehouse > Location profiles.
2. Click New.
 - The location profile is used for packing stations and contains information and rules for a location.
3. In the Location profile ID field, type a value.
4. In the Name field, type a value.
5. In the Location format field, enter or select a value.
6. In the Location type field, enter or select a value.
7. Select Yes in the Allow mixed items field.
8. Select Yes in the Allow mixed inventory statuses field.
9. Select Yes in the Override rules for batch days field.
10. Close the page.

Set up warehouse management parameters

1. Go to Warehouse management > Setup > Warehouse management parameters.
2. Click the Packing tab.
3. In the Profile ID for packing location field, enter or select a value.
 - Select the location profile that you want to use for packing.
4. Close the page.

Set up container types

1. Go to Warehouse management > Setup > Containers > Container types.
2. Click New.
 - You can define the types of containers to use. You can specify the physical dimensions of the container, including tare weight, maximum weight, maximum volume, length, width, and weight. The Attributes are customized fields that allow you to add extra dimensions on the container type.
3. In the Container type code field, type a value.
4. In the Description field, type a value.
5. In the Tare weight field, enter a number.
6. In the Maximum weight field, enter a number.
7. In the Volume field, enter a number.
8. In the Length field, enter a number.
9. In the Width field, enter a number.

10. In the Height field, enter a number.
11. Click Save.
12. Close the page.

Set up packing profiles

1. Go to Warehouse management > Setup > Packing > Packing profiles.
2. Click New.
3. In the Packing profile ID field, type a value.
4. In the Description field, type a value.
5. In the Container closing profile ID field, enter or select a value.
 - A container closing profile ID is optional and is the default close container profile for this packing profile.
6. In the Container ID mode field, select an option.
 - This option determines whether a container ID will be automatically generated when a container is created or if a container ID will be created manually.
7. In the Container type field, enter or select a value.
 - The container type will be used by default when a new container is created.
8. Select the Autocreate container at container close check box.
9. Click Save.
10. Close the page.

Set up container closing profiles

1. Go to Warehouse management > Setup > Containers > Container closing profiles.
 - Container closing profiles define what happens when a container is closed. You can set up multiple close container profiles.
2. Click New.
3. In the Container closing profile ID field, type a value.
4. In the Description field, type a value.
5. In the Manifest at field, select an option.
 - Specify whether manifesting will occur when closing containers or when confirming the shipment. Note that manifesting requires Transportation management. Manifesting must be implemented in the transportation engines in order for it work.
6. In the Warehouse field, enter or select a value.
7. In the Default location for final shipment field, enter or select a value.
 - This will be location to which products will be moved after the containers are closed. This location must have a location profile defined on Warehouse parameters.
8. In the Weight unit field, enter or select a value.
9. Click Save.

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Set up short picking item reallocation

2/18/2021 • 2 minutes to read • [Edit Online](#)

This procedure shows how to enable warehouse workers to quickly find alternative locations if there isn't sufficient inventory at the location they've been directed to.

The reallocation process is controlled by a **Work exception** and used by the warehouse **worker**.

It is possible to use Automatic, Manual, or both reallocation processes:

- Automatic reallocation - Location directives are used to determine if the goods are available at another location. If possible, the work will be updated and the warehouse user will be directed to the alternative location.
- Manual reallocation - Allows the warehouse user to select from one or more locations with unreserved quantities of goods.
- Automatic and manual - If the system is unable to perform an automatic reallocation, and locations are available with unreserved quantities, the user will be prompted to select a location.

Set up work exceptions

It's possible to define several work exceptions with different item reallocation policies to enable the warehouse worker to choose one based on the needs of the shipment that they are processing.

The USMF demo data company was used to create this procedure.

1. In the **Navigation pane**, go to **Warehouse management > Setup > Work > Work exceptions**.
2. Click **New**
3. In the **Work exception code** field, type a value. This will be the title of this exception . For example, Short picking manual.
4. In the **Description** field, type a value. This will be a short description of the usage of this exception. For example, Short picking - item not available.
5. In the **Exception type** field, select **Short pick**.
6. Select the **Adjust inventory** check box. If selected, inventory will automatically be adjusted to 0 at the short picked location.
7. In the **Default adjustment type code** field, enter or select a value. For example, in USMF you can select **Remove Res Adj Out**. Each Adjustment type code contains four characteristics: name, description, inventory journal name, and **Remove reservations**. If **Remove reservations** is enabled, the short-picked order line's reservations will be removed.
8. In the **Item reallocation** field, select a value, such as Manual. If you select Manual, or Automatic and Manual, the warehouse worker needs to be enabled to use manual reallocation.

Set up a worker to use manual item reallocation

The USMF demo data company was used to create this procedure.

1. Close the page.
2. In the **Navigation pane**, go to **Warehouse management > Setup > Worker**.
3. Click **Edit**.
4. In the list, select worker. For example, Julia Funderburk.
5. Expand the **Users** FastTab.

6. In the list, select a **User ID**. For example, 24.
7. Expand the **Work** FastTab.
8. Select **Yes** in the **Allow manual item reallocation** field.

NOTE

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Cancel warehouse work for exception handling

2/18/2021 • 2 minutes to read • [Edit Online](#)

The Cancel work functionality in Microsoft Dynamics 365 Supply Chain Management lets the admin user cancel specific warehouse work that is currently in progress, but that is blocked by the system or can't be completed because of exceptional circumstances. This functionality is an attractive and secure alternative to SQL corrective scripts that fix inconsistent data. However, whereas these scripts are typically requested from IT professionals, the Cancel work functionality can be used by users in the company who have admin rights.

You can access the Cancel work functionality at **Warehouse management > Periodic tasks > Clean up > Cancel work**. In the **Cancel work** dialog box, specify the work ID of the work to cancel, and then select **OK**.

Warehouse work that can be canceled

During warehouse picking operations, a worker might encounter situations where they have registered quantities as picked from a storage location to their user location, but then they can't register the put operation. Inconsistent warehouse data is often, but not always, the reason why work is blocked.

Unlike the regular Cancel functionality that can be accessed by using the **Cancel** button on the work header, the Cancel work functionality doesn't require that the last completed work line be a work line of the **put** type. In other words, for the Cancel work functionality, cancellation logic can be run even if the item quantity on a work line is in a user location.

NOTE

For work that must be canceled for operational reasons, warehouse users must continue to use the regular Cancel functionality on the work page.

Only work of the **Sales**, **Transfer issue**, **Raw material picking**, or **Replenishment** type can be canceled by using the Cancel work functionality. Cancellation logic won't be run for frozen raw material picking work or work that can be canceled by using the regular Cancel functionality (see the preceding note).

To unblock the work, the system cancels any remaining work lines and fixes the warehouse data that is associated with the work ID that the user specified. Any regular warehouse-handling operations that involve the affected item quantity can then resume.

To put the affected item in a specific location after the work is canceled, the user must use an inventory movement or quantity adjustment operation on a mobile device.

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System-directed work sequencing

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System-directed work sequencing lets you sort and filter the work orders that the system presents to users for execution. It's helpful in scenarios where additional criteria (such as the time of shipping, the picking zone, the location profile, or a combination of various criteria) are required to drive the warehouse picking process.

This functionality extends the current system-directed picking functionality by adding a system-directed query order, where users can set up a sequence and one or more queries that will evaluate all work orders that are created. Only work orders that meet the criteria that are specified in the setup of the mobile device menu item will be captured and presented.

Therefore, this functionality allows for further optimization of warehouse picking processes as it identifies work orders that match the specified criteria, assigns them to the correct mobile device menu item, and then presents them to a worker, based on a specific skill set, picking equipment, or other requirement.

NOTE

If different criteria are needed, multiple mobile device menu items must be used.

Turn on the Organization-wide system directed work sequencing feature

Before you can use system-directed work sequencing, the feature must be turned on in your system. Admins can use the [Feature management](#) workspace to check the status of the feature and turn it on if it's required. There, the feature is listed in the following way:

- **Module:** *Warehouse management*
- **Feature name:** *Organization-wide system directed work sequencing*

Setup

Make demo data available

To work through the scenario by using the values that are presented in this topic, you must work on a system where the standard demo data is installed. Additionally, you must select the **USMF** legal entity. The scenario uses warehouse *51* from the demo data.

IMPORTANT

Before you release the orders to the warehouse, make sure that the pick locations have enough inventory for all the items on the orders.

Default USMF data should support this scenario. If you aren't using demo data, review the **Location directive** setting to learn which picking locations are used for sales order picking. If you must adjust the inventory, you can create manual movements, use replenishment, or use any other flow.

Set up a mobile device menu item

1. Go to **Warehouse management > Setup > Mobile device > Mobile device menu items**.
2. In the list of mobile device menu items, select **Sales Picking – System**. The required menu item should

already exist.

3. Confirm the following settings:

- On the **General** FastTab, the **Directed by** field should be set to *System directed*.
- The **Work classes** FastTab should show the following settings.

WORK CLASS ID	WORK ORDER TYPE
Sales	Sales orders
SO Pick	Sales orders

4. On the Action Pane, select **System directed work sequence queries**.

5. Select **Edit**.

6. Delete the existing line, and then confirm the action by selecting **Yes**.

7. On the Action Pane, select **New** to create a line.

8. On the new line, set the following values:

- **Sequence number:** 1
- **Description field:** *Work quantity less than 20 and Descending*

9. Select **Save**.

10. On the Action Pane, select **Edit Query**.

11. On the **Joins** tab, expand the join hierarchy to show the **Work lines** table.

12. Select the **Work lines** table join.

13. Select **Add table join**.

14. In the list that appears, find and select the row that has the following settings:

- **Join mode:** *n:1*
- **Relation:** *Locations (Location)*

15. Select **Select**.

Locations are added to the table join.

16. On the **Sorting** tab, select **Add** to add a line.

17. On the new line, set the following values:

- **Table:** *Work lines*
- **Derived table:** *Work lines*
- **Field:** *Work quantity* (In the message box that appears, select **Yes** to add sorting to this field.)
- **Search direction:** *Descending*

18. Select the **Range** tab.

If only specific work criteria should be included in the sequencing, you can specify them on the **Range** tab. In this example, you want to include only work where the quantity is less than 20 ea (the lowest unit of measure).

Notice that some lines are already included. Those lines should not be removed.

19. Select **Add** to add a line.

20. On the new line, set the following values:

- **Table:** *Work lines*
- **Derived table:** *Work lines*
- **Field:** *Inventory work quantity*
- **Criteria:** *<20* (less than 20)

21. Select **Add** to add another line.

22. On the new line, set the following values:

- **Table:** *Work lines*
- **Derived table:** *Work lines*
- **Field:** *Work type*
- **Criteria:** *Pick*

23. Select **Add** to add another line.

24. On the new line, set the following values:

- **Table:** *Locations*
- **Derived table:** *Locations*
- **Field:** *Location profile ID*
- **Criteria:** *!STAGE*

IMPORTANT

Be sure to include the exclamation point (!) in front of *STAGE*.

25. Select **OK** to save and close the query.

26. Select **Save**.

27. Close the page to return to the **Mobile device menu items** page.

NOTE

This setup defines the criteria that will be used to feed eligible work to the mobile device menu item. If you add more criteria lines to the query, the system will use the query line that has lowest sequence number first. In other words, all eligible work for sequence number 1 will be presented to the user first, and then all work for sequence number 2. Therefore, if a specific range and sorting must be used together, they should be specified in the same system-directed work sequence query.

This setup will capture any work that has at least one line where the quantity is less than 20 ea. Therefore, if the work has a line where the quantity is exactly 20 ea or more than 20 ea, it will be valid, provided that it also has at least one line where the quantity is less than 20 ea.

Location directives

If you're using default Contoso data, the query for the location directive action won't require changes. However, to make sure that the location directives will capture the items on the sales orders when you apply the feature in a non-Contoso environment, create a new location directive. To verify the settings in the demo environment, follow these steps.

1. Go to **Warehouse management > Setup > Location directives**.

2. In the **Work order type** field, select *Sales orders*.
3. Select the location directive that is named *51 Pick*.
4. On the **Location Directive Actions** FastTab, select the line for the **Pick** action.
5. Select **Edit query** above the grid.
6. Review the **Range** query.
 - a. Find the line where the **Field** field is set to *Location*.
 - b. Make sure that the **Criteria** field is blank (that is, there are no restrictions).

Scenario

Create sales order picking work

Before system-directed picking is run, some outbound work should be created. For this scenario, you will create four sales orders that are based on the specified system-directed work sequence queries.

You will reserve inventory quantities for each sales order. Therefore, reserved inventory can't be withdrawn from the warehouse for other orders unless the inventory reservation, or part of the inventory reservation, is canceled.

You will then release each sales order to the warehouse to create the outbound work.

Sales order 1

1. Go to **Sales and marketing > Sales orders > All sales orders**.
2. On the Action Pane, select **New** to create sales order 1.
3. In the **Create sales order** dialog box, set the following values:
 - In the **Customer** section, set the **Customer account** field to *US-004*.
 - In the **General** section, set the **Warehouse** field to *51*.
4. Select **OK** to close the dialog box. Make a note of the sales order number.
5. Add a line to the new sales order, and set the following values:
 - **Item number:** *M9200*
 - **Quantity:** *20*
6. On the **Inventory** menu above the grid, select **Reservation**.
7. On the **Reservation** page, select **Reserve lot** to reserve the inventory.
8. Close the **Reservation** page.
9. On the Action Pane, on the **Warehouse** tab, select **Release to warehouse** to create work for the warehouse.

You receive informational messages that show the wave ID and shipment IDs that were created for the sales order.

Sales order 2

1. On the Action Pane, select **New** to create sales order 2.
2. In the **Create sales order** dialog box, set the following values:
 - **Customer account:** *US-007*
 - **Warehouse:** *51*
3. Select **OK** to close the dialog box. Make a note of the sales order number.

4. Add a line to the new sales order, and set the following values:
 - **Item number:** *M9200*
 - **Quantity:** *5*
5. Select **Add line** to add a second line, and set the following values:
 - **Item number:** *M9201*
 - **Quantity:** *1*
6. Reserve inventory for both lines.
7. Release the order to the warehouse.

Sales order 3

1. On the Action Pane, select **New** to create sales order 3.
2. In the **Create sales order** dialog box, set the following values:
 - **Customer account:** *US-009*
 - **Warehouse:** *51*
3. Select **OK** to close the dialog box. Make a note of the sales order number.
4. Add a line to the new sales order, and set the following values:
 - **Item number:** *M9200*
 - **Quantity:** *7*
5. Select **Add line** to add a second line, and set the following values:
 - **Item number:** *M9202*
 - **Quantity:** *8*
6. Reserve inventory for both lines.
7. Release the order to the warehouse.

Sales order 4

1. On the Action Pane, select **New** to create sales order 4.
2. In the **Create sales order** dialog box, set the following values:
 - **Customer account:** *US-010*
 - **Warehouse:** *51*
3. Select **OK** to close the dialog box. Make a note of the sales order number.
4. Add a line to the new sales order, and set the following values:
 - **Item number:** *M9200*
 - **Quantity:** *25*
5. Select **Add line** to add a second line, and set the following values:
 - **Item number:** *M9202*
 - **Quantity:** *10*
6. Reserve inventory for both lines.
7. Release the order to the warehouse.

Get work IDs for the work that was created

1. Go to **Warehouse management > Work > Work details**.
2. Filter on the **Warehouse** field so that only work for warehouse *51* is shown.

3. Four work IDs should have been created. Make a note of the work ID for each sales order.

SALES ORDER ID	WORK ID	WORK QUANTITY
Sales Order 1	Work ID 1	20 ea
Sales Order 2	Work ID 2	6 ea (sum of both lines)
Sales Order 3	Work ID 3	15 ea (sum of both lines)
Sales Order 4	Work ID 4	35 ea (sum of both lines)

Before you run the flow on the mobile device, make sure that only the work that you just created is in *Open* status for warehouse *51* and the *Sales order* work order type. Otherwise, the results of the test might vary, because the system-direct picking will include all eligible work.

1. Go to **Warehouse management > Work > Outbound > Open sales work**.
2. In the **Open sales work** grid, filter on the **Warehouse** field so that only work for warehouse *51* is shown.
3. Confirm that only the four work IDs that you created earlier are shown.
4. Close the **Work** page.

Mobile device flow execution

Based on the setup, the system will feed the user work that is sorted from the highest work line quantity to the lowest. The quantity on every line will be less than 20 ea.

Remember that this setup will capture any work that has at least one line where the quantity is less than 20 ea. Therefore, if the work has another line where the quantity is exactly 20 ea or more than 20 ea, it will also be valid.

Mobile app

1. Sign in to the warehousing app as a user in warehouse *51*.
2. Go to **Outbound > Sales Picking - System**.

The pick step for work ID *4* is presented. This work ID is presented first because of the setup of the system-directed query order, where you specified that work should be sequenced based on descending work line quantity.

3. Complete the required pick and put to close the work ID.

Next, work ID *3* is presented. One of its work lines is next in the sequence, based on the work line quantity.

4. Complete the pick and put to close the work ID.

Next, work ID *2* is presented. This work's pick line is next in the sequence.

5. Complete the pick and put to close the work ID.

No further work should be presented to you. Work ID *1* isn't eligible for this mobile device menu item, because the query specifies that work headers are considered only if the quantity on the work lines is less than 20 ea.

Tips

The system-directed work sequence queries are *inclusive*. It's important that you remember this fact for some setups. For example, you want a specific menu item to process only work where the work unit is *ea*, and you

specify that restriction on the **Range** tab of the query. In this case, all work where at least one work line has the work unit set to *ea* will be fed to the worker. Therefore, this work might also include work where work lines have a work unit other than *ea* (such as *box* or *pallet*). The query will exclude only work where no work line has the work unit set to *ea*.

Therefore, in the example from this scenario, work ID 4 was also captured by the query. When it was created, two lines were added: one for 25 ea and another for 10 ea. The work was still presented to the user, because at least one work line has a quantity of less than 20 ea.

Depending on the scenario, you can prevent this behavior by using work breaks.

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Pick line grouping

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Pick line grouping enables multiple work lines that have the same item and location to be combined into a single pick that is presented to the user on the mobile device. Therefore, warehouse workers can receive the most efficient instructions, but required work line separation (for different containers, orders, and so on) can still be maintained in the system.

Turn on the pick line grouping feature

Before you can use this feature, it must be turned on in your system. Administrators can use the [Feature management](#) workspace to check the status of the feature and turn it on if it's required. There, the feature is listed in the following way:

- **Module:** *Warehouse management*
- **Feature name:** *Pick line grouping*

Set up pick line grouping

Create a mobile device menu item

1. Go to **Warehouse management > Setup > Mobile device > Mobile device menu items**.
2. On the Action Pane, select **New**.
3. In the **Menu item name** field, enter *Sales group line picking*.
4. In the **Title** field, enter *Sales group line picking*. This title will be shown on the mobile device menu.
5. In the **Mode** field, select *Work*.
6. Set the **Use existing work** option to *Yes*.
7. On the **General** FastTab, set the following values:
 - In the **Directed by** field, select *User directed*.
 - Set the **Generate license plate** option to *Yes*.
 - Set the **Group pick** option to *Yes*.
 - Accept the default values for the remaining options.
8. Follow these steps to configure the valid work classes for the mobile device menu item:
 - a. On the **Work classes** FastTab, elect **New**.
 - b. In the **Work class ID** field, you can select either *Sales* or *SO Pick*, depending on the warehouse that you will use. For this scenario, select *SO Pick*.

The **Work order type** field is automatically set to *Sales orders*.

Set up a mobile device menu

Follow these steps to add the menu item that you just created to the **Outbound** menu.

1. Go to **Warehouse management > Setup > Mobile device > Mobile device menu**.
2. On the Action Pane, select **Edit**.
3. The list pane shows all existing mobile device menus. Select *Outbound* in the list.

4. In the **Available menus and menu items** list, find and select the *Sales group line picking* menu item that you created.
5. Select the right arrow button to move the *Sales group line picking* menu item to the **Menu structure** list.
6. Use the up arrow and down arrow buttons to move the menu item into the desired position in the menu structure.
7. On the Action Pane, select **Save**.

Set up a work template

1. Go to **Warehouse management > Setup > Work > Work templates**.
2. In the **Work order type** field, select *Sales orders*.
3. In the **Overview** grid, find and select the work template that should be used with this function. For this scenario, select the *51 Pick to stage* template.
4. On the Action Pane, select **Edit query**.
5. In the query editor dialog box, on the **Sorting** tab, select **Add**, and then set the following values for the new row:
 - In the **Table** column, select *Temporary work transactions*.
 - In the **Derived table** column, select *Temporary work transactions*.
 - In the **Field** column, select *Item number*.
 - In the **Search direction** column, select *Ascending*.
6. Select **OK** to close the dialog box and save your selection.
7. You receive the following message: "Grouping will be reset, continue?" Select **Yes** to continue.

IMPORTANT

For the pick line grouping functionality to work, the work lines must be sorted by item ID. If lines that have the same items aren't sequenced one after another, they won't be grouped.

Example

Create picking work

Before you can set up pick line grouping, you must create some eligible outbound work.

1. Go to **Sales and marketing > Sales orders > All sales orders**.
2. Select **New** to create a sales order.
3. In the **Customer account** field, select *US-004*.
4. On the **General** FastTab, in the **Warehouse** field, select *51*.
5. Select **OK**.
6. On the **Sales order lines** FastTab, add the following six lines:
 - **Line 1:** In the **Item number** field, select *M9200*. In the **Quantity** field, enter *3*.
 - **Line 2:** In the **Item number** field, select *M9201*. In the **Quantity** field, enter *3*.
 - **Line 3:** In the **Item number** field, select *M9202*. In the **Quantity** field, enter *2*.
 - **Line 4:** In the **Item number** field, select *M9200*. In the **Quantity** field, enter *1*.
 - **Line 5:** In the **Item number** field, select *M9200*. In the **Quantity** field, enter *3*.
 - **Line 6:** In the **Item number** field, select *M9202*. In the **Quantity** field, enter *7*.

Here is a summary of the total quantities for each item:

- **Item M9200:** 7 each
- **Item M9201:** 3 each
- **Item M9202:** 9 each

7. Before you release the orders to the warehouse, you must make sure that the pick locations have enough inventory for all the items on all the orders. Review the **Location directive** setting to determine which picking locations are used for sales order picking. If you're using the Contoso demo data environment for warehouse 51, confirm that there is available inventory.

You must now reserve the inventory for each line.

8. On the **Sales order lines** FastTab, select one of the lines that must be reserved.
9. On the **Inventory** menu above the grid, select **Reservation**.
10. On the **Reservation** page, on the Action Pane, select **Reserve lot** to apply the reservation. Then close the page.
11. Repeat steps 8 through 10 for the remaining lines that must be reserved.

You must now release the sales order to the warehouse.

12. On the Action Pane, on the **Warehouse** tab, select **Release to warehouse**.

You receive a message that states that a shipment and a wave have been created, and that the wave has been submitted to run in a batch.

When the wave and all downstream jobs have been completed, a work ID is created for work that has six lines. The lines are sorted by item number.

13. Go to **Warehouse management > Work > All work** to view the work that was created. Make a note of the **Work ID** value, because you will need it in the next procedure.

Initiate picking from the mobile device

1. Sign in to the mobile device as a user who is set up for warehouse 51.
2. On the mobile device, select the menu that includes the new mobile device menu item. For this scenario, select **Outbound**.
3. Select the **Sales group line picking** menu item to initiate the pick.
4. Enter the **Work ID** value that you made a note of in the previous procedure.

You should see a pick step where all pick lines for item *M9200* are grouped, and you should receive an instruction to pick 7 each of item *M9200*.

IMPORTANT

On the mobile device, the pick work for the three pick work lines has been aggregated into one picking step for the user.

5. Confirm the pick step.
6. Go to the work page for the work ID, and notice that all three pick lines for item *M9200* were closed simultaneously.
7. Go back to the mobile device, and continue to pick. Work line 4 for item *M9201* should be presented. Because there was only one work line on the order, there is nothing to aggregate.

8. Confirm the pick step.
9. The last pick step on the mobile device aggregates the last two pick lines from the work order.
10. Complete the pick step for 9 each of item *M9202*.
11. Confirm the put step and any additional pick/put pairs to complete the work.

IMPORTANT

- Work lines can be grouped only if they are in sequence.
- The following functionality isn't supported:
 - Catch-weight items

If there are any catch-weight items on the work, you receive an error message before you start to pick.

- Piece picking
- Work lines that have unfinished replenishment work
- Over-picking
- Short picking with item reallocation

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Warehouse slotting

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Several warehouse slotting features are available to help warehouse managers intelligently plan picking locations before they release orders to the warehouse and create picking work.

The *Warehouse slotting feature* lets you consolidate demand by item and unit of measure from orders that have a status of *Ordered*, *Reserved*, or *Released*. Generated demand can then be applied to locations that will be used for picking, based on quantity, unit, physical dimensions, fixed locations, and more. After the slotting plan has been established, replenishment work can be created to bring the appropriate amount of inventory to each location.

The *Warehouse slotting for transfer orders* feature lets warehouse managers replenish picking locations, based on demand from transfer orders that aren't yet released to the warehouse. It ensures that picking locations will include all the items that are required for the transfer orders after they are released to warehouse. This feature requires that you also turn on the *Warehouse slotting feature* feature.

The *Warehouse slotting allocation enhancements* feature adds an option for the template lines that are used by the *Warehouse slotting feature* feature. The option enables the system to consider existing on-hand inventory at a target location. Therefore, fewer replenishments might be generated for slotting. The *Warehouse slotting allocation enhancements* feature requires that you also turn on the *Warehouse slotting feature* feature. It can optionally be used together with the *Warehouse slotting for transfer orders* feature.

Turn on the warehouse slotting features

Before you can use these features, they must be turned on in your system. Admins can use the [feature management](#) settings to check the status of the features and turn them on if they are required. Turn on the following features as required:

- Warehouse slotting feature
- Warehouse slotting for transfer orders

IMPORTANT

The *Warehouse slotting feature* feature must be turned on before this feature.

- Warehouse slotting allocation enhancements

IMPORTANT

The *Warehouse slotting feature* feature must be turned on before this feature.

Set up warehouse slotting

To use warehouse slotting, you must set up the following elements in your system:

- Slotting unit of measure tiers
- Directive codes
- Slotting templates

- Location directives

Create unit-of-measure tiers for slotting

Unit-of-measure tiers enable multiple units of measure to be grouped together for the purposes of slotting. For example, if multiple sizes of boxes are all picked from the same box picking area, one tier can be created for all the sizes. **A line must be created for each unit of measure that should be part of the tier.**

1. Go to **Warehouse management > Setup > Replenishment > Slotting unit of measure tiers**.
2. Select **New**.
3. In the header, set the following values:
 - **Unit of measure tier:** *EaBoxPl*
 - **Description:** *Each box pallet*
4. Select **Save**.
5. On the **Units of measure** FastTab, select **New** to add a line to the grid.
6. On the new line, set the following values:
 - **Unit:** *Box*
 - **Description:** Leave this field blank. It will be filled in automatically when you save your changes.
 - **Unit class:** *Quantity*
7. Select **New** to add a second line to the grid.
8. On the new line, set the following values:
 - **Unit:** *ea*
 - **Description:** Leave this field blank. It will be filled in automatically when you save your changes.
 - **Unit class:** *Quantity*
9. Select **New** to add a third line to the grid.
10. On the new line, set the following values:
 - **Unit:** *PL*
 - **Description:** Leave this field blank. It will be filled in automatically when you save your changes.
 - **Unit class:** *Quantity*
11. Select **Save** to save the tier.

Create a directive code for slotting

You must select the directive code that should be associated with a template.

1. Go to **Warehouse management > Setup > Directive codes**.
2. On the Action Pane, select **New**.
3. In the **Directive code** field, enter *Slotting*.
4. In the **Directive description** field, enter *Slotting*.

Set up slotting templates

Each slotting template controls how inventory is assigned to locations for a specific warehouse. Each template must include a line for each slotting specification. Use the procedures in this section to set up slotting templates.

1. Go to **Warehouse management > Setup > Replenishment > Slotting templates**.
2. Select **New** to create a template.

Next, you must set up the template header, slotting specifications, and location directives, as explained in the following subsections. The setup for slotting for transfer orders resembles the setup for slotting for sales orders,

but the **Demand type** field is set *Transfer orders* instead of *Sales order*.

Set up the header for a sales order slotting template

1. In the header for the template, set the following values:

- **Slotting template:** *61*
- **Description:** *61*
- **Demand type:** *Sales order*

NOTE

Currently, *Sales orders* and *Transfer orders* are the only demand types that are supported. You can select *Transfer orders* only if the *Warehouse Slotting for transfer orders* feature is turned on.

- **Demand strategy:** *Ordered*

The following values are available in this field:

- **Ordered** – The full ordered quantity on the sales order should be considered demand.
- **Reserved** – Only the sales order line quantities that are reserved (physical and ordered) should be considered demand.
- **Released** – The released quantity should be considered demand.
- **Warehouse:** *61*
- **Allow wave demand to use unreserved quantities:** *Yes*

You can also specify a query to narrow the scope of the demand that is evaluated.

Set up slotting specifications for each template

For each sales order template that you create, follow these steps to add a line for each slotting specification.

1. On the **Slotting template details** FastTab, select **New** to create a template line.

2. On the new line, set the following values:

- **Sequence:** *1*
- **Description:** *Fixed location*
- **Minimum quantity:** *1*

This field defines the minimum quantity of demand that is required for the line.

- **Maximum quantity:** *1000000*

This field defines the maximum quantity of demand that is valid for the line.

- **Unit:** Leave this field blank.

This field defines the unit of measure that the minimum and maximum quantities refer to.

- **Unit of Measure Tier:** *EaBoxPI*

This field defines the units of measure of demand that are valid for the line. (For more information, see the [Set up unit-of-measure tiers for slotting](#) section earlier in this topic.)

- **Assign slot criteria:** *Consider qty*

The following values are available in this field:

- **Assume empty** – This system should assume that all locations in the picking area are empty and should not check those locations for inventory.
- **Consider qty** – The system should check the locations in the picking area for inventory and should skip any locations that aren't empty.
- **Consider on-hand** – The system should check whether any target location contains unreserved quantities for the item on the demand line. If the quantity is large enough to satisfy at least one unit of the demand line, the generated slotting plan record is reduced by the available amount. For example, if the demand is 10 cases, and one case is on hand, the located demand will be nine cases. If the demand is 10 cases, and one each is on hand, the located demand will be 10 cases. This value is available only when the *Warehouse slotting allocation enhancements* feature is turned on.

- **Directive code:** *Slotting*

This field defines the location directive that is used to find the picking location of the replenishment work.

- **Overflow location:** Leave this field blank.

This field defines the location that inventory that is put to if a location can't be found for the quantity when the line is processed.

- **Allow let up:** *Yes*

When this option is set to *Yes*, if any demand can't be slotted, movement work will be created to take inventory out of locations where there is inventory, but where nothing was slotted. The template is then run again. This time, it ignores the inventory in the locations. This functionality works best when the **Assign slot criteria** field is set to *Consider qty*.

- **Fixed location usage:** *Only fixed locations for the product*

The following values are available in this field:

- **Fixed and non-fixed locations** – The system should not be limited to using only fixed locations.
- **Only fixed locations for the product** – The system should slot only to locations that are fixed locations for the product.
- **Only fixed locations for the product variant** – The system should slot only to locations that are fixed locations for the product variant.

NOTE

If the slotting template contains at least one line where the **Assign slot criteria** field is set to *Consider on-hand*, let-ups are no longer allowed for any line in the template.

1. Select **Save**.
2. Select **New** to create a second template line.
3. On the new line, set the following values:
 - **Sequence:** *2*
 - **Description:** *Other*
 - **Minimum Qty:** *1*
 - **Maximum Qty:** *1000000*
 - **Unit:** Leave this field blank.

- **Unit of measure tier:** *EaBoxPl*
- **Assign slot criteria:** *Consider qty*
- **Directive code:** *Slotting*
- **Overflow location:** Leave this field blank.
- **Allow let up:** *Yes*
- **Use fixed locations:** *Fixed and non-fixed locations*

In the query for the second line, you will now specify the criteria that are used to determine what locations the demand for that line can be slotted to.

4. Select the line where the **Sequence** field is set to 2.
5. Select **Edit query**.
6. On the **Range** tab, select **Add** to add a line to the grid.
7. On the new line, set the following values:
 - **Table:** *Locations*
 - **Derived table:** *Locations*
 - **Field:** *Location profile ID*
 - **Criteria:** *Pick-06* (Select the double plus sign [++] in the field to expand the list, and then select *Pick-06 - Picking Site 6*.)
8. Select **OK**.

Set up location directives

At least one location directive must be set up to support slotting picks. Use the procedures in this section to set up a new *replenishment location directive* for slotting picks.

1. Go to **Warehouse management > Setup > Location directives**.
2. In the left pane, in the **Work order type** field, select *Replenishment*.
3. On the Action Pane, select **New**.
4. In the header for the new location directive, in the **Name** field, enter *61 Slotting pick*.
5. In the **Sequence number** field, accept the default value.

Configure the Location directives FastTab

1. On the **Location directives** FastTab, set the following values. Accept the default values for all other fields.
 - **Work type:** *Pick*
 - **Site:** *6*
 - **Warehouse:** *61*
 - **Directive code:** *Slotting*
2. Select **Save** to make the **Lines** FastTab available.

Configure the Lines FastTab

1. On the **Lines** FastTab, select **New** to create a line.
2. On the new line, set the following values.
 - **From quantity:** *0*
 - **To quantity:** *1000000*
3. Accept the default values for the remaining fields.
4. Select **Save** to make the **Location Directive Actions** FastTab available.

Configure the Location Directive Actions FastTab

1. On the **Location Directive Actions** FastTab, select **New** to create a line.
2. On the new line, set the following values. Accept the default values for all other fields.
 - **Sequence number**: Accept the default value.
 - **Name**: *Bulk*
 - **Strategy**: *None*
3. Accept the default values for the remaining fields.
4. Select **Save** to make the **Edit query** button available.

Edit the query

1. On the **Location Directive Actions** FastTab, select **Edit query**.
2. On the **Range** tab, select **Add** to add a line to the grid.
3. On the new line, set the following values:
 - **Table**: *Locations*
 - **Derived table**: *Locations*
 - **Field**: *Zone ID*
 - **Criteria**: *Bulk* (Select the double plus sign [+ +] in the field to expand the list, and then select *Bulk*.)
4. Select **OK**.

Scenario

Set up the scenario

For this scenario, use the built-in sample data, and create the records that are described in this section.

Use the USMF sample data

To work through this scenario by using the sample records and values that are specified here, you must be on a system where the standard [demo data](#) is installed. Additionally, you must select the **USMF** legal entity before you begin.

Create demand

Follow these steps to create the demand that you will apply slotting to.

1. Go to **Sales and marketing > Sales orders > All sales order**.
2. Select **New** to create a sales order.
3. In the **Create sales order** dialog box, in the **Customer account** field, select *US-007*.
4. In the **Warehouse** field, select *61*.
5. Select **OK**.
6. The new sales order is opened. It includes an empty line on the **Sales order lines** FastTab. On this line, set the following values:
 - **Item**: *L0101*
 - **Quantity**: *20*
7. Select **Add line** to add a new line, and set the following values:
 - **Item**: *T0100*
 - **Quantity**: *8*
8. Select **Save**.
9. Select **New** to create a second sales order.

10. In the **Create sales order** dialog box, in the **Customer account** field, select *US-008*.
11. In the **Warehouse** field, select *61*.
12. The new sales order is opened. It includes an empty line on the **Sales order lines** FastTab. On this line, set the following values:
 - **Item:** *T0100*
 - **Quantity:** *1*
13. Select **Save**.

Walk through a typical slotting scenario

After all the prerequisite elements are in place, as described in the previous section, you're ready to try out the feature by working through each exercise in this section.

Generate demand

1. Go to **Warehouse management > Setup > Replenishment > Slotting templates**, and select the slotting template that you created earlier.
2. On the Action Pane, select **Generate demand**. This command evaluates all demand that is in the system, and that matches the slotting template query. The total demand across all orders is then consolidated onto one line per quantity/unit of measure. An informational message appears when the process is completed.

Slotting demand

The *slotting demand* shows the results of demand generation, based on the setup of the slotting template.

- On the Action Pane, select **Slotting demand** to view the results from the **Generate demand** command. The lines in the slotting demand can be edited. You can delete a line, add a new line, or edit the line details.

NOTE

You can edit demand manually, or you can import it from an external system by using data management. Whatever is in the slotting demand will be used in the next step, regardless of where it came from.

Locate demand

After demand has been generated, you must use the **Locate demand** command to generate the *slotting plan*.

- On the Action Pane, select **Locate demand**. The slotting process runs. An informational message appears when the process is completed.

Slotting plan

The slotting plan shows the location that each item/quantity was assigned to, whether overflow was used, whether let-up work was created, and the template line that was used. *Any demand that could not be slotted is highlighted in red.*

- On the Action Pane, select **Slotting plan** to view the results.

NOTE

- The **Generate demand**, **Locate demand**, and **Run replenishment** processes are now run in a sandbox. (These processes are available from the Action Pane on the **Slotting templates** page.)
- The **Generate demand**, **Locate demand**, and **Run replenishment** processes have a lock to ensure that they can't be triggered at the same time. Otherwise, the data that is used could be deleted.
- The **Generate demand** and **Locate demand** processes show a warning if the run didn't generate records, or if the records are missing information.
- When you select **Slotting plan**, the page doesn't have **New**, **Edit**, or **Delete** buttons on the Action Pane, because the data source can't be edited.
- When you select **Run replenishment**, the system validates the selected slot template and processes.

Create replenishment

After the slotting plan has been created, you must create *replenishment work*, based on the plan.

- On the Action Pane, select **Run replenishment**. An informational message appears when the process is completed. This message indicates the number of headers that were created for the work build ID.

Location directives that will be used are identified based on the directive code that is specified on each template line.

Tips

Set up automatic slotting

After all the required elements are in place, you can set up slotting to run automatically by following these steps.

1. Go to **Warehouse management > Replenishment > Run slotting**.
2. Specify the slotting steps to run. Select one or more of the following slotting steps:
 - Generate demand
 - Locate demand
 - Create replenishment work

NOTE

The slotting steps are progressive. If you want to select *Locate demand*, you must first select *Generate demand*.

3. Specify the slotting template to use.
4. Set the recurrence to run automatically, if you want.

For the exercises in the scenario, do **not** set up automatic slotting.

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Location directive inventory picking aging

2/18/2021 • 7 minutes to read • [Edit Online](#)

This topic explains how to use first in, first out (FIFO) and last in, first out (LIFO) location directive strategies during picking. These strategies work in conjunction with the aging dates that are recorded for locations to track when inventory first entered the warehouse. The *Location directive inventory picking aging* feature uses the date on the location to determine aging. The *Warehouse location status* feature updates the date on the location, based on the date from the license plate.

You can use FIFO and LIFO strategies to ship both batch-tracked items and non-batch-tracked items, based on the date when the inventory entered the warehouse. This capability can be especially useful for non-batch-tracked inventory, where an expiration date isn't available to use for sorting.

When inventory is first received or created in the warehouse, the system updates the relevant license plate so that the current date is shown as the aging date. This date is then used by the location directive strategies to identify the oldest or newest inventory in the warehouse. If inventory is moved to a location that isn't tracked by license plate, the location itself is updated with aging information, and this information will then be used by the strategies.

Turn on the feature

To make this feature available, turn on the following features in [feature management](#), in this order:

1. Warehouse location status
2. Location directive inventory picking aging

Feature requirements

To use this feature, you must set the **Enable location status** option set to *Yes* for every [location profile](#) that is used to store inventory. To set this option for a location profile, go to **Warehouse management > Setup > Warehouse > Location profiles**, and select the location profile. You can find the option on the **General** FastTab.

Feature scenarios

This section provides examples that show how to set up and use FIFO and LIFO strategies.

TIP

This section provides two scenarios, one for FIFO and one for LIFO. The procedures that are provided assume that you will do both scenarios, in order. We recommend that you do both scenarios, so that you can experience the differences between the two strategies.

Make sample data available

To work through these scenarios by using the sample records and values that are specified here, you must be on a system where the standard [demo data](#) is installed. Additionally, you must select the **USMF** legal entity before you begin.

You can also use these scenarios as guidance for using the feature on a production system. However, in that case, you must substitute your own values for each setting that is described here.

Set up the scenarios

The demo data requires setup and inventory adjustments to support the scenarios. Follow these steps to create the inventory data that is required to work through the FIFO and LIFO scenarios.

1. Sign in to a system where demo data is installed, and select the **USMF** legal entity.
2. Go to **Warehouse management > Setup > Warehouse > Location profiles**.
3. On the Action Pane, select **Edit**.
4. In the list of location profiles, select **FLOOR-05**.
5. On the **General** FastTab, set the **Enable location status** option to *Yes*.
6. Select **Save**.
7. Go to **Warehouse management > Setup > Location directives**.
8. In the list of location directives, select **63 Pick containerization**.
9. Select **Edit** to put the page into edit mode.
10. On the **Location directive actions** FastTab, find the line where the **Sequence number** field is set to *1*, and follow one of these steps:
 - If you're setting up a FIFO scenario, change the value of the **Strategy** field to *Location aging FIFO*.
 - If you're setting up a LIFO scenario, change the value of the **Strategy** field to *Location aging LIFO*.
11. On the **Location directive actions** FastTab, select **Edit query**.
12. In the query dialog box, on the **Range** tab, select **Add** to add a line, and then set the following values:
 - **Table:** *Locations*
 - **Derived table:** *Locations*
 - **Field:** *Zone ID*
 - **Criteria:** *Floor*
13. Select **OK** to apply your settings and close the query dialog box.
14. Select **Save** to save your changes to the location directive.
15. On a mobile device or in the *Dynamics 365 for Finance and Operations - Warehousing* app on your PC, follow these steps to remove existing inventory from the warehouse location to support the scenarios:
 - a. Sign in to warehouse *63* by using the appropriate user ID and password.
 - b. On the main menu, select **Quality**.
 - c. On the **Quality management** menu, select **Scrap**.
 - d. On the **Scrap** page, select the **LOC/LP** field, and then enter *63_1*.
 - e. Select **Enter** or **OK**.
 - f. Confirm the **Scrap** details for **Adjustment out** by selecting **Enter** or **OK**.

When the license plate inventory is adjusted out, you receive a "Work Completed" message.

These steps leave inventory in two locations in the demo data. Each location has a different aging date. Location *FL-001* has an aging date of April 15, 2017, and location *FL-002* has an aging date of January 29, 2017. Both locations contain item *A0001*.

To view this data, go to **Inventory management > Inquiries and reports > On-hand list**, and then filter on warehouse *63* and item *A0001*. In the rows where the **Location** field is set to *FL-001* or *FL-002*, select a line that has a positive **Physical inventory** value, and then, on the Action Pane, select **Transactions**. The **Physical date** field will show a date that corresponds to one of the previously

mentioned aging dates.

Scenario 1: Set up and use FIFO location aging

The FIFO strategy finds the location that contains the oldest aging date, and it allocates picking based on that aging date.

1. If you haven't already done so, [prepare the sample data](#) that is required for this scenario.
2. Go to **Sales and marketing > Sales order > All sales orders**.
3. Select **New**.
4. In the **Create sales order** dialog box, set the following values:
 - On the **Customer** FastTab, set the **Customer** account field to *US-001*.
 - On the **General** FastTab, set the **Warehouse** field to *63*.
5. Select **OK** to create the sales order and close the dialog box.
6. The new sales order is opened. It includes a new, empty row in the grid on the **Sales order lines** FastTab. For this order line, set the **Item number** field to *A0001* and the **Quantity** field to *1*.
7. On the **Inventory** menu above the grid, select **Reservation**.
8. On the **Reservation** page, select **Reserve lot** to reserve the ordered quantity of this item from inventory at the selected warehouse.
9. Close the **Reservation** page.
10. On the **Sales order** page, on the Action Pane, on the **Warehouse** tab, in the **Actions** group, select **Release to warehouse**. You receive informational messages. The system creates a shipment, adds it to a new load, and creates the required work.
11. On the **Sales order lines** FastTab, on the **Warehouse** menu, select **Work details** to open the work that was created for this sales order. Notice that the line where the **Work type** value is *Pick* shows a **Location** value of *FL-002*. This location contains the license plate that has the oldest aging date (FIFO).
12. Select **Warehouse > Shipment details**.
13. On the ***General** FastTab, make a note of the wave ID, so that you can use it in scenario 2.

Scenario 2: Set up and use LIFO location aging

The LIFO strategy finds the location that contains the newest aging date, and it allocates picking based on that aging date. In scenario 2, you will edit the setup for scenario 1 (FIFO), and reuse the sales order and wave that were created during that scenario.

1. Before you start this scenario, set up and complete the full FIFO scenario as described in the [previous section](#). In this scenario, you will reuse the wave and most of the setup that were created for that scenario.
2. Edit the **63 Pick containerization** location directive so that it uses the *Location aging LIFO* strategy, as described in the first part of the [Set up the scenarios](#) procedure.

Next, you will modify the wave that was created for the sales order in scenario 1, so that it uses the *Location aging LIFO* strategy.

3. Go to **Warehouse management > Outbound waves > Shipment waves > All waves**.
4. Select and open the wave that contains the order that you created for the FIFO scenario.
5. On the Action Pane, on the **Work** tab, select **Cancel** to cancel the work that you created for the FIFO scenario.

6. On the Action Pane, on the **Wave** tab, in the **Wave** group, select **Process**.
7. When the processing is completed, on the Action Pane, on the **Wave** tab, in the **Related information** group, select **Work** to open the work that was created for this wave.
8. On the **Work** page, on the **Overview** tab, there should be two lines. Select the line where the **Work status** field is set to *Open*.
9. Notice that the line where the **Work type** value is *Pick* shows a **Location** value of *FL-001*. This location contains the license plate that has the newest aging date (LIFO).

In these scenarios, you've seen how the location aging strategy directs work to the inventory location that has either the oldest inventory or the newest inventory, depending on the selected strategy.

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Outbound sorting

2/18/2021 • 24 minutes to read • [Edit Online](#)

This functionality makes it easier to handle small containers and helps warehouse workers better plan and organize pallet capacity in the truck. When you use outbound sorting, you can sort packed containers to the correct pallet after they have been at a packing station. You can also build a packing hierarchy.

This functionality lets you build pallets from containers that are packed through the packing functionality. The container isn't sent to the final shipping location as it is in the original packing flow. Instead, workers can close the container and move it to a sort type location. They can then sort containers to positions, each of which has a license plate (LP). After the containers have been sorted, work can be created to send the whole LP to the final shipping dock or stage locations, based on location directives or your own requirements. Additionally, the action of closing of the sort position can immediately move the inventory to the final shipping location and pick it to the order.

Turn on the Outbound sorting feature

Before you can use the feature, it must be turned on in your system. Admins can use the [Feature management](#) workspace to check the status of the feature and turn it on if it's required. There, the feature is listed in the following way:

- **Module:** *Warehouse management*
- **Feature name:** *Outbound sorting*

Setup

For this scenario, you must use standard **USMF** demo data and warehouse *62*. You must also complete the setup that is described in the following subsections.

Set up a wave template

This setup automatically processes the wave and creates work when a line is released to the warehouse.

1. Go to **Warehouse management > Setup > Waves > Wave templates**.
2. In the template list, select **Warehouse 62**.
3. On the **General** FastTab, make sure that the **Process wave at release to warehouse** option is set to *Yes*.

Set up a worker

The packing station is considered a location. Warehouse workers who sign in at the packing station see and work on only shipments and containers that are planned at that specific packing location. A user who signs in to Microsoft Dynamics 365 must be set up as a worker in Warehouse management. If the user's name doesn't appear in the list of work users, use the following procedure to add it.

NOTE

These steps assume that the user already exists in the system and has been associated as an employee or worker in the **Human Resources** module.

1. Go to **Warehouse management > Setup > Worker**.
2. Select **New**.

3. In the **Worker** field, select the target user in the list of employees.
4. Select **Select**.
5. On the Action Pane, select **Save**.
6. On the **Users** FastTab, select **New** to create a mobile device account, and set the following values for it:
 - **User ID:** Enter a unique ID.
 - **User name:** Enter a name for the ID.
 - **Default warehouse:** *62*
 - **Menu name:** *Main*
7. On the Action Pane, select **Save**.
8. The **Set password** dialog box appears, where you can create a simple password that the user can use to sign in to the mobile app. Set the following values:
 - **Password:** Enter a simple password.
 - **Confirm password:** Enter the same password again.
9. Select **Set password**.

A notification in the Action Center informs you that the password has been set for the user that you created.

Create a location type

1. Go to **Warehouse management > Setup > Warehouse > Location types**.
2. On the Action Pane, select **New** to create a location type, and set the following values for it:
 - **Location type:** *SORT*
 - **Description:** *Sort*
3. On the Action Pane, select **Save**.

Set up Warehouse management parameters

1. Go to **Warehouse management > Setup > Warehouse management parameters**.
2. On the **General** tab, on the **Location types** FastTab, set the **Sorting location type** field to *SORT*.
3. On the Action Pane, select **Save**.

Set up a location profile

1. Go to **Warehouse management > Setup > Warehouse > Location profiles**.
2. On the Action Pane, select **New**.
3. In the header, set the following values:
 - **Location profile ID:** *Sorting*
 - **Name:** *Sorting*
4. On the **General** FastTab, set the following values:
 - **Location format:** *ASRB* (Aisle-Rack-Shelf-Bin)
 - **Location type:** *SORT*
 - **Use license plate tracking:** *Yes*
 - **Allow mixed items:** *Yes* (When you set this option to *Yes*, the **Allow mixed inventory batches** option is automatically set to *Yes* and can't be changed independently.)
5. Select **Save**.

Set up a location

1. Go to **Warehouse management > Setup > Warehouse > Locations**.
2. In the header, clear the **Generate check digits for location** check box.
3. On the Action Pane, select **New** to create a location, and set the following values for it:
 - **Warehouse:** *62*
 - **Location:** *SORT*
 - **Location profile ID:** *SORTING*
4. Select **Save**.

Set up an outbound sorting template

The outbound sorting template determines whether work is created out of the sort location, and whether sorting is done manually or automatically.

For this scenario, you will create an outbound sorting template to build pallets after the packing station.

1. Go to **Warehouse Management > Setup > Packing > Outbound sorting template**.
2. On the Action Pane, select **New**.
3. In the header of the new template, set the following values:
 - **Outbound sorting template ID:** *AutoWork*
 - **Description:** *Auto Work Creation*
 - **Outbound sorting template type:** *Container*
 - **Warehouse:** *62*
 - **Location:** *SORT*
4. On the **General** FastTab, set the following values:
 - **Sort verification:** *Position scan*
 - **Create work on position close:** *Yes*

If this option is set to *Yes*, when the position is closed, work will be created to move inventory to the final shipping location. If it's set to *No*, inventory will immediately be picked to the order when the position is closed.
 - **Position assignment:** *Automatic*

If this field is set to *Manual*, the user must always indicate which position the inventory should be sorted to. If it's set to *Automatic*, the system will automatically guide the inventory to a position whenever it can, based on the sort template breaks.
5. Select **Save** to make the **Edit query** button on the Action Pane available.
6. On the Action Pane, select **Edit Query**.
7. In the query editor, on the **Sorting** tab, add a line that has the following values:
 - **Table:** *Shipments*
 - **Derived table:** *Shipments*
 - **Field:** *Carrier service*

When you select this value, you might receive the following message: "Field Carrier service is not an index field. Do you want to add sorting on this?" Select **Yes**.
 - **Search direction:** *Ascending*

8. Select **OK**.
9. You might receive the following message: "Grouping will be reset, continue?" Select **Yes**.
The **Outbound sorting template breaks** button on the Action Pane becomes available.
10. On the Action Pane, select **Outbound sorting template breaks**.
11. In the **Outbound sorting criteria** dialog box, set the following values:
 - **Reference table name:** *Shipments*
 - **Reference field name:** *Carrier service*
 - **Group by field:** Select this check box to group shipments by carrier service.
12. Select **OK** to save your settings and close the dialog box.

Set up container packing policies

1. Go to **Warehouse management > Setup > Containers > Container packing policies**.
2. On the Action Pane, select **New**.
3. In the header of the new policy, set the following values:
 - **Container packing policy:** *Sort*
 - **Description:** *Sort*
4. On the **Overview** FastTab, set the following values:
 - **Warehouse:** *62*
 - **Default location for sorting:** *SORT*
 - **Weight unit:** *kg*
 - **Container closing policy:** *Automatic release*
 - **Container release policy:** *Assign container to outbound sorting position*
5. Select **Save**.

Set up packing profiles

Create a new packing profile that will be used together with the sorting functionality.

1. Go to **Warehouse management > Setup > Packing > Packing profiles**.
2. On the Action Pane, select **New** to create a line, and set the following values for it:
 - **Packing profile ID:** *Sort*
 - **Description:** *Sort*
 - **Container packing policy:** *Sort*
 - **Container ID mode:** *Auto*
 - **Container type:** *Box-Large*
 - **Auto create container at container close:** Cleared (= *No*)
3. Select **Save**.

Set up work classes

Set up a work class that will be used together with sorting.

1. Go to **Warehouse management > Setup > Work > Work classes**.
2. On the Action Pane, select **New** to create a work class for sorting, and set the following values for it:
 - **Work class ID:** *Sort*
 - **Description:** *Sort*

- **Work order type:** *Sorted inventory picking*

3. Select **Save**.

Set up mobile device menu items

Set up a new pallet menu item

Create a mobile device menu item to build pallets during sorting.

1. Go to **Warehouse management > Setup > Mobile device > Mobile device menu items**.

2. On the Action Pane, select **New**.

3. In the header, set the following values:

- **Menu item name:** *Pallet build*
- **Title:** *Pallet build*
- **Mode:** *Indirect*
- **Use existing work:** *No*

4. On the **General** FastTab, set the following values:

- **Activity code:** *Outbound sorting*

When this field is set to *Outbound sorting*, the **Outbound sorting template ID** field is shown.

- **Use process guide:** *Yes*

When the **Activity code** field is set to *Outbound sorting*, this option is automatically set to *Yes*.

- **Outbound sorting template ID:** *AutoWork*

5. Select **Save**.

Set up a new loading menu item

Next, create a menu item that lets users move the sorted inventory items to the shipping location.

1. Go to **Warehouse management > Setup > Mobile device > Mobile device menu items**.

2. On the Action Pane, select **New**.

3. In the header, set the following values:

- **Menu item name:** *Load from Sorting*
- **Title:** *Load from Sorting*
- **Mode:** *Work*
- **Use existing work:** *Yes*

4. On the **General** FastTab, set the **Directed by** field to *User directed*.

5. On the **Work classes** FastTab, select **New**, and then set the following values:

- **Work class ID:** *SORT*
- **Work order type:** *Sorted inventory picking*

6. Select **Save**.

Set up the mobile device menu

You must now add the new menu items to the mobile device menu.

1. Go to **Warehouse management > Setup > Mobile device > Mobile device menu**.

2. Select the **Outbound** menu.

3. On the Action Pane, select **Edit**.

4. In the **Available menus and menu items** column, find and select **Pallet build**.

5. Select the right arrow button to move **Pallet build** to the **Menu structure** column.
6. Use the up arrow and down arrow buttons to put the **Pallet build** menu item in the desired position on the mobile device menu.
7. Select **Save**.
8. Repeat this procedure to add the **Load from Sorting** menu item to the **Outbound** menu.

Set up location directives

Location directives are rules that help identify pick and put locations for inventory movement. You must now create a rule to manage the sorting work.

Set up a single-SKU directive

1. Go to **Warehouse management > Setup > Location directives**.
2. In the left pane, change the value of the **Work order type** field to *Sorted inventory picking*.
3. On the Action Pane, select **New**.
4. In the header, set the following values:
 - **Sequence:** 1
 - **Name:** *Baydoor*
5. On the **Location directives** FastTab, set the following values:
 - **Work type:** *Put*
 - **Site:** 6
 - **Warehouse:** 62
 - **Multiple SKU:** *No*
6. Select **Save** to make the toolbar on the **Lines** FastTab available.
7. On the **Lines** FastTab, select **New**, and then set the following values on the new line. Accept the default values for all the other fields.
 - **Sequence:** 1
 - **From:** 0
 - **To:** 1,000,000
8. Select **Save** to make the toolbar on the **Location Directive Actions** FastTab available.
9. On the **Location Directive Actions** FastTab, select **New**, and then set the following values on the new line. Accept the default values for all the other fields.
 - **Sequence:** 1
 - **Name:** *Baydoor*
10. Select **Save**.
11. On the **Location Directive Actions** FastTab, select **Edit query**.
12. In the query editor, on the **Range** tab, find the row where the **Field** field is set to *Location*. Set the **Criteria** field for this row to *Baydoor*.
13. Select **OK** to save your settings and close the query editor.

Set up a multiple-SKU directive

1. Go to **Warehouse management > Setup > Location directives**.
2. In the left pane, change the value of the **Work order type** field to *Sorted inventory picking*.
3. On the Action Pane, select **New**.

4. In the header, set the following values:

- **Sequence:** 2
- **Name:** *Baydoor Multi*

5. On the **Location directives** FastTab, set the following values:

- **Work type:** *Put*
- **Site:** 6
- **Warehouse:** 62
- **Multiple SKU:** *Yes*

6. Select **Save** to make the toolbar on the **Lines** FastTab available.

7. On the **Lines** FastTab, select **New**, and then set the following values on the new line. Accept the default values for all the other fields.

- **Sequence:** 1
- **From:** 0
- **To:** 1,000,000

8. Select **Save** to make the toolbar on the **Location Directive Actions** FastTab available.

9. On the **Location Directive Actions** FastTab, select **New**, and then set the following values on the new line. Accept the default values for all the other fields.

- **Sequence:** 1
- **Name:** *Baydoor Multi*

10. Select **Save**.

11. On the **Location Directive Actions** FastTab, select **Edit query**.

12. In the query editor, on the **Range** tab, find the row where the **Field** field is set to *Location*. Set the **Criteria** field for this row to *Baydoor*.

13. Select **OK** to save your settings and close the query editor.

Set up work templates

1. Go to **Warehouse management > Setup > Work > Work templates**.

2. Change the value of the **Work order type** field to *Sorted inventory picking*.

3. On the Action Pane, select **New** to create a work template.

4. On the **Overview** tab, set the following values:

- **Sequence:** 1
- **Work template:** *Sort*
- **Work template description:** *Sort*

5. Select **Save** to make the **Work Template Details** FastTab available.

6. On the **Work Template Details** FastTab, select **New** to add a line, and then set the following values for it:

- **Work type:** *Pick*
- **Work class ID:** *SORT*

7. Select **New** again to add a second line, and then set the following values for it:

- **Work type:** *Put*
- **Work class ID:** *SORT*

8. Select **Save**.

Scenario

This scenario simulates a situation where packed containers should automatically be sorted to different positions (pallets) after the packing station, depending on the shipping carrier service. After all items from the load are packed and sorted by address, the pallets will be moved to the bay door.

Create sales orders and picking work

Create sales order 1

1. Go to **Sales and marketing > Sales orders > All sales orders**.
2. On the Action Pane, select **New**.
3. In the **Create sales order** dialog box, set the following values:
 - **Customer account:** *US-005*
 - **Warehouse:** *62*
4. Select **OK** to close the dialog box.

The new sales order is opened.
5. Switch to the **Header** view.
6. On the **Delivery** FastTab, in the **Transportation** section, set the following values:
 - **Shipping carrier:** *Air cargo*
 - **Carrier service:** *Air*
7. Switch to the **Lines** view.
8. If a new, empty line isn't automatically added to the grid on the **Sales order lines** FastTab, select **Add line** to add one.
9. On the new order line, set the following values:
 - **Item number:** *A0001*
 - **Quantity:** *2*
10. While the new order line is still selected on the **Sales order lines** FastTab, on the **Inventory** menu above the grid, select **Reservation**.
11. On the **Reservation** page, select **Reserve lot** to reserve the full quantity of the selected line in the warehouse.
12. Close the **Reservation** page to return to the sales order.
13. On the Action Pane, on the **Warehouse** tab, in the **Actions** group, select **Release to warehouse**.
14. You receive an informational message that shows the shipment and wave for this order. Make a note of the wave ID and shipment ID numbers.

Sales order 2

1. Go to **Sales and marketing > Sales orders > All sales orders**.
2. On the Action Pane, select **New**.
3. In the **Create sales order** dialog box, set the following values:
 - **Customer account:** *US-006*
 - **Warehouse:** *62*

4. Select **OK** to close the dialog box.
5. The new sales order is opened. It should include a new, empty line in the grid on the **Sales order lines** FastTab. Set the following values on this order line:
 - **Item:** *A0001*
 - **Quantity:** *1*
6. On the **Line details** FastTab, on the **Delivery** tab, set the **Mode of delivery** field to *Flowe-STD*.
7. On the **Sales order lines** FastTab, select **Add line**, and then set the following values on the second order line:
 - **Item:** *A0002*
 - **Quantity:** *1*
8. On the **Line details** FastTab, on the **Delivery** tab, change the value of the **Mode of delivery** field to *Air C-Air*.
9. On the **Sales order lines** FastTab, select the first order line. Then, on the **Inventory** menu above the grid, select **Reservation**.
10. On the **Reservation** page, select **Reserve lot** to reserve the full quantity of the selected line in the warehouse.
11. Close the **Reservation** page to return to the sales order.
12. On the **Sales order lines** FastTab, select the second order line. Then, on the **Inventory** menu above the grid, select **Reservation**.
13. On the **Reservation** page, select **Reserve lot** to reserve the full quantity of the selected line in the warehouse.
14. Close the **Reservation** page to return to the sales order.
15. On the Action Pane, on the **Warehouse** tab, in the **Actions** group, select **Release to warehouse**.
16. You receive an informational message that shows the shipment and wave for this order. Notice that two wave ID numbers and two shipment ID numbers have been created, one for each mode of delivery for the sales order lines.

Get the work IDs from the work details

1. Go to **Warehouse management > Work > Work details**.
2. The page shows the work IDs that have been created from sales orders. Use the wave IDs and shipment IDs from the sales orders that you created to find the work ID for each wave and shipment. Make a note of those work IDs, because you will need them in the next steps. Notice that two work IDs were created for the second sales order. If different items are picked from different locations, separate work IDs are generated.

Pick items for the sales orders

Complete the created work by using the mobile device to move the items to the pack station.

1. On the mobile device, sign in to warehouse *62* by using the user ID that you created for this scenario (or the user ID of an existing demo data user).
2. On the main menu, select **Outbound**.
3. On the **Outbound** menu, select **Sales Picking**.
4. In the **ID** field, enter the work ID that was created for sales order 1.
5. Select **OK**.

6. On the **Sales orders - Pick** page, enter a target LP that was created for sales order 1. Notice that the picking location (*bulk-001*), item (*A0001*), and quantity (*2 pcs*) are shown.
7. Select **OK**.
8. Review the information on the **Sales orders - Put** page. The **Loc** field should indicate that the picked items are going to the *Pack* location.
9. Select **OK**.

On the **Scan a work ID / license plate ID** page, you receive a "Work Completed" message, which indicates that the work ID from sales order 1 has been completed.

You will now pick sales order 2.

10. In the **ID** field, enter the work ID that was created for sales order 2, where line 1 has item *A0001*.
11. Select **OK**.
12. On the **Sales orders - Pick** page, enter a target LP. Notice that the picking location (*bulk-001*), item (*A0001*), and quantity (*1 pcs*) are shown.
13. Select **OK**.
14. Review the information on the **Sales orders - Put** page. The **Loc** field should indicate that the picked items are going to the *Pack* location.
15. Select **OK**.

On the **Scan a work ID / license plate ID** page, you receive a "Work Completed" message. This message indicates that the work ID from line 1 of sales order 2 has been completed.

16. In the **ID** field, enter the work ID that was created for sales order 2, where line 2 has item *A0002*.
17. Select **OK**.
18. On the **Sales orders - Pick** page, enter a target LP. Notice that the picking location (*bulk-002*), item (*A0001*), and quantity (*1 pcs*) are shown.
19. Select **OK**.
20. Review the information on the **Sales orders - Put** page. The **Loc** field should indicate that the picked items are going to the *Pack* location.
21. Select **OK**.

On the **Scan a work ID / license plate ID** page, you receive a "Work Completed" message. This message indicates that the work ID from line 2 of sales order 2 has been completed.

Pack sales orders into containers

Pack sales order 1 into containers

1. Go to **Warehouse management > Packing and containerization > Pack**.

The **Select packing station** dialog box appears. By default, the **Worker** field should be set to the name of the worker that you set up earlier.

2. Set the following values to view and work on shipments and containers that are planned at the specific packing location:
 - **Site:** 6
 - **Warehouse:** 62
 - **Location:** *Pack*

- **Packing profile ID:** *Sort*

3. Select **OK** to close the dialog box.
4. On the **Pack** page, in the **License plate or shipment** field, enter the target LP for sales order 1. Then select the **Tab** or **Enter** key on your keyboard to move out of the field.
5. On the Action Pane, select **New container**.
6. Accept all the default settings, and select **OK**. Make a note of the container ID.
7. On the **Item packing** FastTab, set the following values:
 - **Quantity:** *1*
 - **Identifier:** Item *A0001*
8. On the Action Pane, select **Close container**.
9. In the **Close container** dialog box, select **Get system weight** to have the system update the **Gross weight** field.
10. Select **OK**. The container is moved to the *SORT* location and is ready for sorting.
11. Create a second container to add the second item from the LP for sales order 1 to a new container.
12. On the Action Pane, select **New container**.
13. Accept all the default settings, and select **OK**. Make a note of the container ID.
14. On the **Item packing** FastTab, set the following values:
 - **Quantity:** *1*
 - **Identifier:** Item *A0001*
15. On the Action Pane, select **Close container**.
16. In the **Close container** dialog box, select **Get system weight** to have the system update the **Gross weight** field.
17. Select **OK**. The container is moved to the *SORT* location and is ready for sorting.

Pack sales order 2 into containers

1. On the **Pack** page, in the **License plate or shipment** field, enter the target LP for line 1 of sales order 2. Then select the **Tab** or **Enter** key on your keyboard to move out of the field.
2. On the Action Pane, select **New container**.
3. Accept all the default settings, and select **OK**. Make a note of the container ID.
4. On the **Item packing** FastTab, set the following values:
 - **Quantity:** *1*
 - **Identifier:** Item *A0001*
5. On the Action Pane, select **Close container**.
6. In the **Close container** dialog box, select **Get system weight** to have the system update the **Gross weight** field.
7. Select **OK**. The container is moved to the *SORT* location and is ready for sorting.
8. In the **License plate or shipment** field, enter the target LP for line 2 of the sales order 2. Then select the **Tab** or **Enter** key on your keyboard to move out of the field.
9. On the Action Pane, select **New container**.

10. Accept all the default settings, and select **OK**. Make a note of the container ID.
11. On the **Item packing** FastTab, set the following values:
 - **Quantity:** 1
 - **Identifier field:** Item *A0002*
12. On the Action Pane, select **Close container**.
13. In the **Close container** dialog box, select **Get system weight** to have the system update the **Gross weight** field.
14. Select **OK**. The container is moved to the *SORT* location and is ready for sorting.

To view the container details, go to **Warehouse management > Packing and containerization > Containers**, and search for the container IDs that were created during packing.

Sort the containers

IMPORTANT

When you access the **Pallet build** menu item on the mobile app to do outbound sorting, you will see a button that is labeled **Full**. *Don't use the Full button to sort or close the position.*

The **Full** button is provided by default and can't be disabled or removed from the page. It isn't used for the *Outbound sorting* feature.

Sort the first container

1. On the mobile device, sign in to warehouse *62* by using the user ID that you created for this scenario (or the user ID of an existing demo data user).
2. On the main menu, select **Outbound**.
3. On the **Outbound** menu, select **Pallet build**.
4. In the **LP/Con** field, enter the first container ID that is associated with sales order 1.
5. Select **OK**.
6. Because no sort positions currently exist, you must specify one. In the **Sort position ID** field, enter *SP01*.
7. Because no LP is currently associated with sort position *SP01*, you must specify one. In the **LP** field, enter *PLP01*.
8. Select **OK**.
9. Because sort position validation is turned on, you must enter the sort position ID again. In the **Sort Position ID** field, enter *SP01*.
10. Select **OK**.

You receive a "Work completed" message.

TIP

To view the sort position and the LP in it, go to **Warehouse management > Packing and containerization > Outbound sorting position assignments**.

The **Outbound sorting position assignments** page shows all the sort positions that are currently active. The **Sort position transactions** field shows the LP that is associated with each sort position, and the containers that are in the sort position. Notice that one sort position currently exists, and that the **Sort position criteria** FastTab shows a criterion of **Shipment – Carrier service - Air**.

Sort the remaining containers

1. On the mobile device, sign in to warehouse *62* by using the user ID that you created for this scenario (or the user ID of an existing demo data user).
2. On the main menu, select **Outbound**.
3. On the **Outbound** menu, select **Pallet build**.
4. In the **LP/Con** field, enter the second container ID that is associated with sales order 1.
5. Select **OK**. Because the sorting template is set up to sort automatically, and a sort position that has matching criteria already exists, you're automatically directed to the correct sort position.
6. Select **OK**.
7. Confirm the sort position ID to indicate that the inventory is in the correct place. In the **Sort Position ID** field, enter *SP01*.
8. Select **OK**.

Work is completed on the second container from sales order 1. You will now sort the remaining containers from sales order 2.

9. In the **LP/Con** field, enter the container ID of the container from sales order 2 that holds item *A0001*. Because the carrier service differs, you're prompted to enter a new sort position and assign an LP to that position. Use sort position *SP02* and LP *PLP02*.
10. Select **OK**.
11. Confirm the sort position by entering *SP02* in the **Sort Position ID** field.
12. Select **OK**.

Work is completed on the container.

13. In the **LP/Con** field, enter the container ID for the remaining container from sales order 2 that holds item *A0002*. Because the carrier service is the same as the carrier service for sales order 1, the system shows the existing sort position that has matching criteria.
14. Select **OK**.
15. Confirm the sort position by entering *SP01* in the **Sort Position ID** field.
16. Select **OK**.

Work is completed on the container.

Close the outbound sorting positions

When all inventory has been sorted, the position must be closed before work can be created. Sorted inventory picking work will be created to take the inventory to the bay door.

Close a position from the mobile device

1. On the mobile device, sign in to warehouse *62* by using the user ID that you created for this scenario (or the user ID of an existing demo data user).
2. On the main menu, select **Outbound**.
3. On the **Outbound** menu, select **Pallet build**.
4. In the **LP/Con** field, enter a container ID that was sorted to sort position *SP01*.
5. Select **OK**.
6. You receive the following message: "The container is already sorted to position SP01. Close the position?" Select **Close**.

Work is completed.

Close a position from outbound sorting position assignments

1. Go to **Warehouse management > Packing and containerization > Outbound sorting position assignments**.
2. In the left column, select **SP02**. This outbound sorting position row is the one that you will close.
3. On the Action Pane, select **Close position**. The sorting position record is closed and is no longer shown.

TIP

To show all closed position records, select the **Show closed** check box.

Sorted inventory picking

You must complete the sorted inventory picking work. When it's completed, the inventory will be picked to the sales order. At that point, all other warehouse processes apply.

1. On the mobile device, sign in to warehouse *62* by using the user ID that you created for this scenario (or the user ID of an existing demo data user).
2. On the main menu, select **Outbound**.
3. On the **Outbound** menu, select **Load from Sorting**.
4. Enter the target LP ID from the first sort position, *SP01*. Set the **ID** field to *PLP01*.
5. Select **OK**.
6. The **Sorted inventory picking: Pick** page shows the pick work that must be done. Pick from the *SORT* location and target LP *PLP01*, which has multiple items and a quantity of *3*.
7. Select **OK**.
8. The **Sorted inventory picking: Put** page shows the put work that must be done. Put to the *Baydoor* location and target LP *PLP01*, which has multiple items and a quantity of *3*.
9. Select **OK**.

Work is completed.

10. Enter the target license plate ID from the second sort position, *SP02*. Set the **ID** field to *PLP02*.
11. Select **OK**.
12. The **Sorted inventory picking: Pick** page shows the pick work that must be done. Pick from the *SORT*

location and target LP *PLP02*, which has multiple items and a quantity of *1*.

13. Select **OK**.

14. The **Sorted inventory picking: Put** page shows the put work that must be done. Put to the *Baydoor* location and target LP *PLP02*, which has multiple items and a quantity of *1*.

15. Select **OK**.

Work is completed.

From this point forward, all other warehouse processes apply.

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Put to wall - put to store

2/18/2021 • 19 minutes to read • [Edit Online](#)

The *Put to wall - put to store* functionality lets you handle scenarios where you must consolidate a product to a prepack staging area, based on configurable criteria. Because this functionality allows for picking to a single target license plate and can use more put positions than cluster picking, companies that ship to stores or handle small items will benefit from decreased picking time.

The workflow for this functionality directs picked product to a sorting location for distribution into various types of containers. Generally, each sorting location includes multiple sort positions. Each sort position is assigned according to the criteria that are set by the business process. Typical criteria are the final destination, shipment, or load. After a product arrives, it's distributed to each sort position, based on the quantity that is associated with the order, destination, shipment, or load. When a container is full or complete, it's moved to a staging location or a shipping location for further handling, depending on the business process.

This warehousing functionality is also referred to by other names, such as put-to-light and break opens.

Turn on the Outbound sorting feature

Before you can use the *Put to wall - put to store* functionality, the *Outbound sorting* feature must be turned on in your system. Admins can use the [Feature management](#) workspace to check the status of the feature and turn it on if it's required. There, the feature is listed in the following way:

- **Module:** *Warehouse management*
- **Feature name:** *Outbound sorting*

The *Outbound sorting* feature can be used in conjunction with the *Organization wide wave step code* feature if it's turned on. You must also turn on this feature if you will use predefined codes that are set up in wave step codes. In the **Feature management** workspace, this feature is listed in the following way:

- **Module:** *Warehouse management*
- **Feature name:** *Organization wide wave step code*

Setup

For this demo, standard Contoso data and warehouse *62* are used. Some additions that are noted later are also used.

Location type

1. Go to **Warehouse management > Setup > Warehouse > Location types**.
2. On the Action Pane, select **New** to create a location type for sorting.
3. Set the following values:
 - **Location type:** *SORT*
 - **Description:** *Sort*
4. Select **Save**.

Warehouse management parameters

1. Go to **Warehouse management > Setup > Warehouse management parameters**.
2. On the **General** tab, on the **Location types** FastTab, in the **Sorting location type** field, enter *SORT*.

3. Select **Save**.

Location profile

1. Go to **Warehouse management > Setup > Warehouse > Location profiles**.

2. On the Action Pane, select **New** to create a location profile for the sorting location.

3. In the header, set the following values:

- Location profile ID: *Sort*
- Name: *Sort*

4. On the **General** FastTab, set the following values:

- Location format: *PACK*
- Location type: *SORT*
- Use license plate tracking: *Yes*
- Allow mixed items: *Yes*
- Allow mixed inventory statuses: *Yes*

5. Select **Save**.

Locations

1. Go to **Warehouse management > Setup > Warehouse > Locations**.

2. Clear the **Generate check digits for location** check box.

3. On the Action Pane, select **New**, and then set the following values:

- Warehouse: *62*
- Location: *Sort*
- Location profile ID: *Sort*

4. Select **Save**.

Packing profiles

1. Go to **Warehouse management > Setup > Packing > Packing profiles**.

2. On the Action Pane, select **New**, and then set the following values:

- Packing profile ID: *Sort*
- Description: *Sort*
- Container packing policy: Leave this field blank.
- Container ID mode: *Auto*
- Container type: *PALLET 48X48*
- Autocreate container at container close: Leave this field blank.

3. Select **Save**.

Wave step codes

If you turned on the *Organization wide wave step code* feature, set up the following code.

1. Go to **Warehouse management > Setup > Waves > Wave step codes**.

2. On the Action Pane, select **New**, and then set the following values:

- Wave step code: *Sort*
- Wave step description: *Sort*
- Wave step type: *Sort template*

3. Select **Save**.

Outbound sorting template

The sorting template controls whether sort positions are created, what criteria are used, and other attributes of the sorting process.

1. Go to **Warehouse management > Setup > Packing > Outbound sorting template**.
2. On the Action Pane, select **New** to create a sorting template.
3. In the header of the new template, set the following values:

- **Outbound sorting template ID:** *Wave Sort*
- **Description:** *Wave sort*
- **Sort template type:** *Wave demand*

This field defines the process that the sorting template is used for. The following values are available:

- **Wave demand** – The sorting template is used for the *Put to wall* process. This template type is used to bypass the pack station and process inventory directly out of the wave. You can use this type only if the **sorting** wave process method is included in the wave template.
- **Container** – The sorting template is used for the *Pallet building after packing* process. This template type is used to process containers that are closed at the pack station and must be sorted onto pallets.

- **Warehouse:** *62*
- **Location:** *Sort*

4. On the **General** FastTab, set the following values:

- **Sort verification:** *Position scan*

This field defines the verification that is required during sorting. The following values are available:

- None
- License plate scan
- Position scan

- **Create work on position close:** *Yes*

If this option is set to *Yes*, when the position is closed, work will be created to move inventory to the final shipping location. If it's set to *No*, inventory will immediately be picked to the order when the position is closed.

- **Position assignment:** *Manual*

This field defines the type of position assignment. The following values are available:

- **Manual** – The user must always indicate which position the inventory should be sorted to.
- **Automatic** – The system will automatically guide the inventory to a position whenever it can, based on the sort template breaks.

- **Assign sort position criteria:** *Only use empty position*

This field controls whether inventory that is already present on sort positions is taken into account when a position is assigned for the demand. The following values are available:

- **Only use empty position** – Positions that already have inventory associated with them will be taken into account
- **Assume position empty** – Any inventory that is already on the position will be disregarded

during assignment. All available positions will be used.

- **Wave step code:** *Sort*

If the *Organization wide wave step code* feature is turned on, the *Sort* wave step code must also be set up in wave step codes.

- **Auto close sort position:** *Yes*

If this option is set to *Yes*, the sort position will automatically be closed when all work that comes to the position has been completed.

- **Number of sort positions:** *3*

This field defines the maximum number of sort positions that the system will create.

- **Sort position prefix:** *SP-*

This field defines the prefix that the system assigns before the position number.

- **Auto pack sort position:** *Yes*

If this option is set to *Yes*, the inventory on the sort position will be packed into a container when the position is closed.

- **Packing profile ID:** *Sort*

This field defines the packing profile that will be used when the sort position is packed into a container.

5. On the Action Pane, select **Edit query** to specify the criteria that are used for this sorting template.

6. In the query dialog box, on the **Sorting** tab, select **New** to add a line, and then set the following values:

- **Table:** *Load details*
- **Derived table:** *Load details*
- **Field:** *Shipment ID*
- **Search direction:** *Ascending*

7. Select **OK**.

8. You might receive the following message: "Grouping will be reset, continue?" Select **Yes**.

The **Outbound sorting template breaks** button on the Action Pane becomes available.

9. On the Action Pane, select **Outbound sorting template breaks**.

10. Select the **Group by field** check box to group by shipment ID.

This setting will create one sort position per shipment that is a container in the wave.

11. Select **OK**.

Wave process methods

1. Go to **Warehouse management > Setup > Waves > Wave process methods**.

2. On the Action Pane, select **Regenerate methods**.

The **sorting** method is added to the list of available methods, and the *Shipping* wave template type is selected for it.

Wave templates

Edit the wave template that is used for wave demand sorting.

1. Go to **Warehouse management > Setup > Waves > Wave templates**.
2. In the **Wave template type** field, select *Shipping*.
3. Select the existing **62 Shipping default** template.
4. On the Action Pane, select **Edit**.
5. On the **General** FastTab, make the following changes:
 - Set the **Process wave at release to warehouse** option to *No*.
 - Set the **Assign to open waves** option to *Yes*.
6. On the **Methods** FastTab, set up the **sorting** method:
 - a. In the **Remaining Methods** grid, select **sorting**.
 - b. Select the right arrow button to move **sorting** to the **Selected Methods** grid.
 - c. In the **Selected Methods** grid, select **sorting**.
 - d. Set the **Wave step code** field to *Sort*.
7. Select **Save**.

Mobile device menu items

1. Go to **Warehouse management > Setup > Mobile device > Mobile device menu items**.
2. On the Action Pane, select **New**.
3. In the header, set the following values:
 - **Menu item name:** *Sort*
 - **Title:** *Sort*
 - **Mode:** *Indirect*
 - **Use existing work:** *No*
4. On the **General** FastTab, set the following values:
 - **Activity code:** *Outbound sorting*
 - **Use process guide:** *Yes* (default value)
 - **Outbound sorting template ID:** *Wave Sort*
5. Select **Save**.

Mobile device menu

1. Go to **Warehouse management > Setup > Mobile device > Mobile device menu**.
2. In the list of menus, select **Outbound**.
3. On the Action Pane, select **Edit**.
4. In the **Available Menus And Menu Items** grid, find and select the **Sort** menu item that you just created.
5. Select the right arrow button to move **Sort** to the **Menu Structure** grid. In this way, you add the menu item to the **Outbound** menu.
6. Select **Save**.

Location directives

You must create location directives to guide the work that is created after the sorting is completed.

1. Go to **Warehouse management > Setup > Location directives**.
2. In the **Work order type** field, select *Sorted inventory picking*.
3. On the Action Pane, select **New**.

4. In the header, set the following values:

- **Sequence:** 1
- **Name:** *Put to Baydoor*

5. On the **Location directives** FastTab, set the following values:

- **Work type:** *Put*
- **Site:** 6
- **Warehouse:** 62
- **Directive code:** Leave this field blank.
- **Multiple SKU:** *No*

6. Select **Save** to make the **Lines** FastTab available.

7. On the **Lines** FastTab, select **New**, and then set the following values. Accept the default values for all the other fields.

- **Sequence number:** 1
- **From quantity:** 0
- **To quantity:** 1000000

8. Select **Save** to make the **Location Directive Actions** FastTab available.

9. On the **Location Directive Actions** FastTab, select **New**, and then set the following values. Accept the default values for all the other fields.

- **Sequence number:** 1
- **Name:** *Baydoor*

10. Select **Save** to make the **Edit query** button on the **Location Directive Actions** FastTab available.

11. On the **Location Directive Actions** FastTab, select **Edit query**.

12. In the query dialog box, on the **Range** tab, find the row where the **Field** field is set to *Location*. Set the **Criteria** field for this row to *Baydoor*.

13. Select **OK** to confirm the edit.

Work classes

1. Go to **Warehouse management > Setup > Work > Work classes**.

2. On the Action Pane, select **New**.

3. In the header, set the following values:

- **Work class ID:** *Sorting*
- **Description:** *Sorting*
- **Work order type:** *Sorted inventory picking*

4. Select **Save**.

Work templates

1. Go to **Warehouse management > Work > Work templates**.

2. In the **Work order type** field, select *Sales orders*.

3. In the grid, select the 62 **Pick to pack** work template.

4. On the Action Pane, select **Work header breaks**.

5. On the Action Pane, select **Edit**.

6. On the line where the **Field name** field is set to *Shipment ID*, clear the **Group by this field** check box.
7. Select **Save**, and then close the **Work header breaks** dialog box.
8. In the **Work order type** field, select *Sorted inventory picking*.
9. Select **New** to create a work template.
10. In the **Overview** section, set the following values. Accept the default values for all the other fields.
 - **Work template:** *Sorted picking*
 - **Work template description:** *Sorted picking*
11. Select **Save** to make the **Work Template Details** section available.
12. In the **Work Template Details** section, you will create two lines. Select **New**, and then set the following values for line 1:
 - **Work type:** *Pick*
 - **Mandatory:** Selected (= *Yes*)
 - **Work class ID:** *Sorting*
13. Select **New** again, and then set the following values for line 2:
 - **Work type:** *Put*
 - **Mandatory:** Selected (= *Yes*)
 - **Work class ID:** *Sorting*
14. Select **Save**.

Example scenario

This scenario simulates a situation where the warehouse stores small items in locations and must pack them into boxes before they are shipped, and where packing station functionality isn't really suitable. Workers pick orders for multiple customers and different addresses at the same time to increase the picking speed. After picking has been completed, the workers arrive at the sorting location, where the picked items can be sorted to the correct box, based on required criteria. In this example, the shipment ID will be used to determine the correct box, because each shipment has a different address. After all items from the load are packed and sorted by shipment, the boxes will be moved to the staging area and eventually loaded onto a truck.

Before you start the scenario, make sure that all standard warehouse functionality is set up correctly for your warehouse. Standard Contoso warehouse 62 is used for this purpose. Standard configurations haven't been changed, besides what is described in the setup.

Create demand

Before the functionality can be demonstrated, you must create some demand. For this scenario, you will create three sales orders for three different customers to simulate different delivery addresses. In this way, you will create three separate shipments.

Before you create sales orders and shipments, make sure that the pick locations have enough inventory for all the items on the orders. Review the location directive settings to confirm the picking locations that are used for sales order picking. If you must adjust the inventory, you can create manual movements, use replenishment, or use any other flow. Then reserve the inventory.

1. Go to **Sales and marketing > Sales orders > All sales orders**.
2. Select **New** to create a sales order for order 1.
3. In the **Create sales order** dialog box, set the following values:

- **Customer:** *US-001*
 - **Warehouse:** *62*
4. Select **OK**.
 5. A new line is added to the **Sales order lines** FastTab. Set the following values:
 - **Item number:** *A0001*
 - **Quantity:** *5*
 6. Select **Add line** to add a second line, and set the following values:
 - **Item number:** *A0002*
 - **Quantity:** *10*
 7. Repeat the following steps for each sales line on the order to reserve inventory for it:
 - a. On the **Sales order lines** FastTab, on the **Inventory** menu, select **Reservation**.
 - b. On the **Reservation** page, select **Reserve lot**, and then close the page.
 - c. Select **Save**.
 8. Select **New** to create a sales order for order 2.
 9. In the **Create sales order** dialog box, set the following values:
 - **Customer:** *US-004*
 - **Warehouse:** *62*
 10. Select **OK**.
 11. A new line is added to the **Sales order lines** FastTab. Set the following values:
 - **Item number:** *A0001*
 - **Quantity:** *7*
 12. Select **Add line** to add a second line, and set the following values:
 - **Item number:** *A0002*
 - **Quantity:** *3*
 13. Repeat the following steps for each sales line on the order to reserve inventory for it:
 - a. On the **Sales order lines** FastTab, on the **Inventory** menu, select **Reservation**.
 - b. On the **Reservation** page, select **Reserve lot**, and then close the page.
 - c. Select **Save**.
 14. Select **New** to create a sales order for order 3.
 15. In the **Create sales order** dialog box, set the following values:
 - **Customer:** *US-007*
 - **Warehouse:** *62*
 16. Select **OK**.
 17. A new line is added to the **Sales order lines** FastTab. Set the following values:
 - **Item number:** *A0001*
 - **Quantity:** *8*
 18. Follow these steps to reserve inventory for the sales line:
 - a. On the **Sales order lines** FastTab, on the **Inventory** menu, select **Reservation**.
 - b. On the **Reservation** page, select **Reserve lot**, and then close the page.
 - c. Select **Save**.

Complete the following procedure to release each sales order to the warehouse. Three different shipments will be created. You will then add all three shipments to one new wave.

1. Go to **Sales and marketing > Sales orders > All sales orders**.
2. In the grid, select the first sales order that you created.
3. On the Action Pane, on the **Warehouse** tab, select **Release to warehouse**.

You receive an informational message that shows the wave ID and shipment ID that were created.

4. Repeat the previous steps to release sales orders 2 and 3 to the warehouse. Notice that the informational message that you receive indicates that a shipment has been added to the wave that was created when you released sales order 1.

5. Go to **Warehouse management > Outbound waves > Shipment waves > All waves**.

6. Select the wave ID that was created from the release of the sales orders to open the **Waves** page. This page shows the wave details. The **Wave lines** FastTab shows the shipments that were created.

You must now create work to bring items from the picking locations to the sorting location.

7. On the Action Pane, select **Process**.

During wave processing, the sorting method will use the sorting template to assign the inventory to sort positions. When wave processing is completed, you receive an informational message that states that the wave has been posted and work has been created.

8. On the Action Pane, on the **Wave** tab, in the **Related information** group, select **Work** to view the work that was created. Make a note of the work ID.

9. Go to **Warehouse management > Packing and containerization > Outbound sorting position assignments**.

10. In the left column, you can view the outbound sorting position that was created for each shipment.

11. On the **Sort position criteria** FastTab, you can view the shipment ID for that position.

One work ID has been created to bring inventory from the picking locations to the sorting location. To complete the work, you will need the work ID that was created during wave processing.

Sales order picking to the sorting location

1. Sign in to the mobile app as a worker in warehouse 62.
2. On the main menu, select **Outbound**.
3. On the **Outbound** menu, select **Sales Picking**.
4. Select the **ID** field, and then enter the work ID from the wave processing.
5. Confirm your entry.

Next, you're prompted to enter a target license plate (LP). Notice that line 1 from sales order 1 is what must be picked and added to the target license plate. The item number, quantity, item description, and pick location are shown.

6. In the **Target LP** field, enter a license plate number.

You will pick all lines that were created from the processed wave onto the same target license plate.

7. Confirm your entry.

The mobile app now presents a series of **Pick** pages that point you to the picking location, and to the

item and quantity that must be picked. After the picked item is added to the license plate, you will confirm the pick work. The last page will be the work to put the picked items into the sorting location.

8. Confirm the first pick work.
9. The next pick work is shown. Confirm the pick.
10. Continue to confirm the remaining pick work.
11. The last step is to complete the put work. Confirm the put-away to the sorting location.

You receive a "Work completed" message.

12. Exit **Sales Picking** on the mobile app.

Sorting/put-to-wall

Now that all inventory has been put to the sorting location, it must be sorted to the correct sort position.

1. Sign in to the mobile app.
2. On the main menu, select **Outbound**.
3. On the **Outbound** menu, select **Sort** to start to sort the items.
4. In the **LP/CON** field, enter the target license plate of the picked sales order work.
5. Confirm your entry.
6. Enter the item number to sort first.
7. The system determines the first sort position that should be shown. Confirm the sort position.
8. You're prompted to assign a license plate to the sort position. Select the **LP** field, enter a license plate number, and then confirm your entry.

Because the sort position is related to the shipment ID, you will sort the picked items into a license plate that is specific to the outbound shipment and sales order.

The next page shows the item ID, quantity, sort position ID, and the "from" (picking) and "to" (sorting) license plate IDs. The information on this page instructs you to sort the specified item and quantities from the picking license plate into the sorting license plate.

9. Confirm the sort position.
10. Sort the items in the first sort position. When you've finished, the system directs you to the next sort position.
11. Repeat this process for all picked lines on the work order. You should also use this process when there are multiple pick lines that have the same item number.

As you repeat this process for all items, the system evaluates the criteria from the next scanned item (work line) and determines which sorting position it should be put to. You're automatically directed to put the item to the correct sort position. Depending on the confirmation setup, you're also directed to confirm this action by entering the position number or license plate ID.

NOTE

If automatic sorting is turned on, manual override isn't available.

12. When you've finished, in Microsoft Dynamics 365 Supply Chain Management, open the **Outbound sorting position assignments** page to review the status of the positions.

- If positions are closed automatically, select **Show closed** to show the closed positions.
- Notice that sort position transactions are shown. The item and quantity that were processed through the position are shown.

When you set up the outbound sorting template, you set the **Auto close sort position** option to *Yes*. Therefore, the position is automatically closed after the last expected inventory is put to it. The sort positions are in **Closed** status, and work has been created to move the sorted inventory to *Baydoor* location.

13. Complete the sorted inventory picking work to move the inventory to the shipping location. When the inventory is ready, ship-confirm it.

NOTE

For sorted inventory picking work to be processed correctly, a mobile device menu item that has a work class ID where the **Work order type** field is set to *Sorted inventory picking* should be used for the movement and loading process.

Manually close a position (optional)

If sort positions should be closed manually, the **Auto close sort position** option for the outbound sorting template must be set to *No*, and closing must be done before inventory can be moved to the bay door area. Positions can be closed in various ways:

- Via the warehouse app:
 - The user can scan one of the items that are already on the position and then select **Close** to close the position.
 - If the user scans a container that has already been sorted container, an error message is shown. However, the user can still continue to close the position.
- From the Microsoft Dynamics 365 Supply Chain Management **Outbound sorting position assignments** page:
 - The user can select the outbound sorting position record and then select **Close position** on the Action Pane.

Tips

- Items can't be moved between positions after they have been assigned to one. The system evaluates how many of each item should go to a specific position.
- Sorts template can be configured to automatically create containers when positions are closed. This approach will create standard container ID structure that is based on the specified packing profile.

IMPORTANT

After movement work has been created from the sorting location, you must not cancel the work. Otherwise, the position and the containers in it will be deleted from the system and unavailable for further processing. The inventory will also be removed.

NOTE

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Outbound workload visualization

2/18/2021 • 5 minutes to read • [Edit Online](#)

Advanced setup capabilities that are accessible from the **Outbound workload visualization** page let warehouse managers and supervisors create custom workload charts that can be used to monitor the progress of current work and the amount of it that remains. Warehouse managers can create multiple views and set up automatic refresh as they require. Outbound workload visualizations are suitable for display on warehouse performance pages.

This functionality can be used to track the progress of picking work. The feature is integrated with labor management, and if labor management is set up, outbound workload visualizations can show a calculation of the number of hours that remain for the picking work that is shown (filtered).

Turn on the Outbound workload visualization feature

Before you can use this feature, it must be turned on in your system. Admins can use the [Feature management](#) settings to check the status of the feature and turn it on. In the **Feature management** workspace, the feature is listed in the following way:

- **Module:** *Warehouse management*
- **Feature name:** *Outbound workload visualization*

Set up outbound workload visualizations

To set up your visualizations, you create a collection of filters (views) and design each filter so that it shows a different type of analysis. You use the **Configure filters** page to design the filters.

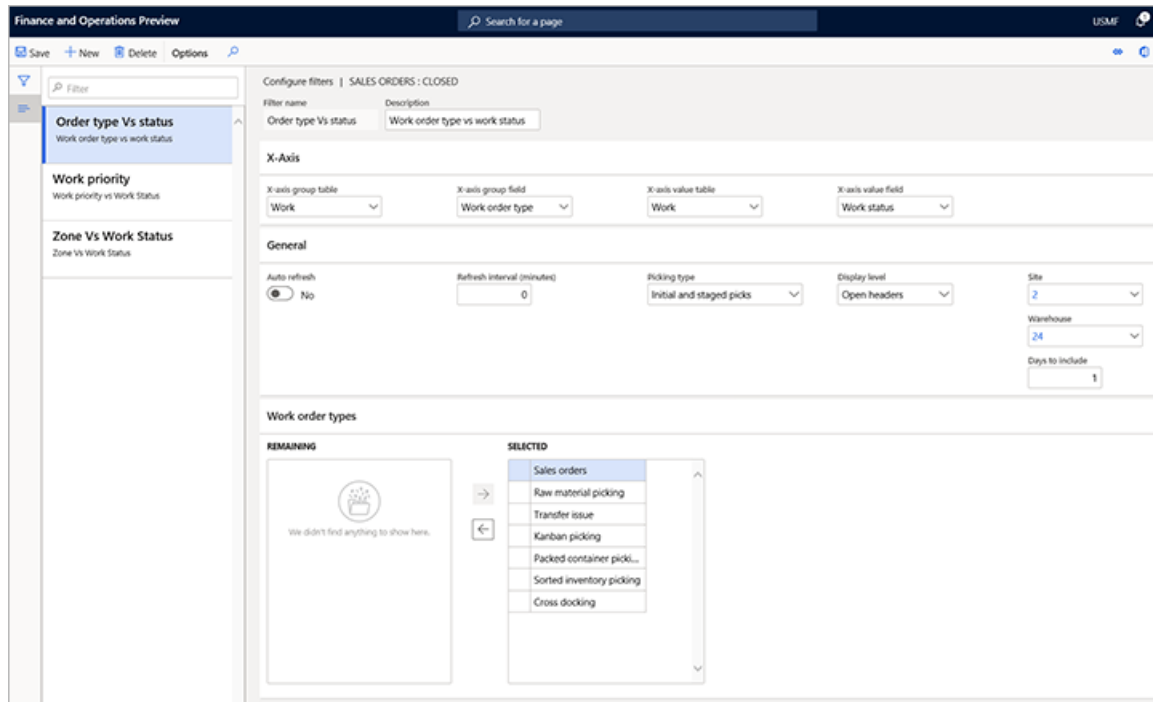
To set up an outbound workload visualization, follow these steps.

1. Go to **Warehouse management > Warehouse monitoring reports > Outbound workload visualization**.

The **Outbound workload visualization** page appears. After you create some filters, this page will show your visualization. You can create as many filters as you want. All the filters that you create are saved under your user account, so that you can use them later. In other words, each user will have their own set of filters that they created. Those filters won't be shared with other users.

2. On the **Outbound workload visualization** page, on the Action Pane, on the **Filters** tab, select **Configure filters**.
3. On the **Configure filters** page, on the Action Pane, select **New** to add a filter, and then set the following fields for it:
 - **X-axis group table** – Select the table that contains the field that should be used to group the X-axis values.
 - **X-axis group field** – From among the fields of the table that you selected in the **X-axis group table** field, select the field that should be used to group the X-axis values.
 - **X-axis value table** – Select the table that contains the field that should be used to further analyze the groups.
 - **X-axis value field** – From among the fields of the table that you selected in the **X-axis value table** field, select the field that provides the values that should be analyzed for each group.
 - **Auto-refresh** – Select whether the visualization should automatically be refreshed.

- **Refresh interval (minutes)** – Enter the number of minutes between automatic refreshes.
- **Display level** – Select whether the chart should show open lines or open header counts.
- **Picking type** – If you set the **Display level** field to *Open lines*, select whether the count of open work lines in the chart should include initial picks, staged picks, or both initial picks and staged picks.
- **Site** – Select the site to load the chart for.
- **Warehouse** – Select the warehouse to load the chart for.
- **Days to include** – Enter the number of days in the past that the chart should be generated for.
- **Work order type** – Select the outbound work order types to filter on.



4. Close the **Configure filters** page to return to the **Outbound workload visualizations** page.

The **Outbound workload visualizations** page now shows data, based on your new filter settings. Your new filter is now available and is selected in the **Filter** field. The following fields are available at the top of the chart:

- **Filter** – This field includes all the filters that you've created so far. Select a filter to view its data in the chart.
- **Last refreshed** – This field shows the date and time when the information in the chart was last updated.
- **Estimated/actual time** – If labor standards are set up in your system, set this option to *Yes* to show accumulated estimated picking times at the top of each column in the chart. If you aren't using labor standards, this option is unavailable.



5. Select any bar in the chart to view the associated work line details.

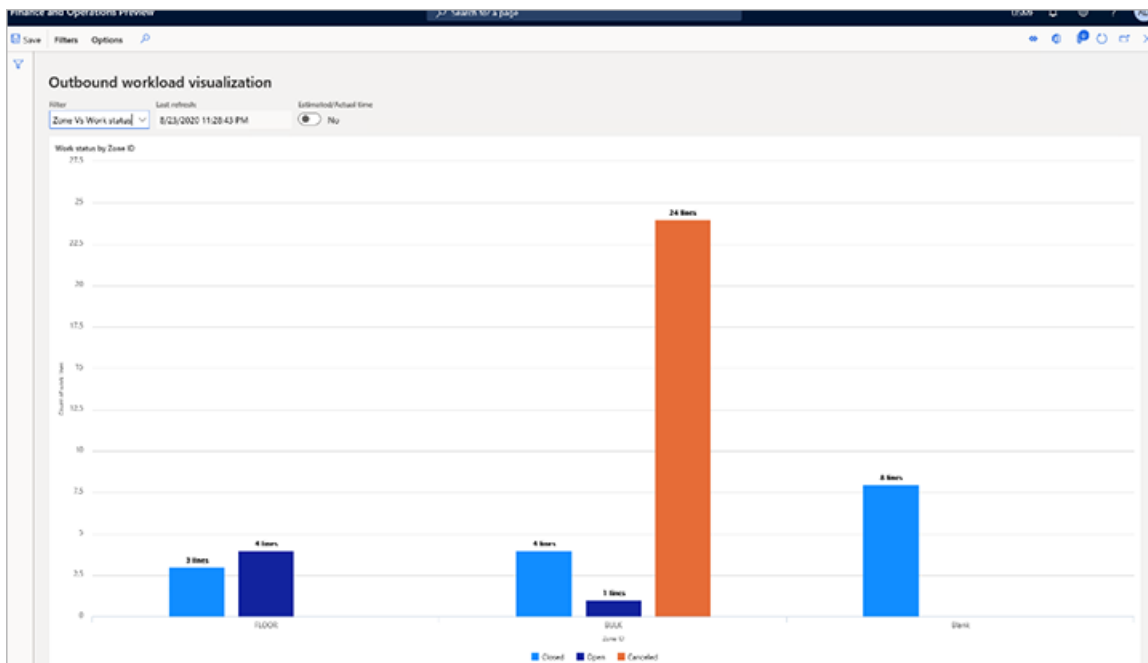
Work ID	Work creation number	Work status	Work order type	Order number	Site	Warehouse	Work in process	Cloud work	Ter
USMF-000001	USMF-00000001	Open	Sales orders	000745	2	24			
USMF-000002	USMF-00000002	Open	Sales orders	000752	2	24			
USMF-000014	USMF-00000013	Open	Sales orders	000776	6	63			
USMF-000015	USMF-00000013	Open	Sales orders	000776	6	63			
USMF-000217	USMF-00000005	Open	Purchase orders	00000100	2	24			00

Example: Outbound workload visualization for zones

For this example, you want to set up a visualization that shows work lines for each zone, and the status of each work line (*Open*, *Closed*, or *Canceled*). In this case, you can set up a filter that has the following settings:

- **Filter name** – Enter a name for this filter (such as *Zone vs. work status*).
- **Description** – Enter a short description for this filter (such as *Zone vs. work status*).
- **X-axis group table** – Select *Locations*.
- **X-axis group** – Select *Zone ID*.
- **X-axis value table** – Select *Work*, because you want to view work per zone.
- **X-axis value field** – Select *Work status*, because you want to view work status.
- **Auto refresh** – Select whether the visualization should automatically be refreshed.
- **Picking type** – Select *Initial picks and staged picks*, because you want to include both initial picks and picks from staging locations. In other words, you essentially want to include all the pick work lines that you have.
- **Display level** – Select *Open lines*, because you want to view the information per line, not per work header.

The following illustration shows an example of the resulting chart.



This chart shows two zones that are named **FLOOR** and **BULK**, plus a zone that is named **Blank**. The **Blank** zone represents all work lines that aren't members of any zones. The chart always shows all unrelated filtered data as **Blank**, to provide as much visibility as possible. In the **FLOOR** zone, the chart shows three closed lines and four open lines. In the **BULK** zone, the chart shows four closed lines, one open line, and 24 canceled lines. Finally, the chart shows eight closed lines that aren't part of any zone and are therefore listed as **Blank**.

NOTE

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Troubleshoot picking and packing

2/18/2021 • 3 minutes to read • [Edit Online](#)

This topic describes how to fix common issues that you might encounter while you pick and pack in Microsoft Dynamics 365 Supply Chain Management.

I receive the following error message: "Dimension location can't be left blank if dimension serial number is set."

Issue description

You receive this error message if you create a transfer order for a serial item by using a warehouse that is enabled for advanced warehouse management (WMS), and then, after the work is completed, you try to confirm the shipment.

Issue resolution

The **Default receipt location** field is blank for a transit warehouse of the "from" warehouse. To fix this issue, specify a default receipt location in the transit warehouse. Make sure that this location is license plate-controlled.

I receive the following error message: "Invalid license plate."

Issue description

You receive this error message in the warehouse app when you scan a license plate ID.

Issue resolution

Make sure that the license plate ID exists in the license plates table, and that the items and quantities on the license plate are available (in other words, they aren't blocked).

I receive the following error message: "Field 'Load weight' (=-%1) can only contain positive numbers. Update has been canceled."

Issue description

You receive this error message if there is open work when you process work from packing locations to staging locations, or from staging locations to dock locations.

Issue resolution

To fix this issue, go to **System administration > Periodic tasks > Database > Consistency check**, and run the process for **Warehouse load weight consistency check**.

I receive the following error message: "The quantity is not valid for unit %1."

Issue description

You receive this error message when you try to perform a *split pick* across multiple batches.

Issue resolution

The warehouse worker must use the *Short picking* process in the warehouse app. If you're trying to pick multiple batches from the same location, you can also use the **Full** option in the warehouse app.

I can't move inventory to a location that is license plate–controlled.

Issue description

You can't reduce picked quantities on a load.

Issue resolution

In earlier versions, you can't reduce picked quantities on a load. However, you can now unpick to a license plate–controlled location. You must specify both a **Location** value and a **License plate** value for the load line on the **Reduce picked quantity** page.

Can I print a delivery note or packing content by warehouse?

Issue description

You want to print a delivery note or packing content by warehouse or site on the **Work audit template line update** page.

Issue resolution

When you print a document by using Print management settings, limit the scope (site/warehouse) through Print management instead of by selecting **Edit print settings** on the **Work audit template line update** page.

I can't cancel a packing slip after it's posted from a sales order.

Issue description

When picking and shipping processes are enabled for WMS, you can't cancel a packing slip after it's posted from a sales order.

Issue resolution

To correct posted packing slips for items that are enabled for WMS, the posting must occur from the load, not from the order. Microsoft has evaluated this issue and has determined that it's a feature limitation. In general, a sales order that has been picked and shipped through warehouse management processes can be packing slip–updated from the load or shipment and the sales order document itself. However, if you packing slip–update the sales order from the sales order document, packing slip reversal still can't be done from the load or sales order. Therefore, we recommend that you use the packing slip posting from the load. In this case, the reversal that must be done from the load will be enabled.

I receive the following error message: "Not enough work can be found for cluster."

Issue description

When you use the *System directed cluster picking* process, if you configure a cluster profile where, for example, 10 positions can be picked, the process works as planned when there is enough work to pick to 10 positions. However, if there are only eight positions to pick, you receive this error message, because there isn't enough work for one cluster.

Issue resolution

To fix this issue, edit the cluster profile, and set the **Activate positions** option to *No*.

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Replenishment overview

2/18/2021 • 5 minutes to read • [Edit Online](#)

This topic describes the replenishment strategies that are available for warehouses that use the functionality that is available in Warehouse management. The information in this topic doesn't apply to the warehousing solution that is available in Inventory management.

The following replenishment strategies are available:

- **Wave demand replenishment** – This strategy creates replenishment work for outbound orders or loads if inventory isn't available when the wave creates work. For example, replenishment work can be created if the quantity that is required for a sales order isn't available when a wave is processed.
- **Min/Max replenishment** – This strategy uses minimum and maximum stocking limits to determine when locations should be replenished. The item and location criteria define the inventory that is evaluated for replenishment. Min/Max replenishment templates are the primary mechanism for maintaining optimal levels in picking locations. To help guarantee that enough pick face inventory is available to meet wave demand, you can use demand replenishment as a supplement between Min/Max replenishment cycles.
- **Load demand replenishment** – This strategy sums the demand for several loads and creates the replenishment work that is required in order to stock the relevant picking locations. This strategy helps guarantee that the loads that are created can be picked in the warehouse after they are released.
- **Immediate replenishment** – This strategy replenishes inventory before a wave is run if allocation fails for a location directive line that has a replenishment template.

All four strategies create replenishment work, based on a replenishment template.

Wave demand replenishment

Wave demand replenishment creates replenishment work, based on demand, if the quantity that is required for production orders, kanbans, outbound orders, or loads isn't available when a wave creates work. The replenishment template contains information about the item criteria, the unit of measure, the demand increment, and the location.

Location directives are used to determine which location should be replenished. You link these location directives to the replenishment template by using the **Directive code** field. If the **Directive code** field isn't set, queries are used to determine which location directive should be used. Note that if a directive code isn't specified in the replenishment template, and the location directive has a directive code, the location directive will be ignored, even if the query on the location directive is correct. Pick location directives are used to determine where to get inventory for the replenishment.

In addition to creating a template, you must specify some replenishment settings in the wave template. The wave template should contain a wave step for replenishment that is run only if an item isn't successfully allocated. This replenishment wave step uses a wave step code to determine which replenishment template should be used. In addition to having a wave step for replenishment, you must make sure that **Replenish** is selected in the **Methods** section of the wave template.

The **Replenishment template** page includes an **Allow wave demand to use unreserved quantities** check box. Select this check box if demand replenishment should be able to deduct unreserved quantities from work that is generated from the selected replenishment template. To enable demand replenishment templates to use this logic, select this check box for every existing replenishment template. When demand replenishment is triggered in the warehouse, it will deduct the demand from existing replenishment work that has unreserved quantities, if the work originates from replenishment templates where the **Allow wave demand to use**

unreserved quantities check box is selected.

Replenishment unit is the minimum unit to replenish. This must be a whole number that is a multiple of the unit. The system will round up to the highest unit possible when creating work.

Demand replenishment is supported for sales orders, transfer orders, production orders, and kanbans.

Min/Max replenishment

In Min/Max replenishment, stock is replenished so that it's between the minimum and maximum limits that have been set. Typically, this process occurs one time every day, to help guarantee that all picking locations are filled to the maximum level before picking starts.

The minimum and maximum amounts are set in a replenishment template. Many of the other settings in the template resemble the settings in templates that are used in Wave demand replenishment. The template should contain one line for each item and location. When you run replenishment by using the batch job, the system evaluates whether replenishment is required by using the sequence that the lines are organized in.

Note that the Min/Max replenishment strategy can't replenish an empty location unless the location is set as the fixed location for the item. If the location that must be replenished isn't a fixed location, the system can't determine which item should be replenished. Therefore, at least some on-hand quantity is required before replenishment occurs.

Load demand replenishment

Load demand replenishment sums the demand for several loads and creates the replenishment work that is required in order to stock the relevant picking locations. Load demand replenishment resembles Wave demand replenishment in many ways. The main difference is how and when Load demand replenishment and Wave demand replenishment are run. Like Min/Max replenishment, Load demand replenishment is run by using a batch job. To set up the batch job, on the **Load demand replenishment** page, select the replenishment template to use, and set a filter query to specify which loads are used to determine the demand. The location query defines the locations that any available quantity will be subtracted from to meet the aggregated demand of the loads.

Immediate replenishment

Instead of having to sum demand at the end of an allocation process and do replenishment on the basis of the summed up quantity, you can apply the Immediate replenishment strategy. When you use this strategy, the inventory can be replenished immediately after a location directive line fails. Therefore, you can set up the replenishment so that it's restricted by specific units, and so that it uses quantities that are set for specific locations.

Replenishment prerequisites

PREREQUISITE	DESCRIPTION
Item	The item must be enabled for warehouse management processes.
Warehouse	The warehouse must be enabled for warehouse management processes. To enable a warehouse for warehouse management processes, on the Warehouses page, select the warehouse, and then select the Use warehouse management processes option.

PREREQUISITE	DESCRIPTION
Replenishment templates	At least one replenishment template must be set up for Min/Max replenishment, Wave demand replenishment, or Load demand replenishment.
Locations	Locations must be created and connected to a location profile.
Location profiles	Location profiles are required in order to create locations.
Location directives	Location directives are required in order to guide work to the locations where replenishment is required and to the locations that inventory is sourced from.
Work templates	Work templates of the Replenishment type are required in order to create replenishment work so that inventory can be moved to the desired locations.

NOTE

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Immediate replenishment

2/18/2021 • 2 minutes to read • [Edit Online](#)

Immediate replenishment lets you replenish inventory immediately after a location directive line fails to allocate inventory. The replenishment is based on a single line in the setup of the location directive. If inventory isn't on hand in the unit of measure that is specified by that line, replenishment of that unit of measure occurs immediately.

Immediate replenishment provides an alternative to the method where the allocation of inventory is based on more lines in the location directive, and where the demand is summed at the end of the allocation and replenished in the unit of measure that is specified by the last line in the location directive.

The benefits of using immediate replenishment are that replenishment can be limited by specific units and the quantity can be directed to specific locations.

Business scenario

For example, you have a warehouse that has separate picking areas for the "box" and "each" units of measure. You want to optimize the picking process by picking as many boxes as possible and then picking any remaining quantity that is less than a box from the "each" area.

In this case, you can use immediate replenishment. In the location directive, you can set up immediate replenishment for boxes so that demand replenishment is used as soon as there is a shortage of boxes that can be picked for the demand quantity. In this way, you optimize the picking process so that picking includes as many boxes as possible. Immediate replenishment will generate replenishment of the boxes, and the demand won't be passed on so that the quantities are picked in the "each" unit of measure. In other words, only the quantities that are supposed to be picked in the "each" unit of measure (that is, quantities that are less than a box) will be picked from the "each" area. If a shortage occurs in the "box" area, you can pick as many boxes as possible out of the total demand. The remaining quantities will then be picked from the "each" area.

Where it applies

Immediate replenishment is used during wave execution if allocation fails for a location directive line that a replenishment template is set for.

Set up immediate replenishment

- Go to **Warehouse management > Setup > Location directives**, and then, on the **Lines** tab, in the **Immediate replenishment template** list, select a replenishment template for wave demand.

The replenishment template is applied if the location directive line fails to allocate a dedicated unit of measure.

Troubleshooting

If immediate replenishment is selected for a location directive line, but no replenishment work is generated when you use demand replenishment templates for that location directive line, two main causes must be investigated:

- Make sure that the demand replenishment template that is applied is set up to use the correct location templates and work templates of the **Replenishment** type.
- Make sure that there is enough on-hand inventory at the locations where the demand replenishment

template searches for on-hand inventory for replenishment.

NOTE

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Replenishment with withdrawal kanbans

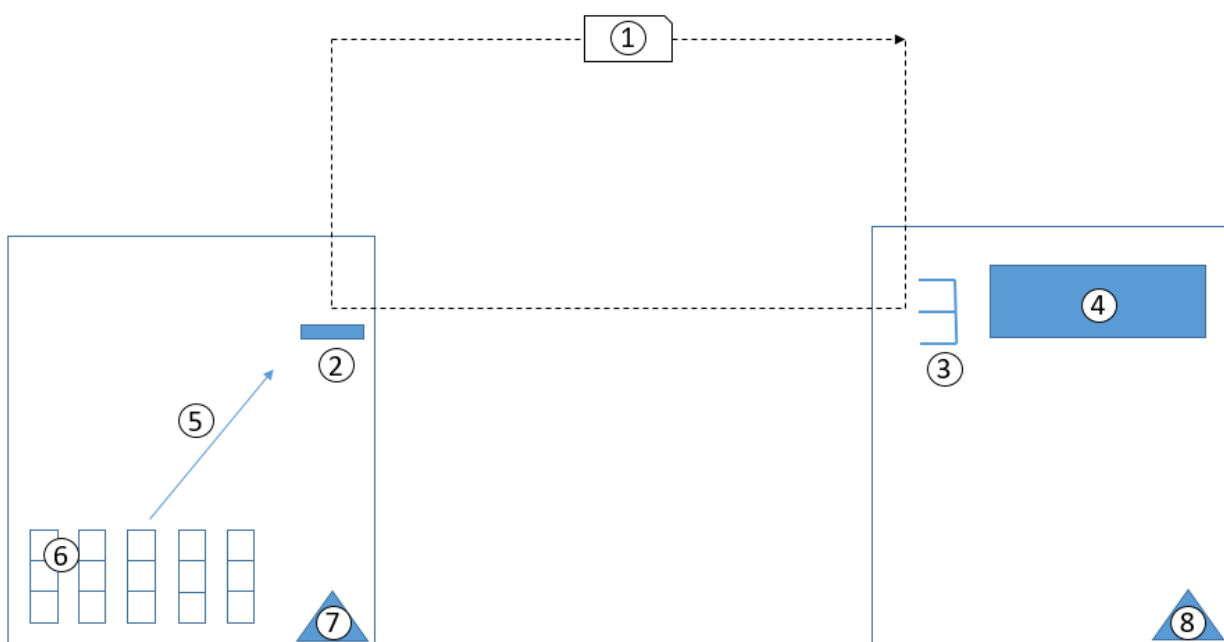
2/18/2021 • 5 minutes to read • [Edit Online](#)

This topic describes how the withdrawal kanban is used for material replenishment for manufacturing activities.

Workflow for material replenishment that uses the withdrawal kanban

The withdrawal kanban can be used to move a kanban of a single item between warehouses and production locations where the material is consumed. The withdrawal kanban supports a pull-based solution for material replenishment, where a pull signal is required in order to trigger supply for a specific demand.

The following scenario shows a pull-based replenishment system where a pull signal triggers the creation of a kanban to replenish material for a production process.



1. Withdrawal kanban
2. Kanban "from" location and put location for warehouse work
3. Kanban "to" location and production input location
4. Manufacturing process
5. Warehouse work for kanban picking
6. Warehouse locations for raw material
7. Material warehouse
8. Manufacturing warehouse

In this scenario, a manufacturing process (4) consumes material from a production input location (3) in the manufacturing warehouse (8). When a handling unit of the material (kanban) is consumed, it's registered as empty. A replenishment signal is created for the item origin, and a new kanban (1) is created. In this case, the item origin consists of locations in the material warehouse (7). The material for the kanban is picked and put to a location (2) in the same warehouse. When the material is picked, it's ready to be transferred from location 2 to the production input location (3) in the manufacturing warehouse (8).

Configure warehouse work for kanban picking for the withdrawal

kanban

To enable raw material picking for the withdrawal kanban, configure wave templates, work templates, and location directives for the **Kanban picking** work order type. This work order type doesn't just support the picking process for the withdrawal kanban. It also supports the picking process for the manufacturing kanban. However, you can configure a separate picking process for each type of kanban by separating the wave templates, work templates, and location directives. To separate the wave templates, work templates, and location directives, set criteria on the activity type (**Process** or **Transfer**) in the queries for those entities.

Configure the withdrawal kanban

The transfer activity that is used for the withdrawal kanban is configured as part of an activated activity plan in a Lean production flow. As part of the configuration of the transfer activity, you specify the "from" and "to" locations for the transfer. After you configure the transfer activity, you can assign it to a kanban rule of the **Withdrawal** type. The kanban rule sets the policies and configurations for the withdrawal kanban. The quantity of the kanban defines how many units of the handling unit the kanban carries during the transfer process. The fixed kanban quantity is used when the Fixed replenishment strategy is selected. This quantity defines how many kanbans that are required in order to prevent stock or build inventory from running out at the source of demand. The fixed quantity can be calculated based on actual demand, historical demand, and service levels. The following two scenarios describe how you can manage material replenishment that uses the withdrawal kanban.

Scenario 1: Replenish a production input location by using a fixed withdrawal kanban

A manufacturing process consumes a purchased raw material from a production input location that is in the production warehouse. When the raw material is received from the vendor, it's stored in locations in the material warehouse. Because the demand for the material is considered stable over a period, it's set up to supply the production in a fixed quantity kanban flow. When a kanban is consumed at the production input location, an empty signal is registered, and a new kanban of the same type is added to the flow.

The empty signal can be configured to occur automatically when a kanban is completed. Alternatively, the empty signal can be set up as a manual interaction that is given either from the Kanban transfer board or from a menu on the hand-held device. The Kanban transfer board is the workspace where all activities in the kanban life cycle are managed.

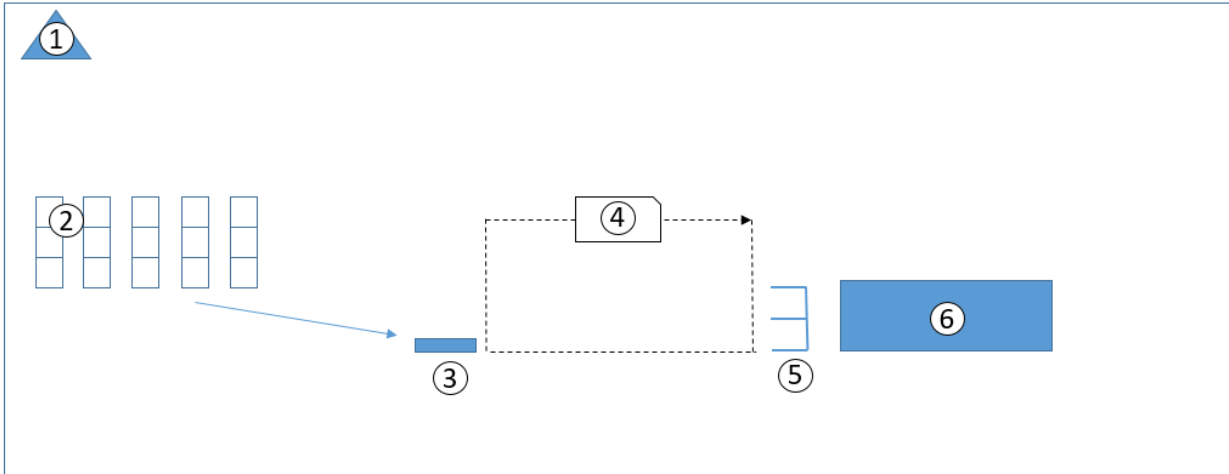
When the kanban is created, a wave line for the raw material is added to a kanban wave for the material warehouse. In the picking list section of the Kanban transfer board, the status of the material and related warehouse processes can be monitored from wave creation to work creation, until the material is on-hand in the "transfer from" location and is ready to be transferred to the production input locations. The kanban can be completed either from the Kanban transfer board or from a menu on the hand-held device.

In this scenario, the picking work in the material warehouse is processed as one activity. The transfer activity between the material warehouse and the production warehouse is processed as a separate activity. This approach can be useful if, for example, there is a large physical distance between the two warehouses. In this case, the kanban transfer activity can represent a truck load.

If the distance between the warehouse locations and the production input location is small, it might be more efficient to include the transfer activity in the picking process. Then, after the material is picked, it can be put directly to the production input location. To support this process, you configure the transfer activity so that it's automatically completed when the pick work of the withdrawal kanban is processed.

Scenario 2: Automatically complete the transfer activity when kanban picking work is processed

In the following scenario, the transfer activity of the withdrawal kanban is configured to transfer between two locations in the same warehouse. The transfer activity of the withdrawal kanban is set up so that it's completed automatically.



1. Shared warehouse for raw materials and production
2. Warehouse locations for raw materials
3. Kanban "from" location and put location for warehouse work
4. Withdrawal kanban
5. Production input location
6. Manufacturing process

After a kanban is consumed at the production input location, the kanban is reported as empty, and a new kanban is added to the flow. When the kanban is created, a wave line is added to a kanban wave. When the kanban wave is processed, warehouse work for kanban picking is created. The warehouse worker processes the work for kanban picking and is directed by the work to pick the material for the kanban in a warehouse location. As this warehouse worker confirms the pick, the kanban is automatically completed, and the warehouse worker is guided to the put the material to the production input location.

NOTE

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Set up a min-max replenishment process

2/18/2021 • 6 minutes to read • [Edit Online](#)

This procedure shows you how to set up a new replenishment process which uses the minimum/maximum replenishment strategy. When inventory falls below the minimum level, work will be created to replenish the location. The procedure also shows how to use fixed picking locations to allow restocking even if inventory falls below the minimum level, and how to enable the replenishment process to run regularly using a batch job. These tasks would typically be carried out by a warehouse manager. You can run this procedure in the USMF demo data company using the example values below, or can run it on your own data. If you're using your own data, make sure that you have a warehouse that's enabled for Warehouse management processes.

Create a fixed picking location

1. Go to **Navigation pane > Modules > Warehouse management > Setup > Warehouse > Fixed locations**. This is an optional task for min-max replenishment, but if you use fixed picking location, this allows stock to be replenished even if it falls below the minimum level, because the system can determine which items need to be replenished, even if there aren't any left.
2. Click **New**.
3. In the **Item number** field, enter or select a value. If you're using USMF, you can select item A0001.
4. In the **Site** field, enter or select a value. If you're using USMF, you can select site 2.
5. In the **Warehouse** field, enter or select a value. If you're using USMF, you can select warehouse 24.
6. In the **Location** field, enter or select a value. If you're using USMF, you can select CP-003.
7. Close the page.

Create a replenishment location directive

1. Go to **Warehouse management > Setup > Location directives**. Location directives are used to determine where items should be picked from in the replenishment process.
2. In the **Work order type** field, select 'Replenishment'.
3. On the **Action Pane**, click **New**.
4. In the **Name** field, type a value.
5. In the **Work type** field, select 'Pick'.
6. In the **Site** field, enter or select a value. If you're using USMF, you can select site 2.
7. In the **Warehouse** field, enter or select a value. If you're using USMF, you can select warehouse 24.
8. Click **Save**.
9. In the **Lines** section, click **New**.
10. In the list, mark the selected row.
11. In the **To quantity** field, enter a number. For example, you can set it to 9999.
12. Select the **Allow split** check box. If you select this option, the work creation process will allow work line quantities to be split across multiple locations.
13. Click **Save**.
14. In the **Location directive Actions** section, click **New**.
15. In the list, mark the selected row.
16. In the **Name** field, type a value.
17. Click **Save**.
18. On the **Action Pane**, click **Edit query**. You can edit this query to add restrictions where inventory can be

selected from in the replenishment process. For example, it could be that inventory should only be used from the Bulk area of the warehouse.

19. Click **OK**.
20. Close the page.

Create a replenishment work template

1. Go to **Warehouse management > Setup > Work > Work templates**. The work template is used to guide the system as to how the min/max replenishment work must be created. As a minimum, there must be a work template line for a pick and a put. The work template will say that it's Invalid until all the necessary information has been filled in.
2. In the **Work order type** field, select 'Replenishment'.
3. On the **Action Pane**, click **New**.
4. In the **Work template** field, type a value.
5. Click **Save**.
6. In the **Work template details**, click **New**.
7. In the **Work type** field, select 'Pick'.
8. In the **Work class ID** field, enter or select a value. This should be a work class related to replenishment. If you're using USMF, select Replenish.
9. In the **Work template details**, click **New**.
10. In the list, mark the selected row.
11. In the **Work type** field, select 'Put'.
12. In the **Work class ID** field, enter or select a value.
13. Click **Save**.
14. Close the page.

Create a new replenishment template

1. Go to **Warehouse management > Setup > Replenishment > Replenishment templates**. The replenishment template is used to define the items and quantities, and the location to replenish.
2. On the **Action Pane**, click **New**.
3. In the **Replenish template** field, type a value. Give the template a name to indicate that it's for min/max replenishment.
4. In the **Description** field, type a value.
5. Select the **Allow wave demand to use unreserved quantities** check box. If you select this option, it enables wave demand replenishment to consume quantities that are related to min/max replenishment. For example, this might be useful if the min/max replenishment work isn't processed immediately, to avoid unnecessary demand replenishment work from being created.
6. In the **Replenishment template details**, click **New**.
7. In the **Sequence number** field, enter a number.
8. In the **Description** field, type a value.
9. In the list, mark the selected row.
10. In the **Replenishment unit** field, enter or select a value. For example, select pcs. This setting is mandatory. It allows you to specify a different unit of measurement for replenishment work compared to the unit specified for the minimum and maximum stock levels in this template.
11. In the **Work template** field, enter or select a value. Choose the work template that you created earlier.
12. In the **Minimum quantity** field, enter a number. Select the minimum quantity that should trigger the replenishment. For example, set this to 50. It is possible to leave this set to zero, if you're replenishing a fixed location and the **Replenish empty fixed locations** option is set to 'Yes'. We also recommend that you

select the **Replenish only fixed locations** option for performance reasons.

13. In the **Maximum quantity** field, enter a number. For example, set this to 100.
14. In the **Unit** field, enter or select a value. Assign the unit for the minimum and maximum quantities. For example, set this to pcs.
15. Select the **Replenish empty fixed locations** check box. Select this check box to replenish fixed locations when they are empty. Otherwise, only the locations where there is a quantity on hand will be replenished.
16. Select the **Replenish only fixed locations** check box.
17. Click **Select products**. This is the place to define which products should be replenished. If the Fixed picking locations option is selected, you also need to define the locations in this query. Variant-specific queries are available as well product-specific queries.
18. Select the **Items** row.
19. In the **Criteria** field, type a value. Select the items that should be replenished at the fixed locations. For example, type A* to select all item numbers beginning with A.
20. Click **Add**. Add the Location entity (unless it already exists) to be able to restrict the replenishment work to the fixed picking locations within a specific area of the warehouse.
21. In the list, mark the selected row.
22. Set the **Table** field to 'Locations'.
23. In the **Field** field, select 'Location profile ID'.
24. In the **Criteria** field, enter or select a value.
25. Click **OK**.
26. Close the page.

Set the replenishment process to run as a batch job

1. Go to **Warehouse management > Replenishment > Replenishments**. The Replenishments page allows you to set up replenishment to run as a batch job, or to require that it's started manually.
2. Click **Filter**.
3. In the list, mark the selected row.
4. In the **Criteria** field, enter or select a value.
5. Click **OK**.
6. Expand the **Run in the background** section.
7. Set the **Batch processing** option to 'Yes'.
8. Click **Recurrence**.
9. Select the **No end date** option.
10. Set the **Recurrence pattern**. For example, select Days.
11. Click **OK**.
12. Click **OK**.

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Zone threshold replenishment

2/18/2021 • 13 minutes to read • [Edit Online](#)

Zone-based replenishment uses a minimum/maximum (min/max) [replenishment](#) strategy, but it evaluates whole warehouse zones instead of just individual locations. Therefore, warehouse managers can more quickly learn when additional inventory is required in a picking zone.

The setup for this feature resembles the setup for location-based replenishment. However, when you set up a template for min/max replenishment, you can also specify whether the threshold should be evaluated per location or per zone. If you set up evaluation that is based on zones, you must add specific zones to the zone selection query.

Like location-based min/max replenishment, zone-based min/max replenishment is based the setup of a minimum inventory threshold that triggers the creation of replenishment work for selected items. This replenishment work will increase inventory up to the specified maximum threshold for the zone.

NOTE

Zone replenishment processes for product variants aren't supported in the current release.

Unlike location-based min/max replenishment, zone-based min/max replenishment doesn't require fixed locations to evaluate whether locations should store a specific item. Therefore, zone-based replenishment lets you use min/max replenishment even if you don't have fixed locations for each item or item variant in the warehouse. When a quantity in the zone falls below the specified minimum threshold, replenishment work is created. Location directives will determine which specific location the inventory should be put into.

Turn on the Zone threshold replenishment feature

Before you can use the *Zone threshold replenishment* feature, it must be turned on in your system. Admins can use the [feature management](#) settings to check the status of the feature and turn it on if it's required. In the **Feature management** workspace, the feature is listed in the following way:

- **Module:** *Warehouse management*
- **Feature name:** *Zone threshold replenishment*

Set up zone-based replenishment

To set up zone-based replenishment, you must configure several parts of the system. This section introduces the various settings and provides demo data values that you can enter if you want to work through the scenario at the end of this topic.

Set up directive codes

[Directive codes](#) let you be more specific when you define the location template that is used in a work template. Each code establishes a common value that you can refer to when you configure each type of template.

View and edit directive codes

To view or edit your directive codes, go to **Warehouse management > Setup > Directive codes**.

Prepare demo data directive codes

This example shows how to prepare a directive code. If you're planning to work through the scenario at the end of this topic, use the demo data values that are provided here. Otherwise, use your own values.

1. Select the **USMF** legal entity to work with the demo data.
2. Go to **Warehouse management > Setup > Directive codes**.
3. On the Action Pane, select **New** to add a row to the grid.
4. In the new row, set the following values:
 - **Directive code:** *Zone replen*
 - **Directive description:** *Zone replenishment*
5. Select **Save** to save the new code.

Set up replenishment templates

[Min/max replenishment templates](#) are the primary mechanism for maintaining optimal levels in picking locations. In these templates, you must set up the rules that will be used to replenish inventory in the warehouse. The replenishment that the templates can be used for includes zone-based replenishment.

View and edit replenishment templates

A replenishment template is a set of rules that control when and how a location is replenished. You select a template to control when and how replenishment is done. To view or edit your replenishment templates, go to **Warehouse management > Setup > Replenishment > Replenishment templates**.

Prepare a demo data replenishment template

This example shows how to prepare a replenishment template. If you're planning to work through the scenario at the end of this topic, use the demo data values that are provided here. Otherwise, use your own values.

1. Select the **USMF** legal entity to work with the demo data.
2. Go to **Warehouse management > Setup > Replenishment > Replenishment templates**.
3. Select **Edit** to put the page into edit mode.
4. On the Action Pane, select **New** to add a row to the **Overview** grid.
5. In the new row, set the following values. Accept the default values for all other fields.
 - **Replenish template:** *Zone min/max replen*
 - **Description:** *Zone min/max replenishment*
 - **Replenishment type:** *Minimum or maximum*
6. Select **Save**.
7. While the new row is still selected in the **Overview** grid, select **New** above the **Replenishment Template Details** grid to add a row that is associated with the *Zone Min/Max replen* replenishment template that you just created.
8. In the new row, set the following values:
 - **Sequence number:** Enter *1*.
 - **Description:** Enter *Pick zone replenishment*.
 - **Replenishment unit:** Select *ea*.
 - **Request type:** Leave this field blank.
 - **Directive code:** This field links the replenishment template with a location directive. Select the demo data directive code that you created earlier (*Zone replen*).
 - **Work template:** Leave this field blank.
 - **Minimum quantity:** This field sets the quantity that replenishment will be triggered at. Enter *50*.
 - **Maximum quantity:** This field sets the maximum quantity of an item that can be present in a zone. Generated replenishment work will increase inventory to this quantity. Enter *150*.

- **Unit:** This field sets the unit for the minimum and maximum values. Select *ea*.
- **Demand increment:** Select *Round up*.
- **Replenish empty fixed locations:** Select this check box.
- **Replenish only fixed locations:** Clear this check box.
- **Product query mode:** Select *Product query*.
- **Replenishment threshold scope:** This field defines whether the template should evaluate by zone or by specific location. Select *Zone*.
- **Warehouse:** Select *61*.

9. Select **Select products** above the **Replenishment Template Details** grid.
10. In the **Product query** dialog box, on the **Range** tab, select **Add** to add a row to the grid.
11. In the new row, set the following values:
 - **Table:** *Items*
 - **Derived table:** *Items*
 - **Field:** *Item number*
 - **Criteria:** *A0001*
12. Select **OK** to save your query and close the dialog box.
13. Select **Select zones to replenish** above the **Replenishment Template Details** grid.
14. In the **Zone query** dialog box, on the **Range** tab, add a row to the grid.
15. In the new row, set the following values:
 - **Table:** *Warehouse zone*
 - **Derived table:** *Warehouse zone*
 - **Field:** *Zone ID*
 - **Criteria:** *FLOOR*
16. Select **OK** to save your query and close the dialog box.

Set up location directives

Unlike location-based min/max replenishment, zone-based min/max replenishment requires that you set up both pick location directives and put location directives, because the system evaluates the whole zone instead of just the pick location for outbound work.

View and edit location directives

To view or edit your location directives, go to **Warehouse management > Setup > Location directives**.

For examples that show how to use the settings to create the required pick location directives and put location directives, see the next section.

Prepare demo data location directives

To prepare demo data so that it can be used in the scenario at the end of this topic, you must create two location directives: one for pick and one for put.

Create a replenishment pick directive

1. Select the **USMF** legal entity to work with the demo data.
2. Go to **Warehouse management > Setup > Location directives**.
3. In the left pane, set the **Work order type** field to *Replenishment*.
4. On the Action Pane, select **New** to create a new directive.
5. Set the following values:

- **Sequence number:** Accept the default value.
 - **Name:** Enter *Zone pick*.
 - **Work type:** Select *Pick*.
 - **Site:** Select *6*.
 - **Warehouse:** Select *61*.
 - **Directive code:** Leave this field blank.
 - **Multi SKU:** Set this option to *No*.
6. Select **Save** to create a directive that has the settings that you've configured so far.
 7. On the **Lines** FastTab, select **New** to add a line to the grid.
 8. On the new line, set the following values:
 - **Sequence number:** Enter *1*.
 - **From quantity:** Enter *0*.
 - **To quantity:** Enter *10000000*.
 - **Unit:** Leave this field blank.
 - **Locate quantity:** Select *None*.
 - **Restrict by unit:** Clear this check box.
 - **Round up to unit:** Clear this check box.
 - **Locate packing quantity:** Clear this check box.
 - **Allow split:** Select this check box.
 9. Select **Save** to save the new line.
 10. While your new line is still selected in the **Lines** grid, select **New** on the **Location Directive Actions** FastTab to add a row to the grid.
 11. In the new row, set the following values:
 - **Sequence number:** Enter *1*.
 - **Name:** Enter *Pick from bulk*.
 - **Fixed location usage:** Select *Fixed and non-fixed locations*.
 - **Allow negative inventory:** Clear this check box.
 - **Batch enabled:** Clear this check box.
 - **Strategy:** Select *None*.
 12. Select **Save** to save the new action.
 13. While your new action still selected, select **Edit query** above the **Location Directive Actions** grid.
 14. A query dialog box appears, where you can select the locations to replenish from. On the **Range** tab, select **Add** to add a row to the grid.
 15. In the new row, set the following values:
 - **Table:** *Locations*
 - **Derived table:** *Locations*
 - **Field:** *Zone ID*
 - **Criteria:** *BULK*
 16. Select **OK** to save your query and close the dialog box.
 17. Select **Save** to save your location directive.

Create a replenishment put directive

1. On the **Location directives** page, in the left pane, make sure that the **Work order type** field is still set

to *Replenishment*.

2. On the Action Pane, select **New** to create another new directive.
3. Set the following values:
 - **Sequence number**: Accept the default value.
 - **Name**: Enter *Zone put*.
 - **Work order type**: Select *Put*.
 - **Site**: Select *6*.
 - **Warehouse**: Select *61*.
 - **Directive code**: Select *Zone replen* to link this location directive with the replenishment template that you created earlier by using the code that you created earlier.
 - **Multi SKU**: Set this option to *No*.
4. Select **Save** to create a directive that has the settings that you've configured so far.
5. On the **Lines** FastTab, select **New** to add a line to the grid.
6. On the new line, set the following values:
 - **Sequence number**: Enter *1*.
 - **From quantity**: Enter *0*.
 - **To quantity**: Enter *10000000*.
 - **Unit**: Leave this field blank.
 - **Locate quantity**: Select *None*.
 - **Restrict by unit**: Clear this check box.
 - **Round up to unit**: Clear this check box.
 - **Locate packing quantity**: Clear this check box.
 - **Allow split**: Select this check box.
7. Select **Save** to save the new line.
8. While your new line is still selected in the **Lines** grid, select **New** on the **Location Directive Actions** FastTab to add a row to the grid.
9. In the new row, set the following values:
 - **Sequence number**: Enter *1*.
 - **Name**: Enter *Zone put*.
 - **Fixed location usage**: Select *Fixed and non-fixed locations*.
 - **Allow negative inventory**: Clear this check box.
 - **Batch enabled**: Clear this check box.
 - **Strategy**: Select *Consolidate*.
10. Select **Save** to save the new action.
11. While your new action is still selected, select **Edit query** above the **Location Directive Actions** grid.
12. A query dialog box appears, where you can select the zone to replenish to. This zone should be the same zone that is specified in the replenishment template. On the **Range** tab, select **Add** to add a row to the grid.
13. In the new row, set the following values:
 - **Table**: *Locations*
 - **Derived table**: *Locations*
 - **Field**: *Zone ID*

- **Criteria:** *FLOOR*

14. Select **OK** to save your query and close the dialog box.

15. Select **Save** to save your location directive.

Scenario

This section provides a sample scenario that shows how to work with the feature.

Prepare the sample data that is required for the sample scenario

Before you start to work through the scenario, you must activate sample data and set up the feature as described in this section and in the previous sections of this topic.

Use the USMF legal entity

To work through the scenario by using the sample records and values that are specified here, you must be on a system where the standard [demo data](#) is installed. Additionally, you must select the **USMF** legal entity before you begin.

Prepare additional sample data

After you've selected the **USMF** legal entity, add the additional sample data that is required, as described in the [Set up zone-based replenishment](#) section earlier in this topic.

Check your on-hand inventory

Follow these steps to make sure that your system includes enough inventory to support the sample scenario.

1. Make sure that there is on-hand inventory for item *A0001* at two different locations in the pick zone (*FLOOR*) that is specified in the replenishment template. However, the total inventory should be less than the required minimum quantity (*50*) that is specified on the replenishment template. In this way, you can simulate how the calculation occurs for the whole zone instead of just for a single location. **Use any of the warehouse processes to adjust inventory as required.**
2. Make sure that there is enough inventory for item *A0001* at a bulk location that is specified in the zone pick location directive where the replenishment work should pick the items from zone ID *BULK*. The total inventory must be more than the required maximum quantity (*150*) that is specified in the replenishment template.
3. Optional but recommended: Follow these steps to create an inventory adjustment journal:
 - a. Go to **Inventory management > Journal entries > Items > Inventory adjustment**.
 - b. Select **New**.
 - c. In the **Create inventory journal** dialog box, in the **Warehouse** field, select *61*.
 - d. Select **OK**.
 - e. On the **Journal lines** FastTab, use the **New** button to add three lines to the grid, and set the following values. After you've finished setting up each line, select **Save**.

- **Line 1:**

- **Item number:** *A0001*
- **Site:** *6*
- **Warehouse:** *61*
- **Location:** *02A01R1S1B*
- **License plate:** Select an existing license plate in the list, or create a new license plate.
- **Quantity:** *1000*

- **Line 2:**

- **Item number:** *A0001*
- **Site:** *6*
- **Warehouse:** *61*
- **Location:** *07A01R2S1B*
- **License plate:** Select an existing license plate in the list, or create a new license plate.
- **Quantity:** *15*
- **Line 3:**
 - **Item number:** *A0001*
 - **Site:** *6*
 - **Warehouse:** *61*
 - **Location:** *07A01R1S1B*
 - **License plate:** Select an existing license plate in the list, or create a new license plate.
 - **Quantity:** *10*

f. On the Action Pane, select **Validate**. Address any errors that are found before you move on to the next step.

g. On the Action Pane, select **Post** to post the inventory to the warehouse.

Sample scenario: Run zone-based min/max replenishment

After all the prerequisite sample data is in place, you can trigger replenishment by following these steps.

1. Go to **Warehouse management > Replenishment > Replenishments**.
2. In the **Replenishment** dialog box, on the **Records to include** FastTab, select **Filter**.
3. In the **Inquiry** dialog box, on the **Range** tab, edit the default table row in the following way:
 - **Table:** Select *Replenishment templates*.
 - **Derived table:** Select *Replenishment templates*.
 - **Field:** Select *Replenishment template*.
 - **Criteria:** Select *Zone min/max replen*. This replenishment template is the replenishment template that you created while you were preparing the demo data for this scenario.
4. Select **OK** to save the query and go back to the **Replenishment** dialog box.
5. Select **OK** to run the replenishment template.

Replenishment work is now created to pick inventory from the *BULK* zone and replenish it to the *FLOOR* zone.

Notes and tips

Here are a few notes and tips for working with the feature:

- To set up replenishment work that goes to the desired zone, you can link the replenishment template lines and location directives in either of the following ways:
 - Edit the location directive header query, and filter the selected replenishment template lines.
 - Use a directive code on the replenishment template line, and match it to the put location directive.
- If you're using dynamic locations, replenishment work will be created either for the first available location or for a location that already contains inventory, if the location directive action is set up to use the **Consolidate** strategy.
- If you're using fixed locations instead of zones, you should use [standard min/max replenishment](#).

NOTE

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Replenishment strategies

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The templates that are defined on the **Replenishment templates** page include wave demand replenishment template lines that let you select how replenishment is done. Each line now includes a **Replenishment strategy** field.

The *Wave demand quantity* strategy is the default strategy. It's the replenishment strategy that was used before the introduction of the **Replenishment strategy** field. It uses the replenishment location directives to find locations that can be replenished. It then replenishes those locations until the demand is covered.

The *Maximum location capacity* strategy introduces some new functionality. Like the *Wave demand quantity* strategy, this strategy uses the replenishment location directives to find locations that can be replenished, and then it replenishes those locations until the demand is covered. It differs from the *Wave demand quantity* strategy in that all the replenished locations are replenished to their maximum capacity, as defined by the location stocking limits. The *Maximum location capacity* strategy tries to create work to bring in the requested quantity, plus some extra quantity, to fill the locations that are being replenished. However, in some cases, that attempt might fail. For example, the bulk locations might not have enough inventory to cover the extra quantity. In these cases, the system detects the failure and tries to recover.

Peak season is one example of a situation where the *Maximum location capacity* strategy is preferable to the *Wave demand quantity* strategy. During peak season, some items might be selling at high volume. Therefore, you might want to proactively replenish the relevant picking locations as much as possible, to reduce the number of work IDs that are created for replenishment.

IMPORTANT

To take full advantage of the *Maximum location capacity* strategy, you must redefine the stocking limits for the relevant locations. Otherwise, this strategy works just like the *Wave demand quantity* strategy.

Turn on the Replenish to max based on stocking limits feature

Before you can use this feature, it must be turned on in your system. Administrators can use the [Feature management](#) workspace to check the status of this feature and turn it on if it's required. There, the feature is listed in the following way:

- **Module:** *Warehouse management*
- **Feature name:** *Replenish to max based on stocking limits*

Set up replenishment strategies

To access the templates, go to **Warehouse management > Setup > Replenishment > Replenishment templates**. In the **Overview** section, select or create a wave demand replenishment template where the **Replenishment type** field is set to *Wave demand*. Then set up the replenishment template lines in the **Replenishment template details** section. For each line, in the **Replenishment strategy** field, select the replenishment strategy that you want to use.

The screenshot shows the SAP Replenishment templates interface. It is divided into two main sections: 'Overview' and 'Replenishment Template Details'.

Overview Table:

Replenish template	Description	Replenishment type	Wave step code	Allow wave demand to use unreserved quantities	Cancel replenishment if demand has...
Demand Replenish	Wave demand replenishment	Wave demand	1	<input type="checkbox"/>	<input type="checkbox"/>
Min-Max Replenish	Min-Max Replenishment	Minimum or maximum		<input type="checkbox"/>	<input type="checkbox"/>
Min-Max Variant	Min-Max Replenishment for v...	Minimum or maximum		<input type="checkbox"/>	<input type="checkbox"/>

Replenishment Template Details Table:

Sequence nu...	Description	Replenishment unit	Request type	Directive code	Work template	Replenishment strategy	Product query mode
1	Wave demand replenishment	ea				Maximum location capacity	Product query

If the **Replenishment strategy** column doesn't appear in the grid in the **Replenishment template details** section, make sure that the feature has been turned on, and that the selected replenishment template has a replenishment type of *Wave demand*.

NOTE

The *Wave demand quantity* strategy is the default strategy. Therefore, you just have to update the replenishment template lines where you want to use the *Maximum location capacity* strategy instead.

Example scenarios

Example 1

For this example, there is only one replenishment template that has only one replenishment template line.

You create a sales order for 130 pieces (pcs) of item A0001. Before you release the order to the warehouse, the warehouse is set up in the following way:

- There is only one bulk location, and it has 500 pcs of available on-hand inventory.
- There are three pick locations, each of which has a stocking limit of 100 pcs. (Remember that stocking limits are required for the *Maximum location capacity* strategy.)
- The replenishment put locations are the same as the sales pick locations.
- The replenishment unit is a box (1 box = 20 pcs).

At the time of the order, the following inventory is on hand at the sales pick locations:

- **Pick-001:** 20 pcs (1 box)
- **Pick-002:** 0 pcs
- **Pick-003:** 0 pcs

Initially, the replenishment strategy is set to *Wave demand quantity*.

After you release the sales order to the warehouse, and wave processing runs for the wave, you get the following replenishment work:

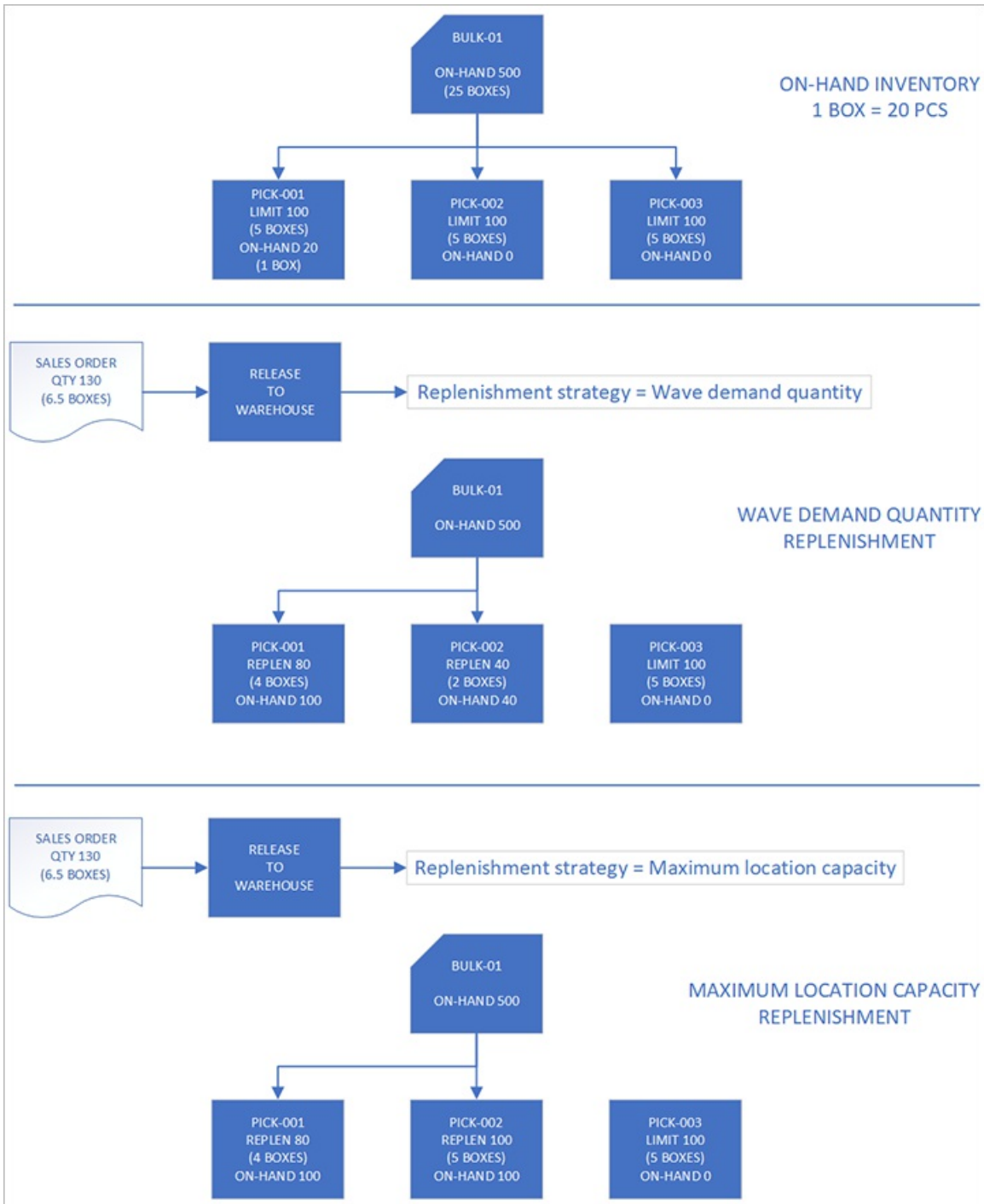
- **Replenishment work 1:** Pick 4 boxes from the bulk location, and put them in location pick-001.
- **Replenishment work 2:** Pick 2 boxes from the bulk location, and put them in location pick-002.

You get two replenishment work IDs because you must replenish two locations, and multi-puts aren't supported.

If you set the replenishment strategy to *Maximum location capacity* instead, you get the following replenishment work:

- **Replenishment work 1:** Pick 4 boxes from the bulk location, and put them in location pick-001.

- **Replenishment work 2:** Pick 5 boxes from the bulk location, and put them in location pick-002.



Example 2

This example shows what happens when the bulk location doesn't have enough inventory to cover the extra quantity. It uses the same scenario as example 1, but the bulk location has 160 pcs (8 boxes).

The *Wave demand quantity* strategy creates the same work that it did in example 1.

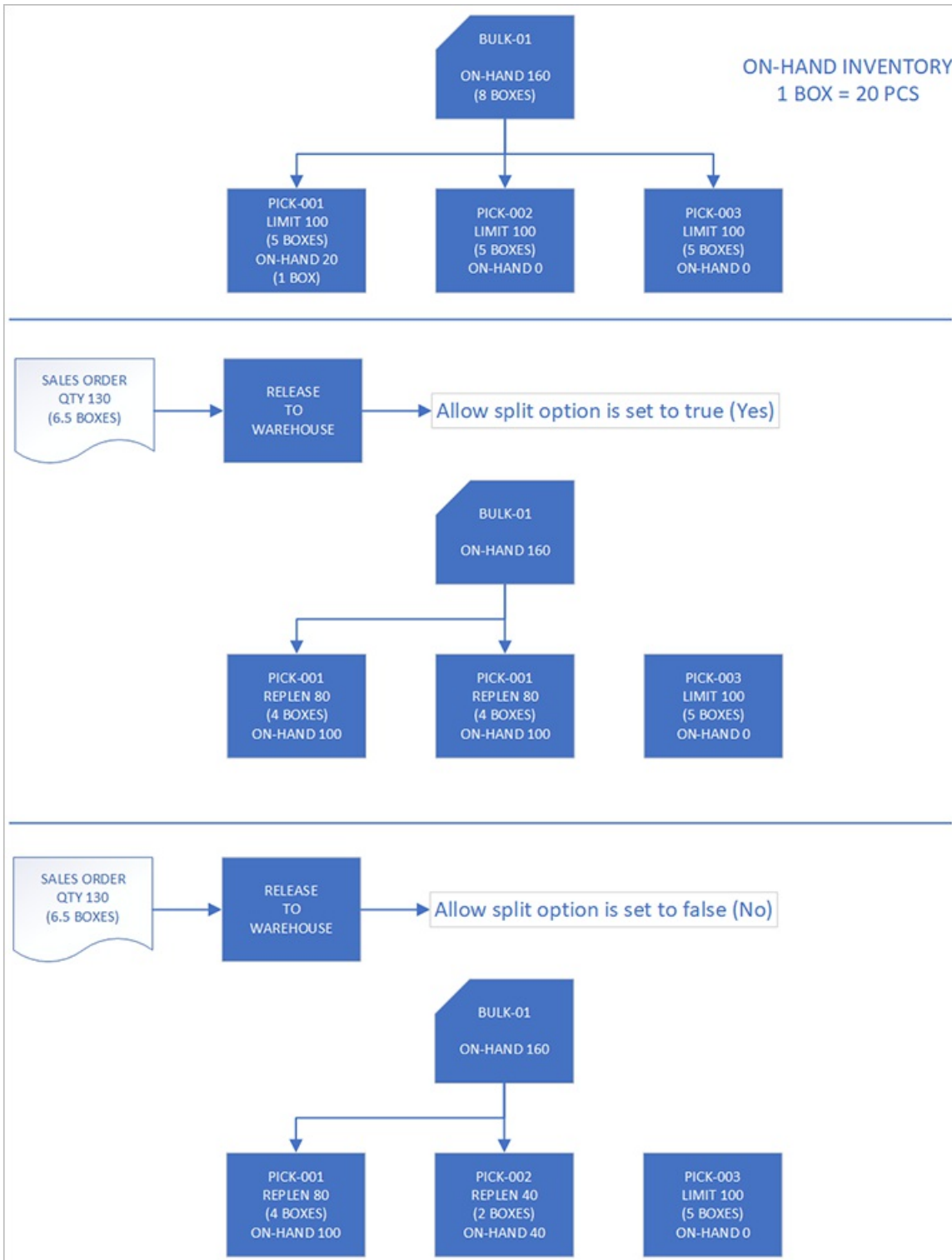
However, because the *Maximum location capacity* strategy tries to create the work IDs as it did in example 1, it might fail. At that point, the system tries to recover.

Depending on the setting of the **Allow split** option on the location directives for replenishment picking, two outcomes are possible:

- If the **Allow split** option is set to *Yes*, the following replenishment work is created:
 - **Replenishment work 1:** Pick 4 boxes from the bulk location, and put them in location pick-001.
 - **Replenishment work 2:** Pick 4 boxes from the bulk location, and put them in location pick-002.

- If the **Allow split** option is set to *No*, the following replenishment work is created:
 - **Replenishment work 1:** Pick 4 boxes from the bulk location, and put them in location pick-001.
 - **Replenishment work 2:** Pick 2 boxes from the bulk location, and put them in location pick-002.

The outcomes differ because of the information that is available when you create the work. When the **Allow split** is set to *Yes* on the location directives for replenishment picking, you know that you managed to find 160 pcs. Therefore, you can create work for that quantity. However, when the **Allow split** option is set to *No*, you don't know about the existence of the 160 pcs. Because the extra quantity that you decided to replenish was 3 boxes, you drop that extra quantity and try the original quantity again.



Therefore, to get the maximum quantity to the replenished locations, you should set the **Allow split** option to *Yes* on the location directives for replenishment picking.

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Replenishment over location capacity

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Some high-volume or space-constrained warehouses must ship more quantity of an item in a day than will fit in the picking location. The *Replenishment over location capacity* feature enables all replenishment work that will be required for the day to be created and manages availability of that replenishment work to ensure that the picking location neither runs out of inventory nor goes above capacity.

The feature enables more replenishment work to be created than will fit in a location, and it blocks replenishment work from being completed when the location is full. As inventory in the picking location drops below a configurable threshold, more replenishment work is made available.

Turn on the Replenishment over location capacity feature

To make this feature available, turn on the following features in [feature management](#) (in this order):

1. Organization-wide work blocking
2. Replenishment over location capacity

Set up the feature for the example scenario

This section provides guidelines and an example that shows how to set up this feature and prepare sample data for the example scenario that is provided later in this topic.

Enable sample data

To work through the [example scenario](#) by using the sample records and values that are specified here, you must be on a system where the standard [demo data](#) is installed. Additionally, you must select the **USMF** legal entity before you begin.

Location profile

Enable the replenish over capacity functionality on the location profile.

1. Go to **Warehouse management > Setup > Warehouse > Locations profiles**.
2. In the left pane, select **PICK-06**.
3. On the Action Pane, select **Edit**.
4. On the **Replenishment** FastTab, set the following values:

- **Exceed Location Capacity:** *Yes*

When enabled, the maximum capacity of the location will be allowed to be exceeded by replenishment work. This also enables other fields on the **Replenishment** FastTab.

- **Work availability threshold type:** *Quantity*

This field defines the method that is used to determine when more work should be released. You can release by either quantity or a percentage:

- *Percent*– Select this option to use percentage capacity that is based on stocking limits or volumetrics. Selecting this option enables the **Overflow percentage** field, and disables the two quantity related fields, **Overflow quantity** and **Overflow unit**.

You can use this option if the picking locations use volumetrics.

If this option is selected, set the **Overflow percentage** field to the percentage at which more replenishment work will be made available.

- **Quantity** – Select this option to use a specific quantity value. Selecting this option disables the **Overflow percentage** field and enables **Overflow quantity** and **Overflow unit** fields.

Use this option when you aren't using volumetrics for the locations that are being replenished, or when you have consistent quantities at which you want more inventory to be brought to the location.

If this option is selected, set the **Overflow quantity** and **Overflow unit** fields to the quantity and unit at which more replenishment work will be made available.

- **Overflow quantity: 0.65**

This field defines the quantity at which the location overflows.

Work will be available whenever the sum of the on-hand quantity in the location and the work quantity is below this value. Any replenishment work above this value will be blocked and must be manually unblocked.

Location stocking limits are considered when the work quantity is calculated.

- **Overflow unit: PL**

This field defines the unit that is associated with the overflow quantity.

In this case, more replenishment work will be made available when the location gets down to 0.65 pallet (PL).

- **Overflow percentage**

This field defines the percentage at which the location overflows.

Work will be available whenever the sum of the on-hand quantity in the location and the work quantity is below this percentage. Any replenishment work quantity percentage above this value will be blocked and must be manually unblocked.

Location stocking limits are considered when the work quantity percentage is calculated. If no location stocking limits are defined, the work quantity percentage is calculated by volume if volume constraints are defined for the location profile.

IMPORTANT

If you're using the demo data for the **USMF** legal entity and previously turned on the *Location license plate positioning* feature, you must turn off the **Enable license plate positioning** setting for the **BULK-06** location profile to complete the mobile steps in the example scenario.

Wave step code

NOTE

To set up a wave step code as described here, you might first have to use [feature management](#) to turn on the feature that is named *Organization wide wave step code*.

1. Go to **Warehouse Management > Setup > Waves > Wave step codes**.

2. Select **New**, and set the following values:

- **Wave step code:** *Replen*
- **Wave step description:** *Replenishment*
- **Wave step type:** *Replenishment*

3. Select **Save**.

Replenishment template

Replenishment templates are a set of rules that control when and how a location is replenished.

1. Go to **Warehouse management > Setup > Replenishment > Replenishment templates**.
2. On the Action Pane, select **Edit**.
3. In the **Overview** section, select the line where the **Replenish template** field is set to *Demand replenish*.
4. Set the following values:
 - **Wave step code:** *Replen*
 - **Allow wave demand to use unreserved quantities:** *Yes*
5. Select **Save**.

Wave template

1. Go to **Warehouse management > Setup > Waves > Wave templates**.
2. In the left pane, set the **Wave template type** field to *Shipping*.
3. Select template **61 Shipping** in the list.
4. On the Action Pane, select **Edit**.
5. On the **General** FastTab, set the **Automate replenishment work release** option to *Yes*.

Set this option to *Yes* to create demand-based replenishment work and release it automatically. You must add the replenishment wave method to the wave template and create a replenishment template of the **Wave demand** type. Set up a replenishment template on the **Replenishment templates** page. To set up a replenishment template, you must add the replenish method to the wave template.

6. On the **Methods** FastTab, in the **Selected methods** column, find the following line:
 - **Method name:** *replenish*
 - **Name:** *Replenishment*
7. Set the **Wave step code** field for this line to *Replen*.
8. Select **Save**.

Example scenario

After you've made all the previously described sample data available and set it up, you can work through this scenario to try out the *Replenishment over location capacity* feature. The values that are shown in this scenario assume that you're working with the standard demo data, that you selected the **USMF** legal entity, and that you prepared the sample records that are described earlier in this topic. This scenario also serves as an example that shows how the feature can be used in a production setting.

Create replenishment work

Create sales order 1

1. Go to **Sales and marketing > Sales orders > All sales orders**.
2. On the Action Pane, select **New** to open a dialog box for creating a new sales order.

3. In the dialog box, set the following values:
 - **Customer account:** *US-007*
 - **Warehouse:** *61*
4. Select **OK** to create the sales order and close the dialog box.
5. The new sales order is opened. It includes a new, empty line on the **Sales order lines** FastTab. On this line, set the following values:
 - **Item number:** *T0100*
 - **Quantity:** *40*
6. On the **Sales order lines** FastTab, select **Inventory > Reservation**.
7. On the **Reservation** page, select **Reserve lot**.
8. Close the page.
9. On the Action Pane, on the **Warehouse** tab, select **Release to warehouse**.

You receive informational messages that show the wave and shipment IDs that were created. A replenishment wave is also created.

You also receive a warning message that states, "Work ID XXXX cannot be unblocked because it has unfinished replenishment work."

Create sales order 2

1. On the **All sales orders**, page, on the Action Pane, select **New** to open a dialog box for creating a new sales order.
2. In the dialog box, set the following value:
 - **Customer account:** *US-001*
 - **Warehouse:** *61*
3. Select **OK** to create the sales order and close the dialog box.
4. The new sales order is opened. It includes a new, empty line on the **Sales order lines** FastTab. On this line, set the following values:
 - **Item number:** *T0100*
 - **Quantity:** *60*
5. On the **Sales order lines** FastTab, select **Inventory > Reservation**.
6. On the **Reservation** page, select **Reserve lot**.
7. Close the page.
8. On the Action Pane, on the **Warehouse** tab, select **Release to warehouse**.

You receive informational messages that show the wave and shipment IDs that were created. A replenishment wave is also created.

You also receive a warning message that states, "Work ID XXXX cannot be unblocked because it has unfinished replenishment work."

Create sales order 3

1. On the **All sales orders** page, on the Action Pane, select **New** to open a dialog box for creating a new sales order.
2. In the dialog box, set the following values:

- **Customer account:** *US-004*
 - **Warehouse:** *61*
3. Select **OK** to create the sales order and close the dialog box.
 4. The new sales order is opened. It includes a new, empty line on the **Sales order lines** FastTab. On this line, set the following values:
 - **Item number:** *T0100*
 - **Quantity:** *30*
 5. On the **Sales order lines** FastTab, select **Inventory > Reservation**.
 6. On the **Reservation** page, select **Reserve lot**.
 7. Close the page.
 8. On the Action Pane, on the **Warehouse** tab, select **Release to warehouse**.

You receive informational messages that show the wave and shipment IDs that were created. A replenishment wave is also created.

You also receive a warning message that states, "Work ID XXXX cannot be unblocked because it has unfinished replenishment work."

View work details

1. Go to **Warehouse management > Work > Work details**.
2. In the **Overview** section, filter the **Warehouse** column for warehouse *61*.
3. You should see that seven work IDs were created for the three demand sales orders.
 - Three of the seven work IDs have a **Work order type** value of *Replenishment*, and four have a **Work order type** value of *Sales orders*.
 - All three work IDs that have a **Work order type** value of *Replenishment* have the same *Pick* and *Put* locations in the **Lines** section:
 - **Pick:** *02A01R5S1B*
 - **Put:** *06A01R2S1B*
 - Two work IDs were created for sales order 1.
4. Make a note of the work IDs for the sales orders.

Depending on your on-hand quantities, the work quantities that are created might vary slightly. However, overall, the work headers that are created should match this scenario example.

On-hand inventory license plate ID

Later in this scenario, you will use the warehouse app (or an emulator), where you must identify the license plate to complete the picking and replenishment scenarios.

To find the license plate IDs that you will need later, follow these steps.

1. Go to **Inventory management > Inquiries and reports > On-hand list**.
2. Select the **Show filters** button to open the filter pane.
3. Enter the following filtering criteria to get the license plates for the scenario. Use the *begins with* filter.
 - **Item number:** *T0100*
 - **Warehouse:** *61*
4. Select **Apply**.

5. On the Action Pane, select **Dimensions**.
6. In the **Dimensions display** dialog box, in the **Storage Dimensions** section, select all the values.
7. In the **Transactions** section, select **Item number** and **Quantity < > 0**.
8. When you've finished, select **OK** to close the dialog box.
9. The **On-hand** grid shows the license plate numbers for item *T0100* in each location. Make a note of the license plate that is in each location, because you will need this information later.
10. Close the page.

Process steps

You will perform the warehouse location replenishment for the first two work IDs. Work on the third replenishment work will be blocked until the inventory level in the picking location falls below the threshold.

Replenishment

1. Sign in to the warehouse app as a user in warehouse *61*. (Enter *61* as the user ID and *1* as the password.)
2. Go to **Inventory > Replenishment**.

You're prompted to complete the first replenishment work. The item number, quantity, and location to pick from are shown.

3. In the **LP** field, enter the license plate number for the item in the location that is shown.
4. Select the **OK** button (check mark symbol).

The system generates a target license plate number for the new license plate for the picked item.

5. Select **OK** to confirm the value.

Put work is shown that instructs the user to put the target license plate into the replenishment location. The *Put* location should be **06A01R2S1B**.

6. Confirm the put details, and select **OK**.

You receive a "Work Completed" message, and the details of the next replenishment pick task are shown: the item number, quantity, and location to pick from. The picking location will be the same as the first replenishment location. Therefore, the license plate will have the same license plate ID that was used for the first replenishment work task.

7. Repeat the preceding steps to complete the replenishment work for the second work task. The quantity and target license plate will differ from the quantity and target license plate for the first work task.

After the second replenishment work is completed, you receive a "Work Completed" message. The mobile device also informs you that there is no work available, even though some replenishment work remains. This behavior occurs because the replenishment work has an availability status of *Held* and is therefore marked as **Blocked**.

The *Held* status was triggered because the location profile for the picking location that the work is being assigned to has an **Overflow quantity** value of *0.65 PL*. The two previous replenishment work tasks filled the location almost to its overflow limit for item *T0100*. (The unit conversion for the item is *1 PL = 100 ea*.) Therefore, the remaining replenishment work would cause the location to exceed its overflow limit.

Until enough inventory is picked from the location to bring it below the work release threshold on the mobile device menu item, this replenishment work will remain blocked.

Sales order pick

Before the remaining replenishment work task can be completed, the picking location must be depleted of

inventory to a level where the remaining replenishment work can be unblocked. In other words, the sum of the quantity of on-hand inventory in the location and the replenishment quantity can't exceed the **Overflow quantity** value. When this sum is less than the overflow quantity, the remaining replenishment work will be unblocked.

1. Sign in to the warehouse app as a user in warehouse *61*. (Enter *61* as the user ID and *1* as the password.)
2. Go to **Outbound > Sales Picking**.
3. Enter the first work ID for sales order 1.

Refer to the work IDs for sales orders that you made a note of earlier, on the **Work details** page. The work ID that you enter here will generate pick work for a quantity of 10 ea from two separate locations.

4. Select **OK**.

The **Sales orders: Pick** task page shows the item number, quantity, and location to pick from for the first location.

5. In the **LP** field, enter the license plate number for the item in the location that is shown.
6. Select the **OK** button (check mark symbol).

The **Sales orders: Pick** task page shows the item number, quantity, and location to pick from for the next location.

7. In the **LP** field, enter the license plate number for the item in the location that is shown.
8. Select the **OK** button (check mark symbol).

The **Sales orders: Put** page instructs you to put away both the completed picking works to the outbound staging location.

9. Select **OK**.

You receive a "Work Completed" message.

10. Enter the second work ID for sales order 1.

There is only one pick task for this work ID.

11. Select **OK**.

The **Sales orders: Pick** task page shows the item number, quantity, and location to pick from.

12. In the **LP** field, enter the license plate number for the item in the location that is shown.

The license plate that you specify will be one of the system-generated license plates from the replenishment work tasks. To make sure that you capture the correct license plate ID, check the inventory on the **On-hand list** page for the item, location, and quantity.

13. Select the **OK** button (check mark symbol).
14. Confirm the instructions for the put task to the outbound staging location.
15. Select **OK**.

You receive a "Work Completed" message.

Sales order 2 is blocked from picking because the replenishment task that it's linked to isn't completed. Currently, there is still a quantity of 30 ea in the picking location, and the replenishment quantity for sales order 2 is 60 ea. The sum of the on-hand inventory and the replenishment inventory (90 ea) exceeds the overflow quantity of 0.65 PL (or 65 ea). Before the replenishment work can be completed, sales order 3 must be picked.

1. Enter the work ID for sales order 3.

There is only one pick task for this work ID.

2. Select **OK**.

The **Sales orders: Pick** task page shows the item number, quantity, and location to pick from.

3. In the **LP** field, enter the license plate number for the item in the location that is shown.

The license plate that you specify will be one of the system-generated license plates from the replenishment work tasks. To make sure that you capture the correct license plate ID, check the inventory on the **On-hand list** page for the item, location, and quantity.

4. Select the **OK** button (check mark symbol).
5. Confirm the instructions for the put task to the outbound staging location.
6. Select **OK**.

You receive a "Work Completed" message.

As soon as the sum of the on-hand quantity in the picking location and the replenishment quantity is below the threshold, you will be able to process the remaining replenishment work.

Return to the **Work details** page, and notice that the replenishment work availability for the final piece of replenishment (for sales order 2) is *Open*, because there is now enough space in the location to accept the replenishment.

You can now process this replenishment work via the mobile device.

1. Go to **Inventory > Replenishment**.

You're prompted to complete the remaining replenishment work. The item number, quantity, and location to pick from are shown.

2. In the **LP** field, enter the license plate number for the item in the location that is shown.
3. Select the **OK** button (check mark symbol).

The system generates a target license plate number for the new license plate for the picked item.

4. Select **OK** to confirm the value.

Put work is shown that instructs the user to put the target license plate into the replenishment location. The *Put* location should be **06A01R2S1B**.

5. Confirm the put details, and select **OK**.

You receive "Work Completed" and "No Work Available" messages.

You can now pick sales order 2. It became unblocked when the replenishment work that is linked to the sales order was completed.

1. Enter the work ID for sales order 2.

There is only one pick task for this work ID.

2. Select **OK**.

The **Sales orders: Pick** task page shows the item number, quantity, and location to pick from.

3. In the **LP** field, enter the license plate number for the item in the location that is shown.

The license plate that you specify will be the system-generated license plate from the replenishment work task. To make sure that you capture the correct license plate ID, check the inventory on the **On-hand list** page for the item, location, and quantity.

4. Select the **OK** button (check mark symbol).
5. Confirm the instructions for the put task to the outbound staging location.
6. Select **OK**.

You receive a "Work Completed" message.

Notes and tips

- This functionality works with all types of replenishment: wave demand, min/max, load demand, and slotting.
- You can manually override the replenishment work availability for each work header from the **Work details** page if you want.
- When the system sets the replenishment work availability, it considers any inventory that is already in the location before any work is completed
- Each piece of sales order work is linked to a specific replenishment work. There is no corresponding sales work availability functionality.

NOTE

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Troubleshoot warehouse replenishment

2/18/2021 • 2 minutes to read • [Edit Online](#)

This topic describes how to fix common issues that you might encounter while you work with warehouse replenishment in Microsoft Dynamics 365 Supply Chain Management.

I receive the following error message: "Work %1 cannot be unblocked because it has unfinished replenishment work."

Issue description

Picking work is blocked because of dependent replenishment work.

Issue resolution

When you use wave demand replenishment, if a picking location must be replenished to fulfill the source order demand, the system creates both the replenishment work and the picking work. However, it blocks the picking work until the replenishment work is completed. This behavior is intentional, because the picking location won't have enough inventory unless the replenishment work is completed. Complete the replenishment work, and then process the picking work.

NOTE

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Confirm and transfer

2/18/2021 • 14 minutes to read • [Edit Online](#)

The *Confirm and transfer* feature lets users ship loads out of the warehouse before they complete all the work that is associated with those loads. When a shipment is received that includes load lines that weren't fully picked, the confirming user is prompted either to split the remaining quantities onto a new load or to cancel the incomplete quantities.

Systems that are set up to allow load splitting support scenarios where planned and partially loaded loads must be adapted because of new or changing circumstances.

The client includes logic that enables a partially loaded load to be closed and confirmed as shipped. All remaining shipments and load lines (including full or partial line quantities) are then rolled over to a newly created load and shipment, if this rollover is required and the setup allows for it. New shipments and loads are automatically created based on the initial criteria for shipment and load creation, and their main attributes remain unchanged. There is also an option to automatically cancel remaining quantities if a work order hasn't yet been created and the user deems this cancellation necessary.

This functionality supports scenarios where the full load doesn't fit onto a single truck, or where some of the load should leave the warehouse before the rest of the load is ready for shipment. In these scenarios, the remaining products can be transferred to a new load and therefore to a new truck. Because this feature can be used with loads that are otherwise intended to require full-load shipment, it provides extra flexibility so that transport managers can solve nonstandard or unforeseen scenarios.

When a load is split, the *Confirm and transfer* feature performs the following actions:

- New loads and shipments are created as they are required. Each load or shipment will have most of the same attributes as the original load or shipment. The exception is the load status, which will be recalculated based on the work status.
- The user is informed that a new load has been created. The user is also notified about the ID of the new load.
- The load lines, work headers, and work lines that were split are updated with the new load and shipment information.
- If a whole shipment is being split, the shipment is maintained, and only the load references are updated. If the shipment must be split, a new shipment is created.

When remaining quantities are canceled, any load line quantities that haven't been picked and that don't have non-canceled work associated with them are removed from the load. If any work is in process, the user can only split the load. Remaining quantities can't be canceled.

You can split only loads that meet all the following criteria:

- One or more load lines have picked quantities.
- The load status is less than loaded.
- There is no load line data. (This data is created through license plate consolidation on the staging location, and the *Confirm and transfer* feature doesn't support license plate consolidation.)
- No inventory is currently awaiting packing at a packing location. (The *Confirm and transfer* feature doesn't support inventory that has been picked to the pack station but hasn't yet been packed.)

NOTE

This functionality differs from the transport load functionality, which should be used in warehouses that can never plan and create loads before picking, but that instead load the available transportation space after picking is completed.

Use the *Confirm and transfer* feature in situations where loads are usually planned and created ahead of time, but where exceptions sometimes occur in which the load doesn't fit the available transport (such as a truck).

Turn on confirm and transfer

Before you can use the *Confirm and transfer* feature, it must be turned on in your system. Admins can use the [feature management](#) settings to check the status of the feature and turn it on if it's required. In the **Feature management** workspace, the feature is listed in the following way:

- **Module:** *Warehouse management*
- **Feature name:** *Confirm and transfer*

Set up confirm and transfer

To use the *Confirm and transfer* feature, you must turn it on in every relevant load template. In addition, depending on your requirements, you might want to prepare your work templates to support the feature. If you want to work through the example scenario that is provided later in this topic, set up your system as described in this section. (That scenario is based on USMF demo data.)

Prepare your load templates

1. Go to **Warehouse management > Setup > Load > Load templates**.
2. On the Action Pane, select **Edit** to put the page into edit mode.
3. Select the **Allow load split during ship confirm** check box for each existing template where you want to turn on the feature. Alternatively, select **New** to create a new template, and configure it as you require. Every load that you create by using that template will inherit this functionality. (If you're working with the USMF demo data, turn on the feature for the **20' Container** load template.)

Prepare your work templates

This setup isn't required in all situations. The example that is shown here ensures that work can be broken by shipment to support the example scenario that is provided later in this topic. There are also other ways to achieve this result.

1. Go to **Warehouse management > Setup > Work > Work templates**.
2. In the grid in the upper part of the page, select an existing work template where you want to set up the *Confirm and transfer* feature. (If you're working with the USMF demo data, select the **51 Pick to stage** work template.) Alternatively, create a new work template.
3. On the Action Pane, select **Edit query** to open the **Sales** dialog box.
4. In the **Sales** dialog box, on the **Sorting** tab, select **Add** to add a row to the grid.
5. In the new row, set the following values:
 - **Table:** *Temporary work transactions*
 - **Derived table:** *Temporary work transactions*
 - **Field:** *Shipment ID*
 - **Search direction:** *Ascending*
6. Select **OK** to save your settings and close the **Sales** dialog box.

7. If you receive a message that states that grouping will be reset, select **Yes** to continue.
8. In the grid in the upper part of the **Work templates** page, select the template that you just edited, and then, on the Action Pane, select **Work header breaks**.
9. On the Action Pane, select **Edit** to put the page into edit mode.
10. In the grid, set the following values:
 - **Table name:** *Temporary work transactions*
 - **Field name:** *Shipment ID*
 - **Group by this field:** Select this check box.
11. On the Action Pane, select **Save**.
12. Close the page.

Scenario

This scenario shows an example where the picking process isn't yet completed, but the items that have been picked so far must be loaded onto a truck and shipped anyway. Therefore, the user can split the unpicked load lines onto a new load. All the data relationships will then automatically be updated.

NOTE

The specific values that are described in this scenario are based on the **USMF** demo data. We recommend that you use this demo data while you're demonstrating or learning how to use the feature. If you aren't using the **USMF** demo data, substitute your own values as required.

Step 1: Create a load that has multiple load lines

Before you can use this functionality, you must have a load that contains multiple load lines. You must also make sure that the pick locations have enough inventory for all the items on the sales orders that you will create. Review the setup of the location directive (**Warehouse management > Setup > Location directives**), and make a note of the picking locations that are used for sales order picking. If you must adjust the inventory, create manual movements, use replenishment, or use any other flow, as required.

To create a qualifying load, first create three sales orders by following these steps.

1. Go to **Sales and marketing > Sales orders > All sales orders**.
2. On the Action Pane, select **New** to open the **Create sales order** dialog box.
3. In the **Create sales order** dialog box, set the following values (at a minimum):
 - On the **Customer** FastTab, set the **Customer account** field to *US-004 (Cave Wholesales)*.
 - On the **General** FastTab, set the **Warehouse** field to *51*.
4. Select **OK** to create the sales order and close the **Create sales order** dialog box.
5. Your new sales order is opened. In the **Sales order lines** grid, add a line that has the following values:
 - **Item number:** *M9200*
 - **Quantity:** *40*
 - **Unit:** *ea*
6. On the **Inventory** menu above the grid, select **Reservation**.
7. On the Action Pane, select **Reserve lot** to open the **Reservation** page.
8. Reserve the inventory on the sales line, and then close the **Reservation** page.

9. Repeat steps 1 through 4 to add a second sales order for the same customer and warehouse.
10. Add two sales lines that have the following values. After you add each line, reserve inventory for it as described in steps 6 through 8.
 - **Line 1:** Set the **Item number** field to *M9200*, the **Quantity** field to *30*, and the **Unit** field to *ea*.
 - **Line 2:** Set the **Item number** field to *M9201*, the **Quantity** field to *20*, and the **Unit** field to *ea*.
11. Repeat steps 1 through 4 to add a third sales order for the same customer and warehouse.
12. Add two sales lines that have the following values. After you add each line, reserve inventory for it as described in steps 6 through 8.
 - **Line 1:** Set the **Item number** field to *M9201*, the **Quantity** field to *20*, and the **Unit** field to *ea*.
 - **Line 2:** Set the **Item number** field to *M9202*, the **Quantity** field to *60*, and the **Unit** field to *ea*.

Load planning workbench

The load planning workbench will use the load template ID to build the shipments and release the sales order lines to the warehouse.

1. Go to **Warehouse management > Loads > Load planning workbench**.
2. In the **Warehouse** field, select *57*.

You will now build the load for the sales orders that you just created.
3. On the **Sales lines** tab, in the grid, select the sales lines for the new sales orders.
4. On the Action Pane, on the **Supply and demand** tab, in the **Add** group, select **To new load**.
5. In the **Load template assignment** dialog box, in the **Load template ID** field, select *20' Container*.
6. Select **OK**.
7. In the **Loads** section of the **Load planning workbench** page, in the grid, find the newly created load ID for warehouse *57*. Scroll right until you see the **Allow load split during ship confirm** column. The check box should be selected for your load.
8. Select the load.
9. On the **Release** menu above the grid, select **Release to warehouse** to create work.
10. In the **Release load to warehouse** dialog box, verify that the **Records to include** FastTab shows your load ID.
11. Select **OK**.

You might receive a "Processing operation" message while the system creates the shipments and work.
12. In the **Loads** section of the **Load planning workbench** page, your load should now have a load status of *Waved*. Select the load, and then, on the **Related information** menu above the grid, select **Wave details** to view the shipment IDs that were created. When you've finished, close the **Waves** page.
13. In the **Loads** section of the **Load planning workbench** page, select the load, and then, on the **Related information** menu above the grid, select **Work details** to view the work that was created for the sales orders.
14. Make a note of the work IDs that were created. You might have to scroll right to see the sales order number and shipment ID that are associated with the work ID.

Step 2: Set up the execution flow for mobile devices

Mobile device tasks will require user input of information, such as the work ID or license plate ID. In the fields,

this information is typically provided for warehouse users in the form of bar codes that are found on documentation, packaging, or racking. To complete the mobile device steps for scenarios, make sure that you've identified the work IDs for the transactions, and the license plate IDs for the item and location in the transactions.

1. Sign in to the mobile device by using a user ID and password for warehouse 51.
2. Select **Outbound**.
3. Select **Sales Picking**.
4. You have the option to enter the work ID or the license plate ID. Enter the work ID for the first sales order, and then select **Enter**.
5. In the **Loc** field, enter the location that is shown to confirm the picking location. Then select **Enter**.
6. In the **LP** field, enter the license plate ID. The license plate ID must be a match for the item, warehouse, and location of the item that is being picked from the selected location. When you've finished, select **Enter**.
7. In the **Item** field, enter the item number to confirm the item that is being picked, and then select **Enter**.
8. In the **Qty** field, enter the quantity of the item that is being picked, and then select **Enter**.
9. In the **Target LP** field, enter a target license plate ID. Target license plates are user-defined. Be sure to enter a license plate ID that you will remember. We recommend that you use the current date plus a two-digit sequence (YYMMDD##) as the format, such as 19112301. When you've finished, select **Enter**.
10. Review information that is shown. This information is the *Pick* information that will now become the *Put* data for the put transaction. When you've finished, select **Enter**.
 - You receive a **Work Completed** message.
11. Repeat steps 4 through 10 for the work ID of the second sales order.

The next step is to load the two picked license plates to the truck.

1. Sign in to the mobile device by using a user ID and password for warehouse 51.
2. Select **Outbound**.
3. Select **Sales Loading**.
4. Enter the user-defined target license plate ID that you created for the first work ID in the previous procedure. Then select **Enter** to put the target license plate into the **STAGE** location.
5. Enter the target license plate ID again, and then select **Enter** to put the license plate into the **BAYDOOR** location.
6. Repeat steps 4 through 5 for the target license plate ID that you created for the second work ID.

The two work IDs will now be closed (loaded).

Step 3: Confirm the outbound shipment

In this step, you will confirm the two sales orders and work that have been completed for the load to ship the picked items of the load and create a new load for the unpicked items. Outbound shipment confirmation must be done on the **Load details** page.

1. Go to **Warehouse management > Loads > Load planning workbench**.
2. In the **Loads** section, in the grid, select the row for the load ID that you created.
3. Select the load ID link to open the **Load details** page.
4. On the **Load details** page, on the Action Pane, on the **Ship and receive** tab, in the **Confirm** group,

select **Outbound shipment** to initiate the confirmation.

5. In the **Ship confirm** dialog box, in the **Load split method during ship confirm** field, select *Split quantity to new load*.
6. Select **OK**.

You might receive a "Processing operation" message.

You receive informational messages that indicate that the shipment for your load has been confirmed, and that a new load has been created from the split quantity.

Refresh the **Load planning workbench** page to see the newly created load.

You can also confirm that transaction relations have been updated in the following ways:

- The remaining (unprocessed) shipment and shipment lines are updated with the new load ID.
- The sales order is linked to the new load ID.
- The original load doesn't include the remaining load lines.
- The remaining work has been updated with the new load ID.
- The wave remains the same.
- The status of the new load is correctly updated. (If the work status is *In process*, the load status should also be *In process*.)

Notes and tips

- You can also turn on the **Allow load split during ship confirm** parameter after the load has been created with the **Load template** parameter turned off but before the loading process has started. Go to the desired load, and then, in the header view, turn on the parameter.
- The **Split quantity to new load** option also works when some of the remaining work headers have a status of *In process*. Therefore, you can still use the functionality even if workers are already running the pick orders.
- If you select **Cancel unfulfilled quantity** while there is remaining work that has a status of *Open* or *In progress*, you receive the following error message: "Unable to cancel remaining qty for load. Work exists for load."
- If you select **Cancel unfulfilled quantity** when there is no remaining work but there are unreleased load lines on the load, you receive the following error message: "The shipment for load could not be confirmed because the quantity for item exceeds the percentage that is defined for under delivery." To avoid the error, you can set the **Under delivery** percentage on the unreleased load line to 100 percent. Unreleased lines won't be moved to a new load, but the current load will be confirmed with under-delivery. In this case, you won't be able to re-release the original order. Therefore, so you will have to handle it in some other way.

NOTE

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Confirm outbound shipments from batch jobs

2/18/2021 • 2 minutes to read • [Edit Online](#)

This topic describes how to set up a batch job that automatically confirms outbound transfer-order shipments for ready-to-ship loads. The batch job described here only applies to transfer order shipments, not to sales orders.

Enable the Confirm outbound shipments from batch jobs feature

Before you can use this feature, it must be enabled on your system. Administrators can use the [Feature management](#) page to check the feature status and enable it if needed. The feature is listed as:

- **Module** - *Warehouse management*
- **Feature name** - *Confirm outbound shipments from batch jobs*

Process outbound shipments

To set up a scheduled batch job to run the outbound shipment confirmation for loads that are ready to ship:

1. Go to **Warehouse management** > **Periodic tasks** > **Process outbound shipments**.
2. The **Confirm shipment** dialog box opens. On the **Records to include** FastTab, select **Filter**.
3. The query editor dialog box opens. On the **Range** tab, add a row with the following values:
 - **Table** - *Loads*
 - **Derived table** - *Loads*
 - **Field** - *Load status*
 - **Criteria** - *Loaded*
4. Select **OK** to return to the **Confirm shipment** dialog box.
5. On the **Run in the background** FastTab, set **Batch processing** to **Yes**.
6. On the **Run in the background** FastTab, select **Recurrence**.
7. The **Define recurrence** dialog box opens. Set the run schedule as needed for your business.
8. Select **OK** to return to the **Confirm shipment** dialog box.
9. Select **OK** on the **Confirm shipment** dialog box to add the batch job to the batch queue.

For more information, see [Batch processing overview](#).

NOTE

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Advanced load building during wave

2/18/2021 • 13 minutes to read • [Edit Online](#)

Advanced wave load building automatically assigns shipments to existing waves during wave execution. Therefore, you can create meaningful loads that represent trucks without having to use the load planning workbench. This capability is useful for businesses that want to use the concept of loads to track and plan the shipment of goods in a truck/trailer, but that don't want to manually create those loads every day.

During wave processing, the system usually creates a new load for each shipment that no load is assigned to. However, when advanced wave load building is turned on, the system assigns each unassigned shipment to an existing load (if an appropriate load exists), and new loads are created only when they are required. Advanced wave load building automatically creates the new loads, based on criteria that you define.

To use the feature, you must set up the system in the following way:

- Create *wave templates* that include the new **buildLoads** method. This method makes advanced wave load building available for waves that use those templates.
- Set up *load build templates*, each of which is linked to a specific wave template and method. Load build templates control which load (existing or new) the load lines that are being waved are added to. You can combine or separate shipments, based on criteria such as the load template, equipment, and other field values on the load line.
- Define *load mix groups* to control which items should and should not be combined on a single load. You also specify whether the restriction should produce a warning or an error, and whether the volumetric restriction of the load template should be evaluated.

Turn on advanced wave load building in your system

Before you can use advanced wave load building, two features must be turned on in your system. Admins can use the [feature management](#) settings to check the status of these features and turn them on if they are required. In the **Feature management** workspace, the features are listed in the following way:

- Wave load building feature:
 - **Module:** *Warehouse management*
 - **Feature name:** *Wave load building feature*
- Organization wide wave step code:
 - **Module:** *Warehouse management*
 - **Feature name:** *Organization wide wave step code*

Make sample data available

To work through this demo by using the sample records and values that are specified here, you must be on a system where the standard [demo data](#) is installed. Additionally, you must select the **USMF** legal entity before you begin.

You can also use this demo as guidance for using this feature when you work on a production system. However, in that case, you must substitute your own values, and you might be missing some types of required records that the standard demo data provides.

Make sure that the scenario setup includes enough available inventory

If you're working with the **USMF** demo data, you must first make sure that your system is set up so that there is enough inventory at each relevant location. For this demo, the expectation is that the following inventory is

available in warehouse 62:

- **Item A0001:** 10 pcs
- **Item A0002:** 10 pcs
- **Item M9200:** 10 ea

Item **M9200** must be added to the warehouse. Complete the procedures in the following subsections to add the item inventory.

Create a new license plate ID

1. Go to **Warehouse management > Setup > Warehouse > License plates**.
2. On the Action Pane, select **New**.
3. In the new row, in the **License plate** field, enter *LP6203*.
4. Select **Save**.

Create a standard cost for item M9200 in site 6

1. Go to **Product information management > Products > Released products**.
2. Search on **M9200**.
3. Select the row for the item, and then, on the Action Pane, on the **Manage costs** tab, in the **Set up** group, select **Item price**.
4. On the **Item price** page, select the **Pending prices** tab.
5. On the Action Pane, select **New**.
6. On the new line, set the following values:
 - **Costing type:** *Planned cost*
 - **Price type:** *Cost*
 - **Version:** *10*
 - **Site:** *6*
 - **Price:** *1.60*
7. On the Action Pane, select **Save**.
8. On the Action Pane, select **Activate pending price(s)**.
9. Select the **Active prices** tab to verify that the new cost price for site 6 has been added.

Create inventory in warehouse 62

1. Go to **Inventory management > Journal entries > Items > Inventory adjustment**.
2. On the Action Pane, select **New**.
3. In the **Create inventory journal** dialog box, on the **Overview** FastTab, in the **Warehouse** field, enter *62*. Accept the default values in all the other fields.
4. Select **OK** to close the dialog box.
5. The **Inventory adjustment** page is opened. On the **Journal lines** FastTab, select **New** to add a line.
6. On the new line, set the following values. Accept the default values in all the other fields.
 - **Item number:** *M9200*
 - **Location:** *bulk-003*
 - **Quantity:** Change the value to *10*.
7. On the Action Pane, select **Save**.

8. On the Action Pane, select **Validate** to check for errors.
9. In the **Check journal** dialog box, select **OK** to start the check. You receive a message when the check is completed.
10. On the Action Pane, select **Post** to commit the inventory adjustment.
11. In the **Post journal** dialog box, select **OK** to start the posting. You receive a message when the posting is completed.

Set up advanced wave load building

Regenerate wave process methods

You might have to regenerate your wave process methods to make the load building method (**buildLoads**) available.

1. Go to **Warehouse management > Setup > Waves > Wave process methods**.
2. Verify that **buildLoads** is present in the list. If it isn't present, select **Regenerate methods** on the Action Pane to add it.

Set up wave templates

To take advantage of advanced wave load building, you must include the **buildLoads** method in each relevant [wave template](#).

1. Go to **Warehouse management > Setup > Waves > Wave templates**.
2. Select a wave template.

If you're working with the **USMF** demo data, select the **62 Shipping Default** template.
3. On the Action Pane, select **Edit** to put the page into edit mode.
4. On the **Methods** FastTab, in the **Remaining methods** grid, select the **buildLoads** method.
5. Select the right arrow button to move the **buildLoads** method to the **Selected methods** grid.
6. To assign a **Wave step code** value for the **buildLoads** method, you must first create a code on the **Wave step codes** page. You can use any value that you want, but be sure to make a note of it, because you will need it later. Follow these steps to create code **WSC2112**:
 - a. In the row for the **buildLoads** method, right-click the down arrow in the **Wave step code** field, and then select **View details**.
 - b. On the **Wave step codes** page, on the Action Pane, select **New**.
 - c. In the **Wave step code** field, enter *WSC2112*.
 - d. In the **Wave step description** field, enter *WSC2112*.
 - e. In the **Wave step type** field, select *Load Building*.
7. Select **Save**, and close the page.
8. In the row for the **buildLoads** method, in the **Wave step code** field, select the code that you just created (**WSC2112**).
9. On the Action Pane, select **Save**.

NOTE

Wave step codes are codes that users can set up and use to link specific instances of wave methods to corresponding templates. The templates include templates for replenishment, containerization, label printing, load building, and sorting.

When wave step codes aren't used, users must enter free text to reference a specific template from the wave method instance. Free text is prone to errors, because users must make sure that the wave step text that they add for a specific wave step method in a wave template exactly matches the wave step text in the target template.

Wave step codes for a specific wave step type are set up on a separate page. For every instance of a wave step method in a wave template that requires a wave step code, the wave step code must be selected in a drop-down list. Selection in a drop-down list replaces free text entry and helps reduce the risk and impact of human error. Setup codes are used to link a wave step method in a wave template to a target template for the method.

Set up load mix groups

Load mix groups establish rules for the types of items that can be combined on a single load. You can set up as many load mix groups as you require. However, to use advanced wave load building, you must have at least one. Follow these steps to create a load mix group.

1. Go to **Warehouse management > Setup > Load > Load mix groups**.
2. On the Action Pane, select **New** to create a load group.
3. In the **Load mix group ID** field, enter a name for the new group.

If you're working with the **USMF** demo data, set the following values:

- **Load mix group ID:** *TV*
- **Description:** *TV*

4. On the Action Pane, select **Save** to make the **Load mix group criteria** FastTab available.
5. On the **Load mix group criteria** FastTab, select **New** to add a row to the grid.
6. In the new row, set the desired values in each field. These values determine the item groups that are considered for the load mix.

If you're working with the **USMF** demo data, select *TV&Video* in the **Item group** field.

7. On the Action Pane, select **Save** to make the **Load mix group constraints** FastTab available.
8. On the **Load mix group constraints** FastTab, select **New** to add a row to the grid.
9. In the new row, set the desired values in each field.

If you're working with the **USMF** demo data, set the following values:

- **Item group:** *CarAudio*
- **Load build action:** *Restrict* (This value will prevent items that belong to the **CarAudio** item group from being on the same load as items that belong to the **TV&Video** item group.)

10. Continue to work with the rules until you've added all the criteria and constraints that you require for the load mix group.

If you're working with the **USMF** demo data, you've now finished this setup.

Set up load build templates

You can set up as many load build templates as you require. However, to use advanced wave load building, you must have at least one. Follow these steps to create a load build template.

1. Go to **Warehouse Management > Setup > Load > Wave load building templates**.

2. On the Action Pane, select **New** to add a row to the grid.

3. In the new row, set the following values.

FIELD	DESCRIPTION	VALUE IN THE USMF DEMO DATA
Sequence number	The order that the template will be evaluated in.	1
Load build template name	Enter the unique identifier of the load build template. You should enter the name of the template that you created or updated earlier in this setup.	<i>62 Shipping Default</i>
Wave step code	Enter the wave step code to use to link the template to a wave method. You should enter the code that you selected for the buildLoads method when you set up the wave template earlier in this setup.	<i>WSC2112</i>
Load template ID	Select the load template to use when new loads are created and to match against when assigning to existing loads. The load template defines the maximum weight and volume that are permitted for the whole load.	<i>Std Load Template</i>
Equipment	The equipment to match against when assigning to existing loads and to enter on new loads that are created.	Leave this field blank.
Load mix group ID	Select the load mix group to use if the item is allowed on the load. The mix group establishes rules for the types of items that can be combined on a single load. You should select one of the mix groups that you created earlier in this setup.	<i>TV</i>
Use open loads	Select whether existing open loads should be added. The following options are available: <ul style="list-style-type: none"> • None – Don't add open loads to any existing loads. • Any – Add open loads to any existing loads that are valid for the line. • Assigned – Add open loads to the load that is assigned to the wave. 	<i>Any</i>
Create loads	Specify whether new loads should be created if no existing loads match the criteria.	Selected (= Yes)

FIELD	DESCRIPTION	VALUE IN THE USMF DEMO DATA
Allow shipment line split	Specify whether a single load line can be split across multiple loads if the full line exceeds the maximum capacity of the load template.	Cleared (= No)
Validate volumetrics	Specify whether load building should check the weight and volume as each load line is added, to ensure that the volumetric limits of the load template are respected.	Cleared (= No)

4. On the Action Pane, select **Save** to make the **Edit query** option available.
5. On the Action Pane, select **Edit query** to open a dialog box for editing the query.
6. In the dialog box, on the **Sorting** tab, select **Add** to add a row to the grid.
7. In the new row, define the sorting rules that you want to use. For example, set the following values to sort the search results in ascending order by order number:
 - **Table:** *Load details*
 - **Derived table:** *Load details*
 - **Field:** *Order number*
 - **Search direction:** *Ascending*
8. Select **OK** to save your changes and close the dialog box.
9. On the **Break by** FastTab, set rules to control how your loads are split up. Typically, you might break on custom fields that have been extended onto the load line, such as **Route**, **Tour**, or **Run**. For example, to create one load per order number, select the **Break by** check box for the row that has the following values:
 - **Reference table name:** *Load details*
 - **Reference field name:** *Order number*

Scenario

This scenario shows how the settings that were described earlier in this topic affect warehouse operations while a sales order is processed. This scenario uses the **USMF** demo data together with other demo values that are provided in those setup instructions.

Create sales orders

1. Go to **Sales and marketing > Sales orders > All sales orders**.
2. On the Action Pane, select **New** to open the **Create sales order** dialog box.
3. In the dialog box, set the following values:
 - On the **Customer** FastTab, set the **Customer account** field to *US-007*.
 - On the **General** FastTab, set the **Warehouse** field to *62*.
4. Select **OK** to create the sales order and close the dialog box.
5. Your new sales order is opened. It should include a new, empty line in the grid on the **Sales order lines** FastTab. On this new line, set the **Item number** field to *A0001* and the **Quantity** field to *1*.
6. On the **Inventory** menu above the grid, select **Reservation**.

7. On the **Reservation** page, on the Action Pane, select **Reserve lot**.
8. Select the **Close** button (X) in the upper-right corner of the page to return to the sales order.
9. On the Action Pane, on the **Warehouse** tab, in the **Actions** group, select **Release to warehouse**. The system creates a shipment and adds it to a new load, because no existing load contains load lines that have this order number.

You receive informational messages that indicate the work, wave, and shipment that are created for this order.
10. To confirm the load, shipment, and work details on the sales line, select the line, and then, on the **Warehouse** menu above the grid, select **Load details**, **Shipment details**, or **Work details**.
11. In the sales order that you just created, on the **Sales order lines** FastTab, select **Add line** to add another line.
12. On the new line, set the **Item number** field to *A0002* and the **Quantity** field to *1*.
13. Repeat lines 6 through 9 to reserve the line and release it to the warehouse. The system creates a **new** shipment for the line that you added. However, because you're using advanced wave load building, the system adds that shipment and load line to the existing wave. If you weren't using advanced wave load building, the system would create a new load for the shipment.
14. In the sales order that you just created, on the **Sales order lines** FastTab, select **Add line** to add another line.
15. On the new line, set the **Item number** field to *M9200* and the **Quantity** field to *1*.
16. Repeat lines 6 through 9 to reserve the line and release it to the warehouse. As before, the system creates a **new** shipment for the line that you added. However, because the item is from the **CarAudio** item group, it **fails to pass the constraints that you set up for the load mix group**. Therefore, it's **added to a new load**. If you hadn't specified a load mix group on the load build template, this shipment would have been added to the first load.

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Release to warehouse rule

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The *Release to warehouse rule* feature provides flexibility during release to the warehouse. It adds a configuration option for each warehouse. You can use this option to specify whether partially reserved order lines can be released for that warehouse. The feature works together with advanced cross-docking functionality in situations where part of an order line quantity is marked against a supply source, but the remaining part can be processed in the warehouse. Therefore, the line can be released so that warehouse processing of the available inventory quantity can continue.

Turn on and initialize the Release to warehouse rule feature

Turn on the feature

Before you can use the *Warehouse release rule* feature, it must be turned on in your system. Admins can use the [feature management](#) settings to check the status of the feature and turn it on if it's required. In the **Feature management** workspace, the feature is listed in the following way:

- **Module:** *Warehouse management*
- **Feature name:** *Warehouse release rule*

Initialize the feature

After the feature is turned on in your system, you must initialize it to set the rule to the correct initial state for all warehouses.

- For warehouses that aren't enabled for warehouse management, the rule is initially set to **Not applicable**.
- For warehouses that are enabled for warehouse management, the rule is initially set to **Allow partial reservation**

To initialize the feature and set the release to warehouse rule for all warehouses, follow these steps.

1. Go to **Warehouse management > Setup > Warehouse management parameters**.
2. On the **Warehouse management parameters** page, on the **General** tab, in the **Company information** section, select the link for the **Initialize release to warehouse rule**. (If this link isn't shown, either the feature isn't turned on or it has already been initialized.)
3. When you're prompted to confirm the action, select **Yes** to initialize the feature.

Set the release to warehouse rule for each warehouse

After the feature is turned on and initialized, all your warehouses will have an initial setting, as described in the previous section. You can change this setting for individual warehouses by following these steps.

1. Go to **Warehouse management > Setup > Warehouse > Warehouses**.
2. Select the warehouse to configure.
3. Select **Edit** to put the page into edit mode.
4. On the **Warehouse** FastTab, in the **Reservations** section, the **Requirement for inventory reservation** field controls whether partial release of orders is allowed. Select one of the following values:
 - **Not applicable** – When the feature is first turned on and initialized, this value is automatically

assigned to all warehouses that aren't enabled for warehouse management. It can't be changed. This value isn't available for warehouses that are enabled for warehouse management.

- **Allow partial reservation** – Orders can be released when any quantity is reserved. The system will evaluate whether the unreserved quantity should be marked for advanced cross-docking and will mark that quantity as required. If no marking exists, the system will create work only for the reserved quantity. When the feature is first turned on and initialized, this value is automatically assigned to all warehouses that are enabled for warehouse management. This value isn't available for warehouses that aren't enabled for warehouse management.
- **Require full reservation** – Orders can be released only if the whole quantity is reserved. They can't be released if the total quantity isn't either physically reserved or planned for cross-docking. This value isn't available for warehouses that aren't enabled for warehouse management.

5. Select **Save**.

Scenarios

This section provides two scenarios that you can work through to learn what the feature does and how to use it.

Make sample data available

To work through these scenarios by using the sample records and values that are specified here, you must be on a system where the standard [demo data](#) is installed. Additionally, you must select the **USMF** legal entity before you begin.

You can also use these scenarios as guidance for the feature when you work on a production system. However, in that case, you must substitute your own values, and you might be missing some types of required records that the standard demo data provides.

Scenario 1: Require full release (no planned cross-docking)

This scenario shows how the feature works for warehouses that are set to **Require full reservation**.

1. Go to **Warehouse management > Setup > Warehouse > Warehouses**.
2. For warehouse *62*, set the **Requirement for inventory reservation** field to **Require full reservation**, as described in the [Set the release to warehouse rule for each warehouse](#) section earlier in this topic.
3. Go to **Sales and marketing > Sales orders > All sales orders**.
4. Select **New** to create a sales order.
5. In the **Create sales order** dialog box, set the following values:
 - On the **Customer** FastTab, set the **Customer account** field to *US-004*.
 - On the **General** FastTab, set the **Warehouse** field to *62*.
6. Select **OK** to create the new sales order and close the dialog box.
7. Your new sales order is opened. It includes an empty line in the grid in the **Sales order lines** section. On this line, set the following values:
 - **Item number**: *A0001*
 - **Quantity**: *2*
8. Select **Add line** to add a new line, and set the following values:
 - **Item number**: *A0002*
 - **Quantity**: *2*
9. Select the first order line, and then, on the **Inventory** menu above the grid, select **Reservation**.

10. On the **Reservation** page, select **Reserve lot** to reserve the selected line's full quantity in the warehouse.
11. Close the **Reservation** page to return to the sales order.
12. Don't reserve the second order line.
13. On the Action Pane, on the **Warehouse** tab, select **Release to warehouse**.
14. Notice that you receive the following error message: "The full quantity must be physically reserved." Therefore, the system doesn't create any work, shipment, or load for the order.

NOTE

You will receive the same error message if you partially reserve the second line.

Scenario 2: Allow partial release

This scenario shows how the feature works for warehouses that are set to **Allow partial release**.

1. Go to **Warehouse management > Setup > Warehouse > Warehouses**.
2. For warehouse *62*, set the **Requirement for inventory reservation** field to **Allow partial reservation**, as described in the [Set the release to warehouse rule for each warehouse](#) section earlier in this topic.
3. As you did in the [previous scenario](#), go to **Sales and marketing > Sales orders > All sales orders**, and create a sales order for customer account *US-004* from warehouse *62*. Add the following two order lines:
 - **Line 1:** Set the **Item number** field to *A0001*, the **Quantity** field to *2*, and the **Unit** field to *Pcs*.
 - **Line 2:** Set the **Item number** field to *A0002*, the **Quantity** field to *2*, and the **Unit** field to *Pcs*.
4. As you did in the [previous scenario](#), reserve the full quantity for order line 1, but don't reserve order line 2.
5. On the Action Pane, on the **Warehouse** tab, select **Release to warehouse**.
6. Notice that you don't receive an error message this time. Instead, the system creates work, shipments, and loads as required, and shows the results.
7. To view the shipment, load, and work information, use the options on the **Warehouse** menu above the grid:
 - **Line 1:** Three options are available: **Shipment details**, **Load details**, and **Work details**. Select each option to view the details of the shipment, load, and work that were created when the order was released to the warehouse.
 - **Line 2:** Only the **Work details** option is available. Select it, and notice that no work has been created, because no inventory was reserved. Therefore, no shipment or load was created either.

NOTE

The same result is expected when the second line is partially reserved. In this case, work will be created for the reserved line quantity but not for the unreserved quantity.

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Wave template grouping

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Wave template grouping enables the system to use [wave template](#) setups to determine, based on criteria that you define, how it should split released lines and assign them to new or existing waves. This feature can be useful in warehouses where waves are created based on specific criteria, but where managers prefer to create waves automatically instead of manually. It enables the system to add each newly released shipment to the first wave that it finds that has matching grouping field values. If no match is found, the system creates a new wave for the new shipment.

IMPORTANT

Wave template grouping isn't supported for the work types *production raw material picking* or *Kanban picking*. This is because wave grouping is based on shipments and these work types don't use shipments.

Turn on the Wave template grouping feature

Before you can use the *Wave template grouping* feature, it must be turned on in your system. Admins can use the [feature management](#) settings to check the status of the feature and turn it on if it's required. In the **Feature management** workspace, the feature is listed in the following way:

- **Module:** *Warehouse management*
- **Feature name:** *Wave template grouping*

Set a wave template to use wave template grouping

To make wave template grouping available, follow these steps to set up your [wave template](#).

1. Go to **Warehouse management > Setup > Waves > Wave templates**.
2. In the left pane, select the wave template to set up. If you're preparing to work through the scenario later in this topic by using demo data, select the **62 Shipping default** template.
3. Select **Edit** to put the page into edit mode.
4. On the **General** FastTab, set the following values:
 - **Automate wave creation:** *Yes*
 - **Assign to open waves:** *Yes*
 - **Process wave at release to warehouse:** *No*
5. On the Action Pane, select **Edit query** to open the query dialog box.
6. In the query dialog box, on the **Sorting** tab, review the sorting criteria, and make sure that there is a rule that includes the field that you want to use to group your waves.

If you're preparing to work through the scenario by using demo data, add a row that has the following values:

- **Table:** *Shipments*
- **Derived table:** *Shipments*
- **Field:** *Carrier service*

NOTE

After you select this value, you might receive the following message: "Field Carrier service is not an index field. Do you want to add sorting on this?" Select **Yes** to add sorting.

- **Search direction:** *Ascending*

7. Select **OK** to save your changes and close the query dialog box.
8. On the Action Pane, select **Wave template grouping**.
9. On the **Wave template grouping** page, select the **Group by** check box for each row that you want to use to group your order lines into waves, as required. If you're preparing to work through the scenario by using demo data, select the **Group by** check box for the *Carrier service* row.
10. Select **Save**.
11. Close the **Wave template grouping** page.
12. Select **Save** to save your template.

Scenario

This section provides a script that you can work through to learn what this feature does and how to work with it.

Make sample data available

To work through this scenario by using the sample records and values that are specified here, you must be on a system where the standard **demo data** is installed. Additionally, you must select the **USMF** legal entity before you begin.

You can also use this scenario as guidance for using the feature when you work on a production system. However, in that case, you must substitute your own values, and you might be missing some types of required records that the standard demo data provides.

Scenario: Wave template grouping

This scenario shows how to use wave template grouping to automatically create multiple waves, based on grouping criteria that are defined in a wave template. In this scenario, the wave template is set up in the system to create one wave per carrier service.

Before you begin, prepare your wave template as described in the [Set a wave template to use wave template grouping](#) section earlier in this topic. If you will be working with demo data for this scenario, be sure to use the demo data values that are suggested in that procedure. This setup will group your waves according to the carrier service that is set for each sales order.

Create sales order 1

1. Go to **Sales and marketing > Sales orders > All sales orders**.
2. Select **New** to create a sales order.
3. In the **Create sales order** dialog box, set the following values:
 - On the **Customer** FastTab, set the **Customer account** field to *US-004*.
 - On the **General** FastTab, set the **Warehouse** field to *62*.
4. Select **OK** to create the sales order and close the **Create sales order** dialog box.
5. The new sales order is opened in the **Lines** view. Make a note of the sales order number.
6. Switch to the **Header** view.

7. On the **Delivery** FastTab, in the **Transportation** section, set the following values:
 - **Shipping carrier:** *Air cargo*
 - **Carrier service:** *Air*
8. Switch back to the **Lines** view.
9. In the **Sales order lines** section, select **Add line** to add a line to the grid.
10. On the new line, set the following values:
 - **Item number:** *A0002*
 - **Quantity:** *2*
11. Select the new order line, and then, on the **Inventory** menu above the grid, select **Reservation**.
12. On the **Reservation** page, on the Action Pane, select **Reserve lot** to reserve the full quantity of the selected line in the warehouse.
13. Close the **Reservation** page to return to the sales order.
14. On the Action Pane, on the **Warehouse** tab, in the **Actions** group, select **Release to warehouse**.
15. You receive an informational message that shows the shipment and wave for this order. Make a note of the wave ID number and the shipment ID numbers.

View the wave that was created from sales order 1

1. Go to **Warehouse management > Outbound waves > Shipment waves > All waves**.
2. Select the wave ID that was created from the sales order.
3. Select the wave ID link to open the wave details page.
4. Notice that the shipment has been added to the **Wave lines** FastTab.

Create sales order 2

1. Go to **Sales and marketing > Sales orders > All sales orders**.
2. Select **New** to create a sales order.
3. In the **Create sales order** dialog box, set the following values:
 - On the **Customer** FastTab, set the **Customer account** field to *US-005*.
 - On the **General** FastTab, set the **Warehouse** field to *62*.
4. Select **OK** to create the sales order and close the **Create sales order** dialog box.
5. The new sales order is opened in the **Lines** view. Make a note of the sales order number.
6. Switch to the **Header** view.
7. On the **Delivery** FastTab, in the **Transportation** section, set the following values:
 - **Shipping carrier:** *Flower moving*
 - **Carrier service:** *Std*
8. Switch back to the **Lines** view.
9. In the **Sales order lines** section, select **Add line** to add a line to the grid.
10. On the new line, set the following values:
 - **Item number:** *A0001*
 - **Quantity:** *1*
11. Select the new order line, and then, on the **Inventory** menu above the grid, select **Reservation**.

12. On the **Reservation** page, on the Action Pane, select **Reserve lot** to reserve the full quantity of the selected line in the warehouse.
13. Close the **Reservation** page to return to the sales order.
14. On the Action Pane, on the **Warehouse** tab, in the **Actions** group, select **Release to warehouse**.
15. You receive an informational message that shows the shipment and wave for this order. Make a note of the wave ID number and the shipment ID numbers. Notice that the wave ID differs from the wave ID of the first sales order.

View the wave that was created from sales order 2

1. Go to **Warehouse management > Outbound waves > Shipment waves > All waves**.
2. Select the wave ID that was created from the second sales order.
3. Select the wave ID link to open the wave details page.
4. Notice that the shipment has been added to the **Wave lines** FastTab.

A new wave was created for this shipment, because it uses a different carrier service than the first sales order.

Create sales order 3

1. Go to **Sales and marketing > Sales orders > All sales orders**.
2. Select **New** to create a sales order.
3. In the **Create sales order** dialog box, set the following values:
 - On the **Customer** FastTab, set the **Customer account** field to *US-006*.
 - On the **General** FastTab, set the **Warehouse** field to *62*.
4. Select **OK** to create the sales order and close the **Create sales order** dialog box.
5. The new sales order is opened in the **Lines** view. Make a note of the sales order number.
6. Switch to the **Header** view.
7. On the **Delivery** FastTab, in the **Transportation** section, set the following values:
 - **Shipping carrier:** *Air Cargo*
 - **Carrier service:** *Air*
8. Switch back to the **Lines** view.
9. In the **Sales order lines** section, select **Add line** to add a line to the grid.
10. On the new line, set the following values:
 - **Item number:** *A0001*
 - **Quantity:** *1*
11. Select the new order line, and then, on the **Inventory** menu above the grid, select **Reservation**.
12. On the **Reservation** page, on the Action Pane, select **Reserve lot** to reserve the full quantity of the selected line in the warehouse.
13. Close the **Reservation** page to return to the sales order.
14. On the Action Pane, on the **Warehouse** tab, in the **Actions** group, select **Release to warehouse**.
15. You receive an informational message that shows the shipment and wave for this order. Make a note of the wave ID number and the shipment ID numbers. The shipment has been assigned to the existing wave from the first sales order.

View the wave for sales orders 1 and 3

1. Go to **Warehouse management > Outbound waves > Shipment waves > All waves**.
2. Select the wave ID that was created from the third sales order.
3. Select the wave ID link to open the wave details page.
4. Notice that the shipment has been added to the **Wave lines** FastTab, together with the shipment for the first sales order.

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Reprint and void wave labels

2/18/2021 • 9 minutes to read • [Edit Online](#)

This topic explains how to manage labels that are generated by wave processing. (For a detailed description and configuration instructions, see [Configure wave label printing](#).)

You can reprint wave labels at any time. For example, you might have to print a single label if an existing label was lost or damaged. Alternatively, a warehouse worker or supervisor might have to reprint a whole roll of labels if the number and/or composition of a whole series of wave labels has changed (for example, because of inventory shortage or other reasons). Often, even if only the number of cartons has changed, the whole roll must be reprinted to keep the total number accurate in the "Carton X of Y" section of each label.

The reprint wave labels feature supports the following functionality:

- Reprint labels from both the warehousing app and the rich client.
- Void labels and simultaneously reprint them. (The ability to void labels is embedded in short pick scenarios, for example.)
- Clean up the wave label history.

This topic presents a collection of scenarios that show, through examples, how to work with the reprint wave labels feature.

IMPORTANT

To work through the scenarios that are presented in this topic, you must first turn on and configure the relevant wave printing features, as described in [Configure wave label printing](#). Several of the scenarios in this topic also require that you first work through the scenarios in that topic to generate prerequisite sample data.

Scenario 1: Reprint labels from the web client

You can view and reprint wave labels from the following pages. On the Action Pane of each page, on the **Shipments** tab, in the **Related information** group, select **Wave labels**.

- All shipments > Shipment details
- All loads > Load details
- All waves
- Wave labels
- Wave label history

To reprint a wave label from the web client, follow these steps.

1. Go to **Warehouse management** > **Outbound waves** > **Shipment waves** > **All waves**.
2. Select the wave to reprint labels from.
3. On the Action Pane, on the **Wave** tab, in the **Print** group, select **Wave labels**.
4. Follow one or both of the following steps:
 - To reprint the label, select a printer in the **Printer name** field. (Leave this field blank if you just want to update the wave label details, without reprinting the label.)
 - To update the label, select the **Update wave label details** check box. (Leave this check box cleared if

you just want to reprint the previous label.)

NOTE

Every time that a wave label is printed or reprinted, its data is converted through the appropriate wave label layout, and all placeholders are replaced with actual values. The resulting string is stored as a record in the wave label history. If the **Update wave label details** check box is cleared, the stored Zebra Programming Language (ZPL) data is used when a label is reprinted. If the **Update wave label details** check box is selected, a new string is generated. The existing wave labels are also recalculated, and any excess labels (for example, if the related work lines have been canceled or modified) are marked as **Voided** and aren't reprinted.

5. Select **OK** to confirm your selection.

Scenario 2: Reprint labels from the warehousing app

This scenario typically applies if a label roll has been lost or damaged. It provides an example that shows how to set up mobile device menu items that will let workers reprint single and multiple labels. It then shows how to use those new menu items while you're working on a mobile device.

Set up the required menu items and menu for the mobile device

Before workers can reprint labels from a mobile device, you must set up menu items to provide this functionality and then add those items to the warehousing app menu.

Create new mobile device menu items

Follow these steps to create a new collection of menu items for reprinting labels from the warehousing app.

1. Go to **Warehouse management > Setup > Mobile device > Mobile device menu items**.
2. Create a menu item, and set the following values for it:
 - **Menu item name:** *Reprint single wave label*
 - **Title:** *Reprint single wave label*
 - **Mode:** *Indirect*
 - **Activity code:** *Reprint single wave label*
3. Create a second menu item, and set the following values for it:
 - **Menu item name:** *Reprint labels (Item)*
 - **Title:** *Reprint wave labels (Item)*
 - **Mode:** *Indirect*
 - **Activity code:** *Reprint multiple wave labels*
 - **Display work list grouping filter:** *Yes*
 - **System grouping field:** *ShipmentID*
 - **System grouping label:** *Shipment ID*
 - **Print mode:** *Product*
4. On the Action Pane, select **Field list** to open a page where you can select the fields that will be shown to help workers identify the correct label roll.
5. You can show up to seven fields. Use the drop-down lists to select the field that is shown in each available position. Leave any fields that you don't require blank.

Here is an example:

- **Display field:** *LabelItemID*
- **Display field 2:** *LabelItemName*
- **Display field 3:** *InventQty*

- **Display field 4:** *LabelUnitId*
6. Close the page.
 7. Create a third menu item, and set the following values for it:
 - **Menu item name:** *Reprint labels (Enum)*
 - **Title:** *Reprint wave labels (Enum)*
 - **Mode:** *Indirect**
 - **Activity code:** *Reprint multiple wave labels*
 - **Display work list grouping filter:** *Yes*
 - **System grouping field:** *ShipmentID*
 - **System grouping label:** *Shipment ID*
 - **Print mode:** *Enumeration*
 8. On the Action Pane, select **Field list**, and then use the drop-down lists to select the fields that will be shown to help workers identify the correct label roll (for example, *LabelItemId*, *LabelItemName*, *InventQty*, *LabelUnitId*, and *NumberOfLabels*).
 9. Close the page.
 10. Create a fourth menu item, and set the following values for it:
 - **Menu item name:** *Reprint labels (by last)*
 - **Title:** *Reprint wave labels (by last)*
 - **Mode:** *Indirect*
 - **Activity code:** *Reprint multiple wave labels*
 - **Display work list grouping filter:** *Yes*
 - **System grouping field:** *ShipmentID*
 - **System grouping label:** *Shipment ID*
 - **Print mode:** *Last good wave label ID*
 11. On the Action Pane, select **Field list**, and then use the drop-down lists to select the fields that will be shown to help workers identify the correct label roll (for example, *LabelItemId*, *LabelItemName*, *InventQty*, *LabelUnitId*, and *NumberOfLabels*).
 12. Close the page.

Set up the mobile device menu

Follow these steps to add your new menu items to the warehousing app menu.

1. Go to **Warehouse management > Setup > Mobile device > Mobile device menu**.
2. Select an existing **Outbound** menu.
3. In the list on the left, find the reprint menu items that you just created, and then use the right arrow button to add them to the list on the right.
4. Close the page.

Use cases

The use cases that are provided here give examples that show how to use the various mobile device menu items that you set up to enable workers to reprint wave labels.

Before you work through these use cases, the following prerequisites must be in place:

- Demo data must be installed, and you must select the **USMF** legal entity.
- Wave label printing must be configured, and some labels must be generated, as described in [Configure wave label printing](#).

Use case 2.1: A single wave label is scratched and must be reprinted.

1. Sign in to the warehousing app as a user who access to warehouse 62. (In the standard demo data, you can sign in by using the user ID 62 and the password 1.)
2. Go to **Outbound > Reprint single wave label**.
3. Enter or scan the wave label ID.
4. Select the printer to reprint on.
5. Select **OK** to confirm the action.

Use case 2.2: Several labels for boxes of the same item were damaged and must be reprinted. Each label has a product bar code, but no enumeration or SSCC number.

1. Sign in to the warehousing app as a user who has access to warehouse 62. (In the standard demo data, you can sign in by using the user ID 62 and the password 1.)
2. Go to **Outbound > Reprint labels (Item)**.
3. Enter or scan the shipment ID.
4. Select the tile that has the correct label roll to reprint from.
5. Scan the product bar code from an existing label to confirm that the correct line has been selected.
6. Enter the number of labels to reprint.
7. Select the printer to reprint on.
8. Select **OK** to confirm the action.

Use case 2.3: Several labels for boxes weren't printed because of a printer jam. Because the labels have enumeration, you can define the carton range to reprint.

1. Sign in to the warehousing app as a user who has access to warehouse 62. (In the standard demo data, you can sign in by using the user ID 62 and the password 1.)
2. Go to **Outbound > Reprint labels (Enum)**.
3. Enter or scan the shipment ID.
4. Select the tile that has the correct label roll to reprint from.
5. Enter the first carton to reprint a label for.
6. Enter the last carton to reprint a label for. Alternatively, leave this field blank to reprint labels for all cartons after the specified first carton.
7. Select the printer to reprint on.
8. Select **OK** to confirm the action.

Use case 2.4: Several labels for boxes weren't printed because of a printer jam. The last good label has a wave label ID that is printed as a bar code.

1. Sign in to the warehousing app as a user who has access to warehouse 62. (In the standard demo data, you can sign in by using the user ID 62 and the password 1.)
2. Go to **Outbound > Reprint labels (by last)**.
3. Enter or scan the shipment ID.
4. Select the tile that has the correct label roll to reprint from.
5. Enter or scan the wave label ID of the last good wave label. The app identifies the next label in the sequence as the first carton that a label will be reprinted for.
6. Enter the last carton to reprint a label for. Alternatively, leave this field blank to reprint labels for all cartons after the specified first carton.
7. Select the printer to reprint on.
8. Select **OK** to confirm the action.

Scenario 3: Short pick and reprint

Before you work through this scenario, the following prerequisites must be in place:

- Demo data must be installed, and you must select the **USMF** legal entity.
- Wave label printing must be configured, and some labels must be generated, as described in [Configure wave](#)

[label printing](#).

Set up work exceptions

Work exceptions control the behavior of short picking. Follow these steps to set up a work exception.

1. Go to **Warehouse management > Setup > Work > Work exceptions**.
2. Create a record that has the following settings:
 - **Work exception code:** *Short pick and print*
 - **Exception type:** *Short pick*
 - **Suggest wave labels reprint:** *Yes*

Void and reprint after a short pick

1. Sign in to the warehousing app as a user who has access to warehouse 62. (In the standard demo data, you can sign in by using the user ID 62 and the password 1.)
2. Open a work processing flow for the sales order work that was created when wave labels were originally printed.
3. Select **Short pick**.
4. Select the work exception code that you created for this scenario.
5. If you selected the correct exception, the **Void and reprint** check box should be available. Select this box and confirm. When confirmed, the label roll sequence identified by the **Label build ID** field is recalculated based on the changed work line quantity. It's then reprinted on the specified printer.

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Small parcel shipping

2/18/2021 • 10 minutes to read • [Edit Online](#)

The small parcel shipping (SPS) feature enables Microsoft Dynamics 365 Supply Chain Management to interact directly with shipping carriers by providing a framework for communication through carrier APIs. This functionality is useful when you're shipping individual sales orders via commercial shipping carriers instead of using container shipping or less-than-truckload (LTL) shipping.

The SPS feature interacts with your shipping carrier through a dedicated *rate engine*. Your organization must develop this rate engine in collaboration with your carrier or carrier hub service. The rate engine enables Supply Chain Management to submit details about a packed container to your carrier, and then receive a shipping label, shipping rate, and tracking number back from that carrier.

The shipping rate that is returned is added to the associated sales order as a miscellaneous charge. The shipping label that is returned can then automatically be printed by using a Zebra Programming Language (ZPL) printer and applied to the shipment. The carrier will scan this shipping label when it picks up the packages at your warehouse.

Prepare your system to support SPS

Before you can start to use SPS functionality, you must turn on the SPS feature in Feature management, add your rate engine, and set up the **Transportation management** and **Warehouse management** modules to support it.

Turn on the SPS feature

Before you can use the SPS feature, it must be turned on in your system. Administrators can use the [Feature management](#) workspace to check the status of the feature and turn it on if it's required. There, the feature is listed in the following way:

- **Module:** *Transportation management*
- **Feature name:** *Small parcel shipping*

Deploy and set up rate engines

Supply Chain Management doesn't include any rate engines. You must obtain or create any rate engines that you require, and then add them to your system. However, Microsoft provides a demo rate engine that you can use for testing.

Download and deploy the demo rate engine

Follow these steps to get the demo rate engine.

1. On GitHub, download the [dynamic-link library \(DLL\) for the demo rate engine](#).
2. On your Supply Chain Management server, save the DLL in the `\AOSService\PackagesLocalDirectory\ApplicationSuite\bin` folder.

Create and deploy functional rate engines

For information about how to create and deploy functional rate engines so that they can be used in a production or test environment, see the following topics:

- [Create a new transportation management engine](#)
- [Set up transportation management engines](#)

For more information about how to create an SPS rate engine, see the following blog post: [Small Parcel](#)

[Shipping: How to leverage small parcel shipping functionality in Microsoft Dynamics 365.](#)

Set up a rate engine in Supply Chain Management

After you've created and deployed a rate engine for SPS, follow these steps to set it up.

1. Go to **Transportation management > Setup > Engines > Rate engine**.
2. On the Action Pane, select **New** to add a row to the grid.
3. In the new row, set the following fields:
 - **Rating engine** – Enter a unique name for the rate engine. If you're using the demo rate engine, enter *Demo rate engine*.
 - **Name** – Enter a short description of the rate engine. If you're using the demo rate engine, enter *Demo rate engine*.
 - **Rating metadata ID** – Select the basis that should be used to calculate your rate. For example, your rate might be calculated based on distance. If you're using the demo rate engine, you can leave this field blank.
 - **Engine assembly** – Enter the file name of the DLL package that you deployed. If you're using the demo rate engine, enter *TMSSmallParcelShippingEngine.dll*.
 - **Engine class** – Enter the class name that was established for your rate engine. If you're using the demo rate engine, enter *TMSSmallParcelShippingEngine.SmallParcelShippingRateEngine*.

Example scenario

This example scenario shows how to set up and use SPS after you've prepared your system as described earlier in this topic. This scenario uses the previously mentioned demo rate engine.

Make demo data available

To work through this scenario by using the demo records and values that are specified here, you must be on a system where the standard [demo data](#) is installed. Additionally, you must select the **USMF** legal entity before you begin.

Set up the scenario

For this example scenario, you must have a demo carrier, carrier group, packing policy, and packing profile. The following subsections explain how to prepare the records that are required for the scenario. In a production scenario, the setup process typically resembles the process that is described here. However, you will set different values.

Set up carriers

Follow these steps to set up a carrier.

1. Go to **Transportation management > Setup > Carriers > Shipping carriers**.
2. On the Action Pane, select **New** to add a carrier.
3. On the header, set the following values:
 - **Shipping carrier:** *Demo Carrier*
 - **Name:** *Demo Carrier*
 - **Mode:** *Ground*
4. On the **Overview** FastTab, set the following values:
 - **Activate shipping carrier:** *Yes*
 - **Activate carrier rating:** *Yes*
5. On the **Services** FastTab, select **New** to add a service to the grid.

6. Set the following values for the new service:

- **Carrier service:** *Demo carrier service*
- **Name:** *Demo carrier service*
- **Transportation method:** *Ground*

Enter arbitrary values for all the other fields, as required. (When you save the new shipping carrier record, a new mode of delivery will be created, and the **Mode of delivery** field will be set automatically.)

7. On the **Rating profiles** FastTab, select **New** to add a rating profile to the grid.

8. Set the following values for the new profile:

- **Rating profile:** *Demo carrier service*
- **Name:** *Demo carrier service*
- **Rate engine:** *Demo rate engine*

Enter arbitrary values for all the other fields, as required.

9. On the Action Pane, select **Save**.

For more information about how to set up carriers, see [Set up shipping carriers](#).

Set up carrier service accounts

Follow these steps to set up a carrier service account.

1. Go to **Transportation management > Setup > Rating > Carrier service account**.

2. On the Action Pane, select **New** to add a carrier service account.

3. Set the following values for the new account:

- **Shipping Carrier:** *Demo Carrier*
- **Carrier service:** *Demo carrier service*
- **Carrier customer account number:** The carrier customer account number that is used to verify and authenticate the connection to the shipping carrier. Your carrier will provide this value. If you're using the demo service, you can enter an arbitrary value.
- **Site:** *6*
- **Warehouse:** *62*

NOTE

Often, the **Carrier customer account number** value is the only value that is required to authenticate the connection. However, if your carrier requires additional authentication parameters, your organization should customize this page to add extra fields as appropriate.

Set up a container packing policy

Follow these steps to set up a container packing policy.

1. If you haven't already set up a ZPL printer definition, use the Document Routing Agent application to set it up. For more information, see [Document printing overview](#) and related topics.

2. Go to **Warehouse Management > Setup > Containers > Container packing policies**.

3. On the Action Pane, select **New** to add a container packing policy.

4. On the header of the new policy, set the following values:

- **Container packing policy:** *Demo packing policy*
- **Description:** A description of the policy

5. On the **Overview** FastTab, set the following values:

- **Warehouse:** *62*
- **Default location for final shipment:** *Baydoor*
- **Weight unit:** *KG*
- **Container closing policy:** *Automatic release*
- **Container release policy:** *Make available at final shipping location*

6. On the **Container manifest** FastTab, set the following values:

- **Automatic manifest at container close:** *Yes*
- **Manifest requirements for container:** *Transportation management*
- **Print container contents:** *No*

7. On the **Carrier label printing** FastTab, set the following values:

- **Print container shipping label:** *Always*
- **Printer name:** The name of the ZPL printer that should print shipping labels

Set up a packing profile

Follow these steps to set up a packing profile.

1. Go to **Warehouse Management > Setup > Packing > Packing profiles**.

2. On the Action Pane, select **New** to add a packing profile to the grid.

3. Set the following values for the new profile:

- **Packing profile ID:** *Demo packing profile*
- **Description:** A description of the profile
- **Container packing policy:** *Demo packing policy*
- **Container ID mode:** *Auto*
- **Container type:** *SmallBox*

Set up a customer to use the SPS carrier

Follow these steps to set up a customer so that it can use the carrier that you created.

1. Go to **Accounts receivable > customers > All customers**.

2. In the grid, find and select customer *US-027*.

3. On the Action Pane, on the **General** tab, in the **Set up** group, select **Carrier customer accounts**.

4. On the **Carrier customer accounts** page, on the Action Pane, select **New** to add an account to the grid.

5. Set the following values for the new account:

- **Shipping carrier:** *Demo Carrier*
- **Carrier customer account number:** *12345* (The value isn't important for this scenario, but it will be referred to in the next section.)

Go through the example scenario

After you've set up all the sample data as described in the previous section, you're ready to go through the example scenario.

Create a sales order and process the work

Follow these steps to create a sales order.

1. Go to **Sales and marketing > Sales orders > All sales orders**.

2. Select **New** to create a sales order.

3. In the **Create sales order** dialog box, set the **Customer account** field to *US-027*.
4. Select **OK** to create the sales order and close the dialog box.
5. The new sales order is opened. On the **Sales order header** FastTab, set the **Carrier customer account number** field to the value that you selected for this customer earlier (*12345*).
6. In the **Sales order lines** section, add a sales line, and set the following values for it:
 - **Item number:** *A0002*
 - **Quantity:** *1*
 - **Site:** *6*
 - **Warehouse:** *62*
7. Switch to the **Header** view.
8. On the **Delivery** FastTab, set the following values:
 - **Shipping carrier:** *Demo Carrier*
 - **Carrier service:** *Demo carrier service*
9. Switch back to the **Lines** view. If you're prompted to update the mode of delivery for the sales lines, select **Yes**.
10. In the **Sales order lines** section, select the order line that you set up earlier, and then select **Inventory > Reservation**.
11. On the **Reservation** page, select **Reserve lot** to reserve the selected line's full quantity in the warehouse.
12. Close the **Reservation** page to return to the sales order.
13. On the Action Pane, on the **Warehouse** tab, select **Release to warehouse**.

Work is created to move items from the picking location to the packing station.
14. In the **Sales order lines** section, select **Warehouse > Shipment details**.
15. On the **Shipment details** page, make a note of the shipment ID. You will need it when you pack the pack the shipment at the packing station.
16. Close the **Shipment details** page to return to the sales order.
17. Make a note of the sales order number, and then go to **Warehouse management > Work > All work**.
18. Use the sales order number to find and select the work that was created for the order.
19. On the Action Pane, on the **Work** tab, select **Complete work**.
20. On the **Work completion** page, in the **User ID** field, select a user ID. Then, on the Action Pane, select **Validate work**.
21. If the work passes validation, select **Complete work** on the Action Pane.

The work is marked as completed to simulate the movement of items to the packing station.

Pack the shipment

Follow these steps to pack the shipment.

1. Go to **Warehouse management > Setup > Worker**, and make sure that your user account is associated with a worker account for warehouse management.
2. Go to **Warehouse management > Picking and containerization > Pack**.

3. In the **Select packing station** dialog box, set the following values:

- **Site:** 6
- **Warehouse:** 62
- **Location:** Pack
- **Packing profile ID:** Demo packing profile

4. Select **OK**.

5. The **Pack** page appears. In a production scenario, a worker will scan a license plate or shipment ID. However, for this scenario, open the **All shipments** page, and look up the shipment number for the shipment that you just created. Then enter this value in the **License plate or shipment** field on the **Pack** page. Alternatively, enter the shipment ID that you made a note of earlier.

6. On the Action Pane, select **New container**.

7. The dialog box that appears shows details about the new container. Leave the default values, and then select **OK**.

8. On the **Pack** page, on the **Item packing** FastTab, in the **Identifier** field, select *A0002* to pack that item. The item is added to the container.

9. On the Action Pane, select **Containers for shipment**.

The **Containers for shipment** page that appears has a row for the container that you just created. However, the **Container manifest ID** field in that row is currently blank, because you haven't yet received the shipping label and tracking number from the carrier.

10. On the Action Pane, select **Close container**.

11. In the **Close container** dialog box, set the **Gross weight** field to *1 kg*, and then select **OK**.

The shipping label should now be printed on the ZPL printer that you selected earlier. It should resemble the following example.



12. Notice that the **Container manifest ID** and **Total freight** values have been added as received from the carrier.

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Troubleshoot load building and shipments

2/18/2021 • 3 minutes to read • [Edit Online](#)

This topic describes how to fix common issues that you might encounter while you work with load building and shipments in Microsoft Dynamics 365 Supply Chain Management.

I receive the following error message: "You can't create a load line for this order line because it contains inventory dimensions that are invalid..."

Issue description

You receive the following error message when you try to release a return sales order to the warehouse:

You can't create a load line for this order line because it contains inventory dimensions that are invalid. You can't reference inventory dimensions that are located below the location dimension in the reservation hierarchy. Remove the invalid dimensions from the order line.

Issue resolution

Unfortunately, the product doesn't support load processing for a sales return process. Therefore, you can't release the return sales order to the warehouse.

On sales order transactions, you can't reference inventory dimensions that are located below the **Location** dimension in the reservation hierarchy. The resolution is to remove the invalid dimensions from the order line.

I receive the following error message: "One of the lines is already on a load. Unable to release to warehouse."

Issue description

If you manually create loads, or if you set up the process so that loads are already created before sales order line entry occurs, the assumption is that the subsequent release will be done manually, and that the route and rating from the load will be used.

In another possible scenario, you're trying to do an automatic release to the warehouse, but the wave process failed to create work. Therefore, an open shipment or load is still created. This open shipment or load then blocks subsequent attempts to automatically release the order until you either delete the open shipment or load, or manually reprocess the wave.

Issue resolution

You can release from the sales order page, or automatic release can be done from the release sales order page, only if no load exists before the release to the warehouse. The load will automatically be created after the wave is processed.

I receive the following error message: "The delivery note correction can't be processed. The delivery note only contains items that are subject to warehouse management processes, as these are not supported by Delivery Note correction."

Issue description

After you post a delivery note, you can't cancel it, because the **Cancel** button is unavailable. You also can't correct the delivery note. If you try, you receive this error message.

Issue resolution

To correct posted packing slips for items that are enabled for advanced warehouse management (WMS), you must do the posting from the load, not directly from the order.

How can I create work from outbound loads instead of waves?

Issue description

Here is one way to reproduce this issue.

1. Create an outbound load by using a sales order or transfer order.
2. Release the load to the warehouse.
3. Notice that no picking work has yet been generated.

Issue resolution

If work must be generated immediately when the load is released, you must configure the wave template accordingly. On the wave template, set the following options to *Yes*:

- Automate wave creation
- Process wave at release to warehouse
- Automate wave release

I can't re-release a partially shipped load.

Issue description

You can't release a partially shipped load to the warehouse. When you do the release to the warehouse, an "Operation complete" message appears, but nothing happens, and no work is created for the remaining quantity. This issue occurs when you use transport load functionality and there is an incomplete reservation.

Issue resolution

[KB issue 470069](#) ("Partially shipped loads can be re-waved and re-processed") is fixed in [release 10.0.15](#).

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Shipment consolidation policies

2/18/2021 • 10 minutes to read • [Edit Online](#)

The shipment consolidation process that uses shipment consolidation policies allows for automated shipment consolidation during automated and manual release to the warehouse. The automated consolidation that was available before this feature was introduced had hard-coded fields and was based on the **Consolidate shipment at release to warehouse** field that was set for a warehouse.

Shipment consolidation policies are used for the following functionality:

- The automated release-to-warehouse batch job
- The **Release to warehouse** command in a sales order or transfer order
- The dedicated **Release to warehouse** page
- The **Release to warehouse** command on the **Load planning workbench** page
- The manual consolidation of shipments on the **Consolidate shipments** and **Shipment consolidation workbench** pages

Before shipment consolidation policies were introduced, the consolidation function existed as a setting at the warehouse level. All orders for all customers from a single warehouse were treated as though they had the same consolidation requirements. Shipment consolidation policies add support for scenarios where different organizations have different requirements for shipment consolidation.

Queries are used to identify the shipment consolidation policy that applies, and then an editable set of fields determines how the load lines are grouped at the shipment level. (This pattern resembles the pattern that wave templates follow.) In addition, a **Consolidate with existing shipments** option has been added to each policy. When this option is turned on, the *Release to warehouse* procedure finds shipments for consolidation by searching among existing shipments that were created based on the same consolidation policy. In this case, the system will select an existing shipment or load instead of creating a new one. However, the system will only consolidate with existing shipments that have a status of *Open*; shipments that belong to a wave release with a status of *Released* or higher won't be considered as targets for consolidation.

When shipment consolidation policies are made available, the **Consolidate shipment at release to warehouse** setting that was previously available on the **Warehouses** setup page is hidden. To help you transition to the new shipment consolidation feature, a function on the **Shipment consolidation policies** page creates a default policy that automatically includes the old setting for existing warehouses. After that default policy is created, the **Consolidate shipment at release to warehouse** setting on the **Warehouses** setup page will no longer be considered.

You can use the **Release to warehouse** page to manually override the applicable consolidation policy in the same way that you can override fulfillment policies.

You can use the **Release > Release to warehouse** command on the **Load planning workbench** page to build outbound loads that are based on sales order and transfer order lines before you do the release to the warehouse. These loads use the same consolidation logic that was introduced together with the consolidation of shipment policies.

You can use the **Shipment consolidation workbench** page to consolidate existing shipments that haven't yet been confirmed but have already been released to the warehouse. This functionality supports scenarios where the automated release process, which has its own shipment consolidation, is run multiple times a day, but potential additional consolidations are manually identified before the shipment to carriers is completed during the confirmation process. This functionality lets you consolidate outbound shipments that are created from sales

order or transfer order lines at any time after the shipments are released to the warehouse but before they are confirmed.

The **Shipment consolidation workbench** page works like the load building workbench, where you can assess multiple shipments at the same time and assign a non-consolidated order to a specific shipment. You can apply shipment consolidation templates to assess proposed consolidations multiple times and confirm them. Some rules are implemented to prevent unauthorized consolidation and to warn you about possible errors.

Overview of new functionality

This section describes the pages, commands, and features that are changed or added when you turn on and use the *Shipment consolidation policies* feature.

Shipment consolidation policies page

Policies are differentiated by work order type. The **Sales orders** type represents *Sales order* shipments, and the **Transfer orders** type represents *Transfer issue* shipments.

Every shipment consolidation policy has a query that defines when it's applied and a sequence number that determines the execution order. Consolidation is applied for each unique combination of the selected fields. An additional parameter that is provided is used for consolidation with existing (open) shipments. The policies are evaluated and applied every time that a new shipment is created (before wave processing).

If a policy is missing any mandatory fields, or if it includes any prohibited fields, the policy is marked as not valid in the **Selected** section. The lists of mandatory and prohibited fields are hard-coded and can be extended.

The following list shows the mandatory fields. Because shipments are always split based on these fields, you can't group multiple shipments that have different values for these fields.

- For sales orders:
 - **Account number:** *WHSShipmentTable.AccountNum*
 - **Delivery recipient:** *WHSShipmentTable.DeliveryName*
 - **Postal address (ReclD):** *WHSShipmentTable.DeliveryPostalAddress*
 - **Warehouse:** *WHSShipmentTable.InventLocationId*
- For transfer orders:
 - **From warehouse:** *InventTransferTable.InventLocationIdFrom*
 - **To warehouse:** *InventTransferTable.InventLocationIdTo*

The following fields are unavailable for all document types. These fields aren't visible in the user interface (UI), and they can't be used for consolidation.

- **Shipment ID:** *WHSShipmentTable.ShipmentId*
- **Status:** *WHSShipmentTable.ShipmentStatus*
- **Shipment consolidation policy:** *WHSShipmentTable.ShipConsolidationPolicyName*
- **Work transaction type:** *WHSShipmentTable.WorkTransType*
- **Wave ID:** *WHSShipmentTable.WaveId*
- **Load ID:** *WHSShipmentTable.LoadId*
- **Shipment ID:** *WHSLoadLine.ShipmentId*
- **Load ID:** *WHSLoadLine.LoadId*

By default, when you create a policy, the set of mandatory fields is used as the consolidation fields. However, you can modify the list by using left arrow and right arrow buttons. (The process resembles the process for selecting methods in wave templates.)

The values that users select for these fields will be used for all newly created shipments, or they will be added to

existing shipments during consolidation with those shipments. When two shipments have the same value for a field that is selected for consolidation of those shipments, the shipments are consolidated. The same principle applies for all subsequent consolidation fields that are selected. If the values differ, the second shipment is discarded and will be selected for a new shipment. The automated consolidation process consists of creating all the unique combinations of values for the shipment consolidation fields and then assigning a shipment to the relevant combination.

Unselected fields are ignored during the consolidation process. If two shipments have different values for an unselected field, the field is cleared (that is, it's set to blank). If both shipments have the same value for an unselected field, the field is filled in.

The list of consolidation fields (that is, fields that will be cleared if they have different values) is hard-coded. The list contains all fields that are initialized from a sales order or transfer order line when a new shipment is created. In other words, if a field isn't initialized from a sales order or transfer order line, it's ignored when new data is added to an existing shipment.

Release to warehouse page

- A new field in the lower grid shows the consolidation policy that was applied.
- A new button lets you manually select and/or override the consolidation policy.

Release to warehouse command on the Load planning workbench page

- The logic was adjusted so that it uses applied consolidation policies.
- Shipments are now consolidated only within a single load.

Consolidate shipments page

- The search for similar shipments (that is, candidates for consolidation) was changed so that it uses fields that are selected in the shipment consolidation policy.
- Fields that have different values in different shipments are now set to blank. (Previously, the values from the selected "base" shipment were used.)

Shipment consolidation workbench page

- New functionality replicates the process of manual consolidation on a larger scale.
- You can now open this page from the **Release to warehouse** menu in the **Warehouse management** module.
- The algorithm analyzes existing shipments that haven't yet been shipped. It then proposes consolidation, based on fields that are selected in the consolidation policies.

Comparison of functionality

The following table summarizes how shipment consolidation works when you don't use shipment consolidation policies and when you do use them.

WITHOUT SHIPMENT CONSOLIDATION POLICIES	WITH SHIPMENT CONSOLIDATION POLICIES
Not applicable	Sales or transfer shipments that are selected for consolidation must have the same consolidation policy as the shipment that is being created, or they must be assigned to an open shipment (when the Consolidate with existing shipments option is turned on).

WITHOUT SHIPMENT CONSOLIDATION POLICIES	WITH SHIPMENT CONSOLIDATION POLICIES
<p>The <i>Release to warehouse</i> procedure doesn't search among existing shipments to find a shipment for consolidation. Only shipments that are created by a current instance of the <i>Release to warehouse</i> procedure are used to find a shipment for consolidation.</p>	<p>If the Consolidate with existing shipments option is turned on for a consolidation policy that is currently being used, the <i>Release to warehouse</i> procedure searches among existing shipments that were created based on the same consolidation policy to find a shipment for consolidation. Therefore, if you have two policies, a shipment that is being created based on policy 2 will never be consolidated with a shipment that was created based on policy 1.</p>
<p>Not applicable</p>	<p>If a list of consolidation policy fields is empty, or if a policy can't be found, a new shipment is created for each sales order or transfer order line.</p>
<p>The following consolidation field defines the unique combination of values that is used to consolidate shipments for a <i>transfer line</i>. (All other fields are ignored.)</p> <ul style="list-style-type: none"> • Order number (OrderNum) 	<p>The following consolidation fields define the unique combination of values that is used to consolidate shipments for a <i>transfer line</i>. (All other fields are ignored.)</p> <ul style="list-style-type: none"> • Order number (OrderNum) • Delivery recipient (DeliveryName) • Postal address (DeliveryPostalAddress) • ISO country code (CountryRegionISOCode) • Address (Address) • Site (InventSiteId) • Warehouse (InventLocationId) • Shipping carrier (CarrierCode) • Carrier service (CarrierServiceCode) • Mode of delivery (ModeCode) • Carrier group (CarrierGroupCode) • Delivery terms (DlvTermId) <p>These fields are the only fields that are available and initialized when a new shipment is created.</p>
<p>The following consolidation fields define the unique combination of values that is used to consolidate shipments for a <i>sales line</i>. (All other fields are ignored.)</p> <ul style="list-style-type: none"> • Order number (OrderNum) • Customer reference (CustomerRef) • Customer requisition (CustomerReq) • Delivery terms (DlvTermId) 	<p>The following consolidation fields define the unique combination of values that is used to consolidate shipments for a <i>sales line</i>. (All other fields are ignored.)</p> <ul style="list-style-type: none"> • Order number (OrderNum) • Account number (AccountNum) • Delivery recipient (DeliveryName) • Postal address (DeliveryPostalAddress) • ISO country code (CountryRegionISOCode) • Address (Address) • Site (InventSiteId) • Warehouse (InventLocationId) • Shipping carrier (CarrierCode) • Carrier service (CarrierServiceCode) • Mode of delivery (ModeCode) • Carrier group (CarrierGroupCode) • Broker ID (BrokerCode) • Direction (LoadDirection) • Delivery terms (DlvTermId) • Customer reference (CustomerRef) • Customer requisition (CustomerReq) <p>These fields are the only fields that are available and initialized when a new shipment is created.</p>

WITHOUT SHIPMENT CONSOLIDATION POLICIES	WITH SHIPMENT CONSOLIDATION POLICIES
Not applicable	<p>The following consolidation fields are mandatory for a <i>sales line</i> and can't be removed:</p> <ul style="list-style-type: none"> • Account number (AccountNum) • Delivery recipient (DeliveryName) • Postal address (DeliveryPostalAddress) • Warehouse (InventLocationId) <p>By default, these fields will be assigned when a new policy is created. They can't be removed.</p>
<p>The <i>Release of loads to warehouse</i> procedure on the Load planning workbench page uses its own separate code to create shipments and waves.</p>	<p>Shipment consolidation policies are applied to determine which fields should be evaluated for consolidation. Shipments are consolidated only within a single load.</p>
<p>You manually select Consolidate shipments on the All shipments page and then select a target "base" shipment. The filter will suggest any existing shipments that have matching values for several key fields.</p>	<p>You manually select Consolidate shipments on the All shipments page and then select a target "base" shipment. The system will suggest other existing shipments by matching the values of several key fields that are configured for the relevant shipment consolidation policies.</p>
<p>You can use the Consolidate shipments command on the All shipments page for only a single shipment.</p>	<p>The Shipment consolidation workbench page helps you find a set of shipments that aren't yet in a shipped state. These shipments are analyzed based on several key fields that are configured in your shipment consolidation policies. Any shipments where the values of these fields match are suggested for consolidation.</p> <p>You can manually maintain the consolidation by removing shipments from suggested consolidations and/or by adding shipments to them. Several types of errors can occur, but you can override some of them.</p>
<p>Design note: The <i>Automatic release of sales orders to warehouse</i> procedure splits sales lines into groups. Each group has its own unique ReleaseToWarehouseId value and is processed separately by the <i>Release to warehouse</i> procedure. This procedure creates new work regardless of the work break setup.</p>	<p>Design note: The <i>Automatic release of sales orders to warehouse</i> procedure assigns the same ReleaseToWarehouseId value to all sales lines that are being processed. All sales lines are processed by the <i>Release to warehouse</i> procedure at the same time. To ensure the earlier behavior, you must configure work break per shipment ID.</p>

Additional resources

- [Configure shipment consolidation policies](#)

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Configure shipment consolidation policies

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The shipment consolidation process that uses shipment consolidation policies allows for automated shipment consolidation during automated and manual release to the warehouse. After you turn on this feature, you must configure your initial policies. If no policies are configured, each sales line will generate a separate shipment that has a single load line.

The scenarios that are presented in this topic show how to set up default and custom shipment consolidation policies.

Turn on the Shipment consolidation policies feature

IMPORTANT

In the [first scenario](#) that is described in this topic, you will first set up a warehouse so that it uses the earlier shipment consolidation feature. You will then make shipment consolidation policies available. In this way, you can experience how the upgrade scenario works. If you plan to use a demo data environment to go through the first scenario, don't turn on the feature before you do the scenario.

Before you can use the *Shipment consolidation policies* feature, you must turn it on in your system. Admins can use the [feature management](#) settings to check the status of the feature and turn it on. In the **Feature management** workspace, the feature is listed in the following way:

- **Module:** *Warehouse management*
- **Feature name:** *Consolidate shipment*

Make demo data available

Each scenario in this topic references values and records that are included in the standard demo data that is provided for Microsoft Dynamics 365 Supply Chain Management. If you want to use the values that are provided here as you do the exercises, be sure to work in an environment where the demo data is installed, and set the legal entity to **USMF** before you begin.

Scenario 1: Configure default shipment consolidation policies

There are two situations where you must configure the minimum number of default policies after you turn on the *Shipment consolidation policies* feature:

- You're upgrading an environment that already contains data.
- You're setting up a completely new environment.

Upgrade an environment where warehouses are already configured for cross-order consolidation

When you start this procedure, the *Shipment consolidation policies* feature should be turned off, to simulate an environment where the basic cross-order consolidation feature was already used. You will then use feature management to turn on the feature, so that you can learn how to set up shipment consolidation policies after the upgrade.

Follow these steps to set up default shipment consolidation policies in an environment where warehouses have already been configured for cross-order consolidation.

1. Go to **Warehouse management > Setup > Warehouse > Warehouses**.
2. In the list, find and open the desired warehouse record (for example, warehouse 24 in the USMF demo data).
3. On the Action Pane, select **Edit**.
4. On the **Warehouse** FastTab, set the **Consolidate shipment at release to warehouse** option to *Yes*.
5. Repeat steps 2 through 4 for all other warehouses where consolidation is required.
6. Close the page.
7. Use [feature management](#) to turn on the *Shipment consolidation policies* feature. In the **Feature management** workspace, the feature is named *Consolidate shipment*.
8. Go to **Warehouse management > Setup > Release to warehouse > Shipment consolidation policies**. You might have to refresh your browser to see the new **Shipment consolidation policies** menu item after you turn on the feature.
9. On the Action Pane, select **Create default setup** to create the following policies:
 - A **CrossOrder** policy for the *Sales orders* policy type (provided that you have at least one warehouse that is set up to use the earlier consolidation feature)
 - A **Default** policy for the *Sales orders* policy type
 - A **Default** policy for the *Transfer issue* policy type
 - A **CrossOrder** policy for the *Transfer issue* policy type (provided you have at least one warehouse that is set up to use the earlier consolidation feature)

NOTE

- Both **CrossOrder** policies consider the same set of fields as the earlier logic, except for the field for the order number. (That field is used to consolidate lines into shipments, based on factors such as the warehouse, transportation mode of delivery, and address.)
- Both **Default** policies consider the same set of fields as the earlier logic, including the field for the order number. (That field is used to consolidate lines into shipments, based on factors such as the order number, warehouse, transportation mode of delivery, and address.)

10. Select the **CrossOrder** policy for the *Sales orders* policy type, and then, on the Action Pane, select **Edit query**.
11. In the query editor dialog box, notice that warehouses where the **Consolidate shipment at release to warehouse** option is set to *Yes* are listed. Therefore, they are included in the query.

Create default policies for a new environment

Follow these steps to set up default shipment consolidation policies in a brand-new environment.

1. Use [feature management](#) to turn on the *Shipment consolidation policies* feature, if you haven't already turned it on. In the **Feature management** workspace, the feature is named *Consolidate shipment*.
2. Go to **Warehouse management > Setup > Release to warehouse > Shipment consolidation policies**.
3. On the Action Pane, select **Create default setup** to create the following policies:
 - A **Default** policy for the *Sales orders* policy type
 - A **Default** policy for the *Transfer issue* policy type

NOTE

Both **Default** policies consider the same set of fields as the earlier logic, including the field for the order number. (That field is used to consolidate lines into shipments, based on factors such as the order number, warehouse, transportation mode of delivery, and address.)

Scenario 2: Configure custom shipment consolidation policies

This scenario shows how to set up custom shipment consolidation policies. Custom policies can support complex business requirements where shipment consolidation depends on several conditions. For each example policy later in this scenario, a short description of the business case is included. These example policies should be set up in a sequence that ensures a pyramid-like evaluation of the queries. (In other words, the policies that have the most conditions should be evaluated as having the highest priority.)

Turn on the feature and prepare master data for this scenario

Before you can go through the exercises in this scenario, you must turn on the feature and prepare the master data that is required to do the filtering, as described in the following subsections. (These prerequisites also apply to the scenarios listed in [Example scenarios of how to use shipment consolidation policies](#).)

Turn on the feature and create the default policies

Use feature management to turn on the feature, if you haven't already turned it on, and create the default consolidation policies that are described in [scenario 1](#).

Create two new product filter codes

1. Go to **Warehouse management > Setup > Product filters > Product filters**, and add two product filters:
 - Product filter 1:
 - **Filter code:** *Flammable*
 - **Filter title:** *Code 4*
 - Product filter 2:
 - **Filter code:** *Explosive*
 - **Filter title:** *Code 4*
2. Go to **Product information management > Products > Released products**.
3. Open the product that has item number *M9200*. (The product that you select must be enabled for advanced warehouse [WMS] processes, and this product is pre-enabled for WMS processes in the **USMF** demo data.)
4. On the **Warehouse** FastTab, set the **Code 4** field to *Flammable*.
5. Close the page.
6. Open the product that has item number *M9201*. (This product is also pre-enabled for WMS processes in the in the **USMF** demo data.)
7. On the **Warehouse** FastTab, set the **Code 4** field to *Explosive*.
8. Close the page.

Create a new transportation mode of delivery

1. Go to **Transportation management > Setup > Carriers > Mode**.
2. Create a transportation mode that will be used in consolidation queries, and name it *Airways*.

3. Go to **Transportation management > Setup > Carriers > Shipping carriers**.
4. Create a carrier that has the following settings:
 - **Shipping carrier:** *Airways*
 - **Name:** *Airways*
 - **Mode:** *Airways*
5. On the **Services** FastTab for the new carrier, add a row that has the following settings:
 - **Carrier service:** *Air*
 - **Transportation method:** *Air*
6. On the Action Pane, select **Save**.

NOTE

When you save the new carrier, the **Mode of delivery** field for the new row in the **Services** grid is automatically set to *Airwa-Air*. When you use the *Airwa-Air* mode of delivery for a sales order, the *Airways* transportation mode will be used for related shipments.

Create an order pool

1. Go to **Sales and marketing > Setup > Sales orders > Order pools**.
2. Create an order pool that will be used for the consolidation query. This order pool should have the following settings:
 - **Pool:** Enter an integer that isn't already used by any other pool.
 - **Name:** *ShipCons*
3. Go to **Sales and marketing > Customers > All customers**.
4. Open the customer that has account number *US-003*.
5. On the **Sales order defaults** FastTab, set the **Sales order pool** field to the order pool that you just created.
6. Close the page, and then repeat the steps 4 and 5 for the customer that has account number *US-004*.


Create example policy 1

In this example, you will create a *Customer+Mode* policy that can be used for the following business case:

- The policy will query for a specific customer account (*US-001*) and a specific mode of delivery (*Airwa-Air*).
- Consolidation with open shipments is turned off.
- Consolidation is done per order ID. (In other words, there will be separate shipments per order, warehouse, and so on.)

Follow these steps to create the shipment consolidation policy for this business case.

1. Go to **Warehouse management > Setup > Release to warehouse > Shipment consolidation policies**.
2. Set the **Policy type** field to *Sales orders*.
3. On the Action Pane, select **New** to create a policy that has the following settings:
 - **Policy name:** *CustomerMode*
 - **Policy description:** *Customer account and mode of delivery*
4. Leave the **Consolidate with open shipments** option set to *No*.

5. On the Action Pane, select **Save**.
6. On the **Consolidation fields** FastTab, in the **Remaining fields** list, select the row where the **Field name** field is set to *Mode of delivery*.
7. Select the **Add** button  to move the field to the **Selected fields** list.
8. On the Action Pane, select **Edit query**.
9. In the query editor dialog box, on the **Range** tab, in the grid, find the row where the **Field** field is set to *Customer account*, and set the **Criteria** field for that row to *US-001*.
10. Select **Add** to add a row that has the following settings to the grid:
 - **Table:** *Order lines*
 - **Derived table:** *Order lines*
 - **Field:** *Mode of delivery*
 - **Criteria:** *Airwa-Air*
11. Select **OK** to close the dialog box.

NOTE


For this business case, order lines for customer *US-001* that use the *Airwa-Air* mode of delivery won't be consolidated across orders. This policy is intended to be used first in a sequence, in cases where shipments for all other modes of delivery are consolidated for this customer.

Create example policy 2

In this example, you will create a *Hazardous goods* policy that can be used for the following business case:

- The policy will query for a specific filter code (*hazardous*) and a specific mode of delivery (*Airwa-Air*).
- Consolidation with open shipments is turned on.
- Consolidation is done across orders. (In other words, there will be separate shipments per account, warehouse, and so on, but only within the item group that is specified in the query.)

Follow these steps to create the shipment consolidation policy for this business case.

1. Go to **Warehouse management > Setup > Release to warehouse > Shipment consolidation policies**.
2. Set the **Policy type** field to *Sales orders*.
3. On the Action Pane, select **New** to create a policy that has the following settings:
 - **Policy name:** *Item type*
 - **Policy description:** *Consolidate the same type of item across orders*
4. Set the **Consolidate with open shipments** option to *Yes*.
5. On the Action Pane, select **Save**.
6. On the **Consolidation fields** FastTab, in the **Remaining fields** list, select the row where the **Field name** field is set to *Mode of delivery*.
7. Select the **Add** button  to move the field to the **Selected fields** list.
8. On the Action Pane, select **Edit query**.
9. In the query editor dialog box, on the **Joins** tab, expand and select **Tables > Load details** in the tree.
10. Select **Add table join**.

11. In the grid of relations that appears, find and select the row where the **Relation** field is set to *Warehouse item number (Item number)*, and then select **Select**.
12. On the **Range** tab, select **Add** to add a row that has the following settings to the grid:
 - **Table:** *Warehouse item number*
 - **Derived table:** *Warehouse item number*
 - **Field:** *Code 4*
 - **Criteria:** *Flammable*
13. Select **OK** to close the dialog box.

NOTE



For this business case, all order lines where items have a specific filter code (that is, the filter code where the **Code 4** field is set to *Flammable*) will be consolidated with other items of the same type across orders. If there is an open shipment for the same account, warehouse, and group of items, the new lines will be attached to it.

Create example policy 3

In this example, you will create a *Customers' requirements* policy that can be used for the following business case:

- The policy will query for a specific customer account.
- Consolidation with open shipments is turned on.
- Consolidation is done across orders but is based on customer requisitions. (In other words, multiple orders will be grouped into shipments, based on the same customer requisition number and warehouse.)

Follow these steps to create the shipment consolidation policy for this business case.

1. Go to **Warehouse management > Setup > Release to warehouse > Shipment consolidation policies**.
2. Set the **Policy type** field to *Sales orders*.
3. On the Action Pane, select **New** to create a policy that has the following settings:
 - **Policy name:** *CustomerOrderNo*
 - **Policy description:** *Consolidate lines based on customer PO*
4. Set the **Consolidate with open shipments** option to *Yes*.
5. On the Action Pane, select **Save**.
6. On the **Consolidation fields** FastTab, in the **Remaining fields** list, select the row where the **Field name** field is set to *Customer requisition*.
7. Select the **Add** button  to move the field to the **Selected fields** list.
8. In the **Remaining fields** list, select the row where the **Field name** field is set to *Mode of delivery*.
9. Select the **Add** button  to move the field to the **Selected fields** list.
10. On the Action Pane, select **Edit query**.
11. In the query editor dialog box, on the **Range** tab, find the row where the **Field** field is set to *Customer account*, and set the **Criteria** field for that row to *US-001*.
12. Select **OK** to close the dialog box.

NOTE


For this business case, all order lines where sales orders have the same customer requisition number will be consolidated into one shipment, regardless of the sales order number. (The customer requisition number is used as the customer's purchase order [PO] number.) If there is an open shipment for the same account, warehouse, and customer requisition, the new lines will be attached to it. This policy can be used if the customer sends additional order lines that have the same PO number several times during a day and wants all the lines to be grouped into one shipment. (In other words, there will be one bill of lading and one packing slip.)

Create example policy 4

In this example, you will create a *Customers allowing consolidation* policy that can be used for the following business case:

- The policy will query for a specific order pool to identify customers who accept consolidated shipments.
- Consolidation with open shipments is turned off.
- Consolidation is done across orders using the fields selected by default CrossOrder policy (to replicate the previous **Consolidate shipment at release to warehouse** check box).
- You can override the rule on a sales order by selecting a different order pool.

Follow these steps to create the shipment consolidation policy for this business case.

1. Go to **Warehouse management > Setup > Release to warehouse > Shipment consolidation policies**.
2. Set the **Policy type** field to *Sales orders*.
3. On the Action Pane, select **New** to create a policy that has the following settings:
 - **Policy name:** *Order pool*
 - **Policy description:** *Consolidate across orders based on order pool*
4. Leave the **Consolidate with open shipments** option set to *No*.
5. On the Action Pane, select **Save**.
6. On the **Consolidation fields** FastTab, in the **Remaining fields** list, select the row where the **Field name** field is set to *Mode of delivery*.
7. Select the **Add** button  to move the field to the **Selected fields** list.
8. On the Action Pane, select **Edit query**.
9. In the query editor dialog box, on the **Range** tab, select **Add** to add a row that has the following settings to the grid:
 - **Table:** *Sales orders*
 - **Derived table:** *Sales orders*
 - **Field:** *Pool*
 - **Criteria:** *ShipCons*
10. Select **OK** to close the dialog box.

NOTE


For this business case, all order lines where sales orders belong to the same order pool will be consolidated into one shipment across sales orders for the same account, warehouse, and transportation mode of delivery. Instead of the order pool, you can use any other field to distinguish a group of customers and use the sales order header by default. You can use this approach if the customer, not the warehouse, is driving the need for consolidation. (In the earlier consolidation logic, the warehouse drove the need for consolidation.)

Create example policy 5

In this example, you will create a *Warehouses allowing consolidation* policy that can be used for the following business case:

- The policy will query for a specific order pool to identify warehouses that can consolidate shipments.
- Consolidation with open shipments is turned off.
- Consolidation is done across orders using the fields selected by default CrossOrder policy (to replicate the previous **Consolidate shipment at release to warehouse** check box).

Typically, this business case can be addressed by using the default policies that you created in [scenario 1](#). However, you can also manually create similar policies by following these steps.

1. Go to **Warehouse management > Setup > Release to warehouse > Shipment consolidation policies**.
2. Set the **Policy type** field to *Sales orders*.
3. On the Action Pane, select **New** to create a policy that has the following settings:
 - **Policy name:** *Cross-order*
 - **Policy description:** *Cross-order consolidation for specific warehouses*
4. Leave the **Consolidate with open shipments** option set to *No*.
5. On the Action Pane, select **Save**.
6. On the **Consolidation fields** FastTab, in the **Remaining fields** field, select the row where the **Field name** field is set to *Mode of delivery*.
7. Select the **Add** button  to move the field to the **Selected fields** list.
8. On the Action Pane, select **Edit query**.
9. In the query editor dialog box, on the **Range** tab, find the row where the **Field** field is set to *Warehouse*, and set the **Criteria** field for that row to *61, 63*.
10. Select **OK** to close the dialog box.

Set the order

Now that you've created all your policies, you must establish the order that they will be applied in. To use a pyramid-like approach, where the policies that have the most conditions are evaluated as having the highest priority, follow these steps.

1. Go to **Warehouse management > Setup > Release to warehouse > Shipment consolidation policies**.
2. Set the **Policy type** field to *Sales orders*.
3. Select each policy that is listed in the left column, and then use the **Move up** and **Move down** buttons on the Action Pane to arrange the policies in the following order:

- a. CustomerMode
- b. Item type
- c. CustomerOrderNo
- d. Order pool
- e. Cross-order
- f. Default

Example scenarios of how to use shipment consolidation policies

The following scenarios illustrate how you could use the shipment consolidation policies that you created while reading this topic. Each scenario walks you through a shipment consolidation process that uses shipment consolidation policies during automated or manual release to the warehouse:

- Scenario 1: [Consolidate shipments when they are released to the warehouse by using Automatic release of sales orders](#)
- Scenario 2: [Consolidate shipments when the shipment consolidation policy is overridden from the Release to warehouse page](#)
- Scenario 3: [Consolidate shipments by using Release to warehouse from the load planning workbench](#)
- Scenario 4: [Consolidate shipments by using the shipment consolidation workbench](#)
- Scenario 5: [Consolidate shipments manually by using the Consolidate shipments page](#)

Additional resources

- [Shipment consolidation policies](#)

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Consolidate shipments when they are released to the warehouse by using Automatic release of sales orders

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This topic presents a scenario where multiple orders are released to the warehouse in the same automated release-to-warehouse periodic procedure. The orders will automatically be consolidated into shipments, based on rules that are defined as shipment consolidation policies.

During the scenario, you will create sets of sales orders and release each set to the warehouse. You will then review the shipments that are created or updated during shipment consolidation, based on the configured policies.

Make demo data available

The scenario in this topic references values and records that are included in the standard demo data that is provided for Microsoft Dynamics 365 Supply Chain Management. If you want to use the values that are provided here as you do the exercises, be sure to work in an environment where the demo data is installed, and set the legal entity to USMF before you begin.

Set up shipment consolidation policies and product filters

The scenario that is described here assumes that you've already turned on the feature, done the exercises in [Configure shipment consolidation policies](#), and created the policies and other records that are described there. Be sure to do those exercises before you continue with this scenario.

Create the sales orders for this scenario

Start by creating a collection of sales orders that you can work with. You must work with a warehouse that is enabled for advanced warehouse (WMS) processes. Unless a different warehouse is explicitly mentioned, that same warehouse must be used for each of the following sets of orders.

Go to **Accounts receivable > Orders > All sales orders**, and create a collection of sales orders that have the settings that are described in the following subsections.

Create order set 1

Sales order 1-1

1. Create a sales order that has the following settings:
 - **Customer account:** *US-001*
 - **Mode of delivery:** *Airwa-Air*
2. Add an order line that has the following settings:
 - **Item number:** *A0001* (an item that no **Code 4** filter is assigned to)
 - **Quantity:** *1.00*

Sales order 1-2

1. Create a sales order that has the following settings:
 - **Customer account:** *US-001*

- **Mode of delivery:** *Airwa-Air*

2. Add an order line that has the following settings:

- **Item number:** *A0001* (an item that no **Code 4** filter is assigned to)
- **Quantity:** *1.00*

Sales order 1-3

1. Create a sales order that has the following settings:

- **Customer account:** *US-001*
- **Mode of delivery:** *10*

2. Add an order line that has the following settings:

- **Item number:** *A0001* (an item that no **Code 4** filter is assigned to)
- **Quantity:** *1.00*

3. Add a second order line that has the following settings:

- **Item number:** *A0002* (an item that no **Code 4** filter is assigned to)
- **Quantity:** *1.00*
- **Mode of delivery:** *Airwa-Air*

Create order set 2

Sales orders 2-1 and 2-2

1. Create two identical sales orders that have the following settings:

- **Customer account:** *US-002*

2. Add an order line that has the following settings:

- **Item number:** *M9200* (an item where the **Code 4** filter is set to *Flammable*)
- **Quantity:** *1.00*

3. Add a second order line that has the following settings:

- **Item number:** *M9201* (an item where the **Code 4** filter is set to *Explosive*)
- **Quantity:** *1.00*
- **Mode of delivery:** *Airwa-Air*

Create order set 3

Sales order 3-1

1. Create a sales order that has the following settings:

- **Customer account:** *US-002*

2. Add an order line that has the following settings:

- **Item number:** *M9200* (an item where the **Code 4** filter is set to *Flammable*)
- **Quantity:** *1.00*

3. Add a second order line that has the following settings:

- **Item number:** *M9201* (an item where the **Code 4** filter is set to *Explosive*)
- **Quantity:** *1.00*
- **Mode of delivery:** *Airwa-Air*

NOTE

This order is identical to the two orders that you created for order set 2. However, it's listed as its own order set because you will release it separately later in this scenario.

Create order set 4

Sales order 4-1

1. Create a sales order that has the following settings:
 - Customer account: *US-001*
 - Customer requisition: *1*
2. Add an order line that has the following settings:
 - Item number: *A0001* (an item that no **Code 4** filter is assigned to)
 - Quantity: *1.00*

Create order set 5

Sales orders 5-1 and 5-2

1. Create two identical sales orders that have the following settings:
 - Customer account: *US-001*
 - Customer requisition: *2*
2. Add an order line that has the following settings:
 - Item number: *A0001* (an item that no **Code 4** filter is assigned to)
 - Quantity: *1.00*

Sales order 5-3

1. Create a sales order that has the following settings:
 - Customer account: *US-001*
 - Customer requisition: *1*
2. Add an order line that has the following settings:
 - Item number: *A0001* (an item that no **Code 4** filter is assigned to)
 - Quantity: *1.00*

Create order set 6

Sales orders 6-1 and 6-2

1. Create two identical sales orders that have the following settings:
 - Customer account: *US-003*
 - Customer requisition: *2*
2. Add an order line that has the following settings:
 - Item number: *A0001* (an item that no **Code 4** filter is assigned to)
 - Quantity: *1.00*

Sales orders 6-3 and 6-4

1. Create two identical sales orders that have the following settings:
 - Customer account: *US-004*
 - Customer requisition: *1*
2. Add an order line that has the following settings:
 - Item number: *A0001* (an item that no **Code 4** filter is assigned to)
 - Quantity: *1.00*

Sales orders 6-5 and 6-6

1. Create two identical sales orders that have the following settings:
 - Customer account: *US-007*

- **Site:** 6
- **Warehouse:** 61
- **Pool:** *ShipCons*

2. Add an order line that has the following settings:

- **Item number:** *A0001* (an item that no **Code 4** filter is assigned to)
- **Quantity:** *1.00*

Sales orders 6-7 and 6-8

1. Create two identical sales orders that have the following settings:

- **Customer account:** *US-007*
- **Site:** 6
- **Warehouse:** 61
- **Pool:** Leave this field blank.

2. Add an order line that has the following settings:

- **Item number:** *A0001* (an item that no **Code 4** filter is assigned to)
- **Quantity:** *1.00*

Automatic release of sales orders to the warehouse

For each set of sales orders that you created earlier, you will complete a procedure for automatic release to the warehouse. In each case, you will work through the [basic release-to-warehouse procedure](#) that is provided here.

Basic release-to-warehouse procedure

For each set of sales orders that you created earlier, you will complete the three procedures that are outlined in the following subsections.

Update the wave template that will be used during release

1. Go to **Warehouse management > Setup > Waves > Wave templates**.
2. Set the **Wave template type** field to *Shipping*.
3. Find and select the wave template that is associated with the warehouse that you used in the order sets that you created for this scenario. For example, if you used warehouse *24*, select the **24 Shipping Default** wave template. If you used warehouse *61*, select the **61 Shipping** wave template.
4. On the Action Pane, select **Edit**.
5. Set the **Process wave at release to warehouse** option to *No*.

Release to the warehouse

1. Go to **Warehouse management > Release to warehouse > Automatic release of sales orders**.
2. Set the **Quantity to release** field to *All*.
3. On the **Records to include** FastTab, select **Filter** to open the query dialog box.
4. On the **Range** tab, select **Add** to add a row that has the following settings to the grid:
 - **Table:** *Sales order*
 - **Derived table:** *Sales order*
 - **Field:** *Sales order*
 - **Criteria:** Enter a comma-separated list of the sales order numbers from the desired order set.
5. Select **OK** to save your query.
6. Select **OK** to start the *Automatic release to warehouse* procedure.

Review the shipment that is created or updated

1. Go to **Warehouse management > Shipments > All shipments**.
2. Find and select the required shipment.
3. If a consolidation policy was used when the shipment was created or updated, you should see it in the **Shipment consolidation policy** field.

Release sales orders from order set 1

Follow the [basic release-to-warehouse procedure](#) to release the sales orders from order set 1.

When you've finished, you should see that two shipments were created:

- The first shipment contains three lines and was created by using the *CustomerMode* shipment consolidation policy.
- The second shipment, which doesn't use the *Airways* transportation mode of delivery, was created by using the *CustomerOrderNo* shipment consolidation policy.

Release sales orders from order set 2

Follow the [basic release-to-warehouse procedure](#) to release the sales orders from order set 2.

When you've finished, you should see that three shipments were created:

- The first shipment contains *Flammable* items.
- Each of the other two shipments contains one line that has the *Explosive* item.

Release sales orders from order set 3

Follow the [basic release-to-warehouse procedure](#) to release the sales orders from order set 3.

When you've finished, you should see that the following actions occurred:

- One existing shipment (the shipment that was created when order set 2 was released to the warehouse) was updated. A line that has the *Flammable* item was added.
- One new shipment was created that contains the *Explosive* item.

Release sales orders from order set 4

Follow the [basic release-to-warehouse procedure](#) to release the sales orders from order set 4.

When you've finished, you should see that one existing shipment (where the **Customer requisition** field is set to 1) was updated. One new line was added to it.

Release sales orders from order set 5

Follow the [basic release-to-warehouse procedure](#) to release the sales orders from order set 5.

When you've finished, you should see that the following actions occurred:

- One existing shipment (where the **Customer requisition** field is set to 1) was updated. A line from sales order 5-3 (where the **Customer requisition** field is set to 1) was added to it.
- One new shipment was created, where lines from sales orders 5-1 and 5-2 are grouped into one shipment.

Release sales orders from order set 6

Follow the [basic release-to-warehouse procedure](#) to release the sales orders from order set 6.

When you've finished, you should see that four shipments were created:

- Lines from two orders for customer *US-003* were grouped into one shipment by using the *Order pool* shipment consolidation policy.
- Lines from two orders for customer *US-004* were grouped into one shipment by using the *Order pool* shipment consolidation policy.
- Lines from sales orders 6-5 and 6-6 for customer *US-007* were grouped into one shipment by using the

Order pool shipment consolidation policy.

- Lines from sales orders 6-7 and 6-8 for customer *US-007* were grouped into one shipment by using the *CrossOrder* shipment consolidation policy.

Additional resources

- [Shipment consolidation policies](#)
- [Configure shipment consolidation policies](#)

NOTE

Can you tell us about your documentation language preferences? [Take a short survey](#).

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Consolidate shipments when the shipment consolidation policy is overridden from the Release to warehouse page

2/18/2021 • 2 minutes to read • [Edit Online](#)

This topic presents a scenario where one or more sales lines must be manually released to the warehouse from the **Release to warehouse** page, and the system-defined shipment consolidation policy must be overridden before the release. An override of the shipment consolidation policy might be required if, for example, an order that isn't usually consolidated with open shipments must be consolidated with open shipments.

During the scenario, you will create a set of sales orders and then override the default shipment consolidation policy before you release the orders to the warehouse.

Make demo data available

The scenario in this topic references values and records that are included in the standard demo data that is provided for Microsoft Dynamics 365 Supply Chain Management. If you want to use the values that are provided here as you do the exercises, be sure to work in an environment where the demo data is installed, and set the legal entity to **USMF** before you begin.

Set up shipment consolidation policies and product filters

The scenario that is described here assumes that you've already turned on the feature, done the exercises in [Configure shipment consolidation policies](#), and created the policies and other records that are described there. Be sure to do those exercises before you continue with this scenario.

Create the sales orders for this scenario

1. Go to **Accounts receivable > Orders > All sales orders**, and create three identical sales orders that have the following settings:
 - **Customer account:** *US-002*
2. Add an order line that has the following settings:
 - **Item number:** *A0001* (an item that no **Code 4** filter is assigned to)
 - **Quantity:** *1.00*
3. Select **Inventory > Reservation**, and then, on the Action Pane, select **Reserve lot** to reserve the order line.

Release the sales orders from the Release to warehouse page

Follow these steps to override the shipment consolidation policy during the release to the warehouse.

1. Go to **Warehouse management > Release to warehouse > Release to warehouse**.
2. In the upper pane, select the first sales order that you created for this scenario.
3. Select **Add** to add the line to the release to the warehouse. Notice that the *Default* shipment consolidation policy is applied in the bottom pane.
4. In the bottom pane, select **Select new shipment consolidation policy**.

5. Select a policy that allows for consolidation with other open shipments of the same policy. For example, select the *CustomerOrderNo* policy.
6. Select **Release to warehouse**.
7. Select the second and third sales orders that you created for this scenario.
8. Select **Add** to add the lines to the release to the warehouse. Notice that the *Default* policy is applied in the bottom pane.
9. Select the second line, and then, in the **Select new shipment consolidation policy** field, select the *CustomerOrderNo* policy.
10. Select **Release to warehouse** for both lines.

Verify the shipments

Two shipments should have been created:

- The first shipment contains two lines and was created by using the *CustomerOrderNo* shipment consolidation policy.
- The second shipment contains one line and was created by using the *Default* shipment consolidation policy.

Follow these steps to review the shipments that were created.

1. Go to **Warehouse management > Shipments > All shipments**.
2. Find and select the required shipment.
3. In the **Shipment consolidation policy** field, review the consolidation policy that was used when the shipment was created.

Additional resources

- [Shipment consolidation policies](#)
- [Configure shipment consolidation policies](#)

NOTE

Can you tell us about your documentation language preferences? [Take a short survey](#).

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Consolidate shipments by using Release to warehouse from the load planning workbench

2/18/2021 • 7 minutes to read • [Edit Online](#)

This topic presents a scenario where multiple orders are released to the warehouse in the same load and are then automatically consolidated into shipments.

Make demo data available

The scenario in this topic references values and records that are included in the standard demo data that is provided for Microsoft Dynamics 365 Supply Chain Management. If you want to use the values that are provided here as you do the exercises, be sure to work in an environment where the demo data is installed, and set the legal entity to USMF before you begin.

Set up shipment consolidation policies and product filters

The scenario that is described here assumes that you've already turned on the feature, done the exercises in [Configure shipment consolidation policies](#), and created the policies and other records that are described there. Be sure to do those exercises before you continue with this scenario.

Create the sales orders for this scenario

Start by creating a collection of sales orders that you can work with. You must work with a warehouse that is enabled for advanced warehouse (WMS) processes. Unless a different warehouse is explicitly mentioned, that same warehouse must be used for each of the following sets of orders.

Go to **Accounts receivable > Orders > All sales orders**, and create a collection of sales orders that have the settings that are described in the following subsections.

Create order set 1

Sales order 1-1

1. Create a sales order that has the following settings:
 - **Customer account:** *US-001*
 - **Mode of delivery:** *Airwa-Air*
2. Add an order line that has the following settings:
 - **Item number:** *A0001* (an item that no **Code 4** filter is assigned to)
 - **Quantity:** *1.00*
3. Select **Inventory > Reservation**, and then, on the Action Pane, select **Reserve lot** to reserve the order line.

Sales order 1-2

1. Create a sales order that has the following settings:
 - **Customer account:** *US-001*
 - **Mode of delivery:** *Airwa-Air*
2. Add an order line that has the following settings:
 - **Item number:** *A0001* (an item that no **Code 4** filter is assigned to)

- **Quantity:** 1.00

3. Select **Inventory > Reservation**, and then, on the Action Pane, select **Reserve lot** to reserve the order line.

Sales order 1-3

1. Create a sales order that has the following settings:

- **Customer account:** *US-001*
- **Mode of delivery:** *10*

2. Add an order line that has the following settings:

- **Item number:** *A0001* (an item that no **Code 4** filter is assigned to)
- **Quantity:** 1.00

3. Select **Inventory > Reservation**, and then, on the Action Pane, select **Reserve lot** to reserve the order line.

4. Add a second order line that has the following settings:

- **Item number:** *A0002* (an item that no **Code 4** filter is assigned to)
- **Quantity:** 1.00
- **Mode of delivery:** *Airwa-Air*

5. Select **Inventory > Reservation**, and then, on the Action Pane, select **Reserve lot** to reserve the second order line.

Create order set 2

Sales orders 2-1 and 2-2

1. Create two identical sales orders that have the following settings:

- **Customer account:** *US-002*

2. Add an order line that has the following settings:

- **Item number:** *M9200* (an item where the **Code 4** filter is set to *Flammable*)
- **Quantity:** 1.00

3. Select **Inventory > Reservation**, and then, on the Action Pane, select **Reserve lot** to reserve the order line.

4. Add a second order line that has the following settings:

- **Item number:** *M9201* (an item where the **Code 4** filter is set to *Explosive*)
- **Quantity:** 1.00
- **Mode of delivery:** *Airwa-Air*

5. Select **Inventory > Reservation**, and then, on the Action Pane, select **Reserve lot** to reserve the second order line.

Create order set 3

Sales orders 3-1 and 3-2

1. Create two identical sales orders that have the following settings:

- **Customer account:** *US-001*
- **Customer requisition:** *1*

2. Add an order line that has the following settings:

- **Item number:** *A0001* (an item that no **Code 4** filter is assigned to)
- **Quantity:** 1.00

3. Select **Inventory > Reservation**, and then, on the Action Pane, select **Reserve lot** to reserve the order

line.

Sales orders 3-3 and 3-4

1. Create two identical sales orders that have the following settings:
 - Customer account: *US-001*
 - Customer requisition: *2*
2. Add an order line that has the following settings:
 - Item number: *A0001* (an item that no **Code 4** filter is assigned to)
 - Quantity: *1.00*
3. Select **Inventory > Reservation**, and then, on the Action Pane, select **Reserve lot** to reserve the order line.

Create order set 4

Sales orders 4-1 and 4-2

1. Create two identical sales orders that have the following settings:
 - Customer account: *US-003*
2. Add an order line that has the following settings:
 - Item number: *A0001* (an item that no **Code 4** filter is assigned to)
 - Quantity: *1.00*
3. Select **Inventory > Reservation**, and then, on the Action Pane, select **Reserve lot** to reserve the order line.

Sales orders 4-3 and 4-4

1. Create two identical sales orders that have the following settings:
 - Customer account: *US-004*
2. Add an order line that has the following settings:
 - Item number: *A0001* (an item that no **Code 4** filter is assigned to)
 - Quantity: *1.00*
3. Select **Inventory > Reservation**, and then, on the Action Pane, select **Reserve lot** to reserve the order line.

Sales orders 4-5 and 4-6

1. Create two identical sales orders that have the following settings:
 - Customer account: *US-007*
 - Site: *6*
 - Warehouse: *61*
 - Pool: *ShipCons*
2. Add an order line that has the following settings:
 - Item number: *A0001* (an item that no **Code 4** filter is assigned to)
 - Quantity: *1.00*
3. Select **Inventory > Reservation**, and then, on the Action Pane, select **Reserve lot** to reserve the order line.

Sales orders 4-7 and 4-8

1. Create two identical sales orders that have the following settings:
 - Customer account: *US-007*
 - Site: *6*

- **Warehouse:** 61
 - **Pool:** Leave this field blank.
2. Add an order line that has the following settings:
 - **Item number:** A0001 (an item that no **Code 4** filter is assigned to)
 - **Quantity:** 1.00
 3. Select **Inventory > Reservation**, and then, on the Action Pane, select **Reserve lot** to reserve the order line.

Use the load planning workbench to create loads and release them to the warehouse

Follow these steps to create a load for each order set that you created for this scenario and then release it to the warehouse.

1. Go to **Warehouse management > Loads > Load planning workbench**.
2. On the **Sales lines** tab, find and select all the sales order lines from one of the order sets that you created for this scenario.
3. On the Action Pane, on the **Supply and demand** tab, select **Add > To new load** to add the selected order lines to a new Load.
4. In the **Load template assignment** dialog box, in the **Load template ID** field, select a load template, such as *Std Load Template*.
5. Select **OK** to close the dialog box.
6. In the **Loads** section, find and select the load that you just created.
7. Select **Release > Release to warehouse** to release the selected load to the warehouse.
8. Repeat this procedure for the other three order sets that you created for this scenario.

Verify the shipments

The following procedure lets you verify the shipments that have been created or updated as a result of shipment consolidation. Use it to review each order set that you created for this scenario, and then review the subsections that follow to make sure that you've obtained the expected results.

1. Go to **Warehouse management > Shipments > All shipments**.
2. Find and select the required shipment.
3. If a consolidation policy was used when the shipment was created or updated, you should see it in the **Shipment consolidation policy** field.

Release order set 1 in one load

Two shipments should have been created:

- The first shipment contains three lines and was created by using the *CustomerMode* shipment consolidation policy.
- The second shipment, which doesn't use the *Airways* transportation mode of delivery, was created by using the *CustomerOrderNo* shipment consolidation policy.

Release order set 2 in one load

Three shipments should have been created:

- The first shipment contains the *Flammable* items.
- Each of the other two shipments contains one line that has the *Explosive* item.

Release order set 3 in one load

Two shipments should have been created:

- The first shipment contains order lines from the sales order where the **Customer requisition** field is set to 1.
- The second shipment contains order lines from sales order where the **Customer requisition** field is set to 2.

Release order set 4 in one load

Four shipments should have been created:

- Lines from two orders for customer account *US-003* were grouped into one shipment by using the *Order pool* shipment consolidation policy.
- Lines from two orders for customer account *US-004* were grouped into one shipment by using the *Order pool* shipment consolidation policy.
- Lines from sales orders 4-5 and 4-6 for customer account *US-007* were grouped into one shipment by using the *Order pool* shipment consolidation policy.
- Lines from sales orders 4-7 and 4-8 for customer account *US-007* were grouped into one shipment by using the *CrossOrder* shipment consolidation policy.

Additional resources

- [Shipment consolidation policies](#)
- [Configure shipment consolidation policies](#)

NOTE

Can you tell us about your documentation language preferences? [Take a short survey](#).

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Consolidate shipments by using the shipment consolidation workbench

2/18/2021 • 7 minutes to read • [Edit Online](#)

This topic presents a scenario where multiple orders are released to the warehouse and then consolidated into shipments later by using the shipment consolidation workbench.

Make demo data available

The scenario in this topic references values and records that are included in the standard demo data that is provided for Microsoft Dynamics 365 Supply Chain Management. If you want to use the values that are provided here as you do the exercises, be sure to work in an environment where the demo data is installed, and set the legal entity to USMF before you begin.

Set up shipment consolidation policies and product filters

The scenario that is described here assumes that you've already turned on the feature, done the exercises in [Configure shipment consolidation policies](#), and created the policies and other records that are described there. Be sure to do those exercises before you continue with this scenario.

Turn on the manual shipment consolidation feature

Before you can use the *Manual shipment consolidation* feature, you must turn it on in your system. Admins can use the [feature management](#) settings to check the status of the feature and turn it on. In the **Feature management** workspace, the feature is listed in the following way:

- **Module:** *Warehouse management*
- **Feature name:** *Manual shipment consolidation*

As was mentioned in [Configure shipment consolidation policies](#), you must also turn on the *Consolidate shipment* feature before you can create policies. However, you should already have completed that step.

Create the sales orders for this scenario

Start by creating a collection of sales orders that you can work with. You must work with a warehouse that is enabled for advanced warehouse (WMS) processes. Unless a different warehouse is explicitly mentioned, that same warehouse must be used for each of the following sets of orders.

Go to **Accounts receivable > Orders > All sales orders**, and create a collection of sales orders that have the settings that are described in the following subsections.

Create order set 1

Sales orders 1-1 and 1-2

1. Create two identical sales orders that have the following settings:
 - **Customer account:** *US-001*
 - **Mode of delivery:** *Airwa-Air*
2. Add an order line that has the following settings:
 - **Item number:** *A0001* (an item that no **Code 4** filter is assigned to)

- **Quantity:** 1.00

3. Select **Inventory > Reservation**, and then, on the Action Pane, select **Reserve lot** to reserve the order line.

Sales order 1-3

1. Create a sales order that has the following settings:

- **Customer account:** *US-001*
- **Mode of delivery:** *10*

2. Add an order line that has the following settings:

- **Item number:** *A0001* (an item that no **Code 4** filter is assigned to)
- **Quantity:** 1.00

3. Select **Inventory > Reservation**, and then, on the Action Pane, select **Reserve lot** to reserve the order line.

4. Add a second order line that has the following settings:

- **Item number:** *A0002* (an item that no **Code 4** filter is assigned to)
- **Quantity:** 1.00
- **Mode of delivery:** *Airwa-Air*

5. Select **Inventory > Reservation**, and then, on the Action Pane, select **Reserve lot** to reserve the second order line.

Create order set 2

Sales orders 2-1 and 2-2

1. Create two identical sales orders that have the following settings:

- **Customer account:** *US-002*
- **Mode of delivery:** *Airwa-Air*

2. Add an order line that has the following settings:

- **Item number:** *M9200* (an item where the **Code 4** filter is set to *Flammable*)
- **Quantity:** 1.00

3. Select **Inventory > Reservation**, and then, on the Action Pane, select **Reserve lot** to reserve the order line.

4. Add a second order line that has the following settings:

- **Item number:** *M9201* (an item where the **Code 4** filter is set to *Explosive*)
- **Quantity:** 1.00
- **Mode of delivery:** *Airwa-Air*

5. Select **Inventory > Reservation**, and then, on the Action Pane, select **Reserve lot** to reserve the second order line.

Create order set 3

Sales orders 3-1 and 3-2

1. Create two identical sales orders that have the following settings:

- **Customer account:** *US-001*
- **Customer requisition:** *1*

2. Add an order line that has the following settings:

- **Item number:** *A0001* (an item that no **Code 4** filter is assigned to)
- **Quantity:** 1.00

3. Select **Inventory > Reservation**, and then, on the Action Pane, select **Reserve lot** to reserve the order line.

Sales orders 3-3 and 3-4

1. Create two identical sales orders that have the following settings:
 - **Customer account:** *US-001*
 - **Customer requisition:** *2*
2. Add an order line that has the following settings:
 - **Item number:** *A0001* (an item that no **Code 4** filter is assigned to)
 - **Quantity:** *1.00*
3. Select **Inventory > Reservation**, and then, on the Action Pane, select **Reserve lot** to reserve the order line.

Create order set 4

Sales orders 4-1 and 4-2

1. Create two identical sales orders that have the following settings:
 - **Customer account:** *US-003*
2. Add an order line that has the following settings:
 - **Item number:** *A0001* (an item that no **Code 4** filter is assigned to)
 - **Quantity:** *1.00*
3. Select **Inventory > Reservation**, and then, on the Action Pane, select **Reserve lot** to reserve the order line.

Sales orders 4-3 and 4-4

1. Create two identical sales orders that have the following settings:
 - **Customer account:** *US-004*
2. Add an order line that has the following settings:
 - **Item number:** *A0001* (an item that no **Code 4** filter is assigned to)
 - **Quantity:** *1.00*
3. Select **Inventory > Reservation**, and then, on the Action Pane, select **Reserve lot** to reserve the order line.

Sales orders 4-5 and 4-6

1. Create two identical sales orders that have the following settings:
 - **Customer account:** *US-007*
 - **Site:** *6*
 - **Warehouse:** *61*
 - **Pool:** *ShipCons*
2. Add an order line that has the following settings:
 - **Item number:** *A0001* (an item that no **Code 4** filter is assigned to)
 - **Quantity:** *1.00*
3. Select **Inventory > Reservation**, and then, on the Action Pane, select **Reserve lot** to reserve the order line.

Sales orders 4-7 and 4-8

1. Create two identical sales orders that have the following settings:
 - **Customer account:** *US-007*

- **Site:** 6
 - **Warehouse:** 61
 - **Pool:** Leave this field blank.
2. Add an order line that has the following settings:
 - **Item number:** A0001 (an item that no **Code 4** filter is assigned to)
 - **Quantity:** 1.00
 3. Select **Inventory > Reservation**, and then, on the Action Pane, select **Reserve lot** to reserve the order line.

Release the orders to the warehouse

Follow these steps to release each sales order that you created for this scenario to the warehouse.

1. Go to **Accounts receivable > Orders > All sales orders**.
2. Find and select the sales order to release.
3. On the Action Pane, on the **Warehouse** tab, select **Actions > Release to warehouse** to release the selected sales order.
4. Repeat this procedure for every other sales order that you created for this scenario.

Consolidate the shipments by using the shipment consolidation workbench

1. Go to **Warehouse management > Release to warehouse > Shipment consolidation workbench**.
2. On the Action Pane, select **Edit query**.
3. In the query editor dialog box, on the **Range** tab, select **Add** to add a row that has the following settings to the grid:
 - **Table:** Sales orders
 - **Field:** Sales order
 - **Criteria:** Enter a comma-separated list of the sales order numbers for each order set that you created for this scenario.
4. Select **OK** to save your query and close the dialog box.
5. On the Action Pane, select **Consolidate shipments**.
6. Select all the shipments, and then, on the Action Pane, select **Consolidate**.

Verify the shipments

The following procedure lets you verify the shipments that have been created or updated as a result of shipment consolidation. Use it to review each order set that you created for this scenario, and then review the subsections that follow to make sure that you've obtained the expected results.

1. Go to **Warehouse management > Shipments > All shipments**.
2. Find and select the required shipment.
3. If a consolidation policy was used when the shipment was created or updated, you should see it in the **Shipment consolidation policy** field.

Related shipments for order set 1

Two shipments should have been created:

- The first shipment contains three lines and was created by using the *CustomerMode* shipment consolidation policy.
- The second shipment, which doesn't use the *Airways* transportation mode of delivery, was created by using the *CustomerOrderNo* shipment consolidation policy.

Related shipments for order set 2

Three shipments should have been created:

- The first shipment contains *Flammable* items.
- Each of the other two shipments contains one line that has the *Explosive* item.

Related shipments for order set 3

Two shipments should have been created:

- The first shipment contains order lines from the sales order where the **Customer requisition** field is set to *1*.
- The second shipment contains order lines from sales order where the **Customer requisition** field is set to *2*.

Related shipments for order set 4

Four shipments should have been created:

- Lines from two orders for customer *US-003* were grouped into one shipment by using the *Order pool* shipment consolidation policy.
- Lines from two orders for customer *US-004* were grouped into one shipment by using the *Order pool* shipment consolidation policy.
- Lines from sales orders 4-5 and 4-6 for customer *US-007* were grouped into one shipment by using the *Order pool* shipment consolidation policy.
- Lines from sales orders 4-7 and 4-8 for customer *US-007* were grouped into one shipment by using the *CrossOrder* shipment consolidation policy.

Additional resources

- [Shipment consolidation policies](#)
- [Configure shipment consolidation policies](#)

NOTE

Can you tell us about your documentation language preferences? [Take a short survey](#).

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Consolidate shipments manually by using the Consolidate shipments page

2/18/2021 • 3 minutes to read • [Edit Online](#)

This topic presents a scenario where multiple orders are released to the warehouse and then consolidated later by using the **Consolidate shipments** page.

Make demo data available

The scenario in this topic references values and records that are included in the standard demo data that is provided for Microsoft Dynamics 365 Supply Chain Management. If you want to use the values that are provided here as you do the exercises, be sure to work in an environment where the demo data is installed, and set the legal entity to **USMF** before you begin.

Set up shipment consolidation policies and product filters

The scenario that is described here assumes that you've already turned on the feature, done the exercises in [Configure shipment consolidation policies](#), and created the policies and other records that are described there. Be sure to do those exercises before you continue with this scenario.

Create the sales orders for this scenario

Start by creating a collection of sales orders that you can work with. You must work with a warehouse that is enabled for advanced warehouse (WMS) processes. Unless a different warehouse is explicitly mentioned, that same warehouse must be used for each of the following sets of orders.

Go to **Accounts receivable > Orders > All sales orders**, and create a collection of sales orders that have the settings that are described in the following subsections.

Create sales orders 1 and 2

1. Create two identical sales orders that have the following settings:
 - **Customer account:** *US-007*
 - **Pool:** *ShipCons*
2. Add an order line that has the following settings:
 - **Item number:** *A0001* (an item that no **Code 4** filter is assigned to)
 - **Quantity:** *1.00*
3. Select **Inventory > Reservation**, and then, on the Action Pane, select **Reserve lot** to reserve the order line.

Create sales orders 3 and 4

1. Create two identical sales orders that have the following settings:
 - **Customer account:** *US-007*
 - **Pool:** Leave this field blank.
2. Add an order line that has the following settings:
 - **Item number:** *A0001* (an item that no **Code 4** filter is assigned to)
 - **Quantity:** *1.00*

3. Select **Inventory > Reservation**, and then, on the Action Pane, select **Reserve lot** to reserve the order line.

Release the orders to the warehouse

Follow these steps to release each sales order that you created for this scenario to the warehouse.

1. Go to **Accounts receivable > Orders > All sales orders**.
2. Find and select the sales order to release.
3. On the Action Pane, on the **Warehouse** tab, select **Actions > Release to warehouse** to release the selected sales order.
4. Repeat this procedure for every other sales order that you created for this scenario.

Consolidate shipments

1. Go to **Warehouse management > Shipments > All shipments**.
2. Find and select a shipment that was created when sales order 1 was released to the warehouse. (Its **Shipment consolidation policy** field should be set to *Order pool*.)
3. On the Action Pane, on the **Shipments** tab, select **Shipments > Consolidate shipments**.
4. Verify the shipments that are suggested for consolidation. Only one shipment that has the same policy should be suggested for consolidation.
5. Close the **Shipment consolidation** page.
6. Find and select a shipment that was created when sales order 3 was released to the warehouse. (Its **Shipment consolidation policy** field should be set to *Default*.)
7. On the Action Pane, on the **Shipments** tab, select **Shipments > Consolidate shipments**.
8. Verify that no shipments are suggested for consolidation.
9. Select **Show filters**.
10. In the **Filters** pane, remove the **Order number** filter, and then select **Apply**.
11. Verify the shipments that are suggested for consolidation. Only one shipment that has the same policy should be suggested for consolidation.

Additional resources

- [Shipment consolidation policies](#)
- [Configure shipment consolidation policies](#)

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Troubleshoot outbound warehouse operations

2/18/2021 • 2 minutes to read • [Edit Online](#)

This topic describes how to fix common issues that you might encounter while you work with outbound warehouse operations in Microsoft Dynamics 365 Supply Chain Management.

I receive the following error message: "Sales order could not be released."

Issue description

This issue can occur for several reasons. For example, the order is on credit management hold, and no shipments can be created until a valid postal address is entered for all sales lines that are associated with a sales order. Alternatively, there is an order hold that must be addressed before the order can be released to the warehouse. This hold might be order-specific, or it might be on the customer account.

Issue resolution

Add or update the address on the sales order and order lines, and then release the order to the warehouse. Orders can be released to the warehouse only if they have a valid delivery address (per the address format setup in the **Organization administration** module).

Investigate the order hold, and address the issues. Then remove the hold from the order or customer, and release the order to the warehouse.

I receive the following message: "The shipment for load 1% has been confirmed." However, no lines are posted.

Issue description

A shipment on a load was confirmed, but no further posting occurred.

Issue resolution

Shipment confirmation doesn't affect posting. It just updates the shipment and load status. Posting must occur in a separate process.

I receive the following error message: "Direct delivery is not able to process for warehouse 1% as it has warehouse management enabled. Please specify another warehouse that is not enabled for warehouse management."

Issue description

An item is added to a sales line for direct delivery from a warehouse that is enabled for warehouse management (WMS). You receive this error message when the sales line is updated.

Issue resolution

Microsoft has evaluated this issue and has determined that it's a feature limitation. Currently, WMS doesn't support direct delivery. Therefore, to use direct delivery, you must select a non-WMS item and warehouse.

NOTE

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Work policies

2/18/2021 • 13 minutes to read • [Edit Online](#)

This topic explains how to set up the system and the warehouse app so that they support work policies. You can use this functionality to quickly register inventory without creating putaway work when you receive purchase or transfer orders, or when you complete manufacturing processes. This topic provides general information. For detailed information that is related to license plate receiving, see [License plate receiving via the warehouse app](#).

A work policy controls whether warehouse work is created when a manufactured item is reported as finished, or when goods are received by using the warehouse app. You set up each work policy by defining the conditions where it applies: the work order types and processes, the inventory location, and (optionally) the products. For example, a purchase order for product *A0001* must be received in location *RECV* in warehouse *24*. Later, the product is consumed in another process at location *RECV*. In this case, you can set up a work policy to prevent putaway work from being created when a worker reports product *A0001* as received in location *RECV*.

NOTE

- For a work policy to be active, you must define at least one location for it on the **Inventory locations** FastTab of the **Work policies** page.
- You can't specify the same location for multiple work policies.
- The **Print label** option for mobile device menu items won't print a license plate label unless work was created.

Activate the features in your system

To make all the functionality that is described in this topic available in your system, turn on the following two features in [Feature management](#):

- License plate receiving enhancements
- Work policy enhancements for inbound work

The Work policies page

To set up work policies, go to **Warehouse management** > **Setup** > **Work** > **Work policies**. Then, on each FastTab, set the fields as described in the following subsections.

The Work order types FastTab

On the **Work order types** FastTab, add all the work order types, and the related work processes, that the work policy applies to. The following work order types and related work processes are supported for work policies.

WORK ORDER TYPE	WORK PROCESS
Raw material picking	All related processes
Co-product and by-product put away	All related processes
Finished goods putaway	All related processes
Transfer receipt	License plate receiving (and putaway)

WORK ORDER TYPE	WORK PROCESS
Purchase orders	<ul style="list-style-type: none"> • License plate receiving (and putaway) • Load item receiving (and putaway) • Purchase order line receiving (and putaway) • Purchase order item receiving (and putaway)

To set up a work policy so that it applies to several work processes of the same work order type, add a separate line for each work process to the grid.

For each line in the grid, set the **Work creation method** field to one of the following values:

- **Never** – The work policy will prevent warehouse work from being created for the selected work order type and related work process.
- **Cross docking** – The work policy will create cross-docking work by using the policy that you select in the **Cross docking policy name** field.

The Inventory locations FastTab

On the **Inventory locations** FastTab, add all the locations where this work policy should be applied. If no location is associated with a work policy, the work policy won't be applied to any process.

You can't specify the same location for multiple work policies.

You can use a warehouse location that is assigned to a location profile where the **Use license plate tracking** option is turned off. In this case, workers will directly register the on-hand inventory.

The Products FastTab

On the **Products** tab, set the **Product selection** field to control which products the policy should apply to:

- **All** – The policy should apply to all products.
- **Selected** – The policy should apply only to products that are listed in the grid. Use the toolbar on the **Products** FastTab to add products to the grid or remove them from the grid.

Default and custom "to" locations

NOTE

To make the functionality that is described in this section available in your system, you must turn on the *License plate receiving enhancements* and *Work policy enhancements for inbound work* features in [Feature management](#).

Previously, the system supported receiving only at the default location that is defined for each warehouse. However, mobile device menu items that use the following work creation processes now provide the **Use default data** option. This option lets you assign a custom "to" location to one or more menu items. (This option was already available for some other types of menu items.)

- License plate receiving (and putaway)
- Load item receiving (and putaway)
- Purchase order line receiving (and putaway)
- Purchase order item receiving (and putaway)

The **To location** setting for a menu item overrides the default receiving location for the warehouse, for all orders that are processed by using that menu item.

To set up a mobile device menu item to support receiving at a custom location, follow these steps.

1. Go to **Warehouse management > Setup > Mobile device > Mobile device menu items**.
2. Select or create a menu item that uses one of the work creation processes that are listed earlier in this section.
3. On the **General** FastTab, set the **Use default data** option to **Yes**.
4. On the Action Pane, select **Default data**.
5. On the **Default data** page, set the following values:
 - **Default data field:** Set this field to *To location*.
 - **Warehouse:** Select the destination warehouse to use with this menu item.
 - **Location:** This field lists all the location IDs that are available for the selected warehouse. However, the setting of this field doesn't actually have any effect. Therefore, you can leave it blank. Nevertheless, you can use the list to confirm the ID that you must enter in the **Hardcoded value** field.
 - **Hardcoded value:** Enter the location ID for the receiving location that applies to this menu item.

TIP

A work policy can be applied only if all the receiving locations are listed in the relevant work policy setup. This requirement applies regardless of whether you're using the default warehouse receiving location or a custom "to" location.

Example scenario: Warehouse receiving

All products that are received by the *Purchase order item receiving (and putaway)* process must be registered in location *FL-001*, and they must be available in warehouse *24*. However, work should not be created. Products that are received by any other process (that is, by using other mobile device menu items) should be registered at the default warehouse receiving location (*RECV*), and work should be created as usual. (This scenario doesn't show the default receiving setup.)

This scenario requires the following elements:

- A work policy for the *Purchase order item receiving (and putaway)* process in location *FL-001*, for all products
- A mobile device menu item that has default data, and that sets the **To location** field to *FL-001*

Prerequisites

To make the functionality that is described in this scenario available in your system, you must turn on the *License plate receiving enhancements* and *Work policy enhancements for inbound work* features in [Feature management](#).

This scenario uses the standard demo data. Therefore, if you want to work through it by using the values that are provided here, you must work on a system where demo data is installed. Additionally, you must select the **USMF** legal entity.

Set up a work policy

1. Go to **Warehouse management > Setup > Work > Work policies**.
2. Select **New**.
3. In the **Work policy name** field, enter *No purchase item putaway work*.
4. Select **Save**.
5. On the **Work order types** FastTab, select **Add** to add a row to the grid, and then set the following values for the new row:

- **Work order type:** *Purchase orders*
 - **Work process:** *Purchase order item receiving (and putaway)*
 - **Work creation method:** *Never*
 - **Cross docking policy name:** Leave this field blank.
6. On the **Inventory locations** FastTab, select **Add** to add a row to the grid, and then set the following values for the new row:
 - **Warehouse:** *24*
 - **Location:** *FL-001*
 7. On the **Products** FastTab, set the **Product selection** field to *All*.
 8. Select **Save**.

Set up a mobile device menu item to change the receiving location

1. Go to **Warehouse management > Setup > Mobile device > Mobile device menu items**.
2. In the left pane, select the existing **Purchase receive** menu item.
3. On the **General** FastTab, set the **Use default data** option to *Yes*.
4. Select **Save**.
5. On the **Action Pane**, select **Default data**.
6. On the **Default data** page, on the **Action Pane**, select **New** to add a row to the grid, and then set the following values for the new row:
 - **Default data field:** *To location*
 - **Warehouse:** *24*
 - **Location:** Leave this field blank.
 - **Hardcoded value:** *FL-001*
7. Select **Save**.

Receive a purchase order without creating work

The example in this section shows how to receive a purchase order item, but without creating work, at a location that differs from the default receiving location that is set up for the warehouse. This example uses the work policy and mobile device item that you created earlier in this scenario.

Create a purchase order

1. Go to **Procurement and sourcing > Purchase orders > All purchase orders**.
2. Select **New**.
3. In the **Create purchase order** dialog box, set the following values:
 - **Vendor account:** *US-101*
 - **Site:** *2*
 - **Warehouse:** *24*
4. Select **OK** to close the dialog box and open the new purchase order.
5. On the **Purchase order lines** FastTab, set the following values for the empty row:
 - **Item number:** *A0001*
 - **Quantity:** *1*
6. Select **Save**.
7. Make a note of the purchase order number.

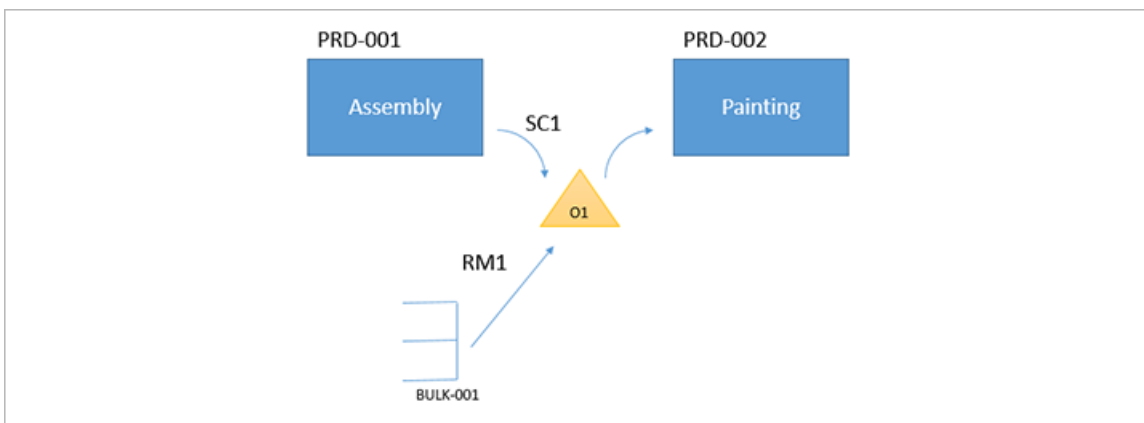
Receive a purchase order

1. On the mobile device, sign in to warehouse 24 by using 24 as the user ID and 1 as the password.
2. Select **Inbound**.
3. Select **Purchase receive**. The **Location** field should be set to *FL-001*.
4. Enter the purchase order number for the purchase order that you created in the previous procedure.
5. In the **Item number** field, enter *A0001*.
6. Select **OK**.
7. In the **Quantity** field, enter *1*.
8. Select **OK**.

The purchase order is now received, but no work is associated with it. The on-hand inventory has been updated, and a quantity of 1 of item *A0001* is now available at location *FL-001*.

Example scenario: Manufacturing

In the following example, there are two production orders, *PRD-001* and *PRD-002*. Production order *PRD-001* has an operation that is named *Assembly*, where product *SC1* is being reported as finished to location *001*. Production order *PRD-002* has an operation that is named *Painting* and consumes product *SC1* from location *001*. Production order *PRD-002* also consumes raw material *RM1* from location *001*. Raw material *RM1* is stored in warehouse location *BULK-001* and will be picked to location *001* by warehouse work for raw material picking. The picking work is generated when production *PRD-002* is released.



When you're planning to configure a warehouse work policy for this scenario, you should consider the following points:

- Warehouse work for putaway of finished goods isn't required when you report product *SC1* as finished from production order *PRD-001* to location *001*. The reason is that the *Painting* operation for production order *PRD-002* consumes product *SC1* at the same location.
- Warehouse work for raw material picking is required to move raw material *RM1* from warehouse location *BULK-001* to location *001*.

Here is an example of a work policy that you can set up, based on these considerations:

- **Work policy name:** *No putaway work*
- **Work order types:** *Finished goods put away* and *Co-product and by-product put away*
- **Inventory locations:** Warehouse 51 and location *001*
- **Products:** *SC1*

The following example scenario provides step-by-step instructions for setting up the warehouse work policy for this scenario.

Example scenario: Report as finished to a location that isn't license

plate-controlled

This scenario shows an example where a production order is reported as finished to a location that isn't license plate-controlled.

This scenario uses the standard demo data. Therefore, if you want to work through it by using the values that are provided here, you must work on a system where demo data is installed. Additionally, you must select the USMF legal entity.

Set up a warehouse work policy

Warehouse processes don't always include warehouse work. By defining a work policy, you can prevent the creation of work for raw material picking and putaway of finished goods for a set of products at specific locations.

1. Go to **Warehouse management > Setup > Work > Work policies**.
2. Select **New**.
3. In the **Work policy name** field, enter *No putaway work*.
4. On the Action Pane, select **Save**.
5. On the **Work order types** FastTab, select **Add** to add a row to the grid, and then set the following values for the new row:
 - **Work order type:** *Finished goods put away*
 - **Work process:** *All related work processes*
 - **Work creation method:** *Never*
 - **Cross docking policy name:** Leave this field blank.
6. Select **Add** again to add a second row to the grid, and then set the following values for the new row:
 - **Work order type:** *Co-product and by-product put away*
 - **Work process:** *All related work processes*
 - **Work creation method:** *Never*
 - **Cross docking policy name:** Leave this field blank.
7. On the **Inventory locations** FastTab, select **Add** to add a row to the grid, and then set the following values for the new row:
 - **Warehouse:** *51*
 - **Location:** *001*
8. On the **Products** FastTab, set the **Product selection** field to *Selected*.
9. On the **Products** FastTab, select **Add** to add a row to the grid.
10. In the new row, set the **Item number** field to *L0101*.
11. On the Action Pane, select **Save**.

Set up an output location

1. Go to **Organization administration > Resources > Resource groups**.
2. In the left pane, select resource group **5102**.
3. On the **General** FastTab, set the following values:
 - **Output warehouse:** *51*
 - **Output location:** *001*
4. On the Action Pane, select **Save**.

NOTE

Location *001* isn't a license plate–controlled location. You can set up an output location that isn't license plate–controlled only if an applicable work policy exists for the location.

Create a production order and report it as finished

1. Go to **Production control > Production orders > All production orders**.
2. On the Action Pane, select **New production order**.
3. In the **Create production order** dialog box, set the **Item number** field to *L0101*.
4. Select **Create** to create the order and close the dialog box.

A new production order is added to the grid on the **All production orders** page.

Keep the new production order selected.
5. On the Action Pane, on the **Production order** tab, in the **Process** group, select **Estimate**.
6. In the **Estimate** dialog box, read the estimate, and then select **OK** to close the dialog box.
7. On the Action Pane, on the **Production order** tab, in the **Process** group, select **Start**.
8. In the **Start** dialog box, on the **General** tab, set the **Automatic BOM consumption** field to *Never*.
9. Select **OK** to save your setting and close the dialog box.
10. On the Action Pane, on the **Production order** tab, in the **Process** group, select **Report as finished**.
11. In the **Report as finished** dialog box, on the **General** tab, set the **Accept error** option to *Yes*.
12. Select **OK** to save your setting and close the dialog box.
13. On the Action Pane, on the **Warehouse** tab, in the **General** group, select **Work details**.

When the production order is reported as finished, no work is generated for putaway. This behavior occurs because a work policy is defined that prevents work from being generated when product *L0101* is reported as finished to location *001*.

More information

For more information about mobile device menu items, see [Set up mobile devices for warehouse work](#).

For more information about license plate receiving and work policies, see [License plate receiving via the warehouse app](#).

For more information about inbound load management, see [Warehouse handling of inbound loads for purchase orders](#).

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Movement of inventory with associated work in Warehouse management

2/18/2021 • 2 minutes to read • [Edit Online](#)

Using movement of inventory, you can decide which warehouse workers are allowed to move reserved inventory. This provides a flexibility in regulated warehouses where you can decide to not allow a worker to choose a new pick location for pick work that is already created. It also allows a warehouse manager to control which capabilities some less experienced workers should have.

The flexibility to manage the daily operations of warehouse workers can be useful in scenarios such as these:

Scenario 1

A company has a relatively small receiving area, and it's congested with pallets and boxes awaiting put away. A large shipment is expected on the current day, so the receiving clerk decides to clear up the receiving area by moving some of the pallets to a secondary inbound staging area.

Scenario 2

An experienced warehouse worker notices an opportunity in a warehouse to consolidate items in one location instead of having them divided across 3 nearby locations with little quantity on each. The worker wants to consolidate the quantity by moving items from each of these locations into the same location and onto the same license plate.

Scenario 3

A pallet is awaiting shipment in a staging location, such as STAGE01, which is near BAYDOOR01. However, due to a change of plans the truck is scheduled to arrive at BAYDOOR04. The shipping clerk is aware of this and needs to ensure that the truck does not have to wait to be loaded from STAGE01. The shipping clerk decides to move the items in that shipment from STAGE01 to STAGE04, which is closer to the new destination.

Current limitations

The work reservations that you can move are limited to Sales order, Transfer order issue, Transfer order receipt, Purchase order, and Replenishment work.

Moving items is restricted to prevent splitting of work lines. This means that if you have a work line for 100 pcs of item A from location Loc1, you won't be able to move only 30 pcs of item A from there to another location. This would lead to a split of the existing work line to 30 and 70, because the locations are now different.

For staging scenarios, where the license plate you move the goods from or the license plate you move the goods to, are set as a Target LP for a work order, only movement of the entire LP is allowed, so as not to break up the Target LP. Only the ad hoc movement is currently supported. That means that you will not be able to move reserved inventory through the movement by template mobile device menu items.

Set up permission to move reserved inventory for individual workers

For the worker who should be allowed to move reserved inventory, select the **Allow movement of inventory with work associated** check box under **Warehouse management > Setup > Worker**.

Backported

This feature has also been back-ported to Microsoft Dynamics AX 2012 R3 and will be available as part of CU12.

It can also be downloaded individually through KB number 3192548.

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Create a work class

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This procedure shows you how to set up a work class. Work classes are used to direct and/or limit the type of work order lines that a warehouse worker can process on a mobile device. The lines that a worker can process are determined from the work classes on the mobile device menu items that the warehouse worker has access to and the work class that's specified on the work lines. Work classes can also be used to validate the put location for a work order line. You can run this procedure in demo data company USMF or on your own data. This procedure is intended for the warehouse manager.

1. Go to Warehouse management > Setup > Work > Work classes.
2. Click New.
3. In the Work class ID field, type a value.
4. In the Description field, type a value.
5. In the Work order type field, select an option.
6. Click New.
7. In the Location type field, type a value.
 - If you select a location type, this sets a restriction on where items can be put after they've been picked. This setting is used when a location directive tries to resolve the location, or if a warehouse worker manually provides the location for the mobile device menu item.
8. Close the page.

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Manage warehouse workers

2/18/2021 • 3 minutes to read • [Edit Online](#)

This article describes how you can use the warehouse app to help control and monitor the work that's carried out by employees in your warehouses.

If you're using the functionality in Warehouse management, all warehouse worker operations are referred to as *work*. Work such as picking, moving, and counting on-hand inventory is recorded by using mobile devices. Before a warehouse worker can perform work, he or she must be associated with a worker in Human resources. Each **Worker** account can have multiple warehouse work users associated with it. Those work users can work in different warehouses and can have different levels of access to the various mobile device menus. You can think of the warehouse work users as multiple logons for the selected worker. Each work user has a default warehouse, and specific workflows are exposed by the menu items that are available to that work user.

To create a new work user, on the **Workers** page, on the **General** tab, in the **Warehouses** section, click **Worker**. You must specify a user ID, a user name, a default warehouse, and a menu name. This menu is loaded when the user signs in to the Warehouse Mobile Device Portal, and lets you define which menu items the user has access to.

As part of the setup for each work user, you can also define specific process workflows. For example, you can use the **Is a cycle count supervisor** field to specify whether the user can process adjustments to cycle counting discrepancies during a counting operation, or whether these adjustments must first be reviewed by another person.

Defining labor standards

The **Labor standards** page lets you define the calculation methods that the system uses to calculate the estimated time that a particular type of work should require. This definition can be set on a generic level or on a specific level. For example, you can define the time that should be required in order to process a sales order pick per weight for a specific unit definition when a specific picking process is used. At the same time, you can record the time, based on another calculation method, for the put operation of the on-hand inventory that is picked.

To enable the labor standards that you've defined, you must select the **Allow labor standards** option for each warehouse where labor standards will be used.

Monitoring and controlling warehouse work

The **All work** page lets you monitor and maintain all work that is planned, in progress, and completed. From this page, you can update various processes, such as warehouse work user assignments and work priority. You can also drill down into the details that are related to the work header and work lines to gain an understanding of the expected or completed work processes.

If you enable the **Labor standards** option, you can see the calculated estimated time for the work. Then, when the work is processed, the actual time will also be shown for each work operation. In this way, you can compare the estimated time calculations to the actual time.

Additionally, you can use the estimated time in the rules for automatically splitting work during work creation. In this way, you can load balance work, based on the expected time to complete the tasks.

Analysis of the time that is used to process work items can help drive improvements in the warehouse workers' efficiency. The following reports are available to help with this analysis:

- **Labor by user** – This report shows worker productivity, based on actual times against expected times.
- **Labor by work transaction type** – You can use this report to investigate inefficiencies in specific warehouse processes. For example, you notice that picks for transfer orders are taking longer this week than in previous weeks. You can then use this information for further investigation.

NOTE

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Deferred processing of warehouse work

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This topic describes the functionality that makes deferred processing of put operations for warehouse work available in Dynamics 365 Supply Chain Management.

The deferred processing functionality lets warehouse workers continue to do other work while the put operation is processed in the background. Deferred processing is useful when many work lines must be processed and the worker can let that work be processed asynchronously. It's also useful when the server can have ad-hoc or unplanned increases in processing time, and the increased processing time might affect the user's productivity.

Background processing is achieved by using the SysOperation framework. For more information, see [SysOperation Framework Overview](#).

Configuring the work processing policies

To use deferred processing, you must configure and use a work processing policy.

Policies are configured on the **Work processing policies** page. The following table describes the fields on that page.

FIELD	DESCRIPTION
Work processing policy name	The name of the work processing policy.
Work order type	The work order type that the policy is applied to.
Operation	The operation that is processed by using the policy.
Work processing method	The method that is used to process the work line. If the method is set to Immediate , the behavior resembles the behavior when no work processing policies are used to process the line. If the method is set to Deferred , deferred processing that uses the batch framework is used.
Deferred processing threshold	A value of 0 (zero) indicates that there is no threshold. In this case, deferred processing is used if it can be used. If the specific threshold calculation is below the threshold, the Immediate method is used. Otherwise, the Deferred method is used if it can be used. For sales and transfer-related work, the threshold is calculated as the number of associated source load lines that are being processed for the work. For replenishment work, the threshold is calculated as the number of work lines that are being replenished by the work. By setting a threshold of, for example, 5 for sales, smaller works that have fewer than five initial source load lines won't use deferred processing, but larger works will use it. The threshold has an effect only if the work processing method is set to Deferred .
Deferred processing batch group	The batch group that is used for processing.

For deferred put-processing, the following work order types are supported: sales order, transfer order issue, and replenishment.

Assigning the work creation policy

The work creation policy can be assigned in the warehouse management parameters. It can also be assigned at the level of individual warehouses. If the policy is assigned to a warehouse, it's applied only to work that is created for that warehouse. If no policy is assigned at the warehouse level, the policy from the warehouse management parameters is applied.

Viewing the deferred put processing tasks

You can view deferred put processing tasks on the **Deferred put processing tasks** page.

By default, the **Completed** tasks are shown.

FIELD	DESCRIPTION
Status	The status of the task.
Batch job status	The status of the related batch job. If the batch job has been processed, the batch history contains the log and information from the batch job.

Here is an explanation of the possible statuses:

- **Awaiting** – The related batch job is awaiting processing on the batch server.
- **Failed** – The processing failed. The task can be reprocessed by using the **Process deferred put** action, or it can be canceled by using the **Cancel deferred put** action.
- **Completed** – The job was completed.

Impact on closed work dates

When deferred put processing is used, the closed work date is set as the created date/time of the deferred put processing tasks. The closed work date is used because it's the best estimate for when the put operation was completed.

Reprocessing a failed task

You can reprocess a failed task by selecting it on the page and then selecting **Process deferred put**.

Reprocessing corresponds to a situation where the user completes the put-away from the mobile device as if it was set for immediate processing.

Canceling failed tasks

Only failed tasks can be canceled. When you cancel a task, you can assign it to a new user. Alternatively, the task can remain assigned to the user who processed the work. Cancellation corresponds to a situation where the work is brought back to the mobile device as if the last pick step was just completed and the work must be put away. However, the user will be able to determine that the work is "different," because it will have only a put-away step, and the location will correspond to the location that the first user who processed the work had as a final put location.

When a task is canceled, the work is no longer blocked by the deferred put processing blocking reason. It can be reprocessed by using the mobile device.

The task record is deleted when the task canceled.

Configuring the mobile device menu to skip the deferred processing

policy

You can configure the mobile device menu item so that the deferred processing policy isn't used. The work is then processed as it is when no deferred processing policy is used. This functionality lets a supervisor use a specific menu item where deferred put isn't used. To configure it, set the **Deferred put processing policy** field to **Override settings and process put synchronously**.

Restrictions when the deferred put processing isn't applied

There are several scenarios where deferred put processing isn't applied even though the policy is configured. Here are some examples:

- Manual work completion is used.
- The work is completed by using auto-completion.
- Audit templates are used.

Monitoring the deferred processing tasks from the Outbound work monitoring workspace

The **Outbound work monitoring** workspace has two tiles that help you monitor deferred put processing tasks:

- **Failed deferred put processing tasks** – This tile shows the number of failed tasks. If there are failed tasks, the warehouse manager must either reprocess them or cancel them, because they won't be reprocessed automatically.
- **Awaiting deferred put processing tasks** – This tile shows the number of tasks that have been in the **Awaiting** status for more than 10 minutes. If the tile shows a number, it might indicate that an issue occurred during batch processing. You can manually process the **Awaiting** tasks. If the batch job for a task is processed later, it will just fail, because it has already been processed. There will be no impact.

Deleting completed tasks

You can delete deferred put processing tasks that have been completed by selecting them and deleting them on the page.

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Cross-docking from production orders to outbound docks

2/18/2021 • 8 minutes to read • [Edit Online](#)

This topic describes how to manage the process of cross-docking material that is being reported as finished from a production line to an outbound transportation dock.

Introduction

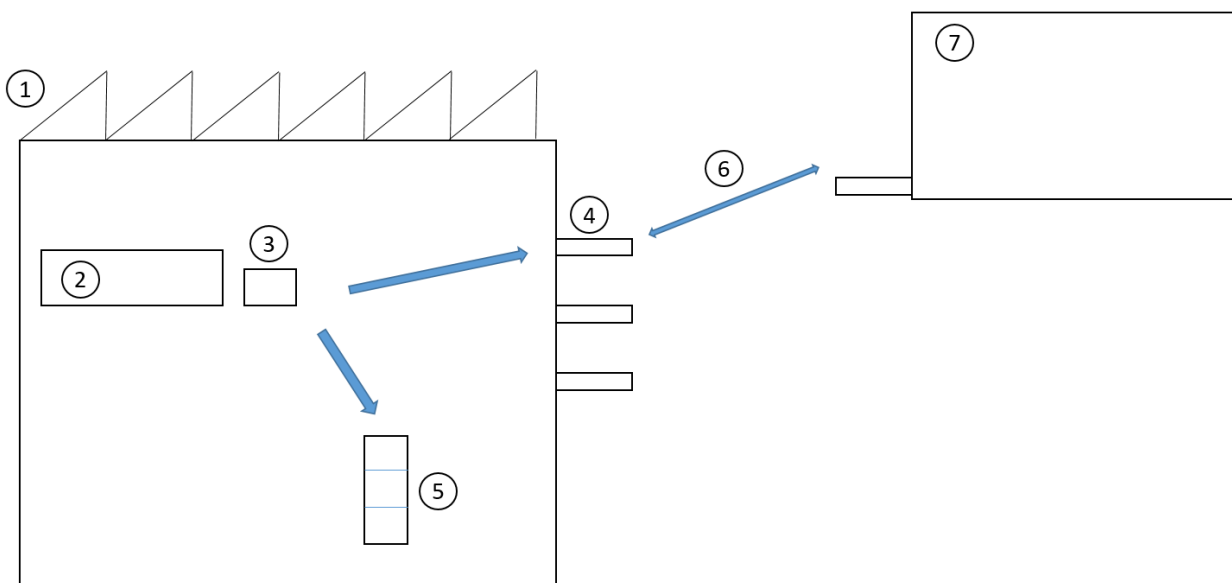
Cross-docking from production to an outbound location is relevant for manufacturers who produce high volume and ideally want to ship the finished products as soon as they are reported as finished from the production lines. The purpose is to ship the products to distribution centers that are physically located close to the customer demand, rather than build up inventory at the manufacturing site.

In case there is no immediate demand for a product, it must be put away to warehouse locations on the manufacturing site. This process is also known as *opportunistic cross-docking*, which indicates that if there is a demand for shipping the product, then this opportunity should be used instead of putting the product away for internal storage.

The following example shows three variations of a flow that starts at the end of the production line (2).

A product is reported as finished to the production output location (3) and a fork lift driver will pick up the pallet at this location (3).

- If there is a planned activity (6) for transferring the product from manufacturing (1) to a distribution center (7), then the truck driver will be directed by the system to put the pallet by a bay-door location (4).
- If a trailer is already assigned to the bay door, the truck driver will be directed to load the product directly to the trailer.
- If there is no planned activity for transferring the product, the fork lift driver will be directed to put the product away to a location in the internal warehouse (5).



Configure cross-docking

You configure the cross-docking process in **work policies**. A work policy includes a work order type, location,

and product. In the following example, cross-docking is configured for product X and location Y.

Work order types

- Work order type: Finished goods put way
- Work creation method: Cross docking
- Cross docking policy name: Transfer orders

Inventory locations

- Warehouse: 51
- Location: Y

Products

- Item number: X

Currently, cross-docking can be configured for only two work order types:

- Finished goods put away
- Co-product and by-product put away

In the **cross-docking policy**, you define which document types are applicable for cross-docking. Currently, the only document type that is supported is **Transfer orders**. The following example shows the configuration of a cross-docking policy.

Cross-docking policy name: Transfer order

- Sequence number: 10
 - Work order type: Transfer issue
- Cross docking demand requires location: False
- Cross docking strategy: Date and time

Sequence number

The **sequence number** indicates the priority of the document type. Currently, **Transfer issue** is the only type that is supported. Therefore, the sequence number will become relevant only when more work order types are supported.

Cross-docking policy

The cross-docking policy also sets the policy for the prioritization of transfer order demand. For example, if multiple transfer orders exist for the same product, the scheduled date and time that are set on the load, and associated with the transfer order, determine the prioritization between the orders. The scheduled date and time can be set directly on the load, or they can be set on an **appointment schedule** that is associated with the load. The prioritization is determined by the cross-docking strategy. Currently, there is only one strategy: **Date and time**.

Cross-docking demand requires location

In the cross-docking policy, you can set up a criterion to require that transfer orders have an assigned location in order to be eligible for cross-docking. This criterion is set in the **Cross docking demand requires location** field. The location on the appointment schedule that is associated with the load is used as the final location for the goods that are being cross-docked. The final location for the goods that are being cross-docked is determined by the location directive for **Transfer issue** for the **Put** work order type. You might find it useful to set the **Cross docking demand requires location** field in a scenario where the finished goods should be cross-docked only if a trailer is assigned to a bay door. In this scenario, the goods are moved directly from the production line into the trailer. When a trailer is assigned to the bay door, a user will assign the location to the appointment schedule and will therefore make the location applicable for cross-docking. The following sections walk you through two examples.

Scenario 1 – Cross-docking from production to transfer orders

After a product is reported as finished at the production line it is transferred to a bay-door location where it is loaded to a truck and transferred to a distribution center. Use company USMF.

1. Enable a new number sequence for cross-docking. Go to the **Number sequences** page, and select the **Generate** button. A wizard will guide you through the process.
2. Create a cross-docking policy. Go to the **Cross docking policy** page, and create a new policy that is named **Cross docking to transfer order**. Note that the only work order type that you can select is **Transfer issue**, and the only cross-docking strategy that is available is **Date and time**.
3. Create a work policy. Go to the **Work policies** page, and create a new work policy that is named **Cross Dock L0101**.
4. Set up loads so that they are created automatically for transfer orders. In the warehouse parameters, set up loads so that they are created automatically when transfer orders are created. A load is a prerequisite for making the transfer order eligible for cross-docking.
5. Set up the item load mapping. Go to the **Item load mapping** page, and set up a standard load template for the **CarAudio** item group. This mapping will automatically insert the load template on the load when the transfer order is created.
6. Create a transfer order. Create the transfer order for item number L0101. Quantity = 20.
7. Release the transfer order from the load planning workbench. On the **Ship** tab, select the menu item for the load planning workbench and on the **Release** menu of the load line, select **Release to warehouse**. An open wave line of type **Transfer issue** now exists for the transfer order.
8. Create a production order. Go to the **Production order** list page, and create a production order for product L0101. Quantity = 20. Estimate and start the production order. Note that the **Post picking list now** field remains set to **No**.
9. Report as finished from the mobile device. Go to the mobile device portal and select menu item **Report as finished and put away**. Now report as finished L0101 from the handheld device. Quantity = 10. Note that the put location is **BAYDOOR**. This location is found from the **Transfer issue** location directive for the **Put** work order type. Also notice that work of the type **Transfer issue** has been created and completed. Go to the transfer order work details to verify the work.
10. Now report additional 10 pieces from the mobile device. Note that the put location again is **BAYDOOR**. Also notice that a new work of type **Transfer issue** has been created for the 10 pieces.
11. Now try to start 20 pieces more on the production order and then try to report 20 ea as finished by using the handheld device. This time, location **LP-001** is suggested as the put location. This location is found from the location directive for **Finished goods put away**. This location directive is being used, because no opportunity for cross-docking exists. The transfer order for LP-001 was completely fulfilled by the two cross-docking activities in step 9 and 10. Notice that work of the type **Finished goods put away** was created and processed.

Scenario 2 - Cross-docking from production to transfer orders with an appointment schedule

After a product is reported as finished at the production line it is transferred to a bay-door location that is identified by an appointment schedule for the bay-door locations. Use company USMF.

1. Change the cross-docking policy. Change the cross-docking policy that you created in scenario 1 by selecting the **Cross docking demand requires location** check box.
2. Create a new transfer order.
3. Open the **Load planning workbench**.
4. From the load planning workbench, go to the **Loads** section, and select **Appointment schedule** on the **Transportation** menu to create a new appointment schedule. Note that the appointment schedule has a reference to the transfer order in the **Order number** field. In the **Planned start date/time at location** field, you can set the date and time for the appointment. This date and time will be used when cross-docking demand is prioritized during the cross-docking process. The date and time that you set in this field will update the **Scheduled load shipping date and time** field on the corresponding load. The location on the **Shipping details** FastTab determines the location that the transfer order is shipped on.

5. On the **Load planning workbench** release to the warehouse.
6. Create a production order for item number **L0101**, and set the status to **Started**, with a quantity of 20.
7. Report as finished from the mobile device.
8. Go to the mobile device portal, and select the **Report as finished and put away** menu item.
9. Report item number **L0101** as finished from the handheld device. Note that the put location is now **BAYDOOR 2**. This location is found from the appointment schedule instead of the **Transfer receipt** location directive.

Additional information

- The cross docking scenario is supported for batch and serial controlled items, both with the batch and serial number dimensions defined above and below location in the reservation hierarchy.

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Auto-release shipment for cross-docking

2/18/2021 • 10 minutes to read • [Edit Online](#)

This topic describes a cross-docking strategy that lets you automatically release a demand order to the warehouse when the production order that supplies the demand quantity is reported as finished. In this way, the quantity that is required for fulfillment of the demand order is moved directly from the production output location to the outbound location.

Cross-docking is a warehouse handling flow where the quantity that is required to fulfill an outbound order is directed to the order's outbound dock or staging area from the location where the inbound order was received. (The inbound order can be a purchase order, a transfer order, or a production order.) Whereas the Advanced cross-docking feature supports all supply and demand orders, and it requires that the outbound demand be released before the cross-dock opportunity is identified, the Auto-release shipment feature has these characteristics:

- It supports only production orders as supply, and only sales orders and transfer orders as demand.
- The cross-docking operation can be started even if the demand order wasn't released to the warehouse before the supply receipt was registered (that is, before the production was reported as finished).

This cross-docking functionality has two advantages:

- The warehouse operations can skip the step of putting away quantities of finished goods to the regular warehouse storage area if those quantities will just be picked up again to fulfill the outbound order. Instead, the quantities can be moved one time, from the output location to a packing/shipping location. In this way, the functionality helps minimize the number of times that stock is handled and, ultimately, helps maximize time and space savings on the warehouse shop floor.
- The warehouse operations can postpone the release of sales orders and transfer orders to the warehouse until the output of finished goods for the associated production order is reported as finished. This advantage might be especially relevant in make-to-order production environments, where manufacturing lead times tend to be longer than the lead times in make-to-stock environments.

Prerequisites

PREREQUISITE	DESCRIPTION
Item	The item must be enabled for warehouse management processes. Note: Catch-weight-enabled items can't be included in the cross-docking processes.
Warehouse	The warehouse must be enabled for warehouse management processes.
Cross-docking templates	At least one cross-docking template that uses the At supply receipt demand release policy must be set up for a given warehouse.
Work class	A cross-docking work class ID must be created for the Cross docking work order type.

PREREQUISITE	DESCRIPTION
Work templates	Work templates of the Cross docking work order type are required to create cross-docking pick and put work.
Location directives	Location directives of the Cross docking work order type are required to guide put work in the locations where sales order quantities will be packed and shipped.
Marking between a demand order and a production order	The warehouse system can trigger automatic release of the outbound order shipment and create cross-docking work from the output location at the report-as-finished action only if sales orders and transfer orders are reserved and marked against a production order.

Example cross-docking flow

A typical cross-docking flow consists of the following main steps.

1. A sales order taker creates a sales order for a make-to-order product. Typically, the requested quantity isn't on hand and must first be produced.
2. The sales order taker creates a production order directly from the sales order line. In this way, the sales order taker reserves and marks the sales order quantity against the production order quantity.

Alternatively, a production planner specifies that the marking must be updated when planned orders are being firmed.

3. The production order goes through the following steps:
 - a. A production planner estimates and releases the production order. (Estimation includes raw material reservation, and the release includes the release to a warehouse.)
 - b. A warehouse worker starts and completes raw material picking from the storage location to the production input location, according to the production pick work.
 - c. A shop floor operator starts the production order.
 - d. In the last operation, a machine operator uses the mobile device to report the production order as finished.
4. The system uses the setup to identify the cross-docking event for the two linked orders and then completes these tasks:
 - a. Automatically release the associated sales order to a warehouse to create a shipment.
 - b. Automatically create cross-docking work that has instructions to pick the finished goods from the output location and move them to the outbound location that the cross-docking location directives assigned to the sales order.
 - c. Prompt a machine operator to complete the cross-docking work immediately after the production order is reported as finished.
5. After the cross-docking work is completed, and quantities are loaded onto the vehicle, an outbound warehouse planner confirms the sales shipment.

Example scenario

For this scenario, you must have demo data installed, and you must use the **USMF** demo data company.

Set up cross-docking that uses the auto-release shipment feature

Cross-docking template

1. Go to **Warehouse management > Setup > Work > Cross docking templates**.
2. Select **New**.
3. In the **Sequence number** field, enter **1**.
4. In the **Cross docking template ID** field, enter a name, such as **XDock_RAF**.
5. In the **Demand release policy** field, select **At supply receipt**.
6. In the **Warehouse** field, enter the number of the warehouse where you want to set up the cross-docking process. For this example, select **51**.

NOTE

As soon as you select **At supply receipt** as the demand release policy for the template, all other fields on the page become unavailable. Likewise, you can't define any supply sources. This behavior occurs because cross-docking that uses the auto-release shipment feature supports only production orders as supply sources, and it requires that a marking exist between sales orders and production orders. If you select **Before supply receipt** as the demand release policy, the fields on the **Planning** and **Supply sources** tabs are available and can be edited.

Work classes

1. Go to **Warehouse management > Setup > Work > Work classes**.
2. Select **New**.
3. In the **Work class ID** field, enter a name, such as **CrossDock**.
4. In the **Work order type** field, select **Cross docking**.

To limit the types of locations where cross-docked finished goods can be put, you can specify one or more valid location types.

Work templates

1. Go to **Warehouse management > Setup > Work > Work templates**.
2. In the **Work order type** field, select **Cross docking**.
3. Select **New**.
4. In the **Sequence number** field, enter **1**.
5. In the **Work template** field, enter a name, such as **CrossDock_51**.
6. Select **Save**.
7. In the **Work Template Details** section, select **New**.
8. For the new line, in the **Work type** field, select **Pick**. In the **Work class ID** field, select **CrossDock**.
9. Select **New**.
10. For the new line, in the **Work type** field, select **Put**. In the **Work class ID** field, select **CrossDock**.

Location directives

A standard put-away process for finished goods requires a **Put** location directive to guide the movement of picked production quantities to a regular storage space. Likewise, you must set up a cross-docking **Put** location directive to instruct the work to put the finished quantity in a designated outbound location that services the shipment of the associated sales order.

For cross-docking, as for regular put-away of finished goods, you don't have to create a location directive for the pick work action, because the output location is given. Additionally, this output location is expected to be set up either as the default output location on one of the resource-related records (that is, the resource, resource group relation, or resource group) or as a default production finished goods location for a warehouse.

1. Go to **Warehouse management > Setup > Location directives**.
2. In the **Work order type** field, select **Cross docking**.

3. Select **New**.
4. In the **Sequence number** field, enter **1**.
5. In the **Name** field, enter a name, such as **Baydoor**.
6. In the **Work type** field, select **Put**.
7. In the **Site** field, select **5**.
8. In the **Warehouse** field, select **51**.
9. On the **Lines** FastTab, select **New**.
10. In the **To quantity** field, enter the maximum quantity of the range, such as **1000000**.
11. Select **Save**.
12. On the **Location Directives Actions** FastTab, select **New**.
13. In the **Name** field, enter a name, such as **Baydoor**.
14. Select **Save**.
15. You can use the standard query facility to limit put locations to one or more specific locations. Select **Edit query**, and select **51** as the criterion for the **Warehouse** field in the **Locations** table.

Cross-dock finished goods to the outbound location

To cross-dock the quantity of finished goods to the outbound location of the associated sales order, follow these steps.

1. Go to **Sales and marketing > Sales orders > All sales orders**.
2. Select **New**.
3. For the sales order header, select customer account **US-001** and a warehouse that is set up for cross-docking that uses the auto-release shipment feature.
4. Add a line for a finished product, and enter **10** as the quantity.
5. In the **Sales order lines** section, select **Product and supply > Production order**.
6. In the **Create production order** dialog box, review the default values, and then select **Create**. A new production order is created and linked to the sales order (that is, it's reserved and marked).
7. Optional: Change the value of the **Quantity** field so that it's more than the value that is required to fulfill the sales order. When the production quantity is reported as finished, the system will create cross-docking work for the marked quantity and put-away work for the remaining quantity, according to the regular procedure for handling the put-away of finished goods.

As was mentioned earlier, a marking must exist between the sales order and the production order. Otherwise, the cross-docking won't work. A marking can be created in the multiple ways:

- The system can automatically create the marking in the following situations:
 - The production order is manually created directly from the sales order line (see step 6).
 - Planned production orders are firmed, and the **Update marking** field is set to **Standard**.
- The user can manually create the marking by opening the **Marking** page from the demand order line.

NOTE

A marking can't be manually created for items that are set up to use standard and weighted average as inventory models.

8. On the **Production order** page, on the Action Pane, on the **Production order** tab, in the **Process** group, select **Estimate**, and then select **OK**. The order is estimated, and the raw material quantity is

reserved for the production.

9. On the Action Pane, on the **Production order** tab, in the **Process** group, select **Release**, and then select **OK**. Warehouse pick work is created for the raw materials.
10. Open and review the work. On the Action Pane, on the **Warehouse** tab, in the **General** group, select **Work details**. Make a note of the work ID.
11. Sign in to the warehouse app to run work in warehouse 51.
12. Go to **Production > Production pick**.
13. Enter the work ID to start and complete the raw material picking.

After the work is reported as finished, the quantity of raw materials is available in the production input location (**005** in USMF demo data), and execution of the production order can start.

14. On the **Production order** page, on the Action Pane, on the **Production order** tab, in the **Process** group, select **Start**, and then select **OK**.
15. In the app, go to **Production > RAF and put away**.
16. In the **Prod ID** field, enter the production order number and other mandatory details, and then select **OK**.

Notice that the following events occur:

- The release to a warehouse is triggered for the linked sales order.
- Based on the release, shipment and cross-docking work is created. This work instructs the warehouse operator to pick the quantities that are required to fulfill the sales order line and put them in the outbound location that specified in the cross-docking location directive.
- If the production order quantity is more than the quantity that is required by the sales order, regular put-away work is created. This work instructs the warehouse operator to pick the quantity of finished goods that remains after cross-docking and move it to regular storage, according to the location directive.

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Planned cross-docking

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This topic describes advanced planned cross-docking. Cross-docking is a warehouse process where the inventory quantity that is required for an order is directed straight from receipt or creation to the correct outbound dock or staging area. All remaining inventory from the inbound source is directed to the correct storage location through the regular put-away process.

Cross-docking lets workers skip inbound put-away and outbound picking of inventory that is already marked for an outbound order. Therefore, the number of times that inventory is touched is minimized, where possible. Additionally, because there is less interaction with the system, time and space savings on the warehouse shop floor are increased.

Before cross-docking can be run, the user must configure a new cross-docking template, where the supply source and other sets of requirements for cross-docking are specified. As the outbound order is created, the line must be marked against an inbound order that contains the same item.

At the time of inbound order receiving, the cross-docking setup automatically identifies the need for cross-docking and creates the movement work for the required quantity, based on the setup of the location directive.

NOTE

Inventory transactions are **not** unregistered when crossing-dock work is canceled, even if the setting for this capability is turned on in Warehouse management parameters.

Turn on the Planned cross docking feature

Before you can use advanced planned cross-docking, the feature must be turned on in your system. Admins can use the [Feature management](#) workspace to check the status of the feature and turn it on if it's required. There, the feature is listed in the following way:

- **Module:** *Warehouse management*
- **Feature name:** *Planned cross docking*

Setup

Regenerate load posting methods

Planned cross-docking is implemented as a load posting method. After you turn on the feature, you must regenerate the methods.

1. Go to **Warehouse management > Setup > Load posting methods**.
2. On the Action Pane, select **Regenerate methods**.

When regeneration is completed, you should see a method that has a **Method name** value of *planCrossDocking*.

3. Close the page.

Create a cross-docking template

1. Go to **Warehouse management > Setup > Work > Cross docking templates**.

2. On the Action Pane, select **New** to create a template.

3. In the header, set the following values:

- **Sequence:** *1*

This field defines the order that templates are evaluated in.

- **Cross docking template ID:** *51*
- **Description:** *Warehouse 51*
- **Demand release policy:** *Before supply receipt*
- **Warehouse:** *51*

4. The setup on the **Planning** FastTab controls how the template works. Set the following values:

- **Demand requirements:** *None*

This field defines the requirements of the demand inventory. If the demand must be linked to the supply before release, select *Marking*. If the demand must be order-reserved against the supply before release, select *Order reservation*.

- **Locating type:** *Shipment locations*

This field defines whether the cross-docking work should use the staging/load locations from the shipment, or whether it should use location directives to find its own staging/load locations.

- **Work template:** Leave this field blank.

This field defines the work template that should be used when cross-docking work is created.

- **Revalidate on supply receipt:** *No*

This option defines whether the supply should be revalidated during receipt. If this option is set to *Yes*, both the maximum time window and the expiration days range are checked.

- **Validate time window:** *Yes*

This option defines whether the maximum time window should be evaluated when a supply source is selected. If this option is set to *Yes*, the fields that are related to the maximum and minimum time windows become available.

- **Maximum time window:** *5*

This field defines the maximum period that is allowed between supply arrival and demand departure.

- **Maximum time window unit:** *Days*

- **Minimum time window:** *0*

This field defines the minimum period that is allowed between supply arrival and demand departure.

- **Minimum time window unit:** *Days*

- **Expiration days range:** *0*

First expiry first out (FEFO) criteria: This field defines the maximum number of days between the expiration date of the first-expiring batch that is currently in the warehouse and the batch that is being received.

5. On the **Supply sources** FastTab, you specify the types of supply that are valid for this template. Select **New**, and then set the following values:

- **Sequence number:** 1
- **Supply source:** *Purchase order*

Create a work class

1. Go to **Warehouse management > Setup > Work > Work classes**.

2. On the Action Pane, select **New** to create a work class.

3. Set the following values:

- **Work class ID:** *CrossDock*
- **Description:** *Cross Dock*
- **Work order type:** *Cross docking*

Create a work template

1. Go to **Warehouse management > Setup > Work > Work templates**.

2. Set the **Work order type** field to *Cross docking*.

3. On the Action Pane, select **New** to add a line to the **Overview** tab.

4. On the new line, set the following values:

- **Sequence number:** 1
- **Work template:** *51 Cross Dock*
- **Work template description:** *51 Cross Dock*

5. Select **Save** to make the **Work Template Details** FastTab available.

6. On the **Work Template Details** FastTab, select **New** to add a line to the grid.

7. On the new line, set the following values:

- **Work type:** *Pick*
- **Work class ID:** *CrossDock*

8. Select **New** to add another line, and set the following values on it:

- **Work type:** *Put*
- **Work class ID:** *CrossDock*

9. Select **Save**, and confirm that the **Valid** check box is selected for the *51 Cross Dock* template.

NOTE

The work class IDs for the *Pick* and *Put* work types must be the same.

Create location directives

1. Go to **Warehouse management > Setup > Location directives**.

2. In the left pane, set the **Work order type** field to *Cross docking*.

3. On the Action Pane, select **New**, and set the following values:

- **Sequence number:** 1
- **Name:** *51 Cross Dock Put*
- **Work type:** *Put*

- **Site:** 5
 - **Warehouse:** 51
4. Select **Save** to make the **Lines** FastTab available.
 5. On the **Lines** FastTab, select **New** to add a line to the grid.
 6. On the new line, set the following values:
 - **From quantity:** 1
 - **To quantity:** 1,000,000
 7. Select **Save** to make the **Location Directive Actions** FastTab available.
 8. On the **Location Directive Actions** FastTab, select **New** to add a line to the grid.
 9. On the new line, set the following values:
 - **Name:** *Baydoor*
 - **Fixed location usage:** *Fixed and non-fixed locations*
 10. Select **Save** to make the **Edit query** button on the **Location Directive Actions** toolbar available.
 11. Select **Edit query** to open the query editor.
 12. On the **Range** tab, make sure that the following two lines are configured:
 - Line 1:
 - **Table:** *Locations*
 - **Derived Table:** *Locations*
 - **Field:** *Warehouse*
 - **Criteria:** 51
 - Line 2:
 - **Table:** *Locations*
 - **Derived Table:** *Locations*
 - **Field:** *Location*
 - **Criteria:** *Baydoor*
 13. Select **OK** to close the query editor.

Create a mobile device menu item

1. Go to **Warehouse management > Setup > Mobile device > Mobile device menu items**.
2. In the list of menu items in the left pane, select **Purchase Put-away**.
3. Select **Edit**.
4. On the **Work classes** FastTab, select **New** to add a line to the grid.
5. On the new line, set the following values:
 - **Work class ID:** *CrossDock*
 - **Work order type:** *Cross docking*
6. Select **Save**.

Scenario

Create a purchase order

Follow these steps to create a purchase order as a source of supply.

1. Go to **Procurement and sourcing > Purchase orders > All purchase orders**.
2. On the Action Pane, select **New**.
3. In the **Create purchase order** dialog box, set the following values:
 - **Vendor account:** *104*
 - **Warehouse:** *51*
4. Select **OK**, and make a note of the order number.
5. A new line is added to the **Purchase order lines** FastTab. On this line, set the following values:
 - **Item number:** *A0001*
 - **Quantity:** *5*

Create a sales order

Follow these steps to create a sales order as a source of demand.

1. Go to **Sales and marketing > Sales orders > All sales orders**.
2. On the Action Pane, select **New**.
3. In the **Create sales order** dialog box, set the following values:
 - **Customer account:** *US-002*
 - **Warehouse:** *51*
4. Select **OK**.
5. A new line is added to the **Sales order lines** FastTab. On this line, set the following values:
 - **Item number:** *A0001*
 - **Quantity:** *3*

Create planned cross-docking

Follow these steps to create the planned cross-docking from the sales order.

1. In the **Sales order details** page for the sales order that you just created, on the Action Pane, on the **Warehouse** tab, in the **Actions** group, select **Release to warehouse**.

The release to warehouse action creates a shipment and load line for the sales order line, and tries to allocate inventory.

You receive an informational message. You also receive the following warning message: "No work was created for wave XXXX. See the work creation history log for details." This behavior is expected, because there is no inventory in the warehouse.

2. On the **Sales order lines** FastTab, on the **Warehouse** menu, select **Shipment details**.

The **Shipment details** page appears and shows the shipment that was created for the sales order.

3. On the **Load lines** FastTab, notice that the **Planned cross docking quantity** field is set to *3*. Because no inventory was available in the warehouse, but a valid supply source will arrive within the time window that is defined in the cross-docking template, the cross-docking quantity was created.
4. On the **Load lines** FastTab, select **Planned cross docking** to view the details of the cross-docking that was created.

Process the cross-docking

Purchase order receiving on the warehousing mobile app

The system will receive the quantity of 5 from the purchase order into the receiving location and create two pieces of work.

The first work ID that is created has a **Work order type** value of *Cross docking* and is linked to the sales order. It has a quantity of 3 and is directed to the final shipping location so that it can be shipped out immediately.

The second work ID that is created has a **Work order type** value of *Purchase orders* and is linked to the purchase order. It has the remaining quantity of 2 that wasn't cross-docked and is directed to put-away to storage.

1. Sign in to the mobile device as a user in warehouse 51.
2. Go to **Inbound > Purchase Receive**.
3. In the **PONum** field, enter your purchase order number.
4. In the **Qty** field, enter 5.
5. Select **OK**.
6. On the next page, set the **Item** field to *A0001*.
7. Select **OK**.
8. On the next page, confirm the **PONum**, **Item**, and **Qty** values by selecting **OK**.

You receive a "Work Completed" message.

9. Select **Cancel** to exit.

Put-away to cross-docking and bulk

Currently, both work IDs have the same target license plate. To complete the next steps, you must get the work ID and the target license plate ID. You can get this information from the work details for the purchase order line and the sales order line. Alternately, you can go to **Warehouse management > Work > Work details** and filter for work where the **Warehouse** value is 51.

1. On the mobile device, go to **Inbound > Purchase put-away**, and enter the target license plate from the work.
2. In the **ID** field, enter the target license plate ID from the work details.

The cross-docking pick page shows the picking location (*RECV*), target license plate (*license plate*), item (*A0001*), and quantity (*3*).

3. Select **OK**.
4. In the **Target LP** field, enter a target license plate for the license plate ID that should be put (cross-docked) to the shipping location. You can select any license plate ID of your choice.
5. Select **OK**.
6. On the next page, in the **ID** field, enter the target license plate ID.
7. Select **OK**.
8. Confirm the work for picking the remaining quantity of 2, and then select **OK**.
9. On the next page, select **Done** to end the picking process and begin the put-away process.

The mobile app presents you with the location and license plate to put the item to.

10. Confirm the bulk storage **Put** by selecting **OK**.

11. On the next page, confirm the cross-docking **Put** by selecting **OK**.

You receive a "Work Completed" message.

12. Select **Cancel** to exit.

The following illustration shows how the completed cross-docking work might appear in Microsoft Dynamics 365 Supply Chain Management.

The screenshot shows the 'Work' interface in Microsoft Dynamics 365 Supply Chain Management. It is divided into two main sections: 'Overview' and 'Lines'.

Overview Tab:

Work priority	Lock...	Work ID ↑	Work status	Site	War...	W...	Target license plate ID	Work order type	Order number	Load ID	Ship
50		USMF-000077	Closed	5	51		CD-001	Cross docking	000876	USMF-000071	USN
50		USMF-000078	Closed	5	51	<input type="checkbox"/>	000USMF-0000000086	Purchase orders	00000266	USMF-000069	USN

Lines Tab:

Work status	Work type	Location	Item number	Product name	Work quantity	Remaining q...	Unit	U
Closed	Pick	RECV	A0001	HDMI 6' Cables	2.00	0.00	pcs	5
Closed	Put	BULK-002	A0001	HDMI 6' Cables	2.00	0.00	pcs	5

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Reason codes for inventory counting

2/18/2021 • 5 minutes to read • [Edit Online](#)

Reason codes let you analyze the results of a counting process and any discrepancies that occur during that process. You can specify the reason for doing the count, such as a broken pallet or a stock adjustment that is based on inventory samples.

Recommendation

Before you set up the system, we recommend that you define a strategy for working with reason codes. For example, try to answer the following questions:

- Should reason codes be mandatory on warehouses?
- Should reason codes be mandatory or optional on some items?
- How many reason codes do you require?
- How should users of barcode scanners use reason codes? Should the reason codes be preselected, mandatory, or not editable?
- Do warehouse workers require different reason code behavior on mobile scanners? If the answer is yes, you can create more menu items and assign them to different people.

Where reason codes apply

You can create multiple reason code policies, and each reason code policy can have two counting reason code policies. The counting reason code policies can be used at the warehouse level or the item level.

Set up reason code policies

1. Select **Inventory management > Setup > Inventory > Counting reason code policies**, and create a new reason code policy.
2. In the **Counting reason code type** field, select either **Mandatory** or **Optional** to specify whether selection of a reason code should be an optional or mandatory action in one of the following counting journals:
 - Cycle Count (mobile device)
 - Spot Count (mobile device)
 - Threshold Count (mobile device)
 - Adjustment In (mobile device)
 - Adjustment Out (mobile device)
 - Counting Journal (rich client)

You can also set up reason codes for individual warehouses and for products. The reason code setup for products can disregard the setup for warehouses.

Mandatory reason codes

If the **Mandatory** parameter is set in the configuration of reason codes for warehouses or items, the counting journal can't be completed and closed until a reason code is provided.

Set up reason codes for warehouses

1. Select **Inventory Management > Setup > Inventory breakdown > Warehouses**.
2. On the **Warehouse** tab, in the **Counting reason code policy** field, select one of the following options:
 - **Blank** – The parameter that is set up for the item is used to determine whether counting journals are mandatory for the product.
 - **Mandatory** – A reason code is always required on counting journals for the warehouse.
 - **Optional** – A reason code isn't required on counting journals for the warehouse.

Set up reason codes for products

1. Select **Product information management > Products > Released products**.
2. On the **Product** tab, select **Counting reason code policy**, and then select one of the following options:
 - **Blank** – The parameter that is set up for the warehouse is used to determine whether counting journals are mandatory for the product.
 - **Mandatory** – A reason code is always required on counting journals for the product. This setting overrides any reason code setting at the warehouse level.
 - **Optional** – A reason code isn't required on counting journals for the product. This setting overrides any reason code setting at the warehouse level.

Use reason codes in counting journals

In a counting journal, you can add reason codes for counts of the following types:

- Cycle Count
- Spot Count
- Threshold Count
- Adjustment In
- Adjustment Out

Reason codes are added to the journal lines in counting journals of the **Counting journal** type.

1. Select **Inventory management > Journal entries > Item counting > Counting**.
2. In the line details of the counting journal, in the **Counting reason code** field, select an option.

View the counting history as it's recorded by reason codes

- Select **Inventory management > Inquiries and reports > Counting history**, and then, in the **Counting reason code** field, view the counting history that has been recorded through a reason code.

Use a reason code for a quantity adjustment

1. On the **On-hand inventory** page, select **Adjust quantity**. You can open the **On-hand inventory** page in several ways. For example, select **Inventory management > Inquiries and reports > On-hand inventory**.
2. Select **Adjust quantity**, and then, in the **Counting reason code** field, select a reason code.

Configure reason codes for mobile device menu items

You can configure reason codes for any type of count on a mobile device menu item. The configuration of the mobile device menu item includes the following information:

- Whether the reason code is shown to the mobile device worker during counting.
- The default reason code that is shown on a mobile device menu item.
- Whether the user can edit the reason code.

Set up reason codes on a mobile device

1. Select **Warehouse management > Setup > Mobile device > Mobile device menu items**.

2. On the **Cycle count** tab, select **Cycle counting**.
3. In the **Default counting reason code** field, set the default reason code that should be recorded when counting is done by using the mobile device menu item.
4. In the **Display counting reason code** field, select **Line** to show the reason code after each variance is recorded. Alternatively, select **Hide** if the reason code shouldn't be shown.
5. Set the **Edit counting reason code** option to either **Yes** or **No**. If you set this option to **Yes**, the worker can edit the reason code when it's shown on the mobile device during counting.

NOTE

The **Cycle counting** button can be enabled on any mobile device menu item where counting can be done. Example include the menu items for spot counts, user-directed work, and system-directed work.

Cycle count approvals

Before a count is approved, the user can change the reason code that is associated with the count. When the count is approved, the reason code is entered on the counting journal lines.

Modify cycle count approvals

1. Select **Warehouse management > Cycle counting > Cycle count work pending review**.
2. Select **Cycle counting**, and then, in the **Reason code** field, select a new reason code.

Modify the mobile device menu item for Adjustment in and Adjustment out

1. Select **Warehouse management > Setup > Mobile device > Mobile device menu items**, and then select **Adjustment in and out**.
2. Set the **Use existing work** option to **No**.
3. In the **Work creation process** field, select **Adjustment in**.

The following fields will be added to the mobile device menu item when **Adjustment in** or **Adjustment out** is selected during the work creation process:

- Default counting reason code
- Display counting reason code
- Edit counting reason code

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Inventory blocking

2/18/2021 • 3 minutes to read • [Edit Online](#)

This topic provides an overview of inventory blocking, which is part of the quality inspection process in Supply Chain Management. You can use inventory blocking to prevent items from being processed or consumed.

You can block inventory items in the following ways:

- Manually
- By creating a quality order
- By using a process that generates a quality order
- By using inventory status blocking

Blocking items manually

You can block a quantity of an item by creating a transaction on the **Inventory blocking** page. Only items that are available as on-hand inventory can be blocked manually. For manually blocked quantities, you must decide whether planning activities include expected receipts as an expected on-hand quantity. Expected receipts are blocked items that you expect to be available as on-hand inventory after inspection is completed. You can maintain the expected date. By default, the **Expected receipts** option is selected for items that are blocked through a quality order. You can cancel a manual block on a quantity by deleting the transaction on the **Inventory blocking** page.

Blocking items by creating a quality order

You can specify items that must be inspected by creating a quality order on the **Quality orders** page. When you create a quality order, the quantity that you specify for an item is blocked. The sampling plan that is associated with a quality order controls only the quantity of items that must be inspected, not the quantity that is blocked. The quantity that is entered on the quality order is the quantity that is blocked, regardless of the quantity that the sampling plan specifies should be sent for inspection.

NOTE

Using both the batch expiry date and blocking inventory status features is not supported by master planning. This could result in double exclusion of on-hand inventory, which can occur during master planning. We recommend that you rely on batch disposition codes, instead of inventory status, for blocking expired batches.

Blocking items by using a process that generates a quality order

If a quality process specifies that an item must be inspected, a quantity of the item is blocked automatically. Therefore, when a quality order is generated automatically, the item sampling plan that is associated with the quality order controls the both quantity of items that is blocked and the quantity that must be inspected. If the **Full blocking** option on the **Item sampling** page is selected, the full quantity of, for example, a purchase order line is blocked during inspection, regardless of the item sampling quantity.

Example

In the following example, a quality order is generated when a purchase order packing slip is posted. On the **Quality associations** page, you specified that posting of a purchase order packing slip is the process that activates a quality order.

SETUP	USER ACTION	RESULT
<p>A quality association specifies that a quality order must be generated when a purchase order packing slip is posted. The item sampling setup of the quality order specifies that 10 percent of the quantity on the purchase order line must be inspected. Furthermore, because the Full blocking option selected in the item sampling setup, the full quantity of the purchase order line must be blocked during inspection, regardless of the quantity that is sent for inspection.</p>	<p>The packing slip is posted.</p>	<p>A quality order is generated. Ten percent of the purchase order quantity for the item is sent to inspection. The full quantity of the purchase order line is blocked.</p>

Blocking items by using inventory status blocking

You can specify which inventory statuses are blocking statuses by using the **Inventory blocking** parameter on the **Inventory statuses** page. You can't use inventory statuses as blocking statuses for production orders, sales orders, transfer orders, outbound transactions, or project integrations. For outbound work, use items that have an available inventory status. If items have a status of **Broken**, and master planning is run on those items, the items are considered missing, and inventory is automatically replenished.

Additional resources

[Create and maintain an inventory blocking](#)

[Quality management processes](#)

[Inspect the quality of goods](#)

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Cycle counting

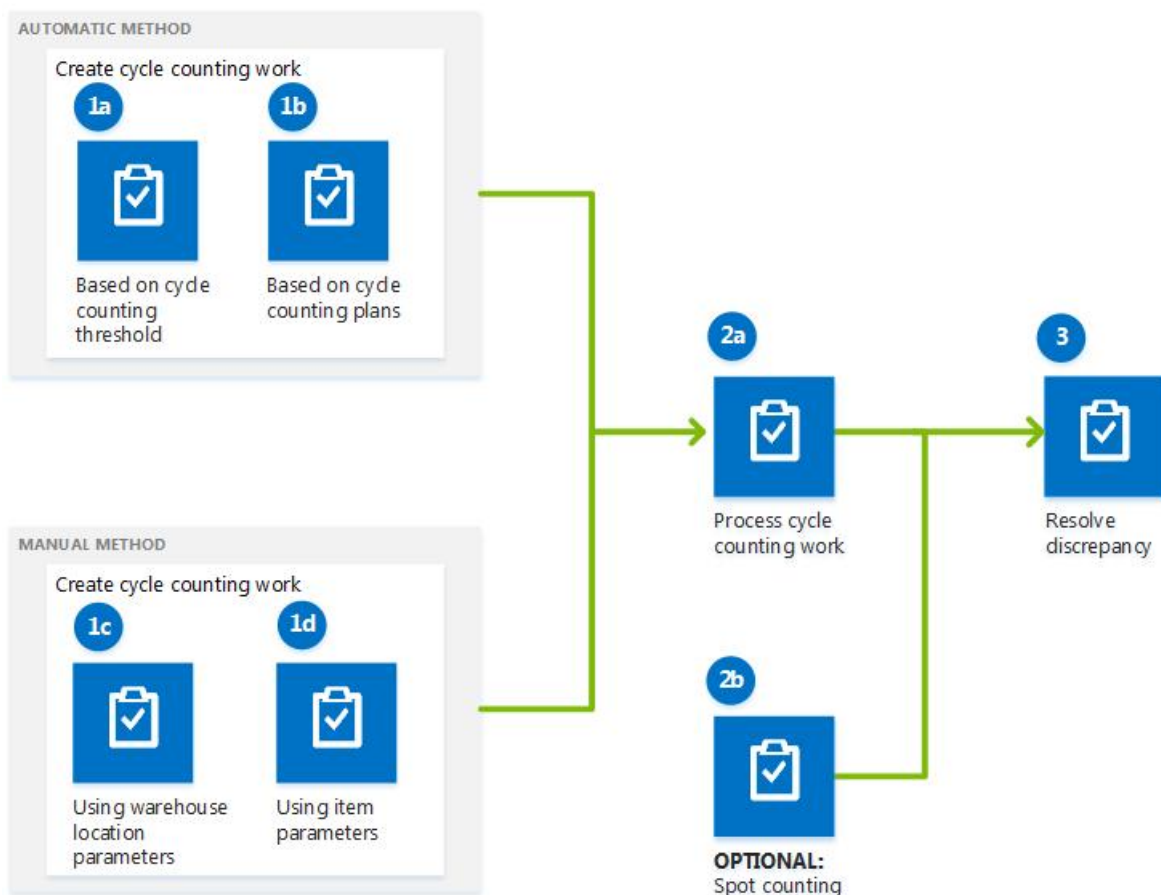
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This article describes how you can use cycle counting with the warehousing solution that is available in Warehouse management. This article doesn't apply to the warehousing solution that's available in Inventory management.

Cycle counting is a warehouse process that you can use to audit on-hand inventory items. The cycle counting process can be described in three steps:

1. **Create cycle counting work** – Cycle counting work can be created automatically, based on threshold parameters for items or by using a cycle counting plan. Alternatively, you can manually create cycle counting work by using the item or warehouse parameters on the **Cycle count work by item** page or the **Cycle count work by location** page.
2. **Process the cycle count** – After cycle counting work is created, you do the cycle counting work by counting items in a warehouse location and then using a mobile device to enter the result in Dynamics 365 Supply Chain Management. Alternatively, you can count items in a warehouse location without creating cycle counting work. This process is referred to as *spot cycle counting*.
3. **Resolve differences in the counted value** – After a cycle count, any items that have differences in the counted value will have a work status of **Pending review** on the **All work** page. You can resolve these differences on the **Cycle count work pending review** page.

The following illustration shows the cycle counting process.



Cycle counting prerequisites

The following table shows the prerequisites that must be in place before you can use cycle counting.

PREREQUISITE	DESCRIPTION
Item	The item must be enabled for warehouse management processes.
Warehouse	The warehouse must be enabled for warehouse management processes. To enable the warehouse for warehouse management processes, on the Warehouses page, select the warehouse, and then select the Use warehouse management processes option. To enable workers to move pallets during a cycle count, on the Warehouse management FastTab, select the Allow pallet moves during cycle counting option.
Work pools	Optional: Create a work pool to segregate the warehouse work, based on the type of work (in this case, cycle counting work).
Locations	Enable cycle counting for locations. To enable cycle counting for a warehouse location, on the Location profiles page, select the Allow cycle counting option.
Warehouse management parameters	Set up parameters for cycle counting. On the Warehouse management parameters page, specify the default adjustment type code, work class ID, and work priority for cycle counting.
Mobile device	<ul style="list-style-type: none"> • Create a menu item for one of the following methods on the Mobile device menu items page: <ul style="list-style-type: none"> ◦ User directed cycle counting ◦ System directed cycle counting ◦ Cycle count grouping ◦ Spot cycle counting • Set up a menu for the mobile device. • Create a work user account, and assign a mobile device menu to the work user ID.
Related setup task	Set up a cycle counting plan for a warehouse location.

Automatically create cycle counting work

There are two ways to schedule recurring creation of cycle counting work: set up cycle counting thresholds or set up cycle counting plans.

- A cycle counting threshold indicates the quantity or percentage limit of inventory items. Cycle counting work is automatically created when the threshold limit is reached.
- A cycle counting plan creates cycle counting work either immediately or periodically through a batch job. When cycle counting work is created, the counting work line includes information about the location to count. The on-hand inventory that is associated with this location isn't blocked, and is therefore available for reservation and outbound processing, even though open counting work exists.

Create cycle counting work, based on threshold parameters for items

Cycle counting work can be created when the number of items falls below a specific threshold value in a location. For example, there are 60 items in a location that has a cycle counting threshold of 40. During a sales

order transaction, 25 items are picked from the location and put in a staging location. Because the new item count, 35, is less than the threshold quantity, cycle counting work is automatically created for the location.

Schedule cycle counting work

You can schedule cycle counting plans to create cycle counting work immediately or periodically. By setting up cycle counting plans, you can control the work pool that cycle counting work is created for, the maximum number of cycle counts that are created for items in different locations, and the number of days before a warehouse location is counted again. For example, an item is available in three locations in the warehouse, and the maximum number of cycle counts is set to 2. In this case, when you run the cycle counting plan, two cycle counts are created for the two locations where the item is present. As another example, you set the number of days between cycle counts to 5. In this case, cycle counting work is created every five days. However, if cycle counting work is processed on day 3, the next cycle counting work will be created five days after the last cycle counting was processed, on day 8.

Create cycle counting work manually

To create cycle counting work manually, you can use the **Cycle count work by item** or **Cycle count work by location** page. You can specify the maximum number of cycle counts to create. For example, if the warehouse manager specifies a value of 5, cycle counting work is created for five locations, even if the item is present in 10 locations. You can also select a work pool ID to assign the cycle counting work IDs that are created to. When a work pool ID is processed for cycle counting, the cycle counting work IDs that are assigned to the work pool are processed as a group.

Perform a cycle count by using a mobile device

There are several methods for processing cycle counting work by using Supply Chain Management on a mobile device:

- **User directed** – The worker can specify a cycle counting work ID that has a status of **Open**.
- **System directed** – Supply Chain Management assigns a cycle counting work ID to the worker.
- **Cycle count grouping** – The worker can group cycle counting work IDs that are specific to a particular location, zone, or work pool.
- **Spot cycle counting** – The worker can count items in a warehouse location at any time, without creating cycle counting work. To perform spot cycle counting in a location, the worker enters the location ID.

The following example shows how you can perform spot cycle counting by using a mobile device. The instructions that the worker sees on the device vary, depending on the setup of the menu item for spot cycle counting.

1. On the mobile device, select the menu item to process spot cycle counting work.
2. Register the location to perform spot cycle counting for.
3. Register and confirm the item number and the counted item quantity. **Note:** The status of the cycle counting work is updated to either **Pending review** or **Closed** on the **All work** page, depending on the parameters that are set on the **Worker** page.
4. Optional: Repeat step 3 for the remaining items in the location, and confirm that no additional items are available for counting.

Resolve cycle counting differences

A cycle counting difference occurs in the following scenarios if the **Is a cycle count supervisor** option is set to **No** for a work user ID:

- The counted value isn't within the deviation limits that are specified in the **Maximum percentage limit** or **Maximum quantity limit** fields on the **Work users** page. For example, the on-hand inventory quantity in a

location is 50, and the deviation limit for the work user is 10. If the work user enters a value that isn't between 40 and 60, a difference occurs.

- The counted value differs from the on-hand inventory quantity, and no deviation limits are set.

You can adjust differences in the counted value and then accept the counted value on the **Cycle count pending review** page. You can verify the modified count of the item quantity on the **On hand by location** page. The counted value is rejected if the difference can't be approved.

Additional resources

[Set up mobile devices for warehouse work](#)

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Define cycle counting

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Cycle counting is a warehouse process that you can use to audit on-hand inventory items. This task recording shows how to set up the default counting work priority, enable a mobile device menu item to process both picking and counting operations, enable a counting threshold trigger when a location becomes empty, and enable a cycle counting plan for a specific item in a specific warehouse. Typically, these tasks are performed by a warehouse manager. You can go through this procedure in the USMF demo data company or in your own data.

Set the priority of counting work

1. In the **Navigation pane**, go to **Modules > Warehouse management > Setup > Warehouse management parameters**.
2. Click the **Cycle counting** tab.
3. In the **Default cycle count work priority** field, enter a number. This step changes the priority of cycle counting work compared to other types of work in the warehouse. By entering a number that is lower than the number for other types of work, you raise the priority of the cycle counting work.
4. Click **Save**.
5. Close the page.

Enable the mobile device

1. In the **Navigation pane**, go to **Modules > Warehouse management > Setup > Mobile device > Mobile device menu items**.
2. Click **New**.
3. In the **Menu item name** field, type a value.
4. In the **Title** field, type a value.
5. In the **Mode** field, select 'Work'.
6. Set the **Use existing work** option to Yes. When you set this option to Yes, the system will look for existing work when the mobile device menu item is used.
7. In the **Directed by** field, select 'System directed'. When "System directed" is selected, the warehouse worker will be directed to open work that is in defined work classes. (We will create these work classes next.)
8. Expand the **Work classes** fastTab. Next, we will create two work classes that will be used with this mobile device menu item. When the menu item is used, these work classes will be queried, and the work that has the highest priority will be shown to the user.
9. Click **New**.
10. In the **Work class ID** field, select a value.
11. Click **New**.
12. In the **Work class ID** field, select a value.
13. In the **Action Pane**, click **Save**.
14. Close the page.
15. In the **Navigation pane**, go to **Modules > Warehouse management > Setup > Mobile device > Mobile device menu**.
16. In the list, find and select the desired record.
17. In the tree, select 'the menu item that you just created'.
18. Click **Edit**.

19. Click the arrow to add the menu item to the menu.
20. Click **Save**.

Create a counting threshold

1. In the **Navigation pane**, go to **Modules > Warehouse management > Setup > Cycle counting > Cycle count thresholds**.
2. Click **New**.
3. In the **Cycle counting threshold ID** field, type a value.
4. Set the **Process cycle counting immediately** option to **Yes**.
5. In the **Description** field, type a value.
6. Click **Save**.
7. Click **Select locations**.
8. In the list, mark the selected row.
9. In the **Criteria** field, select a value.
10. Click **OK**.
11. Close the page.

Create a cycle count plan

1. In the **Navigation pane**, go to **Modules > Warehouse management > Setup > Cycle counting > Cycle count plans**.
2. Click **New**.
3. In the **Cycle counting plan ID** field, type a value.
4. In the **Description** field, type a value.
5. In the **Maximum number of cycle counts** field, enter a number.
6. Click **Save**.
7. Click **Select locations**.
8. In the list, mark the selected row.
9. In the **Criteria** field, select a value.
10. Click **OK**.
11. In the **Days between cycle counting** field, enter a number. For example, if the **Days between cycle counting** field is set to 5, cycle counting work will be created every five days. However, if cycle counting work is processed on day three, the next cycle counting work will be created five days after the last cycle counting was processed, on day 8.
12. Click **Save**.
13. Click **New**.
14. In the **Sequence number** field, enter a number. The sort is from the smallest number to the largest number. The value must be more than 0 (zero).
15. In the list, mark the selected row.
16. In the **Description** field, type a value.
17. Click **Save**.
18. Click **Define product** query.
19. In the list, mark the selected row.
20. In the **Criteria** field, enter or select a value.
21. Click **OK**.
22. Close the page.

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Partial location cycle counting

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Cycle count plans guide the actual counting operations. You can request that only specific products and product variants be counted instead of all on-hand inventory in a location.

By using cycle count plans to create counting work, you can guide the actual counting operations. You can request that only specific products and product variants be counted instead of all on-hand inventory in a location. By filtering on specific products, the warehouse manager can reduce review overhead, avoid consolidation mistakes, and save time.

How to configure partial location cycle counting

When you use the warehouse work process for counting operations, a work header is created for each location. When you define the cycle count plan, you can use the **Select locations** query to limit the cycle counting work that is created. When you select products for the cycle count plan, you can select both product and product variant queries to refine what is counted.

You can associate a **work template** with a cycle count plan to define how the cycle count work should be created. The work template for counting operations is directly referenced from the cycle count plan.

When you define the work template details, you can use the **Work line breaks** option to specify whether the counting work lines must be grouped by item number or product variant number. This setup is required if you want to count on-hand inventory only for specific products in a location. The cycle counting work lines that are created will have the level of information that you define here, and the guided counting operation will be handled based on this level.

If you associate cycle count plans with work templates by using the **Work lines breaks** option, the **Partial cycle count** field is selected for the cycle counting work that is created, and multiple cycle counting work lines will be created based on the definition of the work template.

Before partial cycle count work can be processed, you must, at a minimum, select **Display item number** for the mobile device menu item as part of the cycle counting setup. The warehouse operator will be asked to record only counting information that is related to the counting lines (item numbers and product dimensions). All other on-hand inventory will be ignored for this counting process.

For the partial cycle count process, the **Last cycle count** date/time won't be updated for the location, even though all the items on hand at a given location are counted. The partial cycle count doesn't consider the parameter **Days between cycle counting** on the **Cycle count plans** page. Partial cycle count doesn't support simultaneous counting of multiple items at the same location. Partial cycle count functionality may result in the same location being counted multiple times for an item when **Process cycle counting plan** is run. To avoid that scenario, specify filters in the **Select locations** field.

NOTE

The warehouse app doesn't provide the **Add LP or item** button when you use the partial cycle count process.

Example

For this example, only item number A0001 must be counted in warehouse 61.

1. A new work template for cycle counting is created. The **Work line breaks** option is used to group counting work lines by item number. Therefore, the cycle counting work that is created will have lines per item number. You can also group the lines by product variant number.
2. A new cycle counting plan is created that references the newly created work template. The cycle counting plan includes all locations in warehouse 61 (**Select locations** query) that hold inventory for item number A0001. The selection of specific products is defined in the **Cycle count product selections** section.
3. You can select products for cycle counting plans by setting the **Empty locations** field to **Exclude empty**. When the cycle counting plan is processed, partial cycle count work for item number A0001 is created. The actual counting process can be performed by using a mobile device menu item for guided cycle counting.

Additional resources

[Cycle counting](#)

NOTE

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Define partial location cycle counting process

2/18/2021 • 2 minutes to read • [Edit Online](#)

When you use cycle count plans to create counting work, you can guide the actual counting operations by requesting that only specific products and product variants be counted instead of all on-hand inventory at the location. By filtering on specific products, the warehouse manager can reduce review overhead, help prevent consolidation mistakes, and save time. Typically, a warehouse manager performs the setup tasks. You can go through this procedure in the USMF demo data company or in your own data.

Create a cycle counting work template

1. Go to Warehouse management > Setup > Work > Work templates.
2. In the Work order type field, select 'Cycle counting'.
3. Click New.
4. In the Sequence number field, enter a number.
 - The sort order is from the smallest number to the largest number. The value must be more than 0 (zero).
5. In the list, mark the selected row.
6. In the Work template field, type a value.
7. In the Work template description field, type a value.
8. In the Work pool ID field, enter or select a value.
9. In the Work priority field, enter a number.
10. Click Save.
11. Click New.
12. In the list, mark the selected row.
13. In the Work type field, select 'Counting'.
14. In the Work class ID field, enter or select a value.
15. Click Save.
16. Click Work line breaks.
17. Click New.
18. In the Sequence number field, enter a number.
 - The sort order is from the smallest number to the largest number. The value must be more than 0 (zero).
19. Click Save.
20. Close the page.
21. Close the page.

Create a cycle counting plan

1. Go to Warehouse management > Setup > Cycle counting > Cycle count plans.
2. Click New.
3. In the Cycle counting plan ID field, type a value.
4. In the Description field, type a value.
5. In the Maximum number of cycle counts field, enter a number.
6. In the Work template field, enter or select a value.

7. Click New.
8. In the Sequence number field, enter a number.
 - The sort order is from the smallest number to the largest number. The value must be more than 0 (zero).
9. In the Description field, type a value.
10. Click Save.
11. Click Define product query.
12. In the list, mark the selected row.
13. In the Criteria field, enter or select a value.
14. Click OK.
15. Close the page.

NOTE

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Warehouse management on-hand entries cleanup job

2/18/2021 • 4 minutes to read • [Edit Online](#)

The performance of queries that are used to calculate on-hand inventory is affected by the number of records in the tables that are involved. One way to help improve the performance is to reduce the number of records that the database must consider.

This topic describes the on-hand entries cleanup job, which deletes unneeded records in the `InventSum` and `WHSInventReserve` tables. These tables store on-hand information for items that are enabled for warehouse management processing. (These items are referred to as WHS items.) Deletion of these records can significantly improve the performance of on-hand calculations.

What the cleanup job does

The on-hand entries cleanup job deletes any records in the `WHSInventReserve` and `InventSum` tables where all the field values are 0 (zero). These records can be deleted because they don't contribute to the on-hand information. The job deletes only records that are below the `Location` level.

If negative physical inventory is allowed, the cleanup job might not be able to delete all the relevant entries. The reason for this limitation is that the job must allow for a special scenario where a license plate has multiple serial numbers, and one of those serial numbers has become negative. For example, the system will have zero on hand at the license plate level when a license plate has +1 pcs of serial number 1 and -1 pcs of serial number 2. For this special scenario, the job does a breadth-first deletion, where it tries to delete from lower levels first.

Schedule and configure the cleanup job

The on-hand entries cleanup job is available at **Inventory management > Periodic tasks > Clean up > Warehouse management on-hand entries cleanup**. Use the standard job settings to control the scope and schedule for running the job. In addition, the following settings are provided:

- **Delete if not updated for this many days** – Enter the minimum number of days that the job should wait before it deletes an on-hand entry that has dropped to zero quantity. Use this setting to help reduce the risk of deleting on-hand entries that are still being used. If you want cleanup to occur as soon as possible, either enter 0 (zero) or leave the field blank.
- **Maximum execution time (hours)** – Enter the maximum execution time of the cleanup job, in hours. If the job isn't completed before this time passes, it will save the work that it has completed so far and then close itself. This capability is especially relevant for implementations that have high inventory use. In these cases, you should schedule the job to run at times when the system load is as light as possible. If you want the batch job to continue to run until it's completed, either enter 0 (zero) or leave the field blank. This setting is available only if the related feature has been [turned on in your system](#).

Although you can run the job during regular business hours, we recommend that you run it outside working hours. In this way, you help prevent conflicts that can occur if a user is working with a record that is also being cleaned up.

If the job tries to delete a record for an item while that record is being used by another user, a deadlock error occurs for either the cleanup job or the user.

When the job runs, it has a commit size of 100. In other words, it will try to commit one time for every 100

deletions. However, because some deletions are set-based, there might be scenarios where more than 100 records can be deleted in the same transaction. Therefore, lock escalations can still sometimes occur.

Possible user impact

Users might be affected if the on-hand entries cleanup job deletes all the records for a given level (such as the license plate level). In this case, the functionality for seeing that inventory was previously available on-hand at a license plate might not work as expected because the relevant on-hand entries are no longer available. This can, for example, be experienced in the following situations:

- On the **On-hand list**, when the user deselects the condition **Quantity < > 0** or selects the condition **Closed transactions** in the **Dimensions display** settings.
- In a **Physical inventory by inventory dimension** report for past periods, when the user sets the **As of date** parameter.

However, the performance improvement that the cleanup job provides should make up for these small losses in functionality.

Make the Maximum execution time setting available

By default, the **Maximum execution time** setting isn't available. If you want to use it, you must use [feature management](#) to turn on the related feature in your system. In the **Feature management** workspace, the feature is listed in the following way:

- **Module:** *Warehouse management*
- **Feature name:** *Maximum execution time for the warehouse management on-hand entries cleanup job*

NOTE

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Inventory journals

2/18/2021 • 5 minutes to read • [Edit Online](#)

This topic describes how you can use inventory journals to post various types of physical inventory transactions.

The inventory journals in Supply Chain Management are used to post physical inventory transactions of various types, such as the posting of issues and receipts, inventory movements, the creation of bills of materials (BOMs), and the reconciliation of physical inventory. All these inventory journals are used in a similar way, but they are divided into different types.

Types of inventory journals

The following types of inventory journals are available:

- Movement
- Inventory adjustment
- Transfer
- BOM
- Item arrival
- Production input
- Counting
- Tag counting

Movement

When you use an inventory movement journal, you can add cost to an item when you add inventory, but you must manually allocate the additional cost to a particular general ledger account by specifying a general ledger offset account when you create the journal. This inventory journal type is useful if you want to overwrite the default posting accounts.

Inventory adjustment

When you use an inventory adjustment journal, you can add cost to an item when you add inventory. The additional cost is automatically posted to a specific general ledger account, based on the setup of the item group posting profile. Use this inventory journal type to update gains and losses to inventory quantities when the item should keep its default general ledger offset account. When you post an inventory adjustment journal, an inventory receipt or issue is posted, the inventory values are changed, and ledger transactions are created.

Transfer

You can use transfer journals to transfer items between stocking locations, batches, or product variants without associating any cost implications. For example, you can transfer items from one warehouse to another warehouse within the same company. When you use a transfer journal, you must specify both the "from" and "to" inventory dimensions (for example, for Site and Warehouse). The on-hand inventory for the defined inventory dimensions is changed accordingly. Inventory transfers reflect the immediate movement of material. In-transit inventory isn't tracked. If in-transit inventory must be tracked, you should use a transfer order instead. When you post a transfer journal, two inventory transactions are created for each journal line:

- An inventory issue at the "from" location.
- An inventory receipt at the "to" location.

BOM

When you report a BOM as finished, you can create a BOM journal. By using a BOM journal, you can post the

BOM directly. This posting generates an inventory receipt of the product, together with an associated BOM and an inventory issue of the products that are included in the BOM. This inventory journal type is useful in simple or high-volume production scenarios where routes aren't required.

Item arrival

You can use the item arrival journal to register the receipt of items (for example, from purchase orders). An item arrival journal can be created as part of arrival management from the **Arrival overview** page, or you can manually create a journal entry from the **Item arrival** page. If you enable the item arrival journal name to check for picking locations, Supply Chain Management looks for a location for received items and, if there is room, generates location destinations for the incoming items.

Production input

Production input journals work like the item arrival journals but are used for production orders.

Counting

Counting journals let you correct the current on-hand inventory that is registered for items or groups of items, and then post the actual physical count, so that you can make the adjustments that are required to reconcile the differences. You can associate counting policies with counting groups to help group items that have various characteristics, so that those items can be included in a counting journal. For example, you can set up counting groups to count items that have a specific frequency, or to count items when stock falls to a particular level. For information about how to define counting groups, see [Define inventory counting processes](#).

Tag counting

Tag counting journals are used to assign a numbered tag to a count lot. The tag should contain a tag number, item number, and item quantity. To ensure that a tag is used only one time, and that all tags are used, every item number should have a unique set of tags that has its own number sequence. Three status values can be set for each tag:

- **Used** – The item number is counted for this tag.
- **Voided** – The item number is voided for this tag.
- **Missing** – The item number is missing for this tag.

When you post a tag counting journal, a new counting journal is created, based on the tag counting journal lines. For more information about tag counting, see [Inventory tag counting](#).

Working with journals

A journal can be accessed by only one user at a time. If several users must access journals at the same time to create journal lines, those users must select journals that aren't currently being used, to prevent information from being overwritten. In situations where multiple departments use the same journal type, it's helpful to create multiple journal names (for example, one per department). It can also be helpful to divide journals so that each posting routine is entered in its own unique inventory journal. For posting routines that are associated with inventory transactions, create one journal for periodic inventory adjustments and another for inventory counting.

Posting journal lines

You can post the journal lines that you create at any time until you've locked an item from additional transactions. The data that you enter in a journal remains in that journal, even if you close the journal without posting the lines.

Data entity support for inventory journals

Data entities support the following types of integration scenarios:

- Synchronous service (OData)
- Asynchronous integration

For more information, see [Data entities](#).

NOTE

Not all inventory journals are OData-enabled, therefore you cannot use the Excel data connector to get data published, updated, and imported back to Supply Chain Management.

Another difference between the journal data entities is the ability to use composite entities that include both the header and line data. Currently, you can use the composite entities for:

- Inventory adjustment journal
- Inventory movement journal

These two inventory journals only support the *Initialize stock* scenario as part of a data management import project:

- When a journal header number is not specified, but a number sequence is specified for the journal type, the import job will automatically create journal headers per 1000 lines. For example, importing 2020 lines will result in the following three journal headers:
 - Header 1: will contain 1000 lines
 - Header 2: will contain 1000 lines
 - Header 3: will contain 20 lines
- It is assumed that unique line information exists per inventory dimension, which can be a product, storage, and tracking dimension. Therefore, it's not possible to import journal lines where only the date field differs on the lines within the same import project.

Additional resources

[Data entities](#)

NOTE

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Inventory locations

2/18/2021 • 2 minutes to read • [Edit Online](#)

Inventory locations are used with basic warehousing (WMS I) to determine where items are stored and where items are picked from in a WMS I warehouse.

This topic applies to features in the Inventory management module. It does not apply to features in the Warehouse management module.

The term location refers to the place that items are stored and drawn from.

For each location, the place where the item is inserted can also be specified. By default, they are the same. Items are usually inserted and drawn from the same side of a location, but not always. For example, items that are stored in live storage racks are inserted from one aisle and drawn from another. The main input is given by a location name, which is usually determined by its coordinates: warehouse, aisle, rack, shelf, and bin. This name or ID can be entered manually or generated from the location coordinates—for example, 01-02-03-4 for aisle 1, rack 2, shelf 3, bin 4 in the Inventory locations page. Location properties

A location has the following characteristics:

- Size (height, width, depth, and thereby volume)
- Warehouse, aisle, rack, shelf, and bin position
- Location type (bulk location, picking location, inbound dock, outbound dock, production input location, inspection location, or kanban supermarket)

Check text can be used in online systems to verify that the operator has selected the correct location for a specific item. This check text can be created manually or by default.

Sort codes

Use sort codes to optimize the handling of picking lines, which describe the information that is required for picking items from inventory, including the picking order. Sort codes can be specified by the aisle and other coordinates, or assigned manually for the location.

Blocked locations

Occasionally, you might want to indicate that a location is blocked for a period of time, for example, to allow for repairs. At other times, you may want to indicate blocking of only the input or only output.

Tree structure

In the Inventory locations page, you can view the warehouse layout in a tree structure based on the coordinates of inventory locations, in a defined display format.

Maintain inventory locations via the warehouse form

It is possible to copy locations from one warehouse to another and to create locations via a wizard. Before you run the wizard you should make sure that you have defined the default location names on the Warehouse page.

Additional resources

[Create a new warehouse layout](#)

NOTE

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Inventory statuses

2/18/2021 • 4 minutes to read • [Edit Online](#)

This article describes how you can use inventory statuses to categorize and keep track of inventory.

Set up and use inventory statuses

You can use inventory statuses to categorize inventory. You can then initiate appropriate actions, such as replenishment or put-away work.

Here are some examples of ways that you can use inventory statuses:

- Create inventory statuses for on-hand inventory, inbound transactions, and outbound transactions.
- Specify a default inventory status for warehouse transactions.
- Change an inventory status for items before arrival, during arrival, or when the items are put away during inventory movement.
- Use an inventory status to price items that are returned and to plan item coverage during master planning.

An inventory status is one of the dimensions in the storage dimension group. Inventory statuses can be categorized as available or unavailable, and you can use the **Inventory blocking** parameter to block items that have an unavailable inventory status. Items that have a blocked status are considered physical inventory, and they can't be used on a production order, sales order, transfer order, or outbound transaction.

You can use warehouse items that have either available or unavailable inventory statuses for inbound work. For example, you create an available status that is named *Ready*, an unavailable status that is named *Damaged*, and a blocked status that is named *Blocked*. When you create a purchase order for received or returned items, if any items are damaged or broken, you can change the inventory status of those items to *Damaged* on the purchase order line. After these items are received, the status is automatically set to *Blocked*. If you scan the damaged items by using a mobile device, Supply Chain Management can use location directives and work templates to show information about an appropriate location or range of locations where you can put away those items. For returned items, an issue type of *Reservation* is created on the **Inventory transactions** page.

NOTE

You can't change the status of inventory at locations where open work exists. For example, if you did a purchase receive for an item, but didn't do the putaway step, then open work would exist for the receiving location and you would get an error if you tried to change the status of inventory at that location. Completing or cancelling the related work would allow you to change the status.

For outbound work, use items that have an available inventory status. If you have items that have a status of *Broken*, and master planning is run on these items, the items are considered missing, and inventory is automatically replenished.

After you set up inventory statuses, you can set the default inventory status for a site, item, and warehouse. You can also set a default status for sales, transfer, and purchase orders. The default status for sales orders and outbound transfer order can't have the **Inventory blocking** option set to *Yes*. The inventory status that is inherited from the default settings on a site, warehouse, item, purchase order, transfer order or sales order can be changed by using the mobile device, or on the purchase order, sales order, or transfer order line.

To plan coverage for items that have an available inventory status, select the **Coverage plan by dimension** option for a storage dimension on the **Storage dimension groups** page. When you open the **Item Coverage**

wizard, items that have an available status appear on the **Status** page. To create coverage settings for these items, select the inventory status ID for the available inventory statuses. Based on the coverage settings, you can calculate the item requirements and forecast the supply and demand of available items during master planning. You can't create an item coverage setup that has a blocked inventory status. Alternatively, use the **Item coverage** page to create or modify the item coverage parameters.

Change inventory statuses

You can change inventory statuses either by using the **On-hand by location** page or by using the *Inventory status change* periodic task.

- When using the *Inventory status change* periodic task, you can select which records to include and set the task to run in the batch at the desired interval.
- To change inventory status as an ad-hoc process, go to **On-hand by location** page, select the relevant records, and then select the **Inventory status change** button.

NOTE

The *Change the inventory status of items controlled by tracking dimensions* feature allows you to change the inventory status of items controlled by tracking dimensions, including the ability to update only selected records. Use [feature management](#) to enable the feature as needed. When the feature is enabled, you'll be able to do the following:

- On the **On-hand by location** page, you can group lines based on shown dimensions using the **Display dimensions** button and change the status for the selected lines.
- On the **On-hand by location** page, you can select multiple records and then use the **Inventory status change** button to change all of them at once.
- On the **Inventory status change** periodic task you will be able to filter by tracking dimensions.

NOTE

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Inventory tag counting

2/18/2021 • 2 minutes to read • [Edit Online](#)

This topic provides information about tag counting, which you use to compare the actual contents of a warehouse with the on-hand inventory.

By creating lines on the **Tag counting** page, you place a tag number on each inventory item, such as a number from 1 to 500. During the count, you enter the item number and the quantity on a corresponding tag. This tag can then be used as the basis for input in the tag counting journal. After you post the tag counting journal, a new counting journal is created on the **Counting** page. The new journal is based on the tag counting journal lines that you created. To tag-count items by a specific inventory dimension, select the dimension on the **Display dimension** page that is displayed when you create the tag counting journal. For example, to count items in a specific warehouse, select the **Warehouse** check box. If the **Lock items during count** slider on the **Inventory and warehouse management parameters** page is selected, items can't be physically updated during counting. However, items in tag counting journals aren't locked during counting. Inventory transactions aren't created until the tag counting lines are posted and transferred to a counting journal. If tags are entered randomly, and you want to identify missing tags, click the **Tag** column header to sort the lines by tag.

Additional resources

[Cycle counting](#)

NOTE

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Work line details

2/18/2021 • 6 minutes to read • [Edit Online](#)

The **Work line details** page shows a comprehensive, sortable, and filterable list of the individual work lines in your system. It provides a complete overview of work that is being planned and executed in the warehouse. You can easily switch between viewing all work lines and viewing only open work lines. Details that are provided for each line include the work status, item number, location, work quantity, load ID, and shipment ID.

Turn on the work line details feature

Before you can use this feature, it must be turned on in your system. Admins can use the [feature management](#) settings to check the status of the feature and turn it on if it's required. In the **Feature management** workspace, the feature is listed in the following way:

- **Module:** *Warehouse management*
- **Feature name:** *Work line details*

Open and use the Work line details page

To view the list of work line details, go to **Warehouse management > Work > Work line details**. From here, you can perform the following actions:

- Use the **Filter** field to search for lines that have a specific value for any available parameter. (Available parameters include many parameters that aren't shown as columns in the grid.)
- Use the **Show closed** check box to show or hide closed lines.
- Select **Display dimensions** to open the **Dimensions display** dialog box, where you can choose to show or hide various dimension columns in the grid.
- Select any column heading to open a menu where you can choose to sort or filter the list by values in that column.
- Select a work line, and then select **Change location** to open a dialog box where you can change the location for that work line. The location that you specify will override the setup of the location directive.
- Select a work line, and then select **Cancel work line** to open a dialog box where you can partially or fully reduce the quantity of that work line.
- Adjust quantities.
- View the transactions behind any work line.

Try out the feature

This section provides a three-part demo that shows how to work with work line details.

Make sample data available

To work through this demo by using the sample records and values that are specified here, you must be on a system where the standard [demo data](#) is installed. Additionally, you must select the **USMF** legal entity before you begin.

You can also use this demo as guidance when you work on a production system. However, you must substitute your own values, and you might be missing some types of required records that the standard demo data provides.

Verify that the scenario setup includes enough available inventory

If you're working with the USMF demo data, you should first make sure that your system is set up so that enough inventory is available at each relevant pick location. For this demo, the expectation is that you have the following inventory available:

- **Item M9200:** 45 ea. (or more)
- **Item M9202:** 10 ea. (or more)

Follow these steps to verify that enough inventory is available and to make any adjustments that are required.

1. Go to **Warehouse management > Setup > Location directives**, and determine which picking locations are used for sales order picking at warehouse 51. (For more information, see [Control warehouse work by using work templates and location directives](#).)
2. Check the inventory levels at the relevant locations.
3. Adjust inventory as required. You can create manual movements, use replenishment, or apply any other flow to adjust the inventory.

Part 1: Create picking work

Before you start to create work, make sure that your warehouse is set up to respond to work requests in the expected manner.

Follow these steps to create some picking work.

1. Go to **Sales and marketing > Sales orders > All sales orders**.
2. Select **New** to open the **Create sales order** dialog box.
3. In the **Create sales order** dialog box, set the following values:
 - On the **Customer** FastTab, set the **Customer** account field to *US-001*.
 - On the **General** FastTab, set the **Warehouse** field to *51*.
4. Select **OK** to create the sales order and close the dialog box.
5. Your new sales order is opened. It includes a new, empty row in the **Sales order lines** grid. On this order line, set the following values:
 - **Item number:** *M9200*
 - **Quantity:** *20*
 - **Unit:** *ea*
6. Select the new order line, and then, on the **Inventory** menu, select **Reservation** to open the **Reservation** page.
7. On the **Reservation** page, select **Reserve lot** to reserve the selected line's full quantity in the warehouse.
8. Close the **Reservation** page to return to the sales order.
9. On the Action Pane, on the **Warehouse** tab, select **Release to warehouse**. The system creates a shipment, adds it to a new load, and creates the required work.
10. Create a second sales order for the same customer account and warehouse that you used for the first order. Add the following two order lines to this order:
 - **Line 1:** Set the **Item number** field to *M9200*, the **Quantity** field to *25*, and the **Unit** field to *ea*.
 - **Line 2:** Set the **Item number** field to *M9202*, the **Quantity** field to *10*, and the **Unit** field to *ea*.
11. Repeat steps 6 through 8 to reserve the inventory for each order line (one at a time), and then repeat step 9 to release the order to the warehouse.

Part 2: Change the location for a work line

1. Go to **Warehouse management > Work > Work line details**.
2. Find and select one of the work lines that you created for this demo.
3. Select **Change location** to open the **Select new location** dialog box.
4. In the **Select new location** dialog box, in the **Location** field, select a new location for the work line.
5. Select **OK** to apply your change and close the dialog box.

IMPORTANT

You can submit location changes only if the new location has enough inventory available (for a pick), or if it passes location-type validation (for a put).

Part 3: Change the quantity of a work line or cancel a work line

1. Go to **Warehouse management > Work > Work line details**.
2. Find and select one of the work lines that you created for this demo. Note that you can cancel or change quantities only for work lines where the work type is *pick*.
3. Select **Cancel work line** to open the **Quantity to cancel** dialog box.
4. In the **Quantity to cancel** dialog box, change the value in the **Quantity** field to specify the quantity that should be *subtracted from* the quantity that is currently specified for the line. By default, the **Quantity** field shows the full quantity.
 - If you cancel the full quantity, the **Work status** value will be changed to *Canceled*, but the **Work quantity** field will still show the original value.
 - If you cancel just part of the quantity, the **Work quantity** field will be updated to show the new value, but the **Work status** value won't change.
5. Select **OK** to apply your change and close the dialog box.

IMPORTANT

If you cancel just part of the quantity for a work line, you must also remove the obsolete quantity from the load line. Otherwise, unless under-delivery is set up correctly, the load line can't be ship-confirmed.

NOTE

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Location license plate positioning

2/18/2021 • 10 minutes to read • [Edit Online](#)

License plate location positioning lets you see where a license plate is located in a multi-pallet location, such as a location that uses double-deep pallet racking.

The feature adds a sequence number to each license plate that is put into a storage location. This sequence number is used to order the license plates in the storage location. Therefore, the feature intelligently supports scenarios where customers are using a gravity racking system and must know, for picking purposes, which license plate is front-facing.

This topic presents a scenario that shows how to set up and use the feature.

Turn on the Location license plate positioning feature

Before you can use license plate location positioning, the feature must be turned on in your system. Admins can use the [Feature management](#) workspace to check the status of the feature and turn it on if it's required. There, the feature is listed in the following way:

- **Module:** *Warehouse management*
- **Feature name:** *Location license plate positioning*

Example scenario

Make sample data available

To work through this scenario by using the values that are suggested here, you must work on a system where sample data is installed. Additionally, you must select the **USMF** legal entity before you start.

Set up the feature for this scenario

Complete the following procedures to set up the *Location license plate positioning* feature for the scenario that is presented in this topic.

Location profiles

The feature must be turned on in the location profile for every location where it will be used.

1. Go to **Warehouse management > Setup > Warehouse > Location profiles**.
2. In the list of location profiles in the left pane, select **BULK-06**.
3. On the **General** FastTab, two new options have been added by the feature. Set the following values:

- **Enable license plate position:** *Yes*

When this option is set to *Yes*, the license plate position will be maintained for license plates in the location.

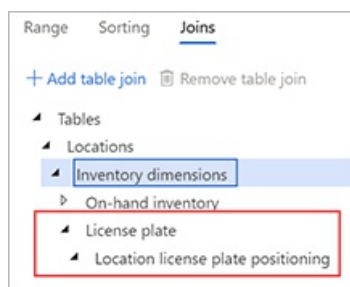
- **Display mobile device LP position:** *Yes*

When this option is set to *Yes*, the license plate position will be shown to mobile device users during adjustment and counting. You can change the setting of this option only when the feature is turned on.

4. Select **Save**.

Location directives

1. Go to **Warehouse management > Setup > Location directives**.
2. In the left pane, make sure that the **Work order type** field is set to *Sales orders*.
3. In the list of location directives, select **61 SO Pick order**.
4. On the Action Pane, select **Edit**.
5. On the **Lines** FastTab, select the line that has a **Sequence number** value of 2.
6. On the **Location Directive Actions** FastTab, select the line that has a **Name** value of *Pick for less than pallet* (it should be the only line), and change its **Sequence number** value to 2.
7. Select **New** above the grid to add a line for a new location directive action.
8. On the new line, set the following values:
 - **Sequence number:** 1
 - **Name:** *Pick position 1*
9. While the new line is still selected, select **Edit query** above the grid.
10. In the query editor, select the **Joins** tab.
11. Expand the **Locations** table join to show the join to the **Inventory dimensions** table.
12. Expand the **Inventory dimensions** table join to show the join to the **On-hand inventory** table.
13. Select **Inventory dimensions**, and then select **Add table join**.
14. In the list of tables that appears, in the **Relation** column, select **License plate (License plate)**. Then select **Select** to add **License plate** to the **Inventory dimensions** table join.
15. While **License plate** is still selected, select **Add table join**.
16. In the list of tables that appears, in the **Relation** column, select **Location license plate positioning (License plate)**. Then select **Select** to add **Location license plate positioning** to the **Inventory dimensions** table join.



17. Select **OK** to confirm the updated joined tables and close the query editor.
18. On the **Location Directive Actions** FastTab, select **Edit query** again to reopen to the query editor.
19. On the **Range** tab, select **Add** to add a line to the grid.
20. On the new line, set the following values:
 - **Table:** *Location license plate positioning*
 - **Derived table:** *Location license plate positioning*
 - **Field:** *LP Position*
 - **Criteria:** 1

Range Sorting Joins			
+ Add Remove			
✓ Table	Derived table	Field	Criteria
Locations	Locations	Warehouse	61
Locations	Locations	Location	
On-hand inventory	On-hand inventory	Physical inventory	>0
On-hand inventory	On-hand inventory	No open quantities	No
On-hand inventory	On-hand inventory	Item number	
Location license plate positioning	Location license plate positioning	LP Position	1

21. Select **OK** to confirm your changes and close the query editor.

Set up sample data for this scenario

For this scenario, the user must sign in to the warehousing mobile app by using a worker who is set up for warehouse *61* to perform work. The user must also complete transactions.

Because the *Location license plate positioning* feature adds a new identifier for license plate positions in a location, you must first create some data to support the scenario.

Spot-count the first location

1. Open the warehousing mobile app, and sign in to warehouse *61*.
2. Go to **Inventory > Spot Counting**.
3. On the **Spot Counting** page, set the **Location** field to *01A01R1S1B*.
4. Select **OK**.

The page shows the location that you entered. It also shows the following message: "Location complete, add new LP or Item?"

5. Select **Refresh** to add a count in the location.
6. On the **Cycle Count: Add New LP or Item** page, select the **Item** field, and then enter the value *A0001*.
7. Select **OK**.
8. On the **Cycle Count: Add New LP or Item** page, select the **LP** field, and then enter the value *LP1001* (or any other license plate number of your choice).

The **Cycle Count: Add New LP or Item** page shows **License Plate Position 1**.

9. Select **OK**.

You must now specify the quantity of the item that is counted on the license plate.

10. Set the **Qty** field to *10*.
11. Select **OK**.

The page shows the location that you entered. It also shows the following message: "Location complete, add new LP or Item?"

12. Select **Refresh** to add another count in the location.
13. On the **Cycle Count: Add New LP or Item** page, select the **Item** field, and then enter the value *A0002*.
14. Select **OK**.
15. On the **Cycle Count: Add New LP or Item** page, select the **LP** field, and then enter the value *LP1002* (or any other license plate number of your choice, provided that it differs from the license plate number that you specified earlier).

16. Change the license plate position by setting the **LP Position** field to *2*.

17. Select **OK**.

18. Specify the quantity of the item that is counted on the license plate by setting the **Qty** field to *10*.

19. Select **OK**.

The page shows the location that you entered. It also shows the following message: "Location complete, add new LP or Item?"

20. Select **OK**.

Work is now completed.

Spot-count the second location

1. On the **Spot Counting** page, set the **Location** field to *01A01R1S2B*.

2. Select **OK**.

The page shows the location that you entered. It also shows the following message: "Location complete, add new LP or Item?"

3. Select **Refresh** to add a count in the location.

4. On the **Cycle Count: Add New LP or Item** page, select the **Item** field, and then enter the value *A0002*.

5. Select **OK**.

6. On the **Cycle Count: Add New LP or Item** page, select the **LP** field, and then enter the value *LP1003* (or any other license plate number of your choice, provided that it differs from the both the license plate numbers that you specified in the previous procedure).

The **Cycle Count: Add New LP or Item** page shows **License Plate Position 1**.

7. Select **OK**.

8. Specify the quantity of the item that is counted on the license plate by setting the **Qty** field to *10*.

9. Select **OK**.

The page shows the location that you entered. It also shows the following message: "Location complete, add new LP or Item?"

10. Select **OK**.

Work is now completed.

Work details

NOTE

Spot counts from the mobile app create cycle counting work in Microsoft Dynamics 365. The work requires that the counts be accepted before they are posted to inventory.

1. Sign in to Dynamics 365 Supply Chain Management.

2. Go to **Warehouse management > Work > Work details**.

3. On the **Overview** tab, look for the lines that have the following values:

- **Work order type:** *Cycle counting*
- **Warehouse:** *61*

- **Work status:** *Pending review*

Two work IDs should have been created for these lines. The counts for both these work IDs must be accepted.

4. In the grid, select the first work ID for the *Cycle counting* work order type.

5. On the Action Pane, on **Work** tab, in the **Work** group, select **Cycle counting**.

Two lines are shown, one for each item and license plate. The values in the **Counted quantity**, **Location**, **License plate**, and **Item** fields should match the count entries that you created on the mobile device. If any of these fields aren't visible, select **Display dimensions** on the Action Pane to add them to the grid.

6. Select both lines.

7. On the Action Pane, select **Accept count**.

8. You receive a "Posting - Journal" message. Select **Message details** to view the posted journal number.

9. Close the message details.

10. Refresh the **Work** page.

The first work ID has been closed and is no longer shown.

TIP

To view closed work, select the **Show closed** check box above the grid.

You will now accept the work for the license plate in the *01A01R1S2B* location.

11. On the **Overview** tab, select the second work ID for the *Cycle counting* work order type.

12. On the Action Pane, on **Work** tab, in the **Work** group, select **Cycle counting**.

One line is shown, for the item and license plate. The values in the **Counted quantity**, **Location**, **License plate**, and **Item** fields should match the count entries that you created on the mobile device.

13. Select the line.

14. On the Action Pane, select **Accept count**.

15. You receive a "Posting - Journal" message. Select **Message details** to view the posted journal number.

16. Close the message details.

17. Refresh the **Work** page.

The second work ID has been closed and is no longer shown.

TIP

To view closed work, select the **Show closed** check box above the grid.

On-hand by location

1. Go to **Warehouse management > Inquiries and reports > On-hand by location**.

2. Set the following values:

- **Site:** *6*
- **Warehouse:** *61*

- **Refresh across locations:** *Yes*

3. Notice that location *01A01R1S1B* has two license plates:

- **A0001**, where the **LP Position** field is set to *1*
- **A0002**, where the **LP Position** field is set to *2*

4. Notice that location *01A01R1S2B* has one license plate:

- **A0002**, where the **LP Position** field is set to *1*

Sales order scenario

Now that the *Location license plate positioning* feature has been set up, and the inventory has been staged, you must create a sales order to generate picking work that will direct the warehouse worker to pick item *A0002* from the inventory location where the pallet ID is in position *1*.

1. Go to **Sales and marketing > Sales orders > All sales orders**.

2. On the Action Pane, select **New**.

3. In the **Create sales order** dialog box, set the following values:

- **Customer account:** *US-004*
- **Warehouse:** *61*

4. Select **OK**.

5. A new line is added to the grid on the **Sales order lines** FastTab. On this new line, set the following values:

- **Item number:** *A0002*
- **Quantity:** *1*

6. On the **Inventory** menu above the grid, select **Reservation**.

7. On the **Reservation** page, on the Action Pane, select **Reserve lot** to reserve inventory for the order line.

8. Close the **Reservation** page.

9. On the Action Pane, on the **Warehouse** tab, in the **Actions** group, select **Release to warehouse**.

You receive an informational message that indicates the wave ID and shipment ID that were created for the order.

10. On the **Sales order lines** FastTab, on the **Warehouse** menu above the grid, select **Work details**.

11. The **Work** page appears and shows the work that was created for the sales line. Make a note of the work ID that is shown.

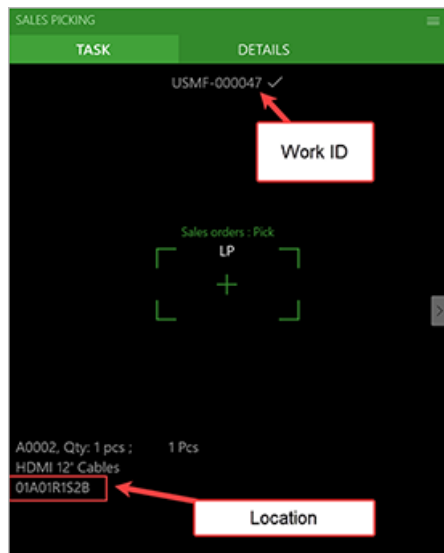
Sales picking scenario

1. Open the mobile app, and sign in to warehouse *61*.

2. Go to **Outbound > Sales picking**.

3. On the **Scan a work ID / license plate ID** page, select the **ID** field, and then enter the work ID from the sales line.

4. Notice that the picking work directs you to pick item *A0002* from location *01A01R1S2B*. You receive this instruction because item *A0002* is on a license plate that is in position *1* in that location.



5. Enter the license plate ID that you created for the location, and then follow the prompts to pick the sales order.

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Change work pool on work

2/18/2021 • 5 minutes to read • [Edit Online](#)

You can use work pools to organize work into groups. For example, you can create a work pool to classify work that occurs in a specific warehouse location.

The *Change work pool on work* feature adds a **Change work pool** button to the Action Pane for work items. Therefore, warehouse managers can easily change the work pool of existing work. This feature lets managers react quickly to changes on the warehouse shop floor, and it helps improve their ability to adapt to changing situations and the need to transfer work to another work pool.

Turn on the Change work pool on work feature

Before you begin to set up or use this feature, you must make sure that it's available in your system. Admins can use the [feature management](#) settings to check the status of the feature and turn it on if it's required. In the **Feature management** workspace, the feature is listed in the following way:

- **Module:** *Warehouse management*
- **Feature name:** *Change work pool on work*

Set up the Change work pool on work feature

To use this feature, you must have some work pools set up. You might also set up your work templates so that they automatically assign a pool. If you want to work through the example scenario that is provided later in this topic, set up your system as described in this section.

Set up work pools

Work pools let you organize work items by type. To work with the *Change work pool on work* feature, you must have at least two work pools available. To view and add work pools, follow these steps.

1. Go to **Warehouse management > Setup > Work > Work pools**.
2. If you're working with demo data from the **USMF** company and will work through the example scenario later in this topic, add two work pools that have the following settings:
 - Work pool 1:
 - **Work pool ID:** *Webshop*
 - **Description:** *Web Shop*
 - Work pool 2:
 - **Work pool ID:** *CallCenter*
 - **Description:** *Call Center*
3. On the Action Pane, select **Save**.

Set up work templates

For each of your work templates, you can set a default work pool, as you require. For each relevant template, you assign a work pool in the **Work pool ID** column. In this case, all work items that are generated by using a given template automatically inherit the assigned work pool. If you're working with the demo data from the **USMF** company and will work through the example scenario later in this topic, follow these steps.

1. Go to **Warehouse management > Setup > Work > Work templates**.

2. On the Action Pane, select **Edit** to put the page into editing mode.
3. Edit the template by setting the following values:
 - **Work template:** *62 Pick to pack*
 - **Work pool ID:** *Webshop*
4. Select **Save**.

Example scenario

This scenario shows how to change the stream of processing for an existing work item by changing its work pool. It uses demo data from the USMF company and the settings that were suggested earlier in this topic.

Create a sales order and release it to the warehouse

1. Confirm that there is enough on-hand inventory for items *A0001* and *A0002* in warehouse *62*. Go to **Inventory management > Inquiries and reports > On-hand list**, and edit the filters as shown here:
 - The **Warehouse** value begins with *62*.
 - The **Item number** value is either *A001* or *A002*.Demo data should have a quantity of 10 each.
Next, you must create a sales order.
2. Go to **Sales and marketing > Sales orders > All sales orders**.
3. On the Action Pane, select **New**.
4. In the **Create sales order** dialog box, set the following values:
 - **Customer account:** *US-007*
 - **Warehouse:** *62*
5. Select **OK** to create the sales order and close the dialog box.
6. The new sales order is opened. It should include a new, empty line in the grid on the **Sales order lines** FastTab. On this line, set the following values:
 - **Item number:** *A0001*
 - **Quantity:** *2*
7. On the **Inventory** menu above the grid, select **Reservation**.
8. On the **Reservation** page, on the Action Pane, select **Reserve lot** to reserve the inventory.
9. Close the page.
10. On the **Sales order lines** FastTab, select **Add line** to add another line to your sales order. On this line, set the following values:
 - **Item number:** *A0002*
 - **Quantity:** *2*
11. On the **Inventory** menu above the grid, select **Reservation**.
12. On the **Reservation** page, on the Action Pane, select **Reserve lot** to reserve the inventory.
13. Close the page.
14. On the Action Pane, on the **Warehouse** tab, select **Release to warehouse**.
15. You receive informational messages that show the wave ID and shipment ID that were created from the

release. Make a note of the wave ID.

Review the outbound wave

1. Go to **Warehouse management > Outbound waves > Shipment waves > All waves**.
2. In the grid, search for the wave ID that was created from the release of the sales order.
3. Select the wave ID to view the details.
4. On the **Wave lines** FastTab, make sure that a shipment ID is shown for the sales order.

TIP

If the **Process wave at release to warehouse** option is set to *No* in the setup for the shipping wave template, you must manually process the wave by selecting **Process** from the **Wave** tab on the Action Pane to create work.

5. Make sure that the wave has been processed. This processing creates the required work.

View work details and change the work pool

You can use the **Work details** page to view the work that was created and to manage the work pool.

1. Go to **Warehouse management > Work > Work details**.
2. Select the row for the work that was just created. The **Order number** column will show the sales order number.

The **Work pool ID** field will be set to the work pool ID that was set up in the work template.

TIP

If you don't see the **Work pool ID** field, add the column to the grid, and then refresh the page.

3. To change the work pool that is associated with the work ID, on the Action Pane, on the **Work** tab, select **Change Work pool ID**.
4. In the **Change work pool** dialog box, on the **Parameters** FastTab, in the **Work pool ID** field, select *CallCenter*.
5. Select **OK** to apply your change.
6. Notice that the value of the **Work pool ID** field has now been changed to *CallCenter*.

IMPORTANT

When the **Change work pool** dialog box appears, the **Work pool ID** field might be blank by default. If the field is blank when you select **OK** to apply changes, you will remove the work pool completely from the work.

In addition to switching work pools, you can use this procedure to add a work pool to any work item that doesn't have one, or to remove a work pool from any work item that does have one.

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Item consolidation - location utilization

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This topic provides information about functionality that makes it easy for warehouse managers to view and filter the volumetric utilization of locations across the warehouse. Managers can select locations and create inventory movement work directly from the **Item Consolidation** page to consolidate items and therefore make better use of warehouse space.

Turn on the features

Before you can use the features that are described in this topic, you must turn them on in your system. Admins can use the [Feature management](#) workspace to check the status of the features and turn them on if they are required. Turn on both the following features, in the order that they are listed in. (Both features are for the **Warehouse management** module.)

1. Warehouse location status
2. Item consolidation location utilization

Warehouse location status

The *Warehouse location status* feature adds four new fields to the **Locations** page to track additional information about the current state of the location:

- **Item number** – The item that is currently in the location. If the location contains multiple items, this field will be blank.
- **Last activity date and time** – The timestamp of the last warehouse transaction that was performed against the location.
- **Aging date** – The date when the inventory in the location was brought into the warehouse. This date is calculated based on the license plate aging date. Although this date is accurate for license plate-tracked locations, it might not be accurate for locations that aren't license plate-tracked.
- **Location status** – The status of the location. Four values are available:
 - **Undetermined** – The location profile doesn't track status. Therefore, the current status is unknown.
 - **Empty** – No inventory is currently in the location.
 - **Picking** – Outbound transactions have been performed against the location after it was last empty.
 - **Storage** – Only inbound transactions have been performed since the location was last empty.

These fields let warehouse managers get a better overview of the status of the locations in the warehouse. They also allow for more advanced reporting and filtering.

Set up item consolidation and location utilization

This section describes how to prepare your system to use item consolidation and location utilization. The procedures use sample values from the standard demo data. If you plan to work through the example scenario that is provided later in this topic, select the **USMF** legal entity (which contains the standard demo data), and create each record that is described in this section. If you don't plan to work through the example scenario, the values that are provided here can be considered examples of the types of setup that you must complete to use the features.

Released product

1. Go to **Product information management > Products > Released products**.
2. In the **Item number** field, select *M9201*, and open the details page.
3. On the Action Pane, on the **Manage inventory** tab, in the **Warehouse** group, select **Physical dimensions**.
4. On the **Physical dimension** page, on the Action Pane, select **New**.
A new line is added to the grid. The **Item number** field is preset.
5. In the **Unit** field, select *ea*. The remaining fields on the line are automatically set.
6. Select **Save**, and close the page.

Location profile

1. Go to **Warehouse management > Setup > Warehouse > Location profiles**.
2. In the list of location profiles, select **FLOOR-05**.
3. On the Action Pane, select **Edit**.
4. On the **General** FastTab, make sure that both the following options are set to *Yes*:
 - **Enable item in location**
 - **Enable location status**
5. Select **Save**.

IMPORTANT

If the **Enable item in location** and **Enable location status** options were already set to *Yes*, skip ahead to the instructions for setting up the **Dimensions** FastTab in step 10. If the options weren't already set to *Yes*, you must run a consistency check for the **Warehouse management** module after you manually set them. In this case, continue to the next step.

6. To run the consistency check, go to **System administration > Periodic tasks > Database > Consistency check**.
7. In the **Consistency check** dialog box, set the following values:
 - **Module:** *Warehouse management*
 - **Check/Fix:** *Check*
 - **From date:** Leave this field blank.
 - **Warehouse location status consistency check:** Select this check box.
8. Select **OK**.

TIP

When the consistency check is completed, you receive a notification. Open the [Action Center](#) to view the message. Select **Message details** to view the details.

If the message for the consistency check states, "Incorrect location status information found for location XXXX in warehouse XX," you must run the consistency check again. This time, set the **Check/Fix** field to *Fix error*. View the messages to make sure that no errors were found.

9. You must now finish setting up the location profile. Go back to **Warehouse management > Setup >**

Warehouse > **Location profiles**, select location profile **FLOOR-05**, and then, on the Action Pane, select **Edit**.

10. On the **Dimensions** FastTab, set the following values:

- **Volume utilization percentage:** *100*
- **Volumetric method used for inventory location:** *Use location volume*
- **Actual location height:** *10*
- **Actual location width:** *10*
- **Actual location depth:** *10*
- **Maximum weight:** *100*

11. Select **Save**.

Mobile device menu items

1. Go to **Warehouse management** > **Setup** > **Mobile device** > **Mobile device menu items**.

2. On the Action Pane, select **New** to create a menu item for sorting.

3. In the header, set the following values:

- **Menu item name:** *Adjust In*
- **Title:** *Adjust In*
- **Mode:** *Work*
- **Use existing work:** *No*

4. On the **General** FastTab, set the following values:

- **Work creation process:** *Adjustment in*
- **Inventory adjustment types:** *Adjust in*

5. Select **Save**.

Mobile device menu

1. Go to **Warehouse management** > **Setup** > **Mobile device** > **Mobile device menu**.

2. In the list of menus, select **Inventory**.

3. On the Action Pane, select **Edit**.

4. In the **Available Menus And Menu Items** list, find and select the **Adjust In** menu item.

5. Select the right arrow button to move **Adjust In** to the **Menu Structure** list. In this way, you add the new menu item to the selected menu.

6. Select **Save**.

Movement types

1. Go to **Warehouse management** > **Setup** > **Inventory** > **Movement types**.

2. On the Action Pane, select **New**, and then set the following values:

- **Movement type code:** *CONSOLIDATE*
- **Description:** *Consolidate locations*
- **Work class ID:** *InvMov*

3. Select **Save**.

Example scenario

The following scenario uses the warehouse app on a mobile device to make an inventory *adjustment in* to two locations in the warehouse.

Add inventory to locations

1. Sign in to the mobile device as a user who is set up for warehouse *51*.
2. Go to **Inventory > Adjust In**.

You will now enter the first location adjustment.
3. In the **Adjustment in** task, select the location to make the inventory adjustment for. In the **LOC** field, select *LP-001*.
4. Confirm the location.
5. Create a license plate ID for the item that will be added to the location. In the **LP** field, enter *LP00101*.
6. Confirm the license plate.
7. Enter the item that will be added to the license plate. In the **ITEM** field, enter *M9201*.
8. Confirm the item.
9. Enter the quantity of the item that will be added. In the **QTY** field, enter *10*.
10. Confirm the quantity.

You receive a "Work Completed" message. You will now enter the second location adjustment.

11. In the **Adjustment in** task, select the location to make the inventory adjustment for. In the **LOC** field, select *LP-002*.
12. Confirm the location.
13. Create a license plate ID for the item that will be added to the location. In the **LP** field, enter *LP00201*.
14. Confirm the license plate.
15. Enter the item that will be added to the license plate. In the **ITEM** field, enter *M9201*.
16. Confirm the item.
17. Enter the quantity of the item that will be added. In the **QTY** field, enter *15*.
18. Confirm the quantity.

You receive a "Work Completed" message.

19. Select the Menu button (sometimes referred to as the hamburger or the hamburger button), and then select **Cancel** to exit the **Adjustment in** task.

Consolidate locations

1. Go to **Warehouse management > Periodic tasks > Item consolidation**.
2. In the header, select a warehouse to do the consolidation for. In the **Warehouse** field, enter *51*.

A record is shown for each location where item *M9201* was adjusted. The **Utilization percentage** column shows the volumetric utilization of each location.
3. To consolidate inventory, select all the locations that must be consolidated, and then, on the Action Pane, select **Consolidate Inventory**.
4. In the **Consolidate inventory** dialog box, specify the location and movement type that should be used to create the work for inventory movement. Set the following values:

- **Location:** *LP-001*

- **Movement type code:** *CONSOLIDATE*

5. Select **OK**.

6. You receive an informational message that shows the movement work that was created. Make a note of the movement work ID.

View movement work

1. Go to **Warehouse management > Work > Work details**.

2. View the work that was created. Use the movement work ID from the inventory consolidation to filter or search the work grid.

In this scenario, an existing location that had inventory was used as the inventory consolidation location. Therefore, only one work ID was created.

NOTE

The system creates one work ID for each move that must be completed. If you specify a location that already contains inventory, only one work ID is created. If you specify a new location, two work IDs are created.

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Troubleshoot warehouse work

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This topic describes how to fix common issues that you might encounter while you work with warehouse work in Microsoft Dynamics 365 Supply Chain Management.

I can't move license plates that have serial number items when blank issue and blank receipt are allowed on the tracking dimension group.

Issue description

You can't move a license plate by using a **Movement** menu item if the serial number has settings of *Blank issue allowed* and *Blank receipt allowed* on the tracking dimension group, and if there are multiple license plates in the same location, some of which have serial numbers and some of which don't have them.

Issue resolution

This issue will be fixed by changes that are deployed in [KB 4571546](#). Those changes will make the **Serial number** field optional when blank receipt and blank issue are allowed.

I receive the following error message in the warehouse app when I process movements: "The inventory owner %1 is not allowed in this process."

Issue description

The **Owner** tracking dimension is missing when the warehouse app is used to make movements. A regular inventory transfer journal from the Supply Chain Management client appears to work as intended and can be posted only if the **Owner** dimension is filled in.

Issue resolution

Microsoft has evaluated this issue and has determined that it's a feature limitation. Currently, warehouse management processes support only inventory that is owned by the legal entity.

NOTE

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Work split

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Work split functionality lets you split large work IDs (that is, work orders that have several lines) into several smaller work IDs that you can then assign to multiple warehouse workers. In this way, the same work creation number can be picked simultaneously by several warehouse workers.

IMPORTANT

You can split only work orders that have a status of *Open* or *In-progress*.

Turn on the work split functionality

Before you can use the work split functionality, you must turn on the feature and its prerequisite feature in your system. Administrators can use the [feature management](#) settings to check the status of the features and turn them on as required.

First, turn on the prerequisite *Organization-wide work blocking* feature if it isn't already turned on. In the **Feature management** workspace, this feature is listed in the following way:

- **Module:** *Warehouse management*
- **Feature name:** *Organization-wide work blocking*

NOTE

When this feature is activated, a data upgrade is automatically applied after the feature is turned on across all legal entities.

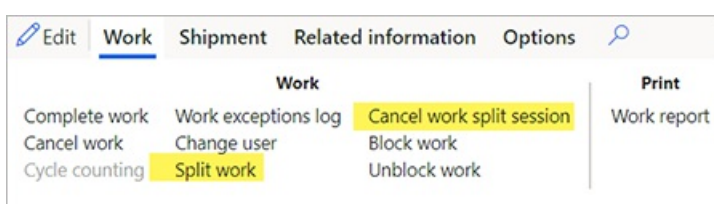
Next, turn on the *Work split* feature, which is listed in the following way:

- **Module:** *Warehouse management*
- **Feature name:** *Work split*

Enhancements to the Work details and All work pages

The *Work split* feature adds the following two buttons to the **Work** tab on the Action Pane of the **Work details** and **All work** pages:

- **Split work** – Split the current work ID into multiple smaller work IDs that can be processed by separate workers.
- **Cancel work split session** – Cancel the work split session, and make the work available for processing.



IMPORTANT

The **Split work** button won't be available if any of the following conditions are met:

- The work status is something other than *Open* or *In progress*.
- A container ID is associated with the work ID. (A container can't be systematically split, because it requires physical actions.)
- The work is associated with a cluster.
- The work order type is something other than one of the following types:
 - Sales orders
 - Raw material picking
 - Transfer issue
- The work is currently being split by another user. If you try to open the splitting page for work that is already being split by another user, you receive the following error message: "The work with ID #### is currently being split. Retry in a few minutes. If you continue to receive this message, contact a supervisor."

A new work blocking reason, *Split work*, indicates when the work ID is in the process of being split. It's shown both on the **Split work** page and in the warehouse app if a user tries to run the work. When blocking reasons are used, the name of the **Blocked wave** field from the work ID is changed to **Blocked**.

Initiate a work split

The feature adds a new **Split work** page that lets users split work lines from the work ID. When the page is first opened, it shows lines that have a work status of *Open* and that are available to be split. On the Action Pane, select **Split work** to process the selected work.

To split work, follow these steps.

1. Open one of the following work pages:
 - **Work details** (Warehouse management > Work > Work details)
 - **All work** (Warehouse management > Work > All work)
2. In the grid, select a work ID to split. The **Work order type** field must be set to one of the following values:
 - Sales orders
 - Raw material picking
 - Transfer issue
3. On the Action Pane, on the **Work** tab, in the **Work** group, select **Split work**.

The **Split work** page appears and shows the work lines that are open and available to be split. By default, only available work lines are shown. To view all lines for the work ID (for example, lines that have a work type of *Put*), select the **Show all lines** check box above the grid.

The following message is shown: "Users can't process lines of the work until you finish splitting and close this page."

The **Work blocking reason** field for the current work will be set to *Split work*, and the work will be blocked.

Work			
<input type="checkbox"/> Show closed			
Overview General Blocking reasons			
<input checked="" type="checkbox"/> Work blocking reason	Description	Created date and time	Created by
<input type="checkbox"/> Split work	The work is currently being split.		

4. Select the lines to remove from the current work ID and add to a new work ID. The following events occur:

- When you split the work, the selected line or lines from the original work ID are canceled and then copied to a new work ID.
- The existing work template structure and the location of the put (and also future pick/put pairs) are preserved. Values for the following work ID fields are copied from the original work to the new work:
 - Load ID
 - Shipment ID
 - Work order type
 - Order number
 - Site
 - Warehouse
 - Work priority
 - Work pool ID
 - Wave ID
 - Work creation number
- The following fields aren't copied to the new work ID:
 - **Work ID** – A new work ID is generated from the appropriate number sequence.
 - **Work status** – This field is set to *Open*.
 - **Locked by** – This field is initially set to blank.
 - **Target license plate ID** – This field is left blank.
 - **Created date and time** – This field is set to the current date and time.
 - **Blocked wave/frozen** – This field is recomputed for the original work ID and the new work ID.

5. On the Action Pane, select **Split work**.

While the work is being split, the following message is shown: "Processing operation - Split work". While this message is visible, you can cancel the operation by selecting **Cancel** in the message box.

If the **Show all lines** check box is cleared, the line that was split off and canceled will no longer appear in the grid. If the check box is selected, you should see that the value of the **Work status** field for that line has changed to *Canceled*.

The following notification is shown to indicate that the new work ID has been created: "Work ##### has been created by splitting off from original work #####."

Other work lines from the original work ID (such as *Put* lines) will be adjusted as required to reflect the lines of work that have been canceled. For example, if the original work ID had a *Put* line for a quantity of 15, and *Pick* lines that have a total quantity of 10 were canceled, the new *Put* quantity on the original work ID will now be 5.

The new work won't immediately be assigned to any user. However, you can assign it to a user now, as required, by using the standard functionality of the **Work details** page.

IMPORTANT

You can split only work IDs that contain two or more available work lines. If you select **Split work** when there is only one work line, you will receive the following error message: "At least one work line must remain on initial work." In this case, no splitting will occur.

Finish a work split

To finish splitting work, the *Split work* blocking reason must be removed. There are two ways to complete this step:

- The user who is splitting the work closes the **Split work** page by selecting the **Close** button (X) in the upper-right corner. When the page is closed, the *Split Work* blocking reason will be removed. The *Blocked* state of this work will be recomputed and, if there are no remaining blocking reasons for this work, the work will be unblocked.
- Any user opens the work ID and selects the **Cancel work split session** button on the Action Pane. The *Split work* blocking reason will be removed, and the *Blocked* state of this work will be recomputed, just as when the **Split work** page is closed.

After the *Split work* blocking reason is removed, the work can be run on the mobile device, provided that the **Blocked** state is set to *No* on the work ID.

User blocking on the warehouse app

If you try to use the warehouse app to run picking work against a work ID that is being split, you will receive the following error message: "The work with ID ##### is currently being split." If you receive this message, select **Cancel**. You can then continue to process other work.

Other blocked operations

Any operations that modify work lines, work inventory transactions, or replenishment links that are related to work that is being split will fail, and the following error message will be shown: "The work with ID ##### is currently being split."

NOTE

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Warehouse configuration overview

2/18/2021 • 6 minutes to read • [Edit Online](#)

This article explains how to configure a warehouse. It includes information about how to enable a warehouse layout and warehouse processes.

NOTE

This article applies to features in the **Warehouse management** module (advanced warehousing). It doesn't apply to warehouse features in the **Inventory management** module.

Warehouse layout

The Warehouse management system in Supply Chain Management gives you flexible ways to define your warehouse layout to meet changing needs, so that you can achieve optimal warehouse efficiency.

- You can establish high-priority and low-priority storages areas for optimum placement of goods.
- You can divide your warehouse into zones to accommodate various storage needs, such as temperature requirements, or various turnover rates for items.
- You can specify warehouse locations on any level (for example, site, warehouse, aisle, rack, shelf, and bin position).
- You can group locations by using physical capacity constraint settings.
- You can control how items are stored and picked, based on query-defined rules.

To use warehouse management in Supply Chain Management, you must create a warehouse and enable it for more advanced or specialized warehouse management activities. On the **Warehouses** page, select the **Use warehouse management processes** option.

Zone groups, zones, location types, and locations

As part of the process for enabling a warehouse layout, you must define warehouse zone groups, and zones, location profiles, location types, and locations.

- **Zone groups** – A logical or physical grouping of zones within a warehouse.
- **Zones** – A logical or physical grouping of locations within a warehouse.
- **Location profiles** – A logical or physical grouping of locations that have the same warehouse location process policies (for example, a mix of different item numbers can be stored there, and the same physical capacity constraints apply).
- **Locations types** – A logical or physical grouping of the warehouse locations. For example, you can create a location type for all staging locations. Mandatory settings on the **Warehouse management parameters** page drive the process of defining staging location types and the final shipping location type.
- **Locations** – The lowest level of location information. Locations are used to track where the on-hand inventory is stored and picked in a warehouse.

The entities that you create to define your warehouse layout are used in the queries that you set up in work templates to drive work orders in the warehouse. Therefore, when you define the zones, location types, and so on, consider how different areas in the warehouse are used for different processes. Additionally, consider factors such as the physical characteristics of a particular area. For example, there might be areas where you can use only a certain type of forklift truck. Or, if your company has both production and finished goods within the same facility, you might want to create a single warehouse in Supply Chain Management but then separate the two

operations by creating two zone groups. Give your entities descriptive names, so that it's easy to identify them when you use them in template queries.

Location stocking limits, location profiles, and fixed picking locations

You must consider the physical layout of the warehouse, both to determine storage capacities (location stocking limits and location profiles) and as part of your attempts to achieve optimal warehouse processes.

Location stocking limits help guarantee that work isn't created to request that inventory be put in a location that doesn't have the physical capacity to carry the inventory. For example, if some locations within a warehouse can hold only one pallet per location, location stocking limits can be enabled. The **Quantity** value can be set to **1**, and the **Unit** value can be set to **PL** within a specific location profile grouping.

If more advanced calculations are required to control the location capacity constraints, the location profile settings can be used. In this case, the weight and volume are considered when capacity calculations are done.

To achieve optimal outbound processes, you should evaluate whether to use fixed picking locations and/or packing locations. Often, minimum/maximum replenishment is used for replenishment processes from a bulk area to the fixed picking locations, and multiple fixed picking locations can be enabled within the same warehouse and for product variants. Consider the flexibility that can you achieve by enabling dedicated demand replenishment overflow locations that are used only for wave/load replenishment processing.

Location setup wizard

To quickly create the locations within a warehouse, you can use the **Location setup** wizard. As part of this process, you can easily maintain the format of the location names.

Warehouse processes

As part of the configuration of the warehouse, it's important that you enable warehouse processes according to business requirements. The most important components that you must configure are wave templates, work templates, work pools, and location directives.

Wave templates

Wave templates help enable the outbound "Release to warehouse" process. As soon as order lines are released (either directly from source documents, via batch job processes, or via loads that have already been created), the wave template functionality is used.

You can create three types of wave templates:

- **Shipping**
- **Production order**
- **Kanban**

Parameters are used to define how far the system should automatically go in the outbound work processing. A wave template is selected based on the wave template sequence and criteria that are specified in the template. If a template is listed at the top of the sequence, the criteria in that template are checked first. If the criteria can be met, the wave template is processed. Otherwise, the criteria in the next template are checked, and so on.

Therefore, it's a good idea to put the template that has the most specific criteria at the top of the wave template sequence list, so that it's processed first. For example, you want to process all the work for a specific carrier today and temporarily delay processing of the work for other carriers. In this case, the wave template that selects work for that carrier should be listed higher in the sequence than other templates. Otherwise, the work for other carriers might be processed before the work for that carrier is completed.

You must specify the wave process methods in each wave template. The methods that are available vary, depending on the wave template type.

Work templates

Work template definitions play an important role in the definition of warehouse management work processes. They define what work is performed, and how the work is done. Templates can also contain a directive code that links to a location directive to determine where work is performed. Work templates include a query that specifies the criteria for the work. Each template must include at least one Pick operation and one Put operation to drive the basic work operation of transferring on-hand inventory from one location to another.

If multiple workers must be able to process work for some of your warehouse operations, you might want to use the concept of *staging* for the inventory and separate the work execution into different work classes.

Work pools

Work pools are used to organize work into groups. For example, you can create a work pool to classify work that occurs in a particular warehouse location. For all work types except counting, you can assign a work pool to a work template. For cycle counting, you can assign a work pool on the following pages:

- Cycle count plans
- Cycle count thresholds
- Cycle count work by location
- Cycle count work by item

When you use work templates to create work, the work pool is automatically assigned to the work.

Work pool IDs can also be used to limit the type of work that is directed to a particular warehouse worker, provided that this functionality is configured on the relevant mobile device menu item.

Location directives

As the name suggests, location directives are used to direct the work transactions to the appropriate locations in the warehouse. In other words, they define where to pick and put.

To make it easier and quicker to define the actions that are associated with each location directive line, use one of the predefined strategies. For example, you can use the **Empty location with no incoming work** strategy to search for free locations in a warehouse, or you can use **FEFO batch reservation** strategy for outbound sales picking.

Additional resources

[Configure locations in a WMS-enabled warehouse](#)

NOTE

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Set up a warehouse by using a warehouse configuration template

2/18/2021 • 4 minutes to read • [Edit Online](#)

This topic explains how to set up a warehouse by using a warehouse configuration template. There are several predefined configuration templates that you can use. For information about how to use these templates, see [Configuration data templates](#).

Scenarios where configuration templates can be helpful

Configuration templates can be helpful in many scenarios. Here are some examples:

- You've completed and tested a configuration setup in a test environment, and you now want to copy the setup to a production environment.
- You want to roll the warehouse setup out to several legal entities or create a new warehouse in the same legal entity.
- You want to quickly prepare for a demo of the warehouse functionality.
- You want existing items and warehouses to use the functionality in Warehouse management instead of the functionality in Inventory management.

This topic focuses on the first of these scenarios. It shows how you can use a configuration template to copy a configuration setup from a test environment to a production environment.

Copy a configuration setup from a test environment to a production environment

For this scenario, the configuration setup for a warehouse and some transaction processes already exist in a test environment. You now want to copy the configuration setup for the warehouse from the test environment to a production environment.

NOTE

It's important that you include other related setup data when you copy a configuration setup. For example, you want to set up products by copying the setup from a test environment. However, you can't set up a fixed picking location for a product before that product is created. Although individual configuration templates don't support this type of dependency, there are default data templates that support it. You can easily include these default data templates in a configuration process.

Export a default warehouse template

1. Open the **Data management** workspace.

NOTE

If you're using this workspace for the first time, you must load all the data entities before you continue.

2. Select the **Templates** tile, and then select **Load default templates** to load the default templates.

NOTE

Load default templates is available only in the **Enhanced** view. Select **Framework parameters**, and then, in the **View defaults** field, select **Enhanced view**.

3. After the default templates are loaded, you can change them so that they meet your business requirements.

NOTE

To load default templates and import templates, you must have system administrator access. This requirement helps guarantee that all entities are correctly loaded into the template.

4. Make sure that you're in the legal entity that you want to export the company-specific data from.
5. In the workspace, select **Export**.
6. Create a new export project.
7. Select **+ Add template**, and find the **400 - WMS** default warehouse template. This template adds data entities for warehouse configuration.

NOTE

If the data that you're exporting must be filtered (for example, you want to export only the data that is related to a specific warehouse), you must evaluate each data entity and add filtering via a query. Alternatively, you can export all data and then delete the records that aren't required in the destination files.

8. Select **Export**. Data that is related to all the data entities in the project is exported.

You can download a zip file for the data package. This file contains all the data in the selected format (for example, Excel format). As has been mentioned, some records in the data package files might have to be updated before you can import them into the production environment. If you update a record, make sure that you don't change the file name.

Import a warehouse configuration setup

1. In the destination environment, make sure that you're in the company that you want to import the warehouse data into.

NOTE

Before you do the import, you should identify any data dependencies. For example, the **Warehouse management** template includes a data entity that is named **Warehouse disposition codes**. This entity contains data that is related to the **Disposition codes** setup page (**Warehouse management** > **Setup** > **Mobile device** > **Disposition codes**). If an existing setup already handles the return process for sales orders, the **Return disposition code** field contains a value. The disposition code in this field is related to the **Disposition code** data entity, which is part of the **Sales and marketing** template. If the data from the **Disposition code** data entity isn't imported before the data from the **Warehouse disposition codes** field, the import will fail.

2. In the **Data management** workspace, select **Import**.
3. Create a new import project.
4. Select **+ Add file**, and upload the zip file for the data package.

5. Select **Import**. In the **Enhanced** view, you can use the **Filter** option to quickly get an overview of issues that might occur during the import.

The **View execution** log provides detailed information about each data entity that is imported. You can use the staging data view to quickly get to the target data. In this way, you can see what the imported data looks like on the related pages in the application. When you use the default data templates, the import sequence for each data entity works in the predefined manner, to help guarantee that all dependent data is imported first. If custom data entities are part of the project, you must make sure that the correct sequence is defined. For more information, see [Configuration data templates](#).

To learn more about how to use warehouse template to copy the configuration of a warehouse from one company to a new company within the same instance, see this 3-minute video on YouTube about [how to use warehouse template to copy the configuration for Finance and Operations](#).

Related topic

[Configuration data templates](#)

NOTE

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Control warehouse work by using work templates and location directives

2/18/2021 • 6 minutes to read • [Edit Online](#)

This topic describes how to use work templates and location directives to determine how and where work is carried out in the warehouse.

The instructions that warehouse workers receive on a mobile device are determined by the Dynamics 365 Supply Chain Management work templates that you set up to define the various warehouse processes and tasks. Work templates determine how the work is performed for each warehouse process. By linking a location directive to work templates, you can help guarantee that work occurs in specific physical areas of the warehouses.

Work templates

The **Work templates** page lets you define the work operations that must be performed in the warehouse. Typically, warehouse work operations consist of a pair of actions: a warehouse worker picks up on-hand inventory in one location and then puts the picked inventory down in another location.

Work templates consists of a header and associated lines. Each work template is for a specific *work order type*. Many work order types are associated with source documents, such as purchase or sales orders. However, other work order types represent separate warehouse processes, such as cycle counting. The *work pool ID* lets you organize work into groups.

Use the settings in the work header definition to determine when a new piece of work should be created. For example, you can set a maximum number of pick lines and a maximum expected pick time. Then, if the work for a sales order picking process exceeds either of those values, that work is split into two pieces of work.

Use the **Work header breaks** button to define when the system should create new work headers. For example, to create a work header for each *order number*, select **Edit query** on the Action Pane, and then add the **Order number** field to the **Sorting** tab of the query editor. Fields that are added to the **Sorting** tab are available for selection as *grouping fields*. To set your grouping fields, select **Work header breaks** on the Action Pane, and then, for each field that you want to use as a grouping field, select the check box in the **Group by this field** column.

The work lines represent the physical tasks that are required to process the work. For example, for an outbound warehouse process, there might be one line for picking up the items in the warehouse and another line for putting those items into a staging area. There can then be an additional line for picking the items from staging and another line for putting the items into a truck as part of the loading process. You can set a *directive code* on work template lines. A directive code is linked to a location directive, and therefore helps ensure that the warehouse work is processed in the correct location in the warehouse.

You can set up a query to control when a particular work template is used. For example, you can set a limitation so that a particular template can be used for work only in a specific warehouse. Alternatively, you might have several templates that create work for outbound sales order processing, depending on the sales origin. The system uses the **Sequence number** field to determine the order that the available work templates are assessed in. Therefore, if you have a very specific query for a particular work template, you should give it a low sequence number. That query will then be evaluated before the other, more general queries.

NOTE

To prevent the system from automatically overwriting work template *sequence numbers* after a template has been deleted, turn on the *Preserve work template sequence numbers on delete* feature in [Feature management](#).

To stop or pause a work process, you can use the **Stop work** setting on the work line. In that case, the worker who is performing the work won't be asked to perform the next work line step. To move on to the next step, that worker or another worker must select the work again. You can also separate the tasks within a piece of work by using a different *work class ID* on the work template lines.

Location directives

Location directives are rules that help identify pick and put locations for inventory movement. For example, in a sales order transaction, a location directive determines where the items will be picked, and where the picked items will be put. Location directives consist of a header and associated lines, and you create them on the **Location directives** page.

On the header, each location directive must be associated with a *work order type* that specifies the type of inventory transaction that the directive will be used for, such as sales orders, replenishment, or raw material picking. The *work type* specifies whether the location directive will be used for picking or putting work, or for some other warehouse process, such as counting or inventory status changes. You must also specify a *site* and a *warehouse*. A *directive code* that you specify on the header can be used to link the location directive to one or more work templates.

As for work templates, you can set up a query to determine when a particular location directive is used. For example, you can specify that when e-commerce is the origin of a sales order, the inventory must be picked up from a dedicated area in the warehouse. The system uses the **Sequence number** field to determine the order that the available location directives are assessed in.

The location directive lines set additional restrictions on the application of the location finding rules. You can specify a minimum quantity and a maximum quantity that the directive should apply to, and you can specify that the directive should be for a specific inventory unit. For example, if the unit of measure is pallets, the items in pallets can be put in a specific location. You can also specify whether the quantity can be split across multiple locations. Like the location directive header, each location directive line has a sequence number that determines the order that the lines are assessed in.

Location directives have one additional level of detail: *location directive actions*. You can define multiple location directive actions for each line. Once again, a sequence number is used to determine the order that the actions are assessed in. On this level, you can set up a query to define how to find the best location in the warehouse. You can also use predefined **Strategy** settings to find an optimal location.

For more information about how to create and configure location directives, see [Create a location directive](#).

How location directives work

Location directives determine *where* items should be picked and *where* they should be put. The system evaluates a location directive against each work line and then selects a location, based on the work line details. The system first finds all location directives that match a particular work line (for example, they are for the correct warehouse and match the query). It then sequentially evaluates the directives that it has found.

NOTE

There are special cases where the pick location or put location is pre-selected. For example, during *purchase registration*, the first pick is always from the location where the registration occurs. Another example is *inventory movement by template*, where the warehouse worker selects the pick location, and only the put locations are found through location directives.

Additional resources

- Video: [Warehouse management configuration deep dive](#)
- Help topic: [Create location directives](#)

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Work with location directives

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Location directives are rules that help identify pick and put locations for inventory movement. For example, in a sales order transaction, a location directive determines where the items will be picked, and where the picked items will be put. Location directives consist of a header and associated lines. They are created for specific *work order types*.

NOTE

This topic applies to features in the **Warehouse management** module. It doesn't apply to features in the [Inventory management](#) module.

You can use location directives to perform the following tasks:

- Put away incoming items.
- Pick and stage items for outbound transactions.
- Pick and put raw materials for production.
- Replenish locations.

Prerequisites

Before you can create a location directive, you must follow these steps to make sure that the prerequisites are in place.

1. Make sure that the required license key is turned on. Go to **System administration > Setup > License configuration**, expand the **Trade** license key, and then select the **Warehouse and Transportation management** configuration key. Note that admin access is required for this step.
2. Go to **Warehouse management > Setup > Warehouse > Warehouses**.
3. Create a warehouse.
4. On the **Warehouse** FastTab, set the **Use warehouse management processes** option to *Yes*.
5. Create locations, location types, location profiles, and location formats. For more information, see [Configure locations in a WMS-enabled warehouse](#).
6. Create sites, zones, and zone groups. For more information, see [Warehouse set up](#) and [Configure locations in a WMS-enabled warehouse](#).

Work order types for location directives

Many of the fields that can be set for location directives are common to all work order types. However, other fields are specific to particular work order types.

Location directives

Work order type

Sales orders

Purchase orders

Sales orders

Raw material picking

Finished goods put away

Co-product and by-product put away

Transfer issue

Transfer receipt

Inventory movement

Canceled work

Cycle counting

Replenishment

Return orders

Kanban put away

Kanban picking

Counting discrepancies accepted

Packed container picking

NOTE

Two work order types, *Canceled work* and *Cycle counting*, are used only by the system. Location directives can't be created for these work order types.

The tables in the following subsections list the common and worker order type-specific fields that are available when you set up a location directive.

Fields that are common to all work order types

The following table lists the fields that are common to all work order types.

FASTTAB	FIELD
Location directives	Work type
Location directives	Site
Location directives	Warehouse
Location directives	Directive code
Location directives	Multiple SKU
Lines	Sequence number
Lines	From quantity
Lines	To quantity
Lines	Unit
Lines	Locate quantity
Lines	Restrict by unit
Lines	Round up to unit
Lines	Locate packing quantity

FASTTAB	FIELD
Lines	Allow split
Location Directive Actions	Sequence number
Location Directive Actions	Name
Location Directive Actions	Fixed location usage
Location Directive Actions	Allow negative inventory
Location Directive Actions	Batch enabled
Location Directive Actions	Strategy

Fields that are specific to work order types

The following table lists the fields that are specific to particular work order types.

FASTTAB	FIELD	WORK ORDER TYPE
Location directives	Locate by	Purchase orders
Location directives	Applicable disposition code	Purchase orders
Location directives	Disposition code	Purchase orders
Location directives	Applicable disposition code	Finished goods put away
Location directives	Disposition code	Finished goods put away
Location directives	Applicable disposition code	Return orders
Location directives	Disposition code	Return orders
Location directives	Applicable disposition code	Kanban put away
Location directives	Applicable disposition code	Kanban picking
Lines	Immediate replenishment template	Sales orders
Lines	Immediate replenishment template	Raw material picking
Lines	Immediate replenishment template	Transfer issue
Lines	Immediate replenishment template	Kanban picking

Open the Location directives page

To open the **Location directives** page, go to **Warehouse management > Setup > Location directives**.

From there, you can view, create, and edit your location directives by using the commands on the Action Pane. See the remaining sections of this topic for information about how to use all the fields that are available on the

page.

Action Pane

The Action Pane on the **Location directives** page contains buttons that you can use to create, edit, and delete directives (**Edit**, **New**, and **Delete**). It also contains the following buttons that let you adjust the sequence that the location directive is processed in and configure a query that defines the criteria for applying the location directive:

- **Move up** – Move the selected location directive up in the sequence. For example, you can move it from sequence number 4 to sequence number 3.
- **Move down** – Move the selected location directive down in the sequence. For example, you can move it from sequence number 4 to sequence number 5.
- **Edit query** – Open a dialog box where you can define the conditions that the selected location directive should be processed under. For example, you might want it to apply only to a specific warehouse.

Location directives header

The location directive header includes the following fields for the sequence number and descriptive name of the location directive:

- **Sequence number** – This field indicates the sequence that the system tries to apply each location directive in for the selected work order type. Low numbers are applied first. You can change the sequence by using the **Move Up** and **Move Down** buttons on the Action Pane.
- **Name** – Enter a descriptive name for the location directive. This name should help identify the general purpose of the directive. For example, enter *Sales order picking in warehouse 24*.

Location directives FastTab

The fields on the **Location directives** FastTab are specific to the work order type that is selected in the **Work order type** field in the list pane.

- **Work type** – Select the type of work that must be performed. The available values depend on the type of inventory transaction that you selected in the **Work order type** field. Select one of the following values:
 - **Put** – The location directive will try to find the most ideal location to put or locate inventory that comes into the system from receiving, production, or inventory adjustments. It can also be used to define the put to the stage location or the final bay door shipping location.
 - **Pick** – The location directive will try to find the most ideal locations to physically reserve inventory from (that is, create work). The pick can be completed (that is, the pick work line can be closed) even if the work isn't completed. The user can complete physical picking. In the system, that action is a pick step. The user can then cancel from the mobile device and complete the work later. However, the work header is first closed when the final put is completed.

IMPORTANT

The other values in the **Work type** field aren't relevant for location directives. They appear only because the field isn't filtered to match the selected work order type.

- **Site** – This field is mandatory, because the location directive must be able to determine the site and warehouse that it's valid for.
- **Warehouse** – This field is mandatory, because the location directive must be able to determine the site and warehouse that it's valid for.

- **Directive code** – Select the directive code to associate with a work template or replenishment template. On the **Directive code** page, you can create new codes that can be used to connect work templates or replenishment templates to location directives. Directive codes can also be used to establish a link between any work template line and a location directive (such as the bay door or stage location).

TIP

If a directive code is set, the system won't search location directives by sequence number when work must be generated. Instead, it will search by directive code. In this way, you can be more specific about the location template that is used for a particular step in a work template, such as the step for staging the materials.

- **Multiple SKU** – Set this option to *Yes* to enable multiple stockkeeping units (SKUs) to be used on a location. For example, multiple SKUs must be enabled for the bay door location. If you enable multiple SKUs, your put location will be specified in work, as expected. However, the put location will be able to handle only a multi-item put (if work includes different SKUs that must be picked and put). It won't be able to handle a single-SKU put. If you set this option to *No*, your put location will be specified only if your put has just one kind of SKU.

IMPORTANT

To be able to do both multi-item puts and single-SKU puts, you must specify two lines that have same structure and setup, but you must set the **Multiple SKU** option to *Yes* for one line and *No* for the other. Therefore, for put operations, you must have two identical location directives, even if you don't have to distinguish single SKUs and multiple SKUs on a work ID. Often, if you don't set up both these location directives, unexpected business process locations will come from the applied Location directive. You must use a similar setup for location directives that have a **Work type** of *pick* if you need to process orders that include multiple SKUs.

Use the **Multiple SKU** option for work lines that handle more than one item number. (The item number will be blank in the work details, and it will be shown as **Multiple** on the processing pages in the warehouse app.)

In a typical example scenario, a work template is set up so that it has more than one pick/put pair. In this case, you might want to search for a specific staging location to use for lines with a **Work type** of *Put*.

NOTE

If the **Multiple SKU** option is set to *Yes*, you can't select **Edit query** on the Action Pane, because the query can't evaluate at the item level when there are multiple items. To ensure that the desired location directive is selected, use the **Directive code** field to guide the selection of the location directive that is related to the put lines where that directive code is assigned in the work template.

Unless you always work with either single-item or mixed-item operations, it's important that you define two location directives for the *Put* work type: one where the **Multiple SKU** option is set to *Yes* and one where it's set to *No*.

- **Applicable disposition code** – Specify whether the disposition code of the location directive must match the disposition code that is applied when the item is received, or whether the location directive can be selected based on any disposition code. If you select *Exact match*, and the **Disposition code** field is blank, only blank disposition codes will be considered for this location directive.

NOTE

This field is available only for selected work order types where replenishment is permitted. For a complete list, see the [Fields that are specific to work order types](#) section earlier in this topic.

- **Locate by** – Specify whether the putaway quantity should be the whole quantity on the license plate, or whether it should be item by item. Use this field to help ensure that all the contents on a license plate is put into one location, and that the system doesn't suggest that you split the contents into several locations for **ASN** (license plate receiving), **Mixed license plate** receiving, and **Cluster** receiving processes. (The **Cluster** receiving process requires that the *Cluster putaway feature* feature be turned on.) The behavior of the location directive query, the lines, and the location directive actions will vary, depending on the value that you select. The **Lines** FastTab is only used when the **Locate by** is set to *Item*.

NOTE

This field is available only for selected work order types where replenishment is permitted. For a complete list, see the [Fields that are specific to work order types](#) section.

- **Disposition code** – This field is used for location directives that have a work order type of *Purchase orders*, *Finished goods putaway*, or *Return orders*, and a work type of *Put*. Use it to guide the flow to use a specific location directive, depending on the disposition code that a worker selected in the warehouse app. For example, you can direct returned goods to an inspection location before they are returned to stock. A disposition code can be linked to an inventory status. In this way, it can be used to change the inventory status as part of a receiving process. For example, you have a disposition code, *QA*, that sets the inventory status to *QA*. You can then have a separate location directive to move that inventory to a quarantine location.

NOTE

This field is available only for selected work order types where replenishment is permitted. For a complete list, see the [Fields that are specific to work order types](#) section.

Lines FastTab

Use the **Lines** FastTab to establish conditions for applying the related actions that are specified on the **Location directive actions** FastTab. For each line, you can specify the minimum quantity and maximum quantity that the actions should apply to. You can also specify that the actions should apply to a specific inventory unit.

- **Sequence number** – Enter the sequence that each location directive line should be processed in for the selected work type. You can change the sequence as you require by using the **Move up** and **Move down** buttons on the toolbar.
- **From quantity** – Specify the start of the range of quantities that the line applies to. Specify the quantity in the unit of measure that is selected in the **Unit** field.
- **To quantity** – Specify the end of the range of quantities that the line applies to. Specify the quantity in the unit of measure that is selected in the **Unit** field.
- **Unit** – Select the unit of measure for the items. You can specify a minimum quantity and a maximum quantity that the directive should apply to, and you can specify that the directive should be for a specific inventory unit. The **Unit** field is used *only* for quantity evaluation. To determine whether the location directive line is applicable at all, the system uses the quantity in the unit that is specified on that line. Every time that it reaches a location directive line, the system tries to convert the demand unit to the unit

that is specified on the line. If the unit of measure conversion doesn't exist, the system moves on to the next line.

- **Locate quantity** – This field is used only during attempts to put or locate items in the warehouse. (Therefore, it applies only when the **Work type** field is set to *Put*). Select one of the following values to specify the quantity that is used to evaluate whether a quantity is within the **From quantity to To quantity** range:
 - **License plate quantity** – Use the quantity on the license plate that is being received.
 - **Unitized quantity** – Use the quantity that is used during the transaction. For example, you receive a quantity of 1,000 in a warehouse and break it into 10 license plates, each of which has a quantity of 100. In this case, you can use a quantity of 1,000 items instead of the license plate quantity of 100.
 - **Remaining quantity** – Use the quantity that must still be received on the purchase order line that is being processed.
 - **Expected quantity** – Use the total quantity of the purchase order line, regardless of what has already been received.
- **Restrict by unit** – This check box lets you make the location directive line specific to a unit of measure or multiple units of measure. Select it to restrict the units of measure that are considered valid selection criteria for the location directive lines. This functionality works only for location directives where the **Work type** field is set to *Pick*.

For example, when you reserve quantities, you want to reserve pallets only from a specific set of locations. In this case, the lines will restrict that sequence to pallets in such a way that any quantity that is less than a pallet won't be selected for the location directive.

Note that the **Restrict by unit** check box doesn't control the unit or units that are applied on work lines. The unit restriction applies only to the units that are made available via the unit sequence group. For example, an item is associated with a unit sequence group that includes both the *pallets* unit and the *pcs* units. A unit of measure has been defined, where 1 pallet = 100 pcs, and the location directive uses the **Restrict by unit** functionality only for pallets. Furthermore, a work template has been defined that limits the work header creation to 50 pcs. In this case, work lines of 50 pcs will be created. To specify the unit of measure for restriction, follow these steps:

1. On the **Lines** FastTab, select **Restrict by unit** on the toolbar. (This button becomes available only after you select the **Restrict by unit** check box on the line and then select **Save**.)
2. On the **Restrict by units** page, in the **Unit** field, select the unit of measure that you want to restrict by for the pick and put processes.

- **Round up to unit** – This field works together with the **Restrict by unit** check box. For example, if **Restrict by unit** and **Round up to unit** are selected on the location directive line, the work that is generated from the directive for raw material picking should be rounded up to a multiple of one of the handling unit that is specified on the **Restrict by unit** page.

NOTE

This **Round up to unit** setup works only for the *Raw material picking* work order type, and only for location directives where the **Work type** field is set to *Pick*.

- **Locate Packing Qty** – If you specify a packing quantity on a sales order, transfer order, or production order, this check box lets you restrict the system so that it can select only locations that have at least that packing quantity.

NOTE

This functionality works only with location directives of the *Pick* type.

- **Allow Split** – Specify whether the location directive can split the quantity that is being received or reserved across multiple warehouse locations, or whether the whole quantity must be located in a single location or reserved from a single location to create work.
- **Immediate replenishment template** – Use this field to create a connection to a replenishment template, so that replenishment is started immediately if items aren't allocated. If you leave this field blank, item replenishment won't be started until all lines of the location directive have been processed.

NOTE

This field is available only for selected work order types where replenishment is permitted. For a complete list, see the [Fields that are specific to work order types](#) section.

Location directive actions FastTab

You can define multiple location directive actions for each line. Once again, a sequence number is used to determine the order that the actions are assessed in. At this level, you can set up a query to define how the best location in the warehouse is found. You can also use predefined **Strategy** values to find an optimal location.

- **Sequence number** – This field shows the sequence that the actions are processed in for the selected work type. You can change the sequence by using the **Move Up** and **Move Down** buttons on the toolbar.
- **Name** – Enter the name of the location directive action. Be specific, so that the action that is performed is clear from the name.
- **Fixed location usage** – Specify which locations the location directive should consider. Select one of the following values:
 - **Fixed and non-fixed locations** – The location directive will consider all locations.
 - **Only fixed locations for the product** – The location directive will consider only fixed locations for products.
 - **Only fixed locations for the product variant** – The location directive will consider only fixed locations for product variants.
- **Allow negative inventory** – Select this check box to allow negative inventory at the specified warehouse location in location directives.
- **Batch Enabled** – Select this check box to use batch strategies for items that are batch-enabled. It's important that you select this check box for processes that use location directives to find locations to pick batch number–tracked items from. In this way, the search for locations that hold batch number–tracked items is included. If this check box is selected, and the **Strategy** field is set to *None*, the system will move on to the next action line.
- **Strategy** – To more easily and quickly define the actions that are associated with each location directive line, you can select one of the following predefined strategies:
 - **None** – No strategy will be used.
 - **Match packing quantity** – This strategy verifies whether a pick location has the specified packing quantity. This strategy is valid only when the **Work type** field is set to *Pick*.
 - **Consolidate** – This strategy consolidates items in a specific location when similar items are already available. This strategy is valid only when the **Work type** field is set to *Put*. A typical setup for put tries

to consolidate on the first action line and then, on the second line, tries to put without consolidation. Consolidation of goods makes later picking more efficient.

- **FEFO batch reservation** – This strategy uses first expiry, first out (FEFO) batch reservations. Use it when inventory is located by using a batch expiration date and allocated for batch reservation. You can use this strategy only for batch-enabled items. It's valid only when the **Work type** field is set to *Pick*.
- **Round up to the full LP and FEFO batch** – This strategy combines the elements of the *FEFO batch reservation* and *Round up to a full LP* strategies. It's valid only for batch-enabled items and location directives that have a work type of *Pick*. The line must be batch-enabled to use the *FEFO batch reservation* strategy, and the *Round up to a full LP* strategy can be used only for replenishment. If this strategy is configured together with a location stocking limit, it can cause the selected put work location to be overloaded and stocking limits to be ignored.
- **Round up to a full LP** – This strategy is used to round up the inventory quantity so that it matches the license plate quantity that is assigned to the items that must be picked. You can use this strategy only for replenishment location directives of the *Pick* type. If this strategy is configured together with a location stocking limit, it can cause the selected put work location to be overloaded and stocking limits to be ignored.
- **License plate guided** – Use this strategy when you release the order to the warehouse to create the pick-and-put work. You can use this approach for multiple license plates. This strategy will try to reserve and create picking work against the locations that hold the requested license plates that have been associated with the transfer order lines. However, if these actions can't be completed, but you still want to create picking work, you should fall back to another strategy for location directive actions. Depending on your business process requirements, you might also want to search for inventory in another area of the warehouse.
- **Empty location with no incoming work** – Use this strategy to locate empty locations. A location is considered empty if it has no physical inventory and no expected incoming work. You can use this strategy only for location directives that have a work type of *Put*.
- **Location aging FIFO** – Use the first in, first out (FIFO) strategy to ship both batch-tracked items and non-batch-tracked items, based on the date when the inventory entered the warehouse. This capability can be especially useful for non-batch-tracked inventory, where no expiration date is available to use for sorting. The FIFO strategy finds the location that contains the oldest aging date, and then allocates picking based on that aging date.
- **Location aging LIFO** – Use the last in, last out (LIFO) strategy to ship both batch-tracked items and non-batch-tracked items, based on the date when the inventory entered the warehouse. This capability can be especially useful for non-batch-tracked inventory, where no expiration date is available to use for sorting. The LIFO strategy finds the location that contains the newest aging date, and then allocates picking based on that aging date.

Example: Using location directives

For this example, consider a purchase order process where the location directive must find free capacity within a warehouse for inventory items that have just been registered at the receiving dock. First, you need to find free capacity within the warehouse by consolidating with existing on-hand inventory. If consolidation isn't possible, then you need to find an empty location.

For this scenario, you must define two location directive actions. The first action in the sequence must use the *Consolidate* strategy, and the second should use the *Empty location with no incoming work* strategy. Unless you define a third action to handle an overflow scenario, two outcomes are possible when there is no more capacity in the warehouse: work can be created even though no locations are defined, or the work creation process can fail. The outcome is determined by the setup on the **Location directive failures** page, where you can choose whether to select the **Stop work on location directive failure** option for each work order type.

Next step

After you create location directives, you can associate each directive code with a work template code for work creation. For more information, see [Control warehouse work by using work templates and location directives](#).

Additional resources

- Video: [Warehouse management configuration deep dive](#)
- Help topic: [Control warehouse work by using work templates and location directives](#)

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Configure product filters for warehouse transactions

2/18/2021 • 8 minutes to read • [Edit Online](#)

This topic describes how to configure product filters and filter codes to categorize inventory items in a warehouse. You can also use filters to specify which customers can order a particular item and which items can be purchased from a particular vendor.

Additionally, you can set up and use product filters to automatically organize inventory items in a warehouse and combine filtered items into filter groups. Filters can be used to put items into categories for handling, purchasing, and selling processes. You might want to group items together or separate them from each other when the way that they are handled is based on weight or handling restrictions. You can also specify which customers or vendors an item can be purchased from or sold to.

Prerequisites

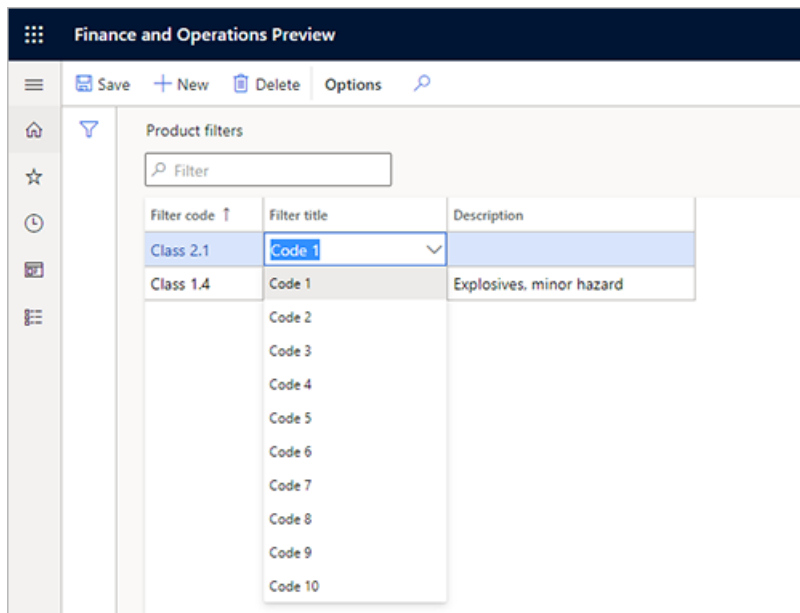
The following table shows the prerequisites that must be in place before you start.

PREREQUISITE	INSTRUCTIONS
Before you start to configure products on the Released product details page, you must turn on warehouse processing for the product's storage dimension group.	Go to Product information management > Setup > Dimension and variant groups > Storage dimension groups , and select or create a storage dimension group where the Use warehouse management processes option is set to <i>Yes</i> .
If you will use customer filters and/or vendor filters, you must enable their use in Warehouse management parameters.	Go to Warehouse management > Setup > Warehouse management parameters . On the Product filters tab, set the Enable customer filters and/or Enable vendor filters option to <i>Yes</i> .

Set up product filters

Product filters provide up to 10 **Filter title** characteristics, which are enumeration (enum) values. These enum values are available for selection when you create a product filter. The enum values *Code 1* through *Code 10* are system-defined and represent a specific characteristic or attribute of an item. For example, *Code 1* might represent items that have a hazardous material classification. *Code 2* might represent items that only vendors can purchase. Product filters then define the specific **Filter code** value that is associated with a **Filter title** value.

1. Go to **Warehouse management > Setup > Product filters > Product filters**.
2. On the Action Pane, select **New** to add a product filter to the grid.
3. In the **Filter title** field, select a value.
4. In the **Filter code** field, enter a value.



- In the **Description** field, enter a name for the code. For example, *Code 2* might represent vendors. You can then create a product filter for a specific vendor or group of vendors. For more information, see the [Setup vendor filter codes](#) section later in this topic.

Filter code ↑	Filter title	Description
Class 1.4	Code 1	Explosives, minor hazard
Class 2.1	Code 1	Flammable Gases
Class 3	Code 1	Flammable and combustible liquids
Class 4.1	Code 1	Flammable solids
Class 4.2	Code 1	Spontaneously combustible
Class 4.3	Code 1	Dangerous when wet
V1001	Code 2	Acme Office Supplies
V1002	Code 2	Lande Packaging Supplies
V1003	Code 2	Ade Supply Company

Set up product filter groups

You can use filter groups to group filter codes. This capability is helpful when a group is used in a query in a location directive, and you want to search for the group instead of a series of codes. Each filter group is associated with an item group.

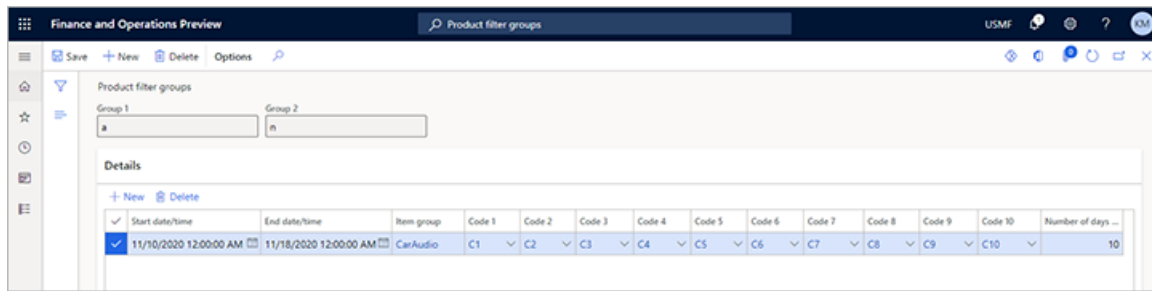
IMPORTANT

Not all product filter groups are available for filter codes that are higher than *Code 4* (that is, *Code 5* through *Code 10*). For example, for released products, although all the product filter codes will be added, the grouping of filter codes won't be updated. This behavior might be updated in later releases.

To set up filter groups, follow these steps.

- Go to **Warehouse management > Setup > Product filters > Product filter groups**.
- On the Action Pane, select **New**.
- In the **Group 1** and **Group 2** fields, enter the names that will be used to categorize items.
- On the **Details** FastTab, select **New** to add a line.

- In the **Start date/time** and **End date/time** fields, enter start and end dates for the filter group.
- In the **Item group** field, select the item group that the product filter should apply to.
- In the **Code 1** through **Code 10** fields, select the filter codes to include in the group, as required.



NOTE

If you receive an error message when you close the page, a code setup might be missing. On the **Item groups** page, you can make the codes mandatory for an item group by selecting the **Assign filter code 1 for item group**, **Assign filter code 2 for item group**, and so on, check boxes.

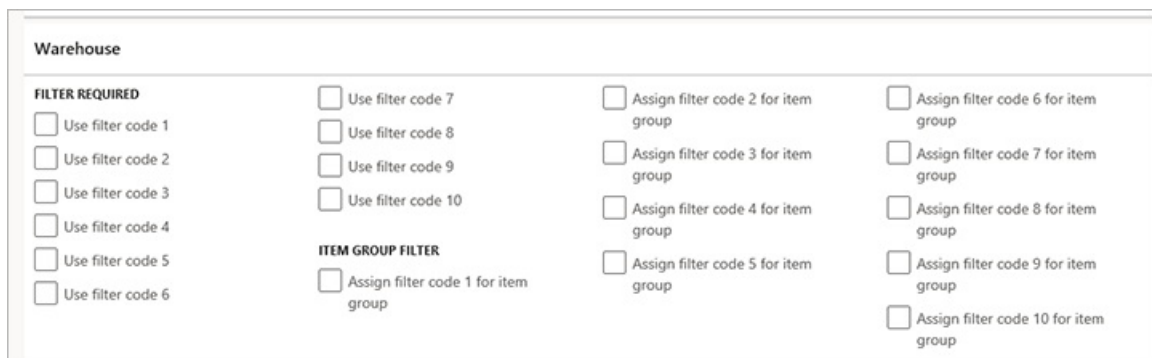
Set up filter codes on item groups

By setting up filter codes on an item group, you can make the codes that are required for products that are attached to that item group.

To set up filter codes on item groups, follow these steps.

- Go to **Inventory management > Setup > Inventory > Item groups**.
- On the Action Pane, select **New** to create an item group.
- In the **Item group** field, enter a name.
- In the **Name** field, enter a description.
- On the **Warehouse** FastTab, in the **Filter required** section, select the check boxes for the filter codes that must be specified for products that are associated with the item group.

To update a released product, open its **Released product details** page, and then, on the Action Pane, select **Edit**. The filters that are associated with codes then become available on the **Warehouse** FastTab.



- In the **Item group filter** section, select the check boxes for the filters that must match for the filter group to be the default filter group for an item.

For example, if the **Use filter code 1** and **Use filter code 2** check boxes are selected, both filter code 1 and filter code 2 of the item must match the setup of the filter group for the item group before the filter group can be selected. When you create a new item, the selected filter group will be the default filter

group in the **Group 1** and **Group 2** fields on the **Warehouse** FastTab of the **Released** product details page.

IMPORTANT

Product filter codes are enabled only for items that use advanced warehouse management.

Specify filter codes for released products

Follow these steps to specify filter codes for released products. For example, you can use filter codes to group hazardous products that specific vendors purchase.

1. Go to **Product information management > Products > Released products**.
2. On the Action Pane, select **New** to create a product.
3. In the **New released product** dialog box, enter the data that is required to create the base of a new product, and then select **OK**.

Product filter codes aren't enabled unless the item group that is attached to the product has been configured for filter codes.

For more information, see [Create a new product](#).

4. On the **Warehouse** FastTab, in the **Product filter codes** section, select filter codes for the **Code 1** through **Code 10** fields, as required, to specify filter codes for the product.

Set up generally available items

You can make specific inventory items available only for customers, only for vendors, or for both customers and vendors.

NOTE

Customer and vendor filters don't apply to any item that is set up as generally available.

To set up generally available items, follow these steps.

1. Go to **Warehouse management > Setup > Product filters > Generally available products**.
2. On the Action Pane, select **New** to create a record.
3. In the **Customer or vendor** field, select *Customer*, *Vendor*, or *All* to make the items available for customers, vendors, or both.
4. In the **Start date/time** field, enter the date and time when the item will become available.
5. In the **Item group** field, select an item group.
6. In the **Code 1** through **Code 10** fields, select the filter codes to limit the items that are generally available.

When you select an item group, you set that group of items as generally available. By selecting filter codes in these fields, you limit the items that are available.

Set up customer product filters

You can use this optional procedure to specify items that should be available for a customer in addition to the

items that are made available via the filter setup on the **Generally available items** page. You can set up multiple filters for a single customer.

To set up customer filter codes, follow these steps.

1. Go to **Sales and marketing > Customers > All customers**.
2. Select a customer.
3. On the Action Pane, on the **Customer** tab, in the **Set up** group, select **Product filters**.
4. On the **Product filter codes** page, on the Action Pane, select **New**.
5. In the **Start date/time** and **End date/time** fields, enter start and end dates for the selected item group.
6. In the **Item group** field, select an item group.
7. In the **Code 1** through **Code 10** fields, select the filter codes to use as criteria to limit the items that are available for customers in the selected item group. You must make a selection for every filter code that is set up for the item group.

Set up vendor product filters

You can use this optional procedure to specify items that should be available for a vendor in addition to the items that are made available via the filter setup on the **Generally available items** page. You can set up multiple filters for a single vendor.

To set up vendor filter codes, follow these steps.

1. Go to **Procurement and sourcing > Vendors > All vendors**.
2. Select a vendor.
3. On the Action Pane, on the **Vendor** tab, in the **Set up** group, select **Product filters**.
4. On the **Filter codes** page, on the Action Pane, select **New**.
5. In the **Start date/time** and **End date/time** fields, enter start and end dates for the selected item group.
6. In the **Item group** field, select an item group.
7. In the **Code 1** through **Code 10** fields, select the filter codes to use as criteria to limit the items that are available for vendors in the selected item group. You must make a selection for every filter code that is set up for the item group.

NOTE

The setup of vendor product filters applies to released products where warehouse management processes are enabled for the associated storage dimension group. The filter codes are used to determine whether the system will allow users to purchase a given item from a given vendor when they create purchase order lines. Microsoft Dynamics 365 Supply Chain Management has two methods for handling vendor approval. If one or more released products exist where the **Approved vendor check method** field is set to *Warning only* or *Not allowed*, both vendor approval methods could be enabled for those items. This situation might cause issues when users create purchase order lines.

See also

For more information see the blog post [WMS-Warehouse Filter Codes](#)

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Location stocking limits

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You can use the **Location stocking limits** page (**Warehouse management > Setup > Warehouse > Location stocking limits**) to control the load capacity at warehouse locations without having to use the more advanced processes for volumetric calculations of physical products.

The purpose of location stocking limits is to evaluate the maximum quantity that a location can contain. You can set up the feature on any of three levels, each of which has its own tab on the **Location stocking limits** page:

- Products
- Product variants
- Container types

For each level, you can define different field values. The system will then evaluate the capacity of a specific location, based on the **Quantity** and **Unit** values for each row. It will select the most detailed matching record first. For example, a row that has a value in the **Location profile ID** field will be evaluated before a row that has a value only in the **Warehouse** field. The remaining capacity will also be evaluated, based on the **Quantity** value for the location stocking limit record that is used.

In the **Products** section of the page, you can define the following field values for the search for location stocking limits:

- Warehouse
- Location profile ID
- Location
- Pack size category ID
- Item number
- Unit

NOTE

You don't have to define a **Unit** value for each location stocking limit record. The location capacity calculations will be based on the inventory unit quantities. If no unit conversion is defined for a value that is used, the location stocking limit record will be skipped, as if another **Item number** value is defined for it.

Example – Purchase order receiving

This example is based on a clean *USMF* demo data set, where the following values are set on the **Product variants** tab of the **Location stocking limits** page.

WAREHOUSE	LOCATION PROFILE ID	ITEM NUMBER	SIZE	QUANTITY	UNIT
24	FLOOR	D0013	M	300	Ea
24	FLOOR	D0013	L	240	Ea
24	FLOOR	D0013	S	360	Ea

Different unit of measure product variants are set up for the products. These variants are aligned with the location stocking limits for three pallets (PL):

- **Size M:** 1 PL = 100 each (Ea)
- **Size L:** 1 PL = 80 Ea
- **Size S:** 1 PL = 120 Ea

Therefore, each location where the **Location profile ID** value is set to *FLOOR* can carry *3 PL* of item number *D0013*.

Prepare for the example

In this example, you will run a purchase order receiving flow for two lines. However, you must first update the demo data in the following way to ensure that the locations allow mixed items to be carried, only the empty locations *FL-002* through *FL-004* are used, and there is no open inbound work.

1. For location *FL-001*, change the value of the **Location profile** field from *FLOOR* to *FLOOR-05*.
2. For the *FLOOR* location profile, set the **Allow mixed items** option to *Yes*.
3. Create a purchase order that has the following two lines.

WAREHOUSE	ITEM NUMBER	SIZE	QUANTITY	UNIT
24	D0013	S	4	PL
24	D0013	L	4	PL

Process the example

You will first receive a quantity of *4* of unit *PL* in size *S*, and review the put line locations for the work that is created. You will then receive a quantity of *4* of unit *PL* in size *L*, and review the put line locations for the work that is created.

1. In the warehouse app, sign in by using *24* as the user ID and *1* as the password.
2. Select **Inbound > Purchase Receive**.
3. Receive *4 PL* of item number *D0013* in size *S*.
4. Review the putaway work that was created. You should see the following result:
 - 3 PL -> FL-002
 - 1 PL -> FL-003
5. Receive *4 PL* of item number *D0013* in size *L*.
6. Review the putaway work that was created. You should see the following result:
 - 1 PL -> FL-003
 - 3 PL -> FL-004

Based on the results, you might conclude that the system failed to allocate the correct putaway locations. Otherwise, why did the system add only *1 PL* of size *L* to location *FL-003* in the last step, not *2 PL*? That is, why isn't there is a total of *3 PL* for putaway to that location?

To explain this apparent failure, you must understand the selection criteria for the location stocking limits. The system selects the most detailed matching record. In this example, the most detailed matching record is the line where the **Size** value is *L*, the **Quantity** value is *240*, and the **Unit** value is *Ea*. Because you already have open work from the previous receipt of a quantity of *120 Ea* of size *S*, the remaining capacity is calculated as $240 - 120 = 120 Ea$. Therefore, the remaining capacity can carry only *1 PL* of *80 Ea*.

NOTE

You can't use location stocking limits to control, for example, the replenishment of items that have different quantities in the same location. In this case, use a *replenishment template*.

NOTE

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Wave step codes

2/18/2021 • 3 minutes to read • [Edit Online](#)

Wave step codes are codes that users can set up and use to link specific instances of wave methods to a corresponding template. The templates include templates for replenishment, containerization, label printing, load building, and sorting.

When wave step codes aren't used, users must enter free text to reference a specific template from the wave method instance. Free text is prone to errors because users must make sure that the wave step text that they add for a specific wave step method in a wave template exactly matches the wave step text in the target template.

Wave step codes for a specific wave step type are set up on a separate page. For every wave step method instance in a wave template that requires a wave step code, the wave step code must be selected in a drop-down list. Selection in a drop-down list replaces free text entry and helps reduce the risk and impact of human error. Setup codes are used to link a wave step method in a wave template to a target template for the method.

NOTE

Use of the wave step codes feature is optional. It is enabled organization-wide for all legal entities.

Setup demo

For this demo, demo data must be installed, and you must use the **USMF** demo data company.

Enable wave step codes

Follow these steps to turn on the wave step codes feature.

1. Go to **Feature Management**.
2. Select to enable the feature called **Organization-wide Wave Step Code**.

All existing wave step free texts in all legal entities are upgraded to the new structure. After this upgrade is completed for all legal entities, then the feature is enabled. If the feature cannot be enabled for one or more legal entities, then the feature is not enabled for any legal entities.

During the enablement, validations are done during the data upgrade. If the upgrade fails, you receive an error message. An upgrade might fail because of the following conflicts:

- Duplicate wave step free texts exist.
- Customizations exist.
- A wave step free text that is associated with a wave step method instance doesn't match the expected template type.

After you've resolved any conflicts that are identified during the validations, you can retry to enable the feature.

When the feature has been enabled, the **Wave step codes** page (**Warehouse management > Setup > Waves > Wave step codes**) becomes available. This page lists the wave step codes that were upgraded when the Organization-wide Wave Step Code feature was enabled.

Create new wave step codes

You can use the **Wave step codes** page to create and delete wave step codes.

Every new wave step code and its associated ID must be unique across all wave step types, and they must be

defined for a specific wave step type.

Apply wave step codes

After you've defined the appropriate wave step codes, they can be applied to the wave process methods.

To apply wave step codes, go to the appropriate target template. Here are the target templates that the wave step codes are designated to point to:

- **Replenishment templates:** Warehouse management > Setup > Replenishment > Replenishment templates
- **Load build templates:** Warehouse management > Setup > Load > Load build templates
- **Sort templates:** Warehouse management > Setup > Packing > Outbound sorting templates
- **Containerization templates:** Warehouse management > Setup > Containers > Container build templates
- **Label printing templates:** Warehouse management > Setup > Document routing > Wave label templates

The templates in this list are applied when they are referenced from a wave process method that is selected in a wave template. When the wave step code on a wave process method in a wave template matches the wave step code in one of the templates types, the template is applied.

Sample scenario

The following procedure helps guarantee that the replenishment template that you created will be applied for the wave template.

1. Go to **Warehouse management > Setup > Waves > Wave step codes**, and create a wave step code for the **Replenishment** type.
2. Go to **Warehouse management > Setup > Replenishment > Replenishment templates**, and create a replenishment template.
3. In the replenishment template, select the wave step code that you created for the **Replenishment** type.
4. Go to **Warehouse management > Setup > Waves > Wave templates**, and select the wave template that you intend to use.
5. In the template, on the **Methods** FastTab, select the **Replenishment** method.
6. In the **Wave step code** field, select the wave step code that you selected in the replenishment template.

You perform these steps for each legal entity.

NOTE

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Configure wave processing

2/18/2021 • 4 minutes to read • [Edit Online](#)

This guide describes how to set up the criteria that determine what work is generated for a warehouse when a wave is processed, and whether waves are processed manually or automatically. You specify the criteria by setting up wave templates and queries that match a wave with released lines in sales orders, production orders, or kanban orders. Wave processing is used in warehouses that use the functionality in the Warehouse management module, and not those that use the functionality in the Inventory management module. You can run this procedure in demo data company USMF.

1. Go to **Navigation pane > Modules > Warehouse management > Setup > Waves > Wave templates**.
2. Click **New**.
3. In the **Wave template name** field, type a value. When you set up a wave template, you specify the sequence in which the templates will be matched to released lines on sales orders, production orders, or kanbans. When a line is released to the warehouse or to production, it uses the first wave template that it meets the criteria for. We recommend that you put templates with the most specific criteria at the top of the list. The broader the criteria, the more likely it is for a line to meet the criteria, and this could lead to lines being assigned to the wrong wave.
4. In the **Wave template description** field, type a value.
5. In the **Site** field, enter or select a value. If you're using USMF, you can select site 2.
6. In the **Warehouse** field, enter or select a value. If you're using USMF, you can select warehouse 24.
7. Set the **Automate wave creation** field to **Yes**. Select this option to automatically create a wave when a sales order, production order, or kanban is released to the warehouse.
8. Set the **Process wave at release to warehouse** option to **Yes**. Select this option to automatically process the wave and create work when a line is released to the warehouse.
9. Set the **Automate wave release option** to **Yes**. Select this option to automatically release the wave. The picking work is created and made available on mobile devices.
10. Set the **Assign to open waves option** to **Yes**. Lines are assigned to waves based on the query filter for the wave template.
11. Set the **Process wave automatically at threshold option** to **Yes**. Select this option to automatically process the wave when its values reach the thresholds for weight, shipment, and lines specified in the Wave thresholds field group. This option is available only if Shipping is selected in the Wave template type field.
12. Set the **Automate replenishment work release option** to **Yes**. Select this option to create demand-based replenishment work and release it automatically. You must add the replenishment wave method to the wave template, and create a replenishment template of the type Wave demand.
13. Expand the **Methods** section.
 - Wave template methods allow you to control the sequence of activities that each wave is going through when it's processed. For example, you might have a method for wave replenishment. When you add a method, it's automatically listed in the appropriate location in the sequence of steps. If you've set the Automate replenishment work release option to Yes, you need to add the replenish

method here.

- Wave attributes act as filters, to restrict the kind of items that can use the wave. For example, you could specify an item group.

14. Click **Save**.
15. Close the page.
16. Go to **Warehouse management > Setup > Warehouse management parameters**.
17. Expand the **Wave processing** section.
18. In the **Wave processing batch group** field, enter or select a value.
19. Set the **Process waves in batch option** to **Yes**.
20. In the **Wait for lock (ms)** field, enter a number. Enter the time, in milliseconds, that an allocation step will wait for a system resource that is locked by another allocation step. When this time is exceeded, the wave is not processed and an error message is displayed.
21. Click **Save**.
22. Close the page.
23. Go to **Navigation pane > Modules > Production control > Setup > Production control parameters**.
24. In the **Release to warehouse** field, select an option.

For sales orders and kanban orders, inventory must be reserved before the order is released to the warehouse. Otherwise, the items or allocation lines cannot be processed in a wave. For production orders, you also have the option of choosing Allow partial reservation. For example, this is useful if you have the materials that you need to start production, and can then wait until the additional materials become available to finish the process. If you select this option, you must manually repeat the release to warehouse process when the additional materials become available.

25. Close the page.

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Schedule work creation during wave

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Use the *Schedule work creation* feature as part of your waving process to help increase wave processing throughput by having the system create work using parallel processing.

When the functionality is enabled, planned work will automatically get created, which the system will eventually process to create actual work. If the number of wave load lines reaches a predetermined threshold, the system will create actual work more quickly by applying parallel, asynchronous processing.

Enable the Schedule work creation feature

Enable the feature in feature management

Before you can use the *Schedule work creation* feature, it must be turned on in your system. Admins can use the [Feature management](#) workspace to check the status of the feature and turn it on if it's required. There, the feature is listed in the following way:

- **Module:** *Warehouse management*
- **Feature name:** *Schedule work creation*

NOTE

The *Organization-wide work blocking* feature must be enabled before you can enable *Schedule work creation*.

Manually enable batch processing of waves

To take advantage of a parallel asynchronous method to create warehouse work, your wave process must be running in batch. To set this up:

1. Go to **Warehouse management > Setup > Warehouse management parameters**.
2. On the **General** tab, set **Process waves in batch** to *Yes*. Optionally, you can also select a dedicated **Wave processing batch group** to prevent your batch queue processing from running at the same time as other processes.
3. Set the **Wait for lock (ms) time**, which applies when the system is processing several waves at the same time. For most larger waving processes, we recommend a value of *60000*.

Manually enable the new wave step method for existing wave templates

Start by creating the new wave step method and enabling it for parallel asynchronous task processing.

1. Go to **Warehouse management > Setup > Waves > Wave process methods**.
2. Select **Regenerate method** and note that *WHSScheduleWorkCreationWaveStepMethod* has been added to the list of wave process methods you can use in your shipping wave templates.
3. Select the record with the **Method name** *WHSScheduleWorkCreationWaveStepMethod* and select **Task configuration**.
4. To add a new row to the grid, select **New** on the Action Pane and use the following settings:
 - **Warehouse** - Select the warehouse you will use to schedule work creation processing.
 - **Maximum number of batch tasks** - Specify a maximum number of batch tasks. In most cases,

this value should be in the range from 8-16, however we recommend that you experiment with the optimal setting based on your scenarios.

- **Wave processing batch group** - Select a dedicated wave processing batch group to optimize your batch queue processing.

Now you are ready to update an existing wave template (or create a new one) to use the *Schedule work creation* wave processing method.

1. Go to **Warehouse management > Setup > Waves > Wave templates**.
2. Select **Edit** on the Action Pane.
3. In the list pane, select the wave template you would like to update (if you are testing using demo data, then you could use *24 Shipping default*).
4. Expand the **Methods** FastTab and select the row with the **Name** *Schedule work creation* in the **Remaining methods** grid.
5. Select the arrow pointing to the **Selected methods** column to move the selected row to that column. (You can only have one selected method at a time that uses either *WHScheduleWorkCreationWaveStepMethod* or *createWork*, so the existing row with **Method name** *createWork* is automatically moved to the **Remaining methods** grid.)

Set wave task processing threshold data

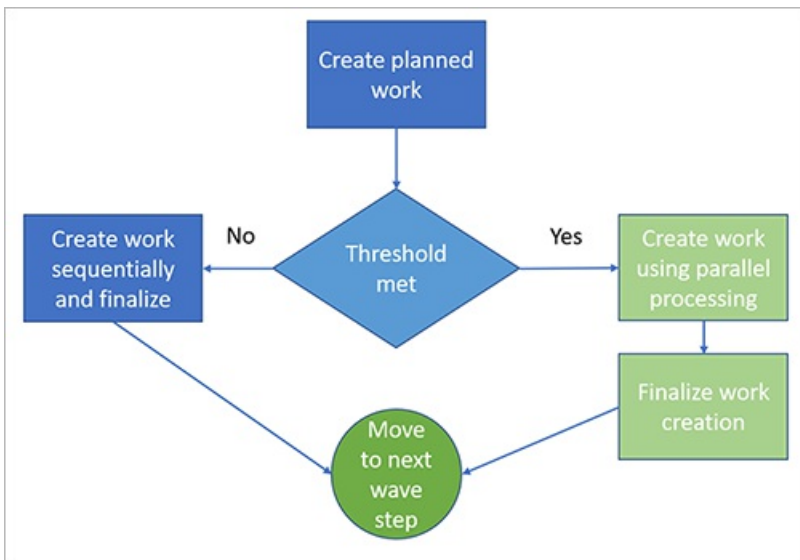
The system will create default wave task processing threshold data the first time a wave process runs using any task-based processing. The data is used to control when wave processing will run asynchronously and be task-based, which enables it to process and create work in parallel.

The default data will initially use a threshold value of 15 for the minimum number of load lines (MINIMUMWAVELOADLINES). This means that when the system processes a wave with more than 15 load lines, it will use asynchronous task processing. You can manually insert/update this data in the **WHSWaveTaskProcessingThresholdParameters** table in your test environments, but if you need to change this setting in a production environment, you must contact Microsoft Support to request the update.

Work with the feature

When the *Schedule work creation* functionality is enabled, wave processing will create planned work, which will eventually be used by the new work creation process. During work creation, the work will be blocked using the *Organization-wide work blocking* feature.

The following flowchart shows how planned work is created during wave processing.



Planned work

The **Planned work details** page (**Warehouse management > Work > Planned work details**) shows information about the planned work, which is initially created during wave processing. The following **Process status** values are available:

- **Queued** - The planned work is waiting to be used to create work.
- **Completed** - The planned work has been used to create work.
- **Failed** – The wave processing has failed. Note that the planned work can be in a **Failed** state with or without related actual work. When the actual work creation process fails, the actual work remains in status *Cancelled*.

Batch job for the work creation process

To view the batch jobs for processing waves, select **Batch jobs** on the Action Pane on the **All waves** page.

From here, you can view all the batch task details for each of the batch job IDs.

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Set up and use wave label printing

2/18/2021 • 31 minutes to read • [Edit Online](#)

Wave label printing offers an alternative approach to label printing by introducing a new wave step method that lets you create and print labels directly from the wave template during wave execution. Therefore, the labels will already be available before workers run the work order on a mobile device. Workers can then attach the required labels during picking instead of after picking.

Wave label printing uses Zebra Programming Language (ZPL) to create label layouts. A label layout is divided into three sections (header, body, and footer) to allow for labels that have repeating structure. Wave label templates tell the system which label layout to use. Users can specify which printer is used. They can also print labels on several printers at the same time, as they require. The **Wave label history** page shows a record of all labels that have been created by using this setup.

You can print and collate labels based on work headers, you can print break labels per work header, and you can print container content labels, case labels, and other similar labels.

NOTE

This functionality doesn't replace existing label printing functionality that is based on document routing.

Wave label printing offers the following enhancements:

- Print labels according to the number of cartons on a single work line, without using containerization. (A "carton" is a unit that is designated on unit sequence group lines.)
- Print several different label sequences (for example, carton and pallet labels).
- Include label enumeration (for example, 1/124, 2/124, ... 124/124), and define the range of enumeration (for example, work line, load line, or shipment).
- Create and print a bill of lading ID on labels before the bill of lading is generated.
- Create a unique serial shipping container code (SSCC) for each carton, and include it on each label.
- Create GS1-compliant number sequences for bill of lading IDs and SSCCs.
- Reprint labels from both mobile devices and the rich client.
- Void labels (for example, in short pick scenarios), and reprint them.
- Clean up the wave label history.
- Improvements to document routing layouts are shared between document routing layouts and wave label layouts. (For more information, see [Document routing layout for license plates](#).)

These enhancements make it more efficient to label cartons before palletization. They especially benefit companies that ship to large retailers that automatically confirm order receipts by scanning each carton separately.

NOTE

You can implement the configuration scenarios that are described in this topic either separately or in combination, depending on your business requirements. You can design several wave label templates that work in sequence (as illustrated in scenario 3). For example, you can use scenario 1 to print carton labels and scenario 2 to print pallet labels (if pallets in stock vary in size and composition).

Turn on the Wave label printing feature

Before you can use the *Wave label printing* feature, it must be turned on in your system. Admins can use the [Feature management](#) workspace to check the status of the feature and turn it on if it's required. There, the feature is listed in the following way:

- **Module:** *Warehouse management*
- **Feature name:** *Wave label printing*

Scenario 1: Wave label printing where a single wave label is generated

This scenario shows how a company can print shipping labels for a large retailer that automatically confirms order receipts by scanning each carton separately.

This scenario shows the end-to-end flow.

Make demo data available

To follow this scenario, you must have demo data installed, and you must select the USMF legal entity.

Make sure that the wave label method is available

You might have to regenerate the wave process methods to make the wave label printing method available.

1. Go to **Warehouse management > Setup > Waves > Wave process methods**.
2. Confirm that `waveLabelPrinting` is in the list. If it isn't, select **Regenerate methods** on the Action Pane to add it.

Configure a wave template

Wave templates let you link specific instances of wave methods to a corresponding wave label template.

1. Go to **Warehouse management > Setup > Waves > Wave templates**.
2. Select a template, such as **62 Shipping Default**.
3. On the **Methods** FastTab, move the **Wave label printing** method to the **Selected methods** column.
4. In the **Selected methods** column, select the **Wave label printing** method, and set its **Wave step code** field to `PrintLabel`. For more information about wave step codes, see [Wave step codes](#).

Create a wave label layout

The label layout controls what information is printed on the label and how it's laid out. Here, you enter the ZPL code that is sent to the printer.

1. Go to **Warehouse management > Setup > Document routing > Wave label layouts**.
2. Create a record that has the following settings:

- **Label layout ID:** *Carton*
- **Description:** *Carton (SSCC)*

3. On the Action Pane, select **Save**.

4. On the Action Pane, select **Wave label row settings**.

The **Wave label row settings** page appears. Here, you can configure the dynamic part of the label.

5. Add a row that has the following settings:

- **Row Id:** *WaveLabel*
- **Row table name:** *WHSWaveLabel*
- **Row start position:** *0*

This field defines the vertical position where the row will begin on the label.

- **Row height:** 0

This field defines the height of each row (in points), according to the ZPL standard. The row height is positive for horizontal labels and negative for vertical labels. Because there is just one row in this example, you can set the value to 0 (zero).

- **Rows per page:** 1

This field defines the number of rows that can be printed on each label.

NOTE

This setup will cause a separate ZPL label to be printed for each record in the wave labels table.

6. Close the page.
7. On the Action Pane, select **Edit query**.
8. In the query editor dialog box, on the **Range** tab, add a row that has the following settings:
 - **Table:** *Work lines*
 - **Derived table:** *Work lines*
 - **Field:** *Work type*
 - **Criteria:** *Pick*

This query ensures that only pick-type work lines will be printed on the label, not put-type work lines.
9. If you want to be able to print the bill of lading ID, on the **Joins** tab, select the **Work lines** table, and join the **Shipments** table to it.
10. Close the query editor dialog box.
11. The **Printer text Layout** FastTab has three sections where you can write printer code: **Header section**, **Body section**, and **Footer section**. In the **Header section** section, in the **Label header** field, enter code for the required header. For example, if you're using Zebra printers, you can use the following code.

```

CT~~CD,~CC^~CT~
^XA~TA000~JSN^LT0^MNW^MTT^PON^PMN^LH0,0^JMA^PR8,8~SD15^JUS^LRN^CI0^XZ
^XA
^MMT
^PW812
^LL1218
^LS0
^FT85,505^A0N,28,28^FH\^FD$WHSShipmentTable.CustomerReq$^FS
^F01,173^GB809,0,1^FS
^F00,391^GB809,0,1^FS
^F03,599^GB809,0,2^FS
^F0420,176^GB0,216,1^FS
^F0313,3^GB0,169,1^FS
^F00,807^GB809,0,1^FS
^FT529,370^A0N,28,26^FH\^FD$WHSShipmentTable.BillOfLadingId$^FS
^BY2,3,132^FT25,344^BCN,,N,N
^FD>:(420)>38102>63^FS
^FT526,315^A0N,28,28^FH\^FD ^FS
^FT437,248^A0N,28,28^FH\^FDCARR: $WHSShipmentTable.SCAC$^FS
^FT425,201^A0N,23,24^FH\^FDCARRIER:^FS
^FT17,68^A0N,20,19^FH\^FDIntershipping, Inc.^FS
^FT15,99^A0N,20,19^FH\^FD1000 Shipping Lane^FS
^FT16,158^A0N,20,19^FH\^FD ^FS
^FT438,368^A0N,28,28^FH\^FDB/L#^FS
^FT15,128^A0N,20,19^FH\^FDShelbyville TN 38102^FS
^FT19,203^A0N,23,24^FH\^FD(420) SHIP TO POSTAL CODE^FS
^FT331,39^A0N,28,28^FH\^FDShip To:^FS
^FT14,39^A0N,28,28^FH\^FDShip From:^FS
^FT331,67^A0N,23,24^FH\^FDWAL-MART DC 1111A-ABC DIS^FS
^FT330,98^A0N,23,24^FH\^FDDEPT 10^FS
^FT329,166^A0N,23,24^FH\^FDSpringfield TN 39021^FS
^FT330,134^A0N,23,24^FH\^FD100 Main Street^FS
^FT19,504^A0N,28,28^FH\^FDPO#:^FS
^FT437,316^A0N,28,28^FH\^FDPRO#^FS
^FT105,371^A0N,28,28^FB130,1,0,C^FH\^FD(420)39021^FS

```

12. In the **Body** section section, in the **Label body** field, enter ZPL code for the required body. Here is an example.

```

<Row name="WaveLabel">
^FT127,439^A0N,28,28^FH\^FD$WHSWaveLabel.SeqNum$^FS
^FT256,439^A0N,28,28^FH\^FD$WHSWaveLabel.NumberOfLabels$^FS
^FT17,439^A0N,28,28^FH\^FDCARTON^FS
^FT522,422^A0N,23,24^FH\^FDVPN:^FS
^FT74,1156^A0N,28,28^FH\^FDSSCC-18^FS
^FT21,579^A0N,28,28^FH\^FDItem name:^FS
^FT107,580^A0N,28,28^FH\^FD$WHSWaveLabel.LabelItemName$^FS
^FT576,423^A0N,23,21^FH\^FD$WHSWaveLabel.LabelItemId$^FS
^FT252,1155^A0N,32,31^FH\^FD(00)$WHSWaveLabel.WaveLabelId$^FS
^BY4,3,283^FT66,1115^BCN,,N,N
^FD>;>800$WHSWaveLabel.WaveLabelId$^FS
^FT194,439^A0N,28,28^FH\^FDof^FS
</Row>

```

13. In the **Body** section section, in the **Label footer** field, enter ZPL code for the required footer. Here is an example.

```

^PQ1^XZ

```


NOTE

This setup will print one copy of each label. If you require more copies (for example, one copy for each side of the pallet), set the **n** value for the **^PQn** section in the footer to the required number of copies. For example, to print four copies of each label, specify **^PQ4**.

Your label is now ready to use.

Create a wave label type

Wave label types are used to link wave label templates to a unit on unit sequence group lines.

1. Go to **Warehouse management > Setup > Document routing > Wave label types**.
2. Add a wave label type that has the following settings:
 - **Label type:** *Carton*
 - **Description:** *Carton*

Set up unit sequence groups

Next, set up the unit sequence group for the wave label type.

1. Go to **Warehouse management > Setup > Warehouse > Unit sequence groups**.
2. Select the **Ea Box PL** group.
3. For the **Box** line, set the **Wave level type** field to *Carton*.

Create a wave label template

Next, create the wave label template for the wave label type.

1. Go to **Warehouse management > Setup > Document routing > Wave label templates**.
2. Add a wave level template, and set the following values in the header:
 - **Label template name:** *Carton labels*
 - **Description:** *Carton labels*
 - **Wave step code:** *PrintLabel*
 - **Warehouse:** *62*
3. On the **General** FastTab, set the **Wave label type** field to *Carton*.
4. On the **Wave label template details** FastTab, add a new row that has the following settings:
 - **Label layout ID:** *Carton*
 - **Printer name:** Select an appropriate ZPL printer.
 - **Run query:** *Yes* (This setting is optional, but it's recommended for optimal performance.)
5. On the Action Pane, select **Save**.
6. Optional: If you're setting up a customer-specific label design, you must create a query to find the customer's account. On the **Wave label template details** FastTab, select **Edit query**. Then, in the query editor dialog box, on the **Range** tab, add a row that has the following settings:
 - **Table:** *Shipments*
 - **Derived table:** *Shipments*
 - **Field:** *Account number*
 - **Criteria:** Enter the relevant customer account number.When you've finished, select **OK** to close the query editor dialog box.
7. On the Action Pane, select **Edit query** to open the query editor dialog box for the whole label template.

8. In the query editor dialog box, on the **Sorting** tab, add a row that has the following settings:
 - **Table:** *Work lines*
 - **Derived table:** *Work lines*
 - **Field:** *Reference load line id (Record-ID)*
 - **Search direction:** *Ascending*
9. Select **OK** to close the query editor dialog box.
10. A message box prompts you to confirm the grouping reset operation. Select **Yes** to continue.
11. On the Action Pane, select **Wave label template group**.
12. In the **Wave label template group** dialog box, select the row where the **Reference field name** field is set to *Reference load line id*, and then select the **Label build ID** check box for this row.

NOTE

This setup will create one label sequence ("Carton 1 of X") per load line throughout the wave, regardless of the work grouping setup. This label sequence can be printed on the label layout.

Configure number sequence extensions

Number sequence extensions control the GS1 compliance of specific number sequences. This configuration is optional for the current scenario. For more information and configuration instructions, see [Configure number sequence extensions](#).

Create a sales order and release it to the warehouse

1. Go to **Sales and marketing > Sales order > All sales orders**.
2. Create a sales order that has the following settings:
 - **Customer account:** *US-001*
 - **Warehouse:** *62*
3. Add two sales order lines that have the following settings:
 - Sales order line 1:
 - **Item number:** *A0001*
 - **Quantity:** *9024*
 - **Unit:** *ea* (9024 ea = 376 Box = 47 PL)
 - Sales order line 2:
 - **Item number:** *A0002*
 - **Quantity:** *9016*
 - **Unit:** *ea* (9016 ea = 322 Box = 46 PL)

NOTE

The items and quantities that are provided here are only examples. They must use the unit sequence group that you defined earlier, appropriate unit conversions from *ea* to *Box* to *PL* must be defined for them, and they must have stock in warehouse *62*. For more information, see [Unit of measure and stocking policies](#).

4. Select sales order line 1. Then, in the **Sales order line** section, on the **Inventory** menu, select **Reservations**.
5. On the **Reservation** page, on the Action Pane, select **Reserve lot**, and then close the page.

- Repeat steps 4 and 5 for sales order line 2.
- On the Action Pane, on the **Warehouse** tab, select **Release to warehouse**.

The following events occur:

- The system processes the created shipment by using the template that includes the label printing step. The label layout will be used to define the format of the label, and the result will be a label that is printed on the printer that is selected in the label template.
- Wave labels are generated and printed. The number of labels will equal the number of cartons (in this example, 376 Box labels for line 1 and 322 Box labels for line 2).
- A new bill of lading ID is generated for the shipments. If you configured the number sequence extensions, the wave label IDs will follow the **SSCC-18** number format.

You can view and reprint wave labels from the following pages. On the Action Pane of each page, on the **Shipments** tab, in the **Related information** group, select **Wave labels**.

- All shipments > Shipment details
- All loads > Load details
- All waves
- Wave labels
- Wave label history

Scenario 2: Wave label printing for containerization (without wave label records)

This scenario lets you print wave labels when you use containerization to automatically split items into cartons and therefore don't require a wave label record. In this case, the container ID acts as a placeholder for the SSCC.

Here are the main differences between this scenario and scenario 1:

- Wave label templates:** You won't select a wave label type on the wave label template, and you won't require a label build grouping. Otherwise, you will configure the wave label template and link to the wave template in the same way that is described in scenario 1. You must leave the wave label type blank to prevent wave labels from being generated.
- Wave label layouts:** You will configure the wave label layout row settings for work lines instead of wave label records. You must configure the row setting for the label layout by using the **WHSWorkLine** table instead of the **WHSWaveLabel** table. The **Rows per page** setting controls the number of rows that the body section will have.

This configuration is also suitable for business scenarios where multiple different items are packed into one labeled box or into a pallet, and this packing process can be defined by work creation (for example, work that is grouped by shipment).

This scenario shows the end-to-end flow.

Make demo data available

To follow this scenario, you must have demo data installed, and you must select the **USMF** legal entity.

Make sure that the wave label method is available

You might have to regenerate the wave process methods to make the wave label printing method available.

- Go to **Warehouse management > Setup > Waves > Wave process methods**.
- Confirm that **waveLabelPrinting** is in the list. If it isn't, select **Regenerate methods** on the Action Pane to add it.

Set up a wave template

Wave templates let you link specific instances of wave methods to a corresponding wave label template.

1. Go to **Warehouse management > Setup > Waves > Wave templates**.
2. Select a template, such as **63 Containerization**.
3. On the **Methods** FastTab, move the **Wave label printing** method to the **Selected methods** column.
4. In the **Selected methods** column, select the **Wave label printing** method, and set its **Wave step code** field to *PrintLabel*. For more information about wave step codes, see [Wave step codes](#).

Create a wave label layout

1. Go to **Warehouse management > Setup > Document routing > Wave label layouts**.
2. Create a record that has the following settings:
 - **Label layout ID:** *Carton*
 - **Description:** *Carton (SSCC)*
3. On the Action Pane, select **Save**.
4. On the Action Pane, select **Wave label row settings**.

The **Wave label row settings** page appears. Here, you can configure the dynamic part of the label.

5. Add a row that has the following settings:

- **Row Id:** *WorkLine*
- **Row table name:** *WHSWorkLine*
- **Row start position:** *500*

This field defines the vertical position where the row will begin on the label.

- **Row height:** *-50*

This field defines the height of each row. The row height is positive for horizontal labels and negative for vertical labels.

- **Rows per page:** *5*

This field defines the number of rows that can be printed on each label.

NOTE

This setup will print several ZPL labels per work, where each page can hold up to five work lines. For example, if a label is printed for a container that has 12 lines, three labels will be printed. If you want to print a separate label for each pick line, set this value to *1*.

6. Close the page.
7. On the Action Pane, select **Edit query**.
8. In the query editor dialog box, on the **Range** tab, add a row that has the following settings:
 - **Table:** *Work lines*
 - **Derived table:** *Work lines*
 - **Field:** *Work type*
 - **Criteria:** *Pick*
9. If you want to be able to print the bill of lading ID, on the **Joins** tab, select the **Work lines** table, and join

the **Shipments** table to it.

- Close the query editor dialog box.
- The **Printer text Layout** FastTab has three sections where you can write printer code: **Header section**, **Body section**, and **Footer section**. In the **Header section** section, in the **Label header** field, enter code for the required header. For example, if you're using Zebra printers, you can use the following code.

```
CT~~CD,~CC^~CT~
^XA
^LH10,10
^F00,0 ^AT ^FD$WHSWorkTable.ContainerId$ ^FS
^F00,75 ^AT ^FD$WHSWorkLine.ShipmentId$ ^FS
^F00,150 ^AT ^FD$WHSWorkTable.BillOfLadingId$ ^FS
```

- In the **Body section** section, in the **Label body** field, enter ZPL code for the required body. Here is an example.

```
<Row name="WorkLine">
<Heading>
//Optional heading for section of rows
</Heading>
^F00,450 ^AT ^FDItem ^FS
^F0200,450 ^AT ^FDQuantity ^FS
^F00,[[YPos]] ^AT ^FD$WHSWorkLine.ItemId$ ^FS
^F0200,[[YPos]] ^AT ^FD$WHSWorkLine.QtyWork$ ^FS
</Row>
```

- In the **Body section** section, in the **Label footer** field, enter ZPL code for the required footer. Here is an example.

```
^PQ1^XZ
```

NOTE

This setup will print one copy of each label. If you require more copies (for example, one copy for each side of the pallet), set the **n** value for the **^PQn** section in the footer to the required number of copies. For example, to print four copies of each label, specify **^PQ4**.

Your label is now ready to use.

Create a wave label template

- Go to **Warehouse management > Setup > Document routing > Wave label templates**.
- Add a wave level template, and set the following values in the header:
 - Label template name:** *Container labels*
 - Description:** *Container labels*
 - Wave step code:** *PrintLabel*
 - Warehouse:** *63*
- On the **Wave label template details** FastTab, add a row that has the following settings:
 - Label layout ID:** *Container*
 - Printer name:** Select an appropriate ZPL printer.
 - Run query:** *Yes* (This setting is optional, but it's recommended for optimal performance.)

4. On the Action Pane, select **Save**.
5. Optional: If you're setting up a customer-specific label design, you must create a query to find the customer's account. On the **Wave label template details** FastTab, select **Edit query**. Then, in the query editor dialog box, on the **Range** tab, add a row that has the following settings:

- **Table:** *Shipments*
- **Derived table:** *Shipments*
- **Field:** *Account number*
- **Criteria:** Enter the relevant customer account number.

When you've finished, select **OK** to close the query editor dialog box.

Configure number sequence extensions

Number sequence extensions control the GS1 compliance of specific number sequences. This configuration is optional for the current scenario. For more information and configuration instructions, see [Configure number sequence extensions](#).

Create a sales order and release it to the warehouse

1. Go to **Sales and marketing > Sales order > All sales orders**.

2. Create a sales order that has the following settings:

- **Customer account:** *US-001*
- **Warehouse:** *63*

3. Add five sales order lines:

- Sales order line 1:
 - **Item number:** *A0001*
 - **Quantity:** *10*
- Sales order line 2:
 - **Item number:** *A0002*
 - **Quantity:** *20*
- Sales order line 3:
 - **Item number:** *L0006*
 - **Quantity:** *20*
- Sales order line 4:
 - **Item number:** *L0100*
 - **Quantity:** *40*
- Sales order line 5:
 - **Item number:** *L0101*
 - **Quantity:** *50*

NOTE

The items and quantities that are provided here are only examples. They must have stock in the specified warehouse.

4. Select sales order line 1. Then, in the **Sales order line** section, on the **Inventory** menu, select **Reservations**.

5. On the **Reservation** page, on the Action Pane, select **Reserve lot**, and then close the page.
6. Repeat steps 4 and 5 for each additional sales order line.
7. On the Action Pane, on the **Warehouse** tab, select **Release to warehouse**.

The following events occur:

- The system processes the created shipment using the template that includes the label printing step. The label layout will be used to define the format of the label, and the end result will be a label that has five lines and that is printed on the printer that is selected in the label template.
- A new bill of lading ID is generated for the shipments. If you configured the number sequence extensions, the wave label IDs will follow the **SSCC-18** number format.

You can reprint these wave labels by going to **Warehouse management > Inquiries and reports > Wave label history**.

Scenario 3: Wave label printing for multi-tiered labels

This scenario shows how to use the wave label printing functionality when the warehousing processes require several tiers of shipping labels. For example, separate labels might have to be printed for cartons and pallets, and a break label might have to be printed for a whole shipment. Break labels are a separate type of label that can be used as a divider between rolls and containers, such as labels for the shipment ID and a barcode, so that the labels can easily be sorted after they are printed.

The main difference between the configuration of this scenario and the configuration of scenario 1, besides the fact that break labels are enabled, is that multiple wave label types must be associated with wave label templates and unit sequence group lines. To accomplish this configuration, you set up the following elements for this scenario:

- **Wave processing methods:** You will mark the wave label method as "repeatable," add it two (or more) times to the wave template, and set different wave step codes.
- **Wave label templates:** You will configure the wave label templates and link them to the wave template. Each wave label template has its own wave label type.
- **Wave label layouts:** You will create multiple wave label layouts. There will be a separate label layout for each "tier" of labels, and there will also be a break label layout.

This scenario shows the end-to-end flow.

Make demo data available

To follow this scenario, you must have demo data installed, and you must select the **USMF** legal entity.

Set up a wave process method

1. Go to **Warehouse management > Setup > Waves > Wave process methods**.
2. Confirm that **waveLabelPrinting** is in the list. If it isn't, select **Regenerate methods** on the Action Pane to add it.
3. For the **waveLabelPrinting** method, select the **Make method repeatable** check box.

Set up a wave template

1. Go to **Warehouse management > Setup > Waves > Wave templates**.
2. Select a template, such as **62 Shipping Default**.
3. On the **Methods** FastTab, move the **Wave label printing** method to the **Selected methods** column.
4. In the **Selected methods** column, assign a **Wave step code** value, such as *Carton*, to the **Wave label printing** method. For more information about wave step codes, see [Wave step codes](#).
5. Move the **Wave label printing** method to the **Selected methods** column a second time.

6. In the **Selected methods** column, assign a different **Wave step code** value, such as *Pallet*, to the second **Wave label printing** method. For more information about wave step codes, see [Wave step codes](#).

Create three wave label layouts

1. Go to **Warehouse management > Setup > Document routing > Wave label layouts**.
2. Create a record that has the following settings:
 - **Label layout ID:** *Carton*
 - **Description:** *Carton (SSCC)*
3. On the Action Pane, select **Save**.
4. On the Action Pane, select **Wave label row settings**.

The **Wave label row settings** page appears. Here, you can configure the dynamic part of the label.

5. Add a row that has the following settings:

- **Row Id:** *WaveLabel*
- **Row table name:** *WHSWaveLabel*
- **Row start position:** *0*

This field defines the vertical position where the row will begin on the label.

- **Row height:** *0*

This field defines the height of each row (in points), according to the ZPL standard. The row height is positive for horizontal labels and negative for vertical labels. Because there is just one row in this example, you can set the value to *0* (zero).

- **Rows per page:** *1*

This field defines the number of rows that can be printed on each label.

NOTE

This setup will cause a separate ZPL label to be printed for each record in the wave labels table.

6. Close the page.
7. On the Action Pane, select **Edit query**.
8. In the query editor dialog box, on the **Range** tab, add a row that has the following settings:
 - **Table:** *Work lines*
 - **Derived table:** *Work lines*
 - **Field:** *Work type*
 - **Criteria:** *Pick*

This query ensures that only pick-type work lines will be printed on the label, not put-type work lines.
9. If you want to be able to print the bill of lading ID, on the **Joins** tab, select the **Work lines** table, and join the **Shipments** table to it.
10. Close the query editor dialog box.
11. The **Printer text Layout** FastTab has three sections where you can write printer code: **Header section**, **Body section**, and **Footer section**. In the **Header section**, in the **Label header** field, enter code for the required header. For example, if you're using Zebra printers, you can use the following code.


```

CT~CD,~CC^~CT~
^XA~TA000~JSN^LT0^MNW^MTT^PON^PMN^LH0,0^JMA^PR8,8~SD15^JUS^LRN^CI0^XZ
^XA
^MMT
^PW812
^LL1218
^LS0
^FT85,505^A0N,28,28^FH\^FD$WHSShipmentTable.CustomerReq$^FS
^F01,173^GB809,0,1^FS
^F00,391^GB809,0,1^FS
^F03,599^GB809,0,2^FS
^F0420,176^GB0,216,1^FS
^F0313,3^GB0,169,1^FS
^F00,807^GB809,0,1^FS
^FT529,370^A0N,28,26^FH\^FD$WHSShipmentTable.BillOfLadingId$^FS
^BY2,3,132^FT25,344^BCN,,N,N
^FD>:(420)>38102>63^FS
^FT526,315^A0N,28,28^FH\^FD ^FS
^FT437,248^A0N,28,28^FH\^FDCARR: $WHSShipmentTable.SCAC$^FS
^FT425,201^A0N,23,24^FH\^FDCARRIER:^FS
^FT17,68^A0N,20,19^FH\^FDIntershipping, Inc.^FS
^FT15,99^A0N,20,19^FH\^FD1000 Shipping Lane^FS
^FT16,158^A0N,20,19^FH\^FD ^FS
^FT438,368^A0N,28,28^FH\^FDB/L#^FS
^FT15,128^A0N,20,19^FH\^FDShelbyville TN 38102^FS
^FT19,203^A0N,23,24^FH\^FD(420) SHIP TO POSTAL CODE^FS
^FT331,39^A0N,28,28^FH\^FDShip To:^FS
^FT14,39^A0N,28,28^FH\^FDShip From:^FS
^FT331,67^A0N,23,24^FH\^FDWAL-MART DC 1111A-ABC DIS^FS
^FT330,98^A0N,23,24^FH\^FDEPT 10^FS
^FT329,166^A0N,23,24^FH\^FDSpringfield TN 39021^FS
^FT330,134^A0N,23,24^FH\^FD100 Main Street^FS
^FT19,504^A0N,28,28^FH\^FDPO#:^FS
^FT437,316^A0N,28,28^FH\^FDPRO#^FS
^FT105,371^A0N,28,28^FB130,1,0,C^FH\^FD(420)39021^FS

```

12. In the **Body** section section, in the **Label body** field, enter ZPL code for the required body. Here is an example.

```

<Row name="WaveLabel">
^FT127,439^A0N,28,28^FH\^FD$WHSWaveLabel.SeqNum$^FS
^FT256,439^A0N,28,28^FH\^FD$WHSWaveLabel.NumberOfLabels$^FS
^FT17,439^A0N,28,28^FH\^FDCARTON^FS
^FT522,422^A0N,23,24^FH\^FDVPN:^FS
^FT74,1156^A0N,28,28^FH\^FDSGCC-18^FS
^FT21,579^A0N,28,28^FH\^FDItem name:^FS
^FT107,580^A0N,28,28^FH\^FD$WHSWaveLabel.LabelItemName$^FS
^FT576,423^A0N,23,21^FH\^FD$WHSWaveLabel.LabelItemId$^FS
^FT252,1155^A0N,32,31^FH\^FD(00)$WHSWaveLabel.WaveLabelId$^FS
^BY4,3,283^FT66,1115^BCN,,N,N
^FD>;>800$WHSWaveLabel.WaveLabelId$^FS
^FT194,439^A0N,28,28^FH\^FDof^FS
</Row>

```

13. In the **Body** section section, in the **Label footer** field, enter ZPL code for the required footer. Here is an example.

```

^PQ1^XZ

```

NOTE

This setup will print one copy of each label. If you require more copies (for example, one copy for each side of the pallet), set the **n** value for the **^PQn** section in the footer to the required number of copies. For example, to print four copies of each label, specify **^PQ4**.

14. The first label is now ready to use.
15. Create a second layout record that has the following settings:
 - **Label layout ID:** *Pallet*
 - **Description:** *Pallet*
16. On the Action Pane, select **Save**.
17. On the Action Pane, select **Wave label row settings**.

The **Wave label row settings** page appears. Here, you can configure the dynamic part of the label.

18. Add a row that has the following settings:
 - **Row Id:** *WaveLabel*
 - **Row table name:** *WHSWaveLabel*
 - **Row start position:** *0*

This field defines the vertical position where the row will begin on the label.

- **Row height:** *0*

This field defines the height of each row (in points), according to the ZPL standard. The row height is positive for horizontal labels and negative for vertical labels. Because there is just one row in this example, you can set the value to *0* (zero).

- **Rows per page:** *1*

This field defines the number of rows that can be printed on each label.

NOTE

This setup causes a separate ZPL label to be printed for each record in the wave labels table.

19. Close the page.
20. On the Action Pane, select **Edit query**.
21. In the query editor dialog box, on the **Range** tab, add a row that has the following settings:
 - **Table:** *Work lines*
 - **Derived table:** *Work lines*
 - **Field:** *Work type*
 - **Criteria:** *Pick*

This query ensures that only pick-type work lines will be printed on the label, not put-type work lines.

22. If you want to be able to print the bill of lading ID, on the **Joins** tab, select the **Work lines** table, and join the **Shipments** table to it.
23. Close the query editor dialog box.

24. The **Printer text Layout** FastTab has three sections where you can write printer code: **Header section**, **Body section**, and **Footer section**. In the **Header section** section, in the **Label header** field, enter code for the required header. For example, if you're using Zebra printers, you can use the following code.

```
CT~~CD,~CC^~CT~
^XA
^LH10,10
^F00,0 ^AT ^FD$WHSWaveLabel.WaveLabelId$ ^FS
^F00,75 ^AT ^FD$WHSWorkLine.ShipmentId$ ^FS
^F00,150 ^AT ^FD$WHSShipmentTable.BillOfLadingId$ ^FS
```

25. In the **Body section** section, in the **Label body** field, enter ZPL code for the required body. Here is an example.

```
<Row name="WaveLabel">
^F00,450 ^AT ^FDItem ^FS
^F0200,450 ^AT ^FDQuantity ^FS
^F00,[[YPos]] ^AT ^FD$WHSWaveLabel.LabelItemId$ ^FS
^F0200,[[YPos]] ^AT ^FD$WHSWaveLabel.QtyWork$ ^FS
</Row>
```

26. In the **Body section** section, in the **Label footer** field, enter ZPL code for the required footer. Here is an example.

```
^PQ1^XZ
```

NOTE

This setup will print one copy of each label. If you require more copies (for example, one copy for each side of the pallet), set the **n** value for the **^PQn** section in the footer to the required number of copies. For example, to print four copies of each label, specify **^PQ4**.

27. The second label is now ready to use.
28. Create a third layout record that has the following settings:
- **Label layout ID:** *Break*
 - **Description:** *Break label*
29. On the Action Pane, select **Save**.
30. The **Printer text Layout** FastTab has three sections where you can write printer code: **Header section**, **Body section**, and **Footer section**. In the **Header section** section, in the **Label header** field, enter ZPL code for the required header. Here is an example.

```
CT~~CD,~CC^~CT~
^XA
^LH10,10
^F00,0 ^AT ^FD$WHSWorkLine.ShipmentId$ ^FS
```

31. This time, no body is required. Therefore, just enter the required text in the **Footer section** section. Here is an example.

```
^XZ
```

The third label is now ready to use.

NOTE

This third label is a break label that will be used as a divider between label rolls.

Create two wave label types

1. Go to **Warehouse management > Setup > Document routing > Wave label types**.
2. Create a record that has the following settings:
 - **Label type:** *Carton*
 - **Description:** *Carton*
3. Create a second record that has the following settings:
 - **Label type:** *Pallet*
 - **Description:** *Pallet*

Set up unit sequence groups

1. Go to **Warehouse management > Setup > Warehouse > Unit sequence groups**.
2. Select or create an **Ea Box PL** group.
3. For the **Box** line, set the **Wave level type** field to *Carton*.
4. For the **PL** line, set the **Wave level type** field to *Pallet*.

Create wave label templates

1. Go to **Warehouse management > Setup > Document routing > Wave label templates**.
2. Create a label template that has the following settings:
 - **Label template name:** *Carton labels*
 - **Description:** *Carton labels*
 - **Wave step code:** *Carton*
 - **Warehouse:** *62*
3. On the **General** FastTab, in the **Wave label type** field, select a value, such as *Carton*.
4. On the **Wave label template details** FastTab, add a row that has the following settings:
 - **Label layout ID:** *Carton*
 - **Printer name:** Select an appropriate ZPL printer.
 - **Run query:** *Yes* (This setting is optional, but it's recommended for optimal performance.)
5. On the Action Pane, select **Save**.
6. Optional: If you're setting up a customer-specific label design, you must create a query to find the customer's account. On the **Wave label template details** FastTab, select **Edit query**. Then, in the query editor dialog box, on the **Range** tab, add a row that has the following settings:
 - **Table:** *Shipments*
 - **Derived table:** *Shipments*
 - **Field:** *Account number*
 - **Criteria:** Enter the relevant customer account number.When you've finished, select **OK** to close the query editor dialog box.
7. On the Action Pane, select **Edit query** to open the query editor dialog box for the whole label template.
8. In the query editor dialog box, on the **Sorting** tab, add a row that has the following settings:

- **Table:** *Work lines*
 - **Derived table:** *Work lines*
 - **Field:** *Reference load line id (Record-ID)*
 - **Search direction:** *Ascending*
9. Add a second row that has the following settings:
- **Table:** *Work lines*
 - **Derived table:** *Work lines*
 - **Field:** *Shipment ID*
 - **Search direction:** *Ascending*
10. Select **OK** to close the query editor dialog box.
11. A message box prompts you to confirm the grouping reset operation. Select **Yes** to continue.
12. On the Action Pane, select **Wave label template group**.
13. In the **Wave label template group** dialog box, for the row where the **Reference field name** field is set to *Shipment ID*, set the following values:
- **Print break label:** Select this check box.
 - **Label layout ID:** Select a break label. (For example, select the *Break* label layout that you created earlier in this scenario.)
 - **Printer name:** Select the printer for the break label. (Typically, for the purpose of splitting label rolls, you should select the same printer that is selected on the **Wave label template details** FastTab. However, other scenarios are possible.)
14. For the row where the **Reference field name** field is set to *Reference load line id*, select the **Label build ID** check box.

NOTE

This setup will create one label sequence ("Carton 1 of X") per load line throughout the wave, regardless of the work grouping setup. This label sequence can be printed on a label layout. Additionally, labels for different shipments will be separated by the selected break label.

15. Select **OK** to close the **Wave label template group** dialog box.
16. Create a second label template that has the following settings:
- **Label template name:** *Pallet labels*
 - **Description:** *Pallet labels*
 - **Wave step code:** *Pallet*
 - **Warehouse:** *62*
17. On the **General** FastTab, in the **Wave label type** field, select a value, such as *Pallet*.
18. On the **Wave label template details** FastTab, add a row that has the following settings:
- **Label layout ID:** *Pallet*
 - **Printer name:** Select an appropriate ZPL printer.
 - **Run query:** *Yes* (This setting is optional, but it's recommended for optimal performance.)
19. On the Action Pane, select **Save**.
20. Optional: If you're setting up a customer-specific label design, you must create a query to find the customer's account. On the **Wave label template details** FastTab, select **Edit query**. Then, in the query editor dialog box, on the **Range** tab, add a row that has the following settings:

- **Table:** *Shipments*
- **Derived table:** *Shipments*
- **Field:** *Account number*
- **Criteria:** Enter the relevant customer account number.

When you've finished, select **OK** to close the query editor dialog box.

21. On the Action Pane, select **Edit query** to open the query editor dialog box for the whole label template.

22. In the query editor dialog box, on the **Sorting** tab, add a row that has the following settings:

- **Table:** *Work lines*
- **Derived table:** *Work lines*
- **Field:** *Reference load line id (Record-ID)*
- **Search direction:** *Ascending*

23. Add a second row that has the following settings:

- **Table:** *Work lines*
- **Derived table:** *Work lines*
- **Field:** *Shipment ID*
- **Search direction:** *Ascending*

24. Select **OK** to close the query editor dialog box.

25. A message box prompts you to confirm the grouping reset operation. Select **Yes** to continue.

26. On the Action Pane, select **Wave label template group**.

27. In the **Wave label template group** dialog box, for the row where the **Reference field name** field is set to *Shipment ID*, set the following values:

- **Print break label:** Select this check box.
- **Label layout ID:** Select a break label. (For example, select the *Break* label layout that you created earlier in this scenario.)
- **Printer name:** Select the printer for the break label. (Typically, for the purpose of splitting label rolls, you should select the same printer that is selected on the **Wave label template details** FastTab. However, other scenarios are possible.)

28. For the row where the **Reference field name** field is set to *Reference load line id*, select the **Label build ID** check box.

NOTE

This setup will create one label sequence ("Carton 1 of X") per load line throughout the wave, regardless of the work grouping setup. This label sequence can be printed on a label layout. Additionally, labels for different shipments will be separated by the selected break label.

Configure number sequence extensions

Number sequence extensions control the GS1 compliance of specific number sequences. This configuration is optional for the current scenario. For more information and configuration instructions, see [Configure number sequence extensions](#).

Create a sales order and release it to the warehouse

1. Go to **Sales and marketing > Sales order > All sales orders**.
2. Create a sales order that has the following settings:

- **Customer account:** *US-001*
- **Warehouse:** *62*

3. Add two sales order lines:

- Sales order line 1:
 - **Item number:** *A0001*
 - **Quantity:** *9024*
 - **Unit:** *ea* (9024 ea = 376 Box = 47 PL)
- Sales order line 2:
 - **Item number:** *A0002*
 - **Quantity:** *9016*
 - **Unit:** *ea* (9016 ea = 322 Box = 46 PL)

NOTE

The items and quantities that are provided here are only examples. They must use the unit sequence group that you defined earlier, appropriate unit conversions from *ea* to *Box* to *PL* must be defined for them, and they must have stock in warehouse *62*. For more information, see [Unit of measure and stocking policies](#).

4. Select sales order line 1. Then, in the **Sales order line** section, on the **Inventory** menu, select **Reservations**.
5. On the **Reservation** page, on the Action Pane, select **Reserve lot**, and then close the page.
6. Repeat steps 4 and 5 for sales order line 2.
7. On the Action Pane, on the **Warehouse** tab, select **Release to warehouse**.

The following events occur:

- The system processes the created shipment by using the template that includes the label printing step. The label layout will be used to define the format of the label, and the result will be a label that is printed on the printer that is selected in the label template.
- Wave labels are generated and printed. The number of labels will equal the number of cartons (in this example, 376 Box labels for line 1, 322 Box labels for line 2, 47 PL labels for line 1, 47 PL labels for line 2, and two break labels that have the shipment ID).
- A new bill of lading ID is generated for the shipments. If you configured the number sequence extensions, the wave label IDs will follow the **SSCC-18** number format.

You can view and reprint wave labels from the following pages:

- All shipments > Shipment details
- All loads > Load details
- All waves
- Wave labels
- Wave label history

For most of these pages, you can find the relevant function by selecting **Wave labels** in the **Related information** group on the **Shipments** tab of the Action Pane.

NOTE

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Shipment auto-updates

2/18/2021 • 9 minutes to read • [Edit Online](#)

The auto-update shipment functionality automatically updates quantities (both increases and decreases) on a load line that is associated with a shipment, after the load has been released to a warehouse. This functionality remains turned on until the load line on the shipment or load is processed on a wave. When it's used, order updates can automatically flow through to the warehouse, without requiring manual intervention, until warehouse work is created.

When the auto-update shipment functionality isn't used, only quantity decreases automatically flow until warehouse work is created. Users must manually update or delete lines, and they must then re-release lines if order quantities are increased or new order lines are added. By using the auto-update shipment functionality, businesses can seamlessly provide updates to the warehouse without having to worry that related shipments and loads won't reflect order line updates.

The auto-update shipment functionality applies to both sales order lines and transfer order lines, and it's turned on for a specific warehouse. Therefore, companies can apply different auto-update shipment policies across warehouses, as they require. By default, the auto-update shipment policy for quantity decreases is applied for all warehouses that use warehouse management processes. When this default policy setting is used, only quantity decreases automatically flow through to a shipment and load until warehouse work is created. This behavior resembles the behavior that was used before the auto-update shipment functionality was introduced.

Main elements of the functionality

The auto-update shipment functionality relies primarily on the shipment status to determine whether the quantity on a load line should be changed when a change is made on a sales order line or transfer order line. It also relies primarily on the shipment status to determine when a new load line should automatically be added to an existing load. When the shipment status is **Waved** or higher, no automatic update occurs.

Wave status is also considered for automatic updates. When the wave that is related to the load line has a status of **Held**, **Executing**, **Released**, **Picked**, or **Shipped**, if a user tries to reduce the quantity on a load line (via a quantity decrease on the sales order line or transfer order line), the following error message is shown: "Reservations cannot be removed because there is work created which relies on the reservations." Additionally, when the wave has one of the previously mentioned wave statuses, if a user tries to indirectly increase the load line quantity by increasing the quantity on the sales order line or transfer order line, the quantity on the load line isn't automatically increased. In this case, the load line must be manually updated.

Scenarios

The auto-update shipment functionality supports four scenarios: adding a new order line, increasing the quantity on an order line, decreasing the quantity on an order line, and removing an order line.

- **Add a new order line** – When the **Auto update shipment** field on the **Warehouse** FastTab of the **Warehouses** page (**Warehouse management > Setup > Warehouse > Warehouses**) is set to **Always**, if a shipment exists for the order, and a new order line is added to a sales order or transfer order after a load has already been created for the sales order, the existing load isn't updated. A new load line that has no reference to the existing load is created and associated with the existing shipment. The new line is added to the load and released.
- **Increase the quantity on an order line** – When the **Auto update shipment** field is set to **Always**, if a shipment exists for the order, and the quantity on an existing sales order line or transfer order line is

increased after a load has already been created for the sales order, the load line is increased by the same quantity as the order line. If the load was released, but no work was created, the load line is increased by the same quantity as the order line.

- **Decrease the quantity on an order line** – When the **Auto update shipment** field is set to **Always** or **On quantity decrease**, if a shipment exists for the order, and the quantity on an existing sales order line or transfer order line is decreased after a load has already been created for the sales order, the quantity on the associated load line is updated to match, unless the quantity on that load line already equals or is less than the new quantity on the order line. In that case, the load line isn't affected. If the load was released, but no work was created, the quantity on the associated load line is updated to match, unless the quantity on the load line already equals or is less than the new quantity on the order line. In that case, the load line is affected.
- **Remove an order line** – When the **Auto update shipment** field is set to **Always** or **On quantity decrease**, if the user tries to remove an order line that a load line exists for, an error message is shown.

Example scenario

For this scenario, you must have demo data installed, and you must use the **USMF** demo data company.

Turn on the auto-update shipment functionality

To turn on the auto-update shipment functionality, follow these steps.

1. Go to **Warehouse management > Setup > Warehouse > Warehouses**.
2. Select warehouse 24.
3. On the **Warehouse** FastTab, in the **Auto update shipment** field, change the value from **On quantity decrease** to **Always**.

After you change the value to **Always**, any increases or decreases in the quantities on sales order lines and transfer order lines, and any additions of new lines, are reflected on shipments and loads for the selected warehouse, given the previously mentioned update constraints.

Change the wave template so that load lines aren't automatically processed

To configure the wave template so that it doesn't automatically process load lines, follow these steps.

1. Go to **Warehouse management > Setup > Waves > Wave templates**.
2. Select wave template 24 **Shipping default**.
3. Select **Edit**.
4. On the **General** FastTab, set the **Automate wave creation** option to **Yes**, and make sure that all other options are set to **No**.

It's important that no work be automatically created and released as part of the wave creation process. After work is created that is related to the load line that was created for the sales order line, the load line is no longer automatically updated if the quantity on the sales order line is changed.

Create a sales order

To create a sales order, follow these steps.

1. Go to **Sales and marketing > Sales orders > All sales orders**.
2. Select customer **US-003**.
3. Create a line for item number **A0001**.
4. Enter a quantity of **10**. (Make sure that you're using warehouse 24.)
5. Select **Save**.
6. On the Action Pane, on the **Warehouse** tab, in the **Actions** group, select **Release to warehouse**. A shipment and a wave are created.

Because you changed the wave template in the previous procedure, no load or work is created. The shipment status is **Open**, and the wave status is **Created**.

Decrease the quantity on a sales order line

To decrease the quantity on a sales order line, follow these steps.

1. Go to **Sales and marketing > Sales orders > All sales orders**.
2. Select the sales order that you just released to the warehouse.
3. Select the sales order line. In the **Quantity** field, change the value from **10** to **8**.
4. From the sales order line, select **Warehouse > Shipment details**. On the **Shipment details** page, on the **Load lines** FastTab, the quantity reflects the change on the sales order line.

Increase the quantity on a sales order line

To increase the quantity on a sales order line, follow these steps.

1. Go to **Sales and marketing > Sales orders > All sales orders**.
2. Select the sales order that you previously released to the warehouse.
3. Change the line quantity from **8** to **12**.
4. Select **Save**.
5. Go back to the **All sales orders** page, and select the sales order again.
6. On the Action Pane, on the **Warehouse** tab, in the **Related information** group, select **Shipment details**. On the **Shipment details** page, on the **Load lines** FastTab, the quantity reflects the change on the sales order line.

Although the quantity on the load line was increased from 8 to 12, only eight items remain reserved, unless automatic reservation is turned on. Because the quantity that was added to the existing shipment hasn't been reserved, if the wave is processed at this point, without reservation, work is created only for the quantity that has already been reserved.

NOTE

When the quantity on an order line is decreased, the quantity on the load line isn't affected if it already equals or is less than the new quantity on the order line. When the quantity on an order line is increased, the load line is increased by the same quantity as the order line. If the quantity on the order line differs from the quantity on the load line, the difference remains.

Add a sales order line

To add a sales order line, follow these steps.

1. Go to **Sales and marketing > Sales orders > All sales orders**.
2. Select the sales order that you previously released to the warehouse.
3. Create a line for item number **A0002**.
4. In the **Quantity** field, enter **10**. (Make sure that you're using warehouse **24**.) The new line is automatically added to the existing shipment.
5. Select **Save**.
6. Go back to the **All sales orders** page, and select the sales order again.
7. On the Action Pane, on the **Warehouse** tab, in the **Related information** group, select **Shipment details**. On the **Shipment details** page, on the **Load lines** FastTab, notice the second load line.

Because the sales order line that you just added to the existing shipment hasn't been reserved, if the wave is processed at this point, work is created only for the quantity on the first sales order line and the first load line.

Process a wave

To process the wave, follow these steps.

1. Go to **Warehouse management > Outbound waves > Shipment waves > All waves**.
2. Select the wave that you previously created.
3. On the Action Pane, on the **Wave** tab, in the **Wave** group, select **Process**.

The wave is processed and creates work for the reserved quantities on the load lines. The shipment status is updated from **Open** to **Waved**. As the shipment status is updated to **Waved**, any changes that occur, such as decreases or increases in line quantities, or the addition of new lines to the sales order, don't affect the existing load lines that are associated with the waved shipment.

If a shipment has a status of **Waved** or higher, updates to the quantity on a sales order line aren't reflected on or validated against a load line that is associated with the shipment. Changes to the quantity on a load line must be made directly on the load line.

Validation is done after work has been created for the load line and a reservation has been made. A decrease in the quantity on the sales order line is then validated against the work line reservation.

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Create a location profile

2/18/2021 • 2 minutes to read • [Edit Online](#)

This topic explains how to create a location profile in Dynamics 365 Supply Chain Management. Every location in the warehouse needs to have a location profile associated with it that describes the properties of the location, for example, whether the location allows mixed items. In this procedure we'll create a profile for a location that doesn't require license plate control. We'll enable mixed items, and mixed inventory statuses, and allow cycle counting. You can use this procedure in the USMF demo data company.

1. In the navigation pane, go to **Modules > Warehouse management > Setup > Warehouse > Location profiles**.
2. Select **New**.
3. In the **Location profile ID** field, type a value.
4. In the **Name** field, type a value.
5. In the **Location format** field, enter or select a value.
6. In the **Location type** field, enter or select a value.
7. In the **Dock management profile ID** field, enter or select a value.
8. Select **Yes** in the **Allow mixed items** field.
9. Select **Yes** in the **Allow mixed inventory statuses** field.
10. Select **Yes** in the **Allow cycle counting** field.
11. Select **Save**.

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Configure locations in a WMS-enabled warehouse

2/18/2021 • 8 minutes to read • [Edit Online](#)

This guide shows you how to configure the location setup for a new WMS-enabled warehouse (a warehouse that uses advanced warehouse management processes). The process is typically done by a warehouse manager. You can run this guide in demo data company USMF or on your own data. A precondition is that you have at least one site configured.

Create a new warehouse

1. Go to **Navigation pane > Modules > Inventory management > Setup > Inventory breakdown > Warehouses**.
2. Click **New**.
3. In the **Warehouse** field, type a value.
4. In the **Name** field, type a value.
5. In the **Site** field, type a value.
6. Expand the **Warehouse** section.
7. Set the **Use warehouse management processes** option to Yes. This setting allows you to run advanced warehousing processes using warehouse work and mobile devices.
8. Close the page.

Define a location format

1. Go to **Navigation pane > Modules > Warehouse management > Setup > Warehouse > Location formats**. Location formats are a naming-system used to create unique and consistent names for the different location bin positions used within a warehouse. It can be useful to use separators as part of the location format to make it easier to identify components of the location such as the aisle number. In this example, we'll create a name with four components. For example, these could be aisle, rack, shelf, and bin.
2. Click **New**.
3. In the **Location format** field, type a value.
4. In the **Name** field, type a value.
5. In the **Segment description** field, type a value. This describes what the first component of the location name represents. For example, it could be 'Aisle'.
6. In the **Length** field, enter a number. This determines how many characters this part of the location name must have. Note that the total of all components in the name, including the separators, cannot exceed 10 characters.
7. In the **Separator** field, type a value. This determines which character or symbol is used between the first and second component of the name.
8. In the **Details** section, click **New**.
9. In the **Segment description** field, type a value.
10. In the **Length** field, enter a number.
11. In the **Separator** field, type a value.
12. In the **Details** section, click **New**.
13. In the **Segment description** field, type a value.
14. In the **Length** field, enter a number.
15. In the **Separator** field, type a value.

16. In the **Details** section, click **New**.
17. In the **Segment description** field, type a value.
18. In the **Length** field, enter a number.
19. Click **Save**.
20. Close the page.

Define location types

1. Go to **Navigation pane > Modules > Warehouse management > setup > Warehouse > Location types**. Location types can be used as filtering options to control the different warehouse management processes. As a minimum, you need to create staging and final shipping location types in order to define the outbound warehouse management process.
2. Click **New**.
3. In the **Location** type field, type a value.
4. In the **Description** field, type a value.
5. Close the page.

Define location profile

1. Go to **Navigation pane > modules > Warehouse management > Setup > Warehouse > Location profiles**. The definition of location profiles is very important. Grouped locations capacity can be controlled here, as well as the policies related to what inventory gets stored, and how it is stored. Location profiles can be used as filtering options to control the different warehouse management processes. As a minimum, you must create a user location profile in order to enable the warehouse management processes.
2. Click **New**.
3. In the **Location profile ID** field, type a value.
4. In the **Name** field, type a value.
5. In the **Location format** field, click the drop-down button to open the lookup.
6. In the list, find and select the desired record.
7. In the list, click the link in the selected row.
8. In the **Location type** field, click the drop-down button to open the lookup.
9. In the list, find and select the desired record.
10. In the list, click the link in the selected row.
11. Select or clear the **Allow mixed inventory statuses** check box. Enable this option if you want to allow mixed inventory status values in the locations that are going to be grouped by this location profile.
12. Select or clear the **Override rules for batch days** check box. Enable this option to override the rule for how many days the inventory batch expiration dates can differ, to allow mixing of inventory batches that don't obeying this rule.
13. Select or clear the **Allow cycle counting** check box. Enable this option to allow cycle counting processing in all the locations that are going to be grouped by this location profile.
14. Expand or collapse the **Dimensions** section. The Dimensions tab allows you to define parameters and methods to enable precise calculations of the load capacity within each of the locations.
15. Close the page.

Enable warehouse management parameters

1. Go to **Navigation pane > Modules > Warehouse management > Setup > Warehouse management parameters**. To be able to process warehouse work, you need to set parameters for the user location profile the staging location type, and the final shipping location type. As soon as the outbound process ends at the final shipping location type that you define, the related outbound transactions will be

updated to "Picked".

2. Expand the **Location profiles** section.
3. In the **User location** field, click the drop-down button to open the lookup.
4. In the list, click the link in the selected row.
5. Expand the **Location types** section.
6. In the **Staging location type** field, click the drop-down button to open the lookup.
7. In the list, click the link in the selected row.
8. In the **Final shipping location type** field, click the drop-down button to open the lookup.
9. In the list, click the link in the selected row.
10. Close the page.

Define warehouse zone groups

1. Go to **Navigation pane > Modules > Warehouse management > Setup > Warehouse > Warehouse zone groups**. Warehouse zones can be used as filters for options to control the different warehouse management processes. You need to create a zone group before you can define a zone.
2. Click **New**.
3. In the **Zone group ID** field, type a value.
4. In the **Zone group name** field, type a value.
5. Close the page.

Define Warehouse zones

1. Go to **Navigation pane > Modules > Warehouse management > Setup > Warehouse > Zones**.
2. Click **New**.
3. In the **Zone ID** field, type a value.
4. In the **Zone name** field, type a value.
5. In the **Zone group ID** field, click the drop-down button to open the lookup.
6. In the list, find and select the desired record.
7. In the list, click the link in the selected row.
8. Close the page.

Create locations using the Location setup wizard

1. Go to **Navigation pane > Modules > Warehouse management > Setup > Warehouse > Location setup wizard**.
2. In the **Warehouse** field, click the drop-down button to open the lookup.
3. In the list, find and select the desired record.
4. In the list, click the link in the selected row.
5. In the **Zone ID** field, click the drop-down button to open the lookup.
6. In the list, find and select the desired record.
7. In the list, click the link in the selected row.
8. In the **Location profile ID** field, click the drop-down button to open the lookup.
9. In the list, find and select the desired record.
10. In the list, click the link in the selected row.
11. In the list, mark the selected row.
12. In the **From number** field, enter a number. The From number and To number fields define how many locations will be created. For example, if you set From number to 1 and To number to 3 for all four lines in the location format, 81 locations will be created (3x3x3x3).

13. In the **To number** field, enter a number.
14. In the list, find and select the desired record.
15. In the **From number** field, enter a number.
16. In the **To number** field, enter a number.
17. In the list, find and select the desired record.
18. In the **From number** field, enter a number.
19. In the **To number** field, enter a number.
20. In the list, find and select the desired record.
21. In the **From number** field, enter a number.
22. In the **To number** field, enter a number.
23. Click Create.

Create locations manually

1. Go to **Warehouse management > Setup > Warehouse > Locations**. Manually creation of locations within a warehouse can easily be done. The location name and the location profile ID are mandatory values.
2. Click **New**.
3. In the **Warehouse** field, type a value.
4. In the **Location** field, type a value. Note that you're creating a new location here, so you need to type a new unique name, rather than selecting an existing one.
5. In the **Location profile ID** field, type a value.
6. Close the page.

Define Pack size categories

1. Go to **Warehouse management > Setup > Warehouse > Pack size categories**. Pack size categories can be used to group items that have similar physical packing sizes. In this example the pack size category will be used to control the capacity at the picking locations within a specific zone of the warehouse. Please note that the pack size category ID must be assigned to the released product entity in order to be used as part of the stocking limits processing.
2. Click **New**.
3. In the **Pack size category ID** field, type a value.
4. In the **Pack size category name** field, type a value.
5. Close the page.

Define location stocking limits

1. Go to **Warehouse management > Setup > Warehouse > Location stocking limits**. Location stocking limits help to make sure that work isn't created to request that inventory to be put in a location that doesn't have the physical capacity to carry the inventory.
2. Click **New**.
3. In the **Warehouse** field, type a value.
4. In the **Location profile ID** field, type a value.
5. In the **Pack size category ID** field, type a value.
6. In the **Quantity** field, enter a number.
7. Click **Save**.
8. Close the page.

Define fixed picking locations

1. Go to **Warehouse management > Setup > Warehouse > Fixed locations**. You can define the locations to be used per product or per product variant. It is possible to create multiple fixed locations for the same product within the same warehouse.
2. Click **New**.
3. In the **Item number** field, type a value.
4. In the **Warehouse** field, type a value.
5. In the **Location** field, click the drop-down button to open the lookup.
6. In the list, click the link in the selected row.
7. Close the page.

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Warehouse location status

2/18/2021 • 8 minutes to read • [Edit Online](#)

Microsoft Dynamics 365 Supply Chain Management includes several location fields that give you flexibility when you work with and maintain locations. You can include location statuses in the location directive query to provide better control over warehouse flow.

The following four fields on the **Locations** page track information about the current status of a location. These fields let warehouse managers get an overview of the status of the warehouse locations. They also allow for advanced reporting and filtering.

- **Item number** – The item that is currently in the location. If the location contains multiple items, this field is blank.
- **Last activity date and time** – The timestamp of the last warehouse transaction that was performed against the location.
- **Aging date** – The date when the inventory in the location was brought into the warehouse. This value is calculated based on the aging date of the license plate. It's accurate for locations that are license plate-tracked, but it might not be accurate for locations that aren't license plate-tracked.
- **Location status** – The status of the location. There are four possible values:
 - **Undetermined** – The location profile can't track status. Therefore, the current status is unknown.
 - **Empty** – There is currently no inventory in the location.
 - **Picking** – Outbound transactions have been performed against the location since it was last empty.
 - **Storage** – Only inbound transactions have been performed against the location since the location was last empty.

Turn on the Warehouse location status feature

Before you can use the *Warehouse location status* feature, it must be turned on in your system. Admins can use the [feature management](#) settings to check the status of the feature and turn it on if it's required. In the **Feature management** workspace, the feature is listed in the following way:

- **Module:** *Warehouse management*
- **Feature name:** *Warehouse location status*

Set up warehouse location status

Prepare the sample data that is required for the example scenario

Before you start to work through the scenario, you must activate sample data and set up the feature as described in this section. To complete the example scenario, you must use either the warehouse app or the browser-based emulator. The steps that are provided here use the warehouse app. The steps for the browser-based emulator are similar.

Use the USMF legal entity

To work through the example scenario by using the sample records and values that are specified here, you must be on a system where the standard [demo data](#) is installed. Additionally, you must select the **USMF** legal entity before you begin.

Set up location profiles

The example scenario requires that you prepare two location profiles.

1. Go to **Warehouse management > Setup > Warehouse > Location profiles**.
2. Select **Edit** to put the page into edit mode.
3. Select the **BULK-06** profile.
4. On the **General** FastTab, set the following values:
 - **Enable item in location:** Set this option to *Yes*.
 - **Enable location activity date and time:** Set this option to *Yes*.
 - **Enable location status:** Set this option to *Yes*.These options control whether the reference fields on the location are active.
5. Repeat steps 3 through 4 for the **PICK-06** profile.

NOTE

When the parameters on the location profile (**Enable item in location**, **Enable location activity**, **Enable location status**) are set to *Yes*, the system immediately updates the relevant locations by executing the *warehouse location status consistency check* job.

Scenario

1. Go to **Procurement and sourcing > Purchase orders > All purchase orders**.
2. Select **New**.
3. In the **Create purchase order** dialog box, on the **Vendor** FastTab, in the **Vendor account** field, select *104*.
4. On the **General** FastTab, in the **Warehouse** field, select *61*.
5. Select **OK**.
6. Your new purchase order (PO) is opened. It includes an empty line in the **Purchase order lines** grid. On this line, set the following values:
 - **Item number:** *A0002*
 - **Quantity:** *5*
7. On the Action Pane, on the **Purchase** tab, in the **Actions** group, select **Confirm** to confirm the purchase order.
8. On the mobile device, go to **Inbound > Purchase Receive**.
9. Select the **PONUM** field, enter the PO number, and confirm.
10. Select the **ITEM** field, enter *A0002* as the item number, and confirm.
11. On the **QTY** page, enter *5* as the quantity, and confirm.

You can enter the quantity in either of the following ways:

 - Select the plus sign (+) or minus sign (–) button to add or subtract a numerical value.
 - Select the blank field between the plus sign (+) and minus sign (–) buttons to open the number pad.
12. Confirm your selection of item number *A0002* and a quantity of *5*. A "Work Completed" message appears at the bottom of the page.
13. Select the Menu button (sometimes referred to as the hamburger or the hamburger button) in the upper-

right corner, and then select **Cancel** to exit **Purchase Receive** and return to the **Inbound** menu.

14. On the purchase order page, select **Work details** above the **Purchase order lines** grid.
15. On the **General** tab, notice the **Work ID** and **Target license plate ID** values that were created.
16. In the **Lines** section, notice the **Location** values for the *Pick* and *Put* work types.
17. On the mobile device, go to **Inbound > Purchase Put-away**.
18. Select the **ID** field, enter the work ID, and confirm.
19. Confirm once more to complete the *Pick* entry.
20. Select the Menu button in the upper-right corner, and then select **Done** to complete the *Pick* work.
21. Make a note of the Putaway location, and confirm. A "Work Completed" message appears at the bottom of the page.
22. Select the Menu button in the upper-right corner, and then select **Cancel** to exit **Purchase Put-away** and return to the **Inbound** menu.
23. Select **Back** to return to the main menu.
24. In Dynamics 365 Supply Chain Management, go to **Warehouse management > Setup > Warehouse > Locations**.
25. Filter on **Location**, and enter the putaway location from the purchase order work. You should see the following results:
 - The **Location status** column shows a value of *Storage*, because the last transaction against this location was a put.
 - The **Item number** column shows a value of *A0002*, because that item was received and put to the location.
 - The **Last activity date and time** column shows the timestamp for the date and time when the work was completed at the location.
26. On the mobile device, go to **Quality > Movement**.
27. Select the **LOC/LP** field, and enter the location you made note of in the previous steps.
28. Confirm the information that is shown. Make a note of the license plate number that is generated.
29. On the **To Information** screen, select the **LOC/LP** field, and enter *06A07R2S1B* as the location to move the item to.
30. On the **To Information** screen, confirm the LP value (the target license plate ID), which is automatically generated. A "Work Completed" message appears at the bottom of the page.
31. Select the Menu button in the upper-right corner, and then select **Cancel** to exit **Movement** and return to the **Quality Management** menu.
32. Select **Back** to return to the main menu.
33. In Dynamics 365 Supply Chain Management, go to **Warehouse management > Setup > Warehouse > Locations**.
34. Refresh the **Locations** page, and view the original putaway location again. Notice that the **Location status** field is now set to *Empty*, and the **Item number** column is blank.
35. View the record for location *06A07R2S1B*, and notice that the **Status** value has changed to *Storage*, and the **Item number** and **Last activity date and time** fields have been updated.

36. Go to **Sales and marketing > Sales orders > All sales orders**.
37. Select **New**.
38. In the **Create sales order** dialog box, in the **Customer account** field, select *US-002*.
39. In the **Warehouse** field, select *67*.
40. Select **OK**.
41. Your new sales order is opened. It includes an empty line in the **Sales order lines** grid. On this line, set the following values:
 - **Item number:** *A0002*
 - **Quantity:** *1*
42. On the **Sales order lines** FastTab, on the **Inventory** menu, select **Reservation**.
43. On the **Reservation** page, select **Reserve lot** to reserve the order line. Then select the **Close** button (X) in the upper-right corner to close the page.
44. On the Action Pane, on the **Warehouse** tab, in the **Actions** group, select **Release to warehouse**.
45. In the **Sales order lines** section, on the **Warehouse** menu, select **Work details**.
46. Copy the **Work ID** value that was created.
47. On the mobile device, go to **Outbound > Sales picking**.
48. Select the **ID** field, enter the work ID that you copied earlier, and confirm.
49. On the **Sales orders: Pick** page, the **LOC** field suggests the picking location as the putaway location that was created earlier. Make a note of the location.
50. Select the **LOC** field, enter the location, and confirm.
51. Select the **LP** field, enter the license plate number that you made a note of during the Movement activity, and confirm.
52. Select the **Item** field, enter the *A0002* as the item number, and confirm.
53. On the **QTY** page, enter *1* as the quantity, and confirm.

You can enter the quantity in either of the following ways:

 - Select the plus sign (+) or minus sign (–) button to add or subtract a numerical value.
 - Select the blank field between the plus sign (+) and minus sign (–) buttons to open the number pad.
54. Select the **TARGET LP** field, enter a user-defined target license plate ID, and confirm.
55. Confirm once more to complete the picking work. A "Work Completed" message appears at the bottom of the page.
56. Select the **Menu** button in the upper-right corner, and then select **Cancel** to complete the picking activity and return to the **Outbound** menu.
57. In Dynamics 365 Supply Chain Management, go to **Warehouse management > Setup > Warehouse > Locations**.
58. Filter on **Location**, and enter the pick location from the sales order work.
59. Notice that the **Location status** field for the location that the sales order work picked from is now set to *Picking*, and the **Last activity date and time** field has been updated.

NOTE

The location fields are updated only by warehouse transactions. If you move inventory by using a journal or other non-WHS processes, the fields won't be updated.

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Additional location zones

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Three new zone fields are available in Microsoft Dynamics 365 Supply Chain Management. Warehouse managers can use them to define additional warehouse organizations or layouts. The new zone fields can be set either manually or by using the **Location setup** wizard. They can be used in any query or filtering that uses the Locations table.

No additional setup is required to use the zone fields.

Turn on the Additional location zone feature

Before you can use the *Additional location zone* feature, it must be turned on in your system. Admins can use the [feature management](#) settings to check the status of the feature and turn it on if it's required. In the **Feature management** workspace, the feature is listed in the following way:

- **Module:** *Warehouse management*
- **Feature name:** *Additional location zone*

Use location zones

1. Go to **Warehouse management > Setup > Warehouse > Location setup wizard**.
2. Set the following values:
 - In the **Warehouse** field, select *62*.
 - In the **Zone ID** field, select *FLOOR*.
 - In the **Additional Zone 1** field, select *PICKZONE1*.
 - In the **Additional Zone 2** field, select *WEBSHOP1*.
 - In the **Location profile ID** field, select *FLOOR*.
3. Select the **Floor** line.
4. In the **From number** field, enter *1*. In the **To number** field, enter *3*.
5. Select the **Aisle** line.
6. In the **From number** field, enter *1*. In the **To number** field, enter *5*.
7. Select **Create**.
8. You receive messages that state that new locations have been added. Select the **Show messages** button to view the messages.
9. Go to **Warehouse management > Setup > Warehouse > Locations**. The new locations appear in the list, and all zone fields are available (that is, the existing zone field and the new additional zone fields).

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Schedule load utilization

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You can schedule load utilization for selected location types, and you can also project the current and future load utilization. You can project the load for one or more sites, for the load units (zone or warehouse), or for a combination of a zone and a warehouse.

Schedule and view the load for a warehouse or site

To schedule the load for sites, warehouses, or zones, you create a space utilization setup and associate it with a master plan.

In the space utilization setup, you use location types, such as **Bulk location** and **Picking location**, to specify how space utilization should be projected. You also specify a storage load mode, such as **Zone**.

The projection of future space utilization is based on information that is calculated on the associated master plan. Master plans forecast the resource planning for incoming and outgoing orders for production and operations. The projection of available space is based on the relation between the space utilization setup and the selected master plan.

By using the storage load mode that you selected in the space utilization setup, you can specify whether the load should be projected for each warehouse or zone, or whether the projections should include information about both warehouses and zones. You also specify whether blocked locations should be excluded from the calculation of load utilization.

You can project the space utilization by generating the **Warehouse load utilization** report. When you generate this report, you can specify whether the load utilization should be projected for each site, across sites, or for the selected load unit, such as zone or warehouse.

Create a space utilization setup for a warehouse

1. Select **Inventory management > Setup > Warehouse monitoring > Space utilization**.
2. Select **New** to create a space utilization setup. Specify an ID and a name for the new setup.
3. In the **Storage load mode** field, select whether the overview of space utilization should show information by warehouse, zone, or warehouse and zone.
4. Set the **Exclude blocked locations** option to **Yes** to exclude blocked inventory locations from the calculation of available space. You can block an inventory location for input and output by specifying a blocking cause for the location in the **Input blocked** or **Output blocked** field on the **Other** FastTab on the **Inventory locations** page.
5. On the **Location type** FastTab, select the location types to include in the space utilization calculation. You must select at least one location type for the projection.

Associate a space utilization setup with a master plan

1. Select **Inventory management > Periodic tasks > Schedule load utilization**.
2. In the **Master plan** field, select a master plan.
3. In the **Number of days** field, specify the number of days to include in the projection of current and future workloads.
4. In the **Space utilization** field, select the space utilization setup to use for the projection of current and future workloads.

Specify the load utilization projection and view information

1. Select **Inventory management > Inquiries and reports > Physical inventory reports > Warehouse load utilization**.
2. In the **Show by** field, select the level of the space utilization projection:
 - **Site** – Project the space utilization for each site. This projection is useful if, for example, you want to view all the warehouses for a site so that you can balance the space utilization between the warehouses.
 - **Load unit** – Project the space utilization for zones or warehouses. The available space is then projected according to the value that you selected in the **Storage load mode** field on the **Space utilization** page when you created the space utilization setup.
3. Follow one of these steps, depending on the value that you selected in the previous step:
 - If you selected **Site** in the **Show by** field, the **Site** field is available. Select one or more sites to include in the projection.
 - If you selected **Load unit** in the **Show by** field, the **Load unit** field is available. Select the load unit.
4. In the **Load type** field, select **Volume** or **Weight** to specify the warehouse operating unit to project space for.
5. In the **Space utilization setup** field, select the space utilization setup that the projection should be based on.

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Schedule workload capacity

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You can schedule workload capacity for warehouses, and you can also project the current and future workloads for the workers in individual warehouses. You can project the workload for the whole warehouse, or you can project the workload separately for incoming and outgoing workloads.

To project workload output for selected warehouses, master scheduling data must be available for those warehouses. For more information, see [Master plans overview](#).

Schedule and view workloads for a warehouse

To schedule workload capacity for a warehouse, you create a workload setup for one or more warehouses, and then associate the workload setup with a master plan. In the workload capacity setup, you can define limits for the weight or volume for incoming and outgoing transactions. You can also create more than one setup for each warehouse and then associate the setup with individual master plans. For example, you might use this approach to accommodate seasonal changes in the workforce.

If the workers for a warehouse work with transactions for both incoming and outgoing workloads, you can configure the warehouse capacity setup so that the workload is projected in a combined view.

To schedule and view workloads for warehouses, you must complete the following tasks:

1. Create a workload capacity setup and define workload capacity limits for one or more warehouses.
2. Associate the workload capacity setup with a master plan to create workload projections and specify how long those projections will apply.

Create a workload capacity setup for a warehouse

1. Select **Inventory management > Setup > Warehouse monitoring > Workload capacity**.
2. On the Action Pane, select **New** to create a workload capacity setup.
3. On the **Warehouses** FastTab, select **New**, and then enter values on the line to associate a warehouse with the workload capacity setup.
4. Select the **Combined inbound and outbound workload** check box if the **Workload capacity** report should show the total workload for incoming and outgoing transactions in one view.
5. On the **Transaction types** FastTab, select the types of incoming and outgoing transactions that the workload limits will apply to.

NOTE

You must select at least one transaction type for both the incoming workload and the outgoing workload.

Define limits for volume or weight

You can set up limits for volume or weight, depending on the limitation that is relevant for the warehouse workforce. The limits that you specify are included in the workload capacity projection that you can view on the **Workload capacity** report.

To project information about volume and weight for items, the standard volume of one inventory item and the weight of one inventory item must be specified for all products. The fields that are required are available in the following field groups on the **Manage inventory** FastTab of the **Released product details** page:

- Handling
- Physical dimensions
- Weight measurements

If this information isn't specified correctly, you receive a message when you generate the **Workload capacity** report. From the report, you can then drill down to identify the missing information that is required in order to project the future workload.

Associate a workload capacity setup with a master plan

1. Select **Inventory management > Periodic > Schedule workload**.
2. In the **Master plan** field, select the master plan to use for workload projections.
3. In the **Number of days** field, specify the number of days that the workload projection covers.
4. In the **Workload** field, select the workload setup to associate with the master plan.

View workload capacity

1. Select **Inventory management > Inquiries and reports > Physical inventory reports > Workload capacity**.
2. In the **Number of columns** field, specify the number of columns to show on the report.
3. In the **Order type** field, select **Planned and confirmed**, **Planned**, or **Confirmed** to indicate the type of orders to project on the report.
4. In the **Load type** field, select a load type to specify whether the workload capacity should be projected for volume or weight.
5. In the **Workload capacity** field, select a workload capacity setup.

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Set up dispositions codes

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This procedure focuses on the setup of a disposition code that can be used on a mobile device for the return order receiving process. Disposition codes are a collection of rules that can be used when items are received. For example, when a work user uses a mobile device to receive items that were damaged, the user must scan a disposition code for damaged items. The inventory status of the goods received, the work template, and the location directive can be determined from the scanned disposition code. For the purchase order receiving process and the production order report as finished process, the use of a disposition code is optional. For the sales order return receiving process, if the items are registered using a mobile device, the use of disposition code is mandatory. This guide was created using the demo data company USMF. This procedure is intended for the warehouse manager.

1. Go to Warehouse management > Setup > Mobile device > Disposition codes.
2. Click New.
 - Create a new disposition code to use for customer returns.
3. In the Disposition code field, type a value.
4. In the Inventory status field, select an inventory status where there is inventory blocking.
 - If you're using USMF, select 'Blocking'. You can add an inventory status to the disposition code to override the default status that's on the order lines.
5. In the Work template field, type a value.
 - Optional: Select a work template code that is associated with a return order. If no value is provided, the work template will be resolved using the standard rules configured in your system. Selecting a work template will limit the processes this disposition code can be used with. For example, if a disposition code has a work template with a work order of type purchase order, it can't be used to register items that are returned by customers.
6. In the Return disposition code field, type a value.
 - The return disposition code determines the remainder of the return order process for the items registered. In this example, the customer should receive a credit note. Add a returns disposition code that contains an action Credit.

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Unit of measure and stocking policies

2/18/2021 • 3 minutes to read • [Edit Online](#)

This article describes how default units, unit sequences, and unit conversions are used in warehouse processes.

Unit sequence groups define the sequence of units that can be used in warehouse operations. They are created on the **Unit sequence groups** page. The sequence shows the relationship of the various units. For example, you store pallets that contain boxes that contain individual pieces of items. In this case, you must provide the three different units and the logical order of the layers. Unit sequence groups let you define the policies for the grouping of license plates, and the default units that should be used for various warehouse processes. This article applies to both the advanced warehousing solution that is available in Warehouse management and the more basic warehousing solution that is available in Inventory management.

Unit sequence groups for released products

If you want to use released products in warehouse work processes, a unit sequence group must be assigned to them. If you validate a product that is associated with a Storage dimension group, and the **Use warehouse management processes** option for the Storage dimension group is set to **Yes**, you receive an error message if a unit sequence group ID isn't defined for the product. If the unit sequence group that you use contains multiple lines (and therefore multiple units), you must set up a unit conversion between the units. You complete this setup on the **Unit conversions** page. The smallest unit in a sequence group that you associate with a released product must match the inventory unit that is defined for the corresponding product. The inventory unit is the unit that is used for base calculations of the on-hand inventory. You can also set up unit of measure conversions for product variants of product masters by using the **Enable unit of measure conversions** option.

License plate grouping

You can specify whether receipts of less than or more than a specific unit should be grouped into one license plate or divided into a license plate for each unit. To set up this behavior, use the **License plate grouping** option on the **Line details** tab of the **Unit sequence groups** page. If you want to use the license plate grouping when you process work by using a mobile device, the **License plate grouping** option must be selected on the **Mobile device** menu item. For example, you're using a mobile device to register an item that is associated with a unit sequence group that has two lines. The first line is for Pieces, and the **License plate grouping** option is set to **Yes**. The second line is for the Pallet unit, and the **License plate grouping** option is set to **No**. In this case, the system can automatically guide the split and creation of license plates per 100 pieces.

Units for cycle counting

To define which units should be used as part of the cycle counting processes, select the **Use unit for cycle counting** option on the **Unit sequence groups** page. You can select a maximum of four units in the sequence group. If you select more than four units, the additional units won't be shown on the mobile device.

Default units for mobile device receiving processes

To set the default units that should be used for receiving processes on mobile devices, enable the **Default unit for purchase and transfer** and **Default unit for production** options on the **Unit sequence groups** page. For example, you can specify that, by default, the system should use Pallet quantities when purchase order on-hand inventory is received by using a mobile device, but that the stock-keeping unit should be Pieces. To get the conversion for the number of pieces that each pallet contains, you must define a unit conversion, such as 100 Pcs = 1 PL.

Default order settings

As part of the creation of released products, you must select default units for purchases, sales, and inventory to process the various orders. You can set the default units and quantities for the various source documents by using the **Default order settings** and **Site specific order settings** pages. You can access these pages from the **Released products** page.

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Warehouse performance Power BI content

2/18/2021 • 10 minutes to read • [Edit Online](#)

This topic describes what's included in the **Warehouse performance** Microsoft Power BI content. It explains how to access the Power BI reports, and provides information about the data model and entities that are used to build the content.

Overview

The **Warehouse performance** Power BI content was created so that warehouse and operations managers can monitor important inbound, outbound, and inventory metrics. It uses Warehouse management, product, and other transactional data from your system, and provides both an aggregate view of warehouse performance and a breakdown for vendors, product groups and products, and site and warehouses.

Warehouse managers can use the **Warehouse performance** Power BI content to measure the following three areas:

- **Inbound performance** – Measure how well a vendor is performing against customer requirements (in other words, measure delivery performance), and measure put-away performance, so that you can identify issues that involve workers or items over a period. It's important that you know whether vendors are delivering on time, early, or late, so that you can determine how vendor performance is affecting overall put-away performance. A vendor that delivers outside the dates that were agreed on can put extra pressure on the warehouse because of unexpected work, and can increase the average put-away time.
- **Shipping performance** – Measure whether your warehouse is shipping in full and on time to customers (in other words, measure outbound shipping and delivery performance), so that you can identify any issues that involve products, sites or warehouses, or dedicated customers. If you find that you're shipping late to specific areas or towns, you might have to pay more attention to transportation or account management.
- **Location inventory accuracy** – Inventory accuracy is important internal warehouse business intelligence (BI). It's very important that you determine how accurately you're counting in general. However, it's also important that you determine how accurate you are at storing items in the correct locations, and that you highlight discrepancy data, so that you can find better positions for items or initiate total counting on specific items. (Currently, the new item-based counting functionality is delivered as a hotfix.) If you're using this Power BI content to determine the correctness of on-hand inventory data per location, you can also identify theft in your shops. You can also determine whether any locations have on-hand quantities that differ from enterprise resource planning (ERP) data. Those locations might be too large, or they might be impossible to count. Alternatively, some of the physical positioning might be bad, so that it's difficult to keep a single type of item in sync with on-hand data.

Accessing the Power BI content pack

The **Warehouse performance** Power BI content is shown on the **Warehouse performance** page (**Warehouse management > Inquiries and reports > Warehouse performance analysis > Warehouse performance**).

Metrics that are included in the Power BI content

The **Warehouse performance** Power BI content includes a report. This report consists of a set of metrics that are visualized as charts, tiles, and tables. The following table provides an overview of the visualizations in the **Warehouse performance** Power BI content.

REPORT PAGE	CHARTS	DESCRIPTION
Inbound Performance	Total put aways	The number of put-away work lines that are processed during a given time.
Inbound Performance	Put away average time	The average time, in hours, for all purchase order put-away lines that are processed, from registration of the items until the last put is processed.
Inbound Performance	Received early	The number of purchase order lines that are received early.
Inbound Performance	Received on time	The number of purchase order lines that are received on time.
Inbound Performance	Received late	The number of purchase order lines that are received late.
Inbound Performance	On time by vendor	A view of the percentage of purchase order lines that are received from a vendor or vendor group early, on time, and late.
Inbound Performance	Dock to stock average put away (hours)	The average dock-to-stock put-away time in hours over time.
Inbound Performance	Average put away by worker	The average time, in hours, that a worker has been taking for put-away processing of purchase order lines.
Inbound Performance	Average put away hour by vendor	The average put-away time in hours by vendor or vendor group.
Inbound Performance	Average put away hour by product	The average put-away time in hours by item or item group.
Location inventory accuracy	Total count	The number of counting work lines that are processed for a given period.
Location inventory accuracy	Discrepancy rate	The total discrepancy rate as a percentage of all lines that are counted for a given period.
Location inventory accuracy	Count without discrepancy	Of the total number of counting work lines that are processed, the number of lines that are processed without any discrepancy.
Location inventory accuracy	Items counted over time	The percentage of items that are counted with and without discrepancy over time.

REPORT PAGE	CHARTS	DESCRIPTION
Location inventory accuracy	Item quantity discrepancy greater than %	A table view of counting lines that have discrepancies that exceed a specified percentage. The table includes information about locations, items, the average discrepancy, the total counting work lines that are counted, the number of counting lines that have discrepancies for the location, the average quantity that is counted, the expected total quantity that will be counted, and the actual item quantity that is counted.
Location inventory accuracy	Item count by worker	The counting performance of workers. Performance is expressed as a percentage of counting work lines that have and don't have discrepancies.
Location inventory accuracy	Item count by site / warehouse	Counting performance by the number of processed counting work lines by site or warehouse that have and don't have discrepancies.
Location inventory accuracy	Discrepancy rate by product	The discrepancy rate for counting performance. The rate is expressed as a percentage of processed counting work lines by item or item group.
Shipping performance	Lines shipped	The total number of shipment lines that are shipped over a given period.
Shipping performance	Early	The percentage of shipment lines that are shipped early.
Shipping performance	On time	The percentage of shipment lines that are shipped on time.
Shipping performance	Late	The percentage of shipment lines that are shipped late.
Shipping performance	Shipments over time	The percentage of shipment lines that are shipped on time, early, or late over a given period. A trend line shows the trend for lines that are shipped on time.
Shipping performance	Shipped late by city	A map visualization of cities and areas that are affected by late shipments.
Shipping performance	Shipped by product	The percentage that is shipped early, on time, or late by item or item group.
Shipping performance	Shipped by customer	The percentage that is shipped early, on time, or late by customer or customer group.

REPORT PAGE	CHARTS	DESCRIPTION
Shipping performance	Shipped by site / warehouse	The percentage that is shipped early, on time, or late by site or warehouse.

Understanding the data model and calculations

The following data is used to fill the report pages in the **Warehouse performance** Power BI content. This data is represented as aggregate measurements that are staged in the Entity store. The Entity store is a Microsoft SQL Server database that is optimized for analytics. For more information, see [Power BI integration with Entity store](#).

The following key aggregate measurements are used as the basis of the content.

REPORT PAGE	CHARTS	TABLES	CALCULATION DESCRIPTIONS
Inbound Performance	Total put aways	WHSWorkLine	The count of work lines where the work type is put .
Inbound Performance	Put away average time	WHSWorkLine	The sum of work lines max. time divided by the count of work lines max. time, where work lines max. time is the maximum gap between the work created date and the closed date.
Inbound Performance	Received early	WHSWorkLine	The count of work lines where the work created date is earlier than the delivery date that is used. If the delivery confirmed date isn't set, use the default delivery date.
Inbound Performance	Received on time	WHSWorkLine	The count of work lines where the work created date is equal to the delivery date that is used. If the delivery confirmed date isn't set, use the default delivery date.
Inbound Performance	Received late	WHSWorkLine	The count of work lines where the work created date is later than the delivery date that is used. If the delivery confirmed date isn't set, use the default delivery date.
Inbound Performance	On time by vendor	WHSWorkLine	Received early, Received on time, and Received late (see the descriptions earlier in this table).

REPORT PAGE	CHARTS	TABLES	CALCULATION DESCRIPTIONS
Inbound Performance	Dock to stock average put away (hours)	WHSWorkLine	Put away average time (see the description earlier in this table).
Inbound Performance	Average put away by worker	WHSWorkLine	Put away average time (see the description earlier in this table).
Inbound Performance	Average put away hour by vendor	WHSWorkLine	Put away average time (see the description earlier in this table).
Inbound Performance	Average put away hour by product	WHSWorkLine	Put away average time (see the description earlier in this table).
Location inventory accuracy	Total count	WHSWorkLineCycleCount	Cycle counts where the absolute discrepancy quantity is equal to or more than 0 (zero).
Location inventory accuracy	Discrepancy rate	WHSWorkLineCycleCount	Cycle counts that have discrepancies, divided by the total count. A cycle count is considered to have discrepancies if the absolute discrepancy quantity is more than 0 (zero).
Location inventory accuracy	Count without discrepancy	WHSWorkLineCycleCount	Cycle counts where the absolute discrepancy quantity is more than 0 (zero).
Location inventory accuracy	Count with discrepancy	WHSWorkLineCycleCount	Cycle counts where the absolute discrepancy quantity is equal to 0 (zero).
Location inventory accuracy	Items counted over time	WHSWorkLineCycleCount	Count without discrepancy and Count with discrepancy (See the descriptions earlier in this table.)

REPORT PAGE	CHARTS	TABLES	CALCULATION DESCRIPTIONS
Location inventory accuracy	Item quantity discrepancy greater than %	WHSWorkLineCycleCount	The average discrepancy is the absolute discrepancy quantity divided by the expected quantity where the absolute discrepancy quantity is more than 0 (zero). The average discrepancy quantity is the average absolute discrepancy quantity where the absolute discrepancy quantity is more than 0 (zero). Count with discrepancy, Total count, Expected quantity, and Counted quantity where the whole quantity is grouped by item and location (see the descriptions earlier in this table).
Location inventory accuracy	Item count by worker	WHSWorkLineCycleCount	Count without discrepancy and Count with discrepancy (see the descriptions earlier in this table).
Location inventory accuracy	Item count by site / warehouse	WHSWorkLineCycleCount	Count without discrepancy and Count with discrepancy (see the descriptions earlier in this table).
Location inventory accuracy	Discrepancy rate by product	WHSWorkLineCycleCount	Discrepancy rate (see the description earlier in this table).
Shipping performance	Lines shipped	SalesLine	The count of sales lines where sales lines are shipped.
Shipping performance	Early	CustPackingSlipOnTimeStat us	Sales lines where the ship date status is 1 (Early) . Early means that the ship date of the packing slip is earlier than the confirmed ship date of the sales line. If the confirmed ship date isn't set, use the requested ship date.

REPORT PAGE	CHARTS	TABLES	CALCULATION DESCRIPTIONS
Shipping performance	On time	CustPackingSlipOnTimeStat us	Sales lines where the ship date status is 2 (On time). On time means that the ship date of the packing slip is equal to the confirmed ship date of the sales line. If the confirmed ship date isn't set, use the requested ship date.
Shipping performance	Late	CustPackingSlipOnTimeStat us	Sales lines where the ship date status is 3 (Late). Late means that the ship date of the packing slip is later than the confirmed ship date of the sales line. If the confirmed ship date isn't set, use the requested ship date.
Shipping performance	Shipments over time	SalesLine CustPackingSlipOnTimeStat us	Orders that are fully shipped, where the whole quantity of the sales line is shipped, plus Early, On time, and Late (see the descriptions earlier in this table).
Shipping performance	Shipped late by city	CustPackingSlipOnTimeStat us	Late (see the descriptions earlier in this table).
Shipping performance	Shipped by product	CustPackingSlipOnTimeStat us	Early, On time, and Late (see the descriptions earlier in this table).
Shipping performance	Shipped by customer	CustPackingSlipOnTimeStat us	Early, On time, and Late (see the descriptions earlier in this table).
Shipping performance	Shipped by site / warehouse	CustPackingSlipOnTimeStat us	Early, On time, and Late (see the descriptions earlier in this table).

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

System grouping on an open work list

2/18/2021 • 2 minutes to read • [Edit Online](#)

By using a system grouping field, you can filter an open work list without having to edit the mobile device menu item. Where it applies, system grouping works for filtering a work list on a single work header field. You cannot use system grouping to filter on line level fields.

Set up system grouping on an open work list

Use these steps to set up system grouping on an open work list.

- From a mobile device menu item, select **Mode: Indirect** and **Activity Code: Display open work list**. The following options become available. These options are required for system grouping on an open work list.

OPTION	DESCRIPTION
Allow system grouping	Enables system grouping for a selected work list menu item.
System grouping field	Available only if Allow system work is set to Yes . Select the field that determines how picking work will be grouped for workers. For example, if you select the ShipmentId field, the worker will scan the shipment ID to group the picking work. All work for the shipment is then assigned to the worker. This field requires that you create a menu item to use existing work that is grouped by the system. Use the System grouping label field to inform the worker what to scan.
System grouping label	Available only if Allow system work is set to Yes . Enter information for the worker about what to scan when picking work is grouped. For example, if you use the ShipmentId field to group picking work by shipment, you might enter Shipment ID in the field. This field requires that you create a menu item to use existing work that is grouped by the system. You must also select the field to group by in the System grouping field.

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Document routing layout for license plate labels

2/18/2021 • 3 minutes to read • [Edit Online](#)

The document routing layout defines the layout of license plate labels, and the data that is printed on them. You configure the printing trigger points when you set up mobile device menu items and work templates.

In a typical scenario, warehouse receiving clerks print license plate labels immediately after they record the contents of pallets that arrive in the receiving area. The physical labels are applied to the pallets. They can then be used for validation as part of the put-away process that follows and future outbound picking operations.

You can print highly complex labels, provided that the printing device can interpret the text that is sent to it. For example, a Zebra Programming Language (ZPL) layout that includes a bar code might resemble the following example.

```
^XA~TA000~JSN^LT0^MNW^MTD^PON^PMN^LH0,0^JMA^PR2,2~SD15^JUS^LRN^CI0^XZ
^XA
^MMT
^PW320
^LL0160
^LS0
^FT20,58^A0N,28,28^FH\^FDLabel:^FS
^FT20,81^AAN,18,10^FH\^FD$LicensePlateId$^FS
^BY1,3,17^FT20,106^BCN,,Y,N,N,A
^FD$LicensePlateId$^FS
^PQ1,,Y^XZ
```

As part of the label printing process, the text `$LicensePlateId$` in this example will be replaced with a data value.

To see the values that will be printed, go to **Warehouse management > Inquiries and reports > License plate labels**.

Several widely available label generation tools can help you format the text for the label layout. Many of these tools support the `$FieldName$` format. In addition, Microsoft Dynamics 365 Supply Chain Management uses special formatting logic as part of the field mapping for the document routing layout.

Custom number formats

You can customize the formatting of numerical field values that are printed by using codes that have the following format.

```
$FieldName:FormatString$
```

Here is an explanation of this format:

- `FieldName` is the name of the data field (such as **Qty**).
- `FormatString` defines how the data must be printed.

The following examples show how you can customize the work quantity (**Qty**) field:

- To always show four digits (by using zeros as placeholders), use `$Qty:0000$`. For example, if the quantity is 10, the label will show "0010."
- To always show two decimal places, use `$Qty:0.00$`. For example, if the quantity is 10, the label will show

"10.00."

For a complete list of the available number format strings, see [Custom numeric format strings](#).

Custom string formats

You can remove the first characters of a string by using the following field and format code.

```
$FieldName:##.$
```

Here, # specifies the number of characters to skip. For example, to print a Serial Shipping Container Code (SSCC) license plate number that doesn't include the first two characters, use `$LicensePlateId:2.$`. In this case, the license plate number 001111111111222221 will be printed as "1111111111222221."

Custom date/time formats

The following example shows how you can control the format that is used to print dates.

```
$PrintedDate:dd-MM-yyyy$
```

In this example, the date April 30, 2020, will be printed as "30-04-2020."

For a complete list of the available date/time formats, see [Custom date and time format strings](#).

Print individual lines from multiline data

If a data field contains multiple lines (that is, lines that are separated by line breaks), you can print an individual line by using the following format.

```
$FieldName[#]$
```

Here, # is the line number that you want to print. (Use 1 for the first line.)

For example, your system has an `AdditionalAddress` field that stores the following multiline address:

Contoso Inc.
123 Street Name
Some City, Some State

You can print this address, one line at a time, by using the following codes.

CODE	TEXT THAT IS PRINTED
<code>\$AdditionalAddress[1]\$</code>	Contoso Inc.
<code>\$AdditionalAddress[2]\$</code>	123 Street Name
<code>\$AdditionalAddress[3]\$</code>	Some City, Some State

Print and format from a display method

You can print from a display method by using the following format.

```
$DisplayMethod()$
```

You can combine this format with other types that were described earlier in this topic. For example, you have a display method that is named `DisplayListOfItemsNumbers()`, and you want to print the first item number of this method. In this case, you can use the following code.

```
$DisplayListOfItemsNumbers()[1]$
```

More information about how to print labels

For more information about how to set up and print labels, see [Enable license plate label printing](#).

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Mobile barcode support

2/18/2021 • 2 minutes to read • [Edit Online](#)

Because Android is an open source project, any manufacturer of hardware for warehouse bar code scanners can build a device to run the Android operating system. A device is only Android-compatible if it can run apps that are written for the Android execution environment. However, a hardware vendor can modify and create overlays for the Android version that runs on their hardware. Microsoft cannot take any responsibility to ensure that a mobile bar code scanning app for Android is compatible with a manufacturer's bar code scanning hardware and the Android version that runs on it.

The Dynamics 365 Supply Chain Management - warehouse app has been tested with a selection of Android powered devices for bar code scanning. These tests only cover a sample of the devices that are available on the market.

As a customer, we recommend that you test the Warehouse mobile scanning app on selected hardware before you decide on the hardware that you want to buy.

NOTE

Can you tell us about your documentation language preferences? [Take a short survey.](#)

The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Set up warehouses for transfer orders

2/18/2021 • 2 minutes to read • [Edit Online](#)

You can use warehouse levels to create a hierarchy that supports transfer orders between warehouses. Based on this setup, master scheduling calculates item requirements at the individual warehouse level and generates planned transfer orders from an assigned source warehouse to fulfill them.

1. Click **Inventory management > Setup > Inventory breakdown > Warehouses**.
2. Select the warehouse that you want to refill.
3. On the **Master planning** FastTab, select the **Refilling** check box.
4. In the **Main warehouse** field, select the warehouse that you want to assign as the refilling warehouse. Master scheduling calculates a transfer requirement for the selected warehouse and generates a planned transfer order from the assigned **Main warehouse**.

NOTE

If you clear the **Refilling** check box, the selected warehouse is assigned a warehouse level in regard to the **Main warehouse**, but the **Main warehouse** is not set up as a refilling warehouse.

5. Close the page to apply the new setup.

TIP

If you want to assign a warehouse for refilling, you must first set up the warehouse as a storage dimension on the **Storage dimension groups** page. On this page, select the **Active** field and the **Coverage plan by dimension** field for the warehouse.

Set up transport lead time

You must also set up the transport lead time between the warehouses on the **Transport days** page.

1. Go to **Inventory management > Setup > Distribution > Transport days**.
2. In the **Receiving point** field, select warehouse.
3. Select the **Shipping warehouse**, **Receiving warehouse**, and **Transport days**.
4. (Optional) You can also set transport time, depending on the mode of delivery, under the **Transport days per mode of delivery** tab.

NOTE

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Troubleshoot warehouse configuration

2/18/2021 • 3 minutes to read • [Edit Online](#)

This topic describes how to fix common issues that you might encounter while you configure Microsoft Dynamics 365 Supply Chain Management.

I receive the following error message: "The license plate or location is not valid."

Issue description

You receive this error message when you scan a license plate ID or location.

Issue resolution

Make sure that the license plate ID isn't reserved by something else. This issue used to occur when the value that a user scanned in the warehouse app was both a valid location and a valid license plate ID. However, this issue was resolved in version 10.0.11.

I receive the following error message: "License plate must be specified for this location."

Issue description

You receive this error message if you create a transfer order by using a warehouse that is enabled for advanced warehouse management (WMS), and then, after the work is completed, you try to confirm the shipment.

Issue resolution

The **Default receipt location** field is blank for a transit warehouse of the "from" warehouse. To fix this issue, specify a default receipt location in the transit warehouse. Make sure that this location is license plate-controlled.

I receive the following error message: "You can't create a work template line for Inventory status change because the work type is not valid. Select a different work type."

Issue description

For a work template, you can't select *Inventory status change* in the **Work type** column of the **Work template details** section.

Issue resolution

This behavior is by design. The *Inventory status change* work type is used only by system processes. It can't be configured. Because the list of work types is fixed as an enumeration, the extra entries can't be filtered out of the **Work type** drop-down menu.

I receive the following error message: "The Quantity is not valid for unit 1%."

Issue description

The quantity isn't valid for the *ea* unit when there is picking work that has multiple license plates in one location.

Issue resolution

Verify that the **Unit sequence group ID** and **Unit conversions** fields on the released product or product variant are set correctly.

Note that the error message has been improved in version 10.0.15 (see [KB 4581627](#)). The new error message is, "The quantity is not valid. Expected %1 %2."

In location directives for sales order put work, the multiple SKU option doesn't evaluate multiple location directive actions.

Issue description

Location directives of the *Sales orders* work order type and the *Put* work type don't evaluate multiple location directive actions when the **Multiple SKU** option is selected. Only the first location directive action is evaluated.

Issue resolution

A new feature, *Evaluate all actions for Multi SKU location directives*, has been added in version 10.0.15 (see [KB 4579866](#)). This feature evaluates all actions for multi-SKU location directives. If you require this feature, use [Feature management](#) to turn it on.

I can't use the warehouse app to do partial picking.

Issue description

For sales and transfer orders, you can't skip items and do partial picking.

Issue resolution

On the **Mobile device menu items** page, for each menu item that is set up to process sales orders or transfer orders, set the **Allow splitting of work** option on the **General** FastTab to *Yes*.

How can I do an inventory status change for partial quantity work?

Issue description

You want to do an inventory status change for a partial quantity of a batch.

Issue resolution

To enable workers to make this change, you can create a menu item for the warehouse app. On the **Mobile device menu items** page, create (or edit) a menu item that has the following settings:

- **Mode:** *Work*
- **Use existing work:** *No*
- **Work creation process:** *Movement*
- **Display inventory status:** *Yes*

You can set other fields on the page as you require.

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Install and connect the Warehouse Management mobile app

2/18/2021 • 15 minutes to read • [Edit Online](#)

IMPORTANT

Some or all of the functionality noted in this topic is available as part of a preview release. The content and the functionality are subject to change. For more information about preview releases, see [One version service updates FAQ](#).

NOTE

This topic describes how to configure the new Warehouse Management mobile app, which is currently in public preview. If you're looking for information about how to configure the old warehouse app, see [Install and connect the warehouse app](#).

The public preview of the Warehouse Management mobile app is available for download on Microsoft App Center. It's provided as a standalone component. Therefore, you must download it on each device and then configure it to connect to your Microsoft Dynamics 365 Supply Chain Management environment.

This topic explains how to install the Warehouse Management mobile app on each of your mobile devices and configure it to connect to your Supply Chain Management environment. You can configure each device manually, or you can import connection settings through a file or by scanning a QR code.

System requirements

The Warehouse Management mobile app is available for both Windows and Google Android operating systems. To use the app, one of the following operating systems must be installed on your mobile devices:

- Windows 10 (Universal Windows Platform [UWP]) October 2018 update 1809 (build 10.0.17763) or later
- Android 4.4 or later

Turn on the feature

Before you can use the app, a related feature must be turned on in your system. Admins can use the [Feature management](#) workspace to check the status of the feature and turn it on if it's required. There, the feature is listed in the following way:

- **Module:** *Warehouse management*
- **Feature name:** *User settings, icons, and step titles for the new warehouse app*

Get the Warehouse Management mobile app

Use one of the following links to download the app:

- **Windows (UWP):** [App Center preview program - Windows](#)

Because this app is a preview app, a few extra steps are required to install it. For details, see [Install a Build from App Center](#).

- **Android:** [App Center preview program - Android](#)

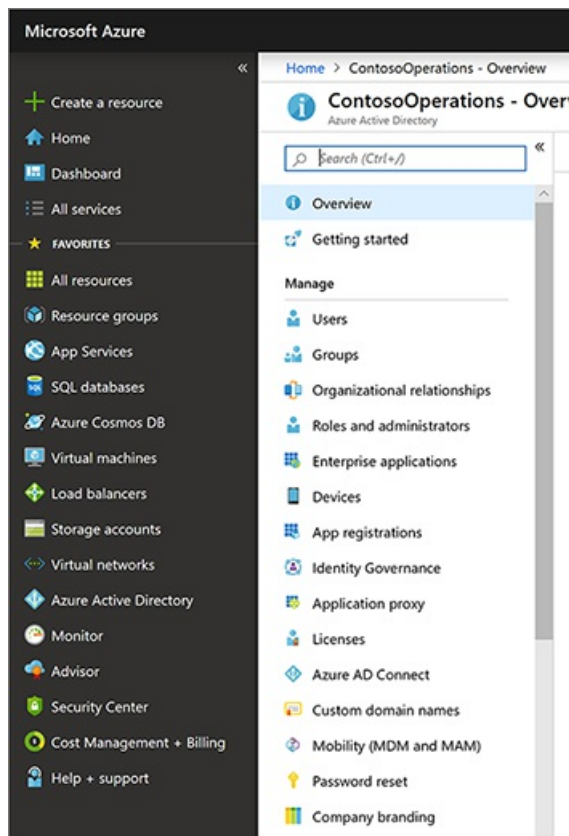
Because this app is a preview app, a few extra steps are required to install it. For details, see [Testing Android Apps](#).

For smaller deployments, you might want to install the app on each device from the relevant store and then manually configure the connection to the environments that you're using. However, you can also automate app deployment and/or configuration. You might find this approach convenient if you manage many devices, and you're using a mobile device management and mobile application management solution such as [Intune](#). For information about how to use Intune to add applications, see [Add apps to Microsoft Intune](#).

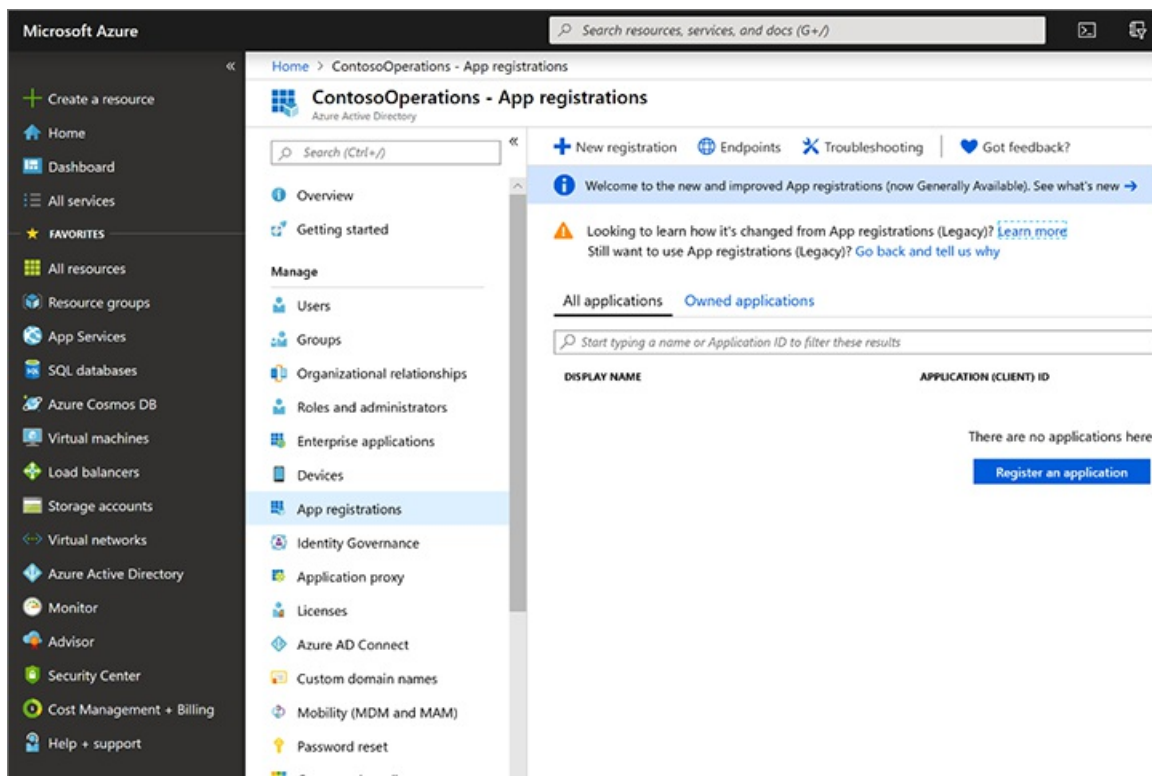
Create a web service application in Azure Active Directory

To enable the Warehouse Management mobile app to interact with a specific Supply Chain Management server, you must register a web service application for the Supply Chain Management tenant in Azure Active Directory (Azure AD). The following procedure shows one way to complete this task. For detailed information and alternatives, see the links after the procedure.

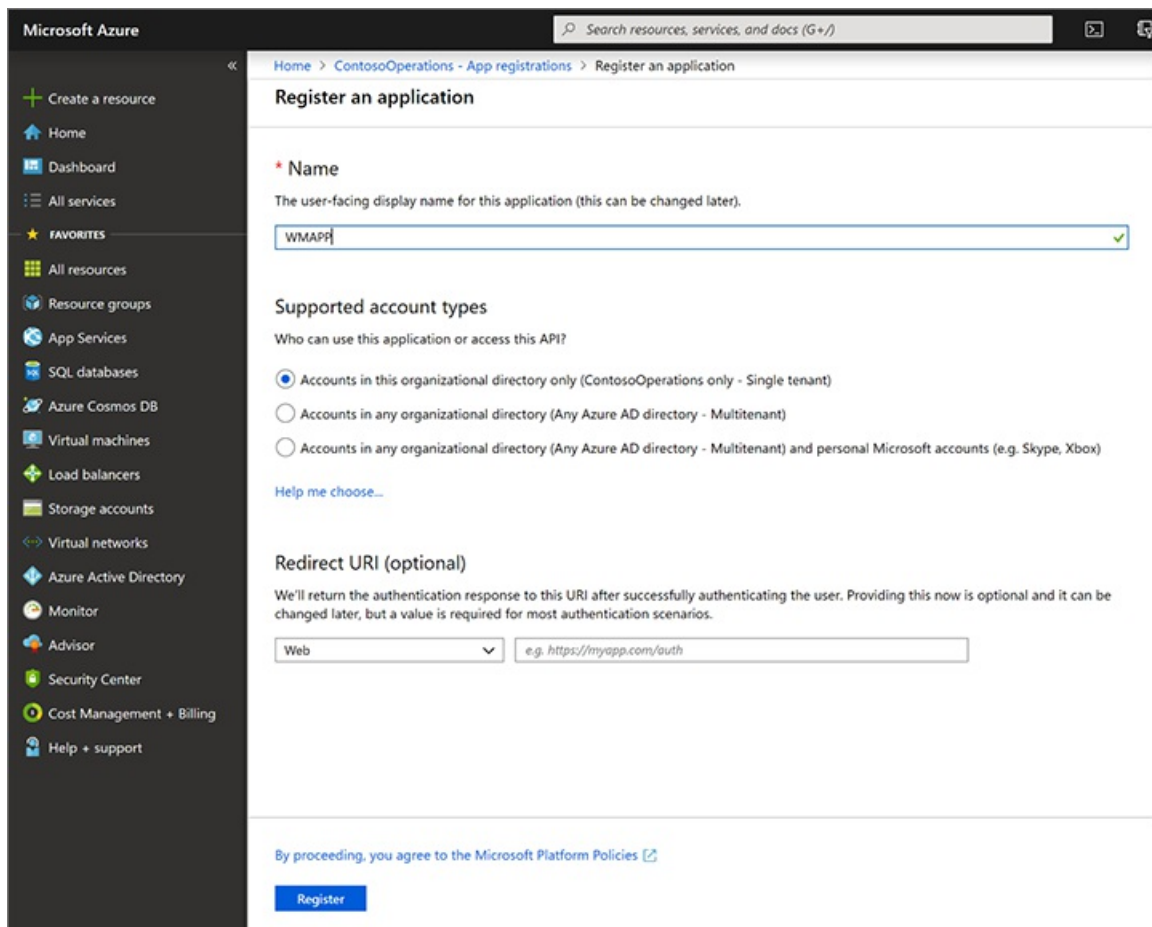
1. In a web browser, go to <https://portal.azure.com>.
2. Enter the name and password of the user who has access to the Azure subscription.
3. In the Azure portal, in the left navigation pane, select **Azure Active Directory**.



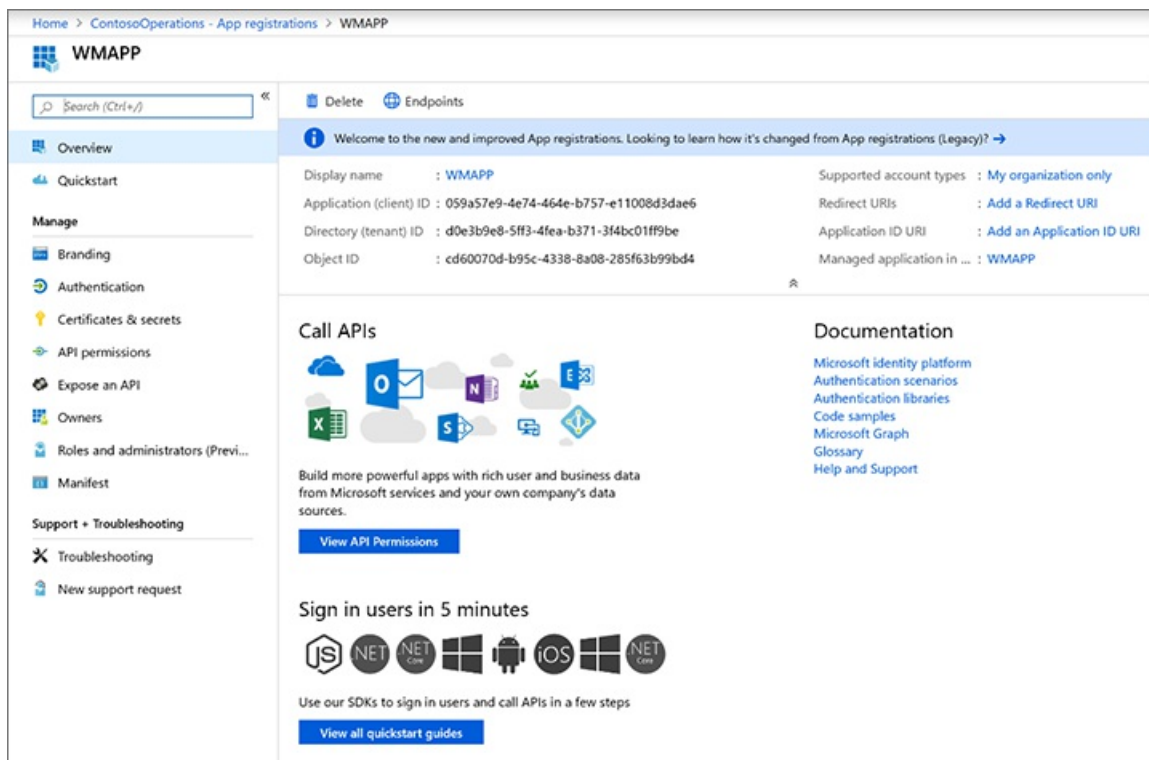
4. Make sure that you're working with the instance of Azure AD that is used by Supply Chain Management.
5. In the **Manage** list, select **App registrations**.



6. On the toolbar, select **New registration** to open the **Register an application** wizard.
7. Enter a name for the application, select the **Accounts in this organizational directory only** option, and then select **Register**.

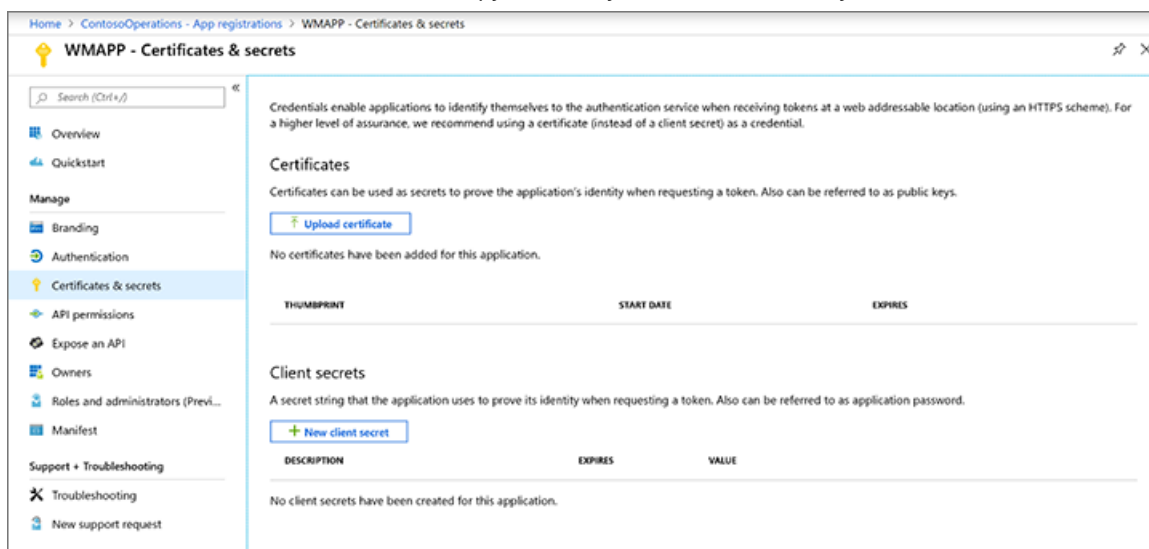


8. Your new app registration is opened. Make a note of the **Application (client) ID** value, because you will need it later. This ID will be referred to later in this topic as the *client ID*.



9. In the **Manage** list, select **Certificate & secrets**. Then select one of the following buttons, depending on how you want to configure the app for authentication. (For more information, see the [Authenticate by using a certificate or client secret](#) section later in this topic.)

- **Upload certificate** – Upload a certificate to use as a secret. We recommend this approach, because it's more secure and can also be automated more completely. If you're running the Warehouse Management mobile app on Windows devices, make a note of the **Thumbprint** value that is shown after you upload the certificate. You will need this value when you configure the certificate on Windows devices.
- **New client secret** – Create a key by entering a key description and a duration in the **Passwords** section, and then select **Add**. Make a copy of the key, and store it securely.



For more information about how to set up web service applications in Azure AD, see the following resources:

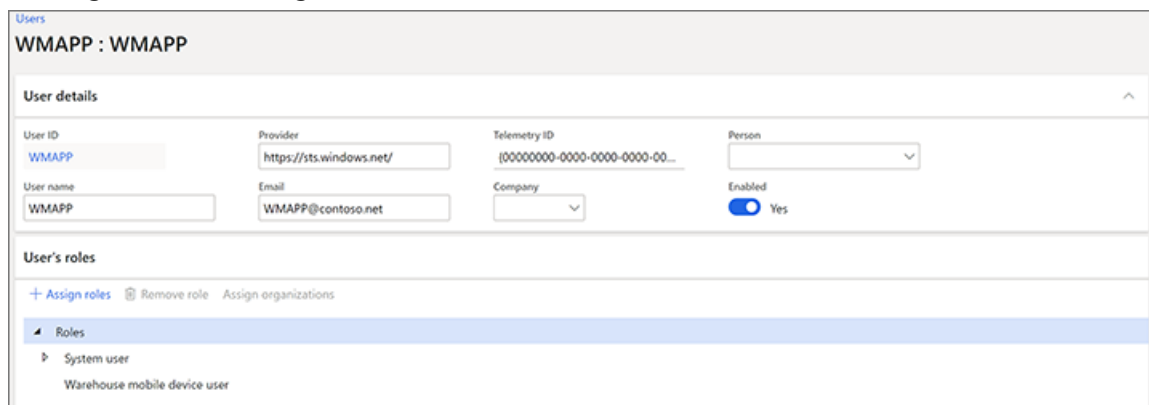
- For instructions that show how to use Windows PowerShell to set up web service applications in Azure AD, see [How to: Use Azure PowerShell to create a service principal with a certificate](#).
- For complete details about how to manually create a web service application in Azure AD, see the following topics:

- [Quickstart: Register an application with the Microsoft identity platform](#)
- [How to: Use the portal to create an Azure AD application and service principal that can access resources](#)

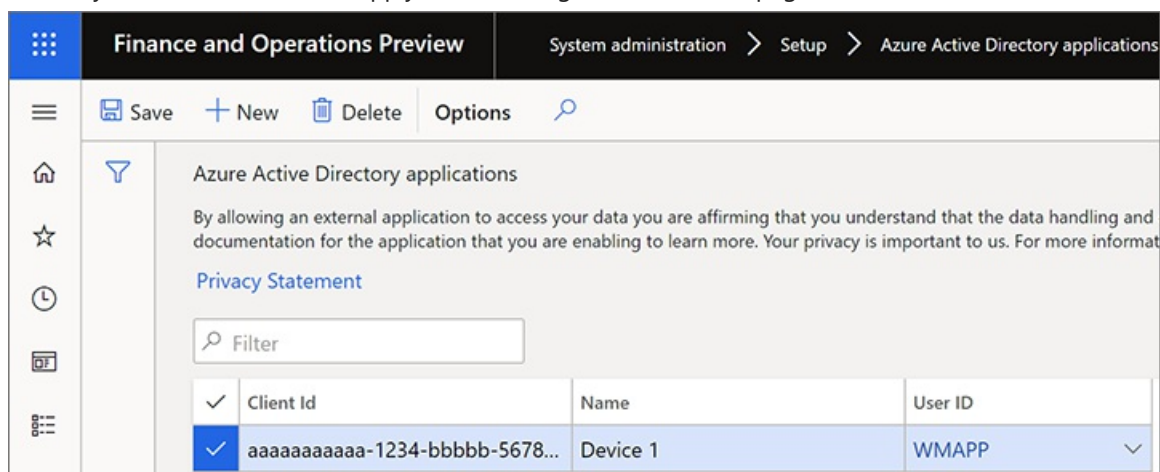
Create and configure a user account in Supply Chain Management

To enable Supply Chain Management to use your Azure AD application, follow these steps.

1. Create a user that corresponds to the user credentials for the Warehouse Management mobile app:
 - a. In Supply Chain Management, go to **System administration > Users > Users**.
 - b. Create a user.
 - c. Assign the warehousing mobile device user.



2. Associate your Azure AD application with the Warehouse Management mobile app user:
 - a. Go to **System administration > Setup > Azure Active Directory applications**.
 - b. Create a line.
 - c. Enter the client ID that you made a note of in the previous section, give it a name, and select the user that you just created. We recommend that you tag all your devices. Then, if a device is lost, you can easily remove its access to Supply Chain Management from this page.



Authenticate by using a certificate or client secret

Authentication with Azure AD provides a secure way of connecting a mobile device to Supply Chain Management. You can authenticate by using either a client secret or a certificate. If you will import connection settings, we recommend that you use a certificate instead of a client secret. Because the client secret must always be stored securely, you can't import it from a connection settings file or a QR code, as described later in this topic.

Certificates can be used as secrets to prove the application's identity when a token is requested. The public part

of the certificate is uploaded to the app registration in the Azure portal, whereas the full certificate must be deployed on each device where the Warehouse Management mobile app is installed. Your organization is responsible for managing the certificate in terms of rotation and so on. You can use self-signed certificates, but you should always use non-exportable certificates.

You must make the certificate available locally on each device where you run the Warehouse Management mobile app. For information about how to manage certificates for Intune-controlled devices if you're using Intune, see [Use certificates for authentication in Microsoft Intune](#).

Configure the application by importing connection settings

To make it easier to maintain and deploy the application on many mobile devices, you can import the connection settings instead of manually entering them on each device. This section explains how to create and import the settings.

Create a connection settings file or QR code

You can import connection settings from either a file or a QR code. For both approaches, you must first create a settings file that uses JavaScript Object Notation (JSON) format and syntax. The file must include a connection list that contains the individual connections that have to be added. The following table summarizes the parameters that you must specify in the connection settings file.

PARAMETER	DESCRIPTION
ConnectionName	Specify the name of the connection setting. The maximum length is 20 characters. Because this value is the unique identifier for a connection setting, make sure that it's unique in the list. If a connection that has the same name already exists on the device, it will be overridden by the settings from the imported file.
ActiveDirectoryClientAppld	Specify the client ID that you made a note of while you were setting up Azure AD in the Create a web service application in Azure Active Directory section.
ActiveDirectoryResource	Specify the root URL of Supply Chain Management.
ActiveDirectoryTenant	Specify the Azure AD tenant that you're using with the Supply Chain Management server. This value has the form <code>https://login.windows.net/<your-Azure-AD-tenant-ID></code> . Here is an example: <code>https://login.windows.net/contosooperations.onmicrosoft.com</code> .
Company	Specify the legal entity in Supply Chain Management that you want the application to connect to.
ConnectionType	(Optional) Specify whether the connection setting should use a certificate or a client secret to connect to an environment. Valid values are <code>"certificate"</code> and <code>"clientsecret"</code> . The default value is <code>"certificate"</code> . Note: Client secrets can't be imported.
IsEditable	(Optional) Specify whether the app user should be able to edit the connection setting. Valid values are <code>"true"</code> and <code>"false"</code> . The default value is <code>"true"</code> .

PARAMETER	DESCRIPTION
IsDefault	(Optional) Specify whether the connection is the default connection. A connection that is set as the default connection will automatically be preselected when the app is opened. Only one connection can be set as the default connection. Valid values are "true" and "false". The default value is "false".
CertificateThumbprint	(Optional) For Windows devices, you can specify the certificate thumbprint for the connection. For Android devices, the app user must select the certificate the first time that a connection is used.

The following example shows a valid connection settings file that contains two connections. As you can see, the connection list (named "ConnectionList" in the file) is an object that has an array that stores each connection as an object. Each object must be enclosed in braces ({}), and separated by commas, and the array must be enclosed in brackets ([]).

```
{
  "ConnectionList": [
    {
      "ActiveDirectoryClientAppId": "aaaaaaaa-bbbb-cccc-dddd-eeeeeeeeeeee",
      "ConnectionName": "Connection1",
      "ActiveDirectoryResource": "https://yourenvironment.cloudax.dynamics.com",
      "ActiveDirectoryTenant": "https://login.windows.net/contosooperations.onmicrosoft.com",
      "Company": "USMF",
      "IsEditable": false,
      "IsDefaultConnection": true,
      "CertificateThumbprint": "aaaabbbbccccdddeeeefffffgggghhhiiii",
      "ConnectionType": "certificate"
    },
    {
      "ActiveDirectoryClientAppId": "aaaaaaaa-bbbb-cccc-dddd-eeeeeeeeeeee",
      "ConnectionName": "Connection2",
      "ActiveDirectoryResource": "https://yourenvironment2.cloudax.dynamics.com",
      "ActiveDirectoryTenant": "https://login.windows.net/contosooperations.onmicrosoft.com",
      "Company": "USMF",
      "IsEditable": true,
      "IsDefaultConnection": false,
      "ConnectionType": "clientsecret"
    }
  ]
}
```

You can either save the information as a JSON file or generate a QR code that has the same content. If you save the information as a file, we recommend that you save it by using the default name, *connections.json*, especially if you will store it in the default location on each mobile device.

Save the connection settings file on each device

Typically, you will use a device management tool or script to distribute the connection settings files to each device that you're managing. If you use the default name and location when you save the connection settings file on each device, the Warehouse Management mobile app will automatically import it, even during the first run after the app is installed. If you use a custom name or location for the file, the app user must specify the values during the first run. However, the app will continue to use the specified name and location afterward.

Every time that the app is started, it reimports the connection settings from their previous location to determine whether there have been any changes. The app will update only connections that have the same names as the connections in the connection settings file. User-created connections that use other names won't be updated.

You can't remove a connection by using the connection settings file.

As has been mentioned, the default file name is *connections.json*. The default file location depends on whether you're using a Windows device or an Android device:

- **Windows:** `C:\Users\`
- **Android:** `Android\data\com.Microsoft.WarehouseManagement\files`

Usually, the paths are automatically created after the first run of the app. However, you can manually create them if you must transfer the connection settings file to the device before installation.

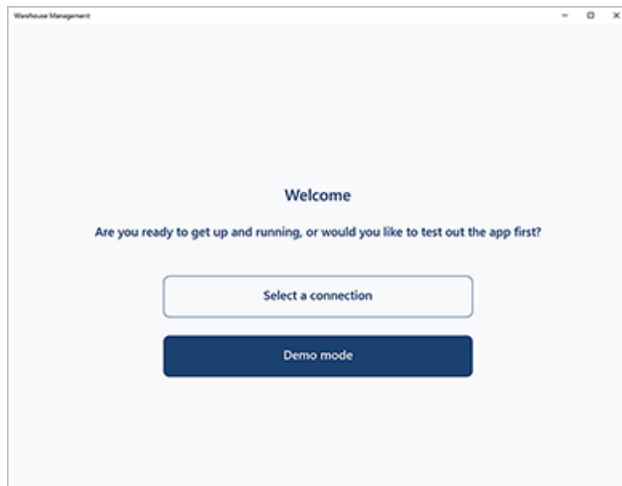
NOTE

If the app is uninstalled, the default path and its contents are removed.

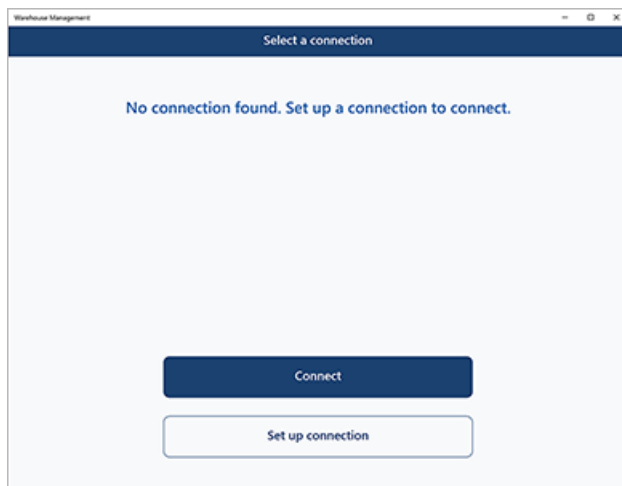
Import the connection settings

Follow these steps to import connection settings from a file or a QR code.

1. Start the Warehouse Management mobile app on your mobile device. The first time that you start the app, a welcome message is shown. Select **Select a connection**.



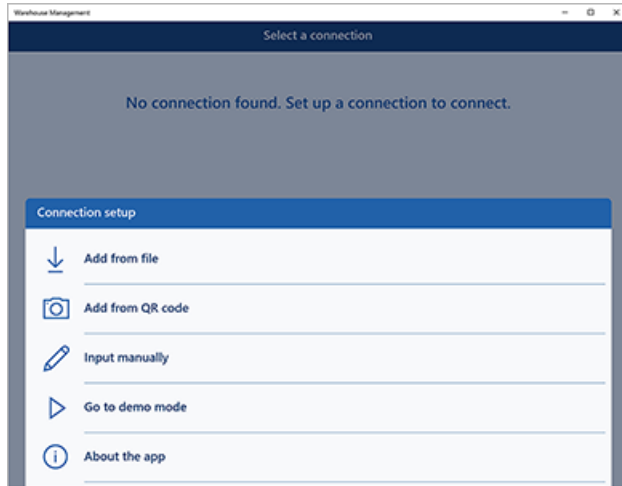
2. If you're importing the connection settings from a file, and the default name and location were used when the file was saved, the app might already have found the file. In this case, skip ahead to step 4. Otherwise, select **Set up connection**, and then continue to step 3.



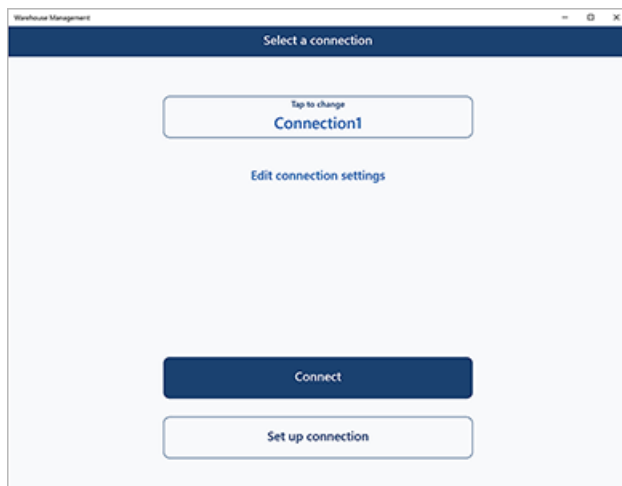
3. In the **Connection setup** dialog box, select **Add from file** or **Add from QR code**, depending on how you want to import the settings:
 - If you're importing the connection settings from a file, select **Add from file**, browse to the file on

your local device, and select it. If you select a custom location, the app will store it and automatically use it the next time.

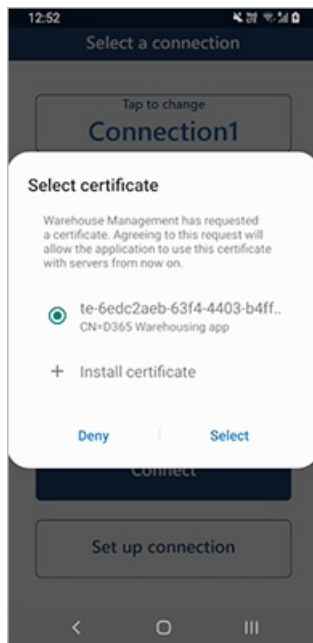
- If you're importing the connection settings by scanning a QR code, select **Add from QR code**. The app prompts you for permission to use the device's camera. After you give permission, the camera is started, so that you can use it for scanning. Depending on the quality of the device's camera and the complexity of the QR code, you might find it difficult to get a correct scan. In that case, try to reduce the complexity of the QR code by generating only one connection per QR code. (Currently, you can use only the device's camera to scan the QR code.)



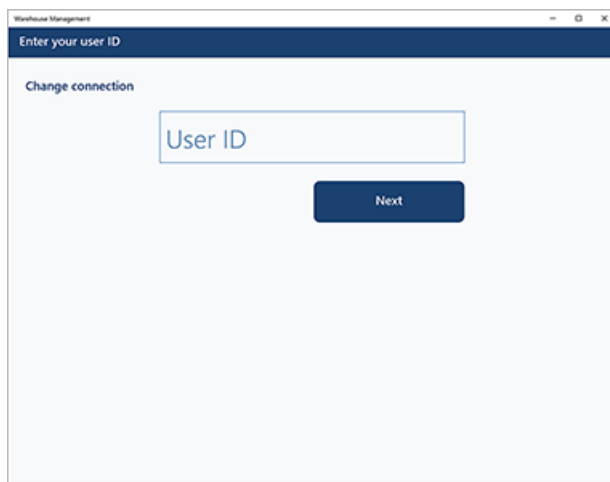
4. When the connection settings are successfully loaded, the selected connection is shown.



5. If you're using an Android device and are using a certificate for authentication, the device prompts you to select the certificate.



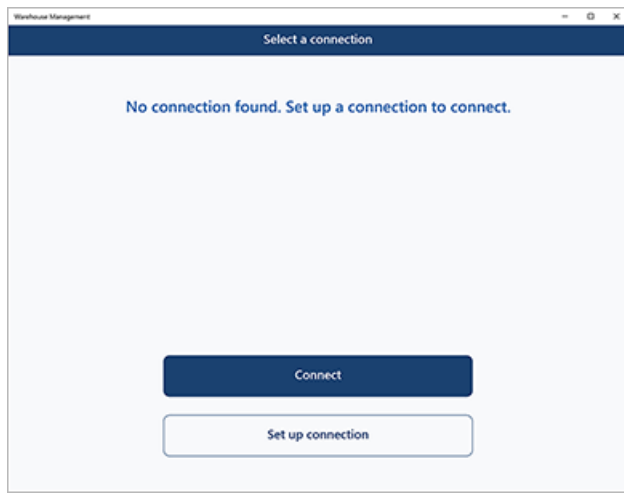
6. The app connects to your Supply Chain Management server and shows the sign-in page.



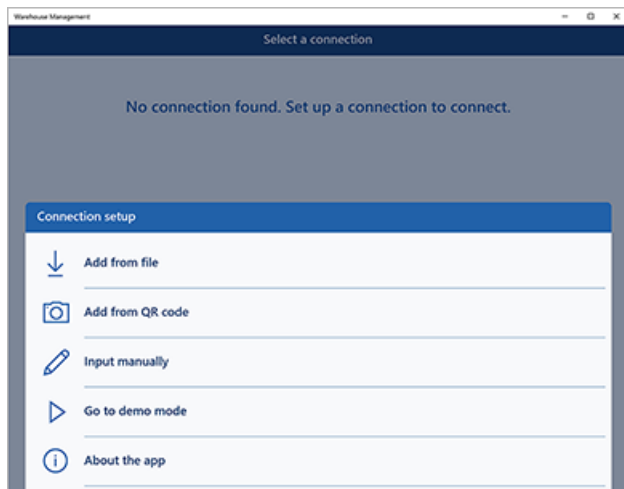
Manually configure the application

If you don't have a file or QR code, you can manually configure the app on the device so that it connects to the Supply Chain Management server through the Azure AD application.

1. Start the Warehouse Management mobile app on your mobile device.
2. If the app is started in **Demo mode**, select **Connection settings**. If the **Sign-in** page appears when the app is started, select **Change connection**.
3. Select **Set up connection**.



4. Select Input manually.



The **New Connection** page appears and shows the settings that are required to manually enter the connection details.

A screenshot of a web application window titled 'Warehouse Management'. The main heading is 'New Connection'. The form contains several input fields with labels: 'Authentication method' (with a dropdown menu showing 'Client secret'), 'Connection name', 'Azure AD client ID', 'Active Directory client secret', 'Azure AD resource', and 'Azure AD tenant'. Each field is represented by a white rectangular box with a blue border.

5. Enter the following information:

- **Use client secret** – Set this option to *Yes* to use a client secret to authenticate with Supply Chain Management. Set it to *No* to use a certificate for authentication. (For more information, see the [Create a web service application in Azure Active Directory](#) section earlier in this topic.)

- **Connection name** – Enter a name for the new connection. This name will appear in the **Select connection** field the next time that you open the connection settings. The name that you enter must be unique. (In other words, it must differ from all other connection names that are stored on your device, if any other connection names are stored there.)
- **Active directory client ID** – Enter the client ID that you made a note of while you were setting up Azure AD in the [Create a web service application in Azure Active Directory](#) section.
- **Active directory client secret** – This field is available only when the **Use client secret** option is set to *Yes*. Enter the client secret that you made a note of while you were setting up Azure AD in the [Create a web service application in Azure Active Directory](#) section.
- **Active directory certificate thumbprint** – This field is available only for Windows devices and only when the **Use client secret** option is set to *No*. Enter the certificate thumbprint that you made a note of while you were setting up Azure AD in the [Create a web service application in Azure Active Directory](#) section.
- **Active directory resource** – Specify the root URL of Supply Chain Management.

IMPORTANT

Don't end this value with a slash (/).

- **Active directory tenant** – Enter the Azure AD tenant that you're using with the Supply Chain Management server. This value has the form `https://login.windows.net/<your-Azure-AD-tenant-ID>`. Here is an example: `https://login.windows.net/contosooperations.onmicrosoft.com`.

IMPORTANT

Don't end this value with a slash (/).

- **Company** – Enter the legal entity (company) in Supply Chain Management that you want the application to connect to.

6. Select the **Save** button in the upper-right corner of the page.
7. If you're using an Android device and are using a certificate for authentication, the device prompts you to select the certificate.
8. The app connects to your Supply Chain Management server and shows the sign-in page.

Remove access for a device

If a device is lost or compromised, you must remove access to Supply Chain Management for it. The following steps describe the recommended process for removing access.

1. Go to **System administration > Setup > Azure Active Directory applications**.
2. Delete the line that corresponds to the device that you want to remove access for. Make a note of the client ID that is used for the device, because you will need it later.

If you've registered only one client ID, and multiple devices use the same client ID, you must push out new connection settings to those devices. Otherwise, they will lose access.

3. Sign in to the Azure portal at <https://portal.azure.com>.
4. In the left navigation pane, select **Active Directory**, and make sure that you're in the correct directory.

5. In the **Manage** list, select **App registrations**, and then select the application to configure. The **Settings** page appears and shows configuration information.
6. Make sure that the client ID of the application matches the client ID that you made a note of in step 2.
7. On the toolbar, select **Delete**.
8. In the confirmation message that appears, select **Yes**.

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Mobile device user settings

2/18/2021 • 6 minutes to read • [Edit Online](#)

The new Warehouse Management mobile app has a set of app-specific settings that help tailor the user experience. Because the app can be used on devices of different screen sizes and configurations (such as tablet, phone, or arm-held), it can be useful to centrally manage these settings from Microsoft Dynamics 365 Supply Chain Management.

The *mobile device user settings* feature lets you define global user settings that will be used on all devices. You can also define more granular user settings for individual device brands, device models, and/or workers. When a worker signs in to the Warehouse Management mobile app, the app fetches and applies the most specific settings profile that is stored in Supply Chain Management for the matching brand, device, and/or user ID.

This feature can help workers get started more quickly whenever they begin to use a new device. Here are some examples:

- Admins can establish a standard set of preferences that work best for devices from a specific manufacturer and/or for specific device models. Therefore, workers can get started with a new device without necessarily having to change the settings.
- If your company has a pool of identical devices that are shared among workers, workers will see their preferred setup every time that they sign in, even if they have never used the specific physical device that they selected on a given day.
- In Supply Chain Management, admins can view and edit all stored settings, even for individual workers. This capability can help them troubleshoot or fine-tune new features.

IMPORTANT

The *mobile device user settings* feature applies only to the new Warehouse Management mobile app. It doesn't work with the old warehouse app.

Turn on the mobile device user settings feature

Before you can use this feature, it must be turned on in your system. Admins can use the [feature management](#) settings to check the status of the feature and turn it on. In the **Feature management** workspace, the feature is listed in the following way:

- **Module:** *Warehouse management*
- **Feature name:** *User settings, icons, and step titles for the new warehouse app*

Create and manage user settings

Use the **Mobile device user settings** page to create, view, and manage settings profiles at all levels of granularity. The first time that a worker edits their user settings on a new device, a new profile is automatically added on this page, if it doesn't already exist. That profile is then updated every time that the worker makes a change.

You can also define a settings profile that applies to all device brands, device models, and/or workers. You can then increase the granularity by applying more specific settings for individual brands, models, and/or workers.

Follow these steps to create and manage user settings for your mobile devices.

1. Go to **Warehouse management > Mobile device > Mobile device user settings**.
2. Select an existing user settings profile in the list pane to open its record. Alternatively, select **New** on the Action Pane to create a new profile.

Each profile in the list pane is labeled to indicate the brand, model, and/or user ID that the profile applies to. More general profiles have a value of *All* for some or all of these characteristics.

3. In the header section of the record for the new or selected settings profile, set the following fields:
 - **Device brand name** – Select the device brand name that the profile should apply to. If the profile should apply to all brands, leave this field blank. The list of values includes all the brands that have been defined in your system. For information about how to define the list of brands, see the next section.
 - **Device model ID** – Select the device model that the profile should apply to. If the profile should apply to all models of the selected brand, leave this field blank. The list of values includes all the models that have been defined for the brand that is selected in the **Device brand name** field. For information about how to define the list of models for each brand, see the next section.
 - **User ID** – Select the user ID of the warehouse worker that the setting profile should apply to. If the profile should apply to all workers, leave this field blank.
4. On the **General** FastTab, set the following fields:
 - **Button position** – Select how buttons should be positioned on the device. Elements in the app will be moved to better fit the preference or handedness of the worker. The available options are *Bottom right (default)*, *Bottom left*, *Top right*, and *Top left*.
 - **Display orientation** – Select the display orientation that should be applied by default in the app.
 - **Scan with camera** – Set this option to *Yes* to use the device camera to scan input fields where the preferred input mode is set to *Scanning*. If your device has a built-in scanner, set this option to *No* to use the scanner instead.
 - **Show product photo** – Select whether product photos should be shown if they are available for the released product. For more information about how to add product images, see [Add an image to a product](#).
 - **Display color theme** – Select a color theme for the device.
 - **Sound level** – Select the sound level for the device. Select a value between 0 (zero) and 10. A value of 0 represents no sound, and a value of 10 represents maximum volume. The default value is 4.
 - **Vibration level** – Select the vibration level for the device. Select a value between 0 (zero) and 5. A value of 0 represents no vibration, and a value of 5 represents maximum vibration. The default value is 1.
 - **Text scale percentage** – Specify the text size as a percentage of the standard size. Enter a value between 70 and 400. A value of 70 represents the smallest text scale, and a value of 400 represents the largest text scale. The default value is 100.
 - **Button scale percentage** – Specify the button size as a percentage of the standard size. Enter a value between 50 and 200. A value of 50 represents the smallest button scale, and a value of 200 represents the largest button scale. The default value is 100.

Create and manage mobile device brands

Use the **Mobile device brands** page to view, create, and manage the device brands and models that can be used with your settings profiles. The mobile app automatically fetches and submits the local brand name and model ID the first time that a worker edits their settings on a given device. Therefore, most of these records will usually be automatically generated. However, you can also manage all the records on this page. For example, you can give more useful descriptions to each brand and model to help distinguish similar or cryptic model IDs.

Follow these steps to create and manage your mobile device brands and models.

1. Go to **Warehouse management > Mobile device > Mobile device brands**.
2. In the list pane, select a mobile device brand to open its record. Alternatively, select **New** on the Action Pane to create a new brand.
3. In the header section of the record for the new or selected device brand, set the following fields:
 - **Device brand name** – The brand name of the device, such as *Microsoft Corporation*.
 - **Description** – You can enter a description to help distinguish brand names.
4. The **Mobile device models** FastTab shows all the models for the selected device brand. Use the buttons on the toolbar to add rows to the grid or remove rows. For each row, you can set the following fields:
 - **Device model ID** – The device model ID, such as *Surface Book 2*.
 - **Description** – You can enter a description to help distinguish model IDs.

Install and connect the warehouse app

2/18/2021 • 14 minutes to read • [Edit Online](#)

NOTE

This topic describes how to configure the old warehouse app. If you're looking for information about how to configure the new Warehouse Management mobile app (currently in public preview), see [Install and connect the Warehouse Management mobile app](#).

NOTE

This topic describes how to configure the warehouse app for cloud deployments. If you're looking for information about how to configure the warehouse app for on-premises deployments, see [Warehousing for on-premises deployments](#).

The warehouse app is available from Google Play Store and Microsoft Store. It's provided as a standalone component. Therefore, you must download it on each device and then configure it to connect to your Microsoft Dynamics 365 Supply Chain Management environment.

This topic explains how to install the warehouse app on each of your mobile devices and configure it to connect to your Supply Chain Management environment. You can configure each device manually, or you can import connection settings through a file or by scanning a QR code.

System requirements

The warehouse app is available for both Windows and Android operating systems. To use the latest version of the app, you must have one of the following operating systems installed on your mobile devices:

- Windows 10 (Universal Windows Platform [UWP]) Fall creators update 1709 (build 10.0.16299) or later
- Android 4.4 or later

NOTE

If you must support older Windows devices that can't run the latest version of Windows, you can still download version 1.6.3.0 of the warehouse app from Microsoft Store. That version will run on Windows 10 (UWP) November Update 1511 (build 10.0.10586) or later. However, be aware that this version of the warehouse app doesn't support mass deployment of connection settings. Therefore, you must [manually configure the connection](#) on each device that runs this version of the app.

Get the warehouse app

Use one of the following links to download the app:

- **Windows (UWP):** [Dynamics 365 for Finance and Operations - Warehousing on Microsoft Store](#)
- **Android:** [Warehousing - Dynamics 365 on Google Play Store](#)

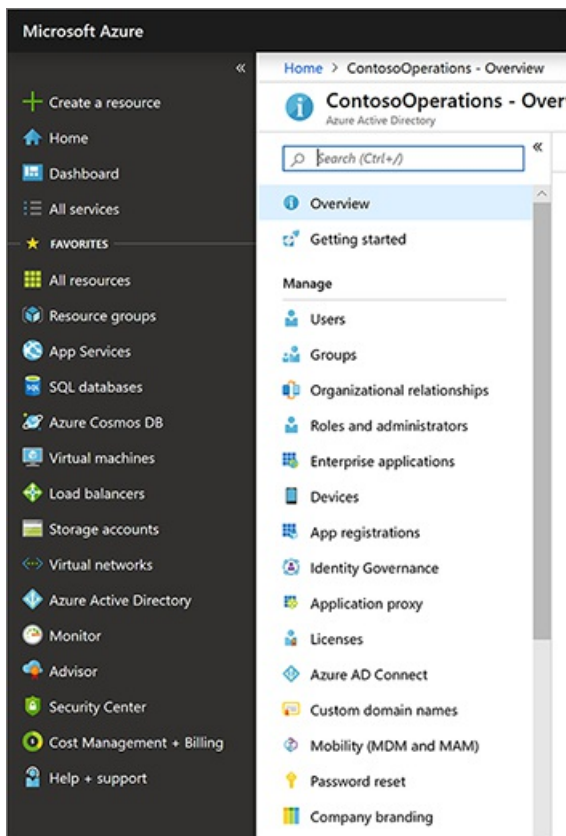
For smaller deployments, you might want to install the app from the relevant store on each device and then manually configure the connection to the environments that you're using. However, in version 1.7.0.0 and later of the warehouse app, you can also automate app deployment and/or configuration. You might find this approach convenient if you manage many devices, and you're using a mobile device management and mobile

application management solution such as [Microsoft Intune](#). For information about how to use Intune to add applications, see [Add apps to Microsoft Intune](#).

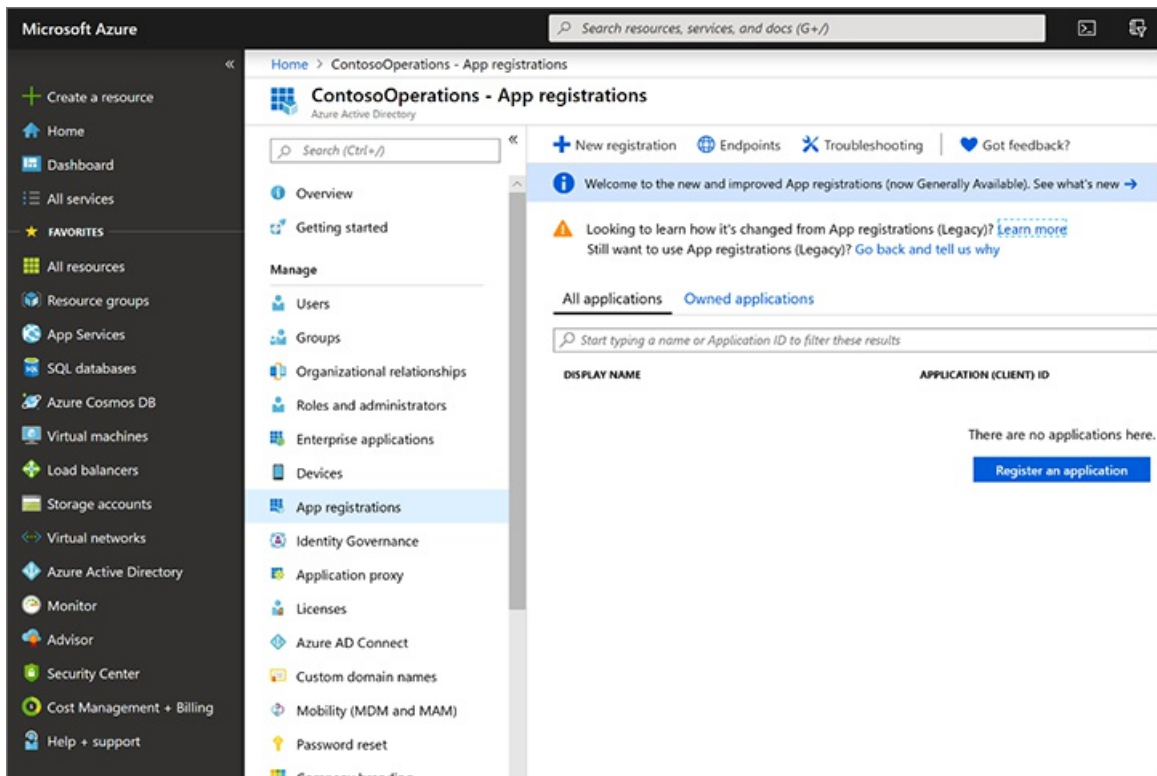
Create a web service application in Azure Active Directory

To enable the warehouse app to interact with a specific Supply Chain Management server, you must register a web service application for the Supply Chain Management tenant in Azure Active Directory (Azure AD). The following procedure shows one way to complete this task. For detailed information and alternatives, see the links after the procedure.

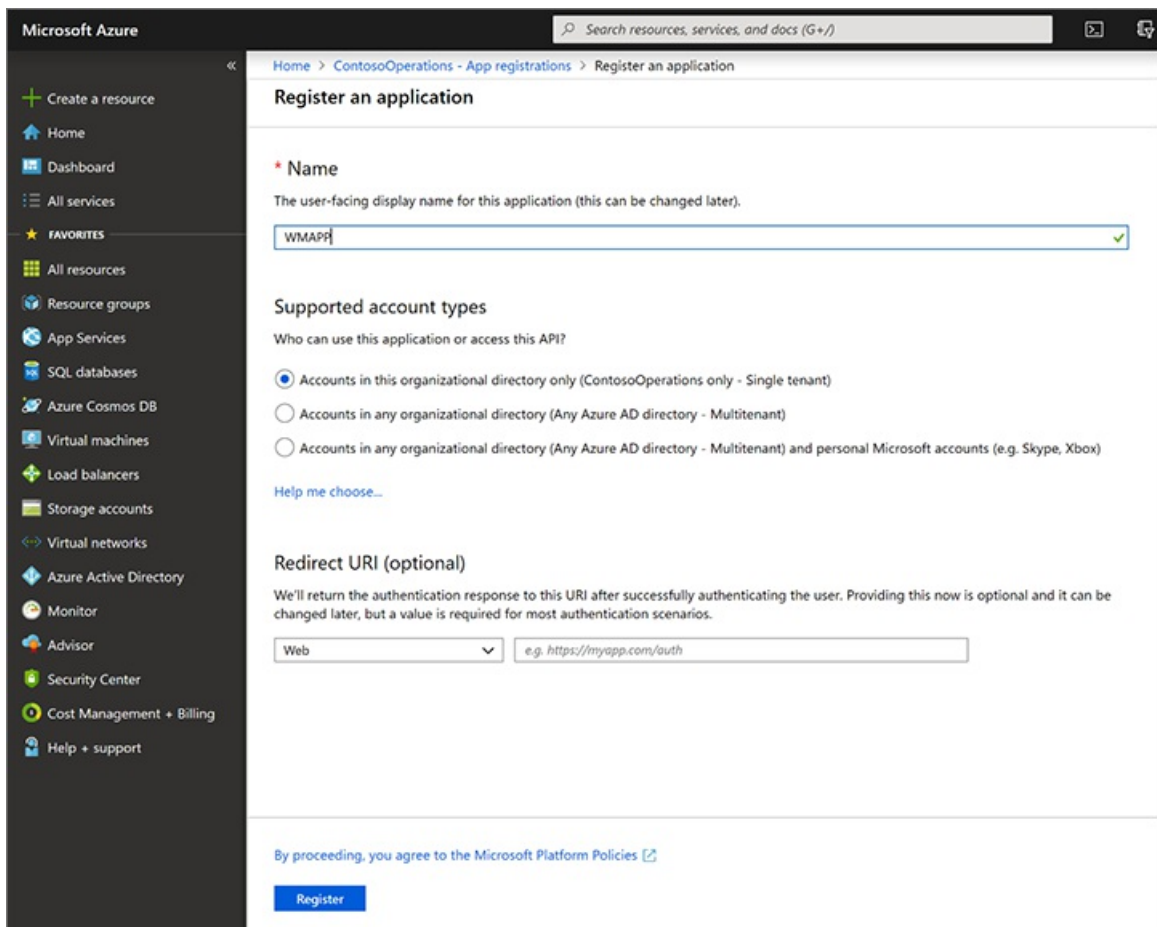
1. In a web browser, go to <https://portal.azure.com>.
2. Enter the name and password of the user who has access to the Azure subscription.
3. In the Azure portal, in the left navigation pane, select **Azure Active Directory**.



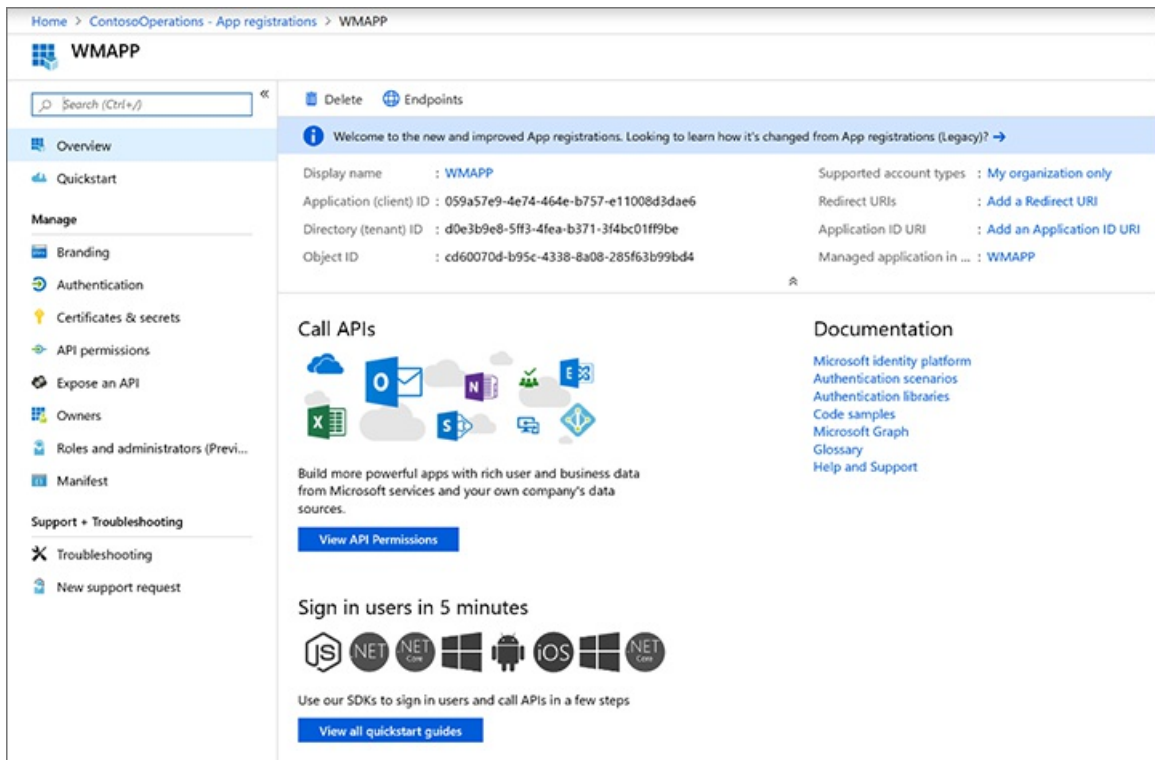
4. Make sure that you're working with the instance of Azure AD that is used by Supply Chain Management.
5. In the **Manage** list, select **App registrations**.



6. On the toolbar, select **New registration** to open the **Register an application** wizard.
7. Enter a name for the application, select the **Accounts in this organizational directory only** option, and then select **Register**.

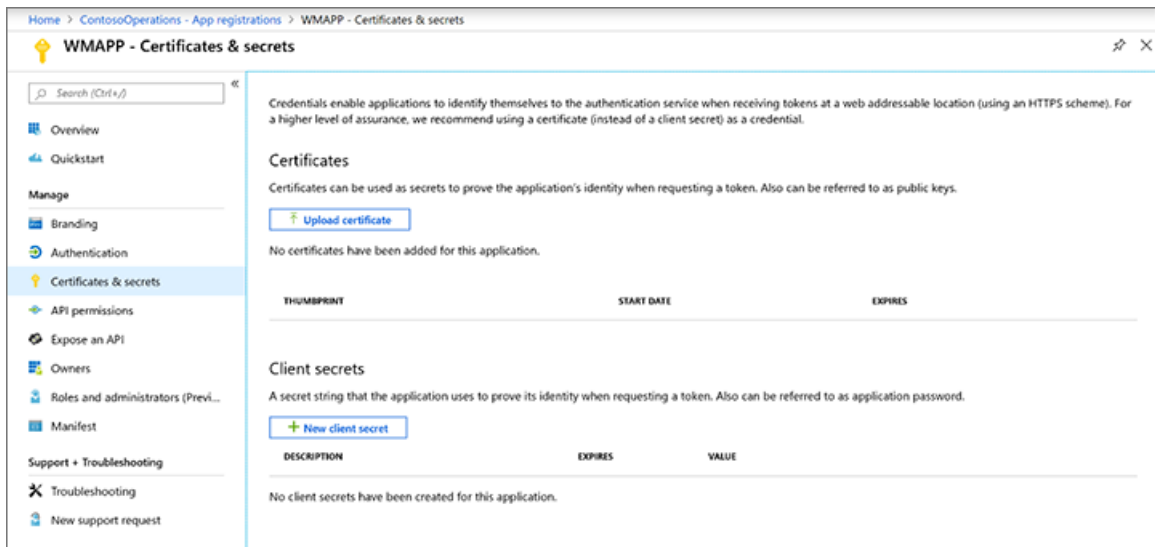


8. Your new app registration is opened. Make a note of the **Application (client) ID** value, because you will need it later. This ID will be referred to later in this topic as the *client ID*.



9. In the **Manage** list, select **Certificate & secrets**. Then select one of the following buttons, depending on how you want to configure the app for authentication. (For more information, see the [Authenticate by using a certificate or client secret](#) section later in this topic.)

- **Upload certificate** – Upload a certificate to use as a secret. We recommend this approach, because it's more secure and can also be automated more completely. If you're running the warehouse app on Windows devices, make a note of the **Thumbprint** value that is shown after you upload the certificate. You will need this value when you configure the certificate on Windows devices.
- **New client secret** – Create a key by entering a key description and a duration in the **Passwords** section, and then select **Add**. Make a copy of the key, and store it securely.



For more information about how to set up web service applications in Azure AD, see the following resources:

- For instructions that show how to use Windows PowerShell to set up web service applications in Azure AD, see [How to: Use Azure PowerShell to create a service principal with a certificate](#).
- For complete details about how to manually create a web service application in Azure AD, see the following topics:
 - [Quickstart: Register an application with the Microsoft identity platform](#)

- o [How to: Use the portal to create an Azure AD application and service principal that can access resources](#)

Create and configure a user account in Supply Chain Management

To enable Supply Chain Management to use your Azure AD application, follow these steps.

1. Create a user that corresponds to the user credentials for the warehouse app:
 - a. In Supply Chain Management, go to **System administration > Users > Users**.
 - b. Create a user.
 - c. Assign the warehousing mobile device user.

The screenshot shows the 'Users' page in Supply Chain Management. The user 'WMAPP : WMAPP' is selected. The 'User details' section includes fields for User ID (WMAPP), Provider (https://sts.windows.net/), Telemetry ID (00000000-0000-0000-0000-00...), Person (dropdown), User name (WMAPP), Email (WMAPP@contoso.net), Company (dropdown), and Enabled (Yes). The 'User's roles' section shows a list of roles, including 'System user' and 'Warehouse mobile device user'.

2. Associate your Azure AD application with the warehouse app user:
 - a. Go to **System administration > Setup > Azure Active Directory applications**.
 - b. Create a line.
 - c. Enter the client ID that you made a note of in the previous section, give it a name, and select the user that you just created. We recommend that you tag all your devices. Then, if they are lost, you can easily remove their access to Supply Chain Management from this page.

The screenshot shows the 'Azure Active Directory applications' page in Supply Chain Management. The page title is 'Finance and Operations Preview' and the breadcrumb is 'System administration > Setup > Azure Active Directory applications'. The page contains a table of applications with the following data:

Client Id	Name	User ID
aaaaa-1234-bbbbb-5678...	Device 1	WMAPP

Authenticate by using a certificate or client secret

Authentication with Azure AD provides a secure way of connecting a mobile device to Supply Chain Management. You can authenticate by using either a client secret or a certificate. If you will import connection settings, we recommend that you use a certificate instead of a client secret. Because the client secret must always be stored securely, you can't import it from a connection settings file or a QR code, as described later in this topic.

Certificates can be used as secrets to prove the application's identity when a token is requested. The public part of the certificate is uploaded to the app registration in the Azure portal, whereas the full certificate must be deployed on each device where the warehouse app is installed. Your organization is responsible for managing

the certificate in terms of rotation and so on. You can use self-signed certificates, but you should always use non-exportable certificates.

You must make the certificate available locally on each device where you run the warehouse app. For information about how to manage certificates for Intune-controlled devices if you're using Intune, see [Use certificates for authentication in Microsoft Intune](#).

Configure the application by importing connection settings

To make it easier to maintain and deploy the application on many mobile devices, you can import the connection settings instead of manually entering them on each device. This section explains how to create and import the settings.

Create a connection settings file or QR code

You can import connection settings from either a file or a QR code. For both approaches, you must first create a settings file that uses JavaScript Object Notation (JSON) format and syntax. The file must include a connection list that contains the individual connections that have to be added. The following table summarizes the parameters that you must specify in the connection settings file.

PARAMETER	DESCRIPTION
ConnectionName	Specify the name of the connection setting. The maximum length is 20 characters. Because this value is the unique identifier for a connection setting, make sure that it's unique in the list. If a connection that has the same name already exists on the device, it will be overridden by the settings from the imported file.
ActiveDirectoryClientAppId	Specify the client ID that you made a note of while you were setting up Azure AD in the Create a web service application in Azure Active Directory section.
ActiveDirectoryResource	Specify the root URL of Supply Chain Management.
ActiveDirectoryTenant	Specify the Azure AD tenant that you're using with the Supply Chain Management server. This value has the form <code>https://login.windows.net/<your-Azure-AD-tenant-ID></code> . Here is an example: <code>https://login.windows.net/contosooperations.onmicrosoft.com</code> .
Company	Specify the legal entity in Supply Chain Management that you want the application to connect to.
ConnectionType	(Optional) Specify whether the connection setting should use a certificate or a client secret to connect to an environment. Valid values are <code>"certificate"</code> and <code>"clientsecret"</code> . The default value is <code>"certificate"</code> . Note: Client secrets can't be imported.
IsEditable	(Optional) Specify whether the app user should be able to edit the connection setting. Valid values are <code>"true"</code> and <code>"false"</code> . The default value is <code>"true"</code> .

PARAMETER	DESCRIPTION
IsDefault	(Optional) Specify whether the connection is the default connection. A connection that is set as the default connection will automatically be preselected when the app is opened. Only one connection can be set as the default connection. Valid values are <i>"true"</i> and <i>"false"</i> . The default value is <i>"false"</i> .
CertificateThumbprint	(Optional) For Windows devices, you can specify the certificate thumbprint for the connection. For Android devices, the app user must select the certificate the first time that a connection is used.

The following example shows a valid connection settings file that contains two connections. As you can see, the connection list (named *"ConnectionList"* in the file) is an object that has an array that stores each connection as an object. Each object must be enclosed in braces ({}), and separated by commas, and the array must be enclosed in brackets ([]).

```
{
  "ConnectionList": [
    {
      "ActiveDirectoryClientAppId": "aaaaaaaa-bbbb-cccc-dddd-eeeeeeeeeeee",
      "ConnectionName": "Connection1",
      "ActiveDirectoryResource": "https://yourenvironment.cloudax.dynamics.com",
      "ActiveDirectoryTenant": "https://login.windows.net/contosooperations.onmicrosoft.com",
      "Company": "USMF",
      "IsEditable": false,
      "IsDefaultConnection": true,
      "CertificateThumbprint": "aaaabbbbccccdddeeeeffffgggghhhhhiiii",
      "ConnectionType": "certificate"
    },
    {
      "ActiveDirectoryClientAppId": "aaaaaaaa-bbbb-cccc-dddd-eeeeeeeeeeee",
      "ConnectionName": "Connection2",
      "ActiveDirectoryResource": "https://yourenvironment2.cloudax.dynamics.com",
      "ActiveDirectoryTenant": "https://login.windows.net/contosooperations.onmicrosoft.com",
      "Company": "USMF",
      "IsEditable": true,
      "IsDefaultConnection": false,
      "ConnectionType": "clientsecret"
    }
  ]
}
```

You can either save the information as a JSON file or generate a QR code that has the same content. If you save the information as a file, we recommend that you save it by using the default name, *connections.json*, especially if you will store it in the default location on each mobile device.

Save the connection settings file on each device

Typically, you will use a device management tool or script to distribute the connection settings files to each device that you're managing. If you use the default name and location when you save the connection settings file on each device, the warehouse app will automatically import it, even during the first run after the app is installed. If you use a custom name or location for the file, the app user must specify the values during the first run. However, the app will continue to use the specified name and location afterward.

Every time that the app is started, it reimports the connection settings from their previous location to determine whether there have been any changes. The app will update only connections that have the same names as the connections in the connection settings file. User-created connections that use other names won't be updated.

You can't remove a connection by using the connection settings file.

As has been mentioned, the default file name is *connections.json*. The default file location depends on whether you're using a Windows device or an Android device:

- **Windows:**

```
C:\Users\<User>\AppData\Local\Packages\Microsoft.Dynamics365forOperations-Warehousing_8wekyb3d8bbwe\LocalState
```

- **Android:** `Android\data/com.Microsoft.Dynamics365forOperationsWarehousing\files`

Usually, the paths are automatically created after the first run of the app. However, you can manually create them if you must transfer the connection settings file to the device before installation.

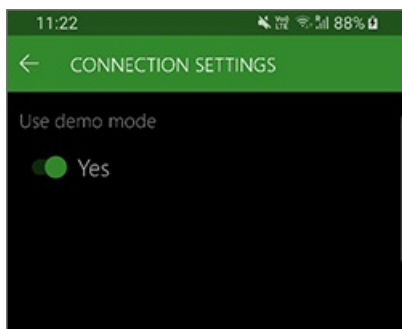
NOTE

If the app is uninstalled, the default path and its contents are removed.

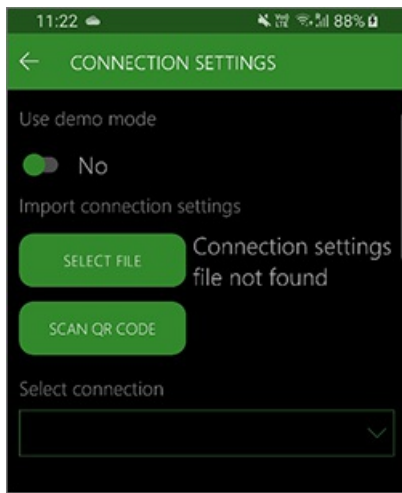
Import the connection settings

Follow these steps to import connection settings from a file or a QR code.

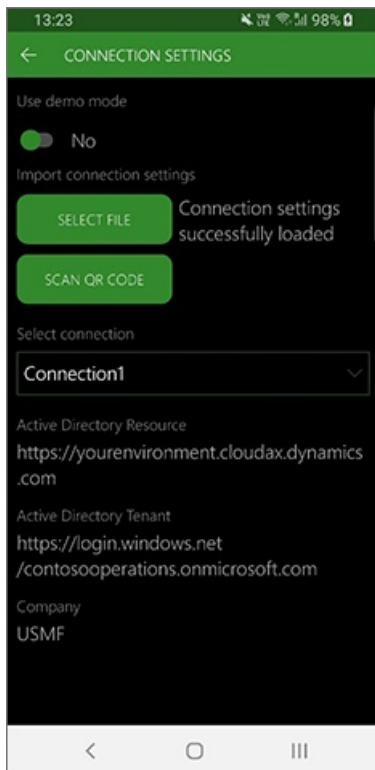
1. Open the warehouse app on your mobile device.
2. Go to **Connection settings**.
3. Set the **Use demo mode** option to *No*.



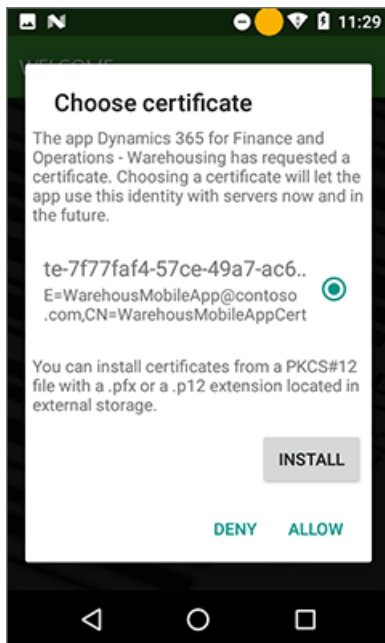
4. Select **Select file** or **Scan QR code**, depending on how you want to import the settings:
 - If you're importing the connection settings from a file, the app might already have found the file if the default name and the default location were used when it was saved. Otherwise, select **Select file**, browse to the file on your local device, and select it. If you select a custom location, the app will store it and automatically use it the next time.
 - If you're importing the connection settings by scanning a QR code, select **Scan QR code**. The app prompts you for permission to use the device's camera. After you give permission, the camera is started, so that you can use it for scanning. Depending on the quality of the device's camera and the complexity of the QR code, you might find it difficult to get a correct scan. In that case, try to reduce the complexity of the QR code by generating only one connection per QR code. (Currently, you can use only the device's camera to scan the QR code.)



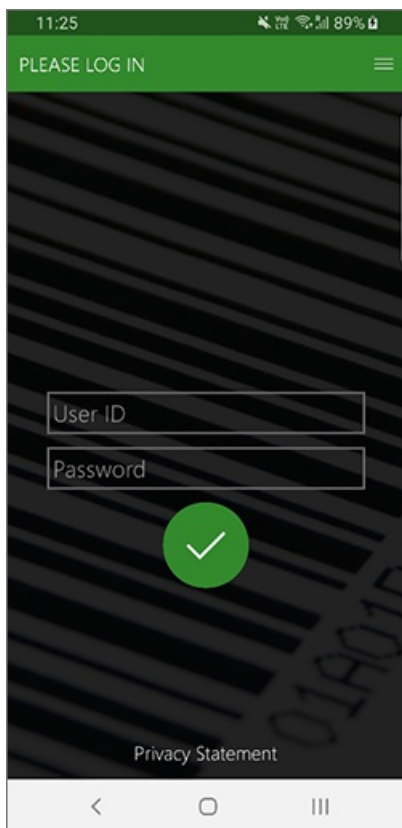
5. When the connection settings are successfully loaded, select the **Back** (left arrow) button in the upper-left corner of the page.



6. If you're using an Android device and are using a certificate for authentication, the device prompts you to select the certificate.



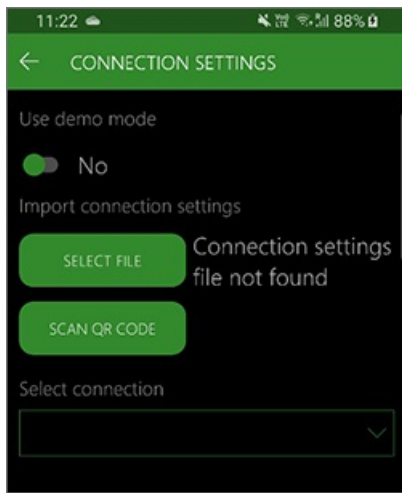
7. The app connects to your Supply Chain Management server and shows the sign-in page.



Manually configure the application

You can manually configure the app on the device so that it connects to the Supply Chain Management server through the Azure AD application.

1. Open the warehouse app on your mobile device.
2. Go to **Connection settings**.
3. Set the **Use demo mode** option to *No*.



4. Tap in the **Select connection** field to expand the settings that are required to manually enter the connection details.



5. Enter the following information:
 - **Use client secret** – Set this option to *Yes* to use a client secret to authenticate with Supply Chain Management. Set it to *No* to use a certificate for authentication. (For more information, see [Create a web service application in Azure Active Directory](#).)
 - **Connection name** – Enter a name for the new connection. This name will appear in the **Select connection** field the next time that you open the connection settings. The name that you enter must be unique. (In other words, it must differ from all other connection names that are stored on your device, if any other connection names are stored there.)
 - **Active directory client ID** – Enter the client ID that you made a note of while you were setting up Azure AD in the [Create a web service application in Azure Active Directory](#) section.
 - **Active directory client secret** – This field is available only when the **Use client secret** option is set to *Yes*. Enter the client secret that you made a note of while you were setting up Azure AD in the [Create a web service application in Azure Active Directory](#) section.

- **Active directory certificate thumbprint** – This field is available for Windows devices only when the **Use client secret** option is set to *No*. Enter the certificate thumbprint that you made a note of while you were setting up Azure AD in the [Create a web service application in Azure Active Directory](#) section.
- **Active directory resource** – Specify the root URL of Supply Chain Management.

NOTE

Don't end this value with a slash (/).

- **Active directory tenant** – Enter the Azure AD tenant that you're using with the Supply Chain Management server. This value has the form `https://login.windows.net/<your-Azure-AD-tenant-ID>`. Here is an example: `https://login.windows.net/contosooperations.onmicrosoft.com`.

NOTE

Don't end this value with a slash (/).

- **Company** – Enter the legal entity in Supply Chain Management that you want the application to connect to.

6. Select the **Save** button in the upper-right corner of the page.
7. If you're using an Android device and are using a certificate for authentication, the device prompts you to select the certificate.
8. The app connects to your Supply Chain Management server and shows the sign-in page.

Remove access for a device

In the event of a lost or compromised device, you must remove access to Supply Chain Management for the device. The following steps describe the recommended process for removing access.

1. Go to **System administration > Setup > Azure Active Directory applications**.
2. Delete the line that corresponds to the device that you want to remove access for. Make a note of the client ID that is used for the removed device, because you will need it later.

If you've registered only one client ID, and multiple devices use the same client ID, you must push out new connection settings to those devices. Otherwise, they will lose access.

3. Sign in to the Azure portal at <https://portal.azure.com>.
4. In the left navigation pane, select **Active Directory**, and make sure that you're in the correct directory.
5. In the **Manage** list, select **App registrations**, and then select the application to configure. The **Settings** page appears and shows configuration information.
6. Make sure that the client ID of the application matches the client ID that you made a note of in step 2.
7. On the toolbar, select **Delete**.
8. In the confirmation message that appears, select **Yes**.

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Scan bar codes using a camera in the warehouse app

2/18/2021 • 2 minutes to read • [Edit Online](#)

This topic explains how to set up the warehouse app to scan bar codes using a camera on a mobile device.

Prerequisites

To use this feature, you need to have version 1.2.0.0 of the warehouse app installed, and your device must have a camera. When you open the app after updating, you will be prompted to allow the app to use the camera. If your device doesn't have a camera, no prompt will be shown, and you will not be able to use a camera as a scanner.

Setup

In the Display settings of the warehouse application, you can select if the camera should be used for bar code scanning. If you enable **Use the camera as scanner**, you can use the camera on every input field that has the preferred input mode set to **Scanning**.

To control whether an input field should be scannable, on the **Warehouse app field names** page, set **Preferred input mode** to **Scanning**. When this option is selected, a camera can be used for scanning in the warehouse app. For information about how to configure app field names in Warehousing, see [Configure app field names in warehouse app](#).

Supported bar code formats

The most common bar code formats are supported, including Code 128, Code 39, Code 93, EAN-8, EAN-13, UPC-E, UPC-A, and QR codes.

Navigation

The camera page will be initiated on each page where the input field has the preferred input mode set to Scanning, when you are on the Camera page use the following options to navigate:

- Click the back button to go back to the Task and details page.
- Click the pencil on the Task and details page to go to the page where you can type input manually.
- Click the camera on the Task and details page to go back to the Camera page.



On the camera page, when you click the Camera button, it will appear dimmed while trying to identify a bar code. If a bar code is not identified within 5 seconds, the process will time out and the Camera button will become available again. You will then be able to try to scan a bar code again.

When you aim the camera at a bar code, keep the bar code aligned within the brackets for best result. When a bar code is scanned successfully, the result will be processed, and you will be taken to the next step. If the next step contains another input field with the preferred input mode set to Scanning, the camera page will start again. If the next step is not a scanning field, then the camera page will not be initiated.

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Configure app field names in the warehouse app

2/18/2021 • 3 minutes to read • [Edit Online](#)

This topic describes how to define and configure warehouse app field names and priorities in Dynamics 365 Supply Chain Management.

NOTE

This topic applies to features in Warehouse management. It doesn't apply to features in Inventory management.

Warehousing is an application that you can use to perform warehouse tasks. You can define and configure the field names that are used in the app, as well as configure the priority to which the field names should be assigned. This topic explains how to define and configure these warehouse app field names and priorities, and how they are used in Warehousing. For detailed information about how to configure the connection to FWarehousing, refer to the tutorial [Install and configure the warehouse app overview](#).

Configure warehouse app field names

When you use Warehousing on your mobile device, you can configure how metadata should be displayed on your device on the **Warehouse app field names** page. In a new company, select **Create default setup** to generate all field names that will be used in the warehouse mobile device workflows, and then assign a preferred input mode and input type to them. After you have generated all field names, you can select the following input options.

OPTION	DESCRIPTION
Preferred input mode	This option defines whether a scanning field or a manual entry input field should be shown for the selected field name. This is useful to distinguish fields depending on if barcodes are used for the field. Note: For field names with preferred input mode set to Scanning , you can enter information manually if the barcode is unreadable or damaged.
Input type	This option defines what input type should be used for the selected field name. Four options are available: <ul style="list-style-type: none">• Selection - Contains a list of options to choose from. Field names with this option are not editable.• Date - Field names specified as date will show a date format with the label. This helps warehouse workers see in which format to enter the date. Field names with this option are not editable.• Alpha - If selected, the device keyboard will be used when entering information manually in the app. The keyboard experience can be changed depending on which device is used.• Numeric - For field names that use numeric input only, you can select this option to display a custom numeric keypad with the input field instead of the device keyboard.

Configure warehouse app field priority

On the **Warehouse app field priority** page, you can put field names into different priority groups. This makes it possible to decide what information should be displayed on the main task page when warehouse workers perform tasks using the app. If you click **Create default setup**, a default set of priority groups will be generated. It is possible to create as many priority groups as needed, but only three priority groups will be shown on the task page. When the system sends metadata to the app, it will assign each field a relative priority depending on its priority group, and the app will display the first three priority groups contained in the metadata on the task page. The rest of the overflowing metadata will be displayed on a secondary details page. The following table shows an example of five priority groups.

PRIORITY GROUP	ASSIGNED FIELDS
Priority 10	<ul style="list-style-type: none"> • Item • Quantity • Unit of measure
Priority 20	<ul style="list-style-type: none"> • Cluster position • Cluster
Priority 30	<ul style="list-style-type: none"> • Item description
Priority 40	<ul style="list-style-type: none"> • Configuration • Color • Size • Style
Priority 50	<ul style="list-style-type: none"> • Location • License plate

For example, when a warehouse worker is performing a task on a mobile device, if the metadata that will be displayed in the app consists of the following fields:

- Item
- Quantity
- Unit of measure
- Item description
- Size and Location

Based on the warehouse app field priority set up in the table above, the following 3 rows of information will be displayed on the task page:

- Row 1: Item, Quantity, Unit of measure
- Row 2: Item description
- Row 3: Size

The remaining metadata, for example, Location, will not be displayed on the task page, but will be displayed on a details page. To learn more and see examples of the user interface, refer to the blog post [Announcing Finance and Operations - Warehousing](#).

Additional resources

[Install and configure the warehouse app overview](#)

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Set up mobile devices for warehouse work

2/18/2021 • 23 minutes to read • [Edit Online](#)

This topic describes how to configure the menu items that warehouse workers use to perform work on a mobile device.

NOTE

This topic applies to features in Warehouse management. It doesn't apply to features in Inventory management. The menu items that appear on the menus on a warehouse mobile device are configured on the **Mobile device menu items** page. Because the menu items can be put onto different menus, it's easy to configure menu structures so that only specific types of work are exposed to specific users. You can configure menu items to perform the following tasks:

- Process an inquiry or perform an activity, such as printing a label, generating license plate numbers, starting a production order, or quickly looking up information about items in a location.
- Create work that will be performed through another process. For example, receiving an item for a purchase order can create put-away work for another worker.
- Perform work that was created by another process (existing work), such as put-away work that was created when an item was received for a purchase order.

To create a menu item for an activity or inquiry, set the **Mode** field to **Indirect**. A list of **Activity code** options then becomes available, so that you can select the type of inquiry or activity that the menu item is for. To create a menu item to generate warehouse work, set the **Mode** field to **Work**. A list of **Work creation process** options then becomes available. To create a menu item to process existing warehouse work, set the **Mode** field to **Work**, and then set the **Use existing work** option to **Yes**.

NOTE

Additional fields might be available for menu items, depending on the mode that you select for the menu item, and whether the menu item is used to perform existing work. For information about the additional field selections, see the "Additional menu item options" section later in this topic.

Configure menu items for activities and inquiries

If the **Mode** field for a menu item is set to **Indirect**, you can create a menu item to perform a general activity or inquiry that doesn't create work. Examples include reprinting license plate labels and an inquiry about the items in a location. The following table lists the options that are available.

OPTION	DESCRIPTION
None	This default value doesn't enable an activity or inquiry.
About	View information about the system, such as the version number, the warehouse ID, and the worker who is currently logged on.
Change warehouse	Change the warehouse that a worker is logged on to.

OPTION	DESCRIPTION
Location inquiry	View information about all items and quantities for a location.
License plate inquiry	View the quantity of items on a license plate and the location of the license plate.
Start production order	Start a production order.
Production scrap	Enter the quantity of scrap that was created during production for each bill of materials (BOM) line.
Production last pallet	Indicate that the last pallet of items has been produced for a production order, and that the status of the production order must be updated to Reported as finished . The status of the raw materials that were not consumed during production is change back from Picked to On order , and the items can be returned to inventory.
Item inquiry	Scan an item to determine where it is in the warehouse. The inquiry returns all locations and quantities for the scanned item.
Reprint label	Reprint a license plate label.
License plate build	Create a parent license plate by combining multiple license plates in the same location. This option is useful if you move multiple license plates at the same time. After the parent license plate is moved, you must perform a license plate break before you can pick items from each license plate. Tip: To move a parent license plate, you must use a mobile device that is configured to create work for movements.
License plate break	Break up a license plate build so that you can pick items from the license plates that were in the build.
Driver check in	If you're using Transportation management, register the arrival of a driver by scanning the outbound load ID, appointment ID, or shipment ID. For this option, a load must be assigned to the appointment, and the status of the load must be Loaded .
Driver check out	Register that a driver has completed his or her appointment.
Flush number sequence cache	Delete number sequence numbers from the number sequence cache. This activity is typically performed by a system administrator to resolve caching issues when mobile devices are used.
Change batch disposition	Allow a worker to specify a batch disposition code for an item and batch. This selection updates the disposition code that is specified for the batch.

OPTION	DESCRIPTION
Display open work list	<p>Show a list of available work to a particular user. The user can then select work to perform and will be directed to it. This list is intended to be viewed on tablet devices that have a screen size of 7 inches or more. When you select this option, the Edit query and Field list menu items become available. The Edit query page lets you set up criteria for the work that appears in the list. The Field list page lets you select what fields appear in the work list. For example, you can reduce the number of fields that appear, so that the user can more quickly select the most appropriate work item. On the General FastTab, in the Records per page field, you can also select how many work records are shown per page. If the Allow users to filter work by transaction type option is selected, the work list will include a Filter work control that the user can use to filter by transaction type. In the work list, users will see only work that they have permission to access. You must make sure that users have permission for one or more user-directed menu items that support the specific work class types that they should be able to access. Permissions are verified when a user tries to perform work from the list.</p>
Create transfer order from license plates	<p>Allows warehouse workers create and process transfer orders directly from the warehouse app. The warehouse workers start by selecting the destination warehouse and can then scan one or more license plates using the app. When the warehouse worker selects Complete order, a batch job will create the required transfer order and order lines based on the on-hand inventory registered for those license plates. For more information, see Create transfer orders from the warehouse app</p>

Configure menu items to create work for another worker or process

You can set up a menu item that creates work for another worker after an initial action is performed on the mobile device. For example, when one worker uses a mobile device to receive an item, put-away work is created for another worker. To set up a menu item that creates work, on the **Mobile device menu items** page, in the **Mode** field, select **Work**. In the following table, the options in the **Work creation process** field are arranged by work order type.

WORK ORDER TYPE	OPTION	DESCRIPTION
Purchase order	Purchase order line receiving	Register the receipt of a quantity of an item by using the purchase order number and purchase order line number, and create put-away work for another worker.
	Purchase order line receiving and put away	Register the receipt of a quantity of an item by using the purchase order number and purchase order line number, and put the items away. The same worker performs both actions.

	Purchase order item receiving	Register the receipt of a quantity of an item for a purchase order by registering the purchase order number and item number, and create put-away work for another worker.
	Purchase order item receiving and put away	Register the receipt of a quantity of an item for a purchase order by registering the purchase order number, and put the item away. The same worker performs both actions.
	License plate receiving	Receive an inbound advance ship notice (ASN) by using the license plate ID.
	License plate receiving and put away	Receive and put away an inbound advance ship notice (ASN) by using the license plate ID.
	Load item receiving	Register the receipt of a quantity for a load by using the load ID, and create put-away work for another worker. The item number and product dimensions match the receipt to the purchase order lines.
	Load item receiving and put away	Register the receipt of a load by using the load ID, and put the items away. The item number and product dimensions match the receipt to the purchase order lines. The same worker performs both actions.
Return order	Return order receiving	Register the receipt of a quantity of an item by registering the RMA number, and create put-away work for another worker.
	Return order receiving and put away	Register the receipt of a quantity of an item by registering the RMA number, and put the items away. The same worker performs both actions.
Transfer order	Transfer order item receiving	Register the receipt of a quantity of an item, and create put-away work for another worker. Note: Use this option only if the items were shipped from a warehouse that isn't enabled for warehouse management processes.

	Transfer order item receiving and put away	Register the receipt of a quantity of an item, and put the items away. The same worker performs both actions. Note: Use this option only if the items were shipped from a warehouse that isn't enabled for warehouse management processes.
	Transfer order line receiving	Register the receipt of a quantity of an item, and create put-away work for another worker.
	Transfer order line receiving and put away	Register the receipt of a quantity of an item, and put the items away. The same worker performs both actions.
	License plate receiving	Receive an inbound advance ship notice (ASN) by using the license plate ID.
	License plate receiving and put away	Receive and put away an inbound advance ship notice (ASN) by using the license plate ID.
Production	Report as finished	Register a quantity of a finished item that has been finished for a production, and create put-away work for another worker. The quantity can be some or all of the quantity that was planned for production.
	Report as finished and put away	Register a quantity of a finished item that has been finished for a production, and put the items away. The quantity can be some or all of the quantity that was planned for production. The same worker performs both actions.
	Kanban	Indicate that a kanban is completed, and create put-away work for another worker.
	Kanban put away	Indicate that a kanban is completed, and put away the items. The same worker performs both actions.
Inventory	Movement	Register that items have been moved from one location to another. The worker specifies the location that the items are moved from and where they are moved to.
	Quarantine	Change the status of the on-hand inventory for a license plate or location to make damaged or missing inventory items unavailable.

	Movement by template	Move items from one location to another in a semi-automated manner. The worker selects the location to move items from, the system uses the location directive to determine where to move the items to.
	Warehouse transfer	Register that items have been transferred from one warehouse to another. This option requires that the worker be allowed to perform work in both warehouses. Note: This menu item requires a default inventory transfer journal where the Voucher draw field is set to Posting .
	License plate loading	Use this option when you're setting up your warehouse for the first time. Scan all the license plates in all locations in the warehouse. The locations must be license plate-controlled. You can't use this option if Serial number or Batch number is listed above Location in the inventory reservation hierarchy.
Cycle count	Adjustment in	Increase the quantity of items in inventory. Specify the location, license plate, item, quantity, unit of measure, and status.
	Adjustment out	Reduce the quantity of items in inventory. Specify the location, license plate, item, quantity, unit of measure, and status of the inventory.
	Spot cycle counting	Start a count for a location. The worker must count all items in the location. When the result of a count is less than the expected quantity, the missing quantity is considered a loss.

Configure menu items to process existing work

In addition to setting up menu items to create warehouse work, you can set up menu items to process work that has already been created. Set the **Mode** field to **Work**, and select the **Use existing work** option. Some additional options then become available on the **General** tab. You can control access to the menu item by assigning one or more work classes on the **Work class** FastTab. The work classes define the work that the menu item can process. The work class can also be used to grant access to specific user roles or to separate processing for different types of operations. The following table describes the options that are available. The option can be chosen under the **Directed by** field in the **Mobile device menu items** page.

OPTION	DESCRIPTION
None	This default value doesn't process work.

OPTION	DESCRIPTION
System directed	Supply Chain Management controls the type of work that is assigned to a worker and the order that the worker performs the work in. When you select this option, you can select System-directed work on the Action Pane to open the System-directed sorting order page, where you can set up sorting criteria for the work. The sorting criteria control the order that the worker performs the work in. You can add as many criteria as you require.
User directed	The worker selects the work to perform and the order to perform it in.
User grouping	The worker manually groups work. This option is useful when, for example, a worker can pick multiple items at the same time in a location. After the worker has finished picking all the required items, he or she can put the items away.
System grouping	Supply Chain Management groups work for the worker, based on a specified field. For example, picking work is grouped when a worker scans a shipment ID, load ID, or any value that can link each work unit. If you select this option, the following fields are required: <ul style="list-style-type: none"> • System grouping field – Select the field that the worker scans to group the work. • System grouping label – Enter text to instruct the worker what to scan to group the work.
Validated user directed	The worker selects the work to perform when work is associated with a larger entity, such as a load or shipment. The worker determines the order that the items are picked in. If you select this option, the following fields are required: <ul style="list-style-type: none"> • Validated user directed field – Select the field that the worker scans to group the work. • Validated user directed label – Enter text that instructs the worker what to scan when picking work is grouped by the system. <p>This option is useful when, for example, multiple pallets are staged for a load. If you select LoadId in the Validated User Directed field, the worker can pick any pallet that is associated with the load. The worker receives an error message if he or she scans an item that isn't associated with the load.</p>
Cluster picking	The worker groups work into clusters. Clusters lets workers pick items from a single location for multiple work orders at the same time.
Cycle count grouping	The worker selects a zone, work pool, or location, and Supply Chain Management assigns work, based on the selection. If you select this option, you can click Cycle counting on the Action Pane to specify additional information to display, and you can also specify the number of times that the worker must repeat the count if a difference is found.

OPTION	DESCRIPTION
Transport loading	This feature allows several warehouse workers to load inventory from the same or different loads onto the same truck, with loads that are fully or partially shipped.

Additional menu item options

Additional menu items options are available on the **Mobile device menu items** page. The options vary, depending on the process that you're configuring the menu item for.

The following table describes these options.

FIELD	DESCRIPTION
Allow splitting of work	Select this option to let users put items for a work order into more than one target license plate. This option is useful when, for example, a target license plate is full, and the worker must add the remaining items to another license plate. The worker can select Full to indicate that the license plate is full and stop receiving picking work for it. The put location for the picked items is then displayed, and the picking work that has already been completed is moved to a new work order. The remaining picking work for the target license plate stays on the original work order.
Anchoring	Select this option to let workers specify a location that overrides the suggested staging or loading location. All the remaining put-away work is directed to the new location. This option is useful when, for example, a worker who must put items for order 1 in a staging location by Dock 1 can't, because a previous load hasn't cleared the location. Instead of waiting for the Dock 1 staging location to become available, the worker can decide to use the staging location for Dock 2. In this case, the worker overrides the suggested staging location. The put location for all remaining items for the work order is then updated to the Dock 2 staging location. If you select this option, you must set the Anchor by field.
Anchor by	If you're using anchoring, you must specify whether to anchor by shipment or by load.
Audit template ID	Select the work audit template that will interrupt the work process for this menu item so that another operation can be performed. For example, if this menu item is for inbound work, the audit template might require that the worker check the temperature in the delivery container. The point at which the process is interrupted is specified on the audit template. This point can be, for example, when work is started or completed, or when its status changes.
Cluster profile ID	Select the cluster profile to use for cluster picking. The cluster profile includes settings such as whether to create clusters automatically, the names of positions and the number of work units that they can be assigned, when to break clusters into individual units, and whether verification is required. This field is available only if Cluster picking is selected in the Directed by field.

FIELD	DESCRIPTION
Count total item quantity first	Select this option to require that a worker count the total quantity first during a count. If a difference is found, the worker must provide additional information, such as the license plate number, batch number, and serial numbers.
Create movement	Select this option to let a worker create work for a movement, but without requiring that the worker perform the work immediately. This option is useful if, for example, a quality inspection has been completed, and the inspector wants the item to be moved from the quality inspection area.
Directive code	To use a specific location directive, select the directive code that is associated the location directive. This field is available when you create work and the work creation process is Movement by template .
Disable cycle count thresholds	Select this option to ignore the cycle count thresholds. If you select this option, cycle count work isn't created when threshold values are exceeded.
Display batch disposition code	<p>Select this option to display batch disposition codes. For example, you can display batch disposition codes when you receive a returned batch. Workers can then evaluate the status or quality of a batch, and select the appropriate code. The rules on the batch disposition code determine whether the batch will be available to other warehouse processes. If you don't select this option, one of the following batch disposition codes is used:</p> <ul style="list-style-type: none"> • If you receive a new batch number, the default batch disposition code that is specified on the item model group. • The batch disposition code that is already assigned to the batch.
Display disposition code	Select this option to display disposition codes. For example, you can display disposition codes when you receive return items. Workers can then evaluate the status or quality of the items, and select the appropriate code. The rules on the disposition code determine whether the items will be available to other warehouse processes.
Display inventory status	Select this option to display the status of items in inventory. This option is available for all menu items that use existing work, except cycle counting.
Display summary of pick screen	Select this option to display a summary of picking work for the selected work order. The summary is displayed until the first work line is processed for the work order.
Generate license plate	Select this option to generate a unique license plate number, based on the number sequence selection. For example, you can generate a license plate number for items that are received for purchase orders.

FIELD	DESCRIPTION
Group put away	Select this option to group the put-away work. This option is available when the work was grouped either by the worker or by Supply Chain Management. When the worker has finished all the picking work in the group, put-away work is created for the same group.
Inventory adjustment types	Select the inventory adjustment type that determines the inventory counting journal that is used to post the adjustment, and whether to remove reservations. This field is available only for the Adjustment in or Adjustment out work creation process.
Override batch number	Select this option to let workers who are reporting a quantity as finished for a production order enter a batch number that differs from the batch number that is assigned to the production order.
Override target license plate	Select this option to let workers specify a target license plate number that differs from the suggested target license plate. Use this option when the first pick for a work order is for the entire quantity of an item on a license plate. This option is useful when, for example, a pallet is reused.
Pick and pack	Select this option to let workers combine work for a sales order or load into a single work unit. A worker can perform work only for the sales order or load. This option is useful when, for example, you must increase a quantity for a sales order after the load, shipment, and work have been created for the sales order. This option is available when the menu item uses existing work, and the work is directed by the user or system.
Pick oldest batch	Indicate whether the worker must pick the oldest batch in a location first. The following options are available: <ul style="list-style-type: none"> • None – The worker can pick any batch in the location. The worker receives no message. • Warn – The worker can pick any batch in the location, but he or she receives a warning message if a batch isn't the oldest batch. • Force – The worker must pick the oldest batch in the location. The worker receives an error message if a batch isn't the oldest batch. Note: This option is relevant only if Batch number is lower than Location in the reservation hierarchy that is assigned to the item.
Print label	Select this option to let workers print license plate labels.
System grouping field	Select the field that determine how Supply Chain Management will group picking work for workers. For example, if you select the ShipmentId field, the worker will scan the shipment ID to group the picking work. All work for the shipment is then assigned to the worker. This field requires that you create a menu item to use existing work that is grouped by the system. You must also enter text in the System grouping label field to instruct the worker what to scan.

FIELD	DESCRIPTION
System grouping label	Enter the text that will instruct the worker what to scan when picking work is grouped by Supply Chain Management. For example, if you're using the ShipmentId field to group picking work by shipment, you might enter Shipment ID in the field. This field requires that you create a menu item to use existing work that is grouped by the system. You must also select the field to group by in the System grouping field.
Use default data	Select this option to enable the Default data button on the Action Pane, where you can select fields to display data that a worker typically requires in his or her daily work. This option is useful if, for example, a worker often picks items from the same location. You can select the From location field to display the location by default.
Validated User Directed Field	Select the field that the worker will scan to group the work. For example, if you select LoadId , a worker can pick any work that is associated with a selected load. You must also enter text in the Validated User Directed Label field to instruct the worker what to scan.
Validated User Directed Label	Enter the text that will instruct the worker what to scan when picking work is grouped by a validated user-directed field. For example, if you're using the LoadId field to group picking work for a load, you might enter Load ID in the field.
Work template code	Select the work template that will create the work for a process. For example, if you receive an item for a purchase order, the put-away work will be generated based on the work template. If you don't select a work template, Supply Chain Management assigns a template, based on query criteria. For more information about work templates, see Controlling warehouse work with work templates and location directives .
Show work line list	Select an option for how workers will be able to view and interact with the lines for the currently selected picking work. For more information about this option, see Set up a mobile device menu item to provide a pick line overview .

Require workers to confirm the product, location, or quantity when they pick items

You can set up work confirmations that require that a worker use a mobile device to register the location or quantity when they perform work in the warehouse. Work confirmations help ensure that the worker is at the correct location or is handling the correct quantity of items. You can also enable Supply Chain Management to automatically confirm the worker's registration. If you enable automatic confirmation, you can't also require confirmations for location or quantity. Work confirmations also include products and product variants.

Additionally, you can register confirmations by scanning a bar code. To confirm products and product variants, you must enter an ID for the product or product variant. This ID can be a product ID, product search ID, external ID, GTIN, or bar code. After you enter the ID or scan the bar code, the dimensions for the product variant are displayed on the mobile device.

The following table describes the various work types that you can use work confirmations with.

OPTION	DESCRIPTION
Pick	Require confirmation when items are picked.
Put	Require confirmation when items are put in a location.
Counting	Require confirmation during cycle counting.
Adjustments	Require confirmation when inventory quantities are adjusted.
Custom	Require confirmation for custom work.
Quarantine	Require confirmation when items are moved to quarantine.
License plate building	Require confirmation when items are consolidated to build a license plate.
Print	Require confirmation when license plate labels are printed.
Status change	Require confirmation when the status of inventory is changed.

NOTE

You can require product confirmation only for pick and put work types.

Additional resources

[Set up a mobile device menu item for completing work of type Purchase order](#)

[Set up a mobile device menu item to register received items](#)

[Inventory statuses](#)

NOTE

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Warehouse app event processing

2/18/2021 • 3 minutes to read • [Edit Online](#)

Batch jobs running in Supply Chain Management can use data from a queue for processing events issued by the warehouse app to react as needed to the signaled events. This feature adds relevant events to the queue in response to certain types of actions taken by workers using the app. An example is when using the **Create and process transfer orders from the warehouse app** feature, the transfer order header and lines get created and updated in the back end when the system is running the **Process warehouse app events** batch job.

Enable the Process warehouse app events feature

Before you can use this feature, it must be enabled on your system. Administrators can use the [feature management](#) page to check the feature status and enable it if needed. The Process warehouse app events feature is listed as:

- **Module** - Warehouse management
- **Feature name** - Process warehouse app events

Set up a batch job to process warehouse app events

Process warehouse app events

Set up a scheduled batch job to process the warehouse app events for the transfer order creation and line updates.

1. Go to **Warehouse management > Periodic tasks > Process warehouse app events**.
2. The Process warehouse app events dialog box opens. Expand the **Run in background** FastTab and set **Batch processing** to **Yes**.
3. On the **Run in the background** FastTab, select **Recurrence**.
4. The **Define recurrence** dialog box opens. Set the run schedule as needed for your business.
5. Select **OK** to return to the **Process warehouse app events** dialog box.
6. Select **OK** in the **Process warehouse app events** dialog box to add the batch job to the batch queue.

Query warehouse app events

You can view the event queue and events messages generated by the warehouse app by going to **Warehouse management > Inquiries and reports > Mobile device logs > Warehouse app events**.

The standard event queue process

The warehouse apps events queue will typically be used with the following described flow:

1. An event gets added to the queue with an event message. The new message initially has an Event state of **Waiting**, which means that the **Process warehouse app events** batch job will not pick up and process this message.
2. As soon as the message state is updated to **Queued**, the **Process warehouse app events** batch job will pick up and process the event.
3. The batch job updates the event states to either **Completed** or **Failed**, depending on whether the requested process was possible.
4. When all the related event messages are **Completed**, the event is deleted from the queue.

For a detailed example, see [Create transfer order from warehouse app process](#).

Handle event errors

As part of the warehouse event processing, the requested message activity may not receive processes from the batch job. In this case, the event message will change to **Failed**. You can use the **Batch log** information to learn why and take needed action to correct any problems.

For a detailed example, see [Create transfer order from warehouse app](#).

To reset a failed warehouse app event message:

1. Go to **Warehouse management > Inquiries and reports > Mobile device logs > Warehouse app events**.
2. On the **Warehouse app event messages** FastTab, find and select a relevant event that is showing **Failed** in the **Event state** column.
3. Select **Reset** from the **Warehouse app event messages** toolbar.
4. Continue working until all relevant messages are reset.

You can also remove a **Failed** event message by using the **Delete** option on the **Warehouse app event messages** toolbar.

NOTE

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License plate receiving via the warehouse app

2/18/2021 • 5 minutes to read • [Edit Online](#)

This topic explains how to set up the warehouse app so that it supports using a license plate receiving process to receive physical inventory.

You can use this functionality to quickly record the receipt of inbound inventory that is related to an advance ship notice (ASN). The system automatically creates an ASN when warehouse management processes are used to ship a transfer order. For the purchase order process, an ASN can be manually recorded, or it can be automatically imported by using an inbound ASN data entity process.

The ASN data is linked to loads and shipments via the *packing structures*, where pallets (parent license plates) can contain cases (nested license plates).

NOTE

To reduce the number of inventory transactions when packing structures that have nested license plates are used, the system records the physical on-hand inventory on the parent license plate. To trigger the movement of the physical on-hand inventory from the parent license plate to the nested license plates, based on the packing structure data, the mobile device must provide a menu item that is based on the *Pack to nested license plates* work creation process.

Warehousing mobile device app processing

When a worker scans an incoming license plate ID, the system initializes a license plate receiving process. Based on this information, the content of the license plate (data coming from the ASN) gets physically registered at the inbound dock location. The flows that follow will depend your business process needs.

Work policies

As with (for example) the *Report as finished* mobile device menu item process, the license plate receiving process supports several workflows based on the defined setup.

Work policies with work creation

When you register incoming items using a work policy that creates work, the system generates and saves put-away work records for each registration. If you use the *License plate receiving and put away* work process, then registration and put away are handled as a single operation using a single mobile device menu item. If you use the *License plate receiving* process, then the receiving and put-away processes are handled as two different warehouse operations, each with their own mobile device menu item.

Work policies without work creation

You can use the license plate receiving process without creating work. If you define work policies that have a work order type of *Transfer receipt* and/or *Purchase orders*, and you use the process for *License plate receiving (and put away)*, the following two Warehousing mobile app processes won't create work. Instead, they will just register the inbound physical inventory on the license plate at the inbound receiving dock.

- *License plate receiving*
- *License plate receiving and put away*

NOTE

- You must define at least one location for a work policy in the **Inventory locations** section. You can't specify the same location for multiple work policies.
- The **Print label** option for Warehousing mobile device menu items won't print a license plate label without work creation.

To make this functionality available on your system, you must turn on the *License plate receiving enhancements* feature in [feature management](#).

Receive inventory on a location that doesn't track license plates

It's possible to use a warehouse location that is assigned to a location profile even when **Use license plate tracking** isn't turned on. Therefore, when you receive inventory, you can directly register the on-hand inventory on a location without work creation.

Add mobile device menu items for each receiving location in a warehouse

The *License plate receiving enhancements* feature lets you receive at any location in a warehouse by adding location-specific license plate receiving (and put away) menu items to the Warehousing mobile app. Previously, the system supported receiving only at the default location that is defined for each warehouse. However, when this feature is turned on, mobile device menu items for license plate receiving (and put away) now provide the **Use default data** option, which lets you select a custom "to" location for each menu item. (This option was already available for some other types of menu items.)

To make this functionality available on your system, you must turn on the *License plate receiving enhancements* feature in [feature management](#).

Show or skip the receiving summary page

You can use the *Control whether to display a receiving summary page on mobile devices* feature to take advantage of an additional detailed Warehouse app flow as part of the license plate receiving process.

When this feature is turned on, mobile device menu items for license plate receiving or license plate receiving and put-away will provide a **Display receiving summary page** setting. This setting has the following options:

- **Display a detailed summary** – During license plate receiving, workers will see an extra page that shows the full ASN information.
- **Skip the summary** – Workers won't see the full ASN information. Warehouse workers also won't be able to set a disposition code or add exceptions during the receiving process.

To make this functionality available on your system, you must turn on the *Control whether to display a receiving summary page on mobile devices* feature in [feature management](#).

Prevent transfer order–shipped license plates from being used at warehouses other than the destination warehouse

A license plate receiving process can't be used if an ASN contains a license plate ID that already exists and has physical on-hand data at a warehouse location other than the warehouse location where the license plate registration occurs.

For transfer order scenarios where the transit warehouse doesn't track license plates (and therefore also doesn't track physical on-hand inventory per license plate), you can use the *Prevent transfer order shipped license plates from being used on other warehouses than the destination warehouse* feature to prevent physical on-

hand updates of license plates that are in transit.

To make this functionality available on your system, you must turn on the *Prevent transfer order shipped license plates from being used on other warehouses than the destination warehouse* feature in [feature management](#).

To manage the functionality when this feature is available, follow these steps.

1. Go to **Warehouse management > Setup > Warehouse management parameters**.
2. On the **General** tab, on the **License plates** FastTab, set the **Transit warehouse license plate policy** field to one of the following values:
 - **Allow reuse of non-tracked license plate** – The system works the same way that it works when the *Prevent transfer order shipped license plates from being used on other warehouses than the destination warehouse* feature isn't available. This value is the default setting when you first activate the feature.
 - **Prevent reuse of non-tracked license plate** – Only on-hand updates that are related to a shipped license plate will be allowed at the destination warehouse until the transfer order has been received.

More information

For more information about mobile device menu items, see [Set up mobile devices for warehouse work](#).

For more information about the *Report as finished* production scenario, see the [Warehouse work policies overview](#).

For more information about inbound load management, see [Warehouse handling of inbound loads for purchase orders](#).

NOTE

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Set up a mobile device menu item for completing work of type Purchase order

2/18/2021 • 3 minutes to read • [Edit Online](#)

This topic shows how to set up a Mobile device menu item. In this example, the menu item is used for performing work of type Purchase order. The work class that's associated with the menu item determines which work is valid. You can use this guide in demo data company USMF. This procedure is typically carried out by a warehouse manager.

Create a mobile device menu item

1. Go to **Mobile device menu items** by entering it in the search bar.
2. Select **New**.
3. In the **Menu item name** field, type a value. Enter a unique value. For example, you could type . Remember the value, you'll need it later.
4. In the **Title** field, type a value. This is the title which will be displayed on the mobile device. For example, you could type .
5. In the **Mode** field, select **Work**.
6. Select **Yes** in the **Use existing work** field.
 - This mobile device menu item is used to perform existing work. Therefore you must set this value to **Yes**.
 - The **Display inventory status** field determines whether the inventory status of the on-hand inventory will be displayed to the warehouse worker on the mobile device.
7. In the **Directed by** field, select **System grouping**. When you select something in the **Directed by** field, additional fields appear in the **General** section on this page. The fields that appear depend on what you selected. When you select **System grouping**, two new fields are added. These are explained below.
8. In the **System grouping** field, select **WorkPoolId**. When warehouse workers open this menu item, they'll be asked to scan a Work pool ID. All work orders with this Work pool ID and open work order lines with one of the work classes added to this menu item will be pushed to the user.
9. In the **System grouping label** field, type a value. This is the text displayed to the user on the mobile device. For example, you could type **Work pool**.
10. Select **Yes** in the **Override license plate during put** field. This option allows warehouse workers to override the target license plate when items are put down on a license plate controlled location.
11. Select **Yes** in the **Group put away** field.
 - If all the Put lines on the work order share the same location, the user will receive one combined Put instruction for all lines.
 - Audit template ID: A work audit template allows you to specify that the work process for a menu item should be interrupted so that another operation can be performed. For example, if this menu item is for inbound work, the audit template might require that the worker checks the temperature. The point at which the process is interrupted is specified on the audit template and can be, for example, when work is started or completed, or when its status changes.
12. Expand the **Work classes** section.
13. Select **New**.
14. In the **Work class ID** field, type . The work pool restricts the work that the menu item can be used for. In this case it will be used for open work order lines that have the Purchase work class ID.
15. Select **Save**.

Set up work confirmation

1. Select **Work confirmation setup**.
2. In the **Work type** field, select **Pick**.
3. Select the **Auto confirm** check box. The work instruction with work type Pick will be auto-confirmed. This instruction will not be presented to the user.
4. Select **New**.
5. In the **Work type** field, select 'Put'.
6. Select the **Location confirmation** check box. The warehouse worker will be asked to perform a confirmation scan of the location, when the item is put down.
7. Select **Save**.

Add the menu item to a mobile device menu

1. Go to **Mobile device** menu by entering it in the search bar.
2. Select **Edit**.
3. Use the Quick Filter to find records. For example, filter on the **Name** field with a value of **inbound**. You want to find the menu you use for inbound menu items. In USMF this is called **Inbound**.
4. In the tree, select **a value**.
5. Select the arrow that points to the right.
6. Select **Save**.
7. Close the page.

NOTE

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Set up a mobile device menu item to register received items

2/18/2021 • 3 minutes to read • [Edit Online](#)

This topic focuses on the setup of a mobile device menu item. This menu item is used for registration of the receipt of items ordered via purchase orders.

You can use this guide in demo data company USMF. This procedure is intended for the warehouse manager.

Create a mobile device menu item

1. In the navigation pane, go to **Modules > Warehouse management > Setup > Mobile device > Mobile device menu items**.
2. Select **New**.
3. In the **Menu item name** field, type a value. This is the unique identifier for this mobile device menu item. For example, you could type .
4. In the **Title** field, type a value. This is the title, which will be displayed to the user on the mobile device. For example, you could type .
5. In the **Mode** field, select **Work**. Registration of on-hand quantities received for a purchase order line will create work to move the items from the receiving area into the inventory. Work isn't created until the items are registered. Therefore, leave the **Use existing work** option set to **No**.
6. In the **Work creation process** field of the **General** section, select **Purchase order item receiving**.
 - A purchase order line must be uniquely identified before on-hand can be registered in the warehouse. In this scenario, the mobile device will register the purchase order number and item number, and this will allow the system to identify the PO line. Put away work will be created and can be picked up by another worker. The work creation method that you select determines which fields become available on the **General** FastTab.
 - If you select the **Use default data** option, the **Default data** button is enabled. Here you can select fields to display data that a worker typically needs in their daily work, so that these values are shown on the mobile device.
 - The **License plate grouping** parameter works in combination with the unit sequence group that's assigned to the item that's being received. You can specify whether receipts of less than or more than one pallet should be grouped into one license plate, or divided into a separate license plate for each unit.
 - If you select the **Generate license plate** option, this generates a unique license plate number based on the number sequence selection.
 - You can select the template that will be used when work is created. For example, if you register an item for a purchase order, the put away work will be generated based on the work template. If you don't select a work template here, the system will assign a template based on the query criteria that are associated with the templates.
 - If disposition codes are displayed on the mobile device, workers can evaluate the status or quality of the items, and select the appropriate code. The rules for the disposition code determine whether the items will be available to other warehouse processes. The rules also determine which location directive is used for the work that's created.
 - If you select the **Batch disposition codes** option, workers can evaluate the status or quality of a batch, and select the appropriate disposition code. The rules that are set on the batch disposition code determine whether the batch will be available to other warehouse processes.

- If you select the **Print labels** option, a license plate label will be printed automatically when items are received.
7. Select **Save**.
 8. Close the page.

Add the menu item to a mobile device menu

1. In the navigation pane, go to **Modules > Warehouse management > Setup > Mobile device > Mobile device menu**.
2. Use the **Quick Filter** to filter on the **Name** field with a value of .
3. Select **Edit**.
4. In the Available menus and items tree, select the menu item that you created before.
5. Select the arrow that points to the right.
6. Select **Save**.
7. Close the page.

NOTE

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Set up a mobile device menu item to provide a pick line overview

2/18/2021 • 3 minutes to read • [Edit Online](#)

IMPORTANT

Some or all of the functionality noted in this topic is available as part of a preview release. The content and the functionality are subject to change. For more information about preview releases, see [One version service updates FAQ](#).

This topic explains how to configure options that are related to the pick line overview for mobile device menu items that are used to process picking work. The pick line overview lets warehouse workers view and select from a list of all the work lines that are related to their current task. This capability can help workers optimize their picking sequence. The feature provides options that replace the standard **Skip** button that lets workers cycle through the lines one at a time, in a fixed order. (However, the option to use that button is still available.)

Admins can configure each menu item individually to control how, when, and where the warehouse app presents the pick line overview.

Turn on the Work pick line overview feature

Before you can use this feature, it must be turned on in your system. Admins can use the [feature management](#) settings to check the status of the feature and turn it on if it's required. In the **Feature management** workspace, the feature is listed in the following way:

- **Module:** *Warehouse management*
- **Feature name:** *Work pick line overview*

Configure menu items to show a list of all work lines

To set up a mobile device menu item to provide a pick line overview, follow these steps.

1. Go to **Warehouse management > Setup > Mobile device > Mobile device menu items**.
2. Select or create a menu item that is related to picking work, and set the following values:

- **Mode:** *Work*
- **Use existing work:** *Yes*
- **Directed by:** *User directed* or *System directed*

For more information about how to create menu items and use the various settings that are available on the **Mobile device menu items** page, see [Set up mobile devices for warehouse work](#).

3. On the **General** FastTab, configure the feature by setting the **Show work line list** field to one of the following values:
 - **Show only upon request** – Workers can choose to view the pick line list by selecting the **Skip to** button in the warehouse app.
 - **Show at the start of every pick** – Workers see the list every time that they start or finish a pick line. They can also view the list again by selecting the **Skip to** button in the warehouse app.
 - **Show at the start of the first pick only** – Workers see the list every time that they start new picking work, but not after each line. They can also view the list again by selecting the **Skip to** button

in the warehouse app.

- **Never show** – The standard **Skip** button appears in the warehouse app, and display of the work line list is turned off. The **Skip** button lets workers cycle through the lines one at a time, in a fixed order. They can also cycle through the list as many times as they require, until all lines have been processed.

4. On the Action Pane, select **Save**.

If you set the **Show work line list** field to any value except *Never show*, the **Field list** button on the Action Pane becomes available.

5. On the Action Pane, select **Field list**.

6. On the **Field list** page, configure the information that the warehouse app shows for each line in the list.

- The **Primary control** field is always set to *LineNum*. Therefore, each row in the list begins with a line number.
- Use the remaining **Display field** fields to add up to seven additional display fields, as you require. In each **Display field** field, select the name of a work line field. Each line will then show a value for that field. The values will be shown in the order that you select here. You can leave some of the **Display field** fields blank if you don't require all seven values.

7. On the Action Pane, select **Save**, and then close the **Field list** page.

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Create a mobile device menu item for license plate consolidation

2/18/2021 • 2 minutes to read • [Edit Online](#)

This procedure shows you how to create a mobile device menu item for license plate consolidation work. This enables warehouse workers to consolidate items on one license plate with items on another license plate within the same location. For example, they might use this if subsequent staging steps were the same on both work orders, so that the work only needs to be performed once for the merged items. You can use this procedure in demo data company USMF. The task would typically be carried out by a warehouse manager. This procedure is for a feature that was added in Dynamics 365 for Operations, version 1611.

1. Go to Warehouse management > Setup > Mobile device > Mobile device menu items.
2. Click New.
3. In the Menu item name field, type a value.
4. In the Title field, type a value.
5. In the Mode field, select 'Indirect'.
6. In the Activity code field, select 'Consolidate license plates'.

NOTE

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Mixed license plate receiving

2/18/2021 • 2 minutes to read • [Edit Online](#)

Mixed license plate receiving allows you to build a license plate consisting of multiple items before you register and create put-away work.

A license plate that consists of multiple items does not have to be split at the receiving dock for you to register each item.

When using an item-related flow to identify the source document lines, you can scan bar codes on the item control. If the bar code has a quantity and a unit of measure (UOM) configured on it, the item and quantity will automatically be added to the mixed license plate, and you will be returned to the screen to scan another item. This allows you to quickly scan all the items without having to make a confirmation at each step.

In the flow for mixed license plate receiving, you can display the list of items that are already scanned to the license plate and from here you can modify or correct the quantity of an item.

Where it applies

Mixed license plate receiving is a mobile device receiving flow to register and create work for multiple lines/items at the same time. This is useful if you receive inbound license plates with multiple items.

How to set up mixed license plate receiving

Mixed license plate receiving is set up as a mobile device menu item.

You need to create a new menu item with mode work that does not use existing work and use one of the following methods:

- Mixed license plate receiving
- Mixed license plate receiving and put away

The options to identify the source document lines are purchase order item, purchase order line, return order, transfer order item, and transfer order line. These options can change the receiving order on a single license plate. The last option is by load item. You can add multiple items to a license plate, but you cannot switch between multiple loads.

NOTE

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Configure Display older batches within warehouse on a mobile device

2/18/2021 • 2 minutes to read • [Edit Online](#)

The **Display older batches within warehouse** configuration lets you display a list of locations with batches older than the current location of the work line. The list of locations that are displayed includes information about the older batches in the location with the expiration date and the physical inventory of each batch. You can choose to pick from a new location or to continue picking from the current location.

- Pick from a new location - If you select a new location to pick from, the current work line will be updated to use the new location and work will continue as usual with the new location. For the new location to be valid, it must have enough available quantity for the whole work line. If the required quantity is not available, the work line will not be updated, and the list will display.
- Continue picking from the current location - If you continue with the current work line location, the quantities for the work line will continue to be picked from the original location.

Where it applies

Display older batches within warehouse is configured on mobile device menu items and affects the pick for batch below items.

Set up Display older batches within warehouse

The **Display older batches within warehouse** configuration is available on mobile device menu items when the **Pick oldest batch** option is set to **Warn**.

- Under **Warehouse management > Setup > Mobile device > Mobile device menu items**, set **Use existing work** to **Yes** for the menu item, and select **Warn** in the **Pick oldest batch** field.

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Pick oldest batch on a mobile device

2/18/2021 • 2 minutes to read • [Edit Online](#)

You can access the configuration **Pick oldest batch** via a mobile device menu and it allows you to force or warn warehouse workers to pick the oldest batch in their current location.

Where it applies

Pick oldest batch is configured on mobile device menu items and effects the pick for batch below items.

How to set up the configuration for Pick oldest batch

For items that are set to use existing work, **Pick oldest batch** can be set to **None**, **Warn**, or **Force** from a mobile device menu.

None: Workers will not receive any messages and they will be allowed to pick any batch in their location.

Warn and **Force:** A list of the batch(es) with the oldest expiration date will be displayed above the batch control when the worker selects a batch. If the location is license plate controlled, a list of license plates that have the oldest batch will be displayed above the license plate control.

- **Warn:** If a worker chooses a license plate or batch that is not on the shown list, the control will be blanked and a warning will be shown that there is an older batch to select. To be allowed to continue the work, the worker can select the same license plate or batch again.
- **Force:** Workers will continue to receive the message that there is an older batch to pick.

NOTE

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Process guide framework

2/18/2021 • 22 minutes to read • [Edit Online](#)

This topic provides information about the process guide framework for developers who are extending the warehouse mobile processes in X++ . The warehouse mobile processes are extensible as a result of the processes being broken into small steps. The business logic and user interface building of each step has been extracted into individual classes, which allows for extensibility.

Overview of the existing design

The warehouse mobile execution flows are exposed through a single custom service endpoint. The request arrives from the mobile app in the form of an XML string, which contains the metadata of the user interface presented in the mobile app, as well as the values entered by the user.

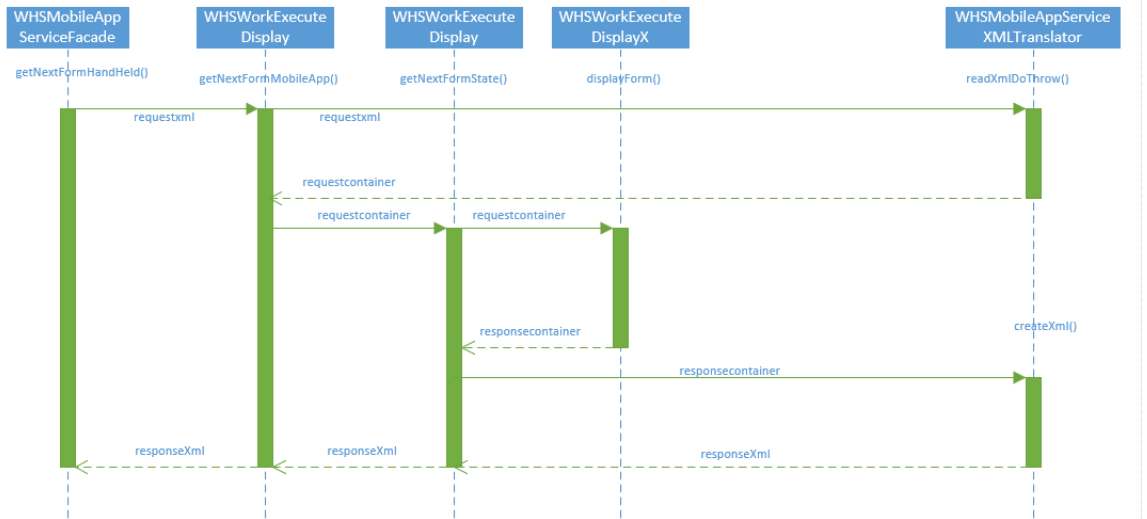
When the request is received, the first step is to deserialize this XML. The **WHSMobileAppServiceXMLTranslator** class converts the XML into a container, which contains both the control information, as well as session information.

Following this, the information in the container is used to deduce which warehouse process the user is working on, or about to start (represented by the **WHSWorkExecuteMode** enumeration), and accordingly instantiate a derived class of **WHSWorkExecuteDisplay**. The **displayform()** method is invoked, which then does the following:

- Processes the data from the user (delegated to the **WHSRFCControlData** class, but some processes implement specific logic by overriding the **processControl()** method).
- Executes business logic.
- Increments the step.
- Builds the container representing the new user interface (typically in a **build...()** method).

The container is then returned to the translator, which then serializes the XML, and sends it back as a response to the mobile device.

The following sequence diagram shows an overview of the execution flow. Note that the diagram is more of a schematic overview and is not a 1:1 representation of the actual code.



This is not an accurate representation of the code, but more of a schematic overview.

Reason for the redesign

The above design offers a very simple framework for building processes used in mobile flows. However, as is evident above, the **displayForm()** methods take over multiple responsibilities. It does delegate them to other methods and classes, but in the absence of concrete class responsibilities, it is done in an inconsistent manner across classes. Also, as the number of supported scenarios grows organically, some of those classes can become quite complex. To make matters more interesting, some of those classes/methods are overridden and re-used in multiple modes. The result is extremely long methods with high cyclomatic complexity. These have posed maintenance issues in the past. Fixing bugs in these methods has been risky and regression prone. For example, the **processWorkLine()** method in the **WhsWorkExecuteDisplay** class is referred from multiple processes (basically, anywhere where work execution is performed).

To make these extensible, one of the options would be to split the **displayForm** methods into smaller methods and introduce extensibility points. However, because of the scenario matrix, it would be challenging for partners to write extensions and validate against regressions. Not only that, because of the lack of structured responsibility distribution noted above, the code would keep growing in unpredictable ways over time, posing challenges in building quality extensions.

As a result, the redesign is the sustainable option, with a goal to have clearly defined classes having independent responsibilities. A class should have one responsibility, one reason to change, and one reason to be extended.

Design overview

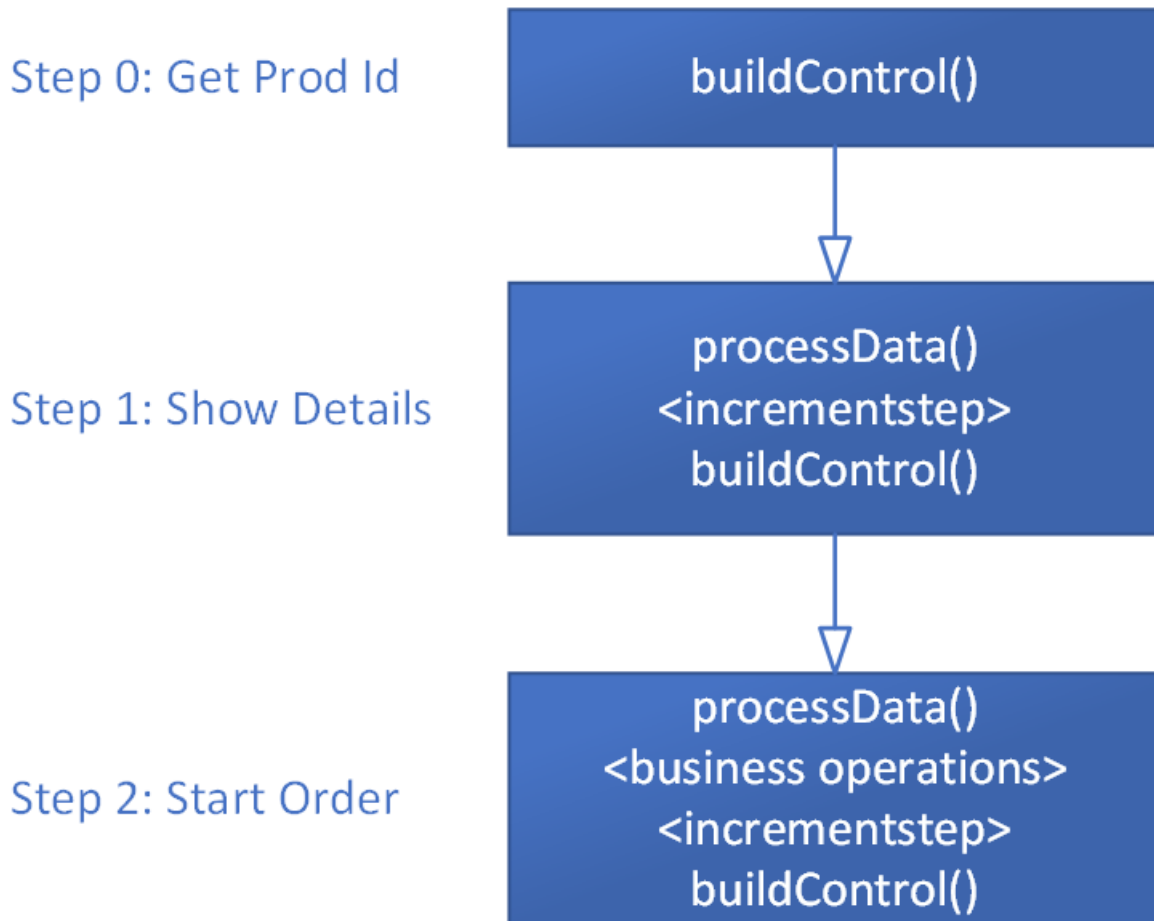
In the redesigned framework, the core strategy revolves around two principles: divide the execution flow into individual components with well-defined responsibilities and have well-defined extension points in each of the components.

The name for the new framework is "ProcessGuide". This is because the aim of these classes is to guide a user through a business process (as opposed to the rich client which is a form-based experiences where the user has more flexibility in how they interact with the data or in which order they perform tasks).

NOTE

One notable detail is the deliberate omission of the "WHS" prefix. While the mobile processes were initially introduced for warehousing, subsequently they have transcended boundaries to support various production and inventory management processes. As a result, the warehouse reference was excluded in the name of the framework.

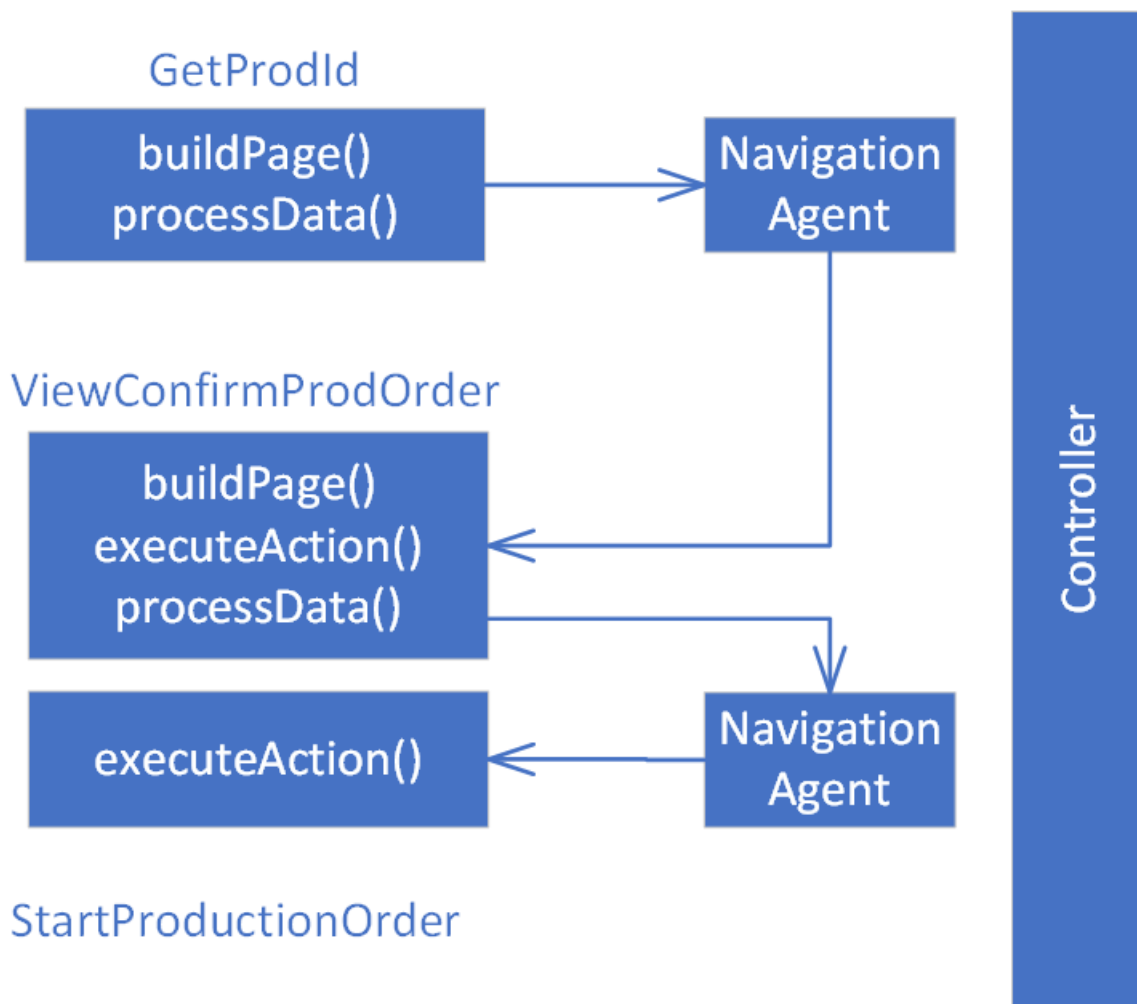
To identify the components, the first step is to look at the Production Start process (WhsWorkExecuteDisplayProdStart class). Here is a schematic of the process.



Looking at the control flow, the following are components needed:

- A controller to stitch through the entire business process.
- A step responsible for execution of a step in the process.
- A data processor for processing the data in a step.
- A page builder responsible for building the user interface for a step.
- A navigation agent responsible for step transition.
- A class responsible for executing the business process.

In the process flow diagram above, if you begin at step 1 and start processing the data from the previous step, and then end with building a UI, data would continue to be processed in the next step. This introduces a tight coupling between consecutive steps, as a result, our new high-level schematic would look like the following:



The following are the key components in the redesigned process:

- **ProcessGuideController** - This class orchestrates the overall execution of the business process. It defines the factories that instantiate the step and the navigation agent, which subsequently constitute the process execution, as well as the clean-up logic for cancellation or exiting the process.
- **ProcessGuideStep** - This class represents one single step in the business process. This class contains a definition of the factories that instantiate a page builder, actions, and data processors and is responsible for invoking them in the correct sequence.
- **ProcessGuideNavigationAgent** - This class is responsible for navigation between the steps. When a step is completed, the navigation agent is responsible for defining the next step and passes any parameters that the previous step may need to communicate to the next one.
- **ProcessGuidePageBuilder** - This class is responsible for instantiating the user interface.
- **ProcessGuideAction** - This class represents an action, shown as a button to the user.
- **ProcessGuideDataProcessor** - This class is responsible for processing the user entered data in a field.

Execution flow

The starting point of the execution flow remains unchanged. So, the request still arrives through the same endpoints, followed by deserializing the XML into the container. This container is then passed to `getNextFormState()`.

There are three important classes to note:

- **ProcessGuideSessionState** – This contains the session state information – mode, pass, controller, and step being executed, and so on.

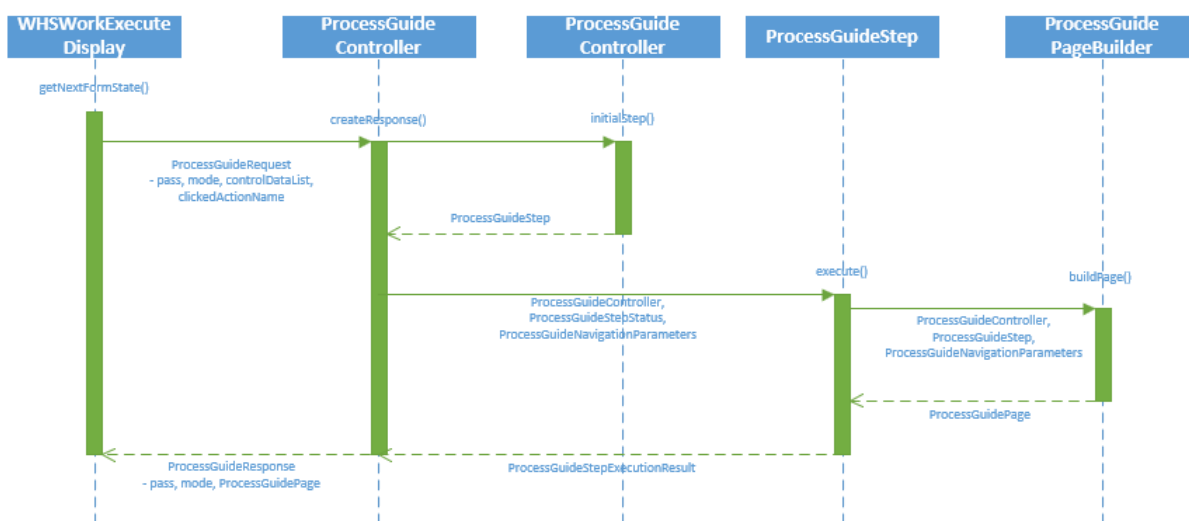
- **ProcessGuidePage** – This contains a strongly-typed representation of the user interface metadata.
- **ProcessGuideRequest** – This contains the above two as members and is a strongly-typed representation of the request received from the mobile device.

These classes are created using the container information (both state and user entered control data). This provides a type-safe way to access and manipulate the values. Compared to repeated access of the container during the process, this provides benefit both in terms of readability and performance.

The session state information is used to instantiate the correct **ProcessGuideController** class. Once instantiated, the **createResponse()** method in the **ProcessGuideController** class is invoked. This method is the entry point to the process guide logic, and after execution, comes back with the response (represented in the **ProcessGuideResponse** class). The response is then converted back to the container and handed back to the legacy logic, which then serializes it to the XML and sends the response back to the mobile device.

Next, the controller needs to find the next step to execute. If this is the start of a new process, the controller will call **initialStep()** to get the first step in the process. After that, it would call **execute()** method in the **ProcessGuideStep**. This method would then instantiate a **ProcessGuidePageBuilder** class and call **buildPage()**, which would return with a **ProcessGuidePage** object, which is a virtual representation of the user interface to be presented to the user. The step would then send the result back to the controller, which would then save the current session state and then return the result back to **getNextFormState()** in the form of the **ProcessGuideResponse** class. Thereafter, the response is converted back to the container, and subsequently serializes to XML and sends back the response to the mobile device.

The following sequence diagram explains this control flow. Note that this is the most common control flow, simplified for explaining the design.



When the user takes an action on the mobile device by clicking a button (or scanning a value – which typically triggers the default action) – the request arrives at the **createResponse()** method in the **ProcessGuideController** class through the same route. This time, however, the controller knows from the session state information which step the user is in. Accordingly, it instantiates the appropriate **ProcessGuideStep** class and invokes the execute method. The **ProcessGuideStep**, in turn, reads the action name invoked by the user and then instantiates the appropriate **ProcessGuideAction** class and calls **execute()**.

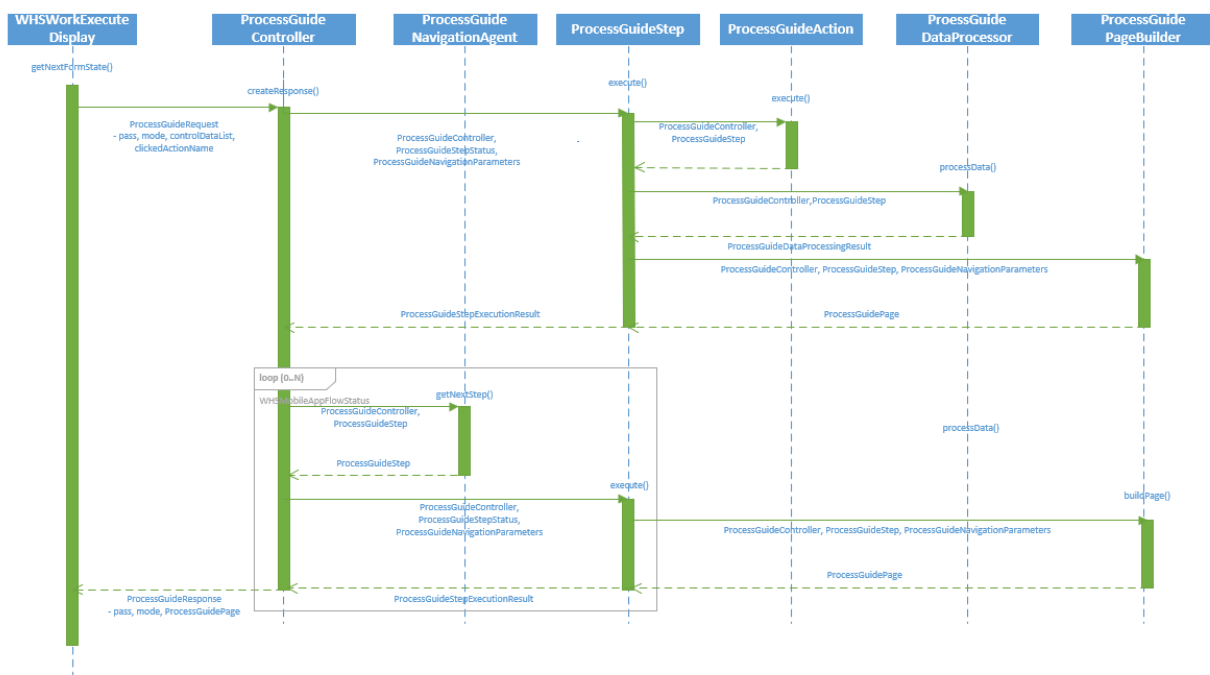
The **ProcessGuideAction** class is responsible for executing the specific action, however there are two notable exceptions.

The first one is the **ProcessGuideOKAction** class. This action implies that the user wants to confirm and move forward in the process. In accordance to that – this method actually does a callback to the **ProcessGuideStep** class, which means that the step invokes **processData()** in **ProcessGuideDataProcessor**. This processes the

data that the user has entered, and then updates the state of the step and sends the result back to the controller. Depending on the outcome of the processor, the step invokes the page builder to build the appropriate user interface or sets the status of the step as completed. This is reflected in the top half of the sequence diagram below.

The other exception is the cancellation action, implemented in the `ProcessGuideCancelResetProcessAction` and `ProcessGuideCancelExitProcessAction` classes. These actions represent an intent to cancel the process and go back to either the start of the process or exit the process altogether. Similar to the OK action, these actions also perform a callback to the step, which signals the intent to the `ProcessGuideController`. The controller then performs the necessary cleanup of state variables and either moves control to the initial step in the process or terminates the process altogether.

After the step is completed, if the status of the step is set to **Completed**, then the controller instantiates the `ProcessGuideNavigationAgent`, which returns the name of the next step. The controller then instantiates this step and invokes the `execute()` method – and the cycle continues. Most commonly, the new step invokes the corresponding `ProcessGuidePageBuilder` to build the user interface for the next screen to be presented to the user, which is then sent back. This flow is depicted in the lower half of the sequence diagram below.

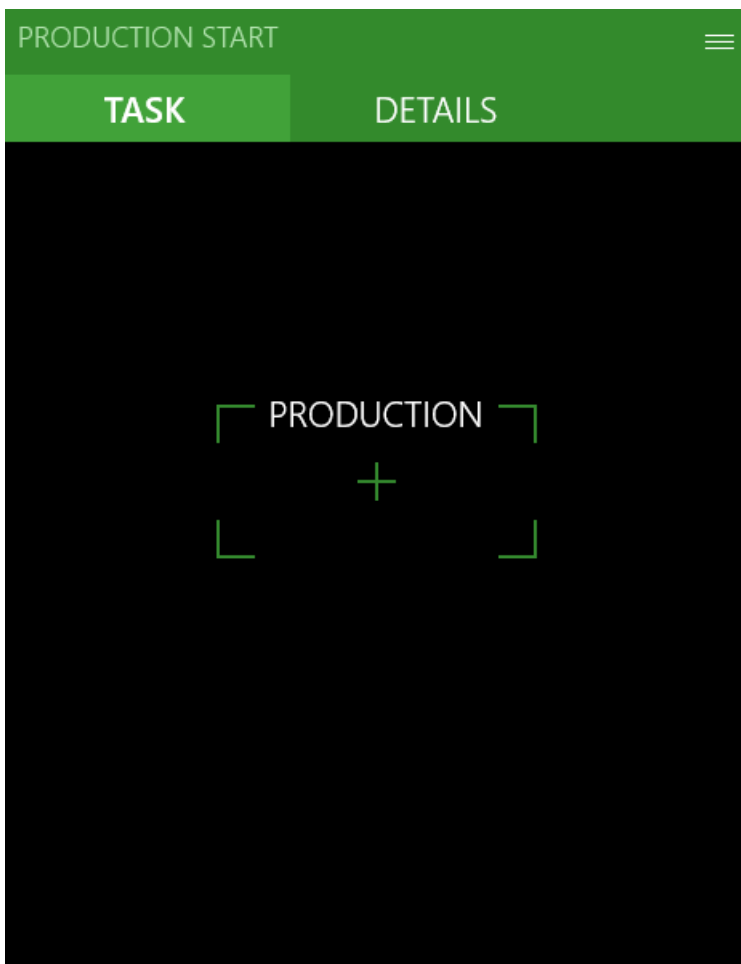


Building a new process using the ProcessGuide framework

The best way to explain the control flow is by using an example that exists in the application – the Production Start process.

Overview of the production start process

Let's start by understanding the process flow. In the first step, the user is prompted for production order ID.



When the user enters the production order ID, the order number is validated. Some of the validations that are run are based on whether the order is in the same warehouse as the user is signed in to, and the status of the order. If the validation fails, the user is shown an error message. If the validation succeeds, then the user is shown details of the production order and item.

The user can either cancel to go back to the start of the process or click **OK** to confirm. In the latter case, the production order is set to **Started** status, the corresponding journals are posted, the control moves back to the first step, and the "Work Completed" message is shown to the user.

Creating the controller

The first step in building the business process is creating the controller class, extending from the **ProcessGuideController** abstract class which implements the default behaviors of a controller. The new class name is **ProdProcessGuideProductionStartController** and decorated with the **WHSWorkExecuteMode** value of **StartProdOrder**. The same **SysExtension** based instantiation that was used in the **WHSWorkExecuteDisplay** classes is used, which helps instantiate the controller when the user executes a menu item for this mode.

```
[WHSWorkExecuteMode(WHSWorkExecuteMode::StartProdOrder)]  
public class ProdProcessGuideProductionStartController extends ProcessGuideController
```

NOTE

The naming pattern of the class is **<FunctionalArea>ProcessGuide<Businessprocessname>Controller**. This is the pattern that is used for the controller classes and to extend to other classes.

Building the first step

Next, to define the first step you create the `ProdProcessGuidePromptProductionIdStep` class, extending from `ProcessGuideStep`.

The task of instantiating the class is delegated to a step factory, which is invoked by the `ProcessGuideController` base class. The default implementation of the factory instantiates the step based on name. Therefore, to instantiate `ProdProcessGuidePromptProductionIdStep` as the first step in the controller, you must do two things:

- Decorate the `ProdProcessGuidePromptProductionIdStep` class with a `ProcessGuideStepName` attribute.

```
[ProcessGuideStepName(classStr(ProdProcessGuidePromptProductionIdStep))] public class ProdProcessGuidePromptProductionIdStep extends ProcessGuideStep
```

- In the controller class, implement the abstract method `initialStepName()` to return the step name.

```
protected final ProcessGuideStepName initialStepName()
{
    return classStr(ProdProcessGuidePromptProductionIdStep);
}
```

NOTE

The value in the `ProcessGuideStepName` attribute does not need to exactly match the class name as shown above. However, implementing this allows for uniformity and type-safety around cross-references when using the class. Using this naming convention is recommended.

The `ProcessGuideStepName` based instantiation of the step is implemented in the `ProcessGuideStepDefaultFactory` class. In the rare case that you want a different strategy for instantiating the step, you need to do the following:

- Create a new factory class inheriting from `ProcessGuidStepAbstractFactory`.
- Optionally, create a new parameter class implementing the `ProcessGuideIStepCreationParameters` interface, containing the parameters the factory would need.
- In your controller class, override the `stepFactory()` and `stepCreationParameters()` methods to return the above factory and parameters.

The next step is to implement the functionality of the `ProdProcessGuidePromptProductionIdStep` class. You need to implement the logic for building the user interface, processing the user-entered data, and determining when the step is complete.

Building the user interface for the first step

The user interface is built using a class inheriting from the `ProcessGuidePageBuilder` abstract class. For this step, name the class to represent what it does – `ProdProcessGuidePromptProductionIdPageBuilder`.

The instantiation mechanism of the class is similar to how the step was instantiated from the controller.

- Decorate the `ProdProcessGuidePromptProductionIdPageBuilder` class with a `ProcessGuidePageBuilderName` attribute.

```
[ProcessGuidePageBuilderName(classStr(ProdProcessGuidePromptProductionIdPageBuilder))] public class ProdProcessGuidePromptProductionIdPageBuilder extends ProcessGuidePageBuilder
```

- In the `ProdProcessGuidePromptProductionIdStep` class, implement the abstract method `pageBuilderName()` to return this name.

```
protected final ProcessGuidePageBuilderName pageBuilderName()
{
    return classStr(ProdProcessGuidePromptProductionIdPageBuilder);
}
```

TIP

Similar to the step factory, there is also an abstract factory pattern implemented for the page builder factory. So, in the rare case that you want a different strategy for instantiating the page builder, you can do the following:

- Create a new factory class inheriting from `ProcessGuidePageBuilderAbstractFactory`.
- Optionally, create a new parameter class implementing the `ProcessGuideIPageBuilderCreationParameters` interface, containing the parameters the factory would need.
- In your step class, override the `pageBuilderFactory()` and `pageBuilderCreationParameters()` methods to return the above factory and parameters.

To implement the user interface you need a page with one text box to enter the production order ID, plus an **OK** button and a **Cancel** button. The **Cancel** button should exit the process.

To implement this, you need to override two methods in the `ProdProcessGuidePromptProductionIdPageBuilder` class:

- Use the `addDataControls()` method to add the text box.

```
protected final void addDataControls(ProcessGuidePage _page)
{
    _page.addTextBox(ProcessGuideDataTypeNames::ProdId, "@SYS4398", extendedTypeNum(ProdId));
}
```

- Use the `addActionControls()` method to add the **OK** and **Cancel** buttons.

```
protected final void addActionControls(ProcessGuidePage _page)
{
    #ProcessGuideActionNames
    _page.addButton(step.createAction(#ActionOK), true);
    _page.addButton(step.createAction(#ActionCancelExitProcess));
}
```

This adds the data controls, followed by the buttons. However, if you want to build a screen with interspersed data controls and buttons, you can override the `addControls()` method instead for flexibility.

An additional scenario to consider is how to rebuild the page in case of validation failures, for example if the user enters an incorrect production order ID. The `ProcessGuidePageBuilder` base class implements the default behavior, which rebuilds the user interface, clears out the scanned value, and adds the error control with the error message. Because this is the default behavior that you want to use, you do not need to add any code for handling errors.

TIP

If you want to implement custom UI behavior for error situations, you can override one or more of the methods `rebuildFromRequestPage()`, `isErrorState()`, and `reuseRequestPageOnError()`.

Processing the user-entered data in the first step

The processing of the data is done in the **ProcessGuideDataProcessorDefault** class, which in turn invokes the legacy **WhsRfControlData** class. No changes are needed to this default behavior, and **WhsRfControlData** already has logic for validating the **ProdId** field, so you do not need to write any logic for handling this. In case of required extensions for the validation logic, consider using the **WhsControl** based extension mechanism.

Determine if the first step is complete

When the validation is successful, it is time to mark the step as completed. This is done in the base class, however, you need to implement the condition to determine the step completion. The following overridden method does that.

```
protected final boolean isComplete()
{
    WhsrfPassthrough pass = controller.parmSessionState().parmPass();
    ProdId prodId = pass.lookup(ProcessGuideDataTypesNames::ProdId);
    return (prodId != '');
}
```

Step two: View order details and confirm

In the second step in the process, the user is shown a screen with details about the order. The user can either click the **OK** button to confirm the start of the production order, or click **Cancel** to go back to the start of the process. For this example, name the step **ProdProcessGuideConfirmProductionOrderStep** and the page builder class **ProdProcessGuideConfirmProductionOrderPageBuilder**.

The **ProdProcessGuideConfirmProductionOrderStep** class looks like the following.

```
[ProcessGuideStepName(classStr(ProdProcessGuideConfirmProductionOrderStep))]
public class ProdProcessGuideConfirmProductionOrderStep extends ProcessGuideStep
{
    protected final ProcessGuidePageBuilderName pageBuilderName()
    {
        return classStr(ProdProcessGuideConfirmProductionOrderPageBuilder);
    }
}
```

Because the user does not enter any values here, you do not need to override the **isComplete()** method. The step is complete when the user clicks **OK**.

The page builder class overrides the **addDataControls()** method to add three labels. The first label shows the production order ID, the second contains item information (such as item ID, dimensions, or description) and the third contains the quantity and unit of measure.

The **addActionControls()** is then overridden to add 2 buttons – the **OK** button, and the **Cancel** button to cancel the process and go back to the start of the process.

```

/// <summary>
/// The <c>ProdProcessGuideConfirmProductionOrderPageBuilder</c> builds a page that allows the user to see
details of a production order
/// and then confirm.
/// </summary>
[ProcessGuidePageBuilderName(classStr(ProdProcessGuideConfirmProductionOrderPageBuilder))]
public class ProdProcessGuideConfirmProductionOrderPageBuilder extends ProcessGuidePageBuilder
{
    protected void addDataControls(ProcessGuidePage _page)
    {
        WhsrFpsthrough pass = controller.parmSessionState().parmPass();
        ProdTable prodTable = ProdTable::find(pass.lookup(ProcessGuideDataTypeNames::ProdId));
        UnitOfMeasureSymbol inventUOM = InventTableModule::find(prodTable.ItemId,
ModuleInventPurchSales::Invent).UnitId;

        _page.addLabel(ProcessGuideDataTypeNames::ProdIdLabelName, strFmt("@WAX1684", prodTable.ProdId),
extendedTypeEnum(ProdId));
        _page.addLabel(ProcessGuideDataTypeNames::ItemInfo,
this.generateItemInfoForProdId(pass.lookup(ProcessGuideDataTypeNames::ProdId)),
extendedTypeEnum(WHSRFUndefinedDataType));
        _page.addLabel(ProcessGuideDataTypeNames::QtyLabelName, strFmt("@WAX1685",
WHSWorkExecuteDisplay::num2StrDisplay(ProdUpdStartup::proposalStartupQty(prodTable.ProdId)), inventUOM),
extendedTypeEnum(WHSRFQuantityAndUOM));

        if (PdsGlobal::pdsIsCWItem(prodTable.ItemId))
        {
            _page.addLabel(ProcessGuideDataTypeNames::InventQtyLabelName, strFmt("@WAX1685",
WHSWorkExecuteDisplay::num2StrDisplay(ProdUpdStartup::pdsCWProposalStartupQty(prodTable.ProdId)),
PdsCatchWeightItem::pdsCWUnitId(prodTable.ItemId)), extendedTypeEnum(WHSRFQuantityAndUOM));
        }
    }

    protected void addActionControls(ProcessGuidePage _page)
    {
        #ProcessGuideActionNames
        _page.addButton(step.createAction(#ActionOK), true);
        _page.addButton(step.createAction(#ActionCancelResetProcess));
    }
}

```

NOTE

You can find the same source code for the X++ methods in this topic by using the Application Explorer. Filter on the class name, and then right-click the class name and select **View code**.

Step 3: Start the production order

The third step is where the business logic of starting the production order is executed. This step is somewhat different from the previous steps, in that, this step does not have a user interface. This step gets executed silently when the user clicks **OK** in the previous step.

The **ProcessGuideStepWithoutPrompt** abstract class implements the default behavior for such steps. The current step, therefore, should extend the **ProcessGuideStepWithoutPrompt** class and override the **doExecute()** method.

The following code example shows the class and the **doExecute()** method implementation. The method simply retrieves the order ID and user ID from the session state and invokes the method to start this production order.

```

/// <summary>
/// The <c>ProdProcessGuideStartProductionOrderStep</c> represents a step that starts a production order.
/// </summary>
[ProcessGuideStepName(classStr(ProdProcessGuideStartProductionOrderStep))]
public class ProdProcessGuideStartProductionOrderStep extends ProcessGuideStepWithoutPrompt
{
    protected final void doExecute()
    {
        WhsrfPassthrough pass = controller.parmSessionState().parmPass();
        WHSUserId userId = pass.lookup(ProcessGuideDataTypeNames::UserId);
        ProdTable prodTable = ProdTable::find(pass.lookup(ProcessGuideDataTypeNames::ProdId));
        WhsWorkExecute workExecute = WhsWorkExecute::construct();
        workExecute.prodStartUp(prodTable.ProdId, ProdUpdStartUp::proposalStartUpQty(prodTable.ProdId),
userId);

        this.addProcessCompletionMessage();

        super();
    }
}

```

In case of an exception, the framework exception handling logic ensures that the process is rolled back to the previous step.

NOTE

The invoke to `addProcessCompletionMessage()` adds the “Work completed” message to the navigation parameters. The next step (assuming it has a user interface) will display this message. The base classes handle this logic, and no specific code needs to be added to the process classes to achieve this behavior.

Building the navigation through the steps

The `ProcessGuideController` base class instantiates the `ProcessGuideNavigationAgentDefault` class, which relies on a pre-defined navigation route, which is a simple map of source and destination steps. For the production start scenario, because there is no conditional branching, this implementation would suffice. Therefore, you only need to override the `initializeNavigationRoute()` method to define the navigation route.

```

protected ProcessGuideNavigationRoute initializeNavigationRoute()
{
    ProcessGuideNavigationRoute navigationRoute = new ProcessGuideNavigationRoute();
    navigationRoute.addFollowingStep(classStr(ProdProcessGuidePromptProductionIdStep),
classStr(ProdProcessGuideConfirmProductionOrderStep));
    navigationRoute.addFollowingStep(classStr(ProdProcessGuideConfirmProductionOrderStep),
classStr(ProdProcessGuideStartProductionOrderStep));
    navigationRoute.addFollowingStep(classStr(ProdProcessGuideStartProductionOrderStep),
classStr(ProdProcessGuidePromptProductionIdStep));

    return navigationRoute;
}

```

There are processes where there will be conditional branching (based on user actions, or any other conditions). Such processes need to do the following:

- Implement specific navigation agents inherited from the `ProcessGuideNavigationAgent` class.
- Implement the specific navigation agent factory inherited from the `ProcessGuideNavigationAgentAbstractFactory` class, containing logic to instantiate the correct navigation agent based on current step, session state, user action, or other logic.

- Optionally, override `navigationAgentCreationParameters()` in the controller class to pass suitable parameters.
- Override `navigationAgentFactory()` in the controller to instantiate the navigation agent factory created above.

Action classes

Action classes represent user actions, so this example uses the **OK** action to show how the actions are created.

```
[ProcessGuideActionName(#ActionOK)]
public class ProcessGuideOKAction extends ProcessGuideAction
{
    public final str label()
    {
        return "@SYS5473";
    }
    protected final void doExecute()
    {
        step.executeOKAction();
    }
}
```

The class must implement 2 abstract methods:

- **label()**, which returns the label to be displayed in a button control tied to this action.
- **doExecute()**, which performs the action. As mentioned earlier, the **OK** button simply performs a callback to the step. However, other actions might have more complex logic here.

The actions are instantiated using **SysExtension** framework based on the **ProcessGuideActionName** attribute. Similar to the instantiation of page builders, the step class implements the default action factory, and it is possible to override that. The page builder adds a button control like this.

```
_page.addButton(step.createAction(#ActionOK), true);
```

In doing so, it asks the step to create an action class for the passed name and ties that action to the button.

Summary

To summarize everything that's been explained in this topic, here's a comprehensive summary of the code needed for the process:

1. **ProdProcessGuideProductionStartController**
 - a. Override `initialStepName()` to provide the name of the first step.
 - b. Override `initializeNavigationRoute()` to construct the navigation map.


```

/// <summary>
/// The <c>ProdProcessGuideProductionStartController</c> class is the controller class for the
production order start process guide.
/// </summary>
[WHSWorkExecuteMode(WHSWorkExecuteMode::StartProdOrder)]
public class ProdProcessGuideProductionStartController extends ProcessGuideController
{
    protected ProcessGuideStepName initialStepName()
    {
        return classStr(ProdProcessGuidePromptProductionIdStep);
    }

    protected ProcessGuideNavigationRoute initializeNavigationRoute()
    {
        ProcessGuideNavigationRoute navigationRoute = new ProcessGuideNavigationRoute();
        navigationRoute.addFollowingStep(classStr(ProdProcessGuidePromptProductionIdStep),
classStr(ProdProcessGuideConfirmProductionOrderStep));
        navigationRoute.addFollowingStep(classStr(ProdProcessGuideConfirmProductionOrderStep),
classStr(ProdProcessGuideStartProductionOrderStep));
        navigationRoute.addFollowingStep(classStr(ProdProcessGuideStartProductionOrderStep),
classStr(ProdProcessGuidePromptProductionIdStep));

        return navigationRoute;
    }
}

```

2. ProdProcessGuidePromptProductionIdStep

- a. Override **isComplete()** to specify when the step is considered complete.
- b. Override **pageBuilderName()** to specify the page builder to be used.

```

/// <summary>
/// The <c>ProdProcessGuidePromptProductionIdStep</c> represents a step that
/// that prompts the user for a production order id.
/// </summary>
[ProcessGuideStepName(classStr(ProdProcessGuidePromptProductionIdStep))]
public class ProdProcessGuidePromptProductionIdStep extends ProcessGuideStep
{
    protected boolean isComplete()
    {
        WhsrFassthrough pass = controller.parmSessionState().parmPass();
        ProdId prodId = pass.lookup(ProcessGuideDataTypeNames::ProdId);

        return (prodId != '');
    }

    protected ProcessGuidePageBuilderName pageBuilderName()
    {
        return classStr(ProdProcessGuidePromptProductionIdPageBuilder);
    }
}

```

3. ProdProcessGuidePromptProductionIdPageBuilder

- a. Override **addDataControls()** to add the Prod ID textbox.
- b. Override **addActionControls()** to add the OK and Cancel buttons.

```

/// <summary>
/// The <c>ProdProcessGuidePromptProductionIdPageBuilder</c> class builds a page
/// that prompts the user for a production order id.
/// </summary>
[ProcessGuidePageBuilderName(classStr(ProdProcessGuidePromptProductionIdPageBuilder))]
public class ProdProcessGuidePromptProductionIdPageBuilder extends ProcessGuidePageBuilder
{
    protected void addDataControls(ProcessGuidePage _page)
    {
        _page.addTextBox(ProcessGuideDataTypeNames::ProdId, "@SYS4398",
extendedTypeNum(ProdId));
    }

    protected void addActionControls(ProcessGuidePage _page)
    {
        #ProcessGuideActionNames
        _page.addButton(step.createAction(#ActionOK), true);
        _page.addButton(step.createAction(#ActionCancelExitProcess));
    }
}

```

4. ProdProcessGuideConfirmProductionOrderStep

- a. Override `pageBuilderName()` to specify the page builder to be used.

```

/// <summary>
/// The <c>ProdProcessGuideConfirmProductionOrderStep</c> class represents the step for
/// viewing production order
/// details and confirming the same.
/// </summary>
[ProcessGuideStepName(classStr(ProdProcessGuideConfirmProductionOrderStep))]
public class ProdProcessGuideConfirmProductionOrderStep extends ProcessGuideStep
{
    protected ProcessGuidePageBuilderName pageBuilderName()
    {
        return classStr(ProdProcessGuideConfirmProductionOrderPageBuilder);
    }
}

```

5. ProdProcessGuideConfirmProductionOrderPageBuilder

- a. Override `addDataControls()` to add the order, item, and quantity information labels.
- b. Override `addActionControls()` to add the OK and Cancel buttons.

```

/// <summary>
/// The <c>ProdProcessGuideConfirmProductionOrderPageBuilder</c> builds a page that allows the
user to see details of a production order
/// and then confirm.
/// </summary>
[ProcessGuidePageBuilderName(classStr(ProdProcessGuideConfirmProductionOrderPageBuilder))]
public class ProdProcessGuideConfirmProductionOrderPageBuilder extends ProcessGuidePageBuilder
{
    protected void addDataControls(ProcessGuidePage _page)
    {
        WhsrfPassthrough pass = controller.parmSessionState().parmPass();
        ProdTable prodTable = ProdTable::find(pass.lookup(ProcessGuideDataTypeNames::ProdId));
        UnitOfMeasureSymbol inventUOM = InventTableModule::find(prodTable.ItemId,
ModuleInventPurchSales::Invent).UnitId;

        _page.addLabel(ProcessGuideDataTypeNames::ProdIdLabelName, strFmt("@WAX1684",
prodTable.ProdId), extendedTypeNum(ProdId));
        _page.addLabel(ProcessGuideDataTypeNames::ItemInfo,
this.generateItemInfoForProdId(pass.lookup(ProcessGuideDataTypeNames::ProdId)),
extendedTypeNum(WHSRFUndefinedDataType));
        _page.addLabel(ProcessGuideDataTypeNames::QtyLabelName, strFmt("@WAX1685",
WHSWorkExecuteDisplay::num2StrDisplay(ProdUpdStartup::proposalStartupQty(prodTable.ProdId)),
inventUOM), extendedTypeNum(WHSRFQuantityAndUOM));

        if (PdsGlobal::pdsIsCWItem(prodTable.ItemId))
        {
            _page.addLabel(ProcessGuideDataTypeNames::InventQtyLabelName, strFmt("@WAX1685",
WHSWorkExecuteDisplay::num2StrDisplay(ProdUpdStartup::pdsCWProposalStartupQty(prodTable.ProdId
)), PdsCatchWeightItem::pdsCWUnitId(prodTable.ItemId)), extendedTypeNum(WHSRFQuantityAndUOM));
        }
    }

    protected void addActionControls(ProcessGuidePage _page)
    {
        #ProcessGuideActionNames
        _page.addButton(step.createAction(#ActionOK), true);
        _page.addButton(step.createAction(#ActionCancelResetProcess));
    }
}

```

NOTE

The `generateItemInfoForProdId()` method, which is used for generating the item information labels, is excluded from this topic. This method queries a few tables to get item ID, description, and dimensions. If you want a better understanding of `generateItemInfoForProdId()`, look at the source code.

6. ProdProcessGuideStartProductionOrderStep

- a. Override `doExecute()` to perform the production start process and add the process completion message.

```

/// <summary>
/// The <c>ProdProcessGuideStartProductionOrderStep</c> represents a step that starts a
production order.
/// </summary>
[ProcessGuideStepName(classStr(ProdProcessGuideStartProductionOrderStep))]
public class ProdProcessGuideStartProductionOrderStep extends ProcessGuideStepWithoutPrompt
{
    protected final void doExecute()
    {
        WhsrfPassthrough pass = controller.parmSessionState().parmPass();
        WHSUserId userId = pass.lookup(ProcessGuideDataTypeNames::UserId);
        ProdTable prodTable = ProdTable::find(pass.lookup(ProcessGuideDataTypeNames::ProdId));
        WhsWorkExecute workExecute = WhsWorkExecute::construct();
        workExecute.prodStartUp(prodTable.ProdId,
ProdUpdStartUp::proposalStartUpQty(prodTable.ProdId), userId);

        this.addProcessCompletionMessage();

        super();
    }
}

```

NOTE

Note that a lot of the common patterns (regeneration of UI on error, setting process completion message, **OK** and **Cancel** behavior) have been moved to the framework – thus saving the application developer from writing boilerplate code that is both error prone, and has a risk of inconsistent behavior across processes. Where the scenario needs to deviate from the common path, though, the application developer is provided the option of overriding suitable methods – but then that is an intentional deviation that is both explicit and trackable.

Extending a business process

So far, this topic has highlighted how to build a new process using the **ProcessGuide** framework. In this final section, you will find some examples of how this business process can be extended.

Add a step in a flow (using **ProcessGuideNavigationAgentDefault**)

Where to extend:

- Child of **ProcessGuideController** class for the process.

How to extend:

- Extend the **initializeNavigationRoute()** method in the controller class, and invoke **addFollowingStep()** in the **ProcessGuideNavigationRoute** class.

Add a step in a flow (using custom navigation agent)

Where to extend:

- Child of **ProdProcessGuideNavigationAgentFactory/ProdProcessGuideNavigationAgent**.

How to extend:

- Create a new child class of **ProcessGuideNavigationAgent** that returns the desired step name.
- Create a new class deriving from **ProcessGuideNavigationAgentFactory** that conditionally returns the navigation agent created above.
- Extend the **navigationAgentFactory()** method in the controller class to return the factory created above.

Add a new control in the UI of an existing step

Where to extend:

- Child of `ProdProcessGuidePageBuilder` for the step.

How to extend:

- Extend the `addDataControls()` method and add the additional control.

Complete overhaul of the user interface in an existing step

Where to extend:

- Child of `ProdProcessGuideStep`.

How to extend:

- Create a new child class of `ProdProcessGuidePageBuilder` class, and implement the desired user interface.
- Extend the `pageBuildName()` method in the step class to return the `ProcessGuidePageBuilderNameAttribute` for the class created above.

Alter logic when a step is considered complete

Where to extend:

- Child of `ProdProcessGuideStep`.

How to extend:

- Extend the `isComplete()` method to build the additional logic.

NOTE

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Troubleshoot warehouse app connection issues

2/18/2021 • 2 minutes to read • [Edit Online](#)

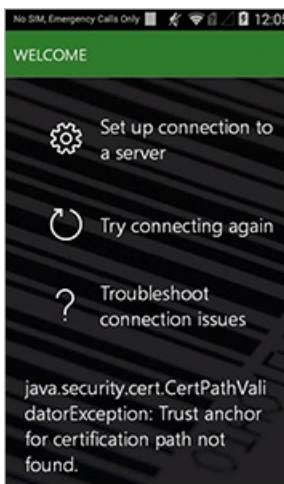
This topic describes how to fix common issues that you might encounter while connecting the Dynamics 365 for Finance and Operations - Warehousing application to Dynamics 365 Supply Chain Management.

NOTE

If you encounter issues that aren't listed on this page, please contact Microsoft Support and let us know so we can help you resolve the errors.

Trust anchor for certification path not found

This section explains what to do if the warehousing app shows a **Trust anchor for certification path not found** error when trying to connect to Supply Chain Management.



Scope

This issue can affect devices with the following properties:

- **OS version:** Android 4.4.x (such as Zebra TC55). This is not an issue on recent Android versions.
- **Supply Chain Management location:** Cloud
- **Connection mode:** Client secret or certificate

Possible root cause

Microsoft may have updated the server SSL certificates used by Supply Chain Management. As a result, the root certificate and/or one of the intermediate certificates may have changed, so the new certificate isn't on the list of trusted system certificates for the mobile device. Newer versions of Android automatically update the lists of trusted certificates, but Android 4.4.x doesn't.

Resolution

Do one of the following to resolve this issue:

- Use the workaround described in the next section to update each relevant device.
- It *might* be possible to contact Zebra or Google to get an update of the system trusted certifying authority (CA) certificates. However, we have not confirmed this.
- If possible, consider replacing older devices with devices that are running a more recent version of Android (where trusted CA certificates are updated automatically).

Workaround

Step 1: Export the new root certificate from Supply Chain Management

Manually download the new root certificate using your internet browser by doing the following:

1. Sign in to Dynamics Supply Chain Management and open the front page.
2. In the address bar of your browser, select the lock icon to open the **Location is secure** dialog box.
3. In the dialog box, select **Certificate (valid)** to open the **Certificate** window for that certificate.
4. Open the **Certification path** tab of the **Certificate** window.
5. Select the top certificate shown in the hierarchy (this is the root certificate).
6. Open the **Details** tab of the **Certificate** window.
7. Select the **Copy to file** button at the bottom of the **Details** tab.
8. The **Certificate export wizard** opens. Select **Next** to continue.
9. The **Export file format** page opens. Select **DER encoded binary X.509 (.CER)**. Then select **Next** to continue.
10. The **Files to export** page opens, specify a file name and location. Then select **Next** to continue.
11. The **Completing the certificate export wizard** page opens, showing the result of your export. Select **Finish**.

Step 2: Install the downloaded certificate onto the affected devices

Install the downloaded certificate by doing the following:

1. Transfer the certificate you downloaded in the previous step to the device you want to update. For example, you might use an SD card or network connection to make the file available to your device.
2. Open the security settings for your device and choose the menu option to install a certificate from a file. (The exact steps for this vary based on device and OS version.)
3. The new certificate should now be shown on the **User** tab for trusted certificates.
4. Repeat this procedure for each affected device.

NOTE

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Upgrade warehouse management from Microsoft Dynamics AX 2012 to Supply Chain Management

2/18/2021 • 4 minutes to read • [Edit Online](#)

This topic provides an overview of the process of upgrading from Microsoft Dynamics AX 2012 R3, running the WMSII module, to Supply Chain Management .

Supply Chain Management no longer supports the legacy **WMSII** module from Microsoft Dynamics AX 2012. Instead, you can use the **Warehouse management** module. In the WMSII module, the Location and Pallet ID inventory dimensions could be selected for financial inventory, however, the Pallet ID inventory dimension cannot be used for financial inventory in Supply Chain Management .

During an upgrade, all products that are associated with a storage dimension group that uses the Pallet ID inventory dimension are identified, marked as blocked, and not processed for upgrade.

Upgrading to Supply Chain Management when AX 2012 R3 WMSII is used

After the upgrade, you can use a set of options in the **Change storage dimension group for items** form to unblock products that were blocked during upgrade, and then process transactions for those products.

Enabling items in Supply Chain Management

This change is required because in Supply Chain Management, item tracking is part of the warehouse management processes. For these processes, all warehouses and their locations must be associated with a location profile. If you want to use warehouse management processes, the following must be configured:

- Existing warehouses must be enabled to use warehouse management processes
- Existing released products must be associated with a storage dimension group that uses warehouse management processes

If the source storage dimension groups use the Pallet ID inventory dimension, the locations of existing on-hand inventory that used the Pallet ID inventory dimension must be associated with a location profile in which the **Use license plate tracking** parameter is selected. If the existing warehouses should not be enabled to use warehouse management processes, you can change the storage dimension groups of the existing on-hand inventory to groups that handle only the Site, Warehouse, and Location inventory dimensions.

NOTE

You can change the storage dimension group for items even if open inventory transactions exist.

Find products that were blocked because of Pallet ID

To view the list of released products that were blocked during upgrade and can't be processed, click **Inventory management > Setup > Inventory > Items blocked for inventory updates**.

Change storage dimension group for blocked products

To be used as part of a warehouse management process, an item must be associated with a storage dimension group in which the Location inventory dimension is active, and the **Use warehouse management processes**

parameter is selected. When this setting is selected, the Site, Warehouse, Inventory status, Location, and License plate inventory dimensions become active.

To unblock products that were blocked during upgrade, you must select a new storage dimension group for the products. Note that you can change the storage dimension group even if open inventory transactions exist. To use items that were blocked during upgrade, you have two options:

- Change the storage dimension group for the item to a storage dimension group that uses only the Site, Warehouse, and Location inventory dimensions. As a result of this change, the Pallet ID inventory dimension is no longer used.
- Change the storage dimension group for the item to a storage dimension group that uses the warehouse management processes. As a result of this change, the License plate inventory dimension is now used.

Configure warehouse management processes

Before you can use released products in the **Warehouse management** module, the products must use a storage dimension group where the **Use warehouse management processes** parameter is selected.

Enable warehouses to use warehouse management processes

1. Create at least one new location profile.
2. Click **Warehouse management > Setup > Enable warehouse management processes > Enable warehouse setup**.
3. On the **Enable warehouse setup** page, add the warehouses that should be enabled. You can complete this step either directly on the page or by using the Microsoft Office integration.
4. Assign a location profile to all the locations. You can easily complete this step by using the Microsoft Office integration directly from the page. You can either export and import the data, or use the data entity processing in [Data management](#).
5. Validate the changes. As part of the validation process, various validations of data integrity occur. As part of a larger upgrade process, issues that occur might have to be adjusted on the source implementation. In this case, an additional data upgrade will be required.
6. Process the changes.

Change the storage dimension group for items, so that it uses warehouse management processes

1. Create a new **Inventory status** value, and assign it as the **Default inventory status ID** value in the **Warehouse management parameters** settings.
2. Create a new storage dimension group where the **Use warehouse management processes** parameter is selected.
3. On the **Reservation hierarchy** page, define a new reservation hierarchy according to the item's storage and tracking dimension groups.
4. Create one or more unit sequence groups that include at least the same units that are used for the items' inventory units.
5. Click **Warehouse management > Setup > Enable warehouse management processes > Change storage dimension group for items**.
6. On the **Change storage dimension group for items** page, add the item numbers, storage dimension groups, and unit sequence groups. You can complete this step directly on the page, by using the Microsoft Office integration, or by using the data entity process in [Data management](#).
7. Validate the changes. As part of the validation process, various validations of data integrity occur. As part of a larger upgrade process, issues that occur might have to be adjusted on the source implementation. In this case, additional data upgrade will be required.
8. Process the changes. An update of all the inventory dimensions can take a while. You can monitor the progress by using the batch jobs tasks.

NOTE

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Troubleshoot upgrade and migration to advanced warehouse management

2/18/2021 • 2 minutes to read • [Edit Online](#)

This topic describes how to fix common issues that you might encounter while you upgrade and migrate to advanced warehouse management.

I receive the following error message:
"java.security.cert.certPathValidatorException: Trust anchor for certification path is not found."

Issue description

You receive this error message in the warehouse app, because self-signed certificates aren't trusted on Android 8+ in on-premises environments.

Issue resolution

Use an external (public) certifying authority (CA). A fix for this issue is available in version 1.9.0.0 of the warehouse app. For more information about this issue and how to fix it, see [Troubleshoot warehouse app connection issues](#).

What is the approved process for moving from basic warehousing to advanced warehousing?

Issue description

You're currently running under stock/inventory management and using basic stock functionality, and you want to move to advanced warehousing to take advantage of mobile devices, waves, and work. However, you're experiencing issues when you try to make this move. For example, you can't change your products so that they use storage dimensions (site, warehouse, and location), because the products have transactions against them. Therefore, you must learn the approved process for moving from basic warehousing to advanced warehousing.

Issue resolution

For more information about the process for moving from basic warehousing to advanced warehousing, see the following blog posts and documentation:

- [Enable warehouse management process for existing items and warehouses](#)
- [Migration of Microsoft Dynamics AX WMS to new R3 warehouse and transportation functionality](#)
- [WMS1/WMS2 item migration](#)
- [Upgrade warehouse management from Microsoft Dynamics AX 2012 to Supply Chain Management](#)

NOTE

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Troubleshoot warehouse setup

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This topic describes how to fix common issues that you might encounter while you set up warehouses in Microsoft Dynamics 365 Supply Chain Management.

I can't use any role except administrator to access the mobile device app emulator.

Issue description

You can't use any role except the administrator role to access the mobile device app emulator.

Issue resolution

The mobile device app emulator is set to work only with the administrator account. For all testing and live process purposes, we recommend that you use the warehouse app itself.

NOTE

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Gantt control development guide

2/18/2021 • 5 minutes to read • [Edit Online](#)

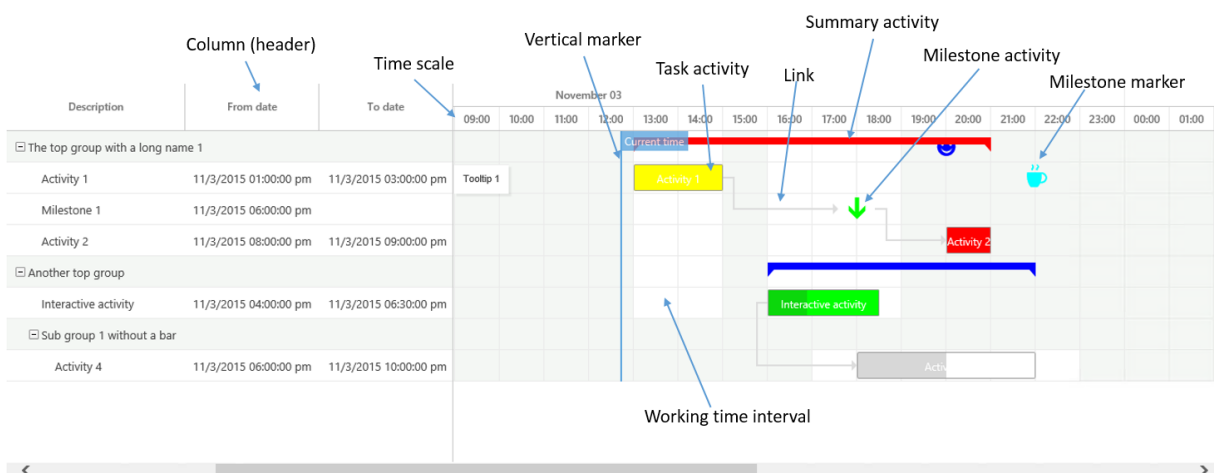
This topic describes how to create new forms by using the Gantt control. We highly recommend that you look at the code in the Tutorial_Gantt form. This code demonstrates the full capabilities of the Gantt control, and shows how to load data and work with the application programming interface (API).

What's new for Gantt

In Microsoft Dynamics AX 2012, the client was a Win32 application, and extensions used Microsoft ActiveX, WinForm, or Microsoft Windows Presentation Foundation (WPF) controls. ActiveX and ManagedHost controls can no longer be used to add custom controls, because they are incompatible with the HTML-based platform. Instead, a new extensible control framework lets you add controls by using HTML and JavaScript. The new Gantt control is implemented by using this framework. Note that, unlike in earlier versions, you don't have to pay an additional license fee to use the control in your own forms or to extend the control.

High-level overview of the control

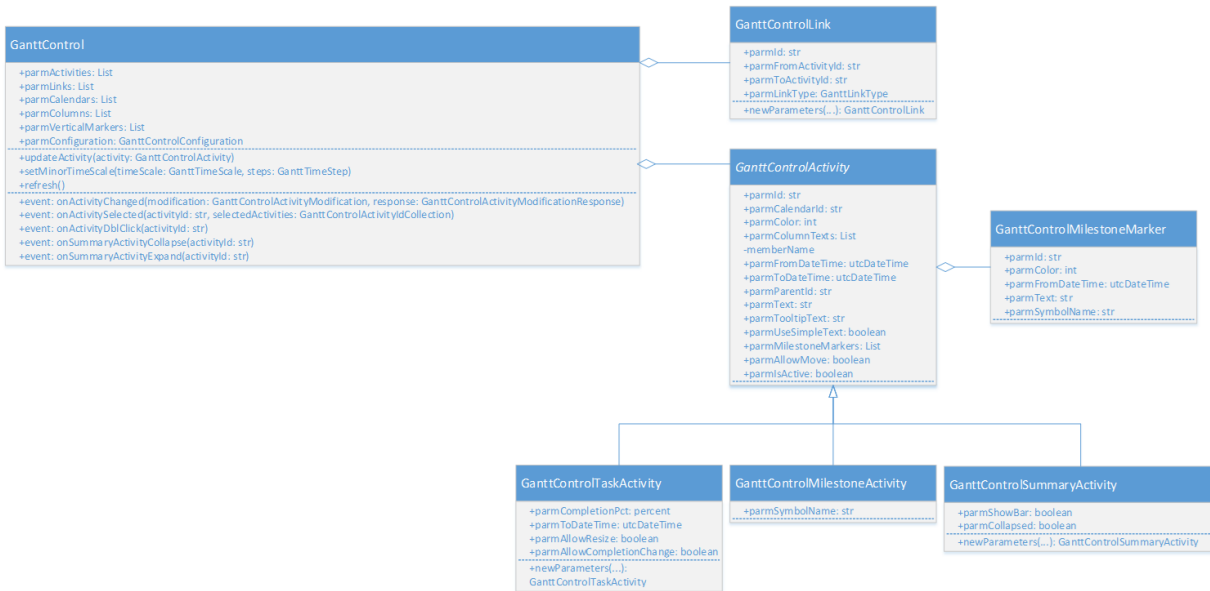
The following illustration shows the visual elements of the Gantt control.



To add the control to a new form, just right-click the top node in the form design, and then select **Add new > Gantt**. After you set the **Height** and **Width** properties to **SizeToAvailable**, there are no other properties that must be set in the designer. Unlike many other controls, Gantt controls can't be bound to data sources. Instead, you must add all data to the control from code.

Adding activities, links, and milestone markers

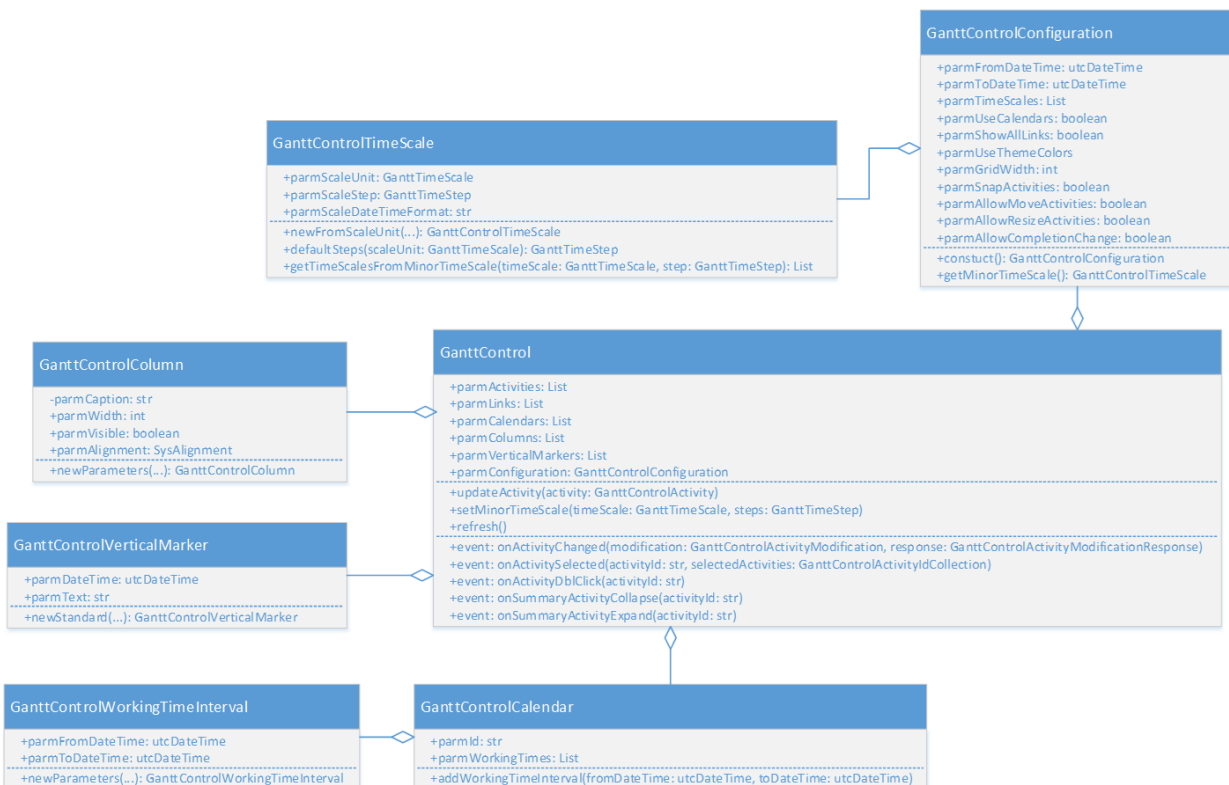
The most basic element of a Gantt chart is the task activity. Each activity is allocated its own row in the chart. Activities can form a hierarchy, like a tree, by referencing a parent activity. Additionally, any two activities can be connected to each other through links (across hierarchies). To add data to the control, you build up a list that contains the instances of the element that you want to add. You then assign the list to the control by using a **parm** method. Note that, when you modify data, you can't just modify the content of the list. To notify the client that data has changed, and to trigger a refresh, you must reassign the list to the control by using the **parm** method.



Each activity must have a unique ID across all activity types. This ID is required in order to build the hierarchy and the links. The ID is also used to identify the activity when the server is notified after a user interaction. There are two types of milestones: the milestone activity is a stand-alone activity that receives its own row in the chart and can be referenced from the links, whereas the milestone markers appear on the same row as the related activity. Both types of markers are represented by using symbols from the Dynamics Symbol font.

Column headers and content

In the "grid" on the left side of the control, you can arrange the data into columns. The column definitions are provided through the **GanttControl.parmColumns** property, which is a list of **GanttControlColumn** objects. The content of the columns is given as a simple **List** object that contains the text strings for an activity through the **GanttControlActivity.parmColumnTexts** property. Note that the values in the column list must be strings. Therefore, any formatting of numbers, enumerations, dates, and so on, must occur on the server side. The formatting of **utcdatetime** must take into account the user's preferred time zone, because that time zone will be used when the Gantt chart is rendered.



Working times

An activity can reference a calendar. A calendar is basically a list of working time intervals. A calendar is used to visually separate working time from non-working time by giving the “cells” (intersections of a row and a time scale interval) a different background color. Note that these working time intervals don't have to come from the standard calendar tables. The intervals are just data that you can load from anywhere. Although calendars are a nice feature that can give you a good overview, there are some performance issues that you must consider. When you turn calendars on (by setting **GanttControlConfiguration.parmUseCalendars** to **true**), each “cell” is rendered in HTML by using a DIV element. If a calendar shows lots of activities for a long period at a very granular minor timescale, there will be many DIV elements. Depending on the browser and hardware, the large number of DIV elements can cause performance issues for the user. In this case, you might have to turn calendars off. In this way, you significantly reduce the number of DIV elements that must be rendered. The control can't turn off calendars by itself to improve performance. Based on the specific scenario, you must determine what will be best for the user.

Color use

Elements such as the activities and milestone markers have a color property. Typically, either the int value for a specific color is calculated by using the **WinAPI::RGB2int** method, or the user sets the value by using the color picker (which is opened by calling **ColorSelection::selectColor**). Instead of controlling the colors yourself, you can specify that the colors should adhere to the current theme. When you set the **GanttControlConfiguration.parmUseThemeColors** option to **true**, if any color values have been set that aren't part of the current theme, they are overridden (no colors have to be specified manually). When theme colors are used, the **parmsActive** flag on an activity is used to determine whether the activity should appear in a dark color or a light color.

Interactions

Whenever the user interacts with the Gantt, an event is raised to notify the server-side code. The following events are currently available:

- **onActivitySelected**(str _activityId, GanttControlActivityIdCollection _allSelectedActivityIds)
- **onActivityDbClick**(str _activityId)
- **onSummaryActivityExpand**(str _activityId)
- **onSummaryActivityCollapse**(str _activityId)
- **onActivityChanged**(GanttControlActivityModification _modification, GanttControlActivityModificationResponse _response)

All these events are one-way notifications from the client. However, the **onActivityChanged** event is somewhat special, because you can set a response. Typically, when a user makes a modification (for example, dragging an activity to a new time), either other activities must also be updated or some adjustments must be made to the activity itself (for example, the column texts must be changed). In the **GanttControlActivityModificationResponse** response, you can provide a list of activities that must be updated. If the change that the user makes is just accepted as is, no response must be set. However, at the very least, the column texts of the current activity must be updated in most cases, to guarantee that the new from and to dates appear. On an activity, the **parmAllowMove** flag determines whether the activity can be moved. However, higher-level flags on **GanttControlConfiguration** determine whether any activity can be moved (**parmAllowMoveActivities**) or resized (**parmAllowResizeActivities**), or whether the completion percentage for the activity can be changed (**parmAllowCompletionChange**).

NOTE

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Create a new transportation management engine

2/18/2021 • 5 minutes to read • [Edit Online](#)

This topic describes how to create a new transportation management engine in Dynamics 365 Supply Chain Management.

Transportation management (TMS) engines define the logic that is used to generate and process transportation rates in Transportation management. Supply Chain Management provides several different engine types that calculate different parameters, such as rates, transit times, and the number of zones that will be crossed during transit. This article explains how to use the Microsoft Visual Studio development environment together with Supply Chain Management development tools to create and deploy a new TMS engine, and then how to set up the engine in Operations. For more information about the engines, see [Transportation management engines](#).

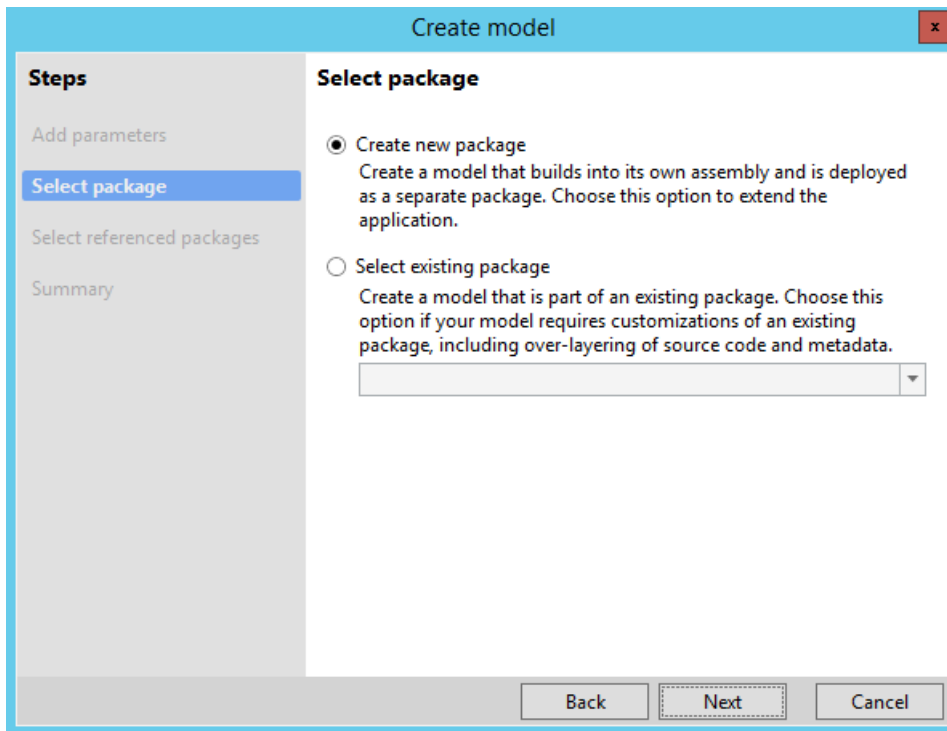
Create a new TMS engine

This section explains how to create a class library that has a TMS engine implementation, and how to reference it from a Supply Chain Management model.

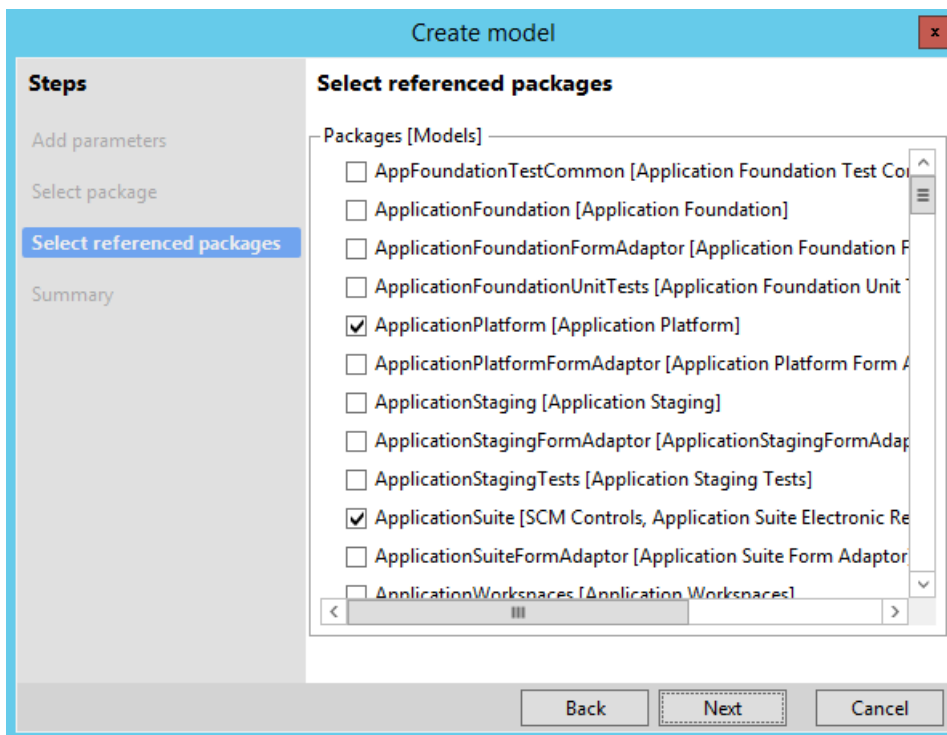
1. To deploy your new engines, you must have a model that will contain the engines. On the **Dynamics 365 > Model Management** menu, click **Create model** to create a new model. On the first page of the **Create model** wizard, name the model **TMSEngines**.

The screenshot shows the 'Create model' wizard interface. On the left, a 'Steps' pane lists 'Add parameters', 'Select package', 'Select referenced packages', and 'Summary'. The 'Add parameters' step is currently selected and highlighted. The main area is titled 'Add parameters' and contains several input fields: 'Model name' with the value 'TMSEngines', 'Model publisher' with 'TMSEnginesPublisher', 'Layer' with a dropdown menu showing 'usr', 'Version' with '1.0.0.0', 'Model description' with an empty text area, and 'Model display name' with 'TMSEngines'. At the bottom, there are three buttons: 'Back', 'Next' (which is highlighted with a dashed border), and 'Cancel'.

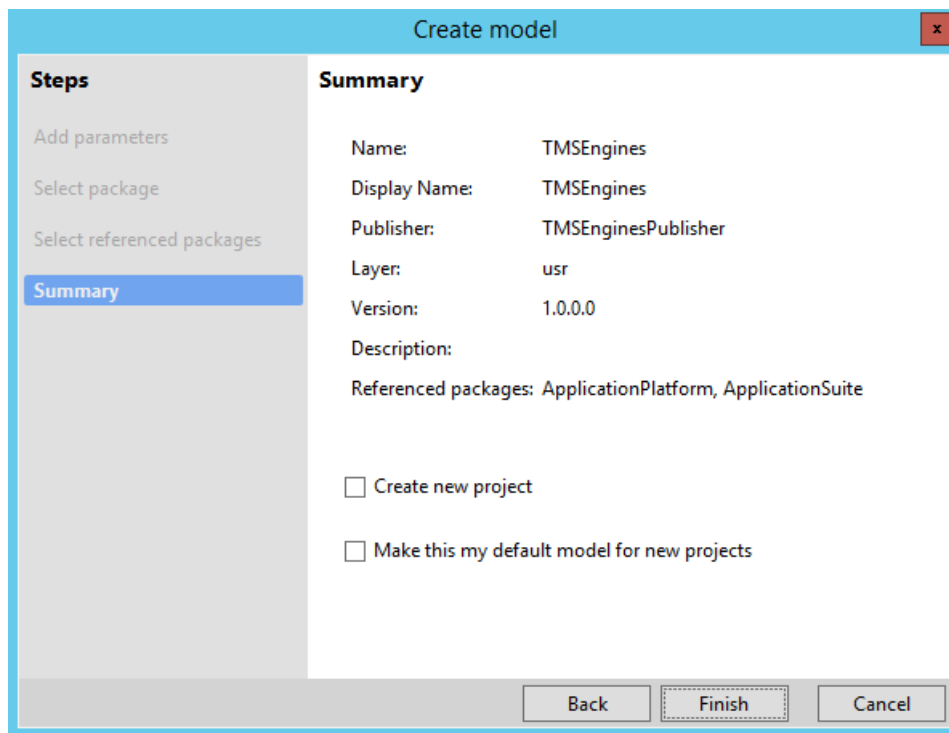
2. On the next page, select **Create new package**.



3. On the next page, select the **ApplicationSuite** model to reference. (The **ApplicationPlatform** model is preselected.)



4. On the next page, click **Finish** to confirm the creation of a new model.



5. In a new solution, create a new Supply Chain Management project, and name it **TMSThirdParty**. In the project properties, set the project's model to **TMSEngines**.
6. Add a new C# class library to your solution, and name it **ThirdPartyTMSEngines**.
7. In the ThirdPartyTMSEngines project, add references to Supply Chain Management–specific assemblies:
 - Application assemblies that enable X++ types to be referenced. These assemblies can be found in the following locations. [Packages root] is the path of the location where all the deployed assemblies are placed, such as C:\Packages.

```
[Packages root]\ApplicationPlatform\bin\Dynamics.AX.ApplicationPlatform.dll
[Packages root]\ApplicationFoundation\bin\Dynamics.AX.ApplicationFoundation.dll
[Packages root]\ApplicationSuite\bin\Dynamics.AX.ApplicationSuite.dll
```

- Framework assemblies that enable access to data, LINQ, and auxiliary functions. All these assemblies can be found in [Packages root]\bin.

```
Microsoft.Dynamics.ApplicationPlatform.Environment.dll
Microsoft.Dynamics.AX.Data.Core.dll
Microsoft.Dynamics.AX.Framework.Linq.Data.AdoNet.dll
Microsoft.Dynamics.AX.Framework.Linq.Data.dll
Microsoft.Dynamics.AX.Framework.Linq.Data.Interface.dll
Microsoft.Dynamics.AX.Framework.Linq.Data.Msil.dll
Microsoft.Dynamics.AX.Server.Core.dll
Microsoft.Dynamics.AX.Xpp.AxShared.dll
Microsoft.Dynamics.AX.Xpp.Support.dll
```

- The core TMS assembly (which contains engines) and the TMS base assembly (which contains helpers, constants, data transfer class definitions, and so on). These assemblies can be found in the following locations.

```
[Packages root]\ApplicationSuite\bin\Microsoft.Dynamics.AX.Tms.dll
[Packages root]\ApplicationSuite\bin\Microsoft.Dynamics.AX.Tms.Base.dll
```

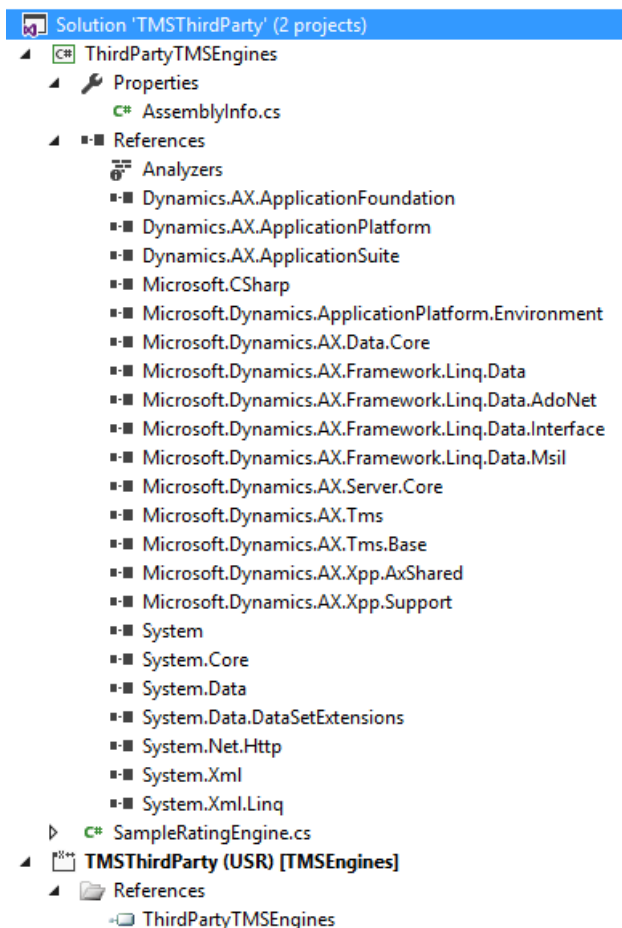
8. Rename the C# class that is automatically generated in the ThirdPartyTMSEngines project to

SampleRatingEngine.

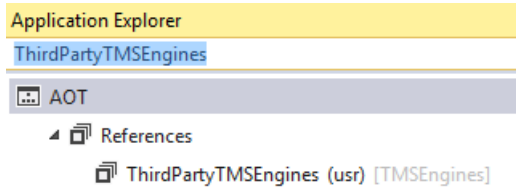
- Implement the engine. Because we are creating a rate engine in this example, we inherit from the base class for rate engines. The base class implements most of the rate engine interface (**TMSFwkIRateEngine**). We just have to implement the rate method. To keep this example simple, we will make this method register a hard-coded rate of 100. You can create engines that implement any of the engine interfaces, such as **TMSFwkIAccessorialEngine**. All the engine interfaces are defined in X++.

```
namespace ThirdPartyTMSEngines
{
    using Dynamics.AX.Application;
    using Microsoft.Dynamics.Ax.Tms.Base.Data;
    using Microsoft.Dynamics.Ax.Tms.Base.Utility;
    using Microsoft.Dynamics.Ax.Tms.Bll;
    using System.Xml.Linq;
    public class SampleRatingEngine : BaseRateEngine
    {
        public override RatingDto rate(TmsTransactionFacade transactionFacade, XElement shipment,
TMSRateMasterCode rateMasterCode)
        {
            XElement re = shipment.RetrieveOrCreateRatingEntity(this.RatingDto);
            re.AddRate(TmsRateType.Rate, 100);
            return this.RatingDto;
        }
    }
}
```

- Build the solution.
- Add a new reference to the TMSThirdParty project. The reference should point to the ThirdPartyTMSEngines project. When you've finished, your solution should look like this.



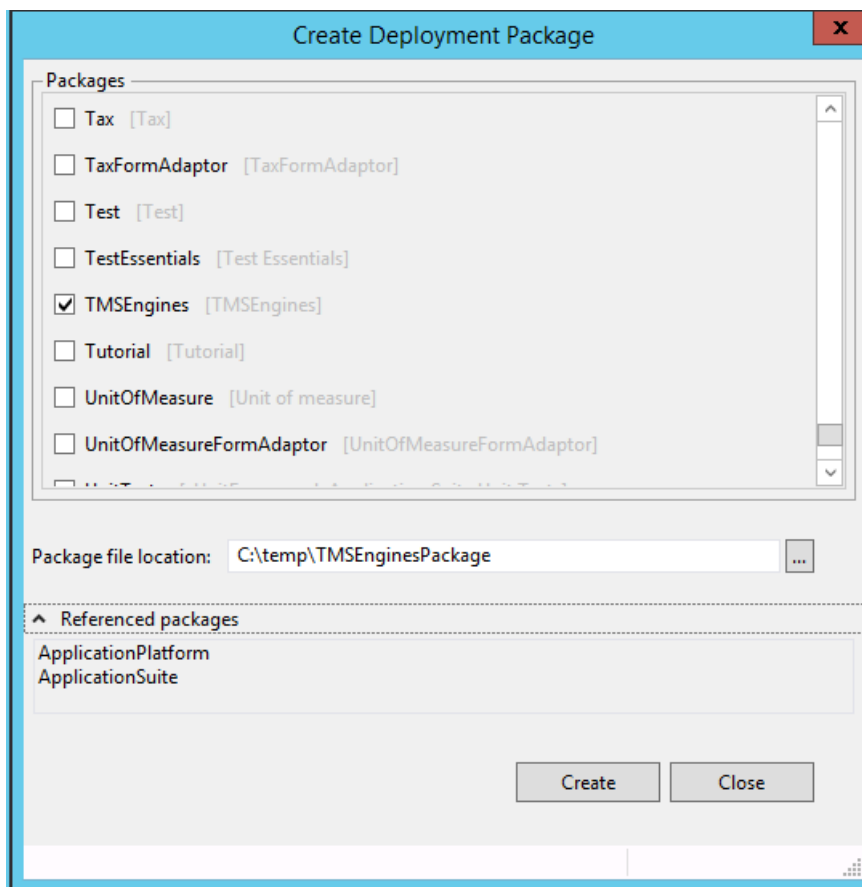
- Build the solution. Verify that the new library appears in the References node in Application Explorer.



Deploy the TMS engine as a package

One way to deploy third-party TMS engines is through a deployment package. This approach is recommended in a production environment. In a development environment, you can manually copy the assemblies, as described in the next section, "Set up a TMS engine in Supply Chain Management." To deploy the engine as a package, follow these steps.

1. On the Dynamics 365 > Deploy menu, click **Create Deployment Package**.
2. In the **Create Deployment Package** dialog box, select the TMSEngines model, and enter the path where you want to store your package files.



3. You can now deploy the package to the target environment. For a tutorial, see [Install a deployable package](#).

Set up the TMS engine in Supply Chain Management

This section explains how to set up Supply Chain Management to use a TMS engine, and shows how the new engine that we have created is used in rate shopping. The example in this section uses the USMF demo data company.

1. Create a new engine as described in the "Create a new TMS engine" section.
2. Build your solution.
3. Copy the resulting assembly into the binary location of the Supply Chain Management server,

[AOSWebRoot]bin. **Note:** This step is relevant only in a development environment. In a production environment, you should deploy through a deployment package. For instructions, see the previous section, "Deploy the TMS engine as a package."

- In Supply Chain Management, on the **Rate engines** page, create a new rating engine. The engine should point to the engine assembly that is produced by building the engine class library and the engine class that you implemented.

Rate engines

Filter

Rate engine ↑	Name	Rating metadata ID	Engine assembly	Engine class
Sample	Sample Engine	▼	ThirdPartyTMSEngines.dll	ThirdPartyTMSEngines.SampleRatingEngine

- Create a shipping carrier that uses the Sample rate engine. Because our engine doesn't use any data, you don't have to assign a rate master.

Shipping carriers

Shipping carrier

SampleCarrier Name: Sample carrier Mode: Ground ▼

Overview

Activate shipping carrier: Yes

Tracking URL:

Transportation tender type: None ▼

Pro number sequence:

Website URL:

Vendor:

SCAC:

Activate carrier rating: No

Services

+ New Delete

Carrier service	Name	Load template ID	Transportation method	Mode of delivery	External code
<input checked="" type="checkbox"/> Default	Default	▼	Ground ▼	Sampl-Defa	

Addresses

Rating profiles

+ New Delete Rate master Transit time engine

Rating profile ↑	Name	Site	Warehouse	Rate engine	Rate master
<input checked="" type="checkbox"/> Default	Default	▼	▼	Sample ▼	▼

- On the **Rate route workbench** page, click **Rate shop**. You should see a rate of 100.00 from SampleCarrier, as shown in the following screen shot. In this example, we are rate shopping for a route from warehouse 24 to customer US-004. However, but because the rate is hard-coded, you will always see a rate of 100.00.

Rate route workbench

Criteria

Route Results

Add to an existing route Assign View exception details

Hide Exceptions

Route guide	Route plan	Shipping carrier	Carrier service	Mode	Total rate ↑	Customer rate	Shipper rate	Currency
<input checked="" type="checkbox"/>		SampleCarrier	Default	Ground	100.00	100.00	100.00	USD

Tips and tricks

- If you're using development tools for Supply Chain Management, it's useful to add a new project to your solution. If you set this project as your startup project and start a debugging session, you can debug both

X++ and C# code in the same debugging session.

- Every time that you change and recompile your ThirdPartyTMSEngines project, you must manually copy the resulting assembly to the binary location or deploy through a deployment package. Otherwise, you might run by using a stale assembly.
- After you execute TMS-specific operations in Supply Chain Management, the Internet Information Services (IIS) worker process might lock the ThirdPartyTMSEngines assembly so that the assembly can't be updated. In this case, restart the w3svc process.

NOTE

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The survey will take about seven minutes. No personal data is collected ([privacy statement](#)).

Extend inventory on-hand data entities

2/18/2021 • 2 minutes to read • [Edit Online](#)

Microsoft Dynamics 365 Supply Chain Management provides [extensibility](#) features that let you [add fields to tables through extension](#). This topic provides an example that shows how to add extended fields to the `INVENTORSITEONHANDENTITY` and `INVENTWAREHOUSEONHANDENTITY` views, so that the capabilities of the inventory on-hand data entities can work with the extensions. For more information about data entities, see [Data management overview](#).

NOTE

Here is a list of some of the inventory on-hand data entities:

- Inventory on-hand by site
- Inventory on-hand by site V2
- Inventory on-hand by warehouse
- Inventory on-hand by warehouse v2

After you add fields to tables that are used by the `inventSiteOnHandView` view, you must sync the engine so that the extensions are correctly recognized.

1. Extend the `InventSiteOnHandView` view by adding the extension field.
2. Extend the `InventSiteOnHandAggregatedView` view with the extension fields.
3. Extend the `InventSiteOnHandAggregatedViewBuilder` viewBuilder class by modifying the `getExtensionFields()` method. In this way, you map old view fields to new view fields when viewBuilder synchronization is run.

For example, you've added the following four fields to the `InventTable` table through extension:

- Custom field 1
- Custom field 2
- Custom field 3
- Custom field 4

In the case, you must modify the `getExtensionFields()` method in the following way.

```
[ExtensionOf(classStr(InventSiteOnHandAggregatedViewBuilder))]  
public final class InventOnHandAggregatedViewBuilder_Extension  
{  
    protected Map getExtensionFields()  
    {  
        next getExtensionFields();  
        Map extensionFields = new Map(Types::Int64, Types::Int64);  
        extensionFields.insert(fieldNum(InventSiteOnHandView, Custom field 1),  
fieldNum(InventSiteOnHandAggregatedView, Custom field 1));  
        extensionFields.insert(fieldNum(InventSiteOnHandView, Custom field 2),  
fieldNum(InventSiteOnHandAggregatedView, Custom field 2));  
        extensionFields.insert(fieldNum(InventSiteOnHandView, Custom field 3),  
fieldNum(InventSiteOnHandAggregatedView, Custom field 3));  
        extensionFields.insert(fieldNum(InventSiteOnHandView, Custom field 4),  
fieldNum(InventSiteOnHandAggregatedView, Custom field 4));  
        return extensionFields;  
    }  
}
```


After you complete these steps, you can extend the inventory on-hand by site and inventory on-hand by warehouse data entities by adding the new fields. In this way, you ensure that the extended fields are recognized and included during data migration that uses those data entities.

NOTE

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Development and administration for Finance and Operations apps

2/18/2021 • 3 minutes to read • [Edit Online](#)

NOTE

Effective November 2020:

- Common Data Service has been renamed to Microsoft Dataverse. For more information, see [Power Automate Blog](#).
- Some terminology in Microsoft Dataverse has been updated. For example, *entity* is now *table* and *field* is now *column*. For more information, see [Terminology updates](#).

This topic will be updated soon to reflect the latest terminology.

Development and administration for Finance and Operations apps includes:

- Administrator experience and Lifecycle Services
- Developer experience
- Intelligence
- Mobile apps
- Data management and data entities
- Office integration

Developer experience

The developer experience is based on modern tooling using Visual Studio and .NET components.

- The development tools are decoupled from any running environment, which means that you develop against local, XML-based files, not the online database.
- Microsoft Visual Studio is the development environment. Finance and Operations customizes the Visual Studio environment to provide you with a smooth and familiar experience.
- The X++ compiler generates Common Intermediate Language (CIL) for all features. CIL is the same intermediate language used by other .NET-based (managed) languages, such as the C# programming language.
- You can leverage the browser-based client and design patterns for forms to provide an improved end-user experience.
- The Application Lifecycle Management (ALM) system supports build automation, test automation, and deployment of models to the cloud.

For more information, see [Develop and customize home page](#).

Administrator experience and Lifecycle Services

Finance, Supply Chain Management, and Commerce are cloud-hosted. As an IT professional, you can use Dynamics Lifecycle Services (LCS) to monitor and tune your environments, deploy features, and stay up to date with recent hotfixes. Within your deployment, you can configure security, and manage when processes run. You can also use LCS when you are called on to support business intelligence and reporting, mobile apps, Office, and other integrations.

BI & reporting

Finance and Operations provides five distinct reporting experiences. Specialized tools are provided to meet the complex and diverse reporting needs of various functions throughout the organization.

- Operational views – Designed to address the specific needs of a given business persona.
- Business documents – Static documents used to capture and exchange processed business data.
- Analytical tools and visualizations – Personalized presentations of logical calculations that allow the user to explore their data.
- Electronic reporting – Tool used to configure formats for electronic documents.
- Financial reporting – Designed to provide in-depth accounting management tools based on standard views of financial activities across legal entities.

Mobile apps

The Finance and Operations mobile app empowers your organization to mobilize its business processes. After your IT admin enables the mobile workspaces feature for your organization, users can sign in to the app and immediately begin to run business processes from their mobile devices. The Dynamics 365 for Finance and Operations mobile app includes the following features that can help increase productivity:

- Users can view, edit, and act on business data, even if they have intermittent network connectivity or their mobile devices are offline. When a device reestablishes a network connection, offline data operations are automatically synchronized with Finance and Operations.
- IT admins or developers can build and publish mobile workspaces that have been tailored to their organization. The app uses your existing code assets, so you don't have to re-implement your validation procedures, business logic, or security configuration.
- IT admins or developers can easily design mobile workspaces by using the point-and-click workspace designer that is included with the Finance and Operations web client.
- IT admins or developers can optionally optimize the offline capabilities of workspaces by using the Business logic extensibility framework. Because data continues to be processed while a device is offline, your mobile scenarios remain rich and fluid, even if devices don't have constant network connectivity.

Data management and data entities

Data from Finance and Operations can easily be integrated with Microsoft and non-Microsoft data sources using Dataverse, Power Apps, and Power BI. For more information, see [Data entities overview](#).

Office integration

The Microsoft Office integration capabilities provide users with a productive environment that helps them get the job done by using Office products. For more information, see [Office integration overview](#).

eLearning courses

For online courses and training, check out [Dynamics 365 Finance and Operations on Microsoft Learn](#).

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Finance home page

2/18/2021 • 2 minutes to read • [Edit Online](#)

This topic provides a list of the help topics and other resources for the financial management features in Microsoft Dynamics 365 Finance.

Select a feature area to learn more about it.

- [Accounts payable](#)
- [Accounts receivable](#)
- [Budgeting](#)
- [Cash and bank management](#)
- [Cost accounting](#)

- [Expense management](#)
- [Financial reporting](#)
- [Fixed assets](#)
- [General ledger and Financial reporting](#)
- [Project management and accounting](#)
- [Public sector](#)

Additional resources

Blogs

- [Microsoft Dynamics 365 blog](#)
- [Financials blog](#)
- [Microsoft Dynamics Operations Partner Community Blog](#)

Task guides

Additional help is available as task guides inside Finance and Operations. To access task guides, click the Help button on any page.

Videos

Check out the how-to videos that are now available on the [Microsoft Dynamics 365 YouTube Channel](#).

Country/region functionality

Country/region regulations affect tax setup and other areas of financial management. Refer to the [Localization and regulatory features](#) section of our help content to learn about country/region-specific functionality.

Additional content

Supply chain management functionality covers parts of the procure-to-pay process that includes requisitioning, ordering, receiving, invoicing and paying for the goods and services your organization purchases. Refer to the [Supply Chain Management home page](#) for information about the capabilities for managing purchases, inventory, and manufacturing.

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Commerce home page

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Dynamics 365 Commerce—built on the proven Dynamics 365 Retail capabilities—delivers a comprehensive omnichannel solution that unifies back-office, in-store, call center, and digital experiences. Dynamics 365 Commerce enables you to build brand loyalty through personalized customer engagements, increase revenue with improved employee productivity, optimize operations to reduce costs and drive supply chain efficiencies, ultimately delivering better business outcomes.

This release enables the creation of digital experiences using built-in web authoring and development tools to produce engaging and intelligent digital storefronts. A connected marketing and headless commerce platform further enable the seamless management of content, assets, promotions, inventory, and pricing across all channels.

- **Everything to build and run digital commerce:** Streamline your business and end-to-end commerce solution that scales to your needs across traditional and emerging channels. Built-in web authoring and development tools enable you to create engaging intelligent digital storefronts, while a connected marketing and headless commerce platform enables seamless management of content, assets, promotions, inventory, and pricing across channels.
- **Build loyalty and exceed customer expectations:** Use clienteling tools to gain a comprehensive view of your customer and respond to their needs at every level of engagement, based on customer profile, history, and preferences that flow across physical and digital channels. Empower your employees to foster lasting relationships through AI-driven recommendations, customer insights, and loyalty programs that elevate brand appeal.
- **Flexible and intelligent omnichannel experience:** Unify physical and digital commerce by providing consistent experiences to customers across cloud search and discovery, product reviews, wish lists, inventory, gift cards, and loyalty. Allow customers to purchase when, how, and where they want, on any device—while providing choice around modern payment methods and product collection or delivery.
- **Streamline operations using AI in the cloud:** Drive omnichannel commerce experiences and integrated, optimized back-office operations through ingrained, pervasive, and context-aware cloud intelligence. Use advanced merchandising, inventory management, distributed order management, and pricing and promotion to innovate and stay ahead of competition. Derive insights by visualizing and analyzing comprehensive and consistent data across all aspects of your business. Use AI-driven technologies to provide accessible websites, protect your business against payment fraud, and efficiently moderate user-generated content like ratings and reviews.

Core concepts and tasks

Select a feature area to learn more about it.

- [Configure a Commerce preview environment](#)
- [Commerce architecture](#)
- [Set up your channels](#)
- [Merchandising your products and services](#)
- [Manage your orders](#)
- [Manage your customers](#)
- [Manage your financials](#)

- [Manage your e-Commerce site](#)
- [Fraud protection](#)
- [Commerce development and extensibility](#)

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