TEAMCENTER

What's New in Teamcenter 2412

Teamcenter 2412

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Contents

1. Teamcenter Documentation

Changes in Teamcenter documentation

Teamcenter documentation home page

The Teamcenter documentation home page, 1st Stop: Teamcenter Documentation Home, is a central hub with links to all documentation deliverables for the Teamcenter release.

This home page replaces the earlier *Browse Teamcenter help by product area* and *Browse Active Workspace help by product area* pages.

To locate a deliverable, explore the categories on the documentation home page, or use Ctrl+F to find what you are looking for.

Teamcenter Release Bulletin

The Teamcenter README containing release notes and support announcements has been renamed and is now called *Teamcenter Release Bulletin* and is available on the Teamcenter documentation home page. The Release Bulletin is now published along with the rest of the documentation. Earlier, it was available only in the Teamcenter **Downloads** area on Support Center.

Consolidated listing of all Teamcenter documentation deliverables

Earlier, the Teamcenter documentation deliverables were spread across multiple locations such as Teamcenter, Active Workspace, Retail Footwear and Apparel, Substance Compliance, and EDA Integration.

Now, these solutions have been merged into a single Teamcenter software kit. Accordingly, the relevant Teamcenter documentation deliverables are also listed in a single location: Teamcenter.

The documentation deliverables for Easy Plan, Electronic Work Instructions and Service Lifecycle Management continue to be listed in separate locations. However, for ease of accessibility, the deliverables for these solutions are also listed on the home page.

Documentation enhancements

Significant documentation changes for any product area are highlighted in a *Documentation enhancements* topic under the respective areas in the What's new deliverable. Significant changes could include revamped, split, consolidated, or discontinued documentation deliverables for a specific product area.

In the current release, you can see *Documentation enhancements* for the following areas:

- Administration

- **ECAD Management**
- **Contract Data Management**
- **Quality Project Management**
- **Weight and Balance Management**

Videos

Over the last several releases, conceptual and procedural videos have been added to the documentation. These videos explain concepts as well as relatively complex Teamcenter procedures and processes.

Some of the videos included in the documentation are as follows:

- **Exploring the Business Modeler IDE**
- **Integrating applications using Linked Data Framework**
- **Digitally sign a PDF file in Adobe Acrobat**

To see a list of videos across different product areas, see the *Teamcenter Video Gallery*.

> Note:
>
> Videos are available only in the HTML version of the documentation.

Process flows and graphics with hyperlinked hotspots

Some graphics in the documentation now have hotspots or hyperlinks that lead you to additional information. You can see such examples in the following topics:

- *Tasks to configure Visualization to work with Teamcenter Active Workspace*
- *Document Management deployment workflow*
- *Upgrading Teamcenter with Active Workspace*

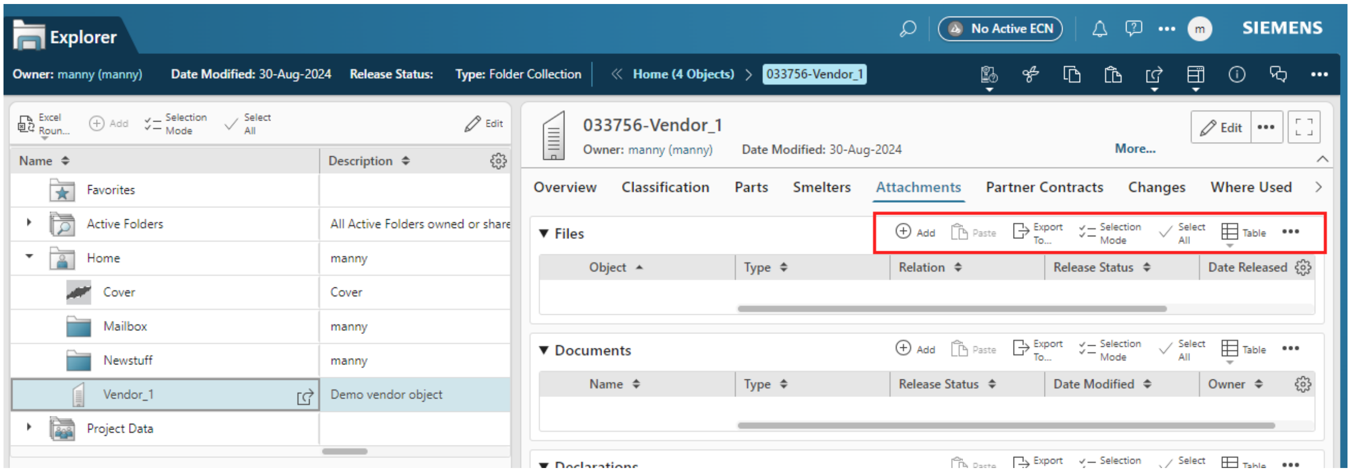
Such graphics provide an overview of a subject and then lead you to the topics you may want to delve further into.

> Note:
>
> The hyperlinked hotspots in the graphics work only in the HTML version of the documentation.

2. Fundamentals

Section toolbar commands moved and reordered

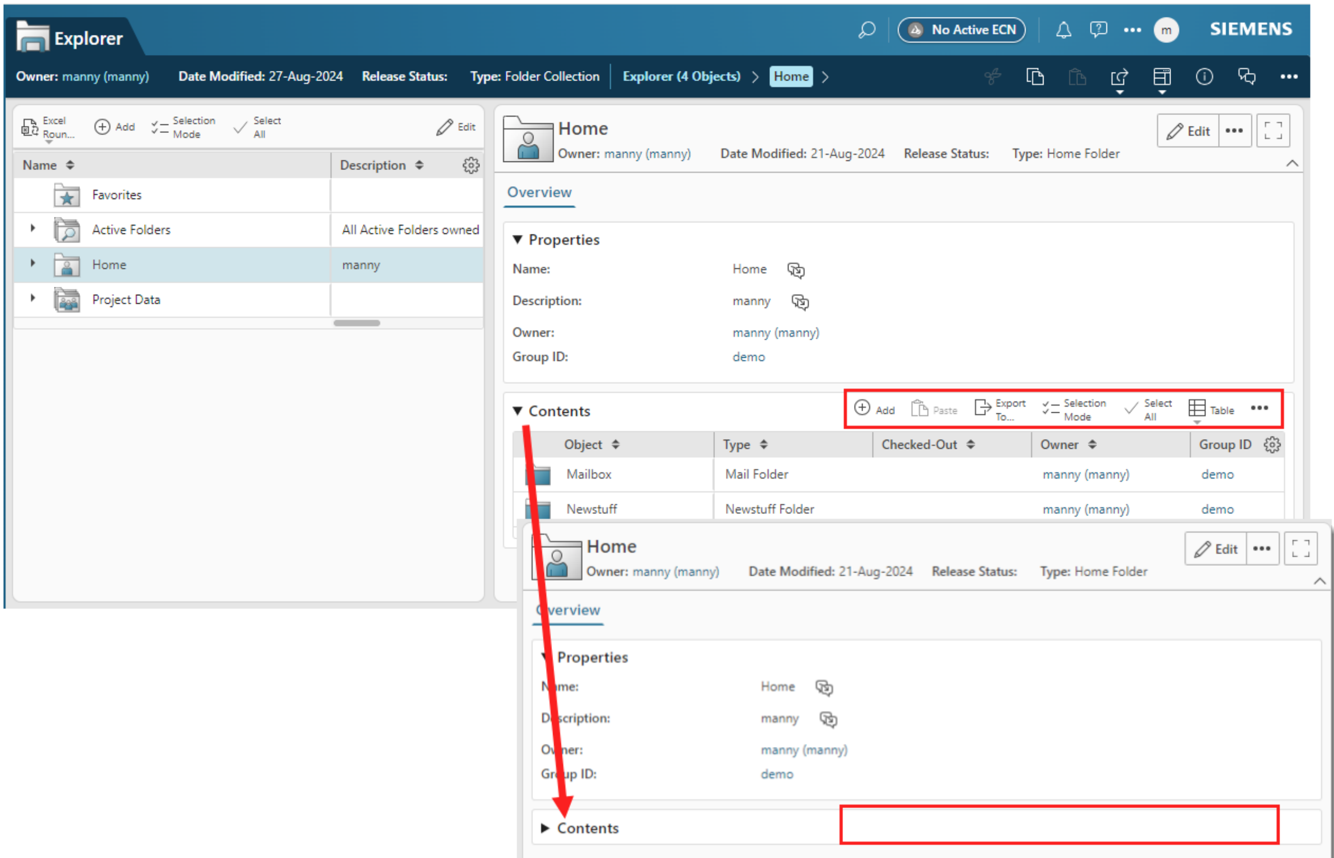
Commands displayed on the section toolbars of open objects are now grouped on the right-hand side and reordered as shown.



Note that some objects do not yet show this updated interface because issues in their existing implementation necessitate manual conversion to use the new component.

Section toolbar commands hidden on collapse

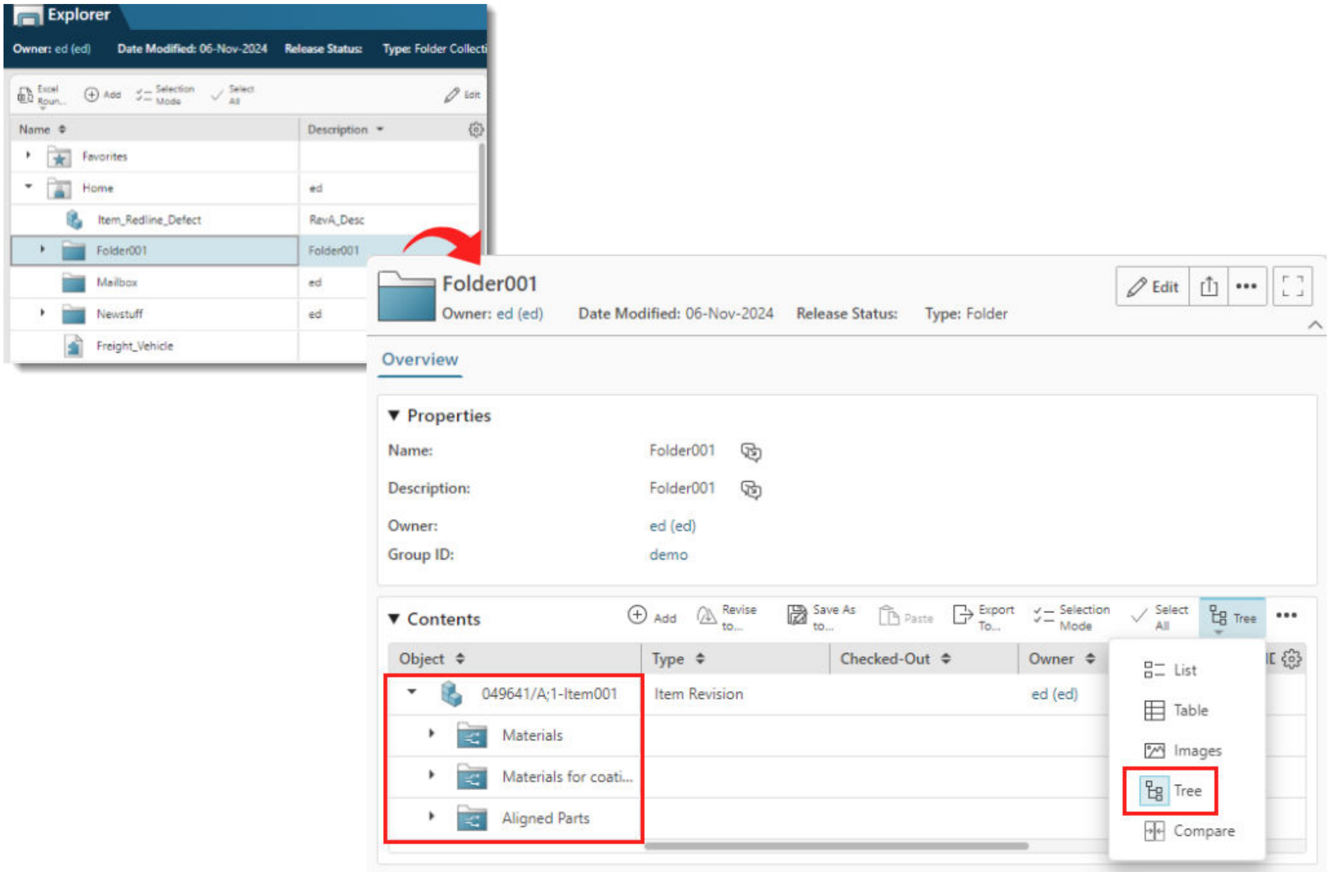
In an opened object, commands displayed on the toolbars of sections in the secondary work area now become hidden when the user collapses the section, and are restored when the section expands. This provides a clear context and scope of operation for the commands.



Browse related objects in a Tree view

Starting in this release, in Active Workspace, you can browse items related to a selected item in a new **Tree** view. The folders displayed in the relations tree represent aggregations of related objects such as attachments, or specifications. This makes it easy to discover what is related to an object you have selected without moving away from your selection. This feature brings parity with the functionality of *pseudo-folders* in Teamcenter Rich Client to Active Workspace.

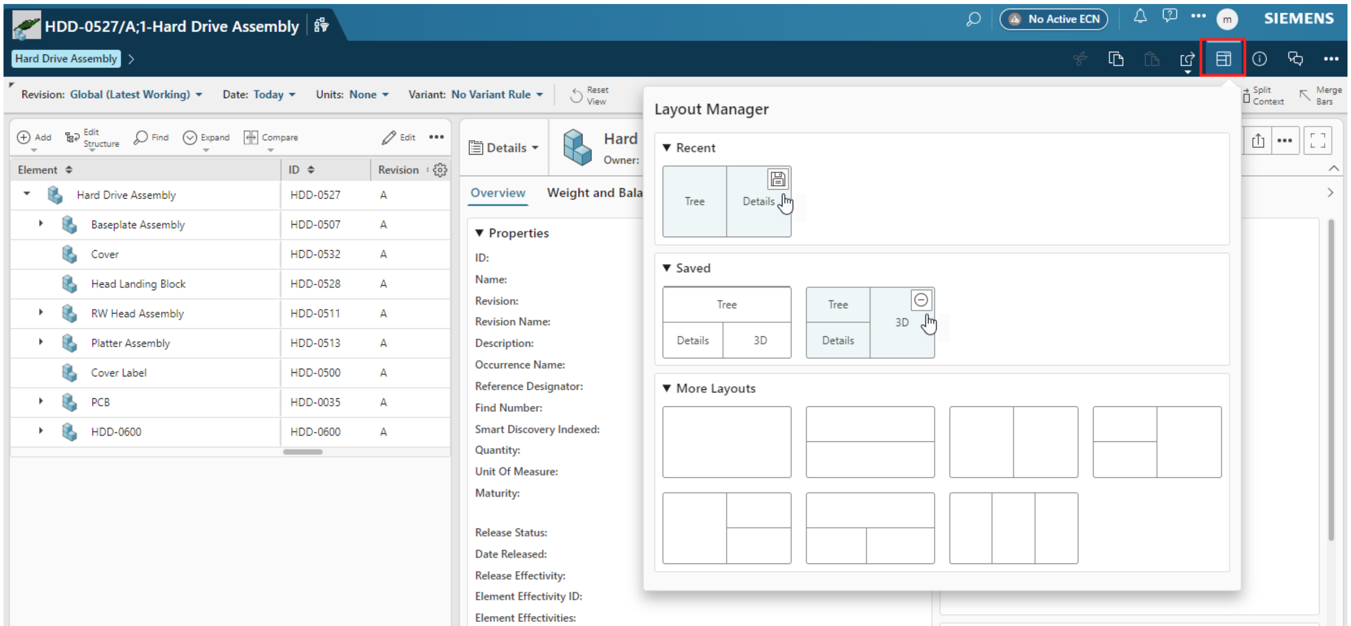
The **Tree** view can be viewed in the**Contents** section of a folder selected in **Explorer**, and the **Targets** panel of an item selected in the **Inbox**.



For more information, see Using the relations Tree view to browse related objects in the Active Workspace Fundamentals documentation.

Layout Manager is more widely available

The new layout view for accessing data,**Layout Manager**, (introduced in the previous release) replaces the older layout view **Layout Chooser** in all instances where it is possible to display more than one view of the information. If **Layout Manager** is blocked by some customization, the older view appears instead.



Create and manage projects as a user

The ability to create a project or a program is controlled through authorization rules in Organization and Access Manager settings. Now, your administrator can override these rules so that any business user can create a project or a program, allowing you to manage your work more effectively. Additionally, privileged users or administrators of a project can now add only folders, or folders and their contents, to a project using **Explorer**.

When you create a project, you are assigned both the **Project Administrator** and **Team Administrator** roles. You can now do the following not only in **Projects**, but also in **Explorer**:

Project Administrator	Team Administrator
Modify the properties of the project.	Add and remove team members to projects.
Add and remove team members to projects.	Assign **Privileged**, **Non-privileged**, and **Team Administrator** status to any team member.
Assign **Privileged**, **Non-privileged**, and **Team Administrator** status to any team member.	

As an administrator in Active Workspace, allow any user to create a project or program by setting the **Tc_project_create_validate_condition** preference.

Discussions enhancements

Manage discussion emails

If your site is configured to send users email notifications when their discussions are updated, you can now manage the frequency of these notifications. Doing so can reduce email clutter when you do not promptly view the active discussions.

When this option is enabled and someone comments in a discussion in which you are participating, you receive an initial email notification about the comment. However, you do not receive another notification about that discussion until you view the thread or until the interval for reducing email notifications expires. The time interval resets once you view an object or discussion that you are following.

As an administrator, you can allow users to reduce the number of email notifications they receive. This capability is not enabled by default. You can also change the default time interval for muting these notifications.

Add discussion participants more easily

When adding participants to discussions, you can now filter the list of possible participants by group and role to find the participants quickly. Previously, you needed to type in partial or full user names to narrow your search results. Searching for participants in this manner could often return lengthy lists of users due to similar names.

Add owners automatically to all discussions on objects

By default, an object's owner is not automatically added as a participant to every discussion on the object. This is convenient for organizations where objects and structures are often created by individuals not actually responsible for the objects, such as when an administrator creates all of the objects and structures. Now, object owners can automatically be added as participants in discussions created on objects they own. Object owners can manually be removed as participants in any individual discussion at any point in time.

As an administrator, you can specify that object owners automatically be added as participants.

Create all discussions as private by default

By default, all discussions are available to all users who can access the related objects. As a participant in a discussion, you can manually set that particular discussion to be viewable by only the participants in the discussion.

If your organization often discusses sensitive information or has other reasons to limit the number of people who can view specific discussions, as an administrator, you can now create all discussions as private by default. (Participants can remove the privacy restriction on individual discussions.)

3. Search and Indexing

Perform a required full index to accommodate a Solr upgrade

Teamcenter 2412 includes an upgrade to Solr version 9.6.0. This upgrade changes the schema and requires the remerging of the Solr and Teamcenter schemas and a full index of all object data and file contents.

Create advanced search queries using Query Builder in Active Workspace

Previously, administrators could create custom advanced search queries in Teamcenter Rich Client.

Now, using Query Builder in Active Workspace, both administrators and business users can create custom advanced search queries.

- Create advanced search queries from scratch or using an existing query as a starting point.
- Edit or delete a query you created.
- Run a search using a query.
- Export a query to an XML file for sharing.
- Import a query from an existing XML file.

Use natural language search to find data

While working in Active Workspace, you may need to quickly access specific information. If Natural Language Search is configured by the administrator, it allows you to search using conversational language instead of programming languages syntax to receive targeted, relevant results immediately.

The following shows the difference between using programming-language syntax and using natural language to search for all item revisions modified within the dates specified, owned by the user, and with a released status.

- Using syntax:

  itemrevision **AND "Date Modified":[***2024-01-01 TO 2024-09-30*] **AND owner:***me* **AND "Release Status":***Released*

- Using natural language search:

My released item revisions modified from Jan to Sept this year

As an administrator, you must understand, install, and configure natural language search.

View the results of file contents embedded for Teamcenter AI Chat with the Indexer and Search Administration Dashboard

As an administrator, you can use the **Indexer and Search Administration Dashboard** in the **Active Admin** workspace to view indexing results.

Now, you can also use the dashboard to view the results of file content embedding that was completed for Teamcenter AI Chat. You can:

- Quickly identify any file contents that were not embedded for corrective action.
- View an overview of all embedded file contents that are in the passed, pending, and failed states in a chart and select any category for details.
- Search for the embedding status of specific file contents.

Refine your search results by adding subgroup names to Group ID filters

As a business user filtering your search results, you may want narrow your results not only by group but also by subgroup. In search settings, you can now choose to **Display qualified group names** so the values in the **Group ID** filter category display both the group and subgroup. For example, if you have an **Engineering** group with subgroups for United States and Europe, the **Group ID** filter category may show values for **Engineering**, **Engineering.US**, and **Engineering.Europe**.

4. Installation and Deployment

Uninstall components in a deployed Teamcenter environment

You can now uninstall Teamcenter components using Deployment Center. This enables you to optimize the distribution of components by removing or moving them to different machines as needed.

Manage Deployment Center and Teamcenter with enhanced maintenance capabilities

You can now update Deployment Center service names and ports, the repository path, and the certificate during Deployment Center maintenance.

You can also migrate a Teamcenter deployment to a different Java runtime environment (JRE). This saves time updating Teamcenter files and settings when you update to a new version of Java.

Simplify server manager configuration when importing environments into Deployment Center

When you import a Teamcenter configuration from TEM and register it in Deployment Center, you can change the Server Manager component's **Config ID** property. This provides identification for Server Manager configurations on the machine with the specified **Config ID**.

5. Administration

Administration documentation consolidation

The two fundamental administration deliverables (**Active Workspace Administration** and **System Administration**) have been combined into a single one, Teamcenter Administration. The new guide contains two parts.

Application Administration	Administration of the end-user environment for the Teamcenter foundation, including information on: • Table configurations and layout • Localization • Preferences and settings • Style sheets This does not include the administration of add-ons or separately licensed pieces, such as Aerospace and Defense, Manufacturing Process Management, Classification. These documentation deliverables have their own administration section.
System Administration	Administration of Teamcenter as a piece of software from an operating system and network perspective, including: • License servers, RDBMS servers, and FSC services • Backup and recovery • Network communication, and file sharing • Encryption key management, cryptography, and the secrets vault

6. Security

Improved secrets management with Teamcenter vault

Teamcenter secrets management is improved this release with the introduction of Teamcenter vault. It securely stores and retrieves Teamcenter cross-application and infrastructure secrets such as passwords, cryptographic keys, and certificates using a centralized secure storage location.

Teamcenter vault is installed automatically and can be customized. As an administrator, you can optionally enable high availability of Teamcenter vault to help ensure vault operation with minimal downtime during failures and outages.

Teamcenter vault manages secrets using third-party secrets-management solutions. By default, Teamcenter supports HashiCorp Vault's free and Enterprise editions.

Enhanced Multi-Site ticket authentication

If you are exchanging data between sites using Multi-Site Collaboration, as an administrator, you can now configure Multi-Site to use File Management System (FMS) enhanced ticket authentication. By default, FMS permits file data access only when the requester presents a valid security ticket. With enhanced ticket authentication, Multi-Site uses Teamcenter Security Services (TCSS) to authenticate FMS tickets. Tickets are successfully authenticated only when the requester presenting the valid security ticket is the requester who generated the ticket.

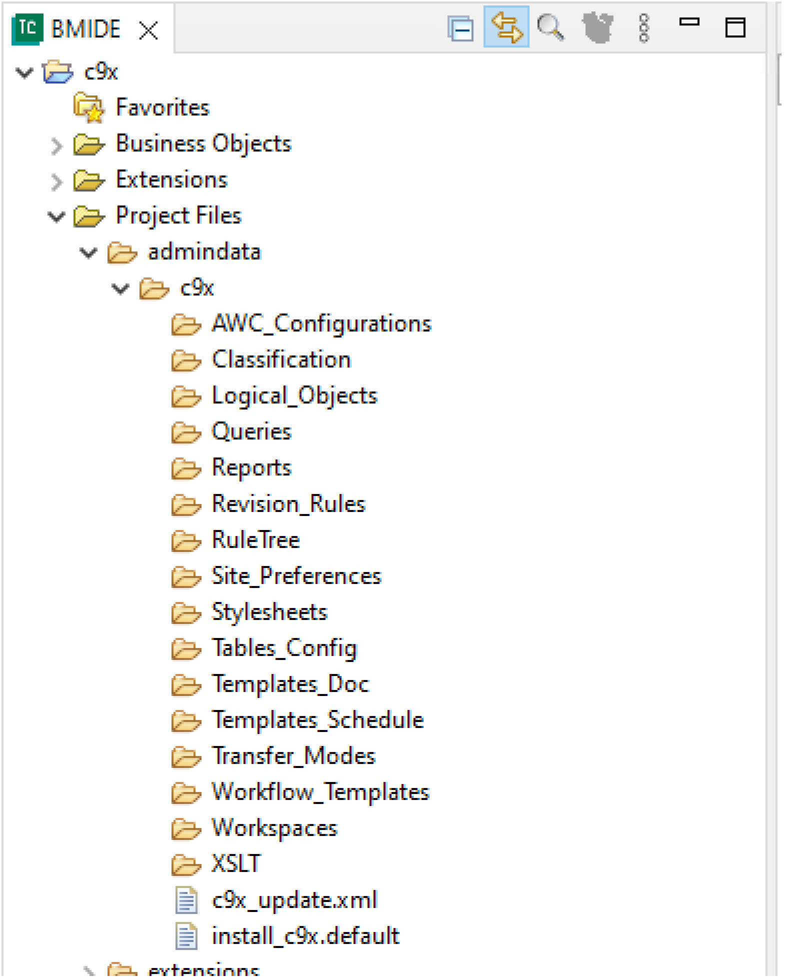
7. Business Modeler IDE

Manage administration data in your BMIDE project

You can add your administration data to your BMIDE template project so it can be packaged and deployed with your data model changes.

BMIDE template projects can be configured with folders for your administration data such as, style sheets, preference definitions, queries, and so on.

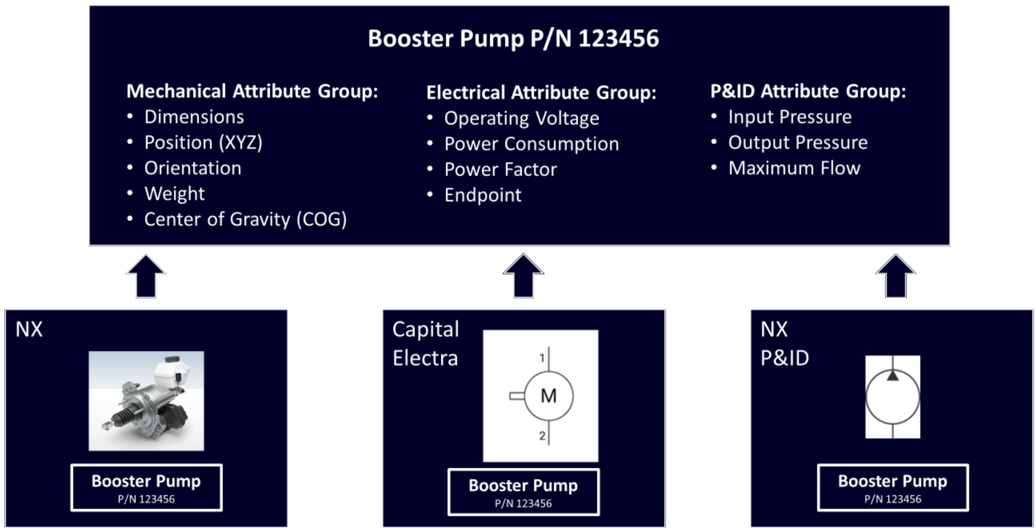
A set of folders for your files and an install file for your necessary import commands are created for you.



Manage groups of attributes independently

Previously, you could only create properties directly on an item or item revision type. These properties are passed down the tree from parent to child due to inheritance. Attribute groups allow you to create properties with more precision. Create a group of properties separately and then assign them to items or item revisions as needed. You can associate an attribute group with any number of items or item revisions and you can associate any number of attribute groups with a single item or item revision.

In the following example, three separate attribute groups are associated with a single part type.



Changes to the BMIDE package file

In order to work more seamlessly with Deployment Center, the *template-name***_package.xml** file has been changed to *template-name***_config.json**. The name and contents of this file now align with the format expected by Deployment Center.

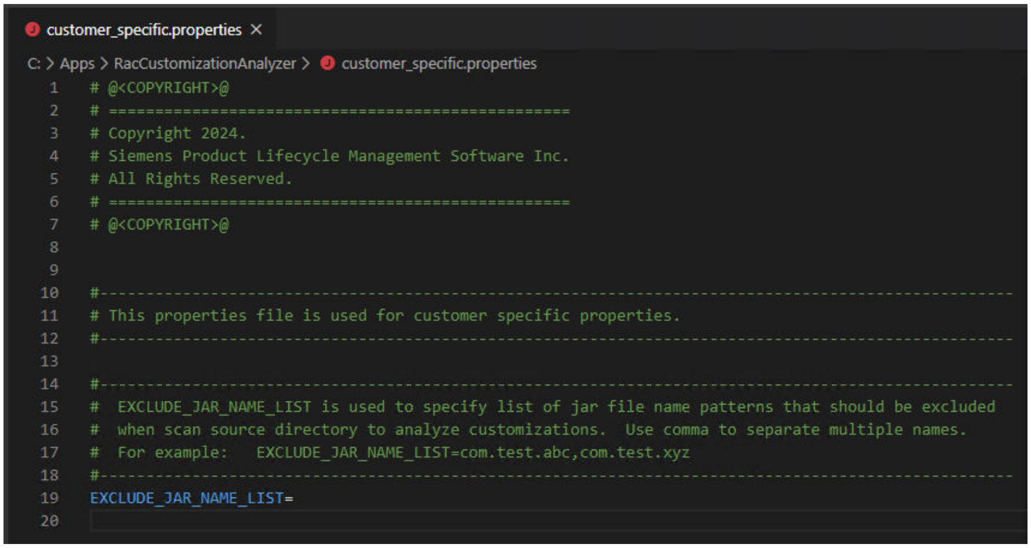
If you have existing package files, you must regenerate them and redeploy them to Deployment Center for the current version.

8. Customization

Rich client customization analyzer

You can now exclude specific **JAR** files when using the rich client customization analyzer.

A new file, *customer_specific.properties*, is included with the analyzer installation ZIP file. In this file, you can use the **EXCLUDE_JAR_NAME_LIST** property to specify a list of **JAR** files to ignore during the analysis.


customer_specific.properties

C: > Apps > RacCustomizationAnalyzer > customer_specific.properties

```
# @<COPYRIGHT>@
# ==================================================
# Copyright 2024.
# Siemens Product Lifecycle Management Software Inc.
# All Rights Reserved.
# ==================================================
# @<COPYRIGHT>@


#----------------------------------------------------------------------------------------------------
# This properties file is used for customer specific properties.
#----------------------------------------------------------------------------------------------------

#----------------------------------------------------------------------------------------------------
#  EXCLUDE_JAR_NAME_LIST is used to specify list of jar file name patterns that should be excluded
#  when scan source directory to analyze customizations.  Use comma to separate multiple names.
#  For example:   EXCLUDE_JAR_NAME_LIST=com.test.abc,com.test.xyz
#----------------------------------------------------------------------------------------------------
EXCLUDE_JAR_NAME_LIST=

```

More efficient scripted business logic customization

Use the new version of Scripted Business Logic customization to connect to the **Teamcenter Customization Server**.

A new **Teamcenter.CustomizationServer** namespace has been created, and it provides the following benefits:

- A simplified, streamlined C# API set to improve efficiency.
- Centralized C# customization code execution using the multi-threaded, stateless **Teamcenter Customization Server**
- Isolation of your C# customization code to prevent run-time errors crashing the **tcserver** process

Run your C# customizations in a separate process

Run your C# customization code in a separate process to isolate the impact of runtime errors from the **tcserver** process.

In previous releases, your Scripted Business Logic C# customization code was run in-process (synchronously) from within the **tcserver**. Now, you can optionally use the **Teamcenter Customization Server** to isolate your C# customization code by running it out-of-process (asynchronously) from the **tcserver** in its own, separate process.

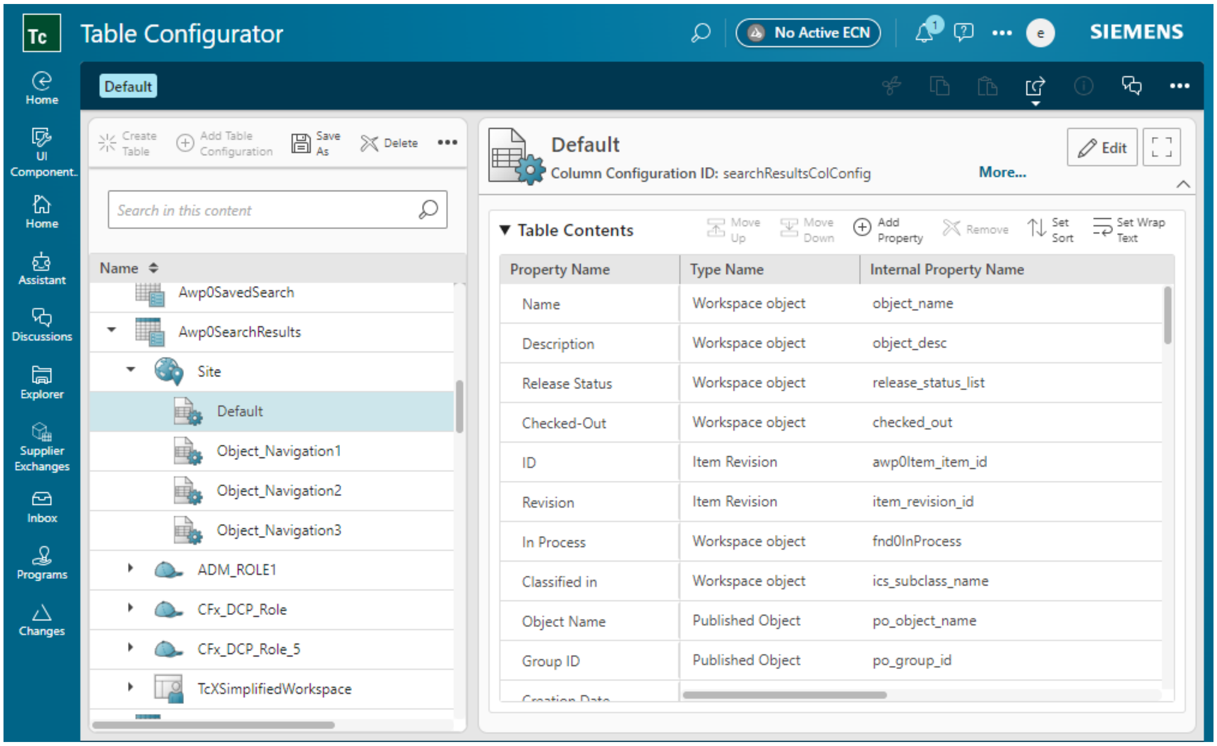
The **Teamcenter Customization Server**:

- Can be shared by many **tcserver** processes.
- Is multi-threaded for improved performance with a concurrent workload.
- Is stateless. The state is maintained by the **tcserver** process.
- Currently only supports C# customization.

Configure your tables from the user interface

Manage your table property column configurations from the user interface with **Table Configurator**.

Previously, you managed your column configurations with command-line utilities. Now, you can create, delete, and modify column configurations directly in the user interface. Import and export capabilities allow you to make changes and perform backups using the XML file format.

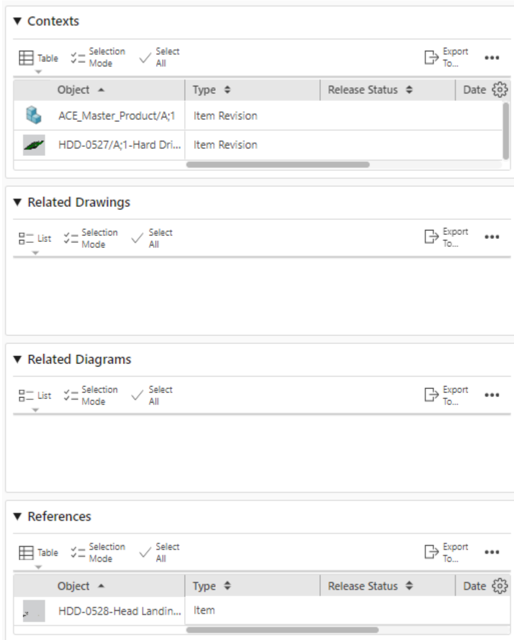
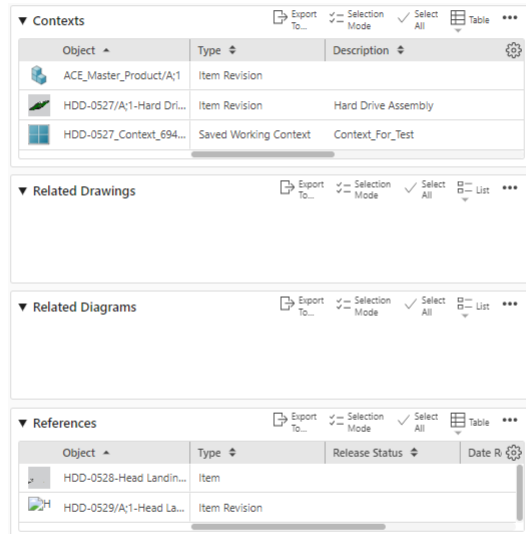


Conserve UI space with a style sheet table in a section

Previously, when an **<objectSet>** style sheet table was contained within a **<section>** element, the table's toolbar was displayed at the top of the table and the section label was above the toolbar, filling up vertical space with whitespace.

The new **objectSetSection** element combines the object set and the section into a single element and displays the toolbar at the section level. The toolbar is not displayed when the section is collapsed.

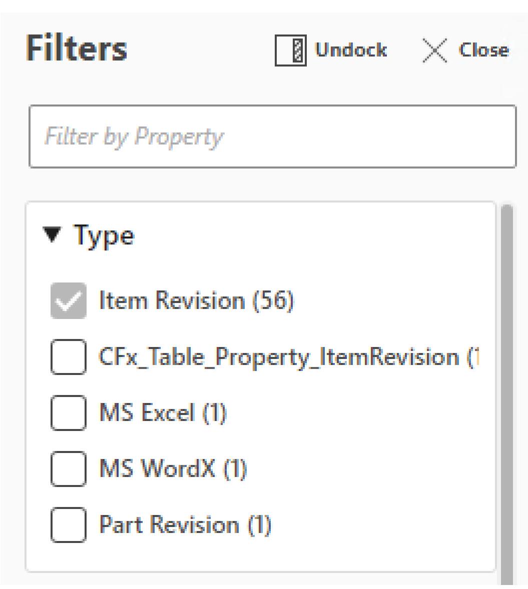
<table>
<tr><th><objectSet> inside <section></th><th><objectSetSection></th></tr>
<tr><td><pre><section titleKey="...">
    <objectSet source="..."
sortdirection="..." sortby="..."
defaultdisplay="...">
    ...</pre></td><td><pre><objectSetSection titleKey="..."
source="..." sortdirection="..."
sortby="..." defaultdisplay="...">
...
</objectSetSection></pre></td></tr>
</table>

<table>
<tr><th><objectSet> inside <section></th><th><objectSetSection></th></tr>
<tr><td><pre>   </objectSet>
</section></pre></td><td></td></tr>
<tr><td>
</td><td>
</td></tr>
</table>

Immutable search filter

In your custom pages, you can configure some search-filter options to be mandatory.

Use these new declarative elements within your **searchState** attribute to remove the ability of your users to turn off a search-filter option. This keeps the focus of your page on the types of data you designed the page to display.



The enhanced Active Workspace development environment

The Active Workspace development environment has been enhanced with new functionality.

The aw script replaces npm run

Previously, you used **npm run** to perform various activities in the development environment. Beginning with Teamcenter release 2412, **npm run** is replaced by the new **aw** script. This new script does everything that **npm run** did but also has additional capabilities.

Use kits to organize your modules

Previously, you created your custom declarative modules with no organization. Beginning with Teamcenter release 2412, you can create kits in which to bundle your modules. These kits will be dependent upon the core Active Workspace kit.

9. Capital Asset Lifecycle Management

Enhancements in CALM native viewer

- **Switch to dark mode**

  For enhanced visualization of 2D piping and instrumentation diagrams (P&ID), you can now switch to dark mode.

- **Visualize a plant (2D):**

  When visualizing a 2D P&ID in the viewer, you can now select partition or element in the structure. This brings up the respective P&ID in the 2D viewer pane.

10. Change Management

View and author BOM content from the Change Management interface

Previously, users had to navigate away from a change notice to manage multiple affected BOMs.

Now, users can view all impacted and solution items in an assembly, eliminating the need to leave the Change Management interface. It provides essential BOM-related functionalities, including **Add**, **Edit**, **Revise**, **Revert**, **Remove**, and **Replace**, and displays redlines as seen in the Change Summary.

Consolidate tables in a change notice

New preferences are available for table organization inside of a change notice.

Consolidate the Affected Items table

Problem, solution, and impacted Items were previously only available in separate tables on the **Affected Items** tab.

Users can now consolidate all of these tables on the **Affected Items** tab into a single table through a preference. The single table makes it easier to track and update item statuses, changes, and related information without navigating through multiple sections. Additional items can be added to the table via the **Add** button, and icons clearly indicate the relation type.

You can also define the relation and the business object type in the consolidated **Affected Items** tab through a new preference.

Consolidate the Participants table

Previously, the **Participants** tab for a change notice separated participants by type.

Users can now consolidate all tables on the **Participants** tab into a single table through a preference. This feature centralizes participant information, making it easier to locate and manage details related to individuals involved in the change notice. The consolidated **Participants** table includes filtering and search capabilities, and users can add, remove, and replace participants as needed.

Change tracking for reference designators in packed mode

Reference designators that have been modified are highlighted with redlines in both the change notice and the bill of materials. Previously, modifications were shown for each reference designator, which could often lead to numerous lines with changes that were cumbersome to sort through.

Now, modifications are displayed with redlines at the beginning of the packed reference designators in BOM. The **Quantity** and **Reference Designator** columns automatically update on the packed line to reflect the updated designators, making a cleaner and more easily readable BOM.

Automatically merge BOM modifications from a released change to an ongoing change

Previously, you could only merge two change notices manually. Now, you can automatically merge BOM changes with a single click. When you release a change, the system updates all other concurrent work-in-progress change notices to incorporate the released change.

A sample workflow for the auto-merge process is provided out of the box as a guidance, and a new workflow handler identifies the specific task(s) that use the auto-merge capabilities and determines if and when other users are notified.

Coordinate multi-site changes for part design authoring and alignment

Change Management now provides a centralized system that streamlines the process of implementing changes across multiple sites. This process uses a master change at a central (or engineering/EBOM) site, which creates and submits subordinate changes to a distributed (or remote, or DBOM) design site through automated workflow handlers. Design engineers then act on the design data subset owned by their respective remote sites and sync back their modifications to the central site when complete.

Enhanced management features for a change notice

Numerous improvements were made for the viewing and management of change notices, including:

- A more compact visual status bar indicates where the change is in its process, and a bigger Change Summary table incorporates 2D thumbnails for BOM items.
- You can set the current change as the active change with a single click.
- The change closure and disposition are prominently featured on the top section of the **Overview tab**.
- The **Impacted Items** table listing items affected by the change is now located on the **Overview tab**.
- The Change Summary displays changes based on one or more selections in the **Impacted Items** table.
- The **Plan Items**, **Implements**, and **Implemented By** tables are available on the Reference Items tab instead of the **Affected Items** tab.
- The Impact Analysis tab is promoted to the third position.

- During impact analysis, you can identify potential usages as impacted candidates for the selected assembly BOM parts. The **Impacted Candidates** table now includes a **Related Usages Revision** column, and the **Impacted Items** table features a new **Parent** column to indicate the parent for the usages.

- You can merge changes more efficiently with our streamlined user interface. The improved design, featuring user-friendly tooltips, adjustable panels, and more visible options, offers a more intuitive merging experience. This significantly reduces the time and effort needed to consolidate changes.

11. Classification

Names changed for Library Management and ECLASS solutions

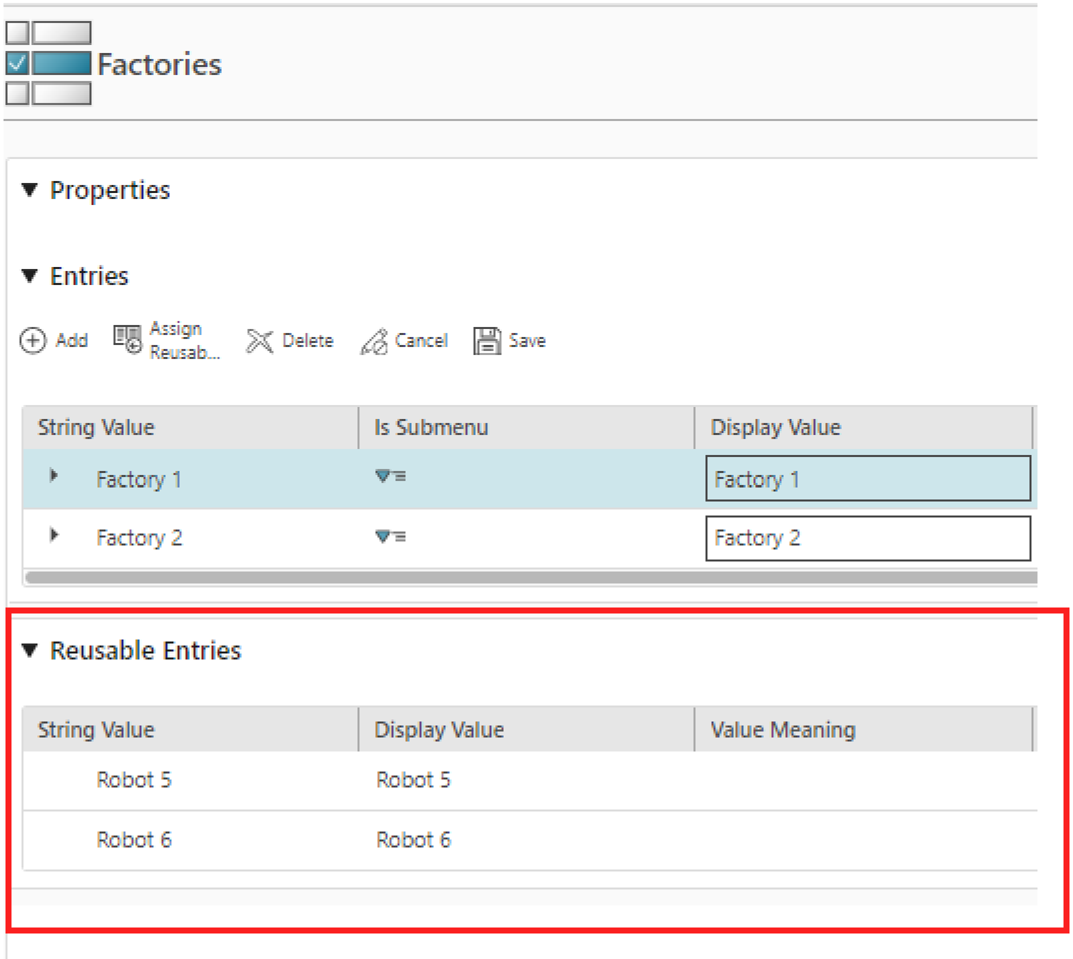
The names of the following solutions have now changed:

Old name	New name
Library management	Teamcenter Classification Collector
Teamcenter for ECLASS Data Management	Teamcenter Classification for ECLASS

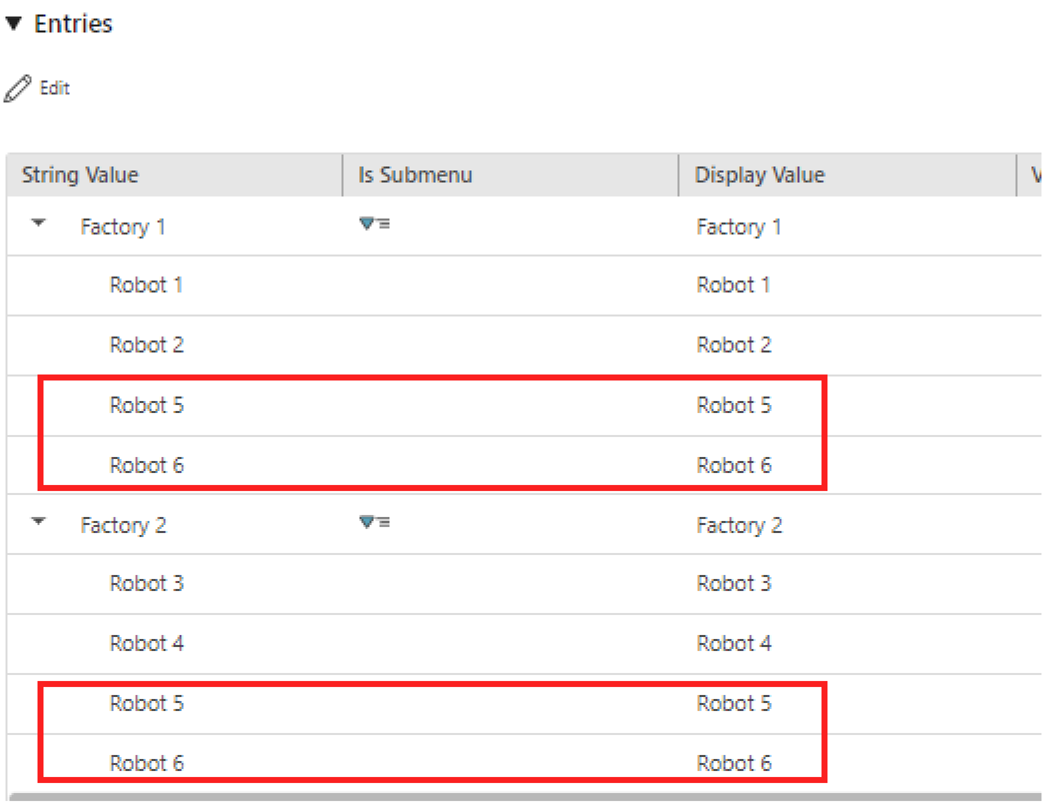
Reuse the entries in a Key LOV

When classifying data, you may want to assign the same data to different objects. For example, if the same type of robot is used across multiple factories, you only define the robot data once using reusable key-value pairs and you can then assign the robots to different factories.

Starting this release, you can specify reusable entries in Key LOVs and then reuse these entries.



In the following example, Robot 5 and Robot 6 and reused in Factory 1 and Factory 2.


▼ Entries

Edit

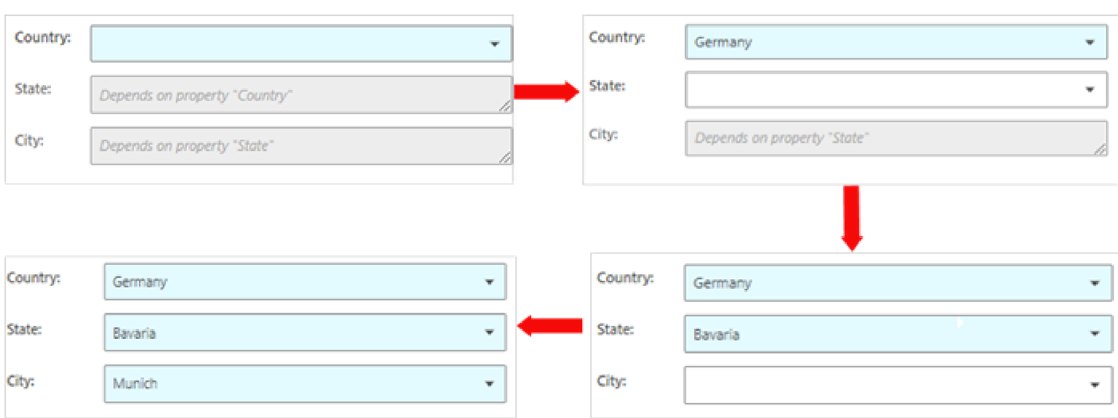
String Value	Is Submenu	Display Value
Factory 1		Factory 1
Robot 1		Robot 1
Robot 2		Robot 2
Robot 5		Robot 5
Robot 6		Robot 6
Factory 2		Factory 2
Robot 3		Robot 3
Robot 4		Robot 4
Robot 5		Robot 5
Robot 6		Robot 6

Create Dependent Key LOVs

Dependent Key LOVs help you to make more accurate selections by narrowing down the options based on related choices.

In a dependent Key LOV, setting the value of one Key LOV makes the next dependent value available for selection.

For example, if you select the country, the dependent value is available for selection and when you select the state, its dependent value is in turn available for selection.



Using dynamic LOVs created in Business Modeler IDE

In Business Modeler IDE (BMIDE), you can create dynamic LOVs, which are lists of values where the values are shown at runtime by querying the database. Therefore, provide real-time and up-to-date data

An example of this is a list of users or a list of parts that belong to a particular group.

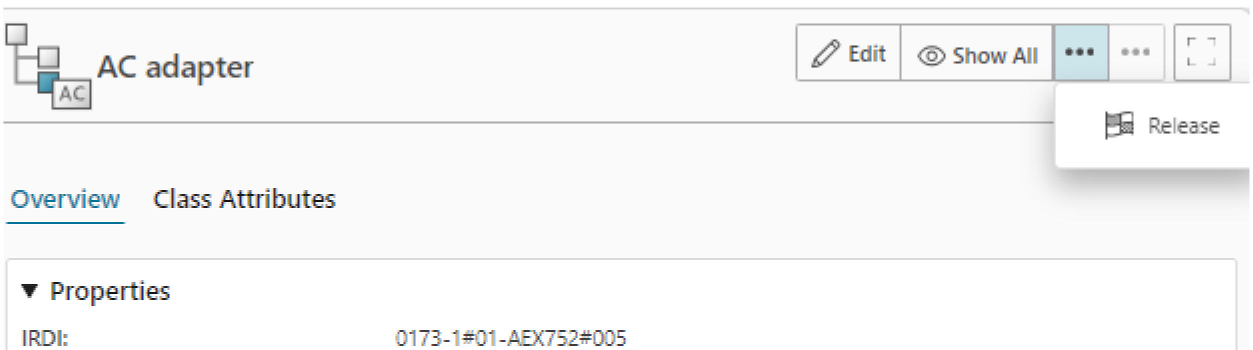
You can use these dynamic LOVs in Classification by associating them with a Key LOV.

Release a class from the user interface

You can only use classification objects that are in the released state.

Previously, you could release a classification object using the **clsutility** command line utility.

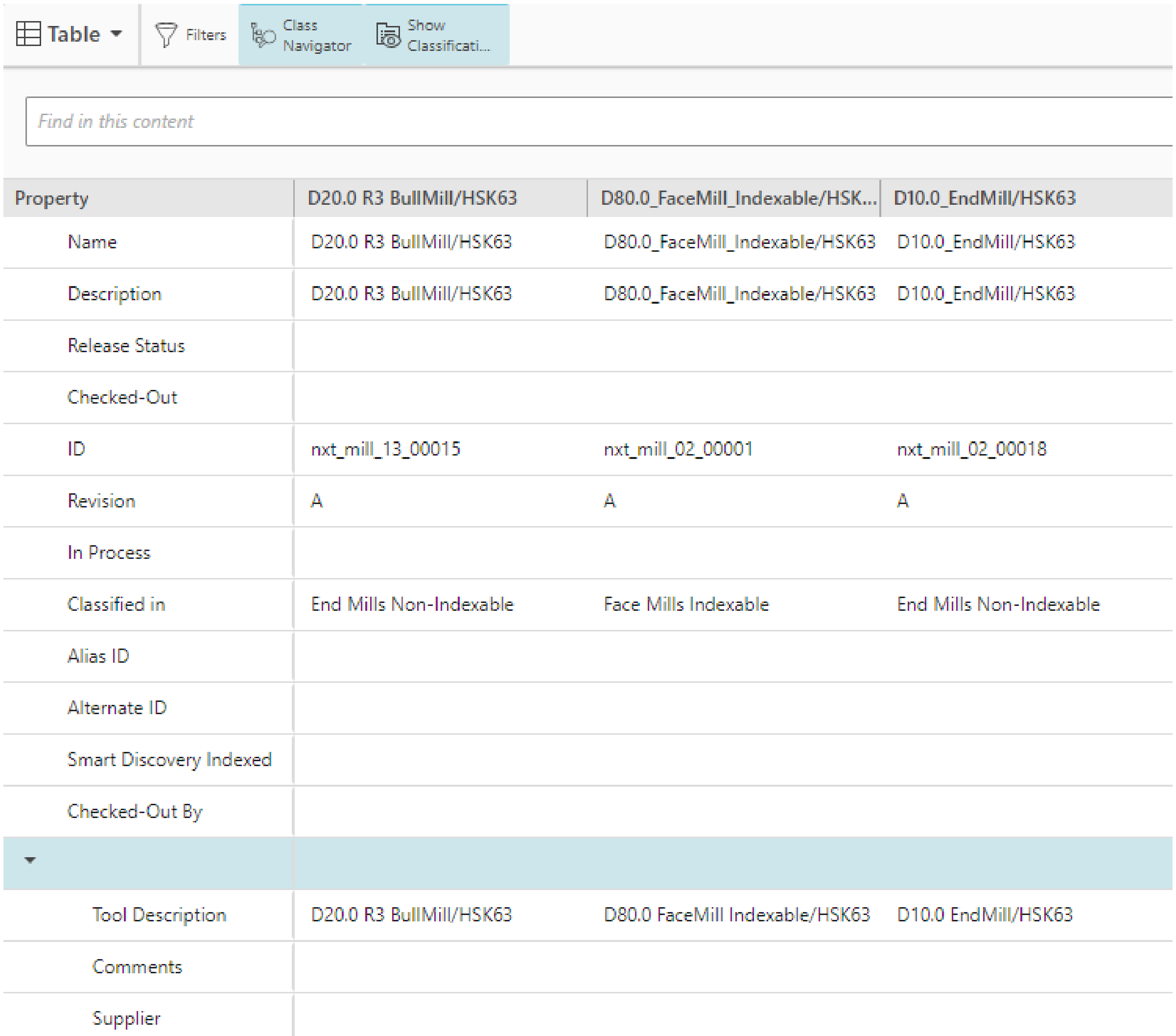
Now, you can also release a classification class from Teamcenter.



When you release a class, the associated properties and Key LOVs are also released.

View multiple objects in a classification class based on the properties

In the table view in Classification, you can now view multiple objects in a classification class based on the object's properties and the classification properties.



Property	D20.0 R3 BullMill/HSK63	D80.0_FaceMill_Indexable/HSK...	D10.0_EndMill/HSK63
Name	D20.0 R3 BullMill/HSK63	D80.0_FaceMill_Indexable/HSK63	D10.0_EndMill/HSK63
Description	D20.0 R3 BullMill/HSK63	D80.0_FaceMill_Indexable/HSK63	D10.0_EndMill/HSK63
Release Status			
Checked-Out			
ID	nxt_mill_13_00015	nxt_mill_02_00001	nxt_mill_02_00018
Revision	A	A	A
In Process			
Classified in	End Mills Non-Indexable	Face Mills Indexable	End Mills Non-Indexable
Alias ID			
Alternate ID			
Smart Discovery Indexed			
Checked-Out By			
Tool Description	D20.0 R3 BullMill/HSK63	D80.0 FaceMill Indexable/HSK63	D10.0 EndMill/HSK63
Comments			
Supplier			

View audit logs of classification events

You can now view audit logs of classification events, where changes to classification objects are tracked and logged, providing a clear audit trail.

Administrators can enable auditing on classification classes and allow authorized users to view the classification audit logs.

Add images and icons to the classification hierarchy definitions

A visual representation of classes and nodes helps end users quickly navigate the hierarchy and provides more information about a class or node.

Previously, you could import images and icons using **smlutility** to automatically display them in the Active Workspace client. Alternatively, you could also add images and icons manually in the rich client.

Now, as an administrator, you can add intuitive images and icons to your classification hierarchy definitions directly within the Classification Manager application. This includes adding images and icons to a node and a class for basic classification and to a node for advanced classification. You can attach multiple images to a node or a class but only one icon to a node or a class.

Guided component search using array attributes and alternate values

The guided component search (GCS) accelerates the search for matching components to build an assembly. GCS finds matching components based on predefined rules that consider the classification connection attributes. This search allows you to choose just the components that physically fit within the initial component of your query. Previously, only single characteristics, exact matches, and wildcards were supported in GCS.

Now, it supports array attributes and alternate values, allowing for more complex searches. Array attributes enable GCS to find matching components based on multiple values within a single attribute. For example, if an attribute has the values red, yellow, and green, the GCS search finds components that have either of these values for that attribute. Alternate values enable GCS to find matching components based on the alternate values specified for a single connection or all connection types.

As an administrator, you can configure GCS to support array attributes and alternate values.

12. Consumer Packaged Goods

Creating brand strategies, strategic roadmaps and goals for a brand

Using Teamcenter, you can now create the following for a brand:

- Brand strategies and strategic roadmaps
- Goals for the strategic roadmaps

You can view the timeline, specifically the dates and duration of the created windows of opportunities and the goals set for the strategic roadmaps. This helps you monitor the performance of the different strategic roadmaps.

Additionally, you can filter windows of opportunities based on selected campaigns and brands.

You can analyze the performance of multiple strategic roadmaps and activate the strategic roadmap that performs the best.

Viewing KPIs for SKUs

To understand trends, opportunities, and challenges related to the brand, starting this release, you can view KPI charts for SKUs based on their maturity status and release status. These charts are based on all item SKUs associated with the brand and can be filtered by region, market, category, and release dates.

13. Content Management

Automatically generate PDF or HTML files containing DITA topic or data module updates

As a system administrator, you can specify the publishing tool that is used for automatically publishing the DITA topics and the S1000D and S1000D 4.x/5.x data modules that a technical writer has edited and checked in.

As a technical writer, you can review your changes to a DITA topic or a data module without manually publishing by checking in the topic or the module. The publishing tool configured by your system administrator automatically publishes a PDF or an HTML file.

View the impact of importing a DITA topic or DITA map before the actual import

You can now preview the impact of importing a DITA topic or a DITA map before you check in the changes. You can do this by generating a report that outlines the potential changes to your DITA topic or DITA map. You receive a notification with a link to view the detailed report. This report is also saved in the **Newstuff** folder.

14. Contract Data Management

Documentation enhancements

New deliverables for Contract Data Management

In the previous release, information about Contract Data Management was available in the following deliverables:

- Aerospace and Defense on Active Workspace — Usage
- Aerospace and Defense on Rich Client — Usage
- Aerospace and Defense — Deployment and Administration

For better usability and accessibility, the information is now removed from these deliverables and is included in the following new deliverables:

- Contract Data Management on Active Workspace — Usage
- Contract Data Management on Rich Client — Usage
- Contract Data Management — Deployment and Administration

15. Data Sharing

Enhanced Multi-Site ticket authentication

If you are exchanging data between sites using Multi-Site Collaboration, as an administrator, you can now configure Multi-Site to use File Management System (FMS) enhanced ticket authentication. By default, FMS permits file data access only when the requester presents a valid security ticket. With enhanced ticket authentication, Multi-Site uses Teamcenter Security Services (TCSS) to authenticate FMS tickets. Tickets are successfully authenticated only when the requester presenting the valid security ticket is the requester who generated the ticket.

csv2tcxml utility documentation is now part of Teamcenter Data Exchange

In previous releases, the detailed *csv2tcxml Converter Guide* and its companion *Quick Start Guide* were delivered only as PDF files located in the Teamcenter installation directories. The content from these two documents is now updated and included in the *Using the csv2tcxml utility to create TC XML bulk data for import* section of Teamcenter Data Exchange, available on Support Center.

16. Document Management

Manage custom markup symbols

As an administrator, you can manage the availability and use of custom symbols between users, can move symbols from one group to another, and promote private symbol groups to public so that all the members in the domain can use the symbols in the promoted group.

As a document reviewer, you can create and modify custom markup symbols using the embedded SVG editor. You can also create private symbol groups to organize your symbols.

While marking up files, you can use a special type of cloud-like edge to create a revision cloud shape. You can also apply the revision cloud markup on an existing shape.

While using GD&T symbols, welding symbols, and leader lines, you can move the two end points of a line segment independently.

17. ECAD Management

EDA client kit integration with the Teamcenter software kit

Previously, customers had to manage separate kits for the installation of the EDA client and Teamcenter, leading to complexities and increased setup time.

Now, the software for the EDA client is combined with the Teamcenter software kit, further simplifying deployment planning. There is no longer a need to identify corresponding or compatible versions of the EDA client or to download multiple software kits.

Users can install the EDA client and its features directly from the Teamcenter software kit through Teamcenter Environment Manager (TEM) or Deployment Center (DC), simplifying the overall installation process.

In addition, a single kit is available for both Win32 and Win64 EDA client installations. Users can select Win32 applications such as PADS library Win32 or EDA translation Win32 directly from Teamcenter Environment Manager or Deployment Center along with the rest of the Win64 applications.

Changes in the EDA cache location

The cache and staging directories temporarily store data as the ECAD designs move between the design tool and Teamcenter. Occasionally, designers may need to refresh a design to synchronize the local copy of the design with the latest version in Teamcenter, or they may need to clear the cache to remove all local copies of the designs that they are not working with.

Previously, the EDA cache was created in the *%USERPROFILE%***/Teamcenter/EDA** directory.

Now, the EDA cache is created in *%USERPROFILE%***/Teamcenter/EDA/<TC_SERVER_SITE_ID>**. This change segregates cache files based on the server site ID. For this change to take effect, ECAD users must check in all designs that are open for modification and clear the cache before performing the upgrade.

New location for all Teamcenter EDA deliverables on Support Center

In the previous releases of *EDA Integration*, the software kit for Teamcenter EDA was available as a separate software kit. Accordingly, the help was also listed under a separate category, **EDA Integration**, on Support Center.

Now, *EDA Integration* is merged within a single Teamcenter software kit. Accordingly, the relevant Teamcenter EDA documentation deliverables are also listed in a single location: **Teamcenter**. To locate a deliverable, explore the categories on the documentation home page, or use Ctrl+F to find what you are looking for. All versions prior to the 2412 release are available at the previous location (under **EDA Integration**) on Support Center.

For ease of accessibility, the documentation home page, 1st Stop: Teamcenter Documentation Home, serves as a single access point for all documentation deliverables associated with the Teamcenter release.

18. Manufacturing Process Planning

Install graphics builder on Linux

You can now use the new installation guide on how to install graphics builder on a Linux machine.

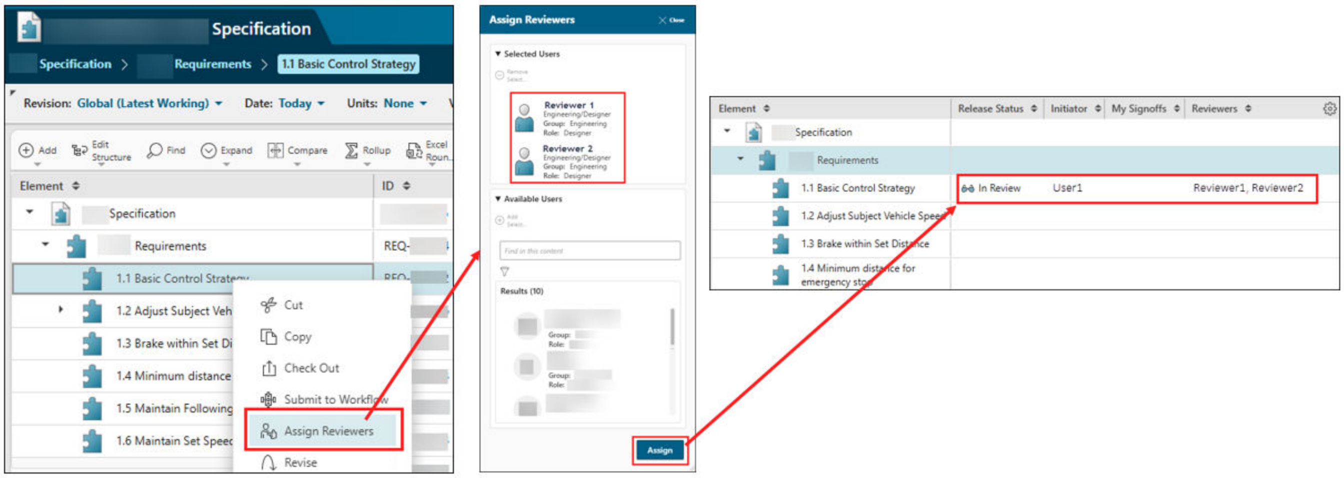
19. Model-Based Systems Engineering

Requirements Management

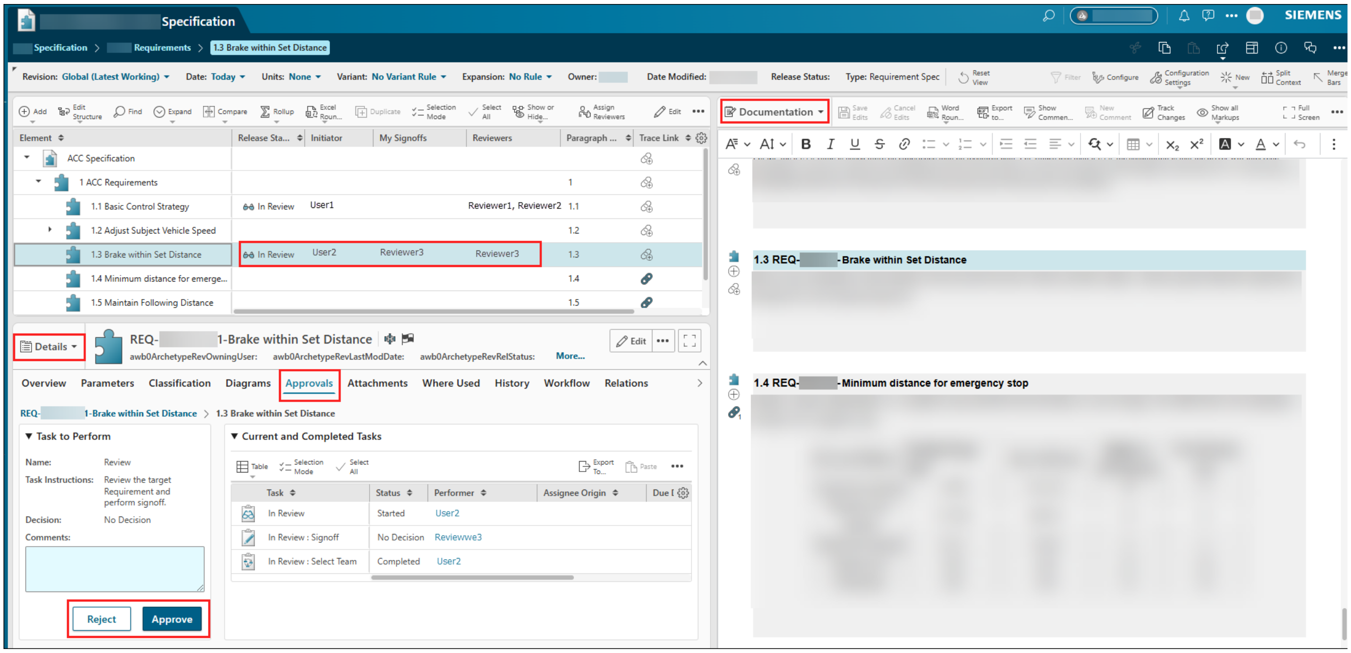
Improved requirement approval process

Requirement Management now provides a new dedicated and improved user interface (UI) that streamlines the approval process for requirements. You can assign one or more reviewers to a requirement by right-clicking the requirement in the structure and click **Assign Reviewers**. This leads to a new and simplified UI for user picking, adding and assigning reviewers.

A new column arrangement as **RM_Approvals** is introduced. This column arrangement displays who initiated the review request, who is assigned to and what the review status is along with **My-Signoffs** column to show you which requirements are assigned to you.



You can switch to a three-section layout with the help of **Layout Manager** and select the **Details** tab as third section. This new layout simplifies the review process where all the review-related activities can be performed in the same page, without going to the workflow inbox.



Filtering the structure to **Status** as **In-Review** allows you to find the list of requirements assigned to you.

In the **Details** tab layout section, a new **Approvals** tab is designed for easy signoff or reject. When approving or rejecting, you can now check the detailed status of other assignees for the same requirement and enter your comments.

Excel Round-trip of LOVs and table properties

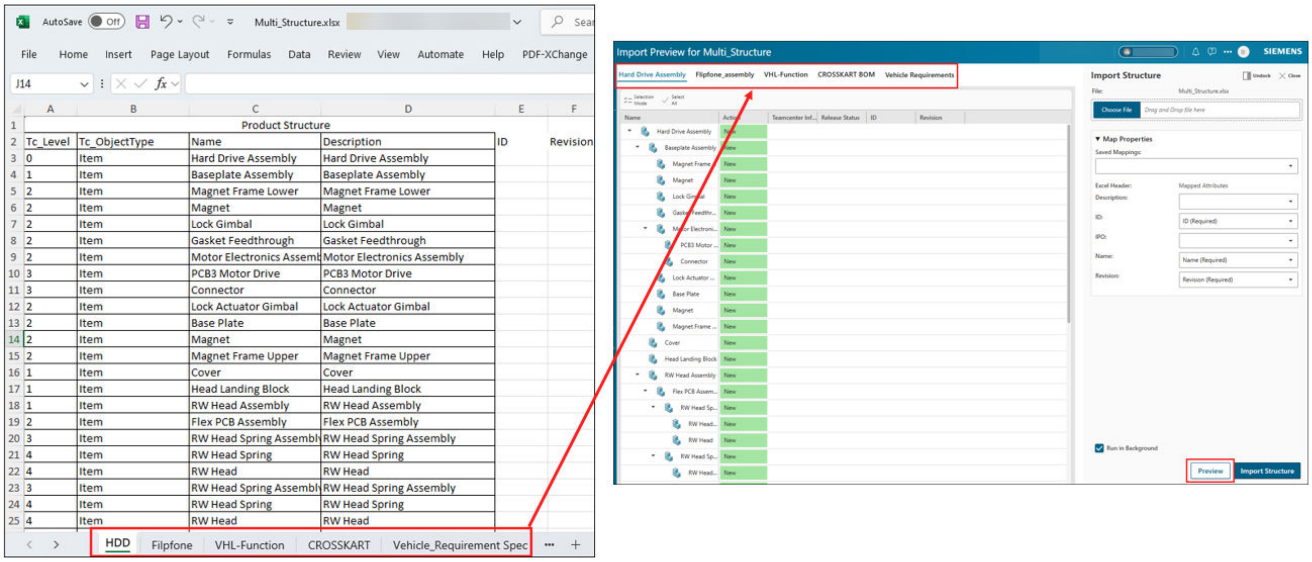
Starting this release, you can edit properties in an Excel round trip even when they are defined as a list of values (LOVs). The Excel file will know all of the values within the list and restrict you from entering any which are not included in that defined list. This functionality will only work with a pre-defined Excel template.

You can also see and edit a property type called table properties in an Excel round trip. For each line item of a table property, you see the header for each table property and its value, and you can edit the values. If the table property has more than one line of values, each line appears below the first, under the appropriate header. This functionality will only work with a pre-defined Excel template.

Excel round trip of MultiBOM on multiple sheet

You can now perform an **Excel Round-trip** for multiple different types of structures or Bills of Material (BOMs) at a single time, in the following two scenarios.

- When you want to import an excel with multiple BOMs for the first time: The source Excel must have one BOM per sheet. When you initiate the Excel round-trip by clicking **More commands •••** > **Import/Export** > **Import Structure**, Teamcenter automatically matches any property that is defined in the Excel file. Until this release, you had to select the matching property value for each property manually.

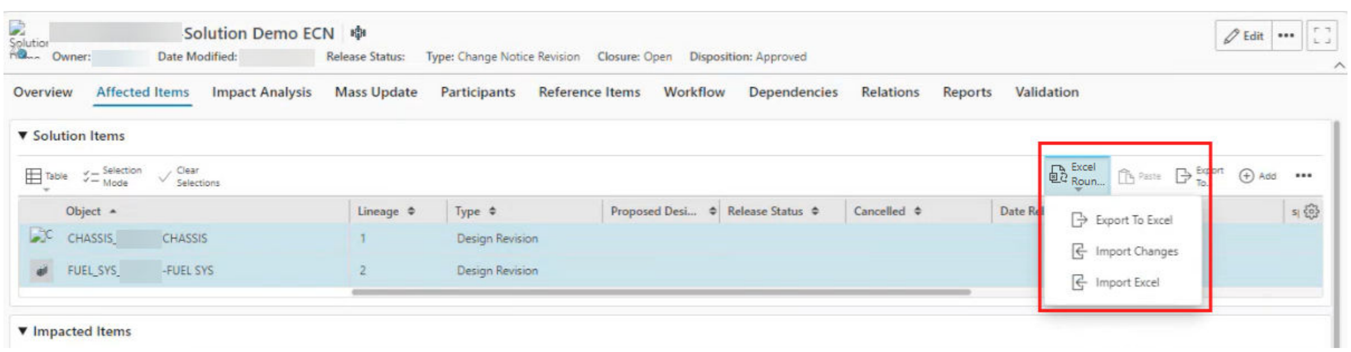


A preview page with a header tab for each Excel sheet is also available. While all the imported BOMs are placed in your home folder or the folder location you initiate the import from, the first one in the file is automatically opened.

- When you want to export existing multiple structures to an Excel: During this process, you can select multiple structures from an existing list and click **Excel Round-trip** > **Export to Excel**. You can edit the properties in any Excel sheet and your edits appear in Teamcenter when the file is reimported.

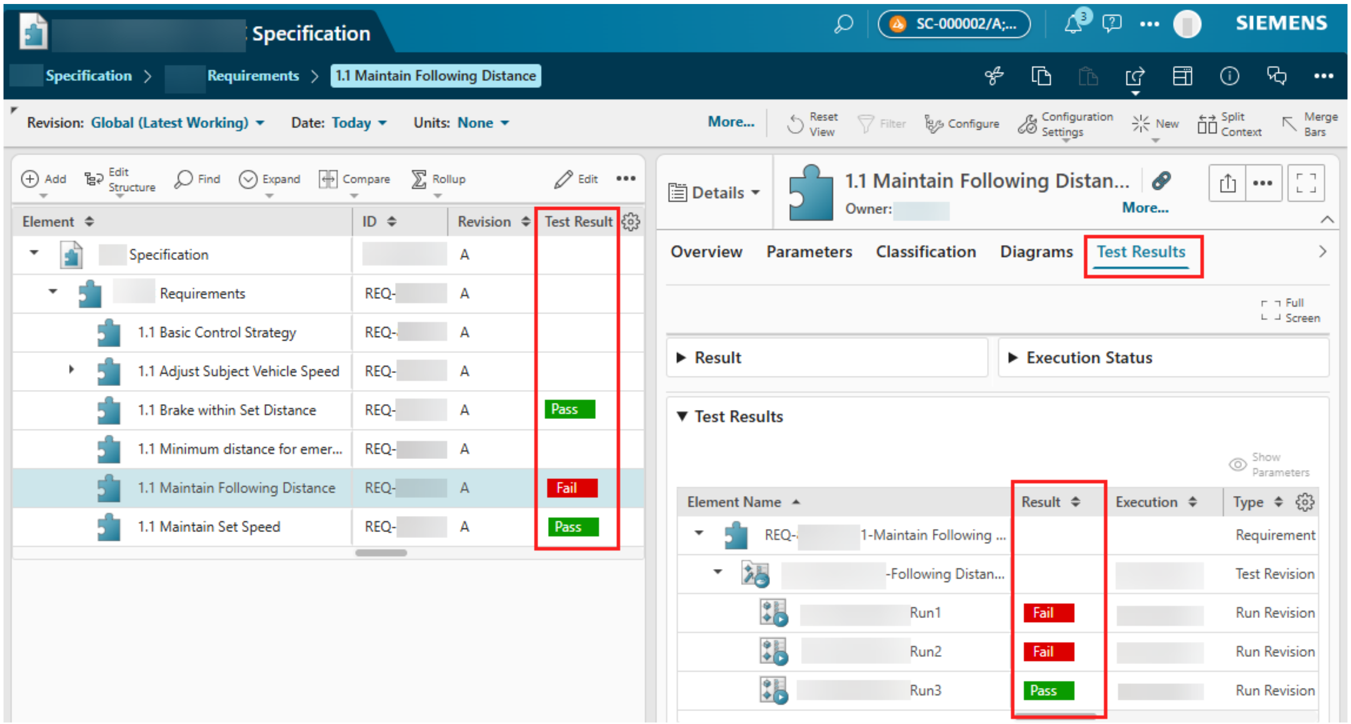
Excel round trip for a change notice

Starting this release, you can perform an**Excel Round-trip** on solution items associated with a change notice (CN).



Viewing test results for requirement objects

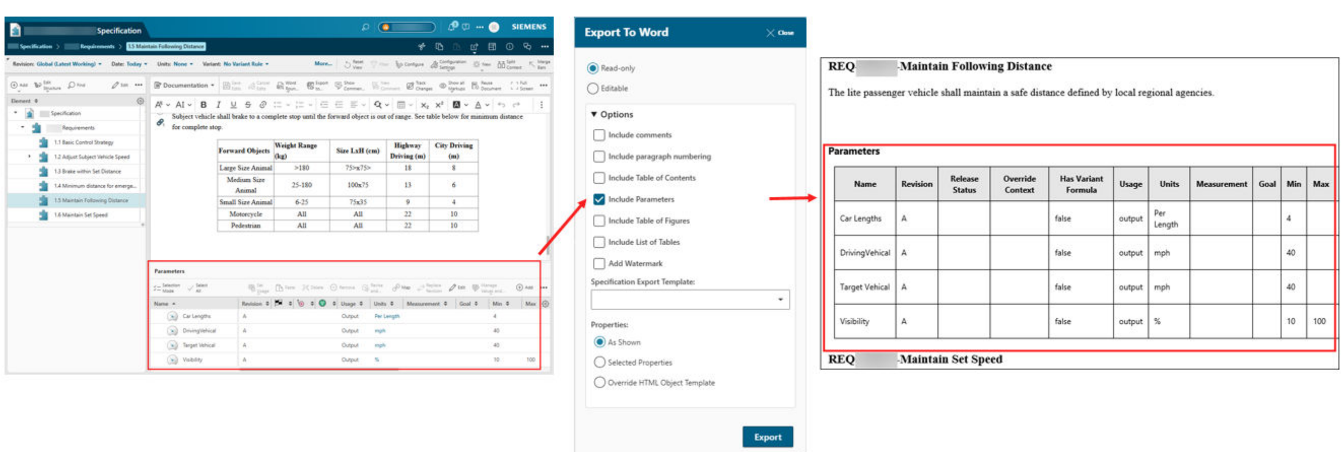
Starting this release, you can view the test result for requirement objects in both the **Tree** view as well as in the **Test Results** tab, allowing you to view the **Overall** or the **Latest** status of your testing without going into the verification requests. You can also open the verification details from the **Test Results** tab to further analyze the test details.



The requirement object rollup uses the rollup system that is used in verification. And the rules for applying the preference for **Latest** or **Overall** work the same way as well.

Export requirements to Word along with variant and parameters

Starting this release, when you export requirements to Word, you can see the assigned parameters in a tabular form in the Word file. The format for the table matches the parameters table in Active Workspace.



In addition, if variant rules are applied to specific parameters related to a requirement, when you export the specification, only the requirements and parameters that meet the applied variant rule are exported to the Word document.

This is a regular export and not a round-trip. The parameter tables in the Word document are not editable.

Enable consumer features or commands

As an administrator, you can now set the **LICENSE_consumer_enforcement_enabled** preference to **true** to view only the consumer user features or commands.

This preference is applicable to requirements management, system modeling, parameter management, and verification management.

Test, Parameter, and Characteristics Management

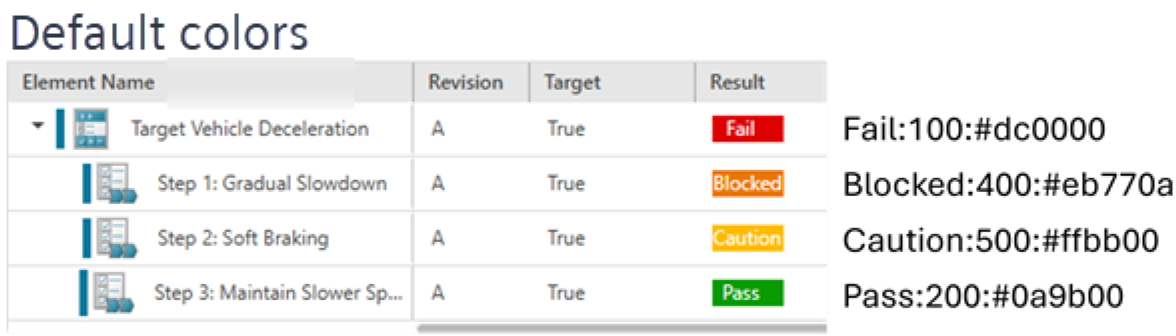
Test result color configuration

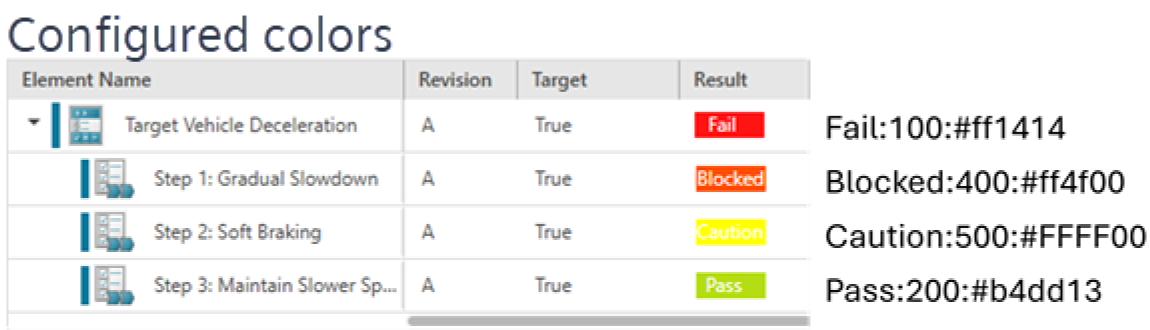
Previously, the colors displayed for the test results of a verification request, such as **Pass**, **Fail**, **Caution**, and **Blocked**, defaulted to a list of values defined in the preference **PLE_Crt1ResultColour**. These are the colors that appear in elements such as tables, pie charts, and simple bar charts. The four result colors are defined using the following hex color code formats:

- Fail:100:xxx
- Pass:200:xxx
- Blocked:400:xxx
- Caution:500:xxx

Starting in this release, an administrator can configure these colors to align to your business requirements.

The following image shows the difference between the default colors and configured colors.



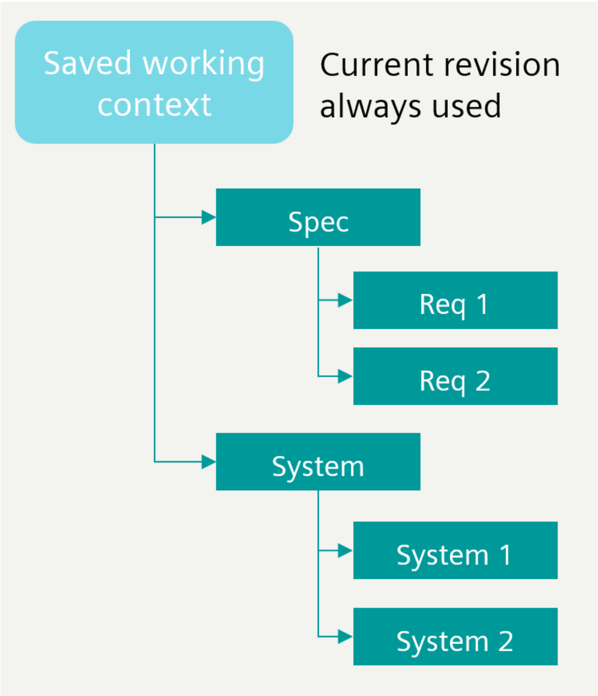


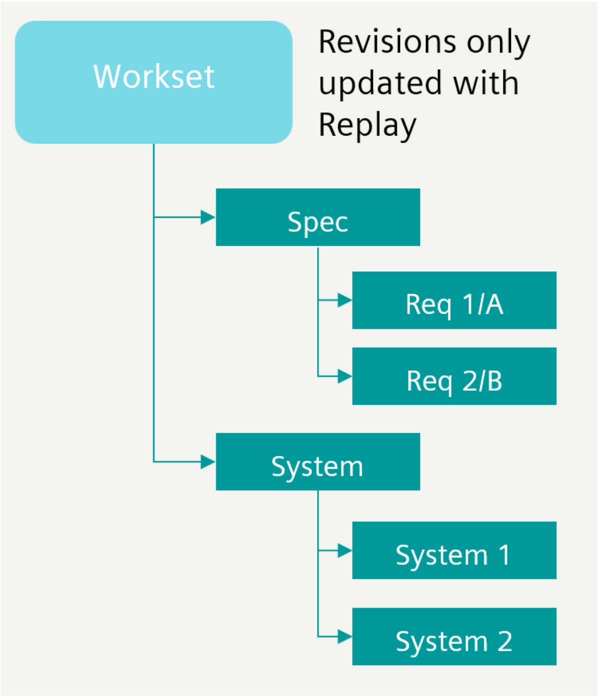
Support workset functionality for verification requests

Previously, verification requests only used the saved working context functionality, which refreshed the BOM structures each time a request was opened. This could potentially lead to results that were not comparable.

Starting with this release, you can use workset functionality, which retains the initial structure and revision content of each BOM and keeps requirement values static. This ensures the request uses the same verification values for each test run, and allows a more accurate representation of results.

The following graphic shows the difference between saved working context and workset functionality.

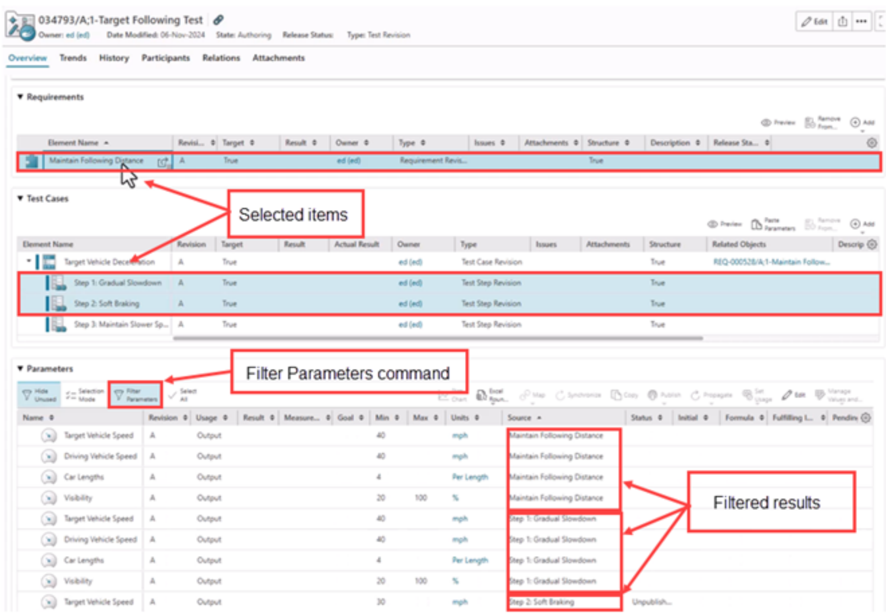




You can use the **Replay** command in a workset to update the revisions of a whole structure, or a subset of a structure.

Test parameter filter functionality

Starting this release, you can filter the parameters table by selecting **Filter Parameters** from the toolbar. You can select multiple elements in a single table or select elements across multiple tables.



Support characteristics data for parts

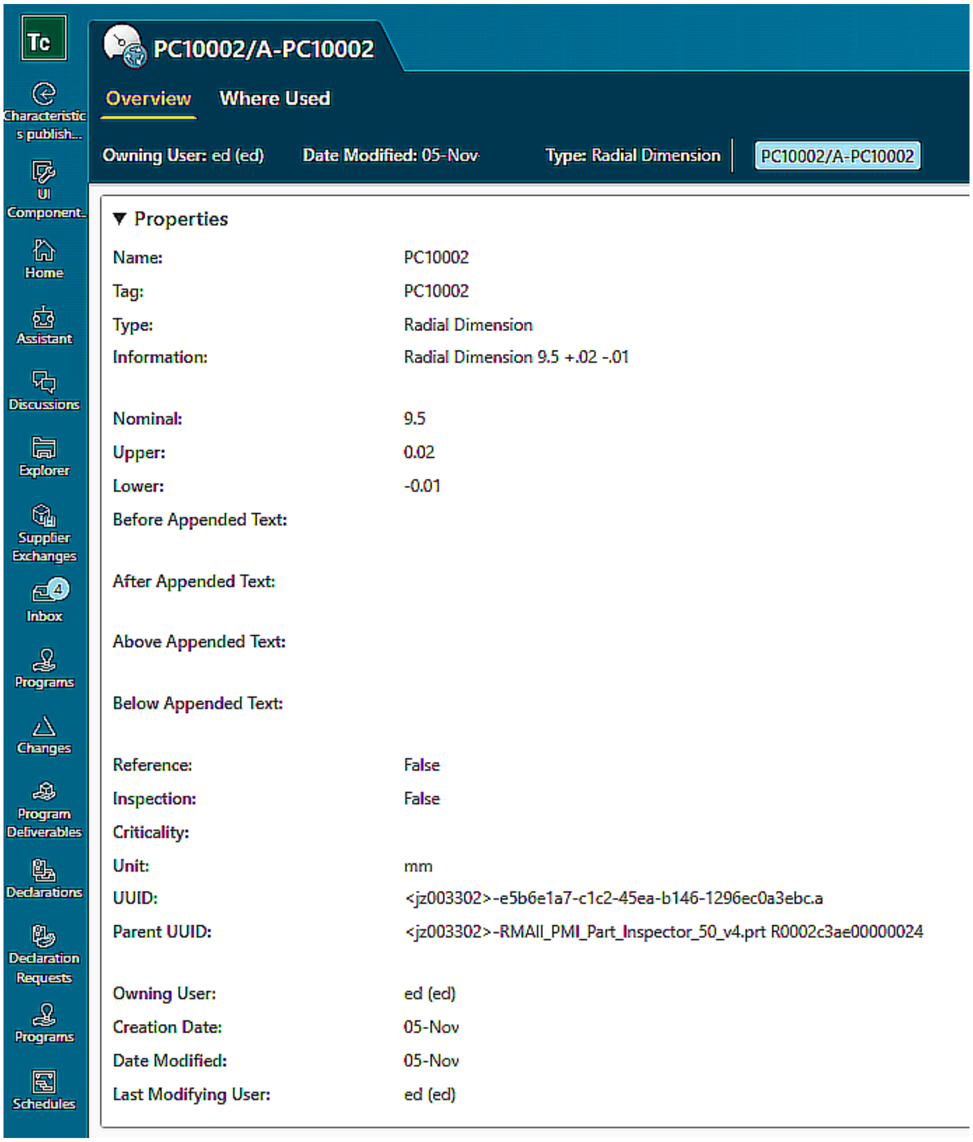
The Model-Based Characteristics (MBC) standard defines the nomenclature, definitions, symbols, data structures, and practices for identifying, communicating, and exchanging model-based characteristics. This standard supports product characteristic tagging for verification, acceptance, change control, non-conformance reporting, and protecting confidential information. It includes optional augmentations for criticality classifications, product requirement associations, and verification plan requirements. Characteristics are defined using the industry standard DMSC (Digital Metrology Standards Consortium) methodology.

Characteristics information can include traits, qualities, or attributes on an element of a feature, such as its size, location, form, or property. These characteristics can define a specification limit and a dimension with tolerance.

Teamcenter supports all types of characteristics defined in the DMSC. The following are examples of some supported characteristics:

- **Flatness** defines the uniformity of the surface using a tolerance value and datum reference frame.
- **Cutoff** defines the surface finish information.
- **Linear Dimension** defines the straight-line distance between two points on a design using nominal, upper, and lower values.
- **Note** captures relevant text information relating to a characteristic.

The characteristics data is displayed in a table with information about the characteristic. You can select a characteristic and open it to view its details, and see where it is used.



MBSE Integration Gateway

Generate classification mapping using the mbse_generate_classification_maps utility

You can define the classification for objects and attributes in your modeling tool and map them to objects and attributes in Teamcenter using the integration definition file. The process often involves handling large amounts of classification information, which can cause errors.

Previously, you had to create this classification mapping manually. Now, with the **mbse_generate_classification_maps** utility, this classification information is generated and saved in an XML file. You can then paste the contents of this XML file in the **Classification mapping** section of the integration definition file.

Export or publish data to Teamcenter asynchronously

Earlier you could only perform one publish operation at a time from the modeling tool to Teamcenter. Now, you can perform multiple publish operations asynchronously in the following ways:

- You can use the sample modeling tool in the MBSE Integration Gateway Toolkit to practice integration operations.

- You can use the **exportCollectionAsync** API.

Check the status of asynchronous export operations

Earlier you could only perform one publish operation at a time from the modeling tool to Teamcenter. Now, you can perform multiple publish operations.

You can check the status of the asynchronous publish operations in the following ways:

- Using the sample modeling tool in the MBSE Integration Gateway Toolkit.

- Using the syncOperationStatus API.

Filter the data extracted from Teamcenter using the importCollection API

Integrators can now filter the output of the **importCollection** API.

To do this, specify the filter expression for the type in the **importCollection** API. If no filter expression is specified for the type, all types of objects are returned.

Test the Teamcenter Product Configurator integration using the sample modeling tool

You can now test the integration of Teamcenter Product Configurator with your modeling tool using the sample modeling tool.

Host any Active Workspace component in a hosted Active Workspace instance

You can now host any Active Workspace component in a hosted Active Workspace instance using a set of Active Workspace hosting APIs. These APIs support hosting environments such as SWT, JCEF, and Swing.

Extract object and classification mappings from the integration definition file using APIs

Previously, you had to write your own code to extract the mapping information from the integration definition file for further integration use cases.

Now, you can use the following APIs to extract the mapping information from the integration definition file:

- getMappedObjectMapForTcType

  Retrieves all object mappings that correspond to a specific Teamcenter type (**tcType**).

- getClassificationMapsForTcClassType

  Retrieves the classes within the classification mapping for a specified Teamcenter class ID (**tcClassId**).

- getClassificationMapForToolType

  Retrieves the classes for a given tool type, including classes obtained through inheritance.

- getMappedRelAttributesForToolNRelType

  Retrieves all attributes associated with the specified **toolRelType** of the BHMElements mapped under the object mappings of the given **toolType**.

- getMappedAttributesForToolType

  Retrieves all the attributes for a given object mapping of the specified **toolType**, including attributes from both extended mappings and classification mappings.

- getMappedObjectMapForToolType

  Retrieves the object mapping for a specified **toolType**, including all attributes inherited from its parent mappings.

20. Product Configurator

Create free form rules in Active Workspace

Starting this release, as a configurator administrator, you can create free form rules in Active Workspace.

In Product Configurator, you can create configurator rules, such as availability, default, exclusion, and inclusion rules. These rules allow you to create a variant expression that sets one or more features, if any stated preconditions are satisfied, and build a relationship between the **Subject** and the **Condition** expressions. All interactions with the standard configurator rules are grid based and table based.

In addition to configurator rules, you can create more complex free-form SMT-based rules using the SMT Lib scripting language. They do not contain the **Subject** and the **Condition** expressions. Instead, they allow you to build a complex expression. A free-form rule is created and modified in a text editor.

You can create free-form rules using the standard templates provided in Active Workspace, such as **Mathematical addition**, **Mathematical multiplication With Variable Definition**, and **If Then Else**.

Create arithmetic constraints in Active Workspace

Starting this release, as a configurator administrator, you can create arithmetic constraints to specify important attributes such as weight and cost in Active Workspace.

You can define these attributes at the feature level in the configurator context, and BOM engineers can roll them up to compute the total weight or cost of the product while performing a solve.

Categorize configurator objects for business purposes or intent in Active Workspace

Starting this release, as a configurator administrator, you can categorize configurator objects for business purposes or intent in Active Workspace.

You can define the intent such as manufacturing, marketing, or technical to categorize groups, families, and features. Additionally, you can define an intent for constraints.

Assign effectivity to models, families, features, and constraints

Starting this release, as a configurator administrator, you can assign date or unit effectivity for product models and summary models; families and features; matrix constraints; and constraints within a configurator context to capture how the product structure has evolved over time.

You can use effectivity on a family to manage its usage, control introduction of mandatory families by specifying an effective in date, obsolete a family, and its effective features by specifying an effective out date. By doing this, you can view only effective families during variant configuration. You can also ensure that the completeness of variants is not impacted when the family is not effective.

Export data from models, features, configurator modules, variants, and constraints to Excel

Starting this release, as a configurator administrator, you can export data from product lines, product models, and summary models; groups, families, and features; configurator modules; variants; and constraints within a configurator context to Microsoft Excel.

Use the autocompletion feature to author variant formula

Starting this release, as a BOM engineer, you can use the autocompletion feature to author variant formula manually in the text editor in Active Workspace.

When the **Intellisense** autocompletion feature is turned on, you can get suggestions by pressing either the Ctrl + space bar or just the space bar and then make a selection. After making the selection, press the **space bar** again to get the appropriate logical operators. You can continue to create a complete formula and click **Validate Syntax** to validate the syntax of the formula you have created manually.

Additionally, the configurator administrator can edit constraints using the **Intellisense** autocompletion feature to modify the **Subject** and the **Condition** columns in the **Grid Editor**.

Add a sequence number and sequence group for inclusion rules

Starting this release, as a configurator administrator, you can add a sequence number and sequence group for inclusion rules. The sequence number dictates the priority of that constraint in that sequence group. A lower number means a higher priority. Hence, the constraint with sequence **10** has a higher priority than the constraint with sequence **20**.

Prior to this, the sequence number was supported only for default rules.

Compare variants to view the differences

Starting this release, as a configurator administrator, you can compare variants associated with a configurator context to view the differences. You can choose the **Highlight Differences** option to highlights the rows where there are differences based on the expressions authored.

Create a constraint to make a family required for a specific product model

Starting this release, as a configurator administrator, you can make families conditionally required for specific product models by creating constraints. By definition, the families were created as optional. However, by creating constraints, you can make these families required.

Consider the example of a product structure such as **Power Tools**, which has multiple product models and groups. The structure includes **HR Rotary Hammer** and **HX Standard Hammer Drill** product models and **Function_PWRTOOLS** and **Power_PWRTOOLS** groups.

Within the **Function_PWRTOOLS** group, there are **TorqueControl** and **SpeedControl** families. These families are optional and do not require any mandatory feature selections by default.

However, for specific business reasons, you might want to make the **TorqueControl** family a required selection for the **HR Rotary Hammer** product model. To do this, you can create a constraint that enforces the **TorqueControl** family as a required selection for the **HR Rotary Hammer** product model.

Set five levels of product hierarchy depth for configuring modular structures

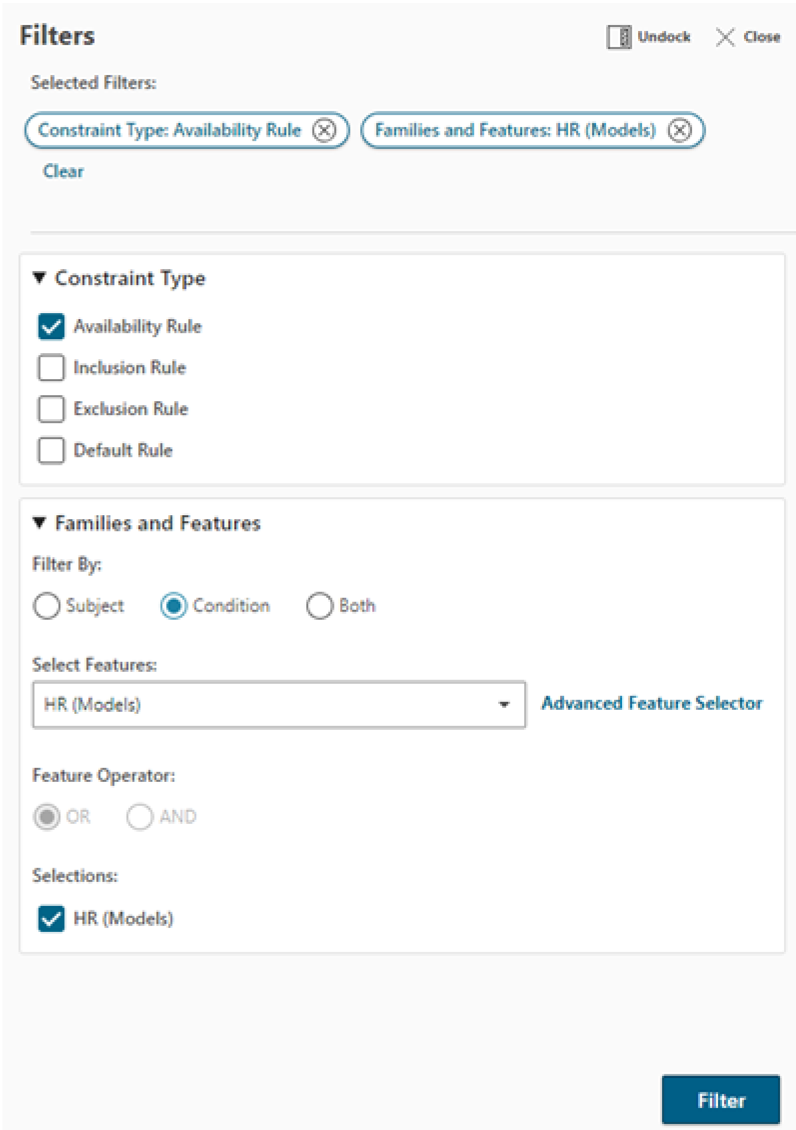
Manufactured goods are often designed and assembled from configurator modules. For example, consider a company that produces a range of refrigerators and freezers in different sizes and colors. The door assemblies are developed in a department that designs a modular door suitable for use in any refrigerator or freezer. They design a generic door assembly that has all possible components for any use—a sheet steel outer door and two internal covers, one for a freezer and one for a refrigerator.

The configurator administrator or a designated user can then configure the door assembly for a particular use in a refrigerator or freezer by setting various parameters or variant conditions that describe it, for example, **door width**, **door height**, **application** (refrigerator or freezer), and **color** (white or stainless steel). This intelligent door assembly is called a configurator module.

Starting this release, the configurator administrator can create a hierarchy of configurator contexts in Active Workspace in a table-based view. Additionally, they can author configurator modules with features that do not need to be allocated to the upper product context. Moreover, a BOM engineer can now set five levels of product hierarchy depth for configuring modular structures. Earlier, only four levels were supported.

Filter constraints to work with specific data

Starting this release, as a configurator administrator, you can filter constraints to work with specific data.



Open a constraint from a folder

Starting this release, as a configurator administrator, you can open a constraint directly in the configurator context from a folder in **Explorer**.

Constraints can be shared with multiple configurator contexts. If you open a shared constraint from a folder in **Explorer**, the system always opens it in the context of the first configurator context.

21. Reporting

Organize reports in separate dashboards in Active Workspace

Starting this release, as a reports administrator, you can organize reports in separate dashboards in Active Workspace. After creating a dashboard, you can add active summary reports and active item reports and share the dashboard with all users or specific users, groups, and roles as appropriate.

This allows you to create multiple personalized dashboards and share them with different teams or your organization. Additionally, you can control which groups and roles can create dashboards by editing the **REPORT_Create_Dashboard_Allowed_GroupRoles** site preference.

Export report tables to Excel and inline edit columns of the report

Starting this release, business users can export the reports with tables that appear as dashboard thumbnails directly to Microsoft Excel or export the table area of the report to Excel after opening the report. Additionally, business users can directly edit the report columns for reports that appear as thumbnails or edit columns inline after opening the report.

22. Resource Management

Machine Data Library edit reference data table attribute updates

When you edit data table attributes in **Machining Data Library**, the associated classification type in the **Assign** panel is already selected.

Refer to the following procedures:

- Edit the Machine Library Reference data table attribute
- Edit the Cut Method Library Reference data table attribute
- Edit the Part Material Library Reference data table attribute
- Edit the Tool Material Library Reference data table attribute
- Edit the Tool Library Reference data table attribute

Prepare graphics for use in NX using Active Workspace

In Active Workspace, you can now prepare graphics for use in NX without having to use the graphics builder.

Manufacturing Resource Library ribbon in NX

You can use the **Manufacturing Resource Library** ribbon in NX to perform the following:

- **Check Tool Retrieve**
- **Prepare Tool Assembly**
- **Extract Holder Data**
- **Create Setup Sheet**
- **Update Graphics**
- **Import Vendor 3D Graphics**

23. Semiconductor Lifecycle Management

Improve traceability by performing Hazard Analysis and Risk Assessment of a part's functional safety

Hazard Analysis and Risk Assessment (HARA) is an industry standard in ensuring functional safety, particularly in the automotive industry.

Now, you can use Teamcenter to manage the end-to-end HARA process. The Semiconductor Lifecycle Management solution provides foundational elements, such as functions, malfunctions, hazards, and harms, needed to perform HARA analyses as defined by the ISO26262 standard. The system calculates an Automotive Safety Integrity Level (ASIL) value based on the given input criteria, and then it generates a report for a given assembly revision depicting ASIL scores, safety groups, severity, controllability, and exposure criteria. This new functionality improves traceability from requirements to design to functional safety analyses.

To perform a HARA analysis, an administrator must install the functional safety feature.

Improve traceability by performing Failure Modes, Effects, and Diagnostics Analysis of a part's functional safety

The Failure Modes, Effects, and Diagnostics Analysis (FMEDA) process is an assessment method used to guarantee functional safety.

Now, you can use Teamcenter to manage the end-to-end FMEDA process. The Semiconductor Lifecycle Management solution provides foundational elements, such as failure modes, safety mechanisms, safety goals, and FMEDA analysis objects, needed to perform FMEDA analyses as defined by the ISO26262 standard. The system calculates various failure rates based on the individual block-level or component-level failure rates and the failure mode values specified by the user. Each system component is then scrutinized to assess its capability to prevent a potential violation of a safety goal. This assessment is accomplished by designing specific system-level safety mechanisms for both single-point and multi-point failures. This new functionality improves traceability from requirements to design to functional safety analyses.

To perform an FMEDA analysis, an administrator must install the functional safety feature.

Generate a safety analysis report using preconfigured templates

A functional safety analysis report typically includes several key components, such as risk assessment, safety goals, and safety mechanisms, to provide a comprehensive evaluation of safety aspects.

Now, the Semiconductor Lifecycle Management solution provides a streamlined functional analysis process with centralized, preconfigured templates in Teamcenter. Improved template configurations such as configuration measures, hardware requirements, safety context, and hardware-software interface templates ensure a more industry-focused and accurate functional safety analysis report.

Create an advanced packaging structure

Starting this release, 3DIC packaging objects, such as die bridges, die spacers, and interposers, are available in Teamcenter. When creating an assembly part, you can now set the property to 3DIC to create an advanced packaging structure. In addition, assembly materials can be automatically classified based on their type when configured by the administrator.

24. Simulation Process and Data Management

Create folders in the context of CAE workspace objects to manage your simulation data

Starting this release, as a simulation analyst, you can create a folder structure in the context of CAE workspace objects such as geometry, model, analysis, and result revision to better manage your simulation data in Active Workspace.

You can create an unlimited number of **CAE Folder** objects at various hierarchical levels and rename them. CAE folder names must be unique within the same level. However, CAE folders with the same name can exist at different hierarchical levels.

Perform simulations in Simcenter System Architect based on a verification request

As a simulation analyst, you can use Simcenter System Architect to enhance system integration, configuration, and simulation architecture management. You can perform co-simulation of multiple heterogeneous models, enabling collaboration across domain boundaries and silos. You can continuously monitor product performance throughout the design cycle by updating, exchanging, and reusing simulation assets as the design evolves.

Starting this release, you can perform simulations in Simcenter System Architect based on a verification request. Previously, the process operated in a standalone mode without the verification request.

Perform simulations efficiently with enhanced Simcenter STAR-CCM+ integration

As a simulation analyst, you can use Simcenter STAR-CCM+ for performing computational fluid dynamics (CFD) analysis. It helps reduce simulation preparation time with automated meshing and preprocessing of complex geometries.

Starting this release, you can directly access Active Workspace from Simcenter STAR-CCM+, allowing you to efficiently upload and download the necessary data for simulations.

You can perform the simulation based on a template or without a template using the STAR-CCM+ application.

Install a feature to index properties for finding recommended simulations

Simulation analysts can use the **Recommended Simulations** tab to quickly find the simulation data with the parameters that are most relevant to the verification request created by the system engineer. This ensures that they have a consistent set of comparable results to start their work.

When verification requests are created, the input and output parameters are automatically included based on the selected object. These parameters have data types such as integer, double, boolean, string, or point and properties such as goal, and minimum, and maximum values. These properties are indexable.

Starting this release, to index these properties, as a simulation administrator, you must ensure that the **Simulation Process Management with Measurable Attribute for Active Workspace** feature is installed. When this feature is installed, the **SWA_IsSwa0simattrmgmtawTemplateInstalled** site preference is set to **true** by default to make these properties indexable.

Configure units of measure for simulation integration applications

Starting this release, as a simulation administrator, you can configure the units of measure (UOM) for simulation integration applications by running the quick set up utility. The UOM values required for simulation integration applications are included in the *TC_DATA***tcsim\unit_definitions.csv** file. The quick set up utility calls a script to import the values from the CSV file to the Teamcenter database.

The simulation analyst can use new units in simulation integration applications.

Automatic copying of parameters from 1D model to 1D analysis revisions

Starting this release, as a simulation analyst, when you create an 1D analysis revision within the context of a 1D model revision, the system automatically copies the input and output parameters from the 1D model revision to the 1D analysis revision.

User interface enhancements

Starting this release, the **Overview** page has been consolidated to include all the information from the **Attachments** page. Simulation analysts can now upload and download files, add external links, review out-of-date objects, and view related objects directly from the **Overview** page. This consolidation reduces context switching between pages, making it easier to find critical information.

Additionally, the **Study** page has been renamed to **Parameter**. Moreover, all **MDO** objects and tab names have been renamed to **MDAO**.

Single sign-on enabled for Teamcenter Simulation Software desktop application

As a simulation analyst, you can use the Teamcenter® Simulation Software desktop application to perform certain daily, recurring activities such as reviewing tasks and uploading and downloading files.

Starting this release, you can use the single sign-on (SSO) functionality to log on to this application by using the same credentials as Teamcenter. SSO simplifies the user experience by reducing the need to remember multiple usernames and passwords and enhances security by centralizing authentication.

Support for all references and file types with the CAE Nastran dataset

Starting this release, the following are the updates to references and file types supported by the **CAE Nastran** dataset to include all the common file references supported by Simcenter 3D:

File type (extension)	Reference	Format
***.diag**	**CAE0DIAG**	Binary
***.plt**	**CAE0PLT**	Binary
***.f56**	**CAE0F56**	Binary
***.rs2**	**CAE0RS2**	Binary
***.sum**	**CAE0SUM**	Binary
***.xml**	**CAE0XML**	Text
***.png**	**CAE0PNG**	Binary
***.html**	**CAE0HTML**	Text
***.ext**	**CAE0EXT**	Binary
***.bun**	**CAE0BUN**	Binary
***.err**	**CAE0ERR**	Binary
***.map**	**CAE0MAP**	Binary
***.mpdat**	**CAE0MPDAT**	Binary
***.mplg**	**CAE0MPLG**	Binary

25. Structure and BOM Management

Structure Management

Save and download the structure comparison report

Previously, you could only compare the content of two structures. Now, you can also save the comparison report and download it as an Excel file.

Create smart baselines

Previously, when you created a baseline, new revisions and copies were made for all the associated data and CAD designs. This process was time-consuming and used significant disk space.

Now, by default, when you create a baseline, the new revision and copies are made for the revision whose **work in progress** were modified since its last baseline was created. A new revision is not created for an assembly that was not changed since the previous baseline. An administrator can set the **ITEM_smart_baseline** preference to an appropriate value to revert to the older way of creating baselines.

View the changes made to reference designators when a structure is in packed mode

Previously, the redlines denoting the changes to reference designators were not highlighted when a structure was displayed in packed mode.

Now, the changes are highlighted even in packed mode. The redlines indicate reference designators that are added, removed, or modified.

Update property overrides and absolute occurrence properties in a solution variant

Previously, absolute occurrence properties (position designator, ID in context, and usage address) were not copied when the solution variant was created. Now, these properties are carried over when the solution variant is created.

Previously, the property overrides were copied when the solution variant was created, but they were not synced when the solution variant was updated. Now, the property overrides are synced even when the solution variant is updated if it is updated for the in-context parent and if the property to be synced must be included in the SolutionVariantSyncProperties preference.

Create new revision rules in Active Workspace

Starting this release, you can create a revision rule with an override clause in Active Workspace. You can modify an existing revision rule and then save it with a new name.

Configure nested variants

Previously, the only way to configure a structure with variant conditions was to apply a variant rule.

Now, you can configure a structure without applying a variant rule considering the nested variant conditions. This nested variant configuration excludes the BOM line items where the variant condition cannot be true in the context of the combined variant condition of its parent hierarchy.

Weight and Balance Management

View mass and balance rollup for engineering BOM

You can calculate and view the mass and balance rollup for the aligned engineering BOM. In addition, you can set the column arrangement to view the mass and balance rollup data of an engineering BOM.

View and manage weight and balance data in a single location

You can view and manage the weight and balance data of structure elements in a single location. The newly added **Mass Properties** section summarizes all the mass and balance properties related to the selected structure element.

Migrate weight and balance data from the old data model to the new data model

If you are upgrading to Teamcenter 2412 and if you have an existing installation of Weight and Balance Management and have data in the old data model, you must run the **wnb_migrate_parameter_data** migration utility so that the data is migrated to the new data model.

As a system administrator, when you set the value of the **WNB0_EnableCADBidirectionalExchange** preference to **True** after successful migration, a bidirectional exchange of data can happen between the CAD application and Teamcenter.

In the earlier rollup functionality with the old data model, a business user could not view the data that they authored in a CAD application within Teamcenter. They could view only the **From Design** values. With the new data model and the value of the preference set to **True**, the business use can view all the data that is saved in the CAD application in Teamcenter. Thus, a bidirectional exchange of data is possible between the CAD application and Teamcenter.

With the new data model, you do not require the *Parameter Management* license to set the weight types. You need the license only to set the weight targets.

In addition, when the value of the preference is set to **True**, in the rollup report, Teamcenter shows alternate representations from NX along with the main representations. In Teamcenter, this depends on the occurrence note that states that an alternate representation data is needed for an occurrence.

Smart Discovery for Structures

Enhanced filter options to expand or contract a structure

As a business user, you use different filters to create an expression and derive a specific product definition you want to work with.

Previously, the different filters you applied were combined into a single group to create the filter expression.

Now, you can create groups, a maximum of three, for the filters you apply. You can also use the date range filter to select a specific period. The filter expression that you create for deriving a specific product definition can also be used in NX.

In addition, if advanced filtering is configured, you can you can use multiple **OR Group** and a **NOT Group** to create a filter expression. As an administrator, to configure this, set the **AW_Discovery_Advanced_Filter** preference.

Enhanced approach to update the Smart Discovery Index

Previously, you needed to first initialize Smart Discovery Indexing and then set up a recurring task to update it.

Now, you can perform the following tasks:

- If no changes are made to the schema, you can set up a recurring task.

  In this process,

  - The Smart Discovery index in Solr is initialized with the necessary Teamcenter data.
  - Items and their occurrences that are regularly updated and the new items that are frequently created in the Teamcenter database are incrementally updated in the Smart Discovery index in Solr and in Teamcenter.

- If the changes are made to the schema due to the addition of new occurrence properties, then you must first run the `discovery:index` task, and then run the `discovery:sync` task.

Support for additional business object, its subclasses, and properties for occurrence indexing

Previously, to cover all the classes of the **Awb0Element** business object in the indexing, you had to configure the indexing properties for both the **Awb0DesignElement** and **Awb0PartElement** business objects.

Now, you can index the **Awb0Element** business object and all its subclasses. You can also use additional types of occurrence properties for indexing.

Design and Engineering BOM Alignment

Copy the reference designator and relations between an engineering BOM and a design structure

Reference designators are positional indicators in various ECAD parts and designs, which can now be effectively used for automatic alignment. In most ECAD cases, multiple designs represent a single part. While generating or updating an engineering BOM or a design structure, it is important to correctly copy the reference designator values between an engineering BOM and a design structure.

Similarly, various relationships, such as those related to the material or the coating, are associated with parts and designs, which also must be copied.

As an administrator, you can now configure the copy mechanism for the reference designator property and relations.

Support of the flexible part summarization

Previously, in the case of multiple flexible designs, even if the grouping criteria were specified, the same number of part instances would be generated for the same part in the engineering BOM. This was also known as non-summarized mode.

Now, the system identifies the packing criteria set for flexible designs to generate a single summarized part.

Generate alignment by matching the property values

As an administrator, if you have an existing design structure and an engineering BOM that are not aligned, particularly when importing a BOM from an external system, you can now automate the alignment process. Instead of manually identifying and selecting occurrences for alignment, you can set the multivalued preference preference to match the values of part and design properties automatically and use it for alignment.

Once this preference is set, you can use one of the following ways to generate the alignment.

- Setup a workflow

  User can submit the structures to this workflow, for alignment by matching of the property values.

- Run an utility

Engineering BOM Management

Updated application names for installing engineering BOM

Starting this release, the names of the applications that are specific to Assembly BOM are displayed in Teamcenter Environment Manager (TEM) and Deployment Center.

In addition to the application names, sample data has been included for the users to quickly get started with managing the engineering BOM.

Add custom properties to parts and part revisions

The steps to add customer properties to parts and part revisions have now changed to improve the process.

Enhancements made to reference designators

As an administrator, you can now use various preferences to manage reference designators in a better way.

- **Configure the display values of reference designator**

  Now, you can accurately configure the display of the reference designator values for a product structure.

- **Pack the product structure lines using reference designator**

  Previously, you could pack the product structure lines using **quantity and find number**. Now, you can also pack the product structure lines using the values of the reference designators.

- **Define reference designator values in ASME format**

  Previously, you could specify reference designators only in the International Organization for Standardization (ISO) format. Now, you can also use the American Society of Mechanical Engineers (ASME) format for specifying the reference designator values.

Documentation enhancements

New deliverables for Weight and Balance Management

In the previous release, information about weight and balance management was bundled into the following deliverables:

- *Structure Management on Active Workspace — Usage*
- *Structure Management — Deployment and Administration*

For better usability and accessibility, the information has been removed from these deliverables and is included in new, dedicated deliverables:

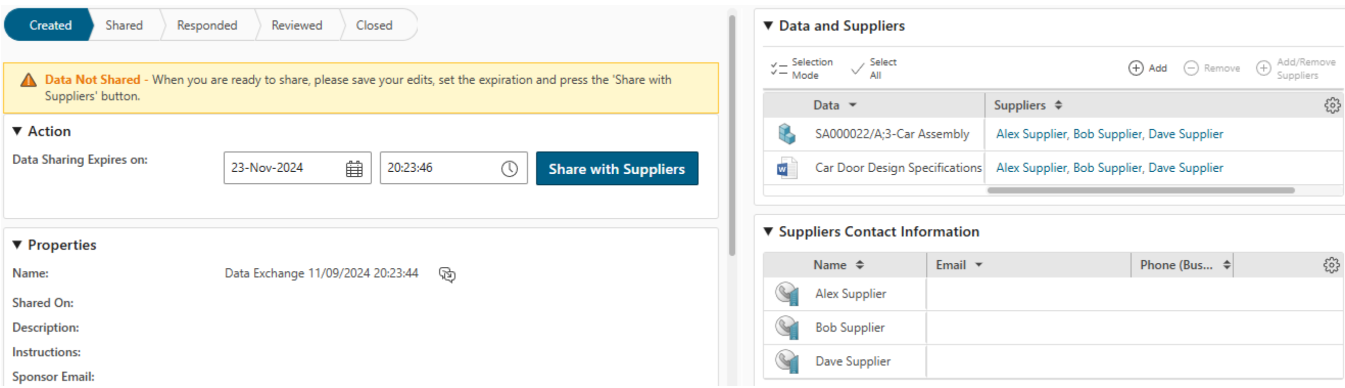
- *Weight and Balance Management — Usage*
- *Weight and Balance Management — Deployment and Administration*

26. Supplier Connect

Include datasets in a Live Data data exchange package

Previously, you, as a sponsor, could only share items or assemblies in a **Live Data** data exchange package with suppliers for design updates.

Now, you can create a **Live Data** data exchange package, include datasets in the data exchange package, and grant modification rights to the datasets. The datasets can be documents, PDFs, images, and so on. Suppliers can review the dataset and send it back to the sponsor by checking it out, and then replacing it with an updated version.



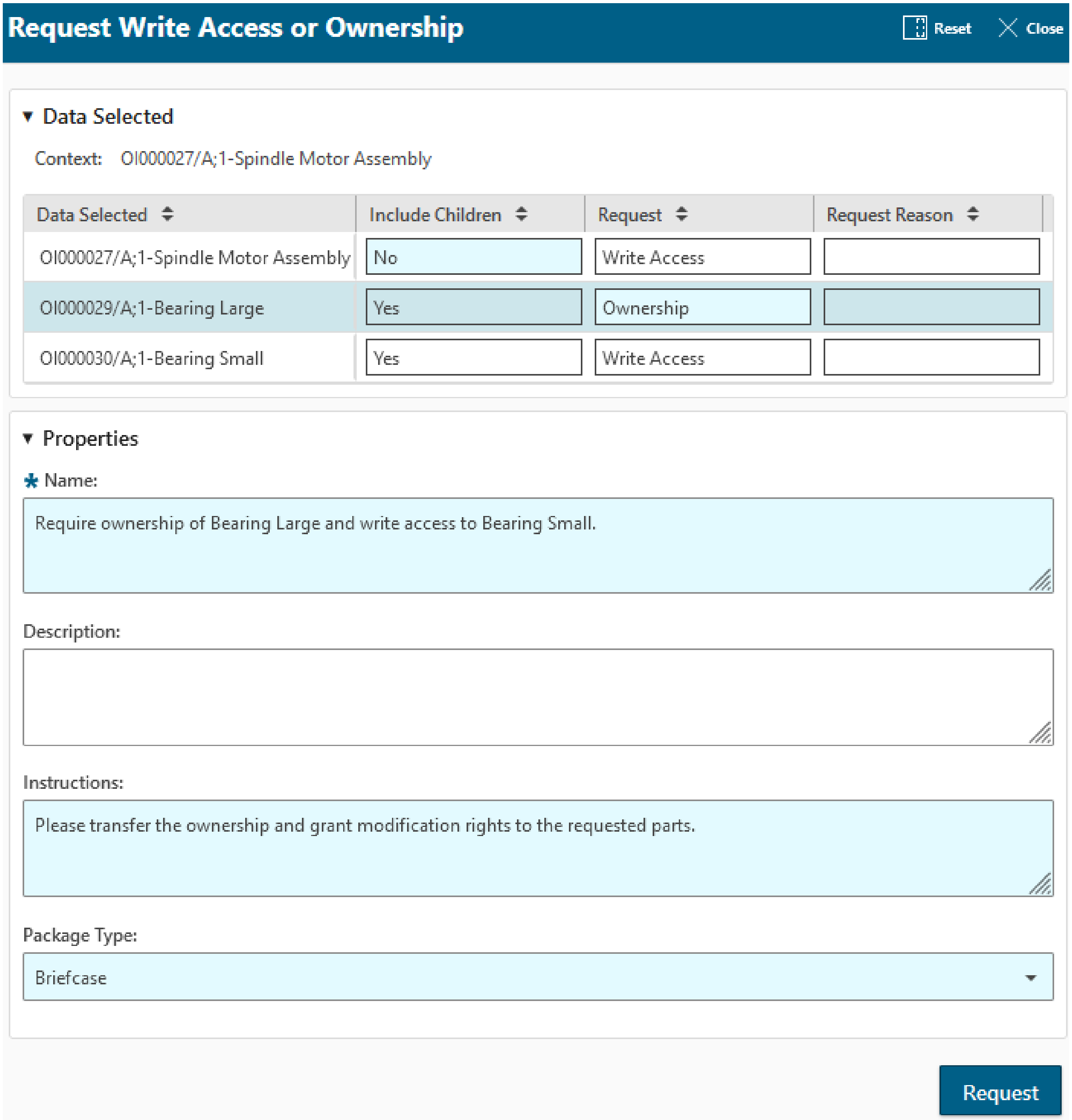
Publish an assembly to all suppliers in a project

Starting this release, you, as a sponsor, can simultaneously publish an assembly to all suppliers in a project. This allows you to share an assembly with all associated suppliers at once. Project security ensures that only project members can access the assemblies associated with the project. You must create the assembly and assign the assembly and its components to the same project as the suppliers. Then, when you publish an assembly, each supplier in the project can search for and work on it in their OEM Supplier Site.

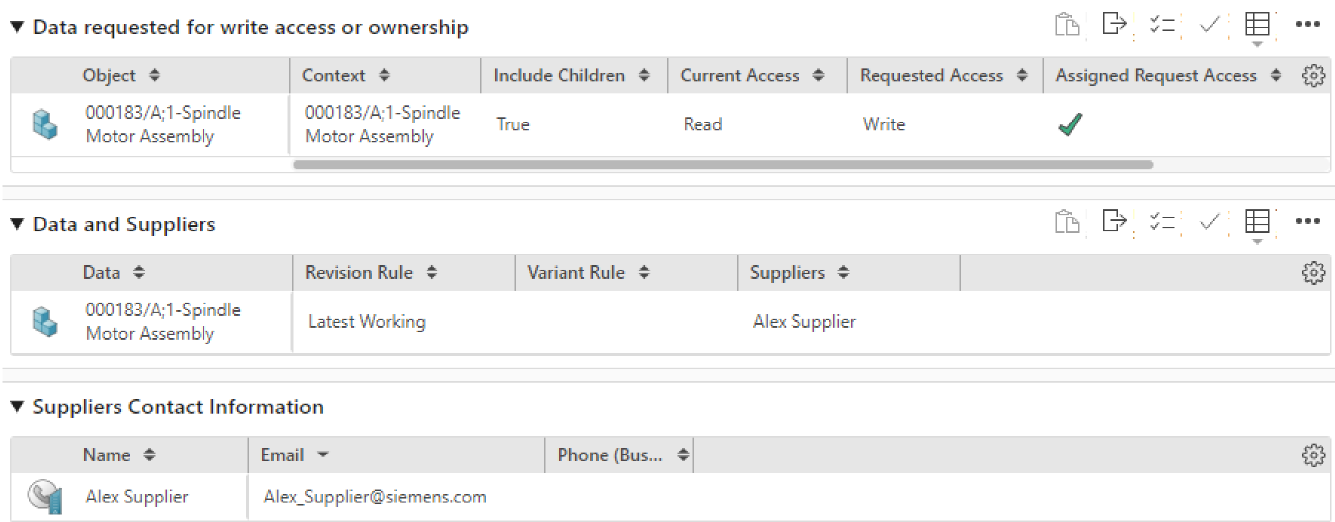
As an administrator, to make this available, you must implement project security in the relevant Teamcenter environment. You must assign design engineers, Teamcenter user accounts for the suppliers, and the suppliers to their associated projects.

Create a Self Service request for access to OEM data

As a supplier, if you want to update OEM data, you can create a *Self Service* request for modification rights or transfer of ownership of the OEM data. You can request access to live data or ask for the data in an unmanaged Briefcase or a managed Briefcase. When you submit this request, the assigned sponsor receives a Self Service package with the selected parts.



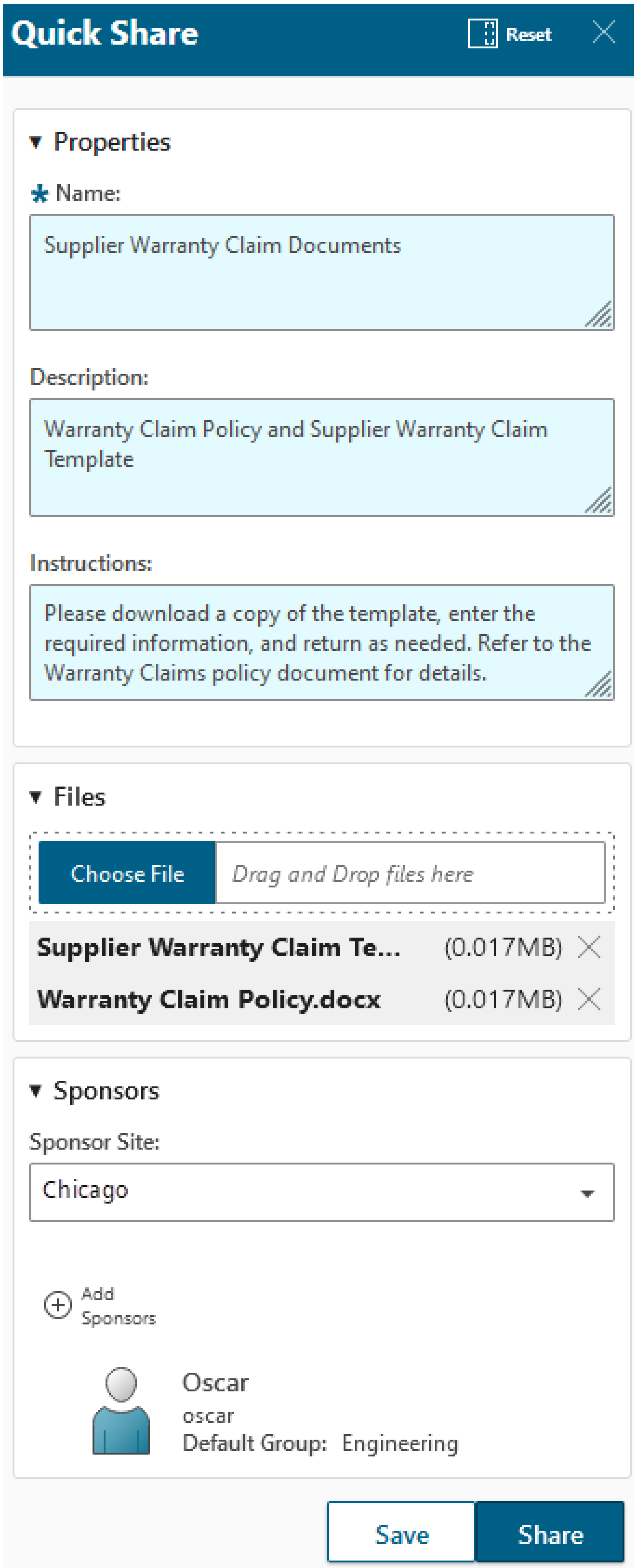
The sponsor reviews the package, and approves or rejects the request at the OEM Sponsor Site. After you receive access, you can update the required parts.



Suppliers can support work requests from multiple OEM Sponsor Sites

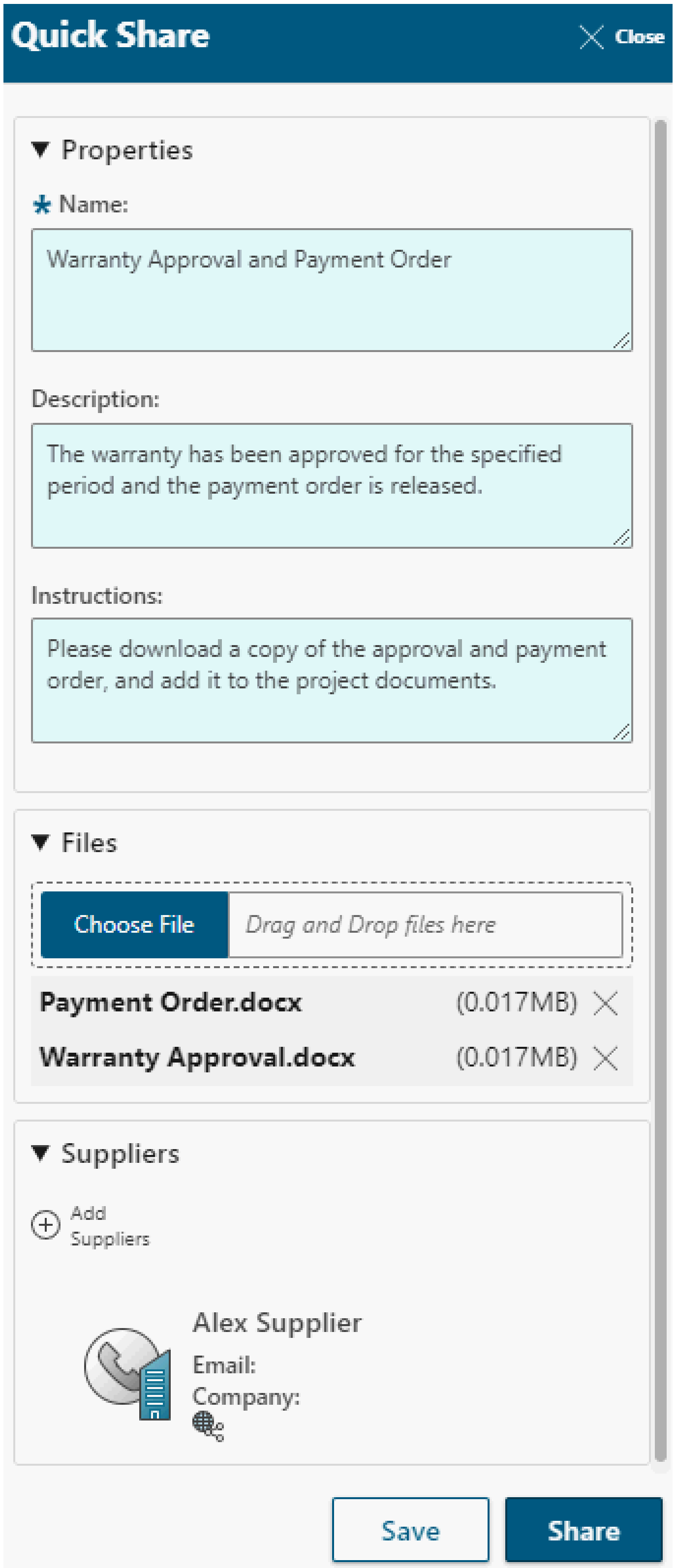
Starting this release, as an administrator, you can set up multiple OEM Sponsor Sites to collaborate with the same group of suppliers from a single OEM Supplier Site. In addition to the existing configurations, you must perform additional configurations for each of the OEM Sponsor Sites and the OEM Supplier Site. You must also set up the vendors and suppliers to support multiple OEM Sponsor Sites. This setup allows each OEM Sponsor Site to configure its own programs to meet their specific needs while working with the same suppliers. Although, sponsors work in separate OEM Sponsor Sites, when they create data exchange packages, they can select the same suppliers to work on the tasks.

When suppliers receive a data exchange package, they can work on it and submit a response. The response is returned to the sponsor in the originating OEM Sponsor Site for review and approval. Suppliers can also submit files to sponsors from multiple OEMs for review and approval. They can select the OEM Sponsor site and select the required sponsors from that site.


Quick Share
Reset
Properties
Name:
Supplier Warranty Claim Documents
Description:
Warranty Claim Policy and Supplier Warranty Claim Template
Instructions:
Please download a copy of the template, enter the required information, and return as needed. Refer to the Warranty Claims policy document for details.
Files
Choose File
Drag and Drop files here
Supplier Warranty Claim Te... (0.017MB)
Warranty Claim Policy.docx (0.017MB)
Sponsors
Sponsor Site:
Chicago
Add Sponsors
Oscar
oscar
Default Group: Engineering
Save
Share

Share files with suppliers

As a sponsor, using Teamcenter, you can now securely share files with suppliers to facilitate collaboration and maintain data integrity throughout the exchange process. This eliminates the need for external file-sharing tools or less-secure methods like email, providing a secure and integrated platform for file exchanges between OEMs and suppliers.


Quick Share
Close
Properties
Name:
Warranty Approval and Payment Order
Description:
The warranty has been approved for the specified period and the payment order is released.
Instructions:
Please download a copy of the approval and payment order, and add it to the project documents.
Files
Choose File
Drag and Drop files here
Payment Order.docx
(0.017MB)
Warranty Approval.docx
(0.017MB)
Suppliers
Add Suppliers
Alex Supplier
Email:
Company:
Save
Share

27. Teamcenter for Microsoft Teams

Create a simple change

You can now create a simple change from the Teamcenter app within Microsoft Teams by either typing in the details manually or by using Azure OpenAI.

Change the language of the Teamcenter app for Microsoft Teams

You can change the language of the Teamcenter app for Microsoft Teams by changing the language of the Microsoft Teams app itself. The Teamcenter app uses the language set in the Microsoft Teams app.

28. Teamcenter Quality

Quality Project Management

Specify the process and subprocess for a quality checklist

Starting this release, you can specify the process and subprocesses for the quality checklist when you create the quality checklist. This helps you to filter and manage your checklists according to the assigned processes and subprocesses.

You can also disable questions in the checklist to view only the relevant questions for your processes.

Define the RYG rating rollup rule for quality checklists

Starting this release, quality managers can define RYG rating rollup rules for quality checklists by setting a minimum threshold percentage for the rating. This allows you to determine when the rating calculation should begin. The RYG rating is rolled up for the checklist only when the specified percentage of questions are answered.

Add a quality checklist to a project

Starting this release, you can add a quality checklist to a project. This reduces the dependency on the event milestones.

Collaborate on checklists and checklist questions across multiple sites

Starting this release, you can use Multi-Site Collaboration network to share checklists and checklist questions across different sites. This allows you to collaborate on the same checklists with teams dispersed across different locations globally. Additionally, you can share only the relevant information with teams at other sites, helping you maintain data privacy.

Document enhancements

Previously, the *Quality Project Management* documentation had combined information about quality checklists and program checklists.

Now, for better user experience and accessibility, and to provide clearer and more focused information, we have separated the information into distinct sections in the Quality Project Management documentation. The updated documentation also includes more concepts, examples, graphics, and process flows.

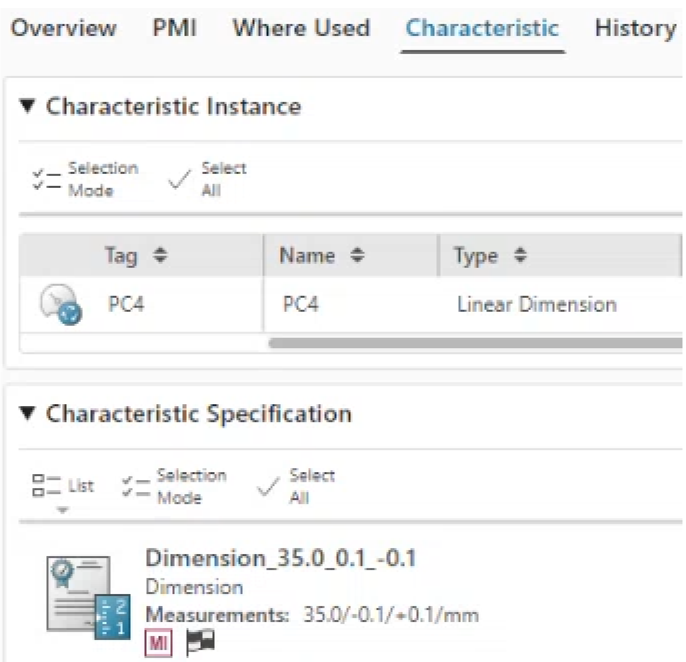
Control Plan

Control Plan is integrated with Model-Based Definition from NX

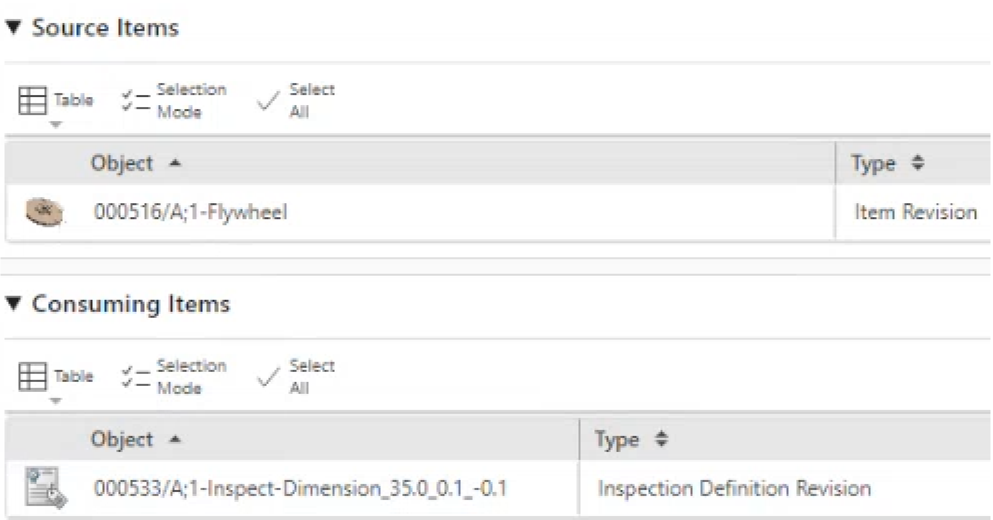
When a designer creates a model in NX, they can create the *characteristics* for the model and publish it to Teamcenter, where the characteristics are populated in the **Characteristics** tab of the part.

In a Control Plan, you can use these characteristics to generate Inspection Definitions for each of the characteristics from the part. The updates to the part can be tracked throughout its lifecycle by revisions. These revisions can be published to Teamcenter, and the Inspection Definitions can be updated to use the new revisions by comparing the revisions, and importing the updates.

If you have imported a balloon from a part, the source Characteristic of the part is displayed in the **Characteristic Instance** section.



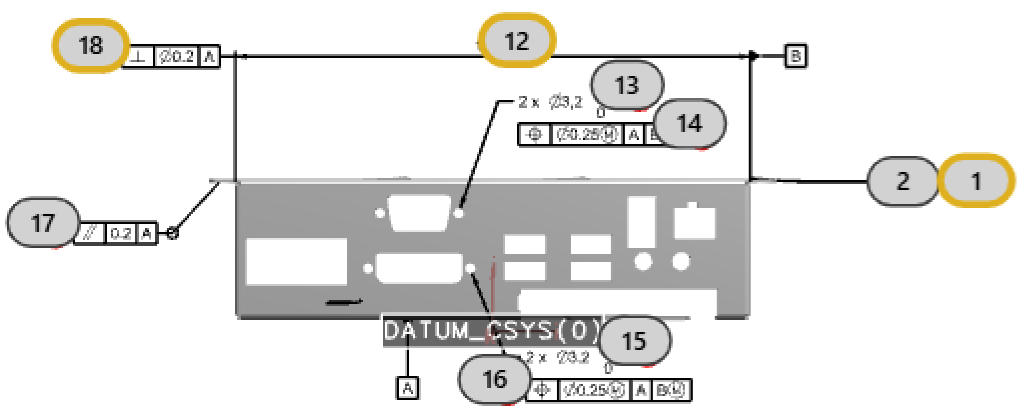
If you open the part's Characteristic from the **Characteristic Instance** section, in the **Where Used** tab, you can view the source part and the Inspection Definitions where the Characteristic is used.



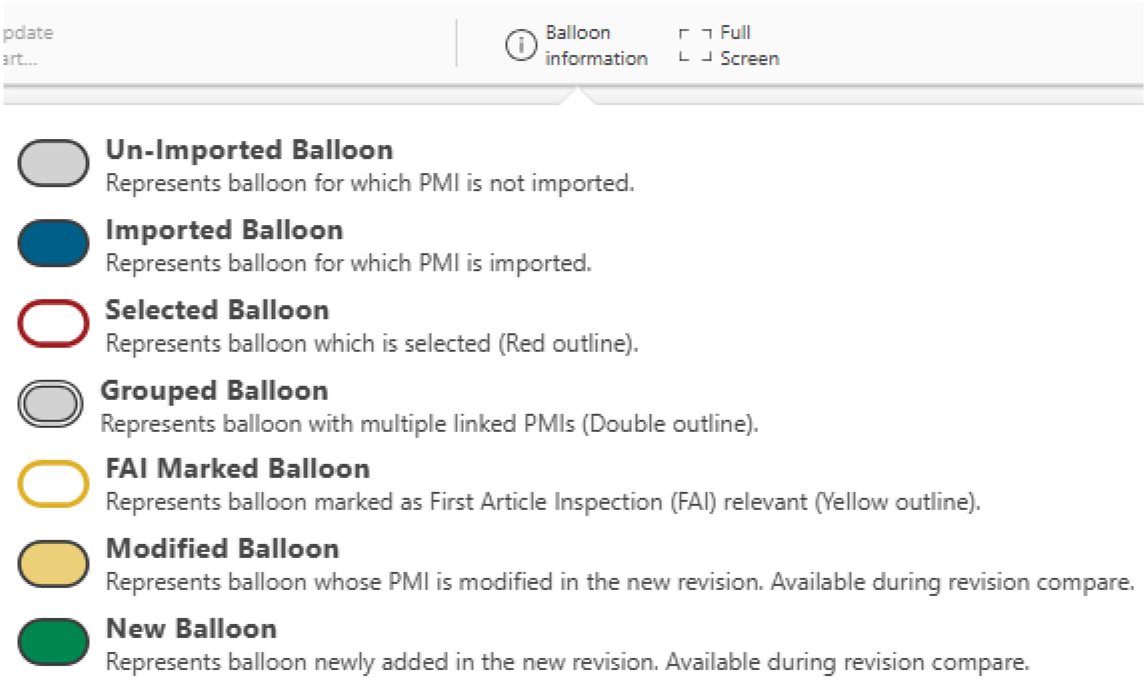
Enhancements to generate Inspection Definitions from a part with PMI

Starting this release, the following enhancements are available to generate Inspection Definitions from a part with PMI:

- Import First Article Inspection (FAI)-marked PMIs from 3D data. In NX, PMIs can be marked as **FAI Relevant**, and these PMIs can be imported into a Control Plan. In the Control Plan, **FAI Marked** balloons are denoted using a yellow border.

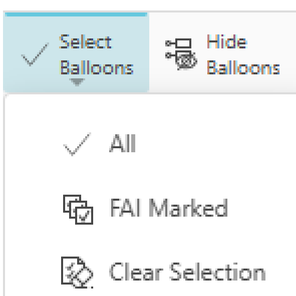


- View a legend for the types of balloons.



- Select multiple balloons using any of the following options:

  - Click **Select Balloons** > **Select All** to select all balloons.

  - Click **Select Balloons** > **FAI Marked** to select only **FAI Marked** balloons. These balloons have a yellow border. It indicates that these balloons are marked for First Article Inspection (FAI). If you import **FAI Marked** balloons, then the **FAI Required** property is set to **True** in the generated Inspection Definitions.

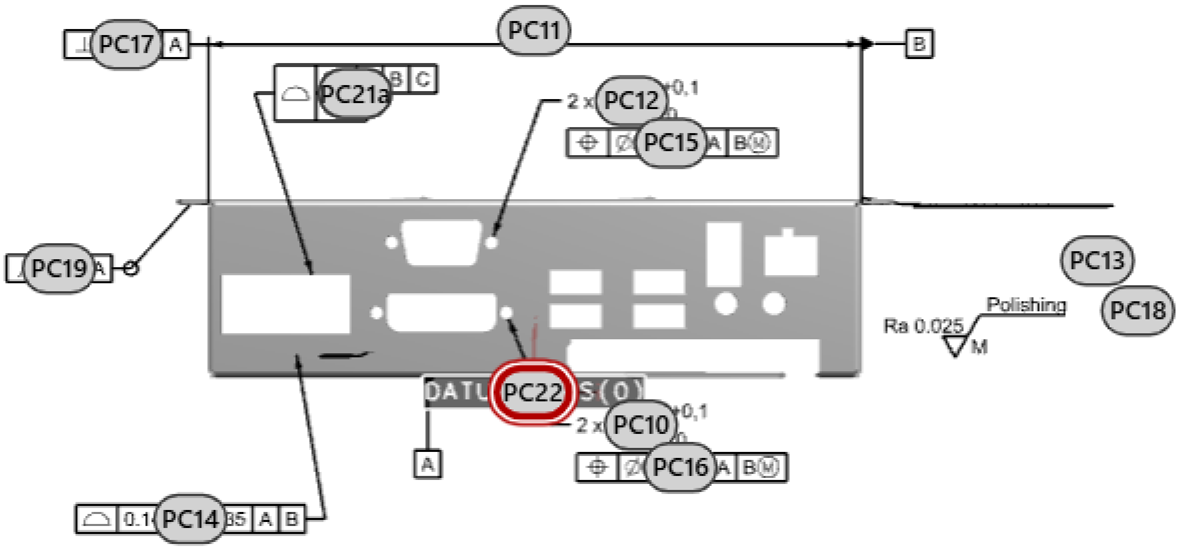
  - Click **Select Balloons** > **Clear Selection** to clear any selections you have made.

- Select a **Grouped Balloon** to select all instances of the Group Characteristics in the table view.

  Group Characteristics are a collection of related attributes or features that are inspected or measured together as a group. They are often associated with specific geometric dimensions, tolerances, surface finishes, or other critical features of a part or assembly. An example of Group Characteristics is a group of dimensions related to the hole pattern on a flange, including hole diameter, spacing, and position.

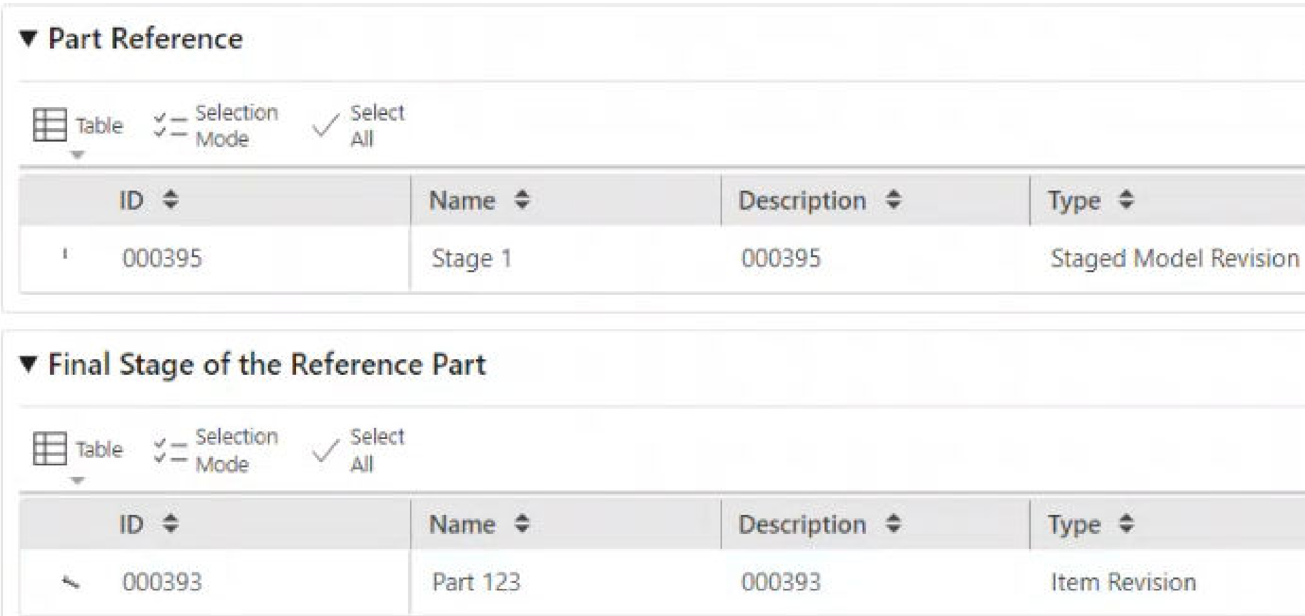
Note:

A **Grouped Balloon** is indicated by a double outline. When you select a **Grouped Balloon**, a red border appears on the balloon to indicate that the balloon is selected. The balloon remains selected until you clear the selection of all characteristics in the group.



☐	FirstArticleInspectionRequired	Characteristic Number	Characteristic Description	Measuring Size	Measuring Size Text	Nominal Value	Upper Specification Limit	Lower Specification Limit	Upper Allowance
☑		16	PC22c	350	Symbol				
☑		15	PC22b	350	Symbol				
☑		14	PC22a	350	Symbol				

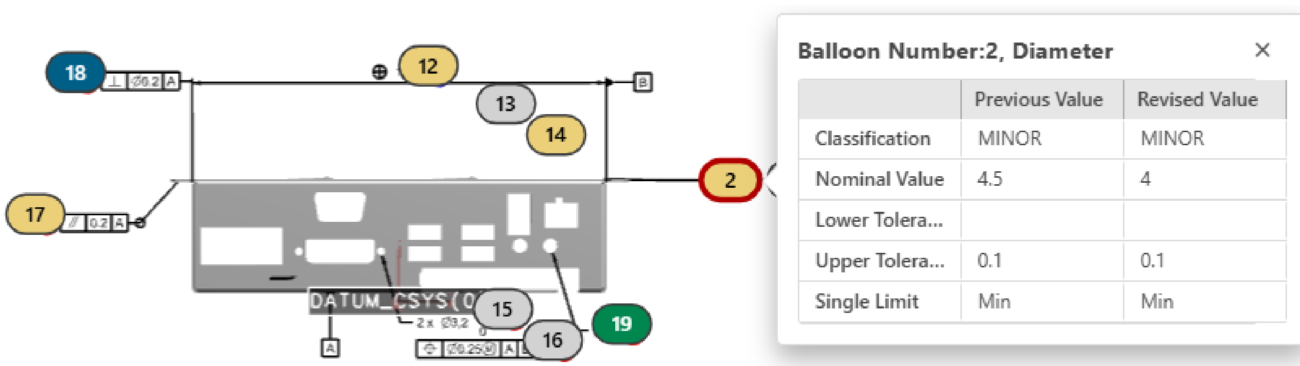
- Identify the final part in the **Final Stage of the Reference Part** section of an Inspection Definition generated from balloons of a stage belonging to a staged model set created in NX.



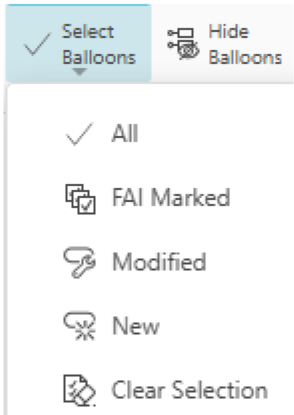
Enhancements to compare PMI from a revised part

Starting this release, the following enhancements are available to compare PMI from a revised part:

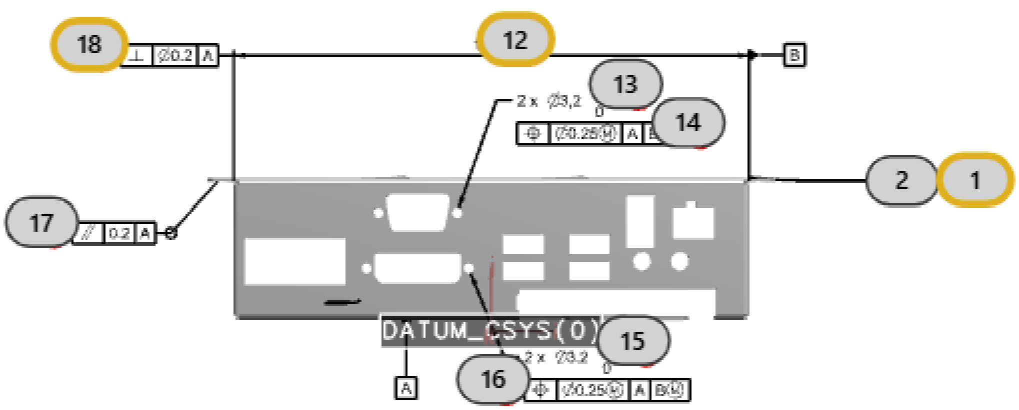
- View a table of the previous and revised values when you click a single modified balloon or select a single row in the table.



- Select multiple balloons using any of the following options:
  - Click **Select Balloons** > **Select All** to select all balloons.



- Click **Select Balloons** > **FAI Marked** to select only **FAI Marked** balloons. These balloons have a yellow border. It indicates that these balloons are marked for First Article Inspection (FAI). If you import **FAI Marked** balloons, then the **FAI Required** property is set to **True** in the generated Inspection Definitions.



- Click **Select Balloons** > **Modified** to select only modified balloons.
- Click **Select Balloons** > **New** to select only new balloons.
- Click **Select Balloons** > **Clear Selection** to clear any selections you have made.

- Update the referenced part revisions in the Inspection Definitions of non-modified balloons.

Safe Launch Control Plan

Starting this release, you can create a **Safe Launch** Control Plan in addition to Control Plans of the types **Prototype**, **Prelaunch**, **Production**, and **First Article Inspection (FAI)**.

The **Safe Launch** Control Plan is used to ensure that the product meets all quality standards and specifications before full-scale production begins. This plan involves heightened monitoring, increased inspection, and additional controls to identify and address any potential issues early in the production process. It helps to minimize the risk of costly recalls, rework, and customer dissatisfaction by addressing issues during the initial production phase.

Define the Dynamic Sampling Size for an Inspection Definition

Dynamic Sampling Size for an Inspection Definition is used to adjust the number of units inspected based on real-time quality performance and production conditions. In cases where the quality performance deteriorates or during critical production phases, you can *tighten*, that is, increase the number of units inspected. If the quality performance is stable and within acceptable limits, you can continue with a normal sampling size. If the quality performance is consistently high, the process is stable, and the risk of defects is low, you can *reduce* the sampling size, that is decrease the number of units inspected.

Dynamic Sampling Guideline is used to define the sample size to be used for different inspection scenarios of **Normal**, **Tightened**, and **Reduced** inspections. You can also create a **Switching Rules Guideline** to define the rules that must be followed during the inspection for switching between the different inspection scenarios.

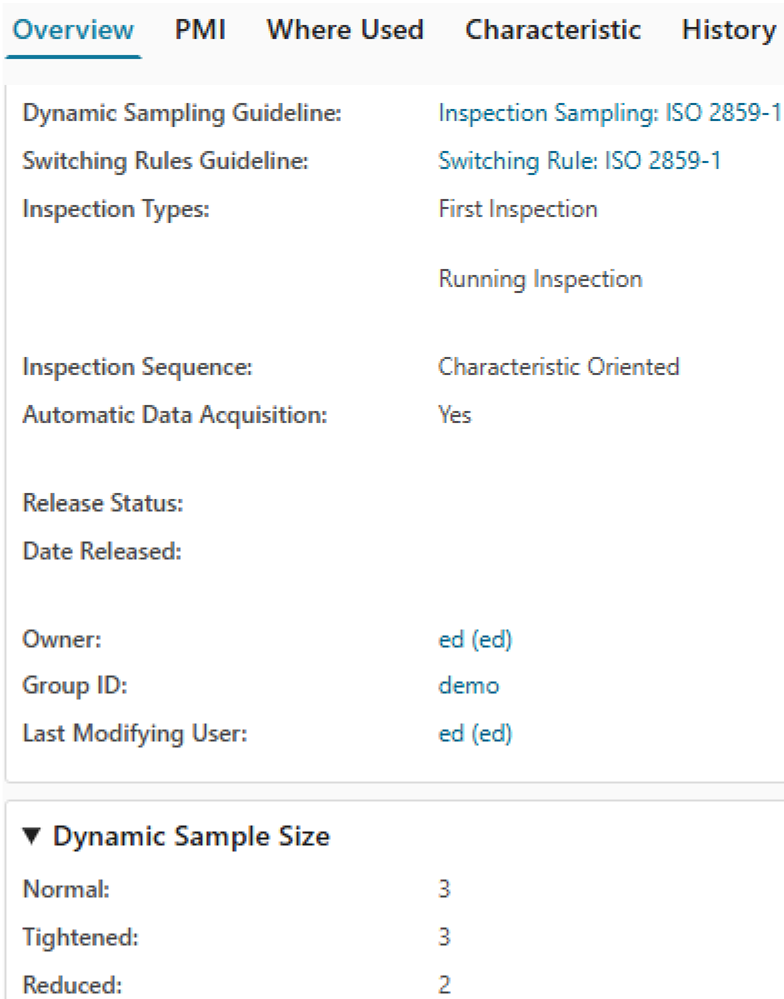
Starting this release, you can create a **Dynamic Sampling Guideline** to define the sample size that must be used for different inspection scenarios: **Normal**, **Tightened**, and **Reduced**. You can also create a **Switching Rules Guideline** to define the rules that must be followed for switching between the scenarios during the inspection.

You can assign these guidelines to an entire Control Plan or an individual Inspection Definition. When you assign **Dynamic Sampling Guideline** and **Switching Rules Guideline** to a Control Plan, and submit the Control Plan to the **Assign Guidelines to the Control Plan structure** workflow, the same guideline is set for each individual Inspection Definition of the Control Plan. You can also define **Dynamic Sampling Guideline** and **Switching Rules Guideline** for each inspection definition separately.

Note:

By default, the following guidelines are available:

- **Dynamic Sampling Guideline**: Inspection Sampling: ISO 2859-1
- **Switching Rules Guideline**: Switching Rule: ISO 2859-1



Inspection Definitions enhancements in Control Plan

Starting this release, you can specify the type of inspection for an Inspection Definition. The four types available are **First Inspection**, **Running Inspection**, **Review Inspection**, and **Final Inspection**.

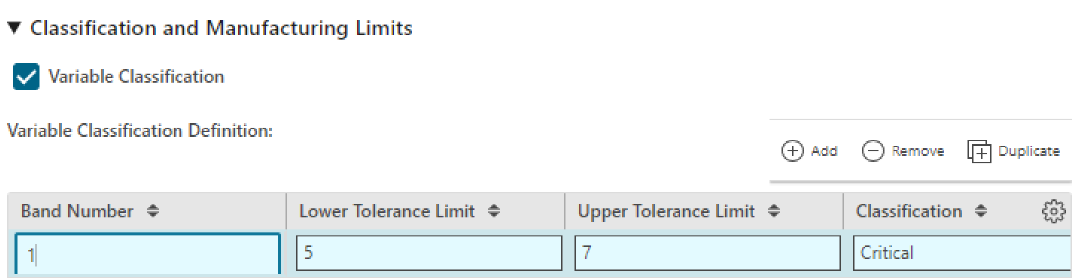
You can also specify the order and method by which inspections are conducted for an Inspection Definition. They can be **Part Oriented**, **Characteristic Oriented**, or **Part & Characteristic Oriented**.

In addition, you can define if the inspection process involves the automated collection and recording of inspection data for an Inspection Definition.

Finally, you can create a quality action from a template and assign it as a Reaction Plan for an Inspection Definition.

Usability enhancements in Control Plan

Starting this release, you can define additional properties for a Variable Quality Characteristic, including upper and lower specification limits, single limit tolerance, and control and warning limits. You can also assign a classification or a variable classification to the quality characteristic.

Property	Description
Upper Specification Limit	Maximum acceptable value for a specific quality attribute or measurement of a product or process
Lower Specification Limit	Minimum acceptable value for a specific quality attribute or measurement of a product or process
Single Limit Tolerance	**Single Limit Tolerance** is a tolerance specification that defines the highest or lowest acceptable value for the Quality Characteristic. A measurement that exceeds this limit is considered out of tolerance and unacceptable. Select this type of limitation to assign a **Maximum** or **Minimum** tolerance limit to the Quality Characteristic.
Classification	Assign a classification to the Quality Characteristic. If you define a **Variable Classification** for the Quality Characteristic, this field is hidden.
Variable Classification	Assign **Variable Classification** to define a range of continuous values for the classification of the Quality Characteristic. You can define the **Upper Tolerance Limit** and **Lower Tolerance Limit** for a type of classification. 
Control Limits	Control limits help identify the range of acceptable variation in the product or process. Specify the highest and lowest values that a product or process variable can reach before it is considered out of control in **Upper Control Limit** and **Lower Control Limit** respectively.
Warning Limits	Warning limits provide an early indication of potential issues. They allow for proactive measures to be taken before the process goes out of control. Specify the highest and lowest values that a product or process variable can reach before it indicates potential issues might occur in **Upper Warning Limit** and **Lower Warning Limit** respectively.

In addition, you can add attachments and remote links to a Control Plan and add attachments to Variable, Attributive, and Visual Quality Characteristics.

FMEA

Enable multi-line display for FMEA object names

Business users can now view an FMEA object's complete name within a node.

As the administrator, to enable this, you must set the value of the **Qfm0FMEA_NetView_MultilineEllipsis** preference to **true**.

Personalize the views for system elements, functions, and failures

You can now personalize the view displayed for each FMEA node, such as a system element, function, or failure, in the net view.

Configure the parameters in the net view settings

As an administrator, you can configure the FMEA elements available in the Net View Settings panel. These include net views and templates.

Enhancements to the net view

The following enhancements have been made to the net view. Starting this release, you can:

- Highlight the immediate connections or entire path.
- Pin a net view in a separate floating panel.
- Sort function and failure analysis items in the net view by order number or tree hierarchy.
- Select corresponding higher or lower level nodes to move.

Problem Solving

Implement project security in Problem Solving and Quality Issues

To ensure that only authorized quality engineers have access to their Problem Solving processes and issues, you can now configure project security specifically for Problem Solving and Quality Issues. This enhancement provides better control over who can view and edit critical quality-related data. Previously, when a quality engineer created a Problem Solving process or issue, all users could view and edit these objects.

With the implementation of project security, only members of the assigned programs and projects can view and edit Problem Solving processes and issues, along with their related objects. These related objects include:

- Problem definition defects
- Defects
- 5Whys
- Why questions
- Child Why questions
- Ishikawa diagrams
- Ishikawa causes
- Child causes
- Quality actions

Users who are not part of the assigned programs and projects can only view these objects, ensuring that sensitive information is protected. To implement project security, you must create a project or a program and assign the relevant quality engineers to their associated projects. You can assign a project either when you create a Problem Solving process or issue or you can assign a project later on.

> Note:
>
> If you have derived a Problem Solving process from an issue, the project security is applicable to the source issue and to the derived Problem Solving process.

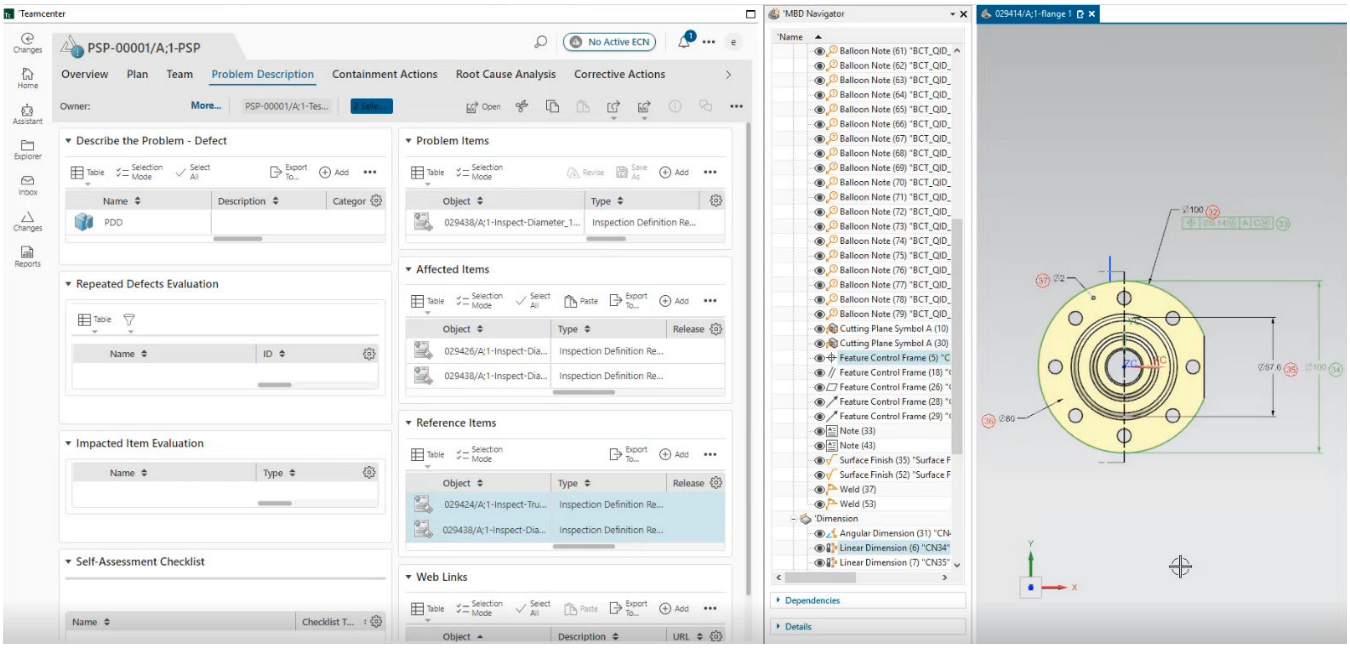
Share a Problem Solving process with other sites in a Multi-Site Collaboration network

When addressing a Problem Solving process in a Multi-Site Collaboration network, you may identify valuable lessons learned that must be shared with other sites. In such cases, starting this release you can share this information with the relevant sites for them to implement the same, and avoid similar Problem Solving processes in their site. Additionally, if you determine that a reported Problem Solving process impacts or is owned by another site (for example, when the same product or part is manufactured at multiple locations), you can transfer the Problem Solving process to the appropriate site for them to perform the necessary actions.

To do this, you must first publish it to the required sites. Then, specify additional sharing details, such as the destination sites and several transfer options, and share the Problem Solving process.

Cross-probing of Problem Solving PMI in Active Workspace embedded in NX

Starting this release, when working on a Problem Solving process in **Active Workspace** embedded in NX, you can cross-probe between the PMI in the graphics window in NX, the **Model-Based Definition (MBD) Navigator** in NX, and the Inspection Definitions added as problem items, affected items, and reference items in the **Problem Description** tab of a Problem Solving process. With cross-probing, you can select an object in one application, resulting in the corresponding object being selected in other applications. When you select an Inspection Definition, its corresponding dimension is highlighted in the graphics window, which allows you to identify the dimension related to the Inspection Definition.



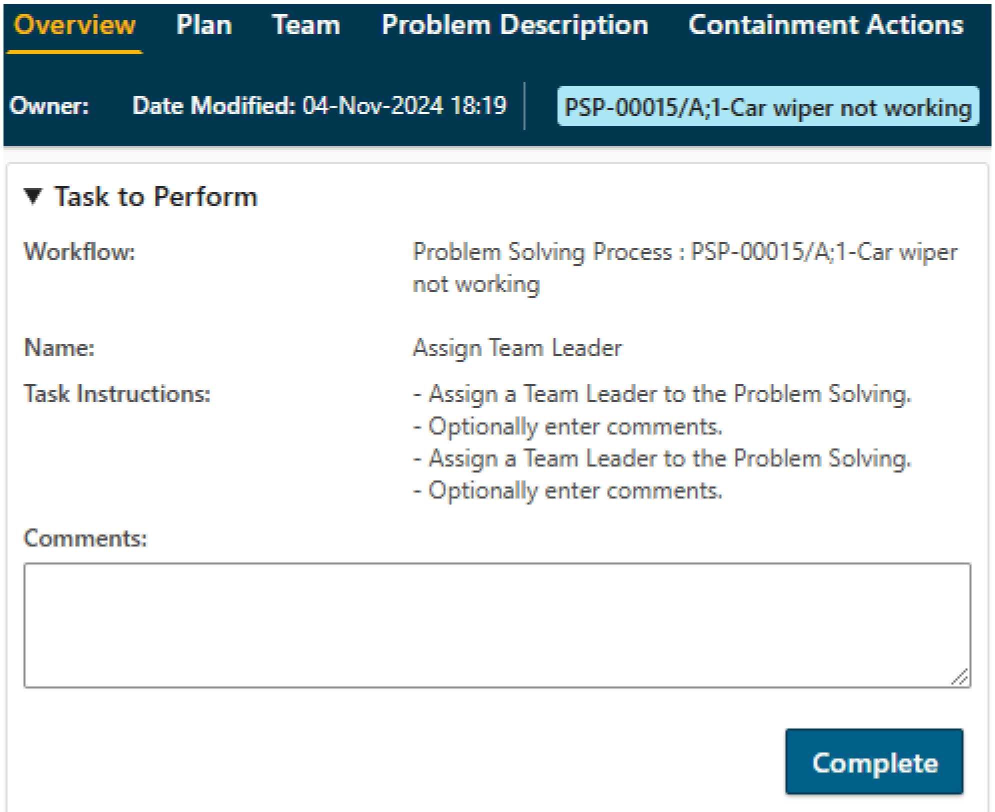
Usability enhancements in Problem Solving

Starting this release, the following enhancements are available:

- Assign resources and answer the questions or subquestions for multiple questions and subquestions at a time in a checklist assigned to a Problem Solving process. You can also edit the checklist to make a question or subquestion, as well as its assessment, mandatory or optional, specify the status of a question or subquestion, and enter your comments. If a checklist, chapter, question, or subquestion is not required, you can delete it.

- View defects, 5Whys, and Ishikawas in the Root Cause Analysis tree structure in the order in which they are created. When you add causes to an Ishikawa, the causes are grouped according to their cause group, and they appear in the order of creation. Cause groups are displayed according to the order defined in the parent Ishikawa.

- Track the progress of the tasks when you submit a Problem Solving process to the **Problem Solving Process** workflow. You can view all the information about the immediate task to be performed in the workflow in the **Task to Perform** section.



- View associated part drawings of the Inspection Definitions added to an issue as problem items, affected items, or reference items in the **PMI Preview** section of the **Problem Description** tab.

Generate different types of reports for a Problem Solving process

Starting this release, you can generate different types of reports for a Problem Solving process. You can generate a **Problem Solving Report** as a PDF file using the **AWC_Problem_Solving_Report_pdf.xsl** style sheet. You can also export Problem Solving active summary reports as a Microsoft Excel file, and choose which properties are exported.

You can generate these different types of reports:

Generate this report	To view this information
Problem Solving Audit Trail	A comprehensive, chronological record of all Problem Solving activities, decisions, and actions taken to address issues within a project or process. This report includes detailed events such as attach, detach, modify, save as a copy, and Problem Solving-specific actions such as marking an issue as the root cause.
Workflow Audit	The workflow steps performed on a Problem Solving process and the events and remarks captured in the workflow steps.
5Why Root Cause Analysis	A summary of the 5Why, Why questions, and the root causes identified by using 5Why.

Generate this report	To view this information
Ishikawa Root Cause Analysis	A summary of the Ishikawa, Ishikawa causes, and the root causes identified by using Ishikawa.
Defect Root Cause Analysis	A summary of the defects and the root causes identified by using defects.

Disable the Due Date verification rule for associated quality actions and checklists

By default, when quality engineers assign a **Due Date** to the associated quality actions and checklists, they must ensure that the date is set no later than the due date of the parent Problem Solving process or issue. If your organization does not implement this verification rule, you, as an administrator, can disable it for Problem Solving processes or issues.

Quality Actions

Collaborate on actions and reminders across multiple sites

Starting this release, you can use the Multi-Site Collaboration network to share quality actions and reminders across different sites. This allows you to collaborate with teams dispersed globally and assign them the required quality actions. Additionally, to maintain data privacy, you can share only the relevant information.

Quality Audit

Collaborate on audit and audit plans across multiple sites

Starting this release, you can use the Multi-Site Collaboration network to share audits and audit plans across different sites. This allows you to collaborate with teams dispersed across globally and assign them the required quality audit and plan with them. Additionally, to maintain data privacy, you can share only the relevant information.

Quality Issue Management

Implement project security in Problem Solving and Quality Issues

To ensure that only authorized quality engineers have access to their Problem Solving processes and issues, you can now configure project security specifically for Problem Solving and Quality Issues. This enhancement provides better control over who can view and edit critical quality-related data. Previously, when a quality engineer created a Problem Solving process or issue, all users could view and edit these objects.

With the implementation of project security, only members of the assigned programs and projects can view and edit Problem Solving processes and issues, along with their related objects. These related objects include:

- Problem definition defects
- Defects
- 5Whys
- Why questions
- Child Why questions
- Ishikawa diagrams
- Ishikawa causes
- Child causes
- Quality actions

Users who are not part of the assigned programs and projects can only view these objects, ensuring that sensitive information is protected. To implement project security, you must create a project or a program and assign the relevant quality engineers to their associated projects. You can assign a project either when you create a Problem Solving process or issue or you can assign a project later on.

> Note:
>
> If you have derived a Problem Solving process from an issue, the project security is applicable to the source issue and to the derived Problem Solving process.

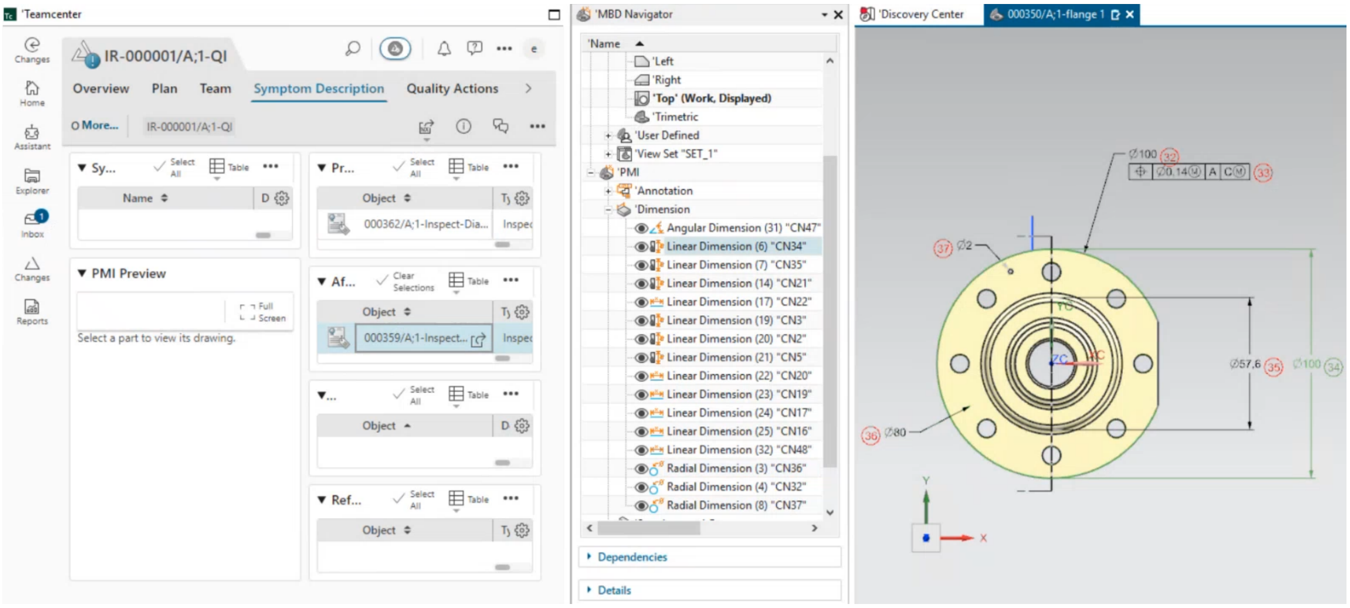
Share an issue with other sites in a Multi-Site Collaboration network

When addressing an issue in a Multi-Site Collaboration network, you may identify valuable lessons learned that must be shared with other sites. In such cases, starting this release you can share this information with the relevant sites for them to implement the same, and avoid similar issues in their site. Additionally, if you determine that a reported issue impacts or is owned by another site (for example, when the same product or part is manufactured at multiple locations), you can transfer the issue to the appropriate site for them to perform the necessary actions.

To do this, you must first publish it to the required sites. Then, specify additional sharing details, such as the destination sites and several transfer options, and share the issue.

Cross-probing of Quality Issues PMI in Active Workspace embedded in NX

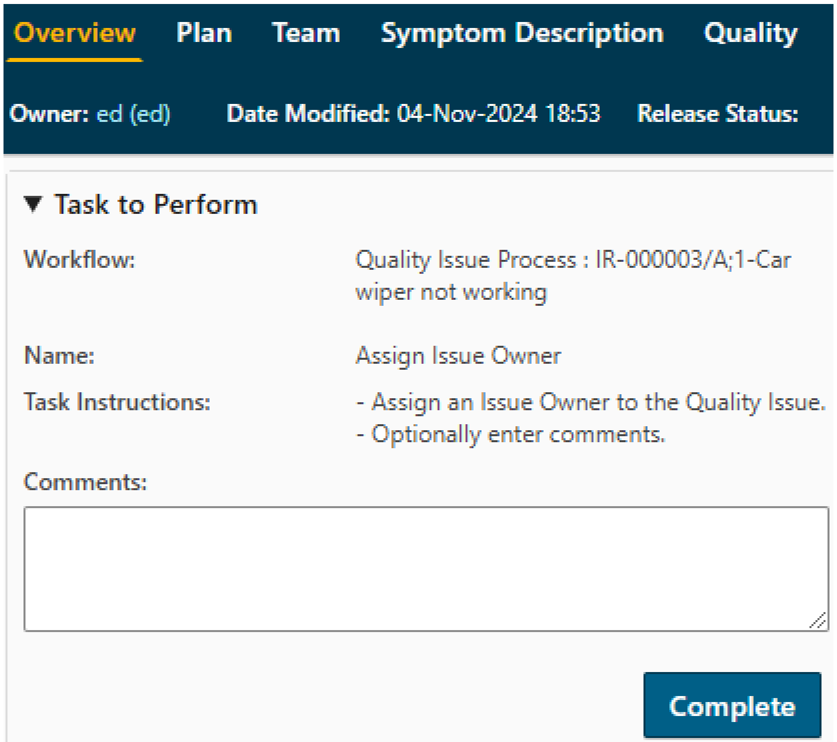
Starting this release, when working on an issue in **Active Workspace** embedded in NX, you can cross-probe between the PMI in the graphics window in NX, the **Model-Based Definition (MBD) Navigator** in NX, and the Inspection Definitions added as problem items, affected items, and reference items in the **Symptom Description** tab of an issue. With cross-probing, you can select an object in one application, resulting in the corresponding object being selected in other applications. When you select an Inspection Definition, its corresponding dimension is highlighted in the graphics window, which allows you to identify the dimension related to the Inspection Definition.



Usability enhancements in Quality Issues

Starting this release, the following enhancements are available:

- Track the progress of completing the tasks in the workflow when you submit an issue to the **Quality Issue Process** workflow. You can view all the information about the immediate task to be performed in the workflow in the **Task to Perform** section.



- View associated part drawings of the Inspection Definitions added to an issue as problem items, affected items, or reference items in the **PMI Preview** section of the **Symptom Description** tab.

Generate different types of reports for an issue

Starting this release, you can generate different types of reports for an issue. You can generate an issue report as a PDF file by using the following style sheets:

Type of report	Associated style sheets
Customer Complaint Issue Report	AWC_Customer_Complaint_Report_pdf.xsl
Non-Conformance Issue Report	AWC_Non_Conformance_Report_pdf.xsl
Quality Issue Report	AWC_Quality_Issue_Report_pdf.xsl

You can also export Quality Issues active summary reports as a Microsoft Excel file, and choose which properties are exported.

You can generate these different types of reports:

Generate this report	To view this information
Quality Issue Audit Trail	A comprehensive, chronological record of all issue activities, decisions, and actions taken to address issues within a project or process. This report includes detailed events such as attach, detach, modify, and save as a copy.
Workflow Audit	The workflow steps performed on an issue and the events and remarks captured in the workflow steps.

Disable the Due Date verification rule for associated quality actions and checklists

By default, when quality engineers assign a **Due Date** to the associated quality actions and checklists, they must ensure that the date is set no later than the due date of the parent Problem Solving process or issue. If your organization does not implement this verification rule, you, as an administrator, can disable it for Problem Solving processes or issues.

Training and Qualification

Enhanced control for assigning Training and Qualification objects

Previously, you could view all available Training and Qualification objects when assigning them to other objects.

Now, as an administrator, you can configure which custom objects are available for assignment to specific custom objects, ensuring that only the necessary items are displayed.

29. Visualization

New features for base

Improved experience for using a volume

Active Workspace

In Active Workspace, you can select parts using a volume, and you can adjust and manipulate a defined volume.

Starting this release, the following improvements have been made:

- You can right-click inside a volume and, from the context menu, select **Contains Only** to select parts that are completely inside the volume. You can also right-click inside a volume and select **Intersecting** to select parts that are contained by or intersect with the volume.

- You can drag a face of the volume to translate the box parallel to that face.

Viewing visual reports

Active Workspace

You can now create visual reports in standalone Lifecycle Visualization and save them as Collaborative Sessions or Product Snapshots that Active Workspace users can view.

Viewer improvements

Active Workspace

Starting this release, the viewer has an improved experience for viewing parts.

- You can specify the amount of time that the cursor must be motionless over a component before it is highlighted in the viewer. The purpose of the delay is to avoid or minimize the flickering effect that can occur when dragging your cursor over parts. It also ensures that the cursor must stop moving for the amount of time specified before a part is highlighted.

- You can adjust the lighting intensity for parts to provide optimal viewing as you work with your products in the 3D viewer.

Translate to surface point

Active Workspace

Starting this release, you can translate an existing section plane to pass through a point on a model by picking that point on the model surface.

Acknowledging security markings in the client-side rendering mode

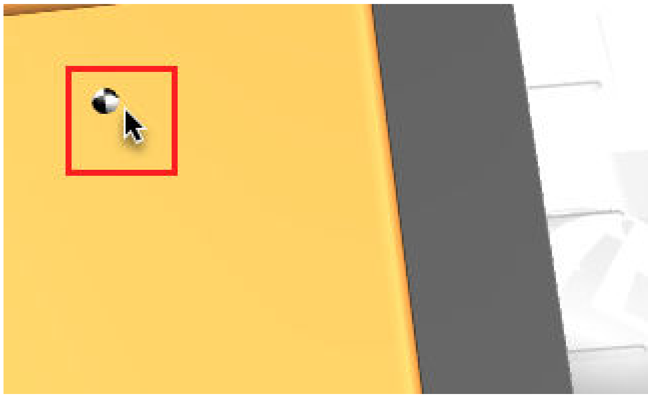
Active Workspace

When a part or assembly component has an NX-authored security marking and you display the part in the viewer, an acknowledgment dialog box appears. Earlier, you had to use the server-side rendering mode for the model to load in the viewer after acknowledging the marking. Now, you can load and display the model in the viewer after acknowledging the marking in the client-side rendering mode.

Rotate around a point on a model

Teamcenter

Beginning in this release, you can select a point on a model as the point of rotation. After you select the point of rotation, moving the mouse rotates the model around the selected point. In previous releases, models rotated around the center of the visible model parts.

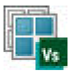


Manage AppSessions in Teamcenter

Teamcenter and Active Workspace

AppSessions may now be managed in Teamcenter, as well as in Lifecycle Visualization, even if the session contains Lifecycle Visualization-specific functionality. The new functionality includes the following:

- Users can now save a multi-document session as an AppSession in Lifecycle Visualization and manage that session in another Teamcenter application, such as Active Workspace or NX. However, multi-document sessions can only be opened and viewed in Lifecycle Visualization.
- AppSessions that contain Lifecycle Visualization-specific functionality appear in Teamcenter applications with the following icon:



New features for professional

Photorealistic digital twin visualization and visual environments

Active Workspace

You can use Active Workspace lifecycle visualization Digital Reality viewer to visualize your photorealistic digital twin and visual environments using NVIDIA Omniverse in Teamcenter.

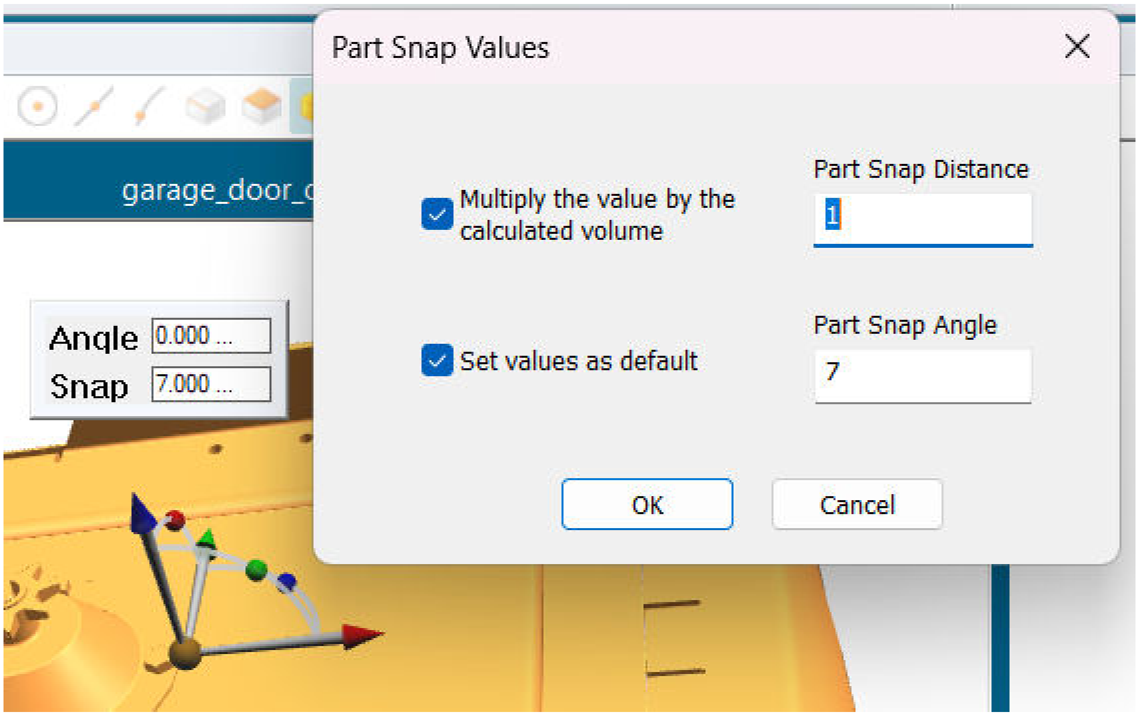
Starting this release:

- You can share a model from Active Workspace to the NVIDIA Omniverse empowered Digital Reality viewer and interact with your model in a high quality visualization environment.
- You can visualize your digital twin in various settings to better understand its appearance and behavior in different contexts by changing the visual environment.

Define default snap values for the manipulator

Teamcenter

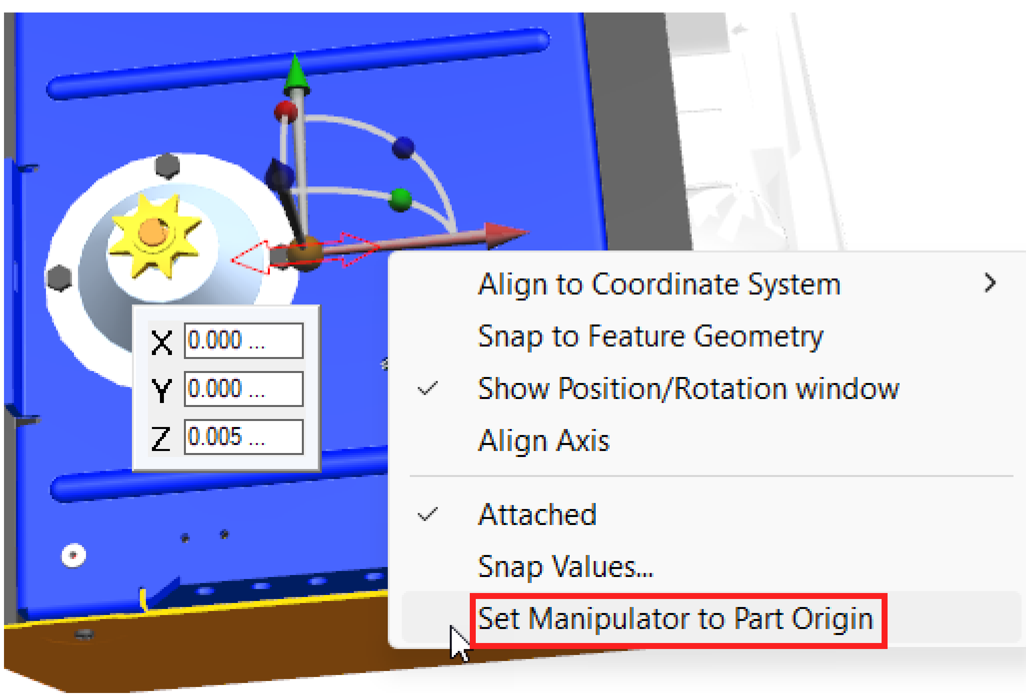
Previously, the snap value of the part manipulator was dependent on the proportion of the part. Now, when manipulating parts with similar dimensions, the **Part Snap Values** dialog box helps you define the default distance and angle snap values with less effort. The values set in the dialog box are applied to all parts.



Position the part manipulator at the part origin

Teamcenter

In previous releases, when the part manipulator was added, it was positioned at the center of the part's bounding box. Beginning in this release, you can move the manipulator to the part's origin.



New features for mockup

Improved volume filter

Active Workspace

Starting this release, from the Volume panel, you can specify or edit the minimum and maximum values of the **Target Volume Coordinates**. To do so, drag the corners or edges of the frame to resize the volume, or drag a face of the volume to translate the box parallel to that face.

Add or remove custom data for clearance results

Active Workspace

Starting this release, customer-defined data can be dynamically added to the list of Available Columns for the Clearance results table. In addition to the static columns that users could already add or remove, users can now also add or remove any custom data configured for the product they are viewing.

ClearanceDB with Active Workspace client

Active Workspace

Previously, the ClearanceDB client was Visualization Mock Up. Starting this release, the new ClearanceDB client is Active Workspace. The ClearanceDB with Active Workspace client uses a webservice to connect to the ClearanceDB.

Automatically update existing product IDs to use ClearanceDB in Active Workspace

Teamcenter and Active Workspace

To view clearance results in Active Workspace, you must specify the clone stable ID for the BOMwriter to include in the generated .plmxml file. In earlier releases this process was completed manually. Beginning in this release, ClearanceDB administrators can run the *update_ngids.pl* utility for each product to automatically update the product data IDs.

Clearance distance line improvements

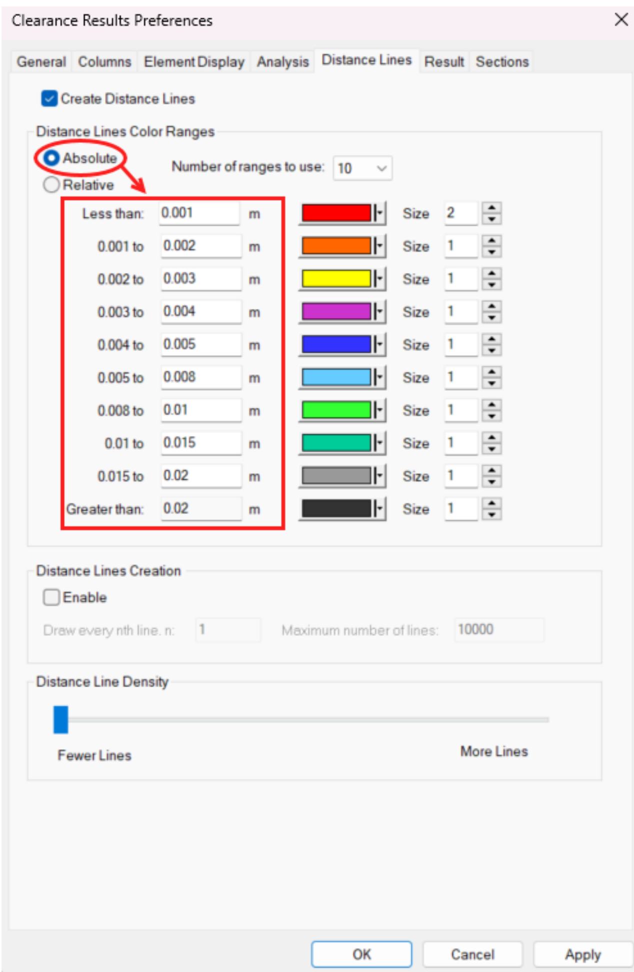
Teamcenter

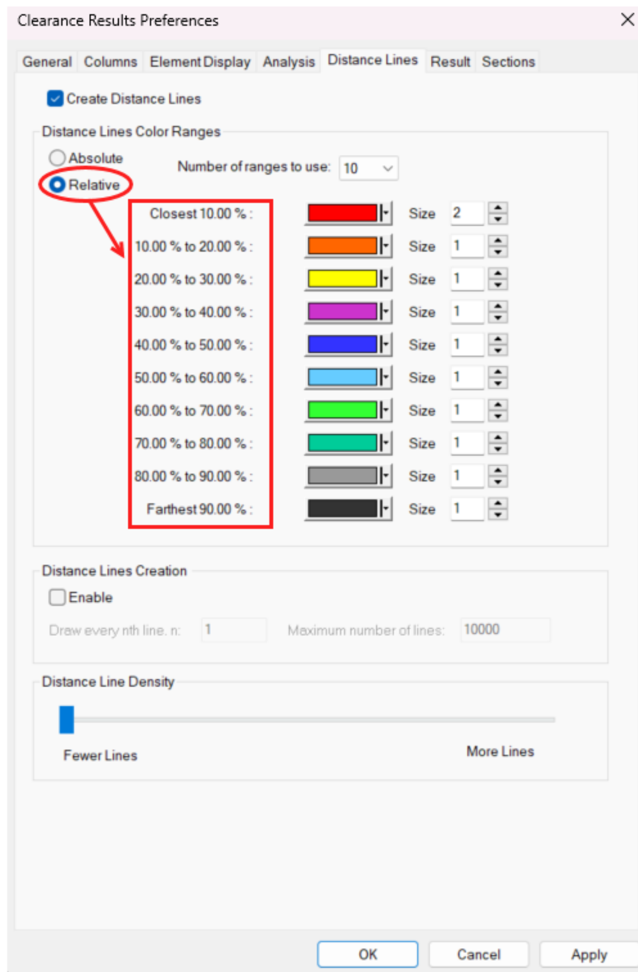
The following improvements have been made to Clearance distance lines:

- The **Create Distance Lines during element pair analysis** check box is now located on the Distance Lines page of the **Clearance Results Preferences** dialog box. In addition, the **Analyze** check box on the Analysis page does not need to be selected prior to selecting **Create Distance Lines during element pair analysis**.

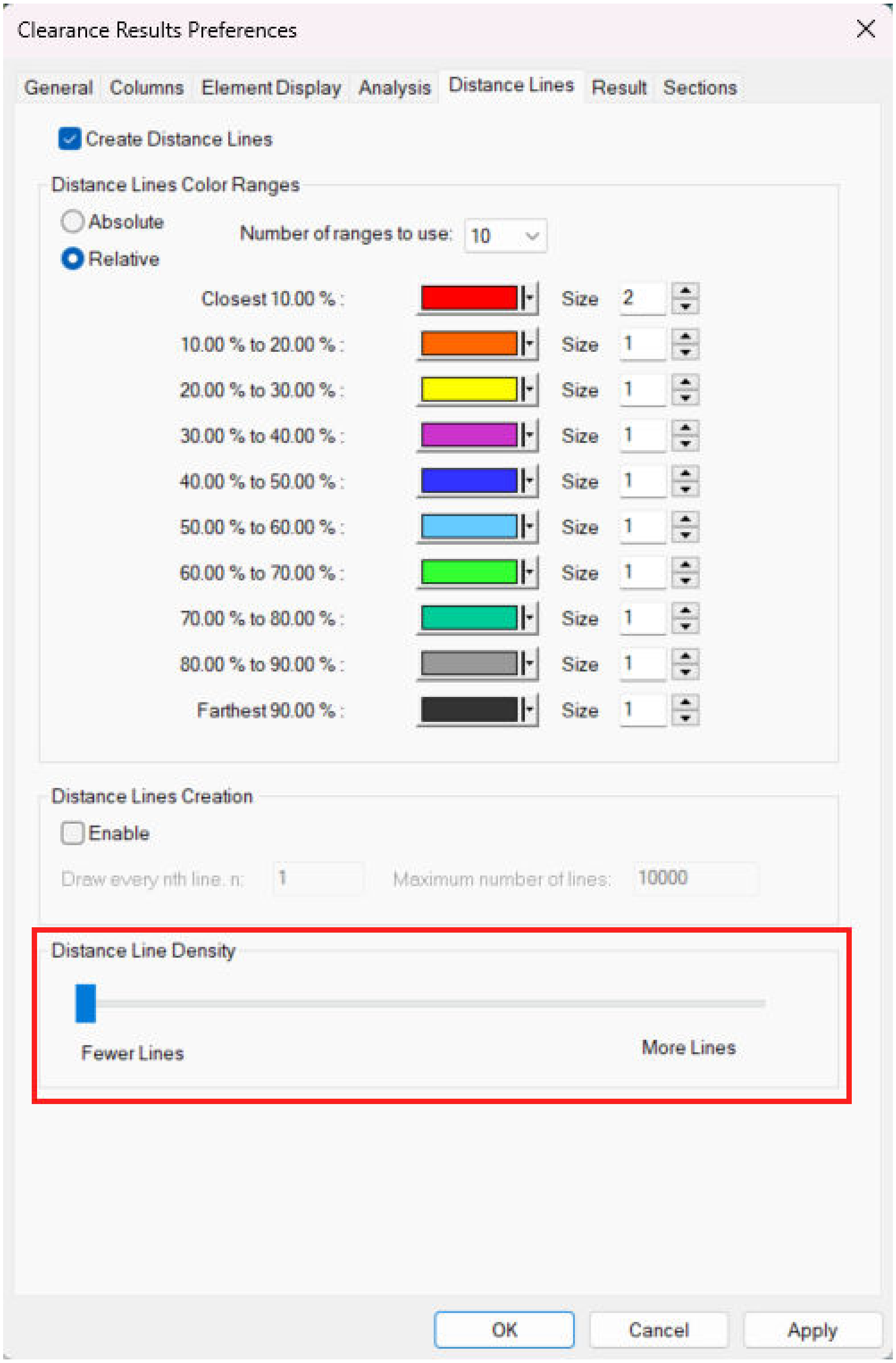
- Clearance distance lines no longer need to be adjusted separately for each part pair. Beginning in this release, all areas where the distance between two parts is below the defined minimum clearance value is indicated with a distance line, if distance lines are being used.

- In earlier versions of Teamcenter lifecycle visualization, Clearance distance line ranges were absolute values. For example, less than 40 mm, 40-75 mm, or greater than 75 mm. Now, users can choose distance line ranges as either absolute values or relative values. Relative distance line ranges contain values relative to the distance requirement, for example, less than 50% of the distance requirement, between 50-70% of the distance requirement, or above 70% of the distance requirement. This functionality allows the user to determine the ranges without needing to adjust them for every part pair.





- Use the slider in the new **Distance Line Density** section to determine the density of distance lines that display after analysis.


Clearance Results Preferences
General
Columns
Element Display
Analysis
Distance Lines
Result
Sections
Create Distance Lines
Distance Lines Color Ranges
Absolute
Relative
Number of ranges to use:
10
Closest 10.00 % :
10.00 % to 20.00 % :
20.00 % to 30.00 % :
30.00 % to 40.00 % :
40.00 % to 50.00 % :
50.00 % to 60.00 % :
60.00 % to 70.00 % :
70.00 % to 80.00 % :
80.00 % to 90.00 % :
Farthest 90.00 % :
Size
Distance Lines Creation
Enable
Draw every nth line. n:
Maximum number of lines:
10000
Distance Line Density
Fewer Lines
More Lines
OK
Cancel
Apply

Using variant criteria in Clearance

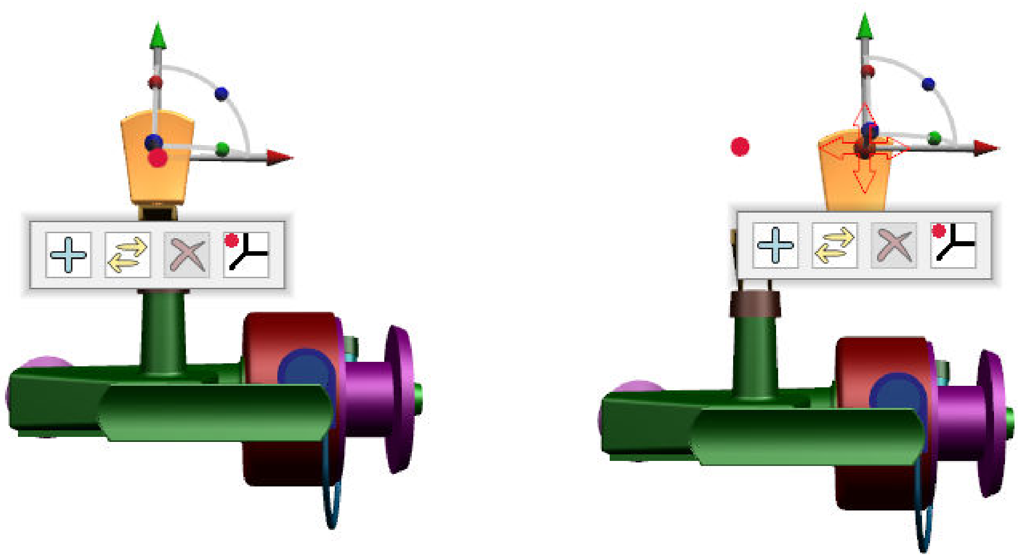
Teamcenter

Beginning in this release, Clearance now supports Product Configurator variant criteria, as well as variant rules, in variant-based clearance analysis.

Change the manipulator's position relative to a part

Teamcenter

When manipulating a model in **Path Editor**, you can now change the manipulator's position relative to a part. This action changes the lever used to manipulate the model. Use the **Detach** option on the **Path Editor** Toolbar to detach the manipulator from the selected part. Use the **Attach** option to reattach the manipulator to the part.



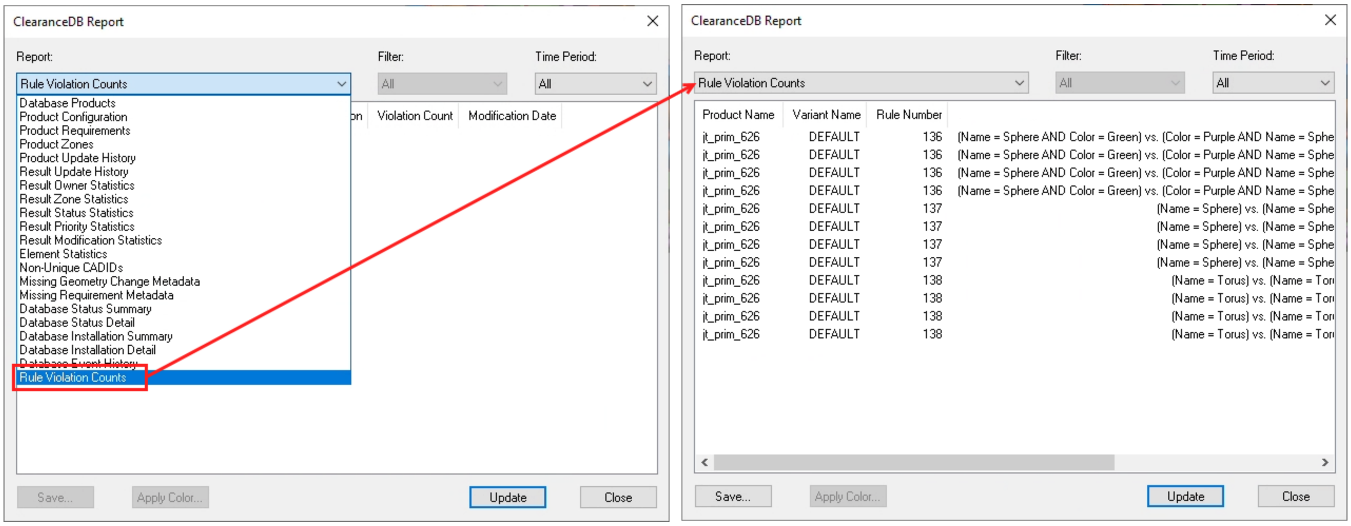
Use ClearanceDB rule categories and rule violation count report

Teamcenter

Beginning in this release, Clearance supports rule violation counts using rule categories.

- ClearanceDB System Administrators can create user-defined rule categories and associate Clearance rules with these categories. Rule categories cause the rule result counts to be stored in the Clearance database.

- The end user can view the stored rule result counts in the new **Rule Violation Counts** report. Use the report to track rule result counts and corrective progress against rule violations.



30. Workflow

Edit the list of approvers until a task has been fully approved

Previously, you could not edit or remove approvers once a workflow was started.

Now, you can update the list of approvers and reviewers as needed to ensure a workflow's accuracy and timeliness, including the ability to replace and remove reviewers.

Enable reauthentication before task completion in TCSS with SSO environments

To enhance security and meet any regulatory requirements, administrators can now enable user reauthentication before task completion in TCSS with SSO environments.