TEAMCENTER

Multi-Structure Management

Teamcenter 2412

SIEMENS

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Multi-Structure Manager preferences

1. Getting started with Multi-Structure Manager

Getting started with Multi-Structure Manager

Multi-Structure Manager allows you to manage any of the structure types compatible with Teamcenter, including product structures and manufacturing process structures.

In the Multi-Structure Manager application, you can:

- Collect a subset of data for comparison and analysis purposes, such as for a design study. You can copy components (for example, piece parts or assemblies) from a base structure into a design study, called a *composition*, where you can add new parts and experiment without changing the original base structure. You can analyze any changes before committing them. Links are maintained from components placed in the design study back to the original base structure. Any changes in configuration (revision or variant rule) in the base structure are reflected in the design study. Because a composition can collect components from different structures, you can use these to design interface parts such as a mounting bracket that attaches one product to another.

- Capture the state of any structure or part of a structure for subsequent retrieval and viewing. This captured data does not represent the final released state of the structure, so it is referred to as an intermediate data capture (IDC). The configuration rules are saved with the structure allowing its exact state at the time of capture to be reproduced each time it is retrieved. Creating an IDC does not affect any subsequent changes to the structure or its release by a Workflow process. The captured data is independent of subsequent changes made to the structure or part.

- Collect a subset of data to send to an external application, for example, Tecnomatix, NX, or third-party applications. Because Multi-Structure Manager allows the configuration (revision and variant) to be stored with the structure, this configuration is passed along with the structure to the external application.

- Open multiple BOM structures, configure these as you would in Structure Manager, perform an accountability check and then save all of this to a collaboration context.

Your Teamcenter administrator may customize the functionality of your particular collaboration context.

Before you begin

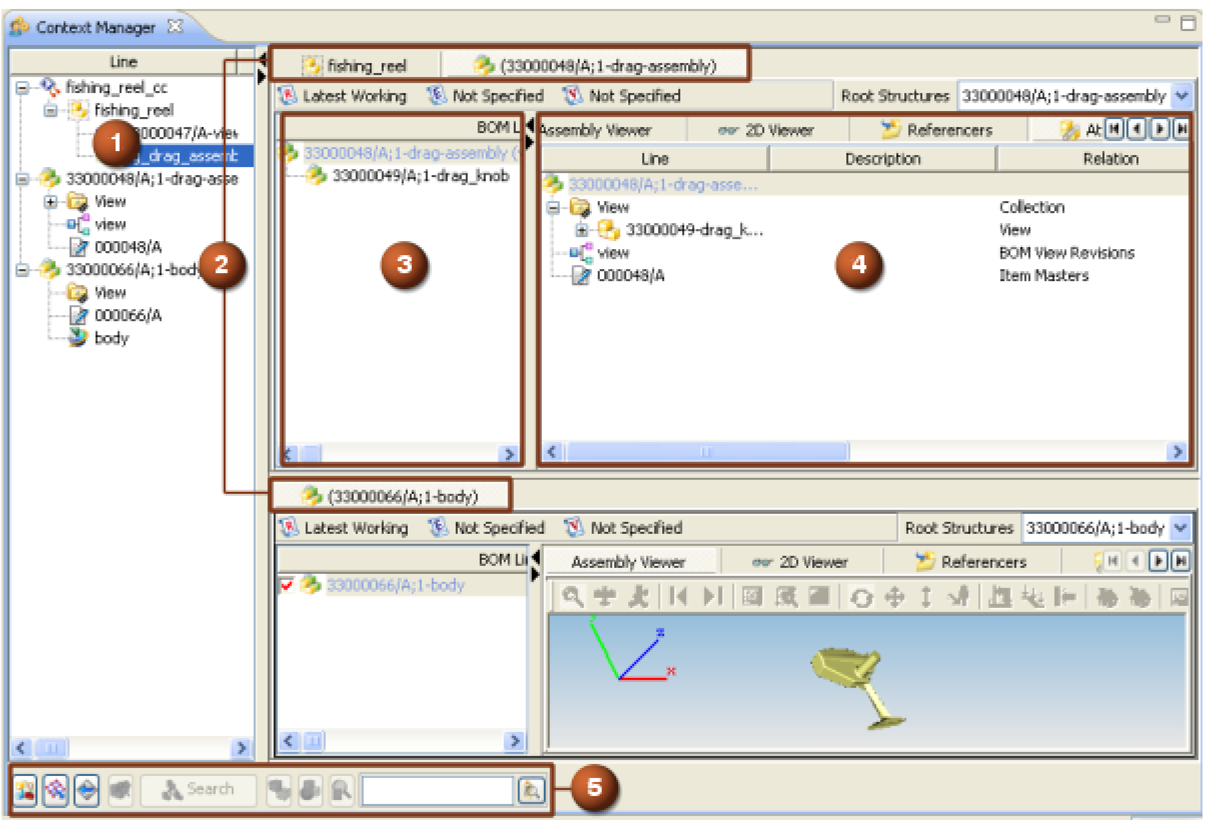
Prerequisites	You do not need any special permissions to use the Multi-Structure Manager application.
Enable Multi-Structure Manager	Multi-Structure Manager does not need to be enabled before you use it. If you have trouble accessing Multi-Structure Manager, see your system administrator; it may be a licensing issue.

> Note:
>
> You can log on to Teamcenter only once. If you try to log on to more than one workstation at a time, you see an error message.

Configure Multi-Structure Manager	Multi-Structure Manager does not need to be configured.
Start Multi-Structure Manager	Click **Multi-Structure Manager** in the navigation pane. You can also launch the application by opening an existing collaboration context.

Multi-Structure Manager interface

Multi-Structure Manager interface overview



1	Collaboration pane	Shows all open structures in the application.
2	Structure tabs	Shows each structure that is currently open. The tab can contain a product, process, plant, or structure context. You can open multiple structures at once, including multiple

		products, processes or plants. Each of these structures is displayed on a different tab.
3	Structure pane	Displays all the information pertaining to a structure. You can split the structure pane into two panes. Each of these contains a structure pane and data tabs pertaining to the selected structure. You can align these panes both vertically and horizontally.
4	Data pane	Displays information about the attributes and relations of the object selected in the structure pane. The tabs displayed depend on the structure tab selected and the type of object selected in the structure.
5	Search area	Allows you to search for any structure in the database.

Multi-Structure Manager menus

Menu command	Purpose
File→New→Collaboration Context	Allows you to create a new collaboration context.
File→New→Structure Context	Allows you to create a new structure context, which may optionally be associated with a collaboration context. The types of structure that you can create are defined by your administrator with the Business Modeler IDE application.
File→New→Configuration Context	Allows you to create a new configuration context, which determines the configuration of the structure to which it is attached.
File→New→Occurrence Group	Allows you to create a new occurrence group and add it to the current structure context or to the currently selected occurrence group. This menu command is available only if you select a structure context in the collaboration pane or a structure pane is open with no object currently selected.
File→New→From Template→Item From Template	Creates a new item from an existing one.
File→New→Item	Inserts an item into the currently selected structure.
File→New→Part	Creates a new part.
File→New→Design	Creates a new design, that is, a CAD representation of a part or assembly.
File→New→Snapshot	Creates a snapshot of the selected structure.

Menu command	Purpose
File→New→Folder	Allows you to attach a folder to an object in the structure context. This menu command is available only in the collaboration and attachments panes.
File→New→Dataset	Allows you to attach a dataset to an object in the structure context. This menu command is available only in the collaboration and attachments panes.
File→New→Form	Allows you to attach a form to an object in the structure context. This menu command is available only in the collaboration and attachments panes.
File→New→BOM View Revision	Allows you to attach a BOM view revision (BVR) to an object in the structure context. This menu command is available only in the collaboration and attachments panes.
File→New→Item Element	Creates objects to represent design or manufacturing features that are not defined as part of the physical structure in the BOM. Features are implemented as item elements, sometimes called general design elements (GDEs). For information about specific item element feature types, see the appropriate application documentation.
File→New→Non-Revisable	Creates a new nonrevisable **Tc Link** connection (for example, connection or datum point connection).
File→New→Revisable	Creates a new revisable **Tc Link** connection (for example, connection or datum point connection).
File→New→Workflow Process	Creates a new workflow process with attachments, an associated process template and the ability to assign tasks to specific users.
File→New→URL	Allows you to attach a URL to an object in the structure context. This menu command is available only in the collaboration and attachments panes.
File→New→Envelope	Allows you to attach an envelope to an object in the structure context. This menu command is available only in the collaboration and attachments panes.
File→Open	Opens the selected structure.
File→Open With	Selects with which tool an object is opened.
File→Save	Saves changes made in Multi-Structure Manager. For example, you must explicitly save any modifications to BOM view revisions.

Menu command	Purpose
File→Save As→Save as New Collaboration Context	Saves the current open objects as a new collaboration context.
File→Save As→Item(Revision)	Saves a selected item as a new item revision.
File→Save As→BOM View Revision	Saves a selected BOM view as a new BOM view.
File→Save As→Replace Assembly in Context	Creates a new MBOM substructure (kit) from an existing one, while preserving the alignment of items within the kit.
File→Revise	Revises the selected item.
File→Close	Closes the currently displayed structure.
File→Print	Views, prints, or saves information about the currently selected structure.
File→Print...	Views, prints or saves properties, textual information, graphics or information associated with the selected item.
File→Unload All	Removes all structures from the collaboration pane.
File→Exit	Ends your Multi-Structure Manager session.
Edit→Cut	Marks the selected lines for removal and copy their contents to the clipboard. Cut lines are only removed once pasted elsewhere in the product structure.
Edit→Copy	Copies the selected lines to the clipboard.
Edit→Paste	Pastes item revisions from the clipboard as components of the selected lines.
Edit→Delete	Deletes a single item or an item and all its children. Optionally, you can also remove any associated referenced objects. This command *permanently* removes any selected item from the structure *and* the database.
Edit→Paste Special	Pastes components on the clipboard to the selected assembly (line).
Edit→Paste Substitute	Pastes item revisions from the clipboard as substitutes for the selected (assembly) lines.
Edit→Replace	Replaces the selected line with the item revision or item element on the clipboard.
Edit→Replace...	Allows you to browse for an item revision to replace the selected line.

Menu command	Purpose
Edit→Split Occurrence	Divides an assembly or part represented by the selected line into two lines, and splits the quantity between them.
Edit→Insert Level	Creates an item and inserts it in the current structure as a new level below the selected line. The number of relative occurrences of the children is preserved.
Edit→Remove	Removes the selected lines from the product structure. Any child branches of the removed line can be removed or moved up to the next level. Data including occurrences notes and absolute occurrences attached to the removed line are lost.
Edit→Purge	Permanently removes old versions of a dataset from the database. You can select whether to purge all old versions or specific versions of a dataset.
Edit→Latest	Displays the latest versions of all datasets in a selected folder. The **Latest** menu command updates all version-0 datasets to reference the latest saved version in the database. This feature is useful in a network environment when multiple users are working on the same dataset.
Edit→Change Ownership	Changes ownership of one or more objects. Using the **Explore Selected Components** option, you can select component objects and attachments, such as datasets, forms, and part files for ownership change.
Edit→Toggle In Context Mode	Enables or disable editing in context mode, allowing creation of absolute occurrences for the selected assembly.
Edit→Toggle In Allocation Context Mode	Allows you to assign directional relationships between specific instances of an item revision in one product structure and one or more item revisions in a related structure.
Edit→Variant Condition	Creates a variant condition on the selected line.
Edit→Toggle Precise/Imprecise	Changes the precision of the selected assembly (line).
Edit→User Setting	Changes your group, role or volume assignments, also your application logging and journaling options.
Edit→Options	Changes user interface settings that affect all applications.
View→Refresh Window	Synchronizes the currently displayed product structure with the database. The displayed structure refreshes with changes that have been made in other sessions and saved since you loaded the currently displayed product structure.
View→Expand	Expands the substructure immediately below the selected lines.
View→Expand Below	Expands the complete substructure below the selected lines.

Menu command	Purpose
View→Expand Below...	Expands the substructure below the selected lines to a user-selected level. You can also collapse an expanded substructure when you choose this option (hide certain child lines).
View→Expand to Type	Expands the substructure below the selected lines to a user-selected type. For more information, see *Expand and collapse a structure*.
View→Collapse Below	Collapses the complete substructure below the selected lines (hide all child lines).
View→Show/Hide Occurrence Groups	Shows or hides any occurrence groups in the structure.
View→Pack	Packs the selected lines so that all lines with the same item revision and find number are displayed as a single line. The actual quantity of lines appended to the node.
View→Pack All	Unpacks the selected packed lines so that they are displayed as separate lines, one for each occurrence.
View→Unpack	Unpacks the selected packed lines so that they are displayed as separate lines, one for each occurrence.
View→Unpack All	Unpacks all lines in the displayed structure.
View→Notes	Allows you to view, and edit if permitted, all occurrence notes for the selected line.
View→Access	Views, changes, and/or applies access permissions for a selected object.
View→Named References	Views, opens, imports, or exports the named references of a selected dataset. You can use the function buttons in the dialog box to cut or copy a selected reference to the clipboard and paste references from the clipboard.
View→Properties	Allows you to view all properties of the selected line. You can edit those properties to which you have permission.
View→Organization	Displays your Teamcenter organizational structure including the groups in your enterprise, the roles in each group, and the users assigned to each role. *Organization Management Using Groups, Roles, and Users* explains how a user with **dba** privileges creates and manages the information displayed in the organization chart.
View→Show Unconfigured Variants	Shows or hides unconfigured variant components.

Menu command	Purpose
View→Show Unconfigured Assigned Occurrences	Shows assigned objects that were configured out by the variant rules of the structures from which the objects were assigned. You can only use this command with composition structures. Note: This command does not automatically refresh. Any changes to the assigned objects are not reflected in the structure until you execute this command again.
View→Show Unconfigured Changes	Shows unconfigured changes. If you hide unconfigured changes, only those changes configured by the current revision rule are visible.
View→Show Unconfigured By Occurrence Effectivity	Shows or hides components that are not configured when using occurrence effectivity.
View→Show Data Panel	Shows or hides the data pane. This menu command is available if the collaboration pane, structure pane, or data pane is open.
View→Show Collaboration Panel	Shows or hides the collaboration pane. This menu command is always active.
View→Show Second Structure Panel	Shows or hides the second structure pane. This menu command is always active.
View→Apply Occurrence Type Filter	Adjusts the display to show only the objects that you select using the **Select Occurrence Type Filters** command. This results in a more compact and ordered view of very large structures.
View→Select Occurrence Type Filter	Chooses which objects are visible in the structure. Select the object types that you want to see.
View→Show GCS Connection Points	Shows or hides all connection points defined for GCSs (guided component searches). GCSs are defined with the Classification Admin application.
Tools→Check-In/Out→ Check-Out	Checks a selected component out of the database.
Tools→Check-In/Out→ Check-In	Checks a selected component into the database.
Tools→Check-In/Out→ Cancel Check-Out	Reverts checkout.
Tools→Check-In/Out→ Transfer Check-Out	Transfers a selected, checked-out component to another user.
Tools→Check-In/Out→ Notification List	Views or edits the list of users who are informed if the selected component is checked in or checked out.

Menu command	Purpose
Tools→Check-In/Out→ Check-Out History	Views the history of check out actions for the selected component.
Tools→ID Display Rule→View/Set Current	Views the ID display rule currently applied to the selected structure or set a different ID display rule.
Tools→ID Display Rule→Modify Current	Modifies the ID display rule currently applied to the selected structure.
Tools→ID Display Rule→Create/ Edit	Creates a new ID display rule or modify an existing ID rule.
Tools→Project→Assign	Assigns the selected structure to a predefined project.
Tools→Project→Remove	Removes the selected structure from a project to which it is assigned.
Tools→Revision Rule→View/Set Current	Views or sets the revision rule for the currently displayed structure.
Tools→Revision Rule→Set Date/ Unit/End Item...	Sets the date, unit number, or end item to configure the structure, if the current rule allows.
Tools→Effectivity→Revision Effectivity	Views, edits, creates, or copies effectivity data for the item revision of the selected line. You must have the appropriate permissions to create or edit effectivity data.
Tools→Revision Rule→Set Override folder...	Sets an override folder to override item revisions that would otherwise be selected by other criteria.
Tools→Revision Rule→Modify Current...	Modifies the current revision rule and apply the modified rule to the current structure. You can save the change if you have write access to the original rule.
Tools→Revision Rule→Create/ Edit...	Creates or edits a revision rule.
Tools→Effectivity→ Revision Effectivity	Views, edits, creates, or copies effectivity data for the item revision of the selected line. You must have the appropriate permissions to create or edit effectivity data.
Tools→Effectivity→ Effectivity Mapping	Views, edits, creates, or copies effectivity mapping for an end item. Effectivity mappings are needed if you implement nested effectivity.
Tools→Effectivity→ Occurrence Effectivity	Views, edits, creates, or copies occurrence date effectivity data for the occurrence of the selected line, or for multiple lines. You must have the appropriate permissions to create or edit effectivity data.

Menu command	Purpose
Tools→Variants→Configure Variants	Configures or edit a variant structure for the selected top-level module.
Tools→Variants→Only Configure Root	When **on**, displays options only for the top-level module, regardless of the line selected. Set to **off** to configure the structure for a lower level module.
Tools→Variants→Search	Searches for an existing variant item.
Tools→Variants→Count Modules	Counts the modules defined for the selected variant structure.
Tools→Variants→Unlink Variant Item	Unlinks a variant item from the generic module item to make changes.
Tools→Variants→Update Variant Items	If you make structural changes to a generic item and create a new item revision, Teamcenter does not automatically propagate such changes to each associated variant item. Choose this command to make such changes manually.
Tools→Accountability Check→Check	Allows you to compare two structures and view the differences (that is, how one structure uses objects compared to the other structure). This submenu is active when two structure panes are visible.
Tools→Accountability Check→Clear Accountability Check Display	Removes color highlights created by the accountability check.
Tools→Accountability Check→Propagation Settings	Allows you to modify the settings governing the propagation of properties or relations in a partial match after running an accountability check.
Tools→Accountability Check→Propagate	Passes along changes from the source structure to the target structure in a partial match.
Tools→Accountability Check→Select Unused	Runs the accountability check and shows all occurrences in the source pane that do not match an occurrence in the target pane in an occurrence group.
Tools→Accountability Check→Select Completely Used	Runs the accountability check and shows all occurrences in the source pane that match more than one occurrence in the target pane in an occurrence group.
Tools→Accountability Check→Select Over-used	Runs the accountability check and shows all occurrences in the source pane that match a corresponding occurrence in the target pane in an occurrence group.
Tools→Accountability Check→Partial Compare Results	Displays all properties that were included in the partial compare criteria that you set in the **Partial Match Options** pane of the accountability check.

Menu command	Purpose
Tools→Accountability Check→Find in Other Structure	Finds the corresponding item in the other panel and selects it. This also expands the tree automatically.
Tools→Multi-Site Collaboration	Controls the data shared with participating sites in a distributed network. Multi-Site Collaboration allows you to publish and unpublish objects. For more information, see *Multi-Site Collaboration*.
Tools→Import→Objects	Imports objects into the database using various import formats.
Tools→Import→From PLMXML	Imports objects into the database using the PLM XML format. For more information, see *Systems Engineering —Deployment and Rich Client Usage*
Tools→Import→Remote	Imports a structure from a remote site in a Multi-Site Collaboration environment. Search for the remote object in My Teamcenter.
Tools→Export→Objects	Exports objects using a Teamcenter or STEP format. You can also use this command to export an application interface object.
Tools→Export→To PLMXML	Exports the selected structure and its attachments in PLM XML format to a selected export directory. You must choose the appropriate transfer mode for the destination system.
Tools→Export→Objects to Excel	Exports the selected structure lines to an Excel spreadsheet. For more information, see *Systems Engineering —Deployment and Rich Client Usage*.
Tools→Export→Objects to Word	Exports the selected structure lines to a Microsoft Word document. For more information, see *Systems Engineering —Deployment and Rich Client Usage*.
Tools→Send Data To	Sends selected data to an external application using an application interface object. Your Teamcenter administrator uses the Business Modeler IDE application to create new application interface types associated with a specific application. Each of these types are available in the **Send Data To** dialog box.
Tools→Send Additional Data To	Sends additional data to a running session of the application launched using the **Send Data To** menu command.
Tools→Structure Search	Searches a structure using various properties of the structure's lines. The search is not limited to the loaded lines of the structure and can search an entire structure without loading it. It then expands the structure to the found lines.

Menu command	Purpose
Tools→Manage Global Alternates	Allows you to define global alternates and a preferred alternate for the selected component.
Tools→Repair Broken Links	Identifies broken links and searches for the possible occurrence that was originally defined, for example, as a consumed part. For more information, see *About broken links*.
Tools→Baseline	Copies work in progress (WIP) item revisions. During the development of a product design, you may need to share such copies of your working design with other users at the same or different sites. You can also save your design for future reference. For more information, see *About baselining or preliminary structures*.
Tools→Address Lists	Displays lists of users who participate in workflow processes.
Tools→Connect	Connects two selected lines with a revisable or nonrevisable connection.
Tools→Disconnect	Disconnects the currently selected line with a revisable or nonrevisable connection to another line.
Tools→Save Configuration	Allows you to save the current configuration of the structure pane, overwriting the structure context's existing configuration. This menu command is available only if a structure context is opened.
Tools→Save as New Configuration Context	Saves the current configuration of the structure pane to a new configuration context and adds it to the structure context. This menu command is available only if a structure context is opened.
Tools→Set View Configuration...	Sets the structure pane's configuration to the previously saved configuration context. This menu command is available only if a structure context is opened.
Tools→Restore Configuration	Resets a structure pane's configuration back to its previously saved configuration context. This menu command is available only if a structure context is opened.
Tools→Assign	When two structure panes are visible, this menu command allows you to select assemblies or components in one structure and *assign* them to an assembly in the other structure as its children. Once this is done, the absolute occurrences of those assigned children are shared between the two structures. You can search for lines that share absolute occurrences between

Menu command	Purpose
	different structures from any instance of the assembly or component. Note: You can also right-click on a selected line in the BOM and choose the **Assign** menu command to do this; the new line does not have an occurrence type. Alternatively, if you choose the **Assign As** menu command from the shortcut menu, you can choose an occurrence type for the new line that is created by the assignment from an additional shortcut menu.
Tools→Intermediate Data Capture	Saves the current structure configuration to a PLM XML format that you can browse and compare against existing structures. For information about creating intermediate data captures, see *About intermediate data captures*.
Tools→Generate Portfolio	Creates a portfolio to hold manufacturing documentation. For more information, see *Using Teamcenter Publish*.
Tools→Validate Occurrences	Allows you to validate that a selected line and (optionally) any child lines meet the business rules defined by your administrator for structure edits. For information, see *Performing on-demand validation*.
Tools→Link Structures	Assigns occurrences in the MBOM to those in the EBOM based on absolute occurrence ID properties.
Tools→Structure Alignment→Completeness Check→Verify Part Structure	Highlights all part occurrences that are aligned with positioned designs in green. Part occurrences that do not have links to positioned designs are highlighted in red.
Tools→Structure Alignment→Completeness Check→Clear Display	Removes highlighting after performing a completeness check.
Tools→Structure Alignment→Publish Data	Creates a snapshot of transformation and shape information on a source design occurrence and publish it to the destination part occurrence.
Tools→Structure Alignment→Create PublishLink	Aligns part and design by creating a publish link between the selected occurrences
Tools→Structure Alignment→Delete PublishLink for source	Removes the link between occurrences aligned between part and design.

Menu command	Purpose
Tools→Structure Alignment→Add Target to PublishLink	Adds a new target part occurrence to a publish link.
Tools→Structure Alignment→Remove Target from PublishLink	Removes a target part occurrence from the selected publish link. Removing the target of the publish link does not delete the part occurrence or the publish link.
Tools→Structure Alignment→Find PublishLink Source	Identifies all publish links for which the selected occurrence is a destination. It highlights the linked occurrences in the companion pane. If it does not find any publish links, it displays an error message
Tools→Structure Alignment→Find PublishLink Targets	Identifies all publish links for which the selected occurrence is a source. It highlights the linked occurrences in the companion pane. If it does not find any publish links, it displays an error message
Tools→Structure Alignment→Open PublishLink source structure	Opens source structure in the structure pane.
Tools→Structure Alignment→Find lines with same logical identity	Highlights all lines with the same logical identity as the selected line, that is, lines that are associated with it by a publish link.

Multi-Structure Manager buttons

Note:

You can add buttons that are not displayed on the main toolbar by right-clicking the toolbar, choosing the **Customize** menu command and selecting the buttons you want to add. Once you have added buttons to the toolbars, they are displayed in future sessions. Consider adding buttons that:

- You use frequently.
- Provide a shortcut to menu commands that are not primary selections, for example, **Tools→Revision Rule→Set Date/Unit/End Item...**.
- Show current status, for example, incremental change configuration options.

These standard buttons are located on the main toolbar at the top of the product structure pane.

Button	Purpose
Abort	Terminates the current activity.
Cut	Cuts the selected lines from the structure and places them on the clipboard.
Copy	Copies the selected lines in the structure and places them on the clipboard.
Paste	Pastes the components from the clipboard as children of the currently selected (assembly) line in the structure or into NX.
Delete	Deletes the selected object from the database.
Toggle in context mode	Enables and disables in context editing.
Save	Saves changes you made to the structure since it was last saved.
Remove	Removes the selected lines from the structure completely and does *not* place them on the clipboard.
Create item	Creates a new item beneath the selected object.
Create occurrence group	Creates a new occurrence group.
Unpack the selected line	Unpacks the selected packed lines so that they are displayed as separate lines, one for each occurrence.
Pack the selected line	Packs the selected lines so that all lines with the same item revision and sequence number are displayed as a single line. The actual quantity of lines appended to the node.
View/edit note	Adds or edits the occurrence notes of the selected line.
Edit the variant condition	Views or edits the variant condition on the selected lines.
Save, set, and load variant rule.	Views, sets, saves, and loads the variant option values for the selected line.
Show/hide data panel	Displays the data pane that contains the **Attachments**, **Incremental Change Info**, **Variants**, **Viewer**, **Referencers**, and **Supersedure** tabs and panes.
Assign across BOM	When two structure panes are visible, allows you to select assemblies or components in the BOM in one pane and *assign* them to an assembly in the BOM tree in the other pane as its children. Once this is done, the absolute occurrences of those assigned children

Button		Purpose
		are shared between the two BOMs. You can search for lines that share absolute occurrences between different BOMs from any instance of the assembly or component. Note: You can also right-click a selected line in the BOM and choose the **Tools→Assign** menu command.
	Find selected in companion panel	When you select a component in the BOM in one structure pane, allows you to search for the component in the BOM in the other structure pane. The search follows the *closest match* rule if it does not find an exact match.
	Send CC to NX	Sends the selected collaboration context to NX.
	Show allocation navigator panel	Opens the allocation navigator pane that lists all allocations created in the current allocation map.
	Show IC information for allocations	Shows any incremental change information that is available for the current allocation map. This is only available if incremental change is activate.
	Show/hide the second structure panel	Shows or hides the second structure pane. This button is always active.
	Show/hide the collaboration panel	Shows or hides the collaboration pane. This button is always active.
	Open or refresh GBC application	Opens the Graphical BOM Compare application or refreshes it if it is already open.
	Export to Word	Exports the contents of a selected object to Microsoft Word.

The following buttons are displayed at the bottom left corner of the navigation tree pane.

Button		Purpose
	Open a Collaboration Context By Name	Browses for and opens a specific collaboration context by name.
	Open a Structure Context By Name	Browses for and opens a specific structure context by name.

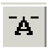
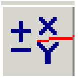
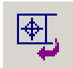
Button	Purpose
Most Recently Used (MRU) List	Shows a list of your most recently accessed structures. If you select an entry from the list, Multi-Structure Manager loads the structure into the structure pane. You can configure the number of entries shown in the MRU list by right-clicking the button and moving the slider to the desired number.
Open an Occurrence Group by Name	Browses for and opens a specific occurrence group by name.
Base View Appearance Search	Performs a search based on a cache of configured product structure, permitting faster searching of the structure for components configured at a specific date or unit. The appearance cache allows you to perform spatial searches, for example, to find all components within one centimeter of a selected part. You can combine appearance searches with other queries, for example, queries for item revision master attributes, classification attributes, or occurrence notes. The appearance search is only enabled if your administrator has configured appearances.
List Substitute Components	Adds or removes alternate components or sets the preferred alternate. This button is enabled if the selected line may have alternates, otherwise it is disabled.
Manage Global Alternates	Shows a list of the global alternates available for the selected line. You can add alternates and select a preferred alternate. The preferred global alternate is indicated by an asterisk (*).
Find Components in Display	Searches for matching lines (components) in the displayed product structure by entering an expression. You can search with any combination of the available properties.
Search for BOM Components with ID In Context	Searches for absolute occurrences using the identifier assigned in the **ID In Context** column of the property table.

The following buttons are displayed when in allocation mode.

Button		Purpose
	List Allocation Context Revisions	Lists all revisions of the current allocation map.
	Create and Set New Allocation Context	Creates a new allocation map.
	Revise and Set a currently loaded Allocation Context Revision	Creates a new revision of the currently active allocation map.
	Search and Set existing Allocation Context	Allows you to search for any existing allocation map in the database.
	Most Recently Used Button (MRU)	Shows a list of the most recently opened allocation maps.
	Clear Allocation Context	Removes the current allocation map from the allocation navigator.
	Save Modifications to the Current Allocation Context	Saves any changes made to the current allocation map.
	Filter Allocations Based on Types	Filters displayed allocations based on type of allocation.
	Highlight Allocated Lines Automatically	Highlights the source and target occurrences, as well as the related allocation in the allocation navigator when you select any one of these.
	Clear BOMLines Selection in All Structures	Removes selection from all lines in displayed structures.

The following buttons are available on the **Drafting Symbols** tab if your administrator has activated it.

Button	Purpose
	Manually refreshes the editing box.
A	Adds a frame around the selected characters.
B	Bolds the selected text.
I	Italicizes the selected text.
U	Underlines the selected text.
A	Sets the color of the selected text.

Button	Purpose
	Decreases the size of the selected text.
	Increases the size of the selected text.
	Subscripts the selected text.
	Superscripts the selected text.
	Aligns the selected text.
	Center aligns the selected text.
	Right-aligns the selected text.
	Inserts the text you typed in the two boxes to the left of this button.
	Inserts a control frame around the selected characters.

Multi-Structure Manager panes

The Multi-Structure Manager interface is divided into various panes.

Pane	Purpose
Collaboration pane	The collaboration pane displays the collaboration context and any additional structures currently open in the application in a navigation tree. Any attachments are shown in the structure pane where you can open them and view their properties.
Structure pane	Each tabbed pane represents an open structure in the application. Closing a pane unloads the structure. You can load multiple structures simultaneously.
Data pane	These panes display information about the attributes and relations of the object selected in the BOM on the structure tab. The tabs displayed depend on the structure tab selected and the type of object selected in the BOM.
Second structure pane	By right-clicking a structure tab, you can open the structure in a second structure pane. Use this pane to compare structures. You can also open a data pane for the second structure pane. Close this pane by clicking **Show/Hide the Second Structure Panel** .

The contents of the menus and toolbar buttons vary depending on what is selected in each pane.

Multi-Structure Manager tabs

The data pane on the right side of the application window contains multiple data tabs, which display information specific to the object selected on the structure pane. The type of object selected on the structure pane determines the data tabs available at any given time.

The following sections describe the data tabs that may become available. Not all tabs are available in all circumstances and their availability depends on the type of structure. Your administrator may also customize the availability of data tabs at your site.

Standard Teamcenter shortcut menu commands are available for any object in the data tabs.

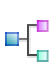
The following table lists Multi-Structure Manager tabs that are available when the data pane is displayed.

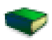
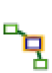
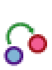
Tab	Description
Assembly Viewer	Displays an image of the selected line or lines, if a **DirectModel** dataset is associated with the object. The following image types are viewable in this tab: • **DirectModel** = imported JT files or JT files created by the translators. These files must have a Teamcenter rendering relation. • **DirectModelMarkup** = captured image of a **DirectModel** dataset. • **DrawingSheets** and **Markup** = imported CGM files. • **Image** = imported TIF, GIF, JPEG and similar file types.
2D Viewer	Displays one or many snapshots associated with a line in your product structure. If there are multiple image datasets attached, you can select the desired image. You can use the **2D Viewer** pane to: • Create new 2D snapshots. • Update existing 2D snapshots. • Apply an existing 2D snapshot to the current view. • Compare an existing 2D snapshot to the current image. • Search for existing 2D snapshots by specified attributes. For more information about using 2D snapshots, see *2D snapshot overview*.

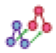
Tab	Description
Referencers	Identifies which, if any, other database components reference the object currently selected on the structure tab. This tab also displays any assemblies where the selected object appears. For more information, see *Teamcenter Basics*.
Attachments	Displays the properties of all related components (including the base item component and all related subcomponents) of the object selected on the BOM in the structure pane. Double-click an attachment on this tab to open the designated application used to edit and view the attachment. Note: Activity attachments must be viewed from the **Operation Activities** tab.
Class Attributes	Shows each attribute that exists in the Classification application for the object currently selected on the structure tab. It is not enabled if you select an occurrence group or view. This data is informational only and cannot be changed on this tab. You must change the data through the Classification application. For more information, see *Basic Classification on Rich Client —Usage*.
Object View	Allows you to perform 2D markups on the top line selected in the BOM on the structure pane. This tab is divided into two panes: • The left pane displays the markup tree table. • The right pane displays an image of the object. Click the buttons at the top of the tab to manipulate the image. Click the buttons at the bottom of the tab to create markup annotations on the image. After the image is annotated, click the **Printer** button to print a sketch of the image and its markup.
Product Manual	Displays a product manual created using the Manufacturing Process Management publishing feature. See *Using Teamcenter Publish*.
Work Instructions	Displays work instructions created using the Manufacturing Process Management publishing feature. See *Using Teamcenter Publish*.

Tab	Description
Report	Supports the creation of reports for structures. It is not available if you select an occurrence group or view. The generated report is presented through a browser window. You can create customized XSL style sheets or use other formatting tools to customize both the data content and the report format.
Variants	Displays and edit variant options, option defaults, and rule checks currently defined for the current object. It is not available if you select an occurrence group or view.
Incremental Change Info	Shows the effectivity of a change order as a range of units or dates, and its release status. The **Incremental Change Info** tab is enabled when you select a line or occurrence group in the BOM and an incremental change order is associated with that line.
TraceLink	Displays defining and complying paths for a given object created when performing requirements management. You can view the predecessors or successors in an upstream or downstream path. You can also view the trace links themselves, as independent objects.
Allocations Traceability	Displays the allocation source and target graphically.
Linked Occurrence Paths	Shows whether the selected BOM line (occurrence) is linked to something else from its associated product or plant structures. The complete path is displayed in this tab so you can identify exactly what is being consumed (for example, the left front or right front wheel). You can also remove the links or identify a corresponding BOM line in the associated product/plant tab using menu commands in the shortcut menu.

Multi-Structure Manager symbols

Symbol	Meaning
	Item
	Item revision (BOM line)
	Item element (general design element)
	Form
	Dataset
	BOM view

Symbol	Meaning
	Alternate ID
	Document
	Document revision
	**DirectModel** dataset
	**NXMaster** dataset
	**NXPart** dataset
	**NXScenario**
	Variant item
	Variant item revision
	Incremental change removed
	Incremental change added
	Separate incremental changes removed and added
	Absolute occurrence override removed by incremental change
	Absolute occurrence override added by incremental change
	Absolute occurrence overrides removed and added by separate incremental changes
	In scope for creation of absolute occurrences
	One or more of the absolute occurrences are edited in a context but not necessarily the current context.
	Process
	Process revision
	Snapshot
	Allocation

Symbol	Meaning
	Allocation map
	Allocation map revision
	Allocated to
	Allocated from
...	When displayed in the structure tree after a search, this symbol indicates the line has hidden children. Click this symbol to load and view the hidden children.

What are perspectives and views?

Within the rich client user interface, application functionality is provided in *perspectives* and *views*.

View	The basic display component that displays related information in a UI window.
Perspective	A collection of one or more views and their layout.

Some applications use a perspective with multiple views to arrange how functionality is presented. Other applications use a perspective with a single view.

You can use the **HiddenPerspectives** preference to prevent the display of some Teamcenter perspectives in the rich client.

If your site has online help installed, you can access the application and view help from the rich client **Help** menu.

Basic concepts about Multi-Structure Manager

Multi-Structure Manager objects

A *collaboration context* may be considered as a project folder that contains all the information associated with a project; it may contain references to objects in Teamcenter, including structure contexts. It is persistent and allows data to be shared by different applications, for example, Teamcenter and an external application. It consists of one or more *structure contexts*, each of which may have a different configuration. The children of a configuration are defined by a *configuration context*.

A *structure context* is a configurable structure that consists of one or more root objects sharing the same configuration. For example, it may be one or more BOMs or assembly structures and their configurations. In this example, each BOM or assembly may be assigned to a different group or vendor to manage and build.

The configuration of the structure context is defined by a *configuration context*. The structure objects may have occurrence groups, items, and item revisions. The configuration context stores a set of rules that determines the configuration of a collaboration context and the entire structure within a structure context. The rule set may include revision or variant rules.

A *composition* is a structure that shows the relationship between other structures for modeling a scenario or manufacturing process. Each structure may have a different configuration. The type of the structure context determines if it is a composition.

Multi-Structure Manager functions

The collaboration context object consists of one or more structure contexts, each with different configuration rules. The BOM lines in each structure context are determined by a revision rule or a variant rule.

> Note:
>
> Collaboration and structure objects are work space objects (WSOs), not items. They cannot be revised, but you can manage them with incremental changes.

Each structure context may include one or more root objects, each of which may be an occurrence group, an item or an item revision. The item revision may include objects derived from an item or another item revision. You can attach WSOs to collaboration context and structure context objects.

You can open a collaboration context or a structure context several ways, for example, by dropping the object on the Multi-Structure Manager button. Within each structure context, you can browse the structure, modify its content, and create relationships with other structures.

You can open each object in the appropriate data pane to visualize the structure, view or edit its properties, perform searches, manage incremental changes, and so on.

You can create and manage structures entirely with the Multi-Structure Manager application. You can also create structures in another application such as Structure Manager or Manufacturing Process Planner, then manage them with Multi-Structure Manager. If you create a structure in another application, it retains the characteristics assigned it in the other application when you open it in Multi-Structure Manager. Consequently, for example, if you create a process structure in Manufacturing Process Planner, you see the appropriate process structure tabs when you open it in Multi-Structure Manager.

Types of objects you can open

The following types of objects can be opened in or sent to the Multi-Structure Manager application:

- Collaboration context object

  All the collaboration context object's structure contexts are displayed on tabs on the structure pane.

- Structure context

  The structure context appears on additional tabs on the structure pane. If it does not belong to the opened collaboration context, the title of its tab shows the name in parentheses, indicating it is a stand-alone context.

- Item, BOM line, or BOM view

  These are opened as temporary structure contexts.

- Intermediate data capture (IDC)

  This is opened as a temporary structure context.

- Processes of type Process

  This is opened as a temporary structure context.

- Operations of type Operation

  This is opened as a temporary structure context.

If an opened structure context is a composition, an asterisk (*) appears before its name on the tab. The system determines whether an item should be displayed as a composition by referring to the **CCCompositionTypesPref** system preference. The default value of this preference is **Process, OP**. You can override this default preference and put other item types in the list.

Basic tasks using Multi-Structure Manager

Use Multi-Structure Manager to perform the following tasks:

- View the assembly structure of a products contained within the contexts, navigate around the structures, and find components in the structures.

  For more information, see *Working with collaboration contexts*.

- Create or open existing contexts, add temporary structures, save contexts, and work with absolute occurrences.

  For more information, see *Overview of creating a collaboration context*.

- Add components to the product structure, change components belonging to the structure, define global alternates and substitute components, and perform many other product structure editing tasks.

  For more information, see *Building and editing product structure*.

- Create occurrence groups and absolute occurrences.

  For more information, see *Introduction to occurrence groups*.

- Track changes using incremental change.

  For more information, see *Incremental change overview*.

- Configure classic or modular variants or search for a variant item, or unlink a variant item from the structure.

  For more information, see *Working with variants—overview*.

- Search the structure for items on the clipboard, or search by name. You can perform where-used and where-referenced searches. You can also search for appearances.

  For more information, see *Searching structures*.

- Create and view a preliminary data indicator (PDI) or baseline.

  For more information, see *About baselining or preliminary structures*.

- Create an intermediate data capture (IDC) of any configured structure including a collaboration context, structure context, or group of BOM lines.

  For more information, see *About intermediate data captures*.

- Compare two structures to ensure all lines in the source structure are consumed in the target structure.

  For more information, see *Running accountability checks*.

- Create publishing pages, work instructions, or a product manual.

  For more information, see *Using Teamcenter Publish*.

- Create directional relationships between two structures to relate specific aspects of these structures, such as the functional structure to the logical structure.

  For more information, see *Allocations overview*.

- Import and export data using PLM XML.

  For more information, see *Importing and exporting structures and items*.

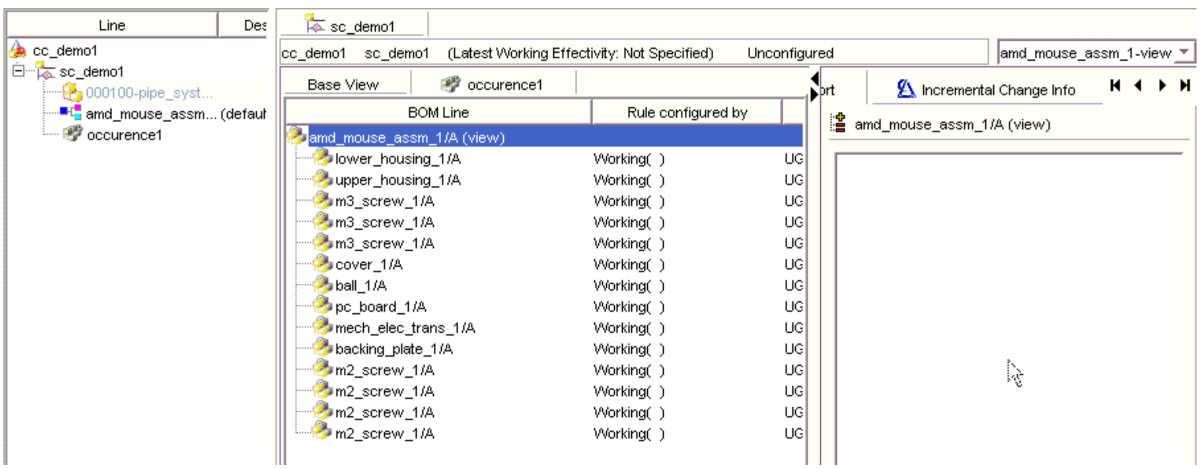
2. Viewing and managing data

Opening the Multi-Structure Manager application

The first time you open Multi-Structure Manager, you see the empty structure pane. You must first create or open an object before you see the data pane or any of the tabs. The menu bar and toolbar appear in the standard Teamcenter locations. They contain standard menu commands and also commands that are specific to collaboration context functionality.

The following figure shows an example of the layout of the Multi-Structure Manager application with the collaboration pane on the left and a structure pane visible in the center. In this example, the right-most pane shows incremental change information about the selected structure; this pane may contain other information, as described in *Using the structure pane*.

> Note:
>
> For more information about viewing and manipulating 2D images in the **Viewer** pane, see *Working with 2D images*.
>
> For more information about viewing and manipulating 3D models and assemblies in the **Viewer** pane, see *Working with 3D models*.



Multi-Structure Manager application, collaboration, and structure panes

Optionally, you can open a data pane for each view tab of a structure tab. By default, the data pane includes the **Referencers** and the **Object Viewer** tab.

Navigating the structure panes

When you first open an object in the Multi-Structure Manager application, the collaboration pane and a structure pane are displayed. The context displays as the root of the collaboration pane tree; the first root of the first structure (if any) is shown in the structure panes.

If the Multi-Structure Manager application is running and you open another component, the opened component is displayed. However, if the opened component contains the current structure, the display does not change.

If you open a structure component, the details displayed depend on the previously opened component, as follows:

- If you open a component for which where there is no structure pane, the structure appears in a new structure pane.
- If you open a component for which there is already a structure pane, the structure pane is selected.

You can optionally open two structure at the same time in different structure panes. This allows you to relate objects (occurrences, occurrence groups, views, or items) in one structure to similar objects in the other structure.

Using the collaboration pane

You can optionally use the collaboration pane to view the open component in a navigation tree. Any attachments are shown in the collaboration pane, and you can open them and view their properties.

> Note:
>
> You can also browse and edit a collaboration context or structure context with My Teamcenter or Manufacturing Process Planner. Any changes you make in those applications are visible in this application; similarly, any changes you make here are visible in those applications.

You can hide or show the collaboration pane as necessary by clicking the **Show/Hide Collaboration Panel** button. When you hide the collaboration pane, it remembers the context expansion and selection to redisplay when you show the collaboration pane again.

The data displayed in the collaboration pane and the structure pane may be independent of each other. However, if you open a structure component in the collaboration pane, the corresponding data always appears in the structure pane.

In the collaboration pane, you can:

- Browse and expand the navigation tree.
- Change the current root objects of a structure context. If the objects are not part of the collaboration context, they are shown as extra lines in the collaboration pane.
- Cut, copy, paste, and delete components in a structure context.
- Remove structures from the collaboration context.

- View multiple root objects such as items, item revisions, BOM lines. These do not have to be part of the collaboration context.
- View attachments that are not visible in the BOM. You can view configured and unconfigured attachments.
- View the variant rules associated with the structures in the collaboration context.
- View and apply the revision rules associated with the structures in the collaboration context.
- Submit an item revision to a predefined workflow. Select the item revision and choose the **Workflow Process** menu command. The status of the item changes to reflect success or failure.

Using the structure pane

A structure pane shows the contents of a single structure context (for example, a product or process structure) in separate panes within the structure pane.

The header bar of each pane in the structure pane contains:

- The name of the structure context component or the opened component.
- The name of the structure context component.
- The names of the rules that apply to the view. Each view may have a revision rule or a variant rule. A rule appears in parentheses if it differs from or is modified from the rule that is attached to the structure's configuration context.

The tab label of each pane has parentheses if the structure is not part of a collaboration context component.

For information about how to save these objects, see *Save temporary objects as structure contexts*.

Choose the **Root Structures** box to display a list of the end items or top line items for each root object in the structure context. If the root is an occurrence group, the top line item is listed, not the occurrence group. The top line item is listed only once, even if the structure context contains many occurrence groups (and the item itself) with the same top line.

Each tabbed pane displays the structure of the root component that you selected in the **Root Structures** box. The format of the display depends on the type of structure context and the root component. If the root component is an occurrence group, an assembly view is shown. If it is an item, revision, base version, or base version revision, a BOM view is shown.

Using the second structure pane

You can split the structure pane in two and use the other structure pane to:

- Reference a line in a separate structure from a composition.
- Find a selected object in the other pane.
- Edit structures in the same way as in the first pane.
- Copy, paste, or drag-and-drop data between structures in the two panes.
- Open multiple structures in different tabs.

> Note:
>
> - If you want to compare two configurations of the same structure, you must save the root structure in two different structure contexts and open these separately.
> - Opening a structure in the second pane closes it in the first pane.

When you open the data pane, you can specify whether it should open to the right of the structure pane or below it. You specify this behavior in the **MEDataPanelPosition** preference. If you set this preference to **right**, the data pane opens to the right of the structure on which you are working. If you set the preference to **bottom**, the data pane opens below the structure. The second data pane that opens in the **Attachments** and **Activities** tabs is not affected by this preference and continues to open in the right side of those panes.

When opening a second structure pane, you can specify that it is opened to the right of the first structure, instead of below it. You define this behavior in the **MESecondStructurePosition** preference that has **right** or **bottom** as valid values.

To show and hide the second structure pane:

- Choose **View→Show Second Structure Panel**.

  -or-

  Click **Show/Hide the Second Structure Panel** .

  If you have not yet opened a structure in the second pane, the pane is empty when you open it. If you have opened a structure in the second pane previously, this structure is shown the next time you open the second pane.

To open a structure in the second structure pane:

1. Right-click the tab of the structure you want to display in the second pane.
2. Choose **Open Structure in Second Panel**.

Teamcenter closes the structure in the first pane and opens it in the second pane. You can open multiple structures in separate tabs in the second pane.

If you want to compare two configurations of the same structure, you must save the root structure in two different structure contexts and open these separately.

Setting up the search for components in other structures

You can select one or more objects in the following areas of the user interface and search for them in a different structure.

- Lines in a view
- Consumed parts in a process
- An object in the **Navigation** pane (**Favorites**, **History**, **Open Items**)
- Objects in the **Home** folder
- Objects in the **My Worklist** folder
- Items attached to a Teamcenter mail
- Lines in the **Summary** view
- Objects in the **Graphics** view

Whether you need to expand a target structure before choosing the **Find in Source Structure** menu command depends on the settings of the following two preferences:

MECopyIdInContextToAssignedLine
MECopyIdInContextLowerLevels

Note:

Whether you need to expand a structure before a found component can be highlighted within it depends on the value of the **MEExpandToSelection** preference. If this preference is set to **false**, you must manually expand the target structure to highlight lines found within that structure.

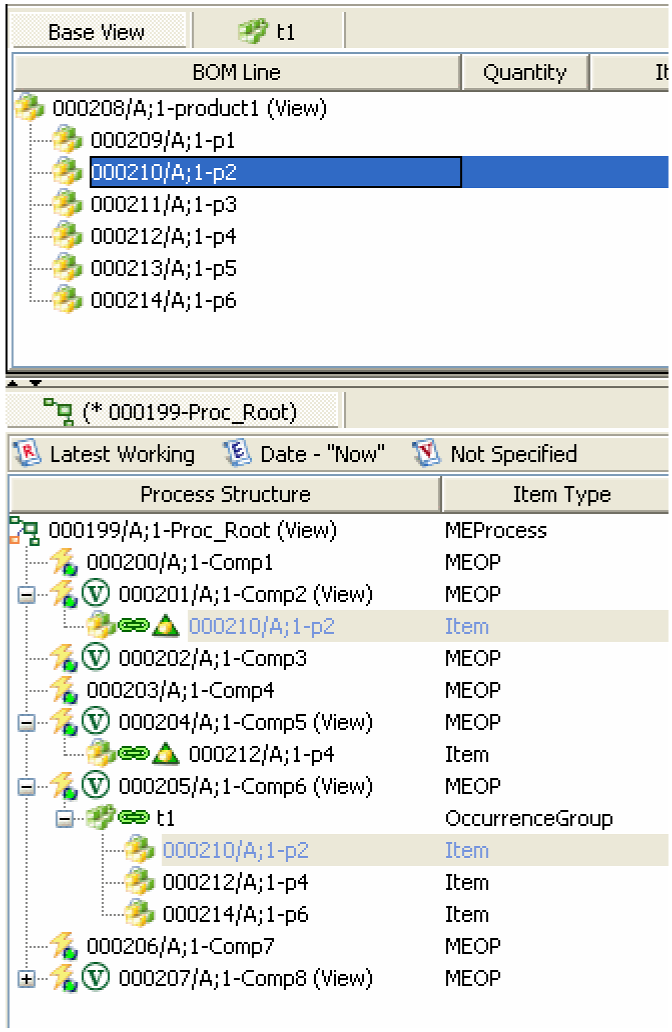
Find components in open structures

1. Open one structure in the structure pane and the second in the second structure pane.

2. Right-click an item in the source structure.

3. Choose **Find in Source Structure** from the shortcut menu.

   Teamcenter searches for the item in the alternate structure and, if successful, highlights it, as shown in the following figure.



Individual search result

Expand and collapse a structure

1. Select an object in the loaded structure.

2. Do one of the following:

   - Choose **View** → **Expand Options** → **Expand** to expand the structure to one level below the selected line.

   - Choose **View** → **Expand Options** → **Expand Below** to expand the entire structure below the selected line.

Teamcenter expands only to the level of consumed objects.

> Note:
>
> This can be time-consuming in very large structures.

- Choose **View** → **Expand Options** → **Expand Below...** and select a level to which you want to expand the structure.

- Choose **View** → **Expand Options** → **Expand to Type**.

  Teamcenter displays the **Expand to Type** dialog box.

  a. In the **Type** list, select the type to which you want to expand the structure.

     The types listed are dependent on the type of selected object and the **MEExpandToBaseTypes** preference. The **MEExpandToBaseTypes** preference is only applicable to selected processes.

Selected object type	Behavior
Process	The list contains subtypes of both **Process** and **Operation**.
Operation	The **Expand to Type** command is unavailable.
Plant	The list contains subtypes of **Plant**.
Product	The list contains subtypes of **Product**.

  b. Click **OK**.

     Teamcenter expands the tree to the selected type.

     - If the expand mechanism reaches the given type in a branch, it stops and moves to the siblings.

     - If the expand mechanism does not find an object of the selected type in the tree, it does not expand the tree.

     - If the expand mechanism does not find an object of the selected type in a branch, the branch remains collapsed.

3. (Optional) Collapse the structure by choosing one of the following:

   - **View** → **Collapse Below** to collapse the entire structure.

- **View → Expand Options → Expand Below...** and selecting the **Collapse lower level** check box.

> Tip:
>
> Each of these commands are also available from the shortcut menu.

Maintain the tab display

To expand and collapse the view of a pane but maintain the accessibility of the tabs, adjust the display area using the left and right arrows at the top of the vertical bar that divides the data panes. You do not need to reset the view to select a different tab.

1. Click to expand the pane.

2. Click the opposite arrow to return the display to its original settings.

Working with views

About views

Teamcenter offers you a variety of views to help you manage your data. Some of these views originate with the manufacturing applications, such as:

- **Structure Search** view
- **Process Gantt** view
- **Accountability Report** view

Other views, such as the **Impact Analysis** view, are common to all Teamcenter applications.

These views have some features in common, such as the ability to change the displayed columns or filtering the results.

Menus and toolbars within a view behave as if a line is selected in the structure pane. When you select a structure line in a view, the line is selected in the structure pane and vice versa. If you delete a line in the view, Teamcenter deletes it from the structure pane. You can drag lines from the view to the structure pane.

Filter data in the view

You can filter the data in the view based on BOM line properties to show only a subset of the contents in the table.

1. Click the **Menu** button ▼ and choose **Filter** from the view menu commands.

   Teamcenter displays the **Auto Filter** dialog box. This dialog box contains a list of all conditions that you create to filter data. The dialog box remembers any conditions you create, including those in other views.

2. Click + to add a new condition line.

   Teamcenter displays the **Filter Condition Editor** dialog box.

3. Create a condition by combining BOM line properties, operators, and available objects and click +.

4. (Optional) Remove a condition by clicking −.

5. (Optional) Clear a condition by clicking .

6. (Optional) Negate the condition by clicking the **!{..}** button.

7. Click **OK**.

   Teamcenter displays the new condition in the **Auto Filter** dialog box.

8. Select the condition that you want to apply to the table.

   Teamcenter displays the filtered results in the view table.

   > Tip:
   >
   > You can select more than one condition in the **Auto Filter** dialog box using the Ctrl key. The search result must fulfill all of the selected conditions (they are joined with the **AND** Boolean operator).

9. (Optional) To remove the filter, select **All** from the condition list or close the **Auto Filter** dialog box.

Modify the column display

1. Select a line in the table in which you want to modify the columns to make the table the active one in the view.

   This is important in views that contain multiple tables.

2. Click the **Menu** button ▼ and choose **Columns** from the view menu commands located in the top-right corner of the view.

   Teamcenter displays the **Column Management** dialog box.

3. Select the desired columns from the **Available Properties** list and move them to the **Displayed Columns** list with the right arrow.

4. (Optional) Modify the order the columns appear in the selected view table using the up and down arrows.

5. Do one of the following:

   - Click **Apply** to save the current state.

   - Click **Save** and type a name for the column configuration. You can restore a saved column layout by choosing **Apply Column Configuration** from the view menu commands and selecting the saved configuration from the list.

Find in display

1. Click the **Menu** button and choose **Find in Display** from the view menu commands.

   Teamcenter displays the **Find in Display** dialog box.

2. Click to add a line to the table.

3. Double-click the **BOM Line** cell of the **Property Name** column and select the property name by which to search from the list.

4. Double-click the equal sign to change the operator.

5. Type a value corresponding to the property name, for example, **OP** if you select **Item Type** as the property name.

6. Click **Find**.

   Teamcenter displays the number of matches in the bottom left of the dialog box.

7. Page through the matches using the right and left arrows, or display them all by clicking .

   Teamcenter selects the matches in the view.

Sort data in view pane

1. Click the **Sort** button at the top right of the view, or select **Sort** from the view menu commands.

   Teamcenter displays the **Sort** dialog box.

2. Do one of the following:

- Sort by default order by selecting **Select default order**.
- Specify a different sort order.

  a. Select **Select below criteria**.

  b. In each of the three boxes, double-click in the box to select from a list of columns available in the view table.

     You can insert or remove columns from tables.

     For more information, see *Modify the column display*.

  c. Select whether to sort the column entries in ascending or descending order.

3. Click **OK**.

   Teamcenter sorts the data in the selected table in the order specified.

Visualizing structures

Ways to visualize structures

You can visualize a structure in several ways.

- The **Assembly Viewer** pane in the Multi-Structure Manager application allows you to visualize a structure. The assembly viewer is sometimes referred to as the *embedded viewer*.
- The rich client Lifecycle Viewer application provides you with nearly all of the visualization tools offered by the stand-alone viewer, many of which are not available in the embedded viewer within Teamcenter applications. You open the rich client Lifecycle Viewer application by clicking the **Lifecycle Viewer** application icon.
- Stand-alone Lifecycle Visualization provides you with all the functionality of a viewer view or the Lifecycle Viewer but with support for optional software modules such as Concept, Visualization Illustration, Quality Producer, and Variation Analysis. Stand-alone Lifecycle Visualization is integrated with Teamcenter, so you can send data from Teamcenter applications into the stand-alone viewer, perform analysis, and then save your work back to the database.

Displaying objects by type

Overview of displaying objects by type

You can display or blank objects in the **Graphics** view based on their type, occurrence type, or a combination of both. For example, you may want to blank all weld points or display only the parts consumed by a process. In addition, a visualization filter allows you to set the object and/or occurrence types you want to hide from the display on a more permanent basis.

The types of objects you can blank or display depend on the type of structure on which you are working. For a process structure, you can display or blank:

- Item types such as **Item**, **WeldPoint**, or **Workarea**. All item types that derive from **Item**, **Workarea**, and **PSConnection** (including **WeldPoint**) are supported.
- All available occurrence types such as **MEConsumed** or **ME Weld Point**.
- Any combination of these item and occurrence types.

For a product structure, you can display all types that derive from:

- **Item**
- **PSConnection**

For a plant structure, you can select all types that derive from the **Workarea** item type.

The object types to be blanked or displayed in the structure must exactly match the selected types. Selecting an item does not select every object derived from the **Item** type.

To reduce the size of this potentially long list of candidates, you can store the commonly used item list in the **MEBlankDisplayTypes** preference.

Display/blank objects by type

1. With a structure open in the **Graphics** view, do one of the following:
   - Choose **Graphics→Visibility→Display/Blank Selected by Type→Object/Occurrence Type**
   - Right-click in the viewer pane and choose **Display/Blank Selected by Type**.
   - Right-click a subassembly in the structure tree and choose **Display/Blank Selected by Type**.
2. Choose the type of object or occurrence type that you want to blank or display.

   The entries in this list are dictated by the value in the **MEBlankDisplayTypes** preference.

The object types that you select are displayed or blanked in the viewer.

Display/blank multiple object types

1. Choose **Graphics→Visibility→Display/Blank Selected by Type→Advanced**.

2. Select all the object types that you want to display. If you open the dialog box with a process displayed in the viewer, you can also select occurrence types.

3. (Optional) Select **Display only selected types** to blank all types other than those selected in the dialog box.

4. Click **OK**.

Set the visualization filter

Use the visualization filter to set the object and/or occurrence types you want to permanently hide from the display.

1. With a structure open in the **Graphics** view, choose **Graphics→Visibility→Define Visualization Filter**, or click the **Define Visualization Filter** button in the toolbar.

2. Choose the object or occurrence types that you want to hide permanently from the display.

3. (Optional) Select **Apply visualization filter** to activate the filter as soon as you close the dialog box.

4. Click **OK**.

5. (Optional) If you did not activate the filter in step 3, activate it by choosing **Graphics→Visibility→Apply Visualization Filter** or clicking the **Apply Visualization Filter** button in the toolbar.

Product view overview

About product views

You can save data in the assembly viewer, including current items, zoom factor, rotation angle, and pan displacements. You can retrieve a saved product view (sometimes called a *3D snapshot or snapshot view*) during a subsequent session or share it with other users. You can only save or retrieve product views when a base view structure is displayed in the viewer. You cannot create product views of occurrence groups.

You can create product views that contain one or more of the following:

- Collaboration contexts
- Structure contexts
- Configurator contexts
- Item revisions (structure lines)

- 2D and 3D NX CAD and Lifecycle Visualization files
- Motion (VFM) files
- Published documents, including work instructions

Each product view is stored in a dataset containing a thumbnail image file, a PLM XML session file, 3D markup layers, and the top-level item of the view.

You can configure the structure with revision rules, effectivity, variant rules, and similar techniques. If appropriate, you can use several **Show Unconfigured** menu commands to hide unconfigured objects in the structure and in the viewer. When product views are captured, these view selections are taken into account; otherwise, potentially unbuildable combinations of parts may be displayed when the view is restored. You can retrieve the original state of the menu commands and consequently the original state of the view.

If the product view is attached to a structure and the structure is cloned, the product view functions correctly in the new (clone) structure. Likewise, product views may be attached to a structure that is shared with Multi-Site Collaboration.

You can also update product views in the Lifecycle Viewer or stand-alone Lifecycle Visualization. You send a dynamic product view to one of these applications, and then create a new product view or update and replace the existing one. When you send the updated product view back to Teamcenter, you can open it in the assembly viewer.

Your Teamcenter administrator sets the size and presentation of the product views with system properties and preferences..

> Note:
>
> In Teamcenter 8.0, the file format of 3D product views changed. If you open a file that was created in an earlier Teamcenter version, it is automatically converted to the new format.

Create and save a product view

1. Adjust the content of the viewer window using the pan, rotate, eyeball, and zoom buttons to create the necessary scene.
2. Select an object in the structure base view window.
3. If necessary, right-click in the viewer menu bar and choose **Create Markup**.

   Teamcenter displays the **Create Markup** toolbar.
4. Click **Create 3D Product Views**  on the **Create Markup** toolbar in the assembly viewer.

Teamcenter displays the **Product View Gallery** dialog box, which contains thumbnails of any previously saved product views that are associated with the selected object.

5. Do one of the following:

   - Click **New Product View** .
   - Right-click in the window and choose **Create New Product View**.

   You are prompted to enter a name for the product view if the **Vis_PV_Show_Name_Dialog** user preference is set to **True**. If it set to **False**, Teamcenter generates a name automatically.

   Teamcenter saves the product view and its configuration in a dataset. It also adds a thumbnail of the view to the **Product Views** dialog box.

   > Note:
   >
   > Thumbnails of all product views are not visible at all times, only for those items related to the selected end item (the top entry in the structure window).

Configure and manage product views

1. Choose **Options→Visualization→Product View**.

   Teamcenter displays the **Product View Creation Preferences** pane.

2. Set the following preferences as required:

Preference	Description
Geometry Asset	Determines whether a geometry asset file is added when a product view is created. This file is required if you want to export a PLM XML file of the product view. This option is equivalent to the **Vis_PV_Geometry_Asset** preference.
Show Product View name dialog	If selected, you are prompted for a name each time you create a product view. If not selected, Teamcenter generates the name automatically. This option is equivalent to the **Vis_PV_Show_Name_Dialog** preference.
View Toggle Warning Level	If selected, Teamcenter displays a warning or prevents you from continuing if you try to create a product view when one or more of the **View** menu commands to show

Preference	Description
	unconfigured data is selected. This option is equivalent to the **Vis_PV_InvalidConfigWarnLevel** preference.
View Toggles to consider	Select the **View** menu commands to show unconfigured data that are considered if the **View Toggle Warning Level** option is selected. This option is equivalent to the **VisPVBlockingViewToggles** preference.
Image Capture	Determines if Teamcenter saves a preview image of the 3D product view when it is created. If you choose **Perform Image Capture (Using Image Export Dialog)**, you are prompted for the settings to use. If you choose, **Perform Image Capture (with preferences)**, it uses values set in preferences. This option is equivalent to the **Vis_PV_ImageCapture** preference.
Image Format: **Image Resolution**, **Width of image**, and **Height of image**	Depending on the setting of the **Image Capture** option, these options may determine the file format, resolution, and size of the preview image. If **Perform Image Capture (Using Image Export Dialog)** is set, these options are disabled. These options are equivalent to the **Vis_PV_ImageCaptureType**, **Vis_PV_ImageCaptureResolution**, **Vis_PV_ImageCaptureWidth**, and **Vis_PV_ImageCaptureHeight** preferences, respectively.
Thumbnail: **Width**, **Height**, and **Quality**	Determine the size and resolution of the thumbnail image created for each product view. These options are equivalent to the **Vis_PV_ThumbnailWidth**, **Vis_PV_ThumbnailHeight**, and **Vis_PV_ThumbnailQuality** preferences, respectively.
Play motion in current view	If selected, any motion (VFM) file in the current product view plays when the view is selected. This option is equivalent to the **Vis_PV_Play_Motion** preference.
Configuration rule to use	Offers you two choices: • **Use configuration from the current BOM** ignores stored rules and preserves the configuration that was active before you applied the product view. • **Use configuration from product view** considers any arrangements, effectivity, variant rules, and revision rules stored with the product view when you apply it. This option is equivalent to the **Vis_PV_HowTo_Configure_BOM** preference.

Note:

Your administrator may configure these preferences with SITE or GROUP protection scope, rather than USER protection scope. If so, you may be able to view but not change the current settings.

3. Right-click a selected product view thumbnail in the **Product View Gallery** dialog box.

   Teamcenter displays a shortcut menu.

   Note:

   You can identify the currently selected product view by the green border (if checked out) or red border (if not checked out) around its thumbnail.

4. Choose one of the following.

Command	Description
New Tab	Creates a new tab for the element currently selected in the structure. This tab is unavailable if no element is selected in the structure base view window.
Refresh Tab	Refreshes the currently selected tab in the product view gallery to reflect structure configuration changes.
Remove Tab	Removes the current tab from the dialog box.
Refresh All Tabs	Refreshes all the tabs in the product view gallery to reflect structure configuration changes.
Remove All Tabs	Removes all tabs from the dialog box.
Add	Creates a new product view from the current contents of the viewer.
Apply	Applies the configuration of the selected product view to the viewer.
Delete	Deletes the selected product view.
Update	Refreshes the stored product view with changes made in the viewer. This command is enabled only if you check out the product view dataset.
Rename	Displays a dialog box that allows you to change the name and description of the selected product view. A product view name appears below each button; the description appears when the cursor is placed over the button.

Command	Description
	If you rename a product view, the order in which thumbnails are displayed in the **Product View Gallery** dialog box changes. Teamcenter generates the default name of a view from the date and time it was initially created. It lists available views in alphanumeric order. You can choose an appropriate new name to move the view up or down the list.
Enable Multiple Selection	Allows you to select more than one product view.
Options	Displays the **Product View Creation Preferences** pane.

Note:

If you right-click any part of the **Product View Gallery** dialog box (except one of the buttons) and no product view is selected, the menu commands to apply, update, rename, and delete the product view are unavailable.

Create product view preview manually

Note:

The menu commands described in this procedure are available only if the **Image Capture** option is set to **Perform Image Capture (using Image Export dialog)**. If you do not select this option, you cannot manually adjust the size, resolution and file format each time you create or update a product view.

1. Right-click a product view or the **Product View Gallery** tab and select **Image Capture**.

   Teamcenter enables the capture of 2D images, as indicated by a check mark next to the menu command.

2. Create or modify the product view.

   If you selected **Perform Image Capture (using Image Export dialog)** previously, Teamcenter displays the **Image Export** dialog box.

3. Change the size and file format of the image if necessary, then click **OK**.

   Teamcenter creates the product view using the parameters you entered.

Manage unconfigured data in a product view

You can use several menu commands to show or hide unconfigured objects in the structure and in the viewer, as follows:

- **Show Unconfigured Variants**
- **Show Unconfigured By Occurrence Effectivity**
- **Show Unconfigured Changes**
- **Show Unconfigured Assigned Occurrences**
- **Show GCS Connection Points**
- **Apply Occurrence Type Filters**

When product views are captured and restored, these view selections are preserved; otherwise, potentially unbuildable combinations of parts may be displayed when the view is restored. If you choose to update the configuration from the product view when you reopen it, the saved view selections are retrieved; if you choose to use the current configuration, the saved view selections are ignored.

To evaluate the configuration of an existing product view, right-click a product view in the **Product View Gallery** and choose **Show Configuration**.

Teamcenter displays a dialog box that shows the assembly configuration when the product view was created. The name of the product view is shown in the title bar of the dialog box. The dialog box also lists any **Show Unconfigured** menu commands that were active at the time the product view was created.

Retrieve and open an existing product view

- Open the product view in Teamcenter:

  1. Select an object in the structure base view window and open the assembly viewer.
  2. Click the **Create 3D Product Views** button on the viewer toolbar.

     Teamcenter displays the **Product View Gallery** dialog box containing thumbnails of available product views of the selected structure. Only product datasets associated with the currently selected end item are visible.
  3. Right-click below the image area in the **Product View Gallery** dialog box and select the configuration that you want to use for the product view.

Command	Description
Options→Configuration rule to use→Use configuration from Current BOM	Applies the product structure configuration that is currently set to the product view that you are loading.
Options→Configuration rule to use→Use configuration from product view	Adopts the configuration that was set at the time the product view being loaded was created.

4. Do one of the following:

    - Select the thumbnail of the product view you want to open and click **Apply**.

      Teamcenter opens the product view and retrieves the saved configuration for the structure window and viewer. You can then click **Cancel** to close the dialog box without opening the product view.

    - Select the thumbnail of the product view you want to open and click **OK**.

      Teamcenter opens the product view as before and closes the dialog box immediately.

5. If the product view contains a motion file, replay it by right-clicking the product view and choosing **Load Motion File(s)**. If **Play motion in current view** is selected, the motion file is played against the current structure; otherwise, it is played against the original structure.

- Open the product view in stand-alone Teamcenter lifecycle visualization:

    1. Select one or more product view datasets in the **Attachments** tab.

    2. Click the **Send to Lifecycle Visualization** button.

Checking product views in and out

After you create a product view (3D snapshot), you can check it into the Teamcenter database to make it available to other users. To refresh or delete an existing product view, you must first check it out to prevent other users from inadvertently overwriting your changes.

You can identify a checked out product view by a green frame around the thumbnail image in the **Product View Gallery** dialog box. Similarly, you can identify a checked in product view by a red frame around the thumbnail.

Check out product view dataset

Select a product view and choose **Tools→Check-In/Out→Check-Out**.

Teamcenter applies a checkout lock to the dataset, allowing you to refresh or delete the product view. Other users cannot refresh or delete the product view while you have checked it out.

> Note:
>
> If you close the **Product View Gallery** dialog box while you still have datasets checked out, Teamcenter displays a request for confirmation that you want to continue. If you do, all active checkout locks are canceled.
>
> The **Check-Out** command is enabled only if you select a product view that is not checked out by another user.

Check in product view dataset

Select the product view you checked out and choose **Tools→Check-In/Out→Check-In**.

Teamcenter removes the checkout lock from the dataset, allowing other users to update or delete the product view.

Cancel checkout of product view dataset

Select the checked out product view and choose **Tools→Check-In/Out→Cancel Check-Out**.

Teamcenter removes the checkout lock from the dataset, allowing other users to update or delete the product view.

Refresh a product view

You can refresh a saved product view of the current structure at any time with changes you make during the current session in one of the following ways:

- Right-click the product view gallery and choose **Refresh Tab** to update the 3D snapshot in the selected tab to reflect any structure configuration changes.
- Right-click the product view gallery and choose **Refresh All Tabs** to update the 3D snapshots in all tabs to reflect any structure configuration changes.
- Right-click the product view and click the refresh product view button, which is the center graphical button in the middle row of buttons.
- Right-click the product view and choose **Apply**.

> Note:
>
> The **Apply** command and refresh button are only enabled if you check out the product view.

Send a product view to an external viewer

Select one or more product views in the structure tree and choose **File→Open in TcVis** or right-click and choose **Send to→Lifecycle Viewer**.

The selected viewer opens the product view with a configured structure. If you already have a 3D document active, Teamcenter allows you to open your product view or merge it into the active document, if the formats are compatible.

> Note:
>
> This method is not available if an incremental change is applied to the structure.

> Note:
>
> You can also select multiple product views in the product view gallery and send them to the Lifecycle Viewer or stand-alone Lifecycle Visualization. The product views open one at a time and any configuration of the original structure is retained.

Delete a product view

1. Click the floppy disk button on the Viewer toolbar.

   Teamcenter displays the **Product Views** dialog box.

2. Select the thumbnail of the product view you want to delete and click the delete product view button, which is the right graphical button in the middle row of buttons. Alternatively, you can right-click in the window and choose **Delete**.

   Teamcenter deletes the product view and its associated dataset.

Working with 2D snapshots

2D snapshot overview

2D snapshots are dynamic objects that represent a 2D scene (a view of the base image and markups) but are more than just image captures. You can have one or many snapshots associated with a BOM line in your product structure. When you select a BOM line, Teamcenter displays the attached image dataset in the **2D Viewer** pane. If there are multiple images attached, you can select the desired image dataset. You can:

- Use 2D snapshots to load base images and markups into the **2D Viewer** pane and restore the saved positioning information.

- Populate assets in technical illustrations with 2D snapshots.

- Query 2D snapshots to find related item revisions and technical illustrations.
- Update 2D snapshots to reflect changes in base images and markups.
- Print 2D snapshots from Teamcenter.
- Send 2D snapshots to Lifecycle Viewer or a standalone application viewer.

You can create 2D snapshots from any file displayed in the 2D viewer.

To work with 2D snapshots in the **2D Viewer** pane, you must activate the **2D Snapshots** toolbar.

The 2D snapshot mechanism works best when the BOM structure used has a one-to-one relationship between BOM lines and image datasets. Although the functionality works when this condition is not satisfied, the user interaction is not as clean. This is especially true when the image datasets are revised. As a result, Siemens Digital Industries Software recommends as a best practice to maintain a one-to-one relationship between image datasets and BOM lines when establishing the BOM structure, if possible.

If you open the **2D Snapshot Gallery** from Manufacturing Process Planner, see *Manufacturing Process Planning —Usage*.

Create or add a 2D snapshot

1. Open an item revision with one or more attached image datasets (for example, a PDF file).
2. Click to display the data pane.
3. Click the **2D Viewer** tab.

   The 2D viewer displays the first image dataset attached to the item revision.
4. If necessary, switch to the correct image dataset.
5. Navigate to the desired page if the base image contains multiple pages by selecting it from the **Page List** section of the navigation tree.
6. Zoom and pan to the region of interest.
7. Create necessary markups.
8. Click to open the **Snapshot Gallery** dialog box.
9. Click **Add** or right-click in the **Snapshot Gallery** dialog box and choose **Add**.
10. (Optional) If you have activated the **Attributes** dialog box, define attributes for the 2D snapshot.

> Note:
>
> Teamcenter opens the **Attributes** dialog box automatically each time you create a 2D snapshot when you choose **Options→Show Attributes Form on Add**.

Select an image dataset for viewing

If there are multiple image datasets attached to an item revision, you can select which one to use.

1. In the **2D Snapshots** toolbar, click .

   Teamcenter displays the **Select Dataset** dialog box.

2. Select the desired image dataset from the list and click **OK**.

Open a 2D snapshot in the Lifecycle Viewer or a standalone application viewer

1. Click to open the **Snapshot Gallery** dialog box.

2. Select a snapshot.

3. Do one of the following:

   - Select **Send to Lifecycle Viewer** in the context menu.

   - Select **Open in Lifecycle Visualization** in the context menu.

   - Click the **Start/Open in Lifecycle Visualization** button in the toolbar.

     > Note:
     >
     > This button is not available when incremental change is in effect.

Apply an existing 2D snapshot

1. With an item revision selected, click in the **2D Snapshots** toolbar in the **2D Viewer** pane.

   Teamcenter opens the **Snapshot Gallery** dialog box.

2. Do one of the following:

   - Double-click a 2D snapshot in the list.

- Select the desired snapshot and click **Apply**.

Teamcenter opens the snapshot in the **2D Viewer** pane. In addition, any markups, zoom, pan, and rotation information active at the time the snapshot was created are also visible in the **2D Viewer** pane.

Populate the snapshot gallery

1. With an item revision selected, click in the **2D Snapshots** toolbar in the **2D Viewer** pane.

   Teamcenter opens the **Snapshot Gallery** dialog box.

2. From the shortcut menu, choose one of the following.

Choose	To
Show All	Load all 2D snapshots for the item revision of the selected BOM line into the **Snapshot Gallery** dialog box.
Search	Search all 2D snapshots for those containing specific attributes. The results of the search are added to the **Snapshot Gallery** dialog box.
Options→Show All on Open	Load all snapshots associated with the selected BOM line when the **Snapshot Gallery** is opened.

Search for a 2D snapshot

1. With an item revision selected, click in the **2D Snapshots** toolbar in the **2D Viewer** pane.

   Teamcenter opens the **Snapshot Gallery** dialog box.

2. From the shortcut menu, choose **Search**.

   Teamcenter displays the **Snapshot Search** dialog box.

3. In the form, type values to define attributes for the 2D snapshot.

4. Click **Search**.

   Teamcenter displays the results of the search in the **Snapshot Gallery** dialog box.

> Tip:
>
> Display all snapshots associated with an item revision by choosing **Show All** from the shortcut menu.

Update an existing 2D snapshot

You can only update a 2D snapshot if you have checked out the selected snapshot. You can only check out a 2D snapshot if the selected snapshot was created from the currently open item revision. If you have a different item revision open, use the **Add** or **Replace** menu commands.

1. Search for the desired 2D snapshot from the current item revision.

2. Select the image by double-clicking or clicking **Apply**.

3. Choose **Check-In/Out→Check-Out** from the shortcut menu.

4. Make any necessary changes to the view such as changing the zoom, panning into a different area of the drawing, and adding or changing markups.

5. In the **Snapshot Gallery** dialog box, click **Update**.

   Teamcenter updates the 2D snapshot with the changes that you made in the viewer.

6. Check in the 2D snapshot by choosing **Check-In/Out→Check-In**.

   > Tip:
   >
   > Any changes you make in the 2D snapshot are not saved to the database until you check in the snapshot. If you make a mistake with the markup, choose **Check-In/Out→Cancel Check-Out** to revert the snapshot to its original state.

Replace a 2D snapshot

When you are working with multiple item revisions and the selected 2D snapshot is based on an item revision older than the one you currently have open, you can replace the selected 2D snapshot with a new one, and the old 2D snapshot remains associated with the old item revision.

1. With the snapshot that you want to replace open in the 2D viewer, and a newer item revision than the one associated with the selected snapshot open, right-click the snapshot in the **Snapshot Gallery** dialog box and choose **Replace**.

   Teamcenter associates the newly created snapshot with the currently open item revision, leaving the original snapshot associated with the original item revision.

2. (Optional) Define attributes for the 2D snapshot.

> Note:
>
> Teamcenter opens the **Attributes** dialog box automatically each time you create a 2D snapshot when you choose **Options→Show Attributes Form on Add**.

Rename a 2D snapshot

1. Select a 2D snapshot in the **Snapshot Gallery**.
2. Choose **Check-In/Out→Check-Out** from the shortcut menu.
3. Choose **Rename** from the shortcut menu.

   Teamcenter opens the **Rename Snapshot** dialog box.
4. Type the new name of the snapshot and click **OK**.
5. Check the snapshot back in by choosing **Check-In/Out→Check-In** from the shortcut menu.

Delete a 2D snapshot

1. Search for the 2D snapshot that you want to delete.
2. Select the snapshot and choose **Delete** from the shortcut menu or click .

   Teamcenter deletes the selected 2D snapshot.

> Note:
>
> Teamcenter can only delete 2D snapshots that are not referenced by an existing document.

Compare a 2D snapshot to the current image

You can visually compare the current image with a 2D snapshot that was captured from a previous revision of the base image dataset.

1. Open a newer item revision that contains a reference to the 2D snapshot that you want to compare.
2. Select a 2D snapshot created from a previous revision in the **2D Snapshot Gallery**.
3. Right-click the selected snapshot and choose **Compare**.

4. Click the **Compare Layers** button.

   Teamcenter displays the **Compare Layer List** dialog box.

5. Click **OK**

   Teamcenter opens the current image dataset to the same view that was used to capture the 2D snapshot in the previous revision and applies the same markup. You can then visually compare any differences in the two image datasets.

6. Right-click the selected snapshot and choose **End Compare**.

Check out/check in a 2D snapshot

1. Search for the 2D snapshot that you want to check out.

2. Right-click the desired snapshot and choose **Check-In/Out→Check-Out**.

   Teamcenter displays the **CheckOut** dialog box.

3. Click **Yes** to check out the snapshot.

   Teamcenter automatically checks out the current version of the snapshot from the database to prevent you from unintentionally overwriting another user's changes.

   > Tip:
   >
   > Note that the checked-out 2D snapshot now has a green or red (if it is currently selected) border in the **Snapshot Gallery** dialog box and its name is displayed in an italic font.

Define attributes for a 2D snapshot

You can define attributes that Teamcenter uses to search the 2D snapshots in the **Attributes** dialog box.

The checkin and checkout for the snapshot attributes are independent from the checkin and checkout for the snapshot itself. You do not need to check out the snapshot to edit its attributes. Even if you have the snapshot checked out, you still need to check out the attributes form to edit it.

1. In the **2D Snapshot Gallery** dialog box, right-click the desired snapshot and select **Snapshot Attributes**.

2. In the **Attributes** dialog box, click **Check-Out and Edit**.

3. In the **CheckOut** dialog box, click **Yes**.

4. Enter values into the boxes. By default, revision ID and page number of the base image are already provided. Your administrator can configure which attributes are available by creating a custom form and setting the **VisSnapshot2DFormName** Business Modeler IDE constant.

5. Click **Save**.

   Teamcenter saves these attributes with the 2D snapshot.

6. Click **Check-In** to check in the changes or **Cancel Check Out** to discard the changes.

7. (Optional) To have Teamcenter display the **Attributes** dialog box each time you create a 2D snapshot, choose **Options→Show Attributes Form on Add**.

Create custom forms for 2D snapshots

If you want to use custom 2D snapshot forms, your administrator must do the following:

1. Create a new business object with **Vis_Snapshot_2D_Form** as the parent.

2. Define the **VisSnapshot2DFormName** business object constant.

3. Set this constant to the name of the extended form.

> Note:
>
> When adding the new custom form, you must not modify the form storage class name that is automatically set (*name_of_custom_form***Storage**).

Create a 2D geometry asset

If you want to embed a 2D snapshot in a work instruction, you must create a 2D geometry asset for the snapshot. You can create work instructions using Teamcenter Publish.

1. Right-click a 2D snapshot in the **Snapshot Gallery** dialog box.

2. Choose **Options→Capture 2D Geometry Asset**.

3. (Optional) Modify the graphic quality of the 2D geometry asset by choosing **Options→Modify 2D Geometry Asset Settings** and adjusting the slider to the desired quality.

4. Create the 2D snapshot.

   Teamcenter creates the 2D geometry asset while creating the snapshot.

Comparing structures graphically

About comparing structures graphically

You can compare two structures (BOMs) and view the results to identify differences. The BOMs can contain different types of objects, such as mechanical parts, electrical parts, routes, and connections. You can use the graphical comparison capability with released BOMs or with structures that are configured by effectivity.

You can compare an assembly with an assembly, a part with a part, or two revisions of the same assembly. If you compare two revisions of an assembly, Teamcenter identifies the following supersedure information:

- Adds

  These are objects that are in the target assembly but not in the source assembly. They have been added to the assembly.

- Cancels

  These are objects that are in the source assembly but not in the target assembly. They have been removed from the assembly.

- Moves

  These are objects that are in different positions in the source assembly and target assembly. Any object whose transform matrix differs between the source and target is identified as repositioned.

- Reshapes

  These are objects that have alternate representations between the source assembly and target assembly. Any object identified with a **UG ALTREP** note type is identified as reshaped.

- Common

  These are objects that are in both the source assembly and target assembly.

Compare two BOMs

1. Choose **View** → **Show Second Structure Panel** to open the second structure pane.

2. Open the two BOMs in the separate structure panes, with the source in the one pane and the target in the other.

3. Apply any revision rules or effectivity needed to configure the structures for the comparison.

4. Choose **Tools** → **Graphical BOM Compare**.

   Teamcenter analyzes the BOMs to identify any differences and displays the **Graphical BOM Compare** dialog box containing a visual indication of those differences.

   Depending on the type of comparison, you can use the tools and controls in the window to change the view and examine differences more closely.

   If you compare two versions of an assembly under change control (for example, a problem item and an affected item of an engineering change), Teamcenter displays a list of supersedures.

5. Click **Close** to close the window on completion.

Set color options

You can change the default colors in which differences and supersedures are displayed in the **Graphical BOM Compare** dialog box as follows:

1. Choose **Edit** → **Options**.

   Teamcenter displays the **Options** dialog box.

2. Choose **Change Management** → **BOM Tracking** from the list of options.

   Teamcenter shows the list of current colors assigned to the **Graphical BOM Compare** dialog box.

3. To change the color assigned to a difference type, double-click the current color assignment.

   Teamcenter displays the palette of available colors. Click the required new color and click **OK** or **Apply** to change the color; alternatively, you can click **Cancel** to exit without changing the color.

Working with markups

Adding and deleting markups

When an image is loaded in the viewer, you can add markup layers to the image. You can mark up JT files that are attached to **DirectModel** datasets or schematic geometries. You can also view images in JPEG or BMP formats that are attached to a schematic geometry. To view and mark up schematics, your administrator must set the **TC_Schematic_BOMView_Types** preference to **on**.

Markups are text or graphical elements that you draw in the viewer with your model or schematic. 3D markups display on 3D layers.

Markups may include lines, rectangles, polygons, ellipses, inset images, and text.

Anchored text markups can include part information and metadata attributes.

To create or modify markups, display the relevant toolbar by right-clicking the Lifecycle Visualization base toolbar and choose the appropriate command from the shortcut menu.

> Note:
>
> If you are working with schematics, only a limited set of functions are available. The following options do not apply to schematics: edit color/translucency, insert, view control, export 3D, reposition, rotate, PMI, clearance, cross-section, navigation, and visibility.

Working with 3D and schematic markups

Create a 3D markup dataset

You need to create a **DirectModel3DMarkup** dataset to store 3D markups of structures or assemblies.

> Note:
>
> You MUST HAVE at least the Teamcenter lifecycle visualization standard configuration installed to work with 3D markups.

1. Load the structure or assembly (**DirectModel** dataset) in the viewer.

   Teamcenter displays the model and the Lifecycle Visualization toolbar.

2. Click the **Create Markup** button.

   Teamcenter displays the **Create Markup3D Dataset** dialog box.

3. In the dialog box, type a name for the dataset in the **Dataset Name** box.

4. (Optional) Type a description of the dataset.

5. Click **OK**.

   Teamcenter creates the **DirectModel3DMarkup** dataset and attaches it to the **DirectModel** dataset.

You can create multiple **DirectModel3DMarkup** datasets under a single structure or assembly. Each **DirectModel3DMarkup** dataset can contain multiple markup layers.

> Note:
>
> Markup layers are stored as VPL files.

Draw 3D markups

Perform the following steps to draw markups on structures, assemblies, or schematics:

1. On the **3D Markup** toolbar, click **Enable Markup** .

2. (Optional) To change colors, fill styles, line and edge styles and sizes, and font styles and sizes, click **Preferences** .

3. (Optional) To draw a filled ellipse, polygon, rectangle, or text markup, click **Fill** .

4. (Optional) To attach the markup to a point on the model or schematic click **Anchor** .

   Anchored markups display, hide, and move with their attached parts. Anchored text markups are attached to parts with leader lines.

5. (Optional) Create or select a layer for the markup. If you do not have a markup layer, one is created when you add the first markup.

6. Specify the markup type by clicking the corresponding button on the **3D Markup** toolbar.

   Teamcenter changes the cursor to indicate the type of markup.

7. Place the markup in one of these ways:

To place this markup	Perform these actions
Line	a. (For an anchored markup) Select a point on the model or schematic.
	b. In the viewer, drag the mouse pointer to draw a line.
	c. (Optional) To draw a horizontal or vertical line, press and hold the shift key as you drag.
Polyline	a. (For an anchored markup) Select a point on the model or schematic.
	b. In the viewer, click to place one endpoint.

To place this markup	Perform these actions
	c. (Optional) To draw horizontal or vertical polyline segments, press and hold the shift key. d. Click to place each vertex. e. Double-click to place the last vertex.
Freehand line	a. (For an anchored markup) Select a point on the model or schematic. b. In the viewer, drag the mouse pointer to draw.
Rectangle	a. (For an anchored markup) Select a point on the model or schematic. b. In the viewer, click to place one corner. c. Drag the mouse pointer, and then release to place the opposite corner. d. (Optional) To draw a square, press and hold the shift key as you drag.
Polygon	a. (For an anchored markup) Select a point on the model or schematic. b. In the viewer, click to place each vertex. c. (Optional) To draw horizontal or vertical segments, press and hold the shift key as click. d. Double-click to place the last vertex.
Ellipse	a. (For an anchored markup) Select a point on the model or schematic. b. In the viewer, drag the mouse pointer to draw. c. (Optional) To draw a circle, press and hold the shift key as you drag the mouse pointer.
Inset image	a. In the **Open** dialog box, select the image dataset and click **Open**.

To place this markup	Perform these actions
	b. (For an anchored markup) Select a point on the model or schematic. c. In the viewer, drag the mouse pointer to place and size the image.
Text	a. (For an anchored text markup) Select a point on the model or schematic. Teamcenter displays the **Markup Text** dialog box. b. (Optional for an anchored text markup) In the **Markup Text** dialog box, click **Advanced** to add part information or metadata attributes. c. (For a floating text markup) Click a point in the viewer to place the text markup. Teamcenter displays the **Markup Text** dialog box. d. (Optional) Change the font, size, and style of the text. e. (Optional) To change the shape in which the text appears, from the **Bounding shape** list, choose the **None**, **Rectangle**, or **Circle**. f. Type the text of the markup in the **Text** box. g. Click **OK**.
URL	a. Place a text or inset image markup. b. Right-click the markup, and choose **Properties**. c. In the **Properties** dialog box, click the **Hyperlink** tab. d. In the **Link Specification** box, type the URL, or click **Browse** and browse to the appropriate file path. You can link to any type of file. The application that is associated with the file type opens and displays the file. e. Click **OK**. f. To navigate to the URL or launch the referenced file, double-click the link.

To place this markup	Perform these actions
	Note: When you open a URL for an animation (VAN) file, the animation plays automatically. To create a URL markup that opens the default E-mail program and addresses a message, type **mailto:** in the **Address** box. When you double-click the link, the E-mail program is launched and a message is addressed to the specified address.

The markup appears in the viewer, with a list of markups under the selected markup layer. If Teamcenter displays an asterisk (*) before the markup layer name, changes were made to the markup layer since it was last saved.

> Note:
>
> If you open a 3D model that includes an anchored text markup that is anchored to an item that has been removed from the current 3D model or moved to a different structure in the same 3D model, when the 3D model file opens, the leader line does not appear and the text of the 3D markup appears in red.

Create a 3D markup layer

Create a 3D markup layer using one of the following methods:

Initial markup layer

1. Ensure a 3D markup is visible.
2. Click the **Save Layers** () button on the Lifecycle Visualization base toolbar.

   The system displays the **Save Layer** dialog box.
3. Type a name for the new layer in the **Name** box and click **OK**.

   Teamcenter displays the new layer in the **Markup Layers** list.

> Note:
>
> The **Markup Layers** list does not display until you create a 3D layer.

Additional markup layers

1. Right-click in the **Markup Layers** list and choose **New Layer** from the shortcut menu.

   Teamcenter displays the **Save Layer** dialog box.

2. Type a name for the new layer in the **Name** box and click **OK**.

   Teamcenter displays the new layer in the **Markup Layers** list.

> Note:
>
> The **Markup Layers** list does not appear until you create a 3D layer.

Open 3D markup layers

- Select a 3D Markup dataset.

  Teamcenter opens the **Markup Layers** list containing the saved layers for the dataset.

Save 3D markup layers

When you create or edit a 3D layer, an asterisk (*) appears before the name of the layer in the **Markup Layers** list until you save the layer. When you save the layer, the asterisk disappears until the layer is edited again.

Save 3D layers together or separately. Perform the following steps to save layers:

1. From the **Markup Layers** list, select the layer that you want to save.

2. Right-click and choose **Save Layer** from the shortcut menu.

   Teamcenter removes the asterisk next to the layer name in the list.

Delete 3D markup layers

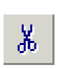
1. Right-click the **DirectModel3DMarkup** dataset in the tree.

   Teamcenter displays the **Dataset Object** menu.

2. Choose **Named References**.

   Teamcenter displays the **Named References** dialog box.

3. In the named reference table, select the markup layer that you want to delete.

4. Click the **Cut**  button.

Teamcenter removes the layer from the named reference list.

5. Click the **Close** button.

   Teamcenter closes the **Named References** dialog box.

Control the display of 3D markup layers

To	Perform these actions
Display or hide 3D layers	Select or clear the state indicator to the left of the layer name in the **Markup Layers** list.
Save all layers	Save all the 3D layers, separately, with their current file names.
Save layer	Save the selected 3D layer.
Save layer as	Save the selected 3D layer with a new file name.
Capture view	Capture the orientation of the model and markup as seen in the viewer for the selected layer.
Apply view	Restore the captured view for the layer selected.
Hide view	Hide the captured view for the layer selected.

Working with 2D markups

View 2D images

1. Select the **DirectModel** dataset in the navigation tree or **Properties** table and click the **Viewer** tab.

   > Note:
   >
   > To view a named reference of the **DirectModel** dataset, right-click the dataset in the tree, choose **Visualize Named Reference** from the **Dataset Object** menu, and choose the named reference file that you want to view.

   Teamcenter displays a message indicating that you are about to view a JT assembly and verifying that you want to download all the components of the assembly.

2. Click **OK** to download the components.

3. Click the **Image Capture** button in the viewer pane. The **Create Markup Layer** dialog box appears, allowing you to create a **DirectModelMarkup** dataset and attach it to the original **DirectModel** dataset as a markup relationship. The **Viewer** pane now contains a **Markup Layers** tree to the left of the graphical display.

Compare 2D image layers

You can compare image layers when you want to:

- Display common areas and differences.
- Display the common areas of both layers, one of the comparison layers, or all of the comparison layers.
- Change the colors of one or both image layers in your comparison.

1. Choose two 2D image datasets in the navigation tree.
2. Choose **Compare 2D Images** from the **View** menu.

   Teamcenter displays the images in the **Viewer** tab and displays the 2D Compare toolbar.

3. Perform one of the following tasks:

To	Perform these actions
Display only the compare layer (common areas of both layers)	Click the **Display Compare Layer** button on the 2D Compare toolbar. Only the compare layer is displayed in the **Viewer** tab. The information that is common to both layers is drawn in black.
Display one layer and not the other	Click the **Display 1st Layer** button or the **Display 2nd Layer** button.
Display all comparison layers	Click the **Display All Layers** button. All the comparison layers are displayed. Unless you have changed the color preferences, the first layer is green; the second layer is red; the comparison layer is black.

Create 2D markups

1. Select the 3D format (**DirectModel**) of the object that you want to revise.
2. Click the **2D Markup** button in the viewer pane.

Teamcenter displays the **Create Markup Layer** dialog box.

3. Type the name of the markup layer that you are creating in the **Name** box.

4. Select the type of file from the **File Type** list.

5. Type a brief explanation of the markup layer's purpose and content in the **Description** box and click **OK**.

   The new markup layer can be found in the **Properties** table, or by expanding the **DirectModel** object in the tree.

Create 2D markup layers

You can use **DirectModelMarkup** and **Markup** datasets to create a new markup layer for a 2D format image, as follows:

1. In the navigation tree, select a **DirectModelMarkup** or **Markup** dataset for the object that you want to revise and click the **Viewer** tab.

2. Mark up the 2D image using the markup toolbar.

3. Save the markup layer in the new dataset component.

4. Click the **Save 2D Markup** button.

   Teamcenter displays the **Save Layer** dialog box.

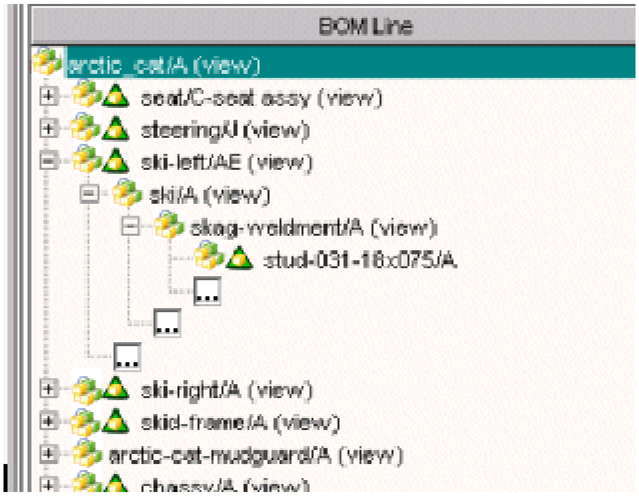
5. Type the name of the layer that you are creating in the **Name** box and click **OK**.

   Teamcenter generates a 2D file, stores it in the current dataset and displays it in the **Markup Layers** tree. If multiple markup layers are created in the same session, they can all be saved simultaneously. Teamcenter displays a separate **Save Layer** dialog box for each saved layer.

Expand partially loaded structures

When Teamcenter displays a BOM or manufacturing view containing the results of a search, the siblings of the node you searched for are hidden so the search results are displayed quickly. Each hidden node is represented by a **...** symbol enclosed in a box. The ancestors of the found node are loaded and visible.

The following figure shows how a partly loaded structure displays in the engineering BOM. In this example, three nodes are hidden and these nodes are siblings of the **stud-031–18x075/A** node found by the search.



Partially loaded structure in engineering BOM

About process configuration

A manufacturing process plan consists of three interconnected structures:

- Product
- Processes and operations
- Work area

Configuration management helps you define and apply variant rules to each of these structures independent of the other structures.

Because the process structure can have its own lifecycle and variability, lines in a process can configure out in one of the following ways:

- By occurrence effectivity

  If you add an operation with occurrence effectivity, it is configured out when it is not effective. Show these lines using **View→Show Unconfigured Data→Show Unconfigured by Occurrence Effectivity**.

  The default state of this button is determined by the **MEShowUnconfiguredOccurrencesEffectivityDefaultState** preference.

- By incremental change effectivity

  If you make changes with an incremental change (IC) and if it carries effectivity, the changes related to it are configured out if it is not effective. Show these changes by choosing **View→Show Unconfigured Data→Show Unconfigured Changes**.

The default state of this button is determined by the **MEShowUnconfiguredChangesDefaultState** preference.

- By variants/options

  If a BOM line carries a variant condition making it valid for a certain set of options, it is configured out for a different option set for which it is not valid. Show these lines by choosing **View→Show Unconfigured Data→Show Unconfigured Variants**. Using this menu command also shows objects that were configured out using effectivity.

  The default state of this button is determined by the **MEShowUnconfiguredVariantsDefaultState** preference.

- By reference window

  If you have a composition-type process, a line (for example, a consumed item) may be configured out because it is configured out in the reference or parent window on which it is based. Teamcenter does not differentiate why it was configured out in the other window. Show these lines by choosing **View→Show Unconfigured Data→Show Unconfigured Assigned Occurrences**. In this case, the lines are gone from this process window because they are configured out of the parent structure. It is irrelevant whether they are configured out of the parent structure because of occurrence effectivity, incremental change effectivity, or variants/options.

  The default state of this button is determined by the **MEShowUnconfiguredAssignedOccurrencesDefaultState** preference.

The following preferences play a role in what processes you see when child processes are configured out:

- **controllingOccsForProcessConfiguration**

- **typeAndRuleForProcessConfiguration**

Reconciling broken links

About broken links

Changes to the product or plant structure are not automatically updated in the process tree where the occurrence is referenced. This results in a *broken* link. With this feature, you can identify broken links and search for the possible occurrence that was originally defined, for example, as a consumed part.

When you expand a process to display linked items, each link line includes a symbol indicating the state of the reference:

Symbol	Description
	Occurrence is linked to a product or plant structure.
	Link is broken.
	Occurrence is linked to a product or plant structure that is not currently loaded, or a product or plant structure is loaded but not currently configuring the process structure.

> Note:
>
> Teamcenter retrieves the status of a link from a run-time property, **Mfg0LinkState**.

When performing the search for broken links, Teamcenter searches through process structures that you specify and looks for broken links. It then looks through product or plant structures that you specify for likely *candidates* to repair these links. The search is based on criteria that you can specify in the **MPP_DefaultCandidateSearchCriteria** preference. Once found, you can have Teamcenter repair these links automatically, or you can choose to select candidates manually from the candidates list.

Your administrator can save search criteria for you to use. You can further modify these criteria and save your modifications to the saved criteria.

When there are many broken links and each broken link has many candidates, a large amount of memory is required for high-speed processing. If the total number of broken links and candidates is too large, for example, 32,000 lines, the memory usage may be a concern if you are performing the search on an underpowered computer. To speed up the search, divide the search scope into smaller pieces to reduce memory usage; for example, select subnodes instead of the root node.

The following properties are supported in a search for broken links:

- A selection of BOM line properties:

  Item Id
  Find number
  Quantity
  Usage Address
  Reference Designator
  Position Designator

- All types of occurrence notes
- Any extended or custom properties your administrator creates
- Properties found on the weld attribute form

Identify broken links

1. Open the process in which you want to search for broken links.

2. Open the product/plant structure in which you are looking for likely link candidates in the second pane by right-clicking the tab and choosing **Open Structure in Second Panel**.

3. Select a product or plant structure as the scope for the candidate search. You can select multiple lines.

4. Select a process or operation as the scope for the broken link search.

   Teamcenter searches from the selected object down through all leaf nodes. If you do not make a selection, Teamcenter uses the root node as the scope for the search.

5. Choose **Tools→Repair Broken Links**.

   Teamcenter displays the **Repair Broken Links** dialog box.

6. Modify the scope for the broken link candidate search by adding or removing product structure lines. Do this by selecting them in the product structure and clicking **Set/Add current selection**.

7. (Optional) Modify the search criteria.

8. To set a revision rule, click **Alternative Revision Rule**.

   You can choose to view or set the revision rule, enter the end unit/date, or set an override folder.

9. Choose whether you want to perform a quick or a more thorough search in the **Structures Traversal** section.

Click	To
Visible Structure	Search through the launched, loaded structure (all the currently expanded and visible lines). The quick search does not include nodes that have never been expanded (that is, nodes that are not loaded) or are hidden due to effectivity or variant conditions.
Full Structure	Search through the complete tree in the launched structures, loading as necessary. The search expands collapsed (unloaded) nodes; it does not include nodes hidden due to effectivity or variant conditions.

10. To search for broken links only, and not perform the more time-consuming candidate search, clear **Include Candidates**.

11. To have Teamcenter repair the links automatically, select **Automatic Repair**.

    Teamcenter searches for eligible candidates in the product or plant structure and, if only one candidate is found, automatically creates a relationship of the same type as the broken link between the process line and the lone candidate.

12. Click **Search**.

    Teamcenter searches for all broken links from the selected process node down to the leaf nodes and displays them in the **Broken Links** list. If you select **Include Candidates**, it also searches for all candidates that fulfill the search criteria and displays them in the **Candidates** list.

    If you select a line in the process structure on which to perform the search with multiple broken links in the substructure, and **Automatic Repair** is active, all broken links for which Teamcenter finds a unique candidate are repaired.

Repair broken links

1. Search for broken links.

2. Select the broken link that you want to repair from the **Broken Links** list.

3. (Optional) Click **Show in Tree** to see the line containing the broken link highlighted in the process structure.

4. Select the candidate to which you want to relink the process line in the **Candidates** list.

5. (Optional) Click **Show in Tree** to see the candidate for repair highlighted in the product or plant structure.

6. Click **Repair**.

    Teamcenter relinks the process line to the product or plant line and the symbol is updated in the **Broken Links** list to show the link is no longer broken. You can select multiple pairs of broken links/candidates before clicking the **Repair** button. Teamcenter remembers your choices and processes all the pairs that you select.

Modify search criteria

By default, when searching for candidates to repair broken links, Teamcenter examines the properties listed in the search criteria that you select from the **Stored Criteria** list. If the criteria of a perspective candidate match the values in the search criteria, the candidate is proposed as a replacement.

1. Select a search criteria from the **Stored Criteria** list.

    The choices shown are saved by your administrator.

2. Click **Edit** beside the **Stored Criteria** box and add BOM line properties by clicking the **Add** + button.

   Teamcenter adds new properties to the criteria list in the order in which they are displayed in the columns of the process view. To display more properties, you must first add new columns with the desired properties to the process view.

   > Note:
   >
   > If a property is added by a preference, its name is displayed as the internal property name.

3. Designate whether the properties should be considered as mandatory or optional by clicking in the cell and selecting a value.

4. Enter a property value.

   You can use the * wildcard symbol or a space between characters.

5. (Optional) Save the modified search criteria by clicking **Save Criteria**.

   You can only modify search criteria that were saved by your administrator. You cannot modify the **MPP_DefaultCandidateSearchCriteria** search criteria.

Working with packed lines

Packing or unpacking structure lines

Grouping multiple identical components in one level of an assembly is known as *packing*. You can pack components if they satisfy all of the following requirements:

- They have the same item revision.
- They have the same find number.
- None have variant conditions or they all have the same variant condition.

For example, if a bicycle designer is working on a wheel hub design, it is time-consuming to negotiate 50 individual spokes within the wheel assembly, if each spoke is identical except for its position. All that is necessary is a **Spoke x 50** entry.

> Note:
>
> A customizer can use an ITK function to register a different algorithm for packing criteria.

Restrictions on packed lines

The following restrictions apply to all lines in the structure that are packed:

- You cannot edit the **Quantity** value.
- If any of the packed lines have notes, the notes are replaced by the text **Packed Notes**. If none of the packed lines has notes, the notes are blank. In both cases, you cannot edit the notes.
- Item and item revision attributes such as part name, weight, and cost remain visible and can be edited if you have the appropriate permissions.
- You can modify the find number. Any such modification applies to each line in the structure and is visible if the structure is unpacked.
- If any of the packed lines has a substitute, the packed line shows **Packed Substitutes** in the **Substitute** column. The pack count includes the substitutes.

Pack structure lines

To pack lines in the structure that meet the packing criteria, select any one of the lines and choose **Pack** in the **View** menu. Alternatively, you can click the **Pack** button in the toolbar.

In the case of the bicycle example, this action collapses the 50 lines in the product structure into one line representing all spokes and indicated by the image. A **x 50** property is appended in the node of the single line and the **Quantity** box shows the value **50**. Teamcenter shows a **Y** character in the **Packed** column, if that column is displayed.

> Note:
>
> Teamcenter makes no distinction made between the sum of a number of separate occurrences or an aggregate occurrence displayed in the **Node** column or the **Quantity** column. However, the **Pack Count** column shows the number of lines that have been packed.

Unpack structure lines

To unpack lines in the structure, right-click the single packed line and choose the **Unpack** menu command, or press the CTRL+N keys. The packed line separates into individual structure lines, each with its own set of attributes. You can edit these individual attributes.

By default, all components are initially packed to save space.

You can change this behavior by editing the **Pack by Default** preference.

Pack all or unpack all lines

Choose **Pack All** or **Unpack All** from the **View** menu to pack or unpack all lines in the currently selected window, if the necessary packing conditions are met.

> Note:
>
> - **Unpack All** unpacks all packed lines in the currently expanded structure.
> - **Unpack All** does not unpack or expand lines in unexpanded structure.
> - After selecting **Unpack All**, the unpacked lines are in an unexpanded state.

Packing or unpacking lines with reference designators

You can pack or unpack product structure lines that include reference designators. For example, if you pack eight occurrences of the same part with different reference designators, the **Ref Designator** property column shows a concatenated set of reference designators, for example, **C1, C5-7, C10, C14-16**. You cannot edit the reference designators of packed lines.

> Note:
>
> There are additional rules that determine general packing rules, as described previously. This preference only controls reference designator packing.

You can also unpack packed lines that include concatenated reference designators. Each unpacked line shows a single reference designator, for example, **C1**.

Teamcenter validates the correct reference designator format. All reference designators must be in the format *prefix number*, where *prefix* is a string of one or more uppercase letters and *number* is an integer.

You can search for reference designator values. As with other product structures searches, this is a wildcard search; if you search for **C1**, the system actually searches for ***C1***. You can also include reference designators in structure comparisons.

You can specify the reference designator values in the International Organization for Standardization (ISO) and in the American Society of Mechanical Engineers (ASME) formats. In the ASME format, the reference designator value is in the capital letter followed by a number and suffix letter. For example, **S1A**.

Add to favorites

1. Right-click a line in the structure pane and choose **Add to Favorites**.

   The **Favorites** dialog box appears.

2. Click **OK**.

   The object is displayed in the **Favorites** list in the navigator pane.

Assign components or assemblies

If two structure panes (sometimes called *companion panes*) are visible, you can select any assembly or component in the BOM tree in one pane and assign it to the BOM tree in the other pane as its children. When you do this, the BOMs share the absolute occurrences of the assigned children. This allows you to search between the BOMs to locate these shared absolute occurrences. You can make such assignments in two ways:

- Select the assembly or component and choose **Tools→Assign**. You can also right-click the selected item and choose **Assign** from the shortcut menu.

  -or-

  Right-click the selected item and choose **Assign As** from the shortcut menu. You can then specify the occurrence type for the assigned component.

Working with collaboration context rules

Managing rules

You can manage cloning and variant rules associated with a collaboration context. You can cut and paste rules to the configuration associated with a configuration context or structure context in the collaboration pane. You can also modify the revision and variant rules associated with a structure context with the **Tools→Save Configuration** menu command as follows:

- To modify the rules associated with the BOM view, use the revision rule and variant rule buttons and menu commands. You can save the modified configuration as the structure context's configuration by choosing **Tools→Save Configuration**.

  > Caution:
  >
  > Modifying a revision rule or variant rule affects your view, but does not affect the structure configuration in the database until you explicitly save the changes.

- You can set the BOM view's rules to the same rules as any other configuration in the database by clicking **Set View Configuration**, then browsing to the required configuration. You can then save these rules to the structure context's configuration by choosing **Tools→Save Configuration**.

- You can modify the rules, then choose **Tools→Save Configuration** to create a new configuration. You can modify the structure's configuration by clicking the **Paste to Structure** button on the **Save** dialog box.

Managing variant rules

A structure may be configured according to selected options defined through variant rules. These variant rules are then applied to the structure. In addition, revision rules and the release status of a component also dictate what is configured for a given top-level end item. Any changes to a product structure affect the manufacturing steps needed to manufacture that product. Process structures are automatically configured by removing operations that consume items not configured from the product structure.

Any BOM lines containing variant conditions are indicated with a variant symbol next to the BOM entry.

Assign variant conditions

Use the following steps to add variant conditions to a structure to configure these items independent of the end item:

1. To apply the variant conditions, select a line in the structure pane.
2. Choose **Edit→Variant**, or click the **Variant** button on the toolbar.

   The dialog box appears to allow you to define variant conditions for the selected object.

Apply variant rules

Use the following steps to apply existing variant conditions to structures:

1. To apply the variant rules, select a line in the structure pane.
2. Choose **Tools→Variant Rule**, or click the **Variant Rule** button on the toolbar.

   Enter the value for the variant rule in the dialog box.
3. Click **OK** or **Apply** to configure the current structure using this variant rule.

Viewing a process structure

If you have a process structure contained within a collaboration context, you can use the **cc_writer** utility to send this structure to Teamcenter lifecycle visualization mockup for viewing.

For more information, see *Teamcenter Utilities*.

Manage drafting symbols and GDT symbols

Your administrator can configure any form to contain geometric dimensioning and tolerance symbols or rich text in forms. You can include geometric dimensioning and tolerance symbols in any box of a form but, in practice, this is done in fields intended for engineering data. For example, a box titled **Work**

Instruction is a good candidate for geometric dimensioning and tolerance symbols, while a box titled **Quantity** is not.

To	Do this
Add or edit symbols in a form	1. Display the form in the **Viewer** tab. 2. Click **Edit**. Teamcenter displays the **Change GD&T Symbols** dialog box.
Add or edit drafting symbols	1. Click the **Drafting Symbols** tab. 2. Click one or more of the predefined symbol buttons.
Add or edit GDT symbols	1. Click the **GDT Symbols** tab. 2. Click one or more of the predefined symbol buttons.
Format rich text	Use the buttons on the **Drafting Symbols** tab.
Save changes and exit	Click **Edit**.

3. Working with collaboration contexts

Overview of creating a collaboration context

There are two methods used to create a collaboration context:

- Top down:

  1. Create an empty collaboration context.

  2. Create empty structure contexts within the collaboration context.

  3. Fill up the content of the new structure context by inserting items.

- Bottom up:

  1. Open desired objects.

  2. Save these objects as structure contexts.

  3. Save all structure contexts in the session to a new collaboration context or move structure contexts into an existing collaboration context.

You can create a collaboration context for each instance of a collaboration between applications within Teamcenter or between Teamcenter and an external application. For example, if your Teamcenter system connects to a Tecnomatix system, you must define a single collaboration context to allow the two systems to share data.

Create a new collaboration context

How you create collaboration contexts depends on the method you use to build your collaboration context structure.

- If you use a top down method:

  1. Choose **File→New→Collaboration Context**.

     Teamcenter displays the **New Collaboration Context** dialog box.

  2. Choose a collaboration context type from the list.

     - Your administrator can create additional types as necessary with the Business Modeler IDE administration application.

- Teamcenter places the types of collaboration context you previously created in the **Most Recently Used** list.

3. (Optional) Select **Open on Create**.

   If you select this option, Teamcenter opens the new collaboration context in the application directly after creation.

   > Tip:
   >
   > If you do not select this option, you can find the new collaboration context in the **Newstuff** folder in My Teamcenter.

4. Click **Next**.

5. Type a name in the **Name** box.

   Mandatory parameters are marked by a red asterisk.

6. (Optional) Type a description of the collaboration context.

7. Click **Finish**.

   > Note:
   >
   > You can create a collaboration context in Multi-Structure Manager, Manufacturing Process Planner, Part Planner, Multi-BOM Management, and My Teamcenter.

If you selected **Open on create**, Teamcenter displays the context as a top-level line. If a collaboration context was previously open, Teamcenter closes it and loads the new collaboration context.

Teamcenter always stores the new collaboration context in the **Newstuff** folder in My Teamcenter.

- If you use a bottom-up approach to creating collaboration contexts, you can also create a new collaboration context that contains an existing structure context.

  1. Select the structure context in the collaboration pane.

  2. Choose **File→Save as→Save as New Collaboration Context**.

     For more information, see *Save objects as collaboration contexts*.

Save objects as collaboration contexts

You can save loaded structures, including studies, to a new collaboration context. Teamcenter creates a structure context from each loaded structure that you include in the collaboration context if is not already contained in a structure context.

1. Select a root line of an object in the collaboration pane and choose **File→Save as→Save as New Collaboration Context**.

   Teamcenter displays the **Save as New Collaboration Context** dialog box.

2. Type a name and description for the new collaboration context in the **Name** and **Description** boxes.

3. Select a type of context from the list. Click **More** to see a complete list of structure context types.

   Your administrator can create new collaboration context business objects (types) in the Business Modeler IDE.

4. For each structure in the list on the left that you want to save, enter the following information. Your administrator can change the existing defaults for this information in the **Default_StructureContext_Type** preference.

   - Name of the structure context
   - (Optional) Description
   - Type of the structure context
   - Type of the configuration context to be created for this structure context

   If the structure is already a part of a structure context, you can see this information when you select the structure in the structure list. Even if a structure is already part of a structure context, Teamcenter creates a new structure context for the structure that is based on the existing one and includes any modifications made to the current structure.

5. (Optional) If you want to save loaded structures to a new collaboration context that captures linked released studies or all studies, review the **Include Studies** list and select the studies to include.

6. (Optional) Select the **Open On Create** option to open the new collaboration context in the collaboration pane.

   > Note:
   >
   > When you open a new collaboration context, any currently open one is unloaded.

- The new collaboration context is opened.
- Any root structure that is participating in the new collaboration context is no longer displayed as a separate root, but only as part of the new collaboration context.
- Any other collaboration context containing structure context objects that were chosen to participate in the new collaboration context object are unloaded.

7. Click **OK**.

   Teamcenter collects all of these structure contexts into the new collaboration context. In addition, it creates a configuration context within the structure context containing the revision and variant rules currently applied to the object. It clones or references the revision and variant rules of the existing structure, according to the following rules:

   - If the current revision rule is saved as public, it creates a reference to it.
   - If the current revision rule is modified and not saved, it clones the modified rule to create a private revision rule for the configuration context.
   - If the current variant rule is saved as public, it creates a reference to it.
   - If the current variant rule is modified and not saved, it clones the modified rule to create a private variant rule for the configuration context. If the variant rule is cloned, it is not linked to the top line item in the structure.

   Each new structure context refers to all of the occurrence groups that have manufacturing views (visible tabs) when you save it.

   > Note:
   >
   > If you try to save a structure that is configured by multiple variant rules, you must set the **DisableSaveSOS** preference to **true**.

Overview of creating a structure context

You can create a structure context and add it to the current collaboration context. You can create any valid structure context, including a product or process to include in a collaboration context. If no collaboration context is open, Teamcenter adds the new structure context to the database for later assignment.

The structure context may be a *composition*, depending on its type. Items in a composition structure may have relationships to other structures or to absolute occurrences and occurrence groups.

If the structure context *is* a composition:

- Each target line in the structure context refers back to the source line, as indicated by the symbol. You can use the **Tools→Find in other panel** command to identify the related source from the target or vice versa.

- Occurrence data is retrieved from the source line to the target line when you open the target structure context; it is not copied. Absolute transforms, absolute occurrence identifiers, and variant conditions are retrieved; occurrence notes are not retrieved.

- No absolute occurrence identifiers are created during assignments. However, if you specify an absolute occurrence identifier in the source, Teamcenter shows it in the **ID at All Levels** property column, not on the top level.

- If you change occurrence data on the source, the change is inherited by the target unless you override the corresponding data on the target.

- If you change occurrence data on the target, Teamcenter does not change the corresponding data on the source. This allows you to reposition lines in the target, for example, to move assemblies to give a different structure or insert lines to represent consumables.

  > Note:
  >
  > When you change item or item revision attributes (for example, the revision master form), the values Teamcenter displays depend on the revision rule that configures the source and target. These attributes are independent of occurrence data.

- Revision or variant rules applied to the source also configure the target.

If the structure context is *not* a composition:

- The target line in the structure context does not refer back to the source line. However, you can use the **Tools→Find in other panel** command to identify the related source from the target, or vice versa.

- Occurrence data is copied from the source line to the target line, including absolute transforms, absolute occurrence identifiers, variant conditions, and occurrence notes.

- The absolute occurrence identifier is populated during the assignment process and, if you already enter a value in the source, the same value is copied to the target. If the value is empty, the source is populated with the UID.

- If you change occurrence data on the source, the change is not propagated to the target.

- If you change occurrence data on the target, Teamcenter does not change the corresponding data on the source.

- When you change item or item revision attributes (for example, the revision master form), the values Teamcenter displays depend on the revision rule that configures the source and target. These attributes are independent of occurrence data.

- If you change occurrence data on the target, Teamcenter does not change the corresponding data on the source. This allows you to reposition lines in the target, for example, to move assemblies to give a different structure or insert lines to represent consumables.

  > Note:
  >
  > When you change item or item revision attributes (for example, the revision master form), the values Teamcenter displays depend on the revision rule that configures the source and target. These attributes are independent of occurrence data.

- Revision or variant rules applied to the source have no impact on the target.

Create a structure context

1. Choose **File→New Structure Context**.

   > Note:
   >
   > You can create a structure context in My Teamcenter by clicking **File→New→Structure Context** to open the **New Structure Context** dialog box.

   Teamcenter displays the **New Structure Context** dialog box.

2. Select a structure context type from the list.

   Teamcenter places the types of structure context you previously created in the **Most Recently Used** list.

3. Click **Next**.

4. Type a name in the **Name** box.

   Mandatory parameters are marked by a red asterisk.

5. (Optional) Type a description of the collaboration context.

6. Choose a configuration context:

   a. Click **Configuration Context** .

      Teamcenter displays the **Find Configuration Context by Name** dialog box.

b. Type the name or part of the name of the configuration context in the **Name** box.

c. Click **Find**.

   Teamcenter displays the contexts matching the name criteria in the table.

d. Double-click a context in the results table.

   Teamcenter closes the dialog box and displays the name of the context in the **New Structure Context** dialog box.

7. Click **Finish**.

   The new structure context appears as a line in the BOM under the current collaboration context. If you did not select a configuration context in the previous step, Teamcenter creates a structure context with the system's default configuration, which is generally:

   - The default revision rule, typically **Latest Working**.

   - No variant rule.

Adding objects to a structure context

You can add objects to the current structure context as development progresses.

If the structure context is defined as a *composition*, the structure context can show references to occurrences and occurrence groups that composition structures such as processes and operations may include.

You can add the following objects:

- *Root objects*

  You can add occurrence groups, items, and item revisions to the current structure context, including:

  - Product items
  - Product and factory views
  - Processes
  - Classified resources

  To create and add a new root object, choose the appropriate menu command, **File→New→Item** or **File→New→Occurrence Group**.

  To add an existing root object, copy and paste it into the structure context in the Multi-Structure Manager collaboration pane.

- *Objects in the structure*

  You can add objects to the structure context by creating new objects or by making copies of existing objects using the copy and paste menu commands. The copy is related to the currently selected line in the BOM.

- *Attachments*

  If the attachments pane is visible, you can attach folders, forms, BOM view revisions, URLs, envelopes, and datasets to a BOM line or its related components. To insert an attachment, choose the appropriate **File→New** menu command, for example, **File→New→Folder**, then browse to the location of the attachment file.

> Note:
>
> You can check out the objects to prevent other users modifying them while you are adding them to the structure context.

Create new items or subassemblies

When you create any new item or subassembly, you can add it to the current structure context as follows:

1. Select the structure in the collaboration pane.

2. Choose the appropriate menu command, **File→New→Item** or **File→New→Occurrence Group**. The new item or subassembly pastes to the selected structure which (by default) is the root.

Create a new item in a structure context

You can create a new item as a new root object in the current structure context or you can add it below the selected line in the current structure context.

> Note:
>
> You cannot create a new **Process**, **OP**, or work area.

- Select the structure context in the collaboration pane and choose **File → New → Item**.

Save objects as collaboration contexts

You can save all loaded objects to a new collaboration context.

1. Choose **File→Save as→Save as New Collaboration Context**.

Teamcenter opens the **Save as New Collaboration Context** dialog box.

2. Specify a name and optional description for the new collaboration context.

3. In the **Structure Contexts** list, select which of the loaded structures to save to the new collaboration context. These structures can include structure context objects, items, item revisions, BOM views, or BOM view revisions.

   Before creating the new collaboration context, Teamcenter creates a structure context from each loaded structure that you include in the collaboration context if is not already contained in a structure context. Therefore, for each structure in the list on the left that you want to save, you must enter the following information. You can change the existing defaults for this information in the **Default_StructureContext_Type** preference.

   - Name of the structure context
   - (Optional) Description
   - Type of the structure context
   - Type of the configuration context to be created for this structure context

   If the structure is already a part of a structure context, the information above is automatically populated when you select the structure in the structure list.

4. Select **Open on Create** if you want the new collaboration context to open when you close the **Save as New Collaboration Context** dialog box. If you choose not to, the object is created in the **Newstuff** folder in My Teamcenter.

5. Click **Save**.

   Teamcenter collects all of these structure contexts into the new collaboration context.

Modifying the configuration of a structure context

Setting structure context configuration

You can associate the rules defined in a configuration context with one or more structure contexts. Once associated, the rules are persistent and become active each time you open the structure context.

When the configuration context is active, the content shown for the displayed structure context depends on the configuration rules

You can select a structure context in the collaboration pane and change configurations from the menu commands. You must save any changes to make them permanent.

You can change the configuration of a structure view as follows:

- Edit the structure view or select different revision or variant rules at any time.
- View a structure using any configuration context in the database.
- Save the current view configuration in the structure's configuration context under a new name by choosing **Tools→Save Configuration**.
- Restore the view configuration in the configuration context assigned to the structure.

Create or edit the configuration context

1. Choose **File→New→Configuration Context**.

   Teamcenter displays the **New Configuration Context** dialog box.

2. Enter the following information:

Box	Description
Name	Specify the name of the configuration context.
Type	Choose the appropriate configuration context type from the list. By default, only the **ConfigurationContext** type is available; your administrator may create additional types as necessary with the Business Modeler IDE administration application.
Revision rule	Choose a revision rule from the list.
Variant rule	(Optional) Choose a variant rule to apply to the structure context.

3. Attach the configuration context to one or more structure contexts as required.

Edit a configuration context

1. Select the required configuration context.
2. Use the cut and paste options to modify it.
3. Save the changes by choosing **Tools→Save Configuration**
4. (Optional) Save the context under a new name by choosing **Tools→Save Configuration...**.

Add, remove, and move structure contexts

- Add an existing structure context to the current collaboration context using the copy and paste menu commands.

- Remove an existing structure context from the current collaboration context by using the cut options.

- Move structure contexts by dragging them from one location to another in the structure.

Opening additional objects in the session

You can send additional objects to a Multi-Structure Manager session that do not appear in the current collaboration context. This is useful in cases where you only want to perform a temporary analysis, such as an accountability check between two BOMs or IDCs, instead of storing a new object in the database. These temporary objects appear in their own tabs with their names in parentheses to signify that they are not a part of the current collaboration context. If you have not yet opened a collaboration context, all tabs titles appear in parentheses.

The types of objects that you can send as temporary structures to Multi-Structure Manager are:

- Structure context objects
- IDC objects
- Items
- Item revisions
- BOM lines
- BVRs

> Note:
>
> You do not have to create structure contexts for these before sending them to Multi-Structure Manager.

Save temporary objects as structure contexts

1. Right-click the tab containing the temporary object.

2. Choose **Save as a Structure Context**.

   Teamcenter displays the **New SC** dialog box.

3. Type a name for the structure context in the **Name** box.

4. Choose the appropriate structure context type from the list of symbols at the left. Your administrator determines which structure context types are listed in this dialog box. New business objects (types) are created in Business Modeler IDE.

5. (Optional) Type a description of the structure context in the **Description** box.

6. (Optional) Set the configuration to a previously stored configuration context by clicking and searching for the configuration context.

7. Click **OK**.

   The new structure context appears as a line in the BOM under the current collaboration context and can be identified by a symbol. If you did not select a configuration context in the previous step, Teamcenter creates a structure context with the system's default configuration which is generally:

   - The default revision rule, typically **Latest Working**.

   - No variant rule.

8. (Optional) Add the new structure context to the existing collaboration context by using cut and paste or drag and drop in the collaboration pane.

Creating a design study using a composition

Creating a design study using a composition

A composition is a special kind of structure context that contains components added from one or more structure contexts, each of which may contain a different product structure. You can use a composition to create a design study based on one or more products stored in structure contexts. Compositions are also used for manufacturing processes containing data from both product and plant structures.

Create a design study

1. Create a new structure context. Ensure that this structure context type is designated as **CompositionContext**.

   The new composition appears in a tab with an asterisk beside its name denoting that it is a composition.

   > Tip:
   >
   > Your administrator can create custom composition type structure contexts by selecting the **is composition** option when creating a new structure context business object in the Business Modeler IDE.

2. Create a new root item within the composition.

3. Open the structure context on which you want to base the composition.

4. Open the new composition in the second structure pane.

5. Assign components from the structure context to the composition using either copy and paste or drag-and-drop. The components assigned to the composition are marked by the symbol.

Configuring compositions

When you configure the source structure, it automatically configures the assigned components in the composition in the second structure pane. This applies to both variant and revision configuration. You can set revision rules on the composition, but that only configures revisions of items that have been added directly into the composition (rather than assigned from the source structure). This is useful if you are designing a new part in the study for which you have several revisions and which you want to configure.

> Note:
>
> If you want to configure the assigned components in the composition, you must do this in the source structure.

Adding items directly to composition

If you do not want to impact the source structure, you must add new items directly to the composition. Do this, for example, by adding the component to the clipboard in My Teamcenter and pasting it into the composition. If items are added to the composition in this way, they are not affected by the source structure. Therefore, you can move components in the composition without moving the components in the source.

> Note:
>
> If you move the components that are added to the composition (for example, using **Graphics→Transformation→Persistent Transformation** or in NX), Teamcenter creates an absolute occurrence override transform in the composition.

Assigning occurrence groups to compositions

You can create collections of components in the source in an occurrence group (created against the source). You can then assign that occurrence group to the composition in the same way that components in the source structure are assigned. This is equivalent to assigning each of the components in the occurrence directly. The advantage is that the components in the occurrence group can be managed as a group, for example, to reposition or hide them.

Creating structures from templates

Creating structures from templates

You can create a new product structure from a template, if your system includes templates for these structures. Cloning rules may be defined that determine the actions taken when you create a new structure from a template, as follows:

- **Clone**

  The new structure includes a copy of the object that is referenced by the template.

- **Reference**

  The new structure references the same object that is included in the template.

- **Ignore**

  The new structure does not include or reference the object.

- **Map**

  The system maps the template to a replacement structure. For example, this allows you to create a process structure from an existing process or from a process template. Optionally, this rule may be allowed by a second, default, action: **Reference**, or **Ignore**.

By applying the relevant cloning rules when you create the structure, Teamcenter maps occurrences in the template to absolute occurrences in the actual structure.

Create a product structure from a template

1. Ensure that the necessary **Product.Template** variables are defined in the preferences, as described in *Getting Started With Manufacturing*. These variables contain the rules that determine how the objects in the template are mapped to the objects in the new product structure.

2. Select the product and choose **File→New→From Template→Item from Template**.

   Teamcenter displays the **New Item** dialog box.

3. Click the **Choose Template** tab.

4. Type the name of the template in the **Template ID** box. Alternatively, you can browse to the template you require or to another product structure to clone.

5. Confirm that the **Use Template** check box is selected.

6. Select a revision rule from the **Revision Rule** list.

   For more information about configuring with revisions, see *Structure Management on Rich Client —Usage*.

7. Select an effectivity by clicking **Set Date/Unit/End Item**.

   For more information about creating effectivities, see *Getting Started With Product Structure*.

8. Do one of the following:

   - Click **Process all variants** to traverse the structure considering all unconfigured variants.

   - Click **Process configured** to only process the configured structure. You must specify a variant rule when you choose this option. The structure is configured using the variant rule and unconfigured variants are not considered during cloning.

9. From the **Cloning Rule** list, select a rule.

10. (Optional) Select **Carry over future incremental changes**.

    If you select this option, you must set the date in cloning dialog. If you do not check this option, cloning copies the configured structure only.

11. (Optional) Select **Show as new root** to create the cloned structure as a top-level object.

12. Click **OK** or **Apply** to create the new structure from the template you choose.

    At the end of any cloning operation, if new incremental changes are created as part of cloning process, Teamcenter displays a dialog box listing the new incremental changes.

4. Building and editing product structure

Building and editing product structure

You can create the product structure manually in Teamcenter or you can import it from your CAD system. When you import a structure, Teamcenter keeps the structure synchronized with any changes to the native CAD design. After you create the structure, you modify it as necessary to reflect any changes to the product design.

Using Save As to save a BOM view revision

In most cases, you do not explicitly save a BOM view with the **Save As** command because Teamcenter automatically copies the BOM view revision whenever you choose the **Save As** command for an item revision. However you may sometimes want to save the BOM view with a different type, for example, if you create a BOM view revision of another view type or copy a structure to another item.

When you save a structure with the **Save As** command, the workspace objects it comprises are renamed by default, including the item identifier, the revision identifier, and any variant rule.

If you select an item revision with multiple views (rather than a BOM view revision) and choose this command, Teamcenter makes a copy of each view type.

Create a new BOM view revision from an existing BOM view revision

1. Select the line containing the BOM view revision in the product structure tree.

2. Choose **File→Save As→BOM View Revision**.

   Teamcenter displays the **Save BOM View Revision As** dialog box.

3. Specify a view type that is not already been created for the item. You select the view type from a list of values defined by the administrator.

   The precision of the BOM view revision is the same as the BOM view revision you copied. If you want to change the precision, choose **Edit→Toggle Precise/Imprecise**.

To add a similar structure to another item revision, choose the **File→Save As→BOM View Revision** menu command to create a new BOM view revision in a different item. Specify the target item identifier and revision in the **Item** and **Revision** boxes of the dialog box. This action copies the occurrence attributes, including the find number, notes, quantity, substitutes, and variant conditions into the new BOM view revision.

> Note:
>
> Variant conditions are copied if you use modular variants but not if you use classic variants.

Adding components to the product structure

You can add components to the product structure in the following ways:

- *Copying and pasting objects*

  Allows you to copy references to existing items, parts, and designs.

- *Add a component to an assembly*

  Allows you to enter the item identifier by specifying (for example) the number of components to add.

- *Create a new item or item revisions*

  Allows you to use a top-down approach by simultaneously modelling structure and creating new items, parts, and designs.

If you manage parts and CAD designs separately, you must publish links between them as an appropriate time.

For more information, see *Aligning CAD designs and parts*.

If another user is editing a single level assembly within the product structure, Teamcenter prevents you making changes until the other user has saved their changes. A warning message identifies the other user working on the assembly. This safeguard does not prevent you making changes to other assemblies that are *not* being worked on.

Optionally, Teamcenter can validate the structure by verifying that you add only appropriate child items and item elements (GDEs). If you attempt to make an invalid addition, Teamcenter displays an error message stating that you cannot add the selected child item to the current parent item. To enable validation, your Teamcenter administrator sets the **TCEnforceSingleType** and **TCAllowedChildTypes_***Item Type/GDE Type* preferences, as described in the *Teamcenter Environment Variables*.

Copying and pasting objects

The Teamcenter clipboard is shared by all applications, including NX. Consequently, for example, objects you place on the clipboard by copying them in My Teamcenter may subsequently be pasted into the product structure in Multi-Structure Manager.

You can also edit the product structure with the **Remove**, **Copy**, and **Paste** commands. When you paste an item or item revision from the clipboard, Teamcenter creates corresponding components in the selected assembly in the product structure. Multi-Structure Manager only allows you to paste items and item revisions (including parts, designs, and their revisions); other objects are ignored if you attempt to paste them.

Copying and pasting occurrence attributes of components

When you copy a component from an assembly and then paste it elsewhere, the occurrence attributes (for example, the quantity and any notes) are also copied and pasted. However, the find number is not copied as Teamcenter automatically generates the find number according to the position of the component in the target assembly. If the component has an associated substitute list, this is also copied and pasted.

If you paste the component into My Teamcenter, rather than Multi-Structure Manager, Teamcenter pastes the lines as individual item revisions.

> Note:
>
> You cannot view occurrence attributes such as quantity or notes in My Teamcenter.

Copy and paste using the BOM line shortcut menu

If you right-click a line in the product structure, Teamcenter displays the BOM line shortcut menu is displayed, allowing you to:

- Choose the **Copy** command to copy the line to the clipboard. This is the same action as pressing the Ctrl+C shortcut keys, choosing **Edit→Copy**, or clicking **Copy** on the toolbar.
- Choose the **Paste** command to paste the contents of the clipboard as components of the line. This is the same action as pressing the Ctrl+V shortcut keys, choosing **Edit→Paste**, or clicking **Paste** on the toolbar.
- Chose the **View** command to view the properties of the line. This is the same action as choosing **View→Properties** or clicking **Properties** on the toolbar.

> Note:
>
> You do not need to explicitly select the line before right-clicking it.

Copy and paste an item or item revision

1. Select and copy the item or item revision (including parts, designs, and their revisions) from elsewhere in the product structure displayed in Multi-Structure Manager or from another

application such as My Teamcenter. You can copy the item or item revision by clicking **Copy**, choosing **Edit→Copy** or pressing the Ctrl+C keys. This action places the item or item revision on the clipboard.

2. In Multi-Structure Manager, select the assembly into which you want to add the component.

3. Paste the item or item revision by clicking **Paste**, choosing **Edit→Paste** or pressing the Ctrl+V keys.

Pasting does not remove the object from the clipboard. Therefore, you can click **Paste** again to add another line of the same item revision to the assembly. Another **Copy** operation replaces the previous clipboard contents with the new object.

Add a component to an assembly

You may want to specify additional data about the use of a component as you add it to the structure, for example, a quantity or find number. You can do this by choosing the **Add...** command to insert a new component.

1. Select the assembly to which you want to add the component.

2. Choose **Edit→Add...** and Teamcenter displays the **Add** dialog box.

   Use the upper pane of the dialog box to specify the component to add and the view type, if multiple views exist. Use the lower pane of the dialog box to specify the occurrence information.

3. Complete the dialog box as follows:

   - Enter the component item identifier directly, or search for the item by its identifier or name. You cannot enter the item name, but Teamcenter displays the name as confirmation that you entered the required identifier.

   - Optionally, specify the revision according to its precision, as follows.

     - If the parent assembly BOM view revision is imprecise, the **Revision** box is disabled and you cannot specify a revision.

       > Note:
       >
       > When the component is added to the structure and displayed in Structure Manager, the actual revision is determined by the revision (configuration) rule. If there is not a revision that satisfies the revision rule, the revision is shown as **???**.

     - If the parent assembly BOM view revision is precise, you are creating a precise occurrence. The **Revision** box is enabled and you can specify a revision.

- Choose **Component** or **Selected Assembly**. You can also define substitute components.

- Set the view type if there are multiple views of the component; you do not want the default view type. You can select another view type from the list of views created for the component.

- Specify any of the following occurrence attributes:

  - **Number of Occurrences**

    Specify the number of lines to add to the structure. The default selection is **1**.

  - **Quantity Per Occurrence**

    Specify the quantity associated with each line in the structure.

    - If the item has a unit of measure defined, the units are displayed next to the **Quantity per Occurrence** box and you can enter a fractional value (for example, 1.5). If the units are displayed as **Each**, the box shows the number of parts and you must enter a whole number.

    - If the quantity box is blank, the default value is **1** for items that have no unit of measure or **0** for items with a unit of measure. These values are used in quantity rollups, for example, when lines in the structure are packed.

      > Note:
      >
      > You can enter the string **A/R** or **a** to specify a quantity value of **As Required**.

  - **Find Number**

    Edit the find number if necessary.

    > Note:
    >
    > Find numbers are automatically generated according to the scheme defined for your site with the **PS_new_seqno_mode** preference. The default scheme increments the find number by 10 as each new component is added. However, after the find number crosses the value 2147483647, for every new line added, the find number starts from 8 and is incremented by 1 instead of 10.

4. If you specified an item ID that is shared by multiple objects, Teamcenter displays the **Select Unique Item** dialog box.

   Select the object you require from the list.

   Teamcenter returns to the **Add** dialog box.

5. Click **OK** or **Apply** to add the component to the assembly.

Paste a component

You can specify additional data about the use of a component as you add it to the structure, for example, a quantity or find number.

- Choose the **Paste...** command to insert an existing component that you copied to the clipboard into the structure.

  Teamcenter prepopulates the **Component ID (Revision)** and **Name** boxes of the **Paste...** dialog box with item or item revision information from the clipboard.

Create a new item or item revisions

You can create an item revision and structure it as an assembly, by adding new components one item or part at one time. This technique is useful when doing top-down modeling. You must have write access to the BOM view revision to create the new item revision.

1. Select the parent assembly in the product structure tree.

2. Choose **File→New→Item** or **File→New→Part**.

   Teamcenter displays the **Create Item** or **Create Part** dialog box.

3. Enter the necessary parameters in the dialog box and click **OK**.

   Teamcenter creates the new item or part (or its revision) and adds it as a component of the selected assembly.

> Note:
>
> If you add parts or part assemblies to an assembly, you can subsequently publish links to the associated CAD designs, as described in *Introduction to aligning CAD and BOM*. This step is not necessary if you add items or item revisions, as you can attach CAD designs directly.

Copy multiple views

If you copy an item revision with more than one view type from another rich client application and paste it into the structure in Multi-Structure Manager, Teamcenter uses the following rules to determine the view type to which the new occurrence refers.

- If a specific view type is copied from the other application, Teamcenter uses the same view.

- If no view type is copied, Teamcenter displays a list of all the available view types for that item.

If you copy a line from the structure in Multi-Structure Manager that represents a specific BOM view revision and paste it into another BOM in Multi-Structure Manager, the new occurrence references the same BOM view revision as you copied.

Restructuring and editing the product structure

Restructuring and editing the product structure

You can restructure a representation, including a BOM view, occurrence group, structure context, or composition. You must revise a frozen product structure before restructuring. Restructuring edits the product structure in downstream views (for example, manufacturing) while preserving the derived occurrence structure and data related to specific occurrences of parts and assemblies. Restructuring is disabled for product structures that contain CAD designs because it can make the CAD data invalid.

During restructuring operations, Teamcenter maintains the integrity of incremental changes, classic or modular variants, and structure relationships. Teamcenter displays warnings when it encounters absolute occurrences attributes and data.

If you have edits pending to a product structure, you must save the edits before you open the structure in another application.

In addition to restructuring, you can edit individual properties on any line, subject to the following limitations:

- Restructuring is not permitted on lines that have pending edits.
- Property edits are associated with a relative occurrence and are marked as pending until they are saved to the database.
- Property edits are highlighted only if you use the column editor. If you use other methods of changing properties (for example, the **Properties** dialog box), these edits are not visually highlighted in the properties table. However, Teamcenter still retains the details of such edits until you save or revert them.
- Use the **PS_structure_change_condition** preference to specify actions as structure edits. For example, by default, changing a reference designator is not considered as a structure edit, but you can add this action to the preference. NX requires reference designator changes to be considered as structure edits.
- If any note in the list of notes is edited, the **All Notes** field shows a **...** icon with a red strike-through. It does not show the exact original value.
- Edits to the absolute or relative transformation matrix are not highlighted.
- You cannot edit the first property column (**BOM Line**).

- If you cut more than one BOM line to the clipboard and then modify the BOM lines on the clipboard, this action changes the ownership of the remaining BOM lines. For example, if you cut two BOM lines and then remove one of these lines from the clipboard, the status of the remaining line changes from *pending cut* to *pending copy*. If you want to modify the BOM lines that are the subject of a cut action, repeat the cut action on the required BOM lines, rather than modifying the contents of the clipboard.

- If you remove a line that contains one or more unsaved changes to its substructure, the system does not automatically save those changes.

- By default, if you cut or copy a line and then paste it to a new location, incremental change elements (ICEs) are not copied. This may necessitate significant manual recreation of data if you are cutting or copying many lines together. To automatically copy ICEs, the administrator must set two Business Modeler IDE constants:

  - **Fnd0EnableIceCarryOver** business object constant

    When moving, copying, or assigning a line from one location to another, this constant determines if the ICEs are carried forward. You must set this constant to **true** on both the source location's parent and the target location's parent.

  - **Fnd0AttrICEsToExclude** property constant

    Defines the occurrence attributes that Teamcenter does not copy to the target location for occurrence attribute changes.

  These settings apply to in-context changes made to structure lines, their attachments, and their occurrence attributes.

> Note:
>
> Restructuring primitive actions include:
>
> - Removing a level (removing a line and keeping child lines)
> - Inserting a level (including pasting a line as a parent of selected lines)
> - Moving a line to a new location (for example, cut and paste actions)
> - Splitting an occurrence
> - Replacing data in context
>
> Only the last two actions make copies of the absolute occurrence data; the other actions share the existing absolute occurrence data.

In certain cases, restructuring may cause valid reports of broken links, as shown in the following examples:

Example 1:

```
A
+-----------B
            +-----------C (APN1 in context of A)
                        +-------------D
```

If you remove level **C**, the structure becomes:

```
A
+-----------B
            +-----------D
```

The link to **C** is lost. This is correctly reported as a broken link.

Example 2:

```
A
+---------E
+---------B
          +---------C
                    +-----------D(APN1 in context of B)
```

If you move **D** to **E**, it is outside of the context of **B** and **APN1** is lost. This is correctly reported as a broken link.

Example 3:

```
A
+-----------B
|           +-----------C
|                       +-------------D(APN2 in context of A)
+-----------B
|           +-----------C
|                       +-------------D(APN1 in context of A)
+-----------D
+-----------D
```

If you move **C** to **D**, the system cannot determine which **D** to move the APN to without user interaction. It skips the APN and logs an error message.

Example 4:

```
A
+-----------B
            +-----------C
                        +-------------D(APN1 in context of B)
```

If you remove level **B**, it becomes:

```
A
+-----------C
            +-----------D
```

The link to **D** is lost. This is correctly reported as a broken link.

Insert a level in the structure

You can create an item and insert it in the current structure as a new level below the selected line. The number of relative occurrences of the children is preserved. If you select more than one line, they must share the same parent.

1. Select the parent line of the new level and choose **Edit→Insert Level**.

   Teamcenter displays the **Insert Level** dialog box.

2. Enter the item identifier and other attributes of the new item. If the inserted item is new, you must insert it with a quantity of **1**.

3. On completion, click **OK** or **Apply**.

   Teamcenter creates the new item and inserts it as a new level. The selected branches become children of the inserted level, while the inserted level becomes a branch of the original parent. All existing variant conditions, notes, absolute occurrences, and other data is moved down with the selected branches. The default quantity of the new level is **1**, meaning that no quantity change occurs.

> Note:
>
> You can only insert a level if the line represents a standard business object type. If the line represents a custom type, copy it to the clipboard and choose **Paste Special**. Teamcenter pastes it as a new level above the currently selected line.

Remove a level from the structure

1. Select the affected line and choose **Edit→Remove** or click **Remove** .

   Teamcenter displays the **Remove** dialog box.

2. Click **Yes** to confirm removal of the line. The total number of instances is preserved at the end of this action. Any options of the removed lines are moved up and variant conditions are merged.

If you try to remove a level that would result in option definitions becoming inconsistent (for example, options that are referenced by a parent line), Teamcenter displays an error message.

Move a node to another branch

You can move a selected node from one branch to another. All substructure and occurrence data moves with the node.

1. Move a node using any of the following methods:

   - Cut and paste using the **Edit→Cut** and **Edit→Paste** menu commands.

   - Cut and paste using the Ctrl+X and Ctrl+V shortcut keys.

   > Caution:
   >
   > Do not try to move a node by dragging the line to its new position. Teamcenter performs a copy action when you drag a line.

   Teamcenter displays the **Paste** dialog box.

2. Do one or more of the following:

   - Change the item ID and revision ID.

   - Change the view type, if applicable.

   - Select if the line should be pasted as a component of the selected assembly line, as a substitute for the selected line, or as a new level above the selected line.

   - Specify the number of occurrences, quantity per occurrence, and find number.

3. Click **OK** or **Apply** to complete moving the line.

> Caution:
>
> If you cut a line and edit tracking is enabled, the line is displayed in red with a strike-through until you commit the edits. Do not attempt to edit or work with this line, or you may obtain unpredictable results. If you want to edit or work with a line that is marked as cut, revert changes to the line by choosing **Edit→Revert Edit** first.
>
> Similarly, do not edit or work with a marked line in another structure editor such as Multi-Structure Manager. Always complete and save your work on the structure before you open it in another structure editor.

Replace a node

You can replace an item representing a node in the structure with another item. All data associated with the original node is preserved.

> Note:
>
> Your system administrator sets the **PS_replace_with_substructure** preference to determine if any substructure below the node is replaced. If this preference is **true**, the node and its entire substructure (if any) are replaced without prompting. If it is **false**, Teamcenter displays an error message and does not complete the replacement action.

You cannot use the **Replace** feature on any type of process or consumed line in manufacturing structures.

1. Select the line to replace and choose **Edit→Replace Node** or click .

   Teamcenter displays the **Replace Node** dialog box.

2. Enter the item identifier and other attributes of the item that replaces the existing item.

3. Click **OK** or **Apply**.

   Teamcenter replaces the existing item.

   If you have edit highlighting turned on, the number of the original part is shown in red, strike-through text.

Split an occurrence

You can split a line that represents several occurrences into two branches. The new branch and the original (changed) branch initially have the same notes, variant conditions, and other data, but you can subsequently modify them independently. The quantity on the original line before the split must be greater than 1.

1. Select the occurrence line and choose **Edit→Split Occurrence**.

   Teamcenter displays the **Split Occurrence** dialog box.

2. Enter the quantity for the new line that results from the split and click **OK** or **Apply**.

Fix in-structure associations

1. Select the top line of the edited structure and choose **Tools→Fix In-Structure Associations→Current Level** or **Tools→Fix In-Structure Associations→All Levels**.

Teamcenter displays a dialog box containing a list of invalid associations. The scope of the invalid associations depends on whether you chose the current level or all levels.

2. Select the first invalid association and click **Remove**.

   Teamcenter removes the selected association from the structure.

3. Repeat the previous step for each of the other invalid associations in turn.

   > Note:
   >
   > Any associations that you do not remove manually remain in the structure.

Performing on-demand validation

Your administrator can configure Teamcenter to enforce any rules imposed by the organization on what types of content are allowed in the structure. You cannot add content or make other structure edits that would violate the defined business rules.

The following types of restrictions on content within a structure are enforced:

- Only certain item classes or types may exist anywhere in a structure.
- Only certain item classes or types may be children of others.
- Only certain item classes or types may be parents of others.
- Properties of the parent or child object must satisfy specified values or be NULL.

For allowable substitutes in a given BOM line, the same restrictions that apply to the primary part occurrence are applied to the substitute.

Validations are provided for the following operations:

- Creating a new occurrence
- Adding a substitute for a given occurrence
- Cloning (duplicating) a structure
- Importing or exporting a structure
- Revise and baseline

> Note:
>
> Teamcenter validates only the first two operations in real time.

When you save edits, Teamcenter validates that they do not violate the defined business rules and, if they do, displays an error message and does not save the changes.

Optionally, you can perform an on-demand validation of property updates at any time by right-clicking a top line with substructure and choosing **Tools→Validate Occurrences**. If no issues are found, Teamcenter displays a confirmation and saves a validation log. If issues are found, it displays a list of errors.

> Note:
>
> The administrator uses the Business Modeler IDE to define these business rules on explicitly stated classes. Any subclasses or subtypes of these classes inherit the same rules.
>
> Your administrator must also create and set the following preferences:
>
> - **PS_Default_Rev_For_Occ_Cond_Validation**
>
>   Defines the default revision rule when a child item is used for validation.
>
> - **PS_Bypass_Occurrence_Condition**
>
>   Configures the system to bypass occurrence condition validation for defined actions or operations.

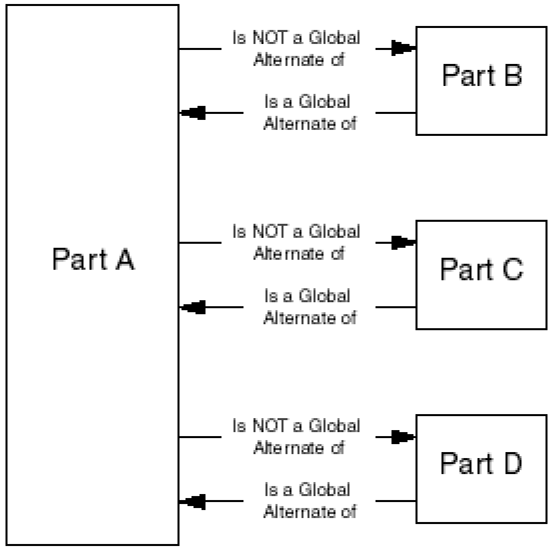
Managing global alternates

Global alternates overview

A *global alternate* part is interchangeable with another part in *all* circumstances, regardless of where the other part is used in the product structure. A global alternate applies to any revision of the part and is independent of any views.

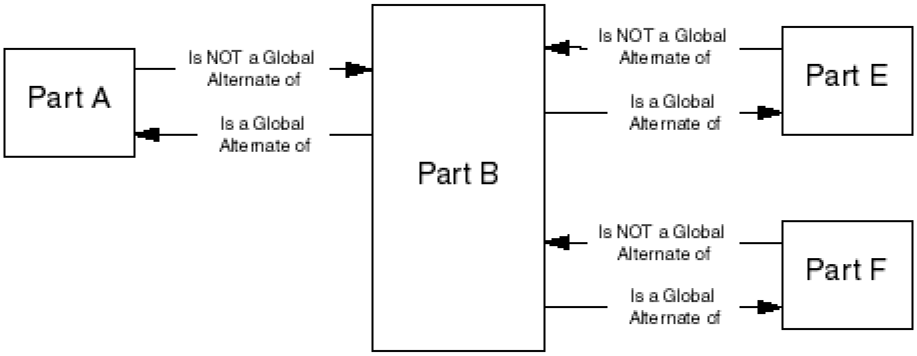
> Note:
>
> If the parts are interchangeable only in specific products or assemblies, use *substitutes* rather than global alternates.

Parts and their global alternates are related only in a single direction. For example, if part **A** has three global alternates (parts **B**, **C**, and **D**), then **B**, **C**, and **D** are each a global alternate of A. However, part A is not an alternate of **B**, **C**, or **D**, as shown next.



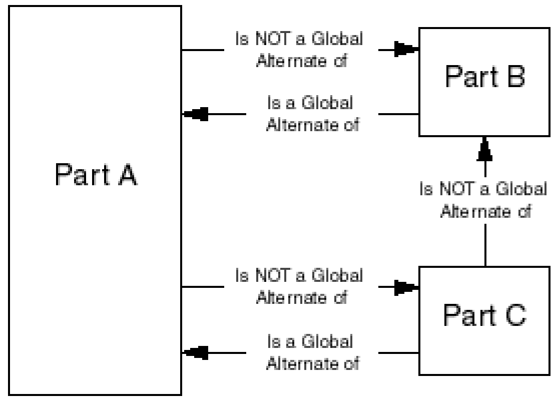
Global alternates – single direction

One part can be a global alternate of more than one other part. For example, part **B** may be a global alternate of parts **E** and **F**, as well as a global alternate of part **A**, as shown next.



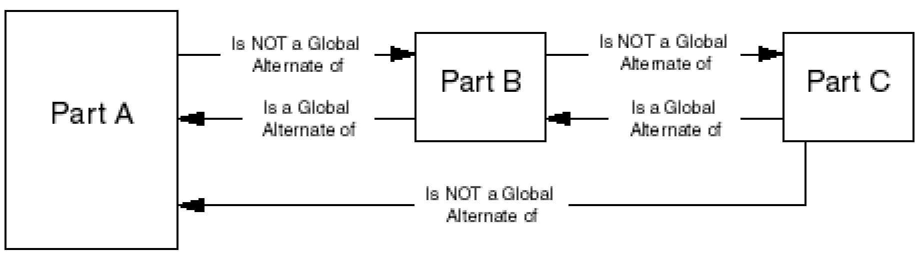
Global alternates – multiple alternates

Global alternate relationships are not shared. For example, part **C** is not a global alternate of part **B**, even though they are both global alternates of part **A**, as shown next.



Global alternates – nonsharing

Likewise, global alternate relationships are not chained. For example, if part **B** is a global alternate of part **A**, and part **C** is a global alternate of part **B**, part **C** is not a global alternate of part **A**, as shown next.



Global alternates – chaining

List global alternates

1. Select a line in the product structure. If it has global alternates, this is indicated by the icon.

2. Click **Global Alternates** at the bottom of the pane.

   Teamcenter displays the **Global Alternate** dialog box, which lists all the global alternatives of the selected item. The preferred global alternate (if any) is marked with a check mark.

> Note:
>
> You can also list global alternates in My Teamcenter.

Add global alternates

1. List the global alternates (if any) of the item for which you want to add one or more global alternates.

2. In the **Global Alternate** dialog box, click **Open** .

Teamcenter displays the **Open by Name** dialog box.

3. Search for the item that you want to define as a global alternate of the selected item.

4. If you want to define more than one global alternate of the selected item, repeat the previous step for each global alternate.

Note:

You cannot add the same item as the global alternate more than once. Teamcenter displays a **Cannot create duplicate alternates of same item** message if you attempt this action.

Remove global alternates

1. List the global alternates of the item from which you want to remove one or more global alternates.

2. In the **Global Alternate** dialog box, select one or more global alternates to remove and click **Remove**.

   Teamcenter removes the selected global alternates from the list.

Note:

If you remove all the global alternates from an item, the corresponding line in the product structure no longer shows the icon.

Set or unset preferred global alternate

1. List the global alternates of the item from which you want to remove one or more global alternates.

2. In the **Manage Global Alternates** dialog box, select a global alternate and click **Prefer**.

   Teamcenter designates the selected global alternate as preferred and places a check mark next to it in the list.

To remove the preferred designation from a global alternate, select it and click **Prefer** again. Teamcenter removes the check mark next to it in the list of global alternates.

Changing components

Changing components

Any modification you make to the product structure changes the BOM view revision in the parent assembly. Modifications that change the BOM view include adding, deleting, or substituting components; adding a substitute component; or changing any of the occurrence attributes, for example, a note or find number.

You must have write access to the BOM view revision to make such modifications. You may not have write access for one of several reasons, including:

- Another user is modifying the BOM view revision and the changes are not yet saved. In this case, Teamcenter displays an error message, stating who is currently modifying the BOM view revision.

- The BOM view revision is protected against write access, for example, because it is released.

You can create a new view type by choosing the **Save** command in two situations:

- To create a new view type, based on an existing view within the same item revision.

- To make a copy of a view into another item revision.

When you choose **File→Save As** for a selected item revision, Teamcenter creates a physical copy of the BOM view revision.

Remove components

1. Select the component or group of components to remove from the product structure tree.

2. Choose **Edit→Remove**, or press Ctrl+R.

   Teamcenter removes the selected components from the structure. If you select a line that has substitutes, these are also removed.

> Note:
>
> This action does not place the selected line or lines on the clipboard.

Move a component to another assembly

1. Select the component or group of components to move to another assembly

2. Click **Cut** on the toolbar, choose **Edit→Cut**, or press Ctrl+X to place the selected components on the clipboard. Teamcenter grays out the affected component lines.

3. Select the target assembly.

4. Click **Paste** on the toolbar, choose **Edit→Paste**, or press the Ctrl+P shortcut keys. New component lines appear under the selected assembly, and the grayed-out lines are removed from the structure.

> Note:
>
> Lines grayed out after a **Cut** command are not actually removed from the structure until you paste them elsewhere in the structure. If you place another object on the clipboard before pasting, the grayed-out lines are restored to their previous state and are removed from the clipboard.

Replace a component

You can make the following replacements in a product structure:

- Replace a component without losing the occurrence data.

  You can change an item revision in an assembly by cutting out the old item revision and pasting in the new item revision. However, this method breaks the occurrence link to the old component, so you lose any occurrence attributes including notes and the find number of the old component. A replacement retains the occurrence data.

- Change the revision of a component item in precise assemblies.

- Change the view type.

  If the component has multiple views and you want the parent assembly to reference a different view, you can edit to the parent assembly to change the view type.

You cannot replace one component with two or more components. However, you can select multiple components and replace each with a single component.

> Note:
>
> Teamcenter does not verify if the replacement request is valid for your business data. If necessary, check the validity of the replacement action with the Teamcenter administrator.

1. Select the component to replace in the product structure.

2. (Optional) Copy the replacement component to the clipboard. This action prepopulates the **Replace Component** dialog box with the item identifier and revision of the replacement component.

3. Choose **Edit→Replace**. Teamcenter displays the **Replace** dialog box. The lower pane of the dialog box contains details of the selected component to replace.

4. In the upper pane of the dialog box, enter the item identifier of the replacement component. If you copied the replacement component to the clipboard, the item ID and revision boxes are already populated with those of the copied component. You can change the identifier if required, but not the item name; the item name is derived from the item identifier you enter.

You can specify a revision in some circumstances, depending on whether the parent assembly BOM view revision of the component replaced is precise or imprecise:

- If the BOM view revision of the parent assembly is precise, you can specify a revision. In this situation, you can use the replace command to replace one component item revision with another item revision or to replace the component with a revision of a different item. If an item is taken from the clipboard, Teamcenter determines the revision by the revision rule.

- If the BOM view revision of the parent assembly is imprecise, you cannot specify the revision. In this situation, you use the replace command to replace one component item with another item.

  If there is not a revision that satisfies the revision rule when you add the component to the structure, Teamcenter displays the revision as **???**.

5. (Optional) Use the bottom section of the **Replace Component** dialog box to change the scope of the replacement by clicking one of the following:

   - **Single Component**

     Replaces only the selected component.

   - **All in Parent Assembly**

     Replaces all components of the selected item revision that are in the parent assembly.

If the component to replace has multiple views, Teamcenter uses the default view type. If no default is defined, Teamcenter displays an error message and you must specify a view type in the **Replace...** dialog box.

Alternatively, to replace one or more items (parts) or item elements for another:

1. Select one or more source lines that represent items or item elements, and choose **Edit→Copy**.

2. Select target lines that represents the same types of item or item element and choose **Edit→Paste**. If you copied more than one source line to the clipboard, but only selected a single target line, Teamcenter displays the **Select Object for Replace** dialog box. Otherwise, it replaces the targets with the sources and updates the find numbers, as appropriate. If you attempt to replace an item or item element with a line of another type, Teamcenter displays an error message and does not replace any of the selected lines.

3. If Teamcenter displays the **Select Object for Replace** dialog box, select the required source from those listed and click **Replace**.

Working with substitute components

Defining substitute components

Substitute components are parts that are interchangeable with a particular component in an assembly. Substitutes are often defined for manufacturing purposes, allowing use of the substitute if the preferred part is unavailable, for example, due to a stock shortage.

You define a substitute for a single occurrence in an assembly and not for an item. In general, you control a change to an item of this nature by making the changes selectively for each assembly, using a where used search to identify each instance of the item. Do not use substitutes to address marketing variations of a product—use variants or modular variants for this purpose.

You can define more than one substitute for each component. One of the substitutes is designated the *preferred substitute* and is displayed in the structure. You can see the other substitutes by clicking the **Substitutes** button. You can change the preferred substitute at any time.

> Note:
>
> If you are working in NX and perform a roll-up calculation (for example, cost or weight), the calculation uses the preferred substitute.

If you add a substitute, you modify the BOM view revision and you consequently must have write access to the BOM view revision. You can change the preferred substitute any time during a session (for example, to view the change in NX), but you can only save the change if you have write access to the BOM view revision.

Substitutes of one occurrence all share the same occurrence attributes, for example, find number, quantity, and notes, as specified for the substituted part.

Substitute components are item revisions in a precise assembly and items for an imprecise assembly. In an imprecise assembly, the revision rule selects the correct revision of a substitute component.

Display substitute components for a line

Teamcenter identifies the lines in the product structure with substitute components by a icon. If the line has substitute components, it has the **Has Substitutes** property set to **Y**.

1. Select the line in the product structure tree.

2. Click **List Substitutes** .

   Teamcenter displays the **List Substitutes** dialog box. This allows you to view the available substitutes.

If a substitute part has an underlying structure, it is still represented as a leaf part when displayed as a separate substitute line.

Create substitute component

1. Copy the substitute item revision to the clipboard in Multi-Structure Manager or another application.

2. Select the line in the product structure in Multi-Structure Manager for which you want to define this item revision as a substitute.

   You can also add a substitute to more than one line in a single operation by selecting all the necessary line. If the lines are packed, unpack them before you select them.

3. Choose **Edit→Paste Substitute** to paste the substitute directly. You can also choose **Edit→Paste** and click **As Substitute of Selected Line** in the resulting dialog box.

Remove a substitute component

You can remove a substitute part that has related substitutes from the product structure. When you do this, Teamcenter:

- Notifies you about all the related substitute parts of the selected substitute.
- Notifies owners of the parent BVRs of all related parts by Teamcenter e-mail.
- Changes or removes all relations in which the selected substitute parts participate to ensure consistency.
- Removes the selected substitute part from the substitute part list.

1. Select the required line in the product structure tree.

2. Click **List Substitutes** and Teamcenter displays the **List Substitutes** dialog box.

3. Select the substitute component you want to remove and click (**Remove**).

   You can also press Shift+Ctrl to select more than one substitute in the list for removal. If you remove all listed substitutes, the line in the product structure is no longer marked as having substitutes.

Change the preferred substitute

1. Select the required line in the product structure tree.

2. Click the **List Substitutes**.

   Teamcenter displays the **List Substitutes** dialog box.

3. Select the item to be the preferred substitute and click **Prefer**.

   Teamcenter displays the item identifier of the selected substitute and adds the original preferred substitute to the list.

   Alternatively, you can right-click the required line and click **Set Preferred Substitute** to display a list of the substitute components. Click the new preferred substitute.

4. If you have write access to the BOM view revision, you can save this change to the structure. If you do not have write access, Teamcenter warns that you cannot save the preferred substitute but you can make a temporary change. The ability to make a temporary change is useful if you want to visualize one of the nonpreferred substitutes in the structure.

Managing substitute part relationships

Relate substitute parts

If there are dependencies between substitute part selections, you can relate the substitute part of one occurrence with substitute parts of the other occurrence. You can define these relationships for any occurrence in any BOM view revision.

Such relationships are *bidirectional*. For example, you can relate substitute A of the lower bearing in the product structure to substitute B of the upper bearing, if the selection of B depends on the current selection of A. The same dependency applies to the selection of B as the upper bearing; that is, A must always be the lower bearing if B is selected as the upper bearing, and B must always be the upper bearing if A is selected as the lower bearing. However, Teamcenter does not enforce this relationship, if you choose to override it in a particular structure configuration.

To relate substitutes, you must have write access to the parent BOM view revisions of the selected BOM lines. If you do not have permission to modify either of the parents, you cannot relate the substitute parts.

1. In the product structure tree, select the two BOM lines that represent the applicable occurrences and choose **Tools→Related Substitute→Relate**. Teamcenter displays the **View/Create Related Substitutes** dialog box.

2. Verify the parent BOM lines and selected substitute items are those you want to relate. You can also click the **Preview** button to check the relation to be created.

3. When you are satisfied that the correct relationship is selected, click the **Create** button to confirm the selection. Teamcenter creates the relationship between the proposed substitutes and saves it in the database; it is not necessary to explicitly save changes to the product structure. If you create an incorrect relationship, click the **Reset** button to reset the changes.

Note:

The **Related Substitute** menu command is only visible if your site administrator sets the **PSE_enable_related_substitutes** preference to **True**.

When you save a product structure that includes related substitute parts as a new structure, all substitute part relations are carried forward.

Relate substitutes with existing substitutes

1. Click the **Preview** button before you create the relation to verify if previous relations exist and their effect on the relation you propose to create.

   For example, the **000005 Substitute A for Lower Bearing** line in the BVR is already related to the **000014 – Substitute A for Fuel Pipe** line. If you try to relate the **000005 Substitute A for Lower Bearing** line to another line, **000006 Substitute A for Upper Bearing**, and click the **Preview** button, Teamcenter displays the following new relation:

   ```
   000002/A-view:000003:10 ->000005 – Substitute A for Lower Bearing
   000002/A-view:000003:20 ->000006 – Substitute A for Upper Bearing
   000012/A-view:000013:150 ->000014 – Substitute A for Fuel Pipe
   ```

2. Click the **Create** button to commit the relation. In the previous example, Teamcenter relates substitute A for the lower bearing, substitute A for the upper bearing and substitute A for the fuel pipe.

Edit a substitute part relationship

You can change or remove the relationship between substitute related parts, as follows:

1. In the product structure tree, select a BOM line with related substitutes and choose **Tools→Related Substitutes→Relate**. Teamcenter displays the **View/Create Related Substitutes** dialog box.

2. Click the **Show Related** button and Teamcenter shows all the related substitute parts for the selected substitute in the right-hand pane of the dialog box.

3. Select the relation to edit and click the **Cut** button to remove it, or click the **Modify** button to change the relation.

Note:

To modify substitute part relationships, you must have write access to the parent BOM view revisions of the selected BOM lines. If you do not have permission to modify either of the parents, you cannot modify the substitute part relationships.

View the related substitutes of a selected BOM line

Choose **Tools→Relate Substitutes→View Related**. Teamcenter displays all defined relations in a dialog box for information purposes; you cannot change the relations in this dialog box.

Create a structure from a template

> Note:
>
> Ensure that the necessary **Product.Template** cloning preferences are defined. These preferences contain the rules that determine how the objects in the template are mapped to the objects in the new plant structure.

1. Choose **File**→**New**→**From Template** and the type of structure that you want to create.

2. Click the **Choose Template** tab.

3. In the **Template ID** box, enter the ID of the structure that you want to use as a template and press Enter.

   You can also browse to the template you want to clone using Resource Manager, either by name or by searching for a template in the Classification Search Dialog if it is classified.

   Teamcenter assigns a new ID in the **Process ID** box.

4. (Optional) Rename the new structure in the **Name** box.

5. Click the **Configuration** tab.

6. Select a revision rule from the **Revision Rule** list.

7. Select an effectivity by clicking **Set Date/Unit/End Item**.

8. Do one of the following:

   - Click **Process all variants** to traverse the structure considering all unconfigured variants.

   - Click **Process configured** to only process the configured structure. You must specify a variant rule when you choose this option. The structure is configured using the variant rule and unconfigured variants are not considered during cloning.

9. From the **Cloning Rule** list, select a rule.

10. If you are creating a process from a template,

- Choose the product to which you want to map the consumed products by selecting it in the **Product Reference Structure** list.

- Choose the work area to which you want to map the consumed work areas by selecting it in the **Plant Reference Structure** list.

This allows you to clone a process and map the consumed objects to different structures from the one chosen in the prototype.

11. (Optional) Select **Carry over future incremental changes**.

    If you select this option, you must set the date in the cloning dialog. If you do not select this option, cloning copies the configured structure only.

12. (Optional) Select **Show as new root** to create the cloned structure as a top-level object.

13. Click **OK** or **Apply** to create the new structure from the template you choose.

    At the end of any cloning operation, if new incremental changes are created as part of cloning process, Teamcenter displays a dialog box listing the new incremental changes.

Use item elements

An item element (sometimes called a general design element) represents an interface, characteristic or feature of a component in the structure. For example, it may represent a weld point on a bracket that is welded to a parent assembly. The item element is shown in the product structure as a separate line under the associated component and is represented by the image.

Do any of the following:

- **Create an item element**

  1. Select the assembly in the product structure with which you want to associate the item element.

  2. Choose **File→New→Item Element**.

     Teamcenter displays the **New Item Element** dialog box.

  3. Enter the name of the item element and click **OK**.

     Teamcenter creates the new item element and adds it as an item element line in the product structure.

Note:

You cannot create a new item element by copying an existing item element. Consequently, the **File→Save As** and **File→Save As→BOM View Revision** menu commands are not available when an item element is selected.

- **Remove item elements**

  1. Select the item element you want to remove from the product structure.
  2. Choose **Edit→Remove**.

     Teamcenter displays the **Removing Lines** dialog box.
  3. Click **OK** to confirm removal of the selected item elements.

- **Copy and paste item elements**

  You can copy and paste item elements in the same way as other lines in the product structure.

  To copy an item element, choose **Edit→Copy** to copy a selected item element to the clipboard.

  To paste an item element, choose **Edit→Paste** to paste a copied item element from the clipboard into the product structure.

- **Replace item elements**

  1. Select one or more item elements (source lines) from the structure and choose **Edit→Replace**.
  2. Select one or more (item elements) target lines in the structure and choose **Edit→Paste**.

     If you copied more than one source line to the clipboard, but only selected a single target line, Teamcenter displays the **Select Object for Replace** dialog box. Otherwise, it replaces the target item elements with the source item elements and updates the instance numbers, as appropriate. If you attempt to replace a target item element with a source item element of another type, Teamcenter replaces only those lines where the source is a subtype of the target type. Otherwise, it displays an error message and does not replaces any lines.
  3. If Teamcenter displays the **Select Object for Replace** dialog box, select the required source item element from those listed and click **Replace**.

- **View notes on item elements**

  You can view a note associated with an item elements, select the item element and choose **View→Notes**.

Create a connection

To create a connection between lines with a **PSConnection** relationship:

1. Choose **File→New→Connection→Revisable** to create a revisable connection.

   Teamcenter displays the **New Connection** wizard.

2. Choose the connection type and its options, then click **Finish**.

   Teamcenter creates the connection as an item element.

3. Select the lines in the product structure you want to connect and the connection, then choose **Edit→Connect**.

   > Note:
   >
   > You can also right-click the lines and choose **Connect**.

Create a link

To create a link between lines with a **GDELinkLine** relationship:

1. Choose **File→New→Connection→Non-Revisable** to create a non- revisable connection (link).

   Teamcenter displays the **New Link** wizard.

2. Enter a name and description, then click **Finish**.

   Teamcenter creates the new link.

3. Select the lines in the product structure you want to link and the link, then choose **Edit→Connect**.

   > Note:
   >
   > You can also right-click the selected lines and choose **Connect**.

Remove a connection or link

1. Select the lines in the product structure you want to disconnect. You cannot remove a connection or link if the top line of the structure is connected.

2. Choose **Edit→Disconnect** to remove the connection or link between the selected lines. You can also right-click the lines and choose **Disconnect**.

Delete a single item from the product structure

1. Select the item in the product structure.

2. Choose **Edit→Delete** or press the Delete key.

   Teamcenter displays a request for confirmation.

3. Click **OK** to confirm and remove the item from the product structure.

   > Note:
   >
   > This action *permanently* removes the item from the Teamcenter database if you have read-write permissions to the item.

Delete multiple assemblies or items

You can delete all items in the product structure below a selected line. This process is called a *recursive deletion* and may be useful if you want to delete several nested assemblies or items from the structure at the same time.

When you request a recursive deletion, Teamcenter verifies if the items below the selected line can be deleted. You can only delete an item if it meets the following criteria:

- The item or one of its revisions is referenced by an occurrence of any view of any revision of any other item in the structure.
- The item and its revisions are not referenced by any other occurrences outside the structure.
- You have delete permission for the item and all its revisions.
- Neither the item or any of its revisions is checked out or otherwise locked.

1. Select the line in the product structure below which you want to delete all items and assemblies, then choose **Edit→Delete** or click the **Delete** button.

   Teamcenter displays the **Delete** dialog box.

2. Click the **Recursive Delete** button and Teamcenter displays an **Explore Selected Component** dialog box. The **Recursive Delete** button appears only if you select a single item for deletion.

3. Select any associated objects to delete (for example, datasets) in the **Explore** dialog box and click **OK**.

Teamcenter displays the dialog box listing items and any associated objects selected for deletion. The list of items includes both items that can be deleted and items that cannot be deleted. If Teamcenter determines that an item cannot be deleted, it displays the reason.

If you set suitable types or relations with the **Type** or **Relation** buttons, Teamcenter automatically checks all these objects for deletion in the dialog box. Alternatively, you can click the **Select All** button to select all objects for deletion.

4. Click **Yes** in the **Delete** dialog box to begin deleting all applicable items and the selected associated objects. Teamcenter shows the status of the deletion process in the status bar.

   You can pause deletion process by clicking the **Stop** button at any time. You can terminate the deletion process by clicking the **Abort** button.

5. When the deletion process is complete, Teamcenter displays an updated **Explore** dialog box. This contains a flattened list of all the items in the substructure of the originally selected item. Any duplicates are removed and any items that Teamcenter could not remove are indicated.

Work with requirements and trace links

Link requirements

Use trace links to associate requirements with items, item revisions, and absolute occurrences that satisfy the requirements. To create, view, or delete trace links, you must enable the trace link features.

> Note:
>
> This procedure sets the **Tracelink_Edit_enabled** preference to **true**. That setting also enables the trace link features in other Teamcenter applications such as My Teamcenter, Systems Engineering, and Multi-Structure Manager.

1. Choose **Edit→Options**.

   Teamcenter displays the **Options** dialog box.

2. Select **Systems Engineering**.

3. Select the **Trace Link Mode** check box.

Create trace links

1. Select one or more source objects.

> Note:
>
> If you select only one source object, you can create trace links to multiple target objects. If you select multiple source objects, you can create trace links to only one target object.

2. Choose **Tools→Start Tracelink**, click the **Start Trace Link Creation** button on the toolbar, or right-click the selection and choose **Start Tracelink**.

   You can also choose **Edit→Copy**, click the **Copy** button on the toolbar, or right-click the selection and choose **Copy**.

3. Select one or more target objects.

4. Specify the trace link subtype and name by doing one of the following:

   - To accept the default subtype and name, choose **Tools→End Tracelink**, click the **End Trace Link Creation** button on the toolbar, or right-click the selection and choose **End Tracelink**.

     You can also choose **Tools→Paste Tracelink**, click the **Create Trace Link using Copy Paste** button on the toolbar, or right-click the selection and choose **Paste Tracelink**.

   - To assign a custom subtype and name:

     a. Choose **Tools→End Tracelink**, click the **End Trace Link Creation with Subtype** button on the toolbar, or right-click the selection and choose **End Tracelink...**.

        The **Create Trace Link with Subtype** dialog box appears.

     b. In the list of subtypes on the left, select the subtype to assign to each trace link.

     c. In the **Name** box, type the name to assign to each trace link.

        In the **Description** box, you can type plain text as additional information.

   A trace link symbol is shown for each defining and complying object. To view a defining or complying path, generate a traceability report.

Create trace links

1. Select one or more source objects, for example, a requirement.

Note:

If you select only one source object, you can create trace links to multiple target objects. If you select multiple source objects, you can create trace links to only one target object.

2. Choose **Tools→Trace Link→Start Trace Link**, click the **Start Trace Link Creation** button on the toolbar, or right-click the selection and choose **Trace Link→Start Trace Link**.

   You can also choose **Edit→Copy**, click the **Copy** button on the toolbar, or right-click the selection and choose **Copy**.

3. Select one or more target objects, for example, an item, item revision, or absolute occurrence.

4. Specify the trace link subtype and name by doing one of the following:

   - To accept the default subtype and name, choose **Tools→Trace Link→End Trace Link**, click the **End Trace Link Creation** button on the toolbar, or right-click the selection and choose **Trace Link→Trace Link→End Trace Link**.

   - To assign a custom subtype and name:

     a. Choose **Tools→Trace Link→End Trace Link**, click the **End Trace Link Creation with Subtype** button on the toolbar, or right-click the selection and choose **Trace Link→End Trace Link...**.

        The **Create Trace Link with Subtype** dialog box appears.

     b. In the list of subtypes on the left, select the subtype to assign to each trace link.

     c. In the **Name** box, type the name to assign to each trace link.

        In the **Description** box, you can type plain text as additional information.

A trace link icon is shown in the **Trace Link** column for each defining and complying object. View a defining or complying path in the **Trace Links** view.

Tip:

You can change the business object icon so that when an object has an associated trace link, the trace link icon appears overlaid on the object's icon in Structure Manager.

Create trace links on absolute occurrences

When creating trace links with manufacturing objects, either the source or the target must be a requirements object. The following procedure describes creating a trace link between a source manufacturing absolute occurrence and a target requirement object. You can also perform the linking in the opposite direction.

1. Right-click the structure line that is the context of the edit. This line must be an ancestor of the structure line that will be the source line for the trace link.

2. Choose **Set In Context**.

   Teamcenter displays the symbol in front of the line and colors the line green to show that the item is the context for the creation of absolute occurrences. In addition, Teamcenter grays out all siblings of the selected context and you cannot create absolute occurrences for these lines. The in-context item is also identified in the title bar of the structure tree.

3. Select the source line, or select multiple objects by using the standard Windows functions.

4. Choose **Tools→Trace Link→Start Tracelink**, click **Start Trace Link Creation** on the toolbar, or right-click the selection and choose **Trace Link→Start Tracelink**.

5. From the **Requirements** view, select the target requirement(s) for the trace link and specify the trace link subtype and name by doing one of the following:

   - To accept the default subtype and name, choose **Tools→Trace Link→End Tracelink**, click the **End Trace Link Creation** button on the toolbar, or right-click the selection and choose **Trace Link→End Tracelink**.

   - To assign a custom subtype and name:

     a. Choose **Tools→Trace Link→End Tracelink**, click **End Trace Link Creation with Subtype** on the toolbar, or right-click the selection and choose **Trace Link→End Tracelink**.

        The **Create Trace Link** dialog box appears.

     b. In the list of subtypes on the left, select the subtype to assign to each trace link.

     c. In the **Name** box, type the name to assign to each trace link.

     d. (Optional) In the **Description** box, type additional information.

   You can view trace links in the **Traceability** view or by creating a traceability report.

Generate a traceability report

A traceability report displays defining and complying relationships for an object. You use this report to view the defining and complying paths of trace links.

1. In the structure pane, select the object for which you want to generate the report.

2. Choose **Edit→Traceability Report**, click the **Traceability Report** button on the toolbar, or right-click the object and choose **Edit→Traceability Report**.

   The **Traceability Report** window appears.

Generate a traceability report

1. In the structure pane, select one or more objects for which you want to generate the report.

2. Choose **Tools→Trace Link→Traceability Report→Defining** or choose **Tools→Trace Link→Traceability Report→Complying**.

   Choose either the **Defining** or **Complying** option depending on whether you want a report of the objects that define, or the objects that comply, with the selected objects in the structure.

   The **Traceability Report** window appears.

   Note:

   - The direct trace link symbol indicates that the trace link relates to the selected object itself.

     For more information about direct trace links, see *Systems Engineering —Deployment and Rich Client Usage*.

   - The indirect trace link symbol indicates that the trace link relates to the revision or item that is associated with the selected object.

     For more information about indirect trace links, see *Systems Engineering —Deployment and Rich Client Usage*.

Tip:

To generate a traceability report showing both the defining and complying objects associated with the selected object, click the **Generate a Traceability** report button in the toolbar.

Export traceability information to Excel in a structure view

1. Open the structure with trace links in a structure view.

   For example, send a structure to the **Structure Manager** view, the **Requirements** view, or another structure view.

2. Choose **Tools→Export→Objects To Excel**.

   Teamcenter displays the **Export To Excel** dialog box.

3. Under **Output**, do one of the following:

   - For a standard Excel file that is not connected to Teamcenter, click **Static Snapshot**.
   - For an interactive live Excel file that is connected to Teamcenter, click **Live integration with Excel (Interactive)**.
   - For a live Excel file that is not connected to Teamcenter, click **Live integration with Excel (Bulk Mode)**.

     You can accumulate changes and later connect the file to Teamcenter.

   - To export the data to an Excel file that also contains import processing information on a separate sheet, click **Work Offline and Import**.
   - To check out objects while exporting to live Excel, select **Check out objects before export**.

     Note:

     The checkout applies to all objects being exported. Use this option carefully if you are exporting a large set of objects or perhaps an entire product structure.

4. Under **Output Template**:

   a. Select **Export All Visible Columns** to export all the columns in the applicable structure view.

      Note:

      Verify the **Trace Links** or **Trace Link** column property appears in the structure view.

b. Select **Use Excel Template** to activate the template list.

In the list, select the template that specifies the data that you want to export.

5. Click **Copy URL**.

> Note:
>
> - **Copy URL** is unavailable if you select more than one object to export.
> - **Copy URL** is unavailable if you select any of the following dialog box options:
>   - **Work Offline and Import**
>   - **Export All Visible Columns**
>   - **Export All Objects in View**
>
>   The export file is generated and the `URL Generated` message is displayed, confirming that the URL is in your Windows Clipboard and showing the URL details.

6. Click **OK** to generate the export Excel file.

Excel opens a temporary file. You can create a permanent file by choosing **File→Save As** in Excel to display the **Save As** dialog box.

If you save a live Excel file, you can open it later in My Teamcenter to reconnect it to the database.

> Note:
>
> Values that you cannot change in Teamcenter are unavailable in the cells of the live Excel file.

Delete a trace link

1. In the **Traceability Report** window, select the trace link in the **Defining Object** or **Complying Object** column.

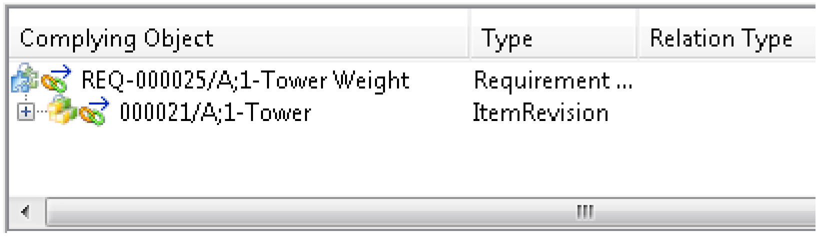
   If necessary, click the **Show Tracelink** button to display the defining and complying trace links.

2. Click the **Delete Tracelink** button at the bottom of the window.

   Teamcenter deletes the trace link from the database.

Delete a trace link

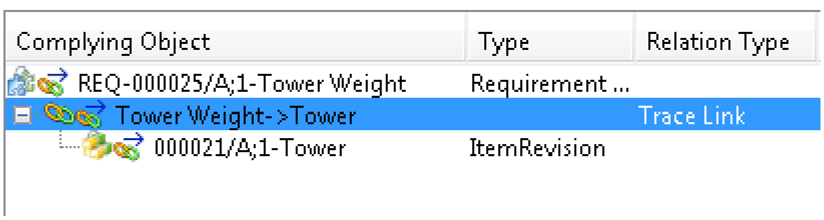
1. Open in the **Traceability** view, or generate a traceability report, that includes the trace link object you want to delete.



> Note:
>
> For occurrence objects, be sure to select the occurrence object in the correct context.

2. Click the **Show Trace Link** button Show Trace Link at the bottom of the report or **Traceability** view.

3. Expand the object to view all trace links.



4. Select the **Trace Link** object you want to delete.

> Note:
>
> The **Relation Type** column indicates **Trace Link** as the type.

5. Click the **Delete Trace Link** button at the bottom of the traceability report or **Traceability** view.

6. Click **Yes** to delete the trace link.

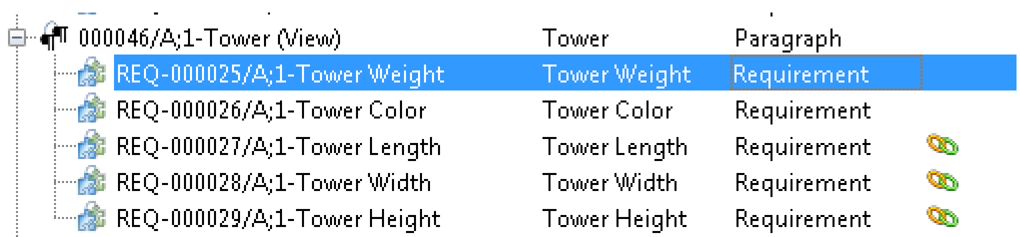
The trace link is deleted from the workspace object or from the occurrence object, in context, and from the Teamcenter database.

7. Click **Yes** to refresh the window.

Note:

You may need to do one of the following also:

- Right-click the object with the trace link symbol and choose **Refresh**.
- Press the F5 key
- Choose **View**→**Refresh**



5. Working with occurrence groups

Introduction to occurrence groups

Occurrence groups help you scope data from a very large structure to a more manageable structure that contains only those objects that you currently need for your work. If you have a very large structure, for example, you can create subsets of this structure in occurrence groups that are tailored to the needs of different departments.

An occurrence group structure is attached to the main structure (the *base view*) and can only hold occurrences from that structure. An occurrence under an occurrence group is the same occurrence as in the main structure. Making changes in the occurrence group structure is the same as making these changes in the main structure. You can think of an occurrence group as holding shortcuts to the occurrences in the main structure. You can have multiple shortcuts to the same occurrence, that is, you can assign the same occurrence to multiple occurrence groups. You can create multiple occurrence group structures, each one holding a different list of occurrence groups and a different list of occurrences from the main structure.

> Note:
>
> You can create incremental change information about occurrence groups and their content (children). However, configuring the view to show or hide configured changes does not work for this information. Only incremental change information that is common with the base view (in the item structure) is filtered.

Create an occurrence group

1. Select a line in the base view.
2. Choose **File** → **New** → **Occurrence Group** or click .

   Teamcenter displays the **New Occurrence Group** dialog box.
3. Select the type of occurrence group.
4. Type a name and description of the new occurrence group and click **OK**.

   Teamcenter creates a new root occurrence group and displays it as a new tab next to the **Base View** tab.
5. Copy components, subassemblies, and other occurrence groups from the source view and paste them into the new occurrence group.

Create an occurrence group within an existing occurrence group

1. Select an existing occurrence group within an occurrence group structure.

2. Choose **File→New→Occurrence Group**.

   Teamcenter displays the **New Occurrence Group** dialog box.

3. Type a name and description of the new occurrence group and click **OK**.

   Teamcenter creates a new occurrence group under the selected occurrence group.

Configuring an occurrence group structure

An occurrence group structure holds shortcuts to the original occurrences in the base view. Therefore, all configurations applied on the base view are also applied on all occurrence group structures, and vice versa.

Removing a line under an occurrence group

When working in an occurrence group structure, the **Remove Line** command can have two different meanings depending on the selected object:

- Selecting an occurrence directly under an occurrence group

  The **Remove Line** command removes the occurrence from that specific occurrence group. The occurrence still remains in the base view. Any other shortcut to this occurrence under another occurrence group is not removed.

- Selecting an occurrence that is not directly under an occurrence group (that is, a part below an assembly under the occurrence group)

  The **Remove Line** command removes the occurrence from its parent assembly. This also affects the base view and any other occurrence group containing this assembly. Moreover, if this occurrence was also directly assigned under an occurrence group, it is automatically removed from that occurrence group.

Creating a new occurrence under an occurrence group

When working in an occurrence group structure, you can also add a new occurrence by using either the **New** command or by copying and pasting. Adding an occurrence to an occurrence group also adds it to the base view as follows:

- If the new object is created directly under an occurrence group, it is added to the root object in the base view.

- If the new object is created under an occurrence in an occurrence group, it also appears under the same occurrence in the base view.

Show or hide an occurrence group structure

If you have multiple occurrence groups attached to a base view, you can decide which one to show and which to hide.

1. Right-click the main tab of the structure and select **Show/Hide Occurrence Groups**.

   Teamcenter displays a dialog box listing all available occurrence groups.

2. Select the one you want to show or hide.

   Alternatively, select **None** or **All**.

   If you loaded a structure directly, this mode is not saved for the next session. If you loaded a structure within a structure context, the list of visible occurrence groups is managed by the structure context. The last state is saved and loaded in the next session.

Synchronizing occurrence group configuration with the base view

There are several points to note about synchronizing the occurrence group configuration with the base view configuration.

- The configuration between the occurrence group and the base view is synchronized.

- Setting the revision rule, effectivity, occurrence type filter, variant configuration, and show unconfigured data in the occurrence group changes this configuration in the base view, and vice versa.

- All the occurrence groups that are not currently visible are updated when they become visible.

6. Managing absolute occurrences

Managing absolute occurrences (in-context editing)

An *absolute occurrence* is a specific instance of a component or assembly in a structure. It may be independent of the top-level assembly and only meaningful in the context of a lower level assembly. For example, you may have four occurrences of a wheel in the design of a vehicle; you can label one of those occurrences as **left rear wheel**, which is an absolute occurrence of the wheel. When you open a window containing the structure, each absolute occurrence is represented by a single line.

To create an absolute occurrence, you edit the occurrence line *in context* with respect to the assembly in which the absolute occurrence data is meaningful. Hence, the creation of absolute occurrences is sometimes referred to as *editing in context*.

> Note:
>
> Do not confuse the arbitrary context in which you create absolute occurrences with a specific collaboration context or structure context. You can create absolute occurrences in the context of any top line item, except for the immediate parent of the line.
>
> Absolute occurrences are not the same as *appearances*. Absolute occurrences are generated when you build the structure (edit in context) and do not have associated spatial information.

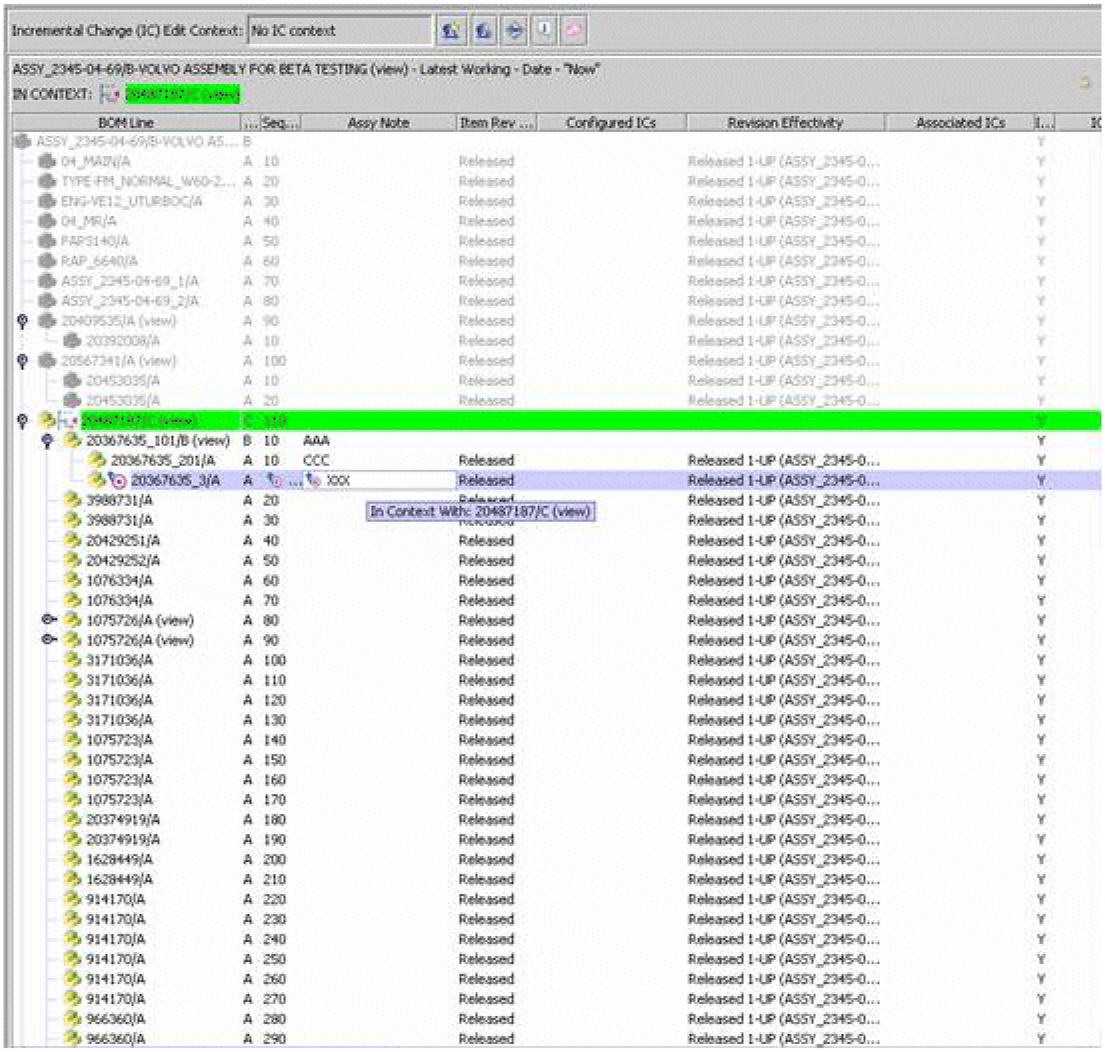
A component or subassembly that appears in more than one product structure can have the same absolute occurrence in each structure.

You cannot create absolute occurrences directly, only by converting a relative occurrence and editing its properties. Similarly, you cannot delete absolute occurrences directly. You cannot create absolute occurrences on substitutes.

An absolute occurrence may appear more than once in the structure, depending on the context in which you created it.

Interpreting absolute occurrence data

The following figure shows how absolute occurrences appear in the structure when in context editing is enabled.



Absolute occurrences in a structure

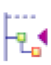
Note the following lines in this structure:

Line	Purpose
20487187/C (view)	The immediate parent that is in context for absolute occurrence edits. The line is also color-coded in the structure and in the title bar of the pane where the current context is shown. The color is green in this example but may be changed by your administrator. Lines that are *not* in the current context are grayed out. Similarly, the out-of-context parts corresponding to the grayed out lines may also be grayed-out in the viewer. You cannot create absolute occurrences from grayed-out lines in

Line	Purpose
	the current context and you cannot edit an existing property value on such lines. Lines below **20487187/C (view)** are generally not grayed out and *are* in context.
20367635_101/B (view)	This is a standard occurrence note. It is in context and may be edited.
20367635_201/A	This occurrence note is *not* in context because it is not in all occurrences of the immediate parent assembly.
20367635_3/A	The overriding note value in the context of **20487187** only for this specific occurrence of the parent. To obtain more information about edited absolute occurrence data, place the cursor over any cell containing the  icon. The tool tip banner shows the context in which the edited data is valid.

By default, the assembly viewer highlights only those items in the assembly that are in scope in the selected context; items that are not in context are shown grayed out. The administrator may optionally change this behavior so that all items are shown.

The structure contains icons that indicate the status of the structure lines as follows:

Icon	Indicates
	A line containing this icon is the context for the creation of certain absolute occurrences. The line is also color-coded in the structure and in the title bar of the pane where the current context is shown.
	A line that contains this icon has one or more of the absolute occurrences edited in a context but not necessarily the current context.
	A property cell containing this icon is already edited in a context; the current absolute occurrence data is shown in the cell. Each cell that contains data for a specific absolute occurrence includes this icon.
	A line that contains this icon before its name is a target for editing data in the current context. Look for a  icon in one or more properties cells of the same line to identify if the necessary edits are already made. Note: This icon identifies a target in the current context. It may not appear in the same line if you select a different context.

Icon	Indicates
	A line that contains this icon has an in-context edit made by an incremental change. The edit may be an add, remove, or both.
	A cell that contains this icon has an in-context edit removed by an incremental change.
	A cell that contains this icon has an in-context edit added by an incremental change.
	A cell that contains this icon has in-context edits added and removed by an incremental change.

Showing and hiding the in-context line

You can show or hide the line that is the context of a particular in-context edit.

To show the line:

1. Click in a property cell, then click outside the same property cell. Ensure you do not select *another* property cell.

   > Note:
   >
   > Right-clicking when editing the value in a cell has no effect.

2. Hover the cursor over the same property cell, right-click, and then choose **Show/Hide In-Context BOM Line** from the menu.

   Structure Manager shows the in-context line highlighted in yellow and the editable property cells are highlighted similarly.

To hide the line, click outside the property cell you edited, right-click, and then choose **Show/Hide In-Context BOM Line** from the menu.

Structure Manager hides the previously highlighted in-context line.

Create absolute occurrences

To create an absolute occurrence, you must enable in-context editing mode and edit the properties of an occurrence, as follows:

1. If necessary, expand the structure by choosing **View→Expand Below**.

2. Select the top line that is the context of this edit and choose **Edit→Toggle In-Context Mode**. You can also right-click the line and choose **Set In-Context**, or click the button on the toolbar.

   If a line in the displayed structure is marked with a icon and colored green, it is the item that is the context for the creation of absolute occurrences. if a line is grayed out, it is not in the selected context and you cannot create absolute occurrences for these lines. The in-context item is also identified in the title bar of the structure tree.

   - You cannot enable in-context editing mode for a line that has no children.

   - You cannot create an absolute occurrence in the context of its immediate parent.

   - You cannot change the value of a property that is already overridden at a higher level.

3. Click the cell in the lower line containing the property you want to enter or edit. You must select one of the following supported properties:

   - Suppressed
   - Position constrained
   - Suppression constrained
   - Any GRM relation impacted by preferences
   - Any occurrence note
   - Quantity
   - Find number
   - Occurrence type
   - Variant conditions
   - Variant formula
   - Absolute transformation matrix
   - Unit of measure
   - Is designed in place
   - Requires positioned design

   Caution:

   Ensure you have selected in-context editing mode. If this mode is not selected, the change is made to *every* instance of the selected item anywhere in the assembly.

4. Type the required new value and press the Enter key. A icon on the line indicates one of its property cells has an absolute occurrence override.

Note:

If you create an absolute occurrence override of a property and the same property is already overridden at a lower level in the structure, the new, higher level value replaces the existing value.

Conversely, you cannot edit an individual property value if the same property is overridden at a higher level in the structure.

Identify absolute occurrences

You can assign identifiers to absolute occurrences and these identifiers are displayed in two columns in the property table, as follows:

- **ID In Context (Top Level)**

  Shows only the identifier assigned to the line in the context of the loaded top-level line. You can add or edit an identifier by double-clicking in this cell and typing the necessary value.

  Note:

  Any absolute occurrence identifiers defined at a lower level than the currently selected top-level line are not visible.

  If in-context editing mode is disabled, the top-level line is always considered the in-context line.

- **ID In Context (All Levels)**

  Shows the identifiers assigned to the line in all contexts. You cannot edit this column.

Change absolute occurrence override data

You can change the override data for an existing absolute occurrence at any time. For example, you may want to change the quantity assigned to a structure line to correct a previous error. It is not necessary to enable context editing to make such changes, ensure only the correct context is selected, then double-click the property cell and edit the value.

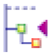
Note:

If you want to define relative occurrence data for a property that is already defined in context, remove the absolute occurrence data from the property first.

Remove absolute occurrence override data

You can remove override data from an absolute occurrence without entering replacement data. To do this, right-click the property to remove (that is, select the relevant cell) and choose the **Remove In Context Override** command.

Deselect in-context editing mode

When you are not creating or editing absolute occurrence data, consider deselecting in-context editing mode to avoid inadvertent changes. Do this by choosing **Edit→Toggle In-Context Mode** or clicking the  button in the toolbar.

Associating data with absolute occurrences

About associating data with absolute occurrences

During the design process, an engineer may attach data such as a CAD design file, viewer (JT) file, classification information, and specifications to an item revision. The actual usage of the item revision in the structure, including its transformation, is tied to an occurrence.

You can attach data to a specific instance of an item revision in the structure, which is represented by an absolute occurrence. You can attach data that is unique to the absolute occurrence, or information that is already attached to the associated item revision or occurrence. Examples of data that you may want to attach to a specific absolute occurrence include:

- Cost data
- Transformations
- Quantity
- Variant conditions (not modular variant expressions)
- Viewer information
- Name and ID
- Occurrence note, type, or find number
- Instance number
- Find number
- Occurrence position constrained
- Occurrence suppressed

For example, you may want to attach a different occurrence note to each absolute occurrence to specify additional assembly work instructions.

The level of the absolute occurrence in the structure determines the precedence of data you attach to it. Data attached at a high or mid-level in the structure override the corresponding data at lower levels; data attached to an absolute occurrence at the lowest level does not override data elsewhere.

Associate a dataset or form with an absolute occurrence

1. Ensure you have selected in-context editing mode by choosing **Edit→Toggle In-Context Mode**, right-clicking the structure line, and choosing **Set In Context**; or clicking the button on the toolbar.

2. Select the line containing the absolute occurrence with which you want to associate a new instance-specific dataset or form, then click the **Attachments** tab in the data pane.

3. If you are associating a new dataset or form, create it by choosing **File→New→Dataset** or **File→New→Form**, respectively.

   If you are replacing an existing dataset or form, select it in the **Attachments** tab. You can then search for and insert a replacement dataset or form.

Associate a transformation with an absolute occurrence

> Note:
>
> You cannot associate a transformation (positioning information) with an absolute occurrence in Teamcenter manufacturing process management; you can only make the initial association in Structure Manager.

1. Ensure you have selected in-context editing mode by choosing **Edit→Toggle In-Context Mode**, right-clicking the structure line, and choosing **Set In Context**; or clicking the button on the toolbar.

2. Select the line containing the absolute occurrence for which you want to change the transformation.

3. Click the **Graphics** tab and choose **Graphics→Transformation→Persistent Transformation**.

4. Change the position of the affected component and save the changes.

Associate an occurrence note with an absolute occurrence

1. Ensure you have selected in-context editing mode by choosing **Edit→Toggle In-Context Mode**, right-clicking the structure line, and choosing **Set In Context**; or clicking the button on the toolbar.

2. Select the line containing the absolute occurrence with which you want to associate an occurrence note.

3. Choose **View→Notes**, or click the **Notes** button on the toolbar.

   Teamcenter displays the **Notes** dialog box.

4. Type the properties of the note and click **OK**.

Apply a variant condition to an absolute occurrence

1. Ensure you have selected in-context editing mode by choosing **Edit→Toggle In-Context Mode**, right-clicking the structure line, and choosing **Set In Context**; or clicking the button on the toolbar.

2. Select the line containing the absolute occurrence with which you want to associate a variant condition.

3. Choose **Edit→Variant Condition** or click the **Edit Variant Conditions** button on the menu bar.

   Teamcenter displays the **Variant Condition** dialog box.

4. Add a new variant condition to the absolute occurrence or edit the existing variant condition.

View attachments associated with an absolute occurrence

To view all the attachments associated with an absolute occurrence, select the line containing the absolute occurrence and choose the **Attachments** pane. All the attachments to the absolute occurrence are shown below the absolute occurrence.

> Note:
>
> If incremental change orders are used at your site, attachments associated with unconfigured changes may be hidden. To view all absolute occurrence data, choose **View→Show Unconfigured Changes** and set unconfigured changes to on.

Associating occurrence data in the context of a composition

A composition is a structure that comprises components from different top lines, in the context of a configured top-level assembly. It is represented by a single line in the structure. It can contain a set of occurrences, absolute occurrences, occurrence group and filtered occurrences (a filtered occurrence references occurrence groups from the item it instantiates). For example, a composition may contain the design view and the process view of the same assembly.

When you view a composition, the revision rule and variant conditions for the referenced window configure the occurrences, if they are linked to a referring window by a corresponding absolute occurrence for the relevant top level. The occurrence groups are configured according to the configuration of absolute occurrences in the top level.

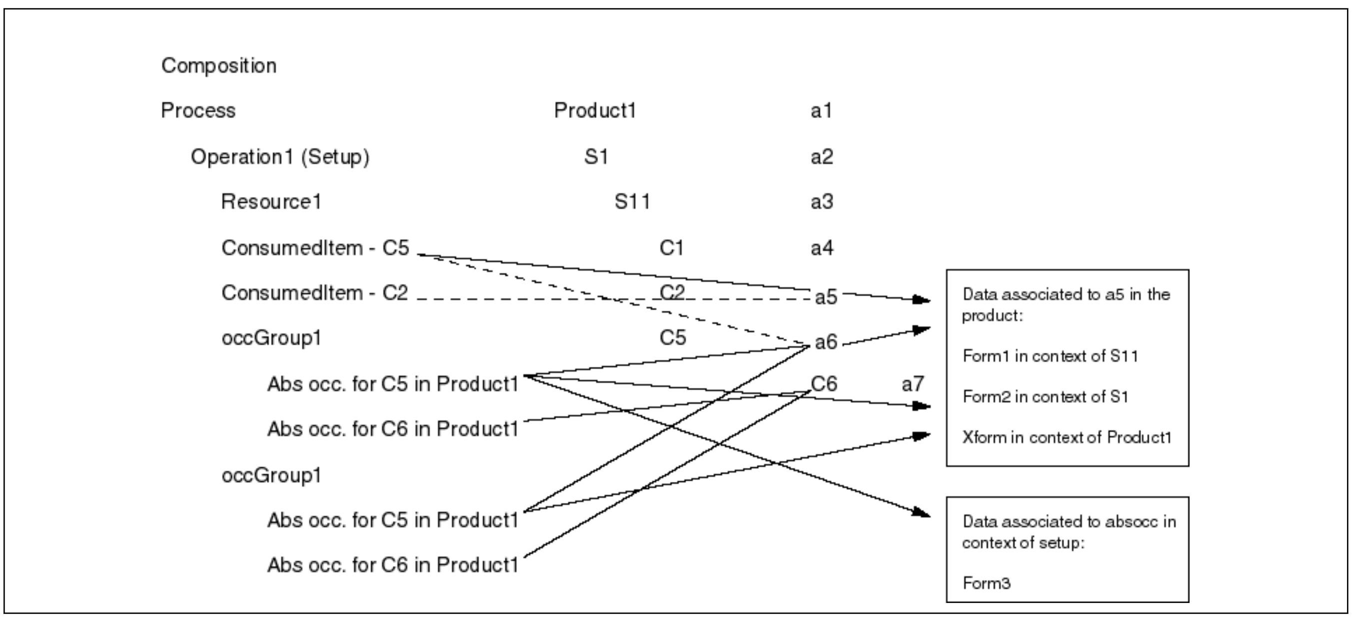
You can associate data to any of the absolute occurrences in the occurrence group, in the context of the composition. You can subsequently view the data associated with absolute occurrences included in occurrence groups in the structure.

If the content (members) of an occurrence group in the composition is changed in another location, your view of the occurrence group is refreshed. Such changes may be made in the source or in another instance of the group that is referenced in a composition.

You can change an occurrence group in the composition (for example, adding or removing members) without having to return to the source view. Any changes you make to the composition are proliferated to all other instances of the occurrence group.

Create occurrence groups in a composition

You can create occurrence groups containing absolute occurrences in a composition, as shown in the following figure.



Occurrence groups in a composition

The absolute occurrences for this composition are as follows:

Component	Absolute occurrence	Parent
Process	A1	None
Operation 1	A2	A1
Resource 1	A3	A2
Consumed Item C1	A4	A2
Consumed Item C2	A5	A2
Occurrence group 1	A6	A2
Occurrence for S1	A7	A6
Occurrence for S11	A8	A7
Occurrence for C5	A9	A8
Occurrence group 1 (2)	A10	A2
Occurrence for C5	A12	A8

The absolute occurrence of **C5** in occurrence group 1 contains a copy of the entire path to the referring occurrence. This is necessary to map this instance of **C5** to the corresponding instance in the product. If the path is already copied for another absolute occurrence, it is reused and not recopied.

You can configure a structure in a composition by associating a configurator context with it. You can paste or drag the configurator context onto the referenced structure, and the configurator context object appears as an attachment to the top line of the structure. Alternatively, you can right-click the configurator context and choose **Attach Configurator Context** to send it to the referenced structure.

Add components in a context

You can add components to a structure in the context of the top level. These components are then visible when you select the top line of the structure. The following examples show how resources may be attached to a structure:

Welding_Cell 1		
	Robot from Classification	
		Standard Definition
		Welding Gun 1→Added in context of cell 1
Welding_Cell 2	Robot from Classification	

		Standard Definition
		Welding Gun 1→Added in context of cell 2
Factory 1		
	Welding Cell 1	
		Robot
		Support Column 1→Added in context of Factory1
	Welding Cell 2	

When you open factory 1, you see welding gun 1 in the context of cell 1 and support column 1 in the context of factory 1. If you view the same robot in My Teamcenter, none of these components are visible as they are not part of a standard robot.

To do this, you can create an absolute occurrence in the context of a top-level item. Add welding gun 1 in the context of cell 1 by adding an absolute occurrence to cell 1 under the robot.

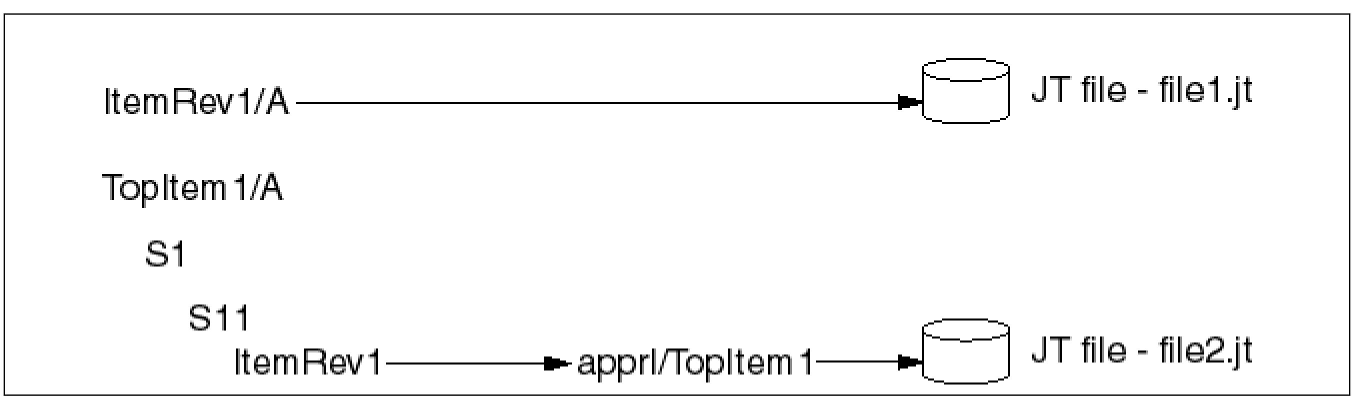
> Note:
>
> When you create an absolute occurrence for a top-level item, you also create absolute occurrences for all children of a parent under which you add the component.

Data precedence

About data precedence

You can associate data with an item revision or absolute occurrence. You can create the absolute occurrence in the context of a top-level item.

The following figure shows how visualization (JT) files may be attached to items.



Attaching visualization files to items

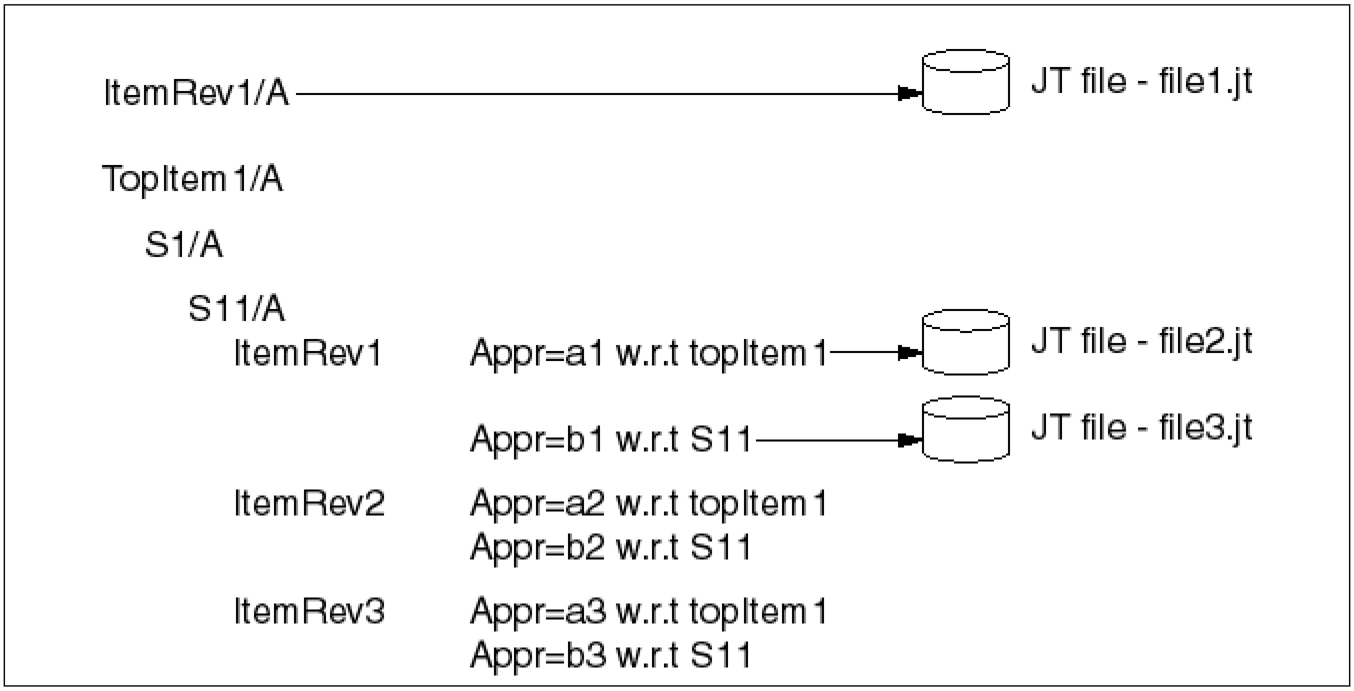
In this example, you can see **file1.jt** in the viewer in My Teamcenter without any context. However, when you view the same item revision (**ItemRev1**) in the context of **TopItem1**, you see the JT file (**file2.jt**) that is associated with the corresponding absolute occurrence (**appr1**) in the context of item **TopItem1/A**.

You can associate a different JT file as an override if **TopItem1** is revised from revision A to revision B.

Data is associated with an absolute occurrence in the context of a specified revision. When you revise an item, the data associated with the previous revision is copied and you can change it as necessary.

Propagate override data

You can associate data to absolute occurrences in the context of an intermediate level, as well as in the context of the top level, as shown in the following figure.

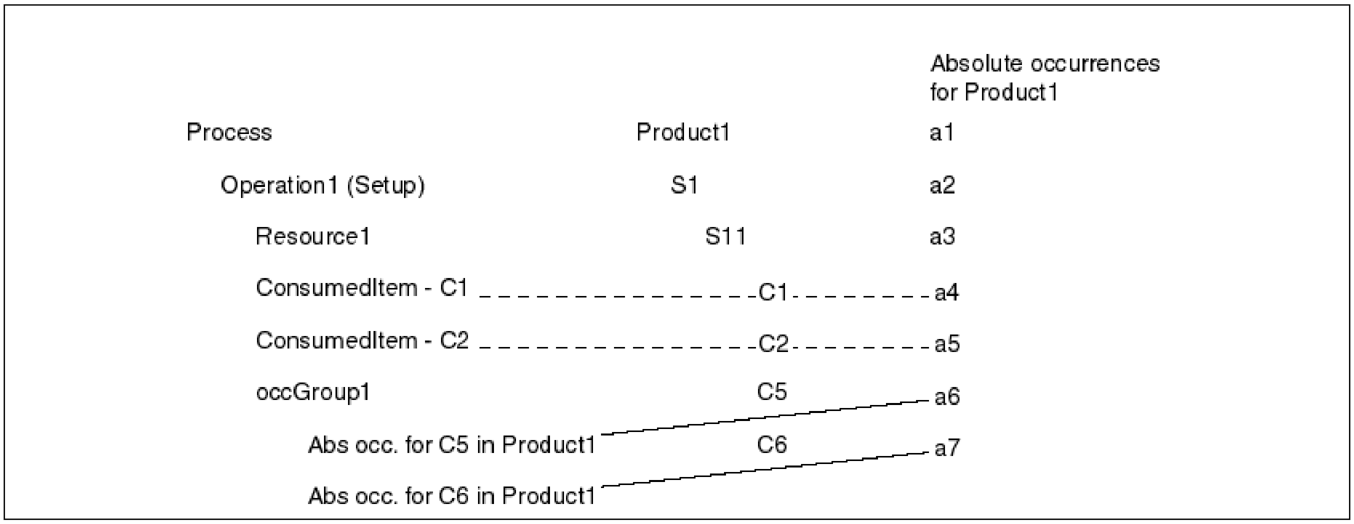


Propagate override data

In this example, **ItemRev1** has two override JT files, **file2.jt** and **file3.jt**. The **file2.jt** file is added in the context of **TopItem1/A**, while the **file3.jt** file is added in the context of **S11/A**. Consequently, if you view **ItemRev1** in the context of **TopItem1/A**, you see the **file2.jt** file.

Override data in the context of a composition

You can associate data to a composition in the context of an operation or process setup. The following figure shows how you may override data in the context of a setup.



Override occurrence data in the context of a composition

This structure contains occurrences (**Resource 1**, and consumed items **C1** and **C2**) and a collection of absolute occurrences (**occGroup1**). This collection consists of absolute occurrences **a6** and **a7** which Teamcenter configures if you load **Product 1**. Thus, **a6** and **a7** in the process structure are absolute occurrences in the context of **occGroup1**. The consumed item **C1** is an occurrence in the setup for **Operation 1** and is linked to absolute occurrence **a4** in **Product 1**.

> Note:
>
> The process structure may also have its own absolute occurrences.

You can override data in the context of the process. You can also override data in the context of **Product 1** through the absolute occurrences in the occurrence groups. The override data is controlled by a rule that allows you to attach JT files at a top level and at an intermediate level. Consequently, a JT file attached to **c5** under **Occurrence Group 1** in the context of the **Operation 1** BOM view revision (BVR) overrides the default file, and also the file associated with **a6** in the product 1 BVR.

If you create absolute occurrences for the process structure and (assuming **P6** is the occurrence for **C5**), the data attached to **P6** in the context of **Process** overrides data attached to **a6** in the context of the **Product 1** BVR.

Override data in multiple contexts

You can create absolute occurrence data on a single line in more than one context. For example, you may want to override the find number in the context of the top-level assembly and the quantity in the context of a lower level assembly. Make these in-context edits in turn, ensuring you have selected the correct context (line) each time. The system shows the relevant absolute occurrence data for the current context and consequently data that applies to other contexts is hidden.

Note:

You cannot change the value of a property that is already overridden in a higher level context.

Understanding ID in context and assigned products

When assigning a product to a process or copying processes or operations from one process structure to another, Teamcenter can assign the same ID in context (IDIC) to the structure lines in the source and target structure. Doing so provides a method for Teamcenter to find the assigned objects in the other structure, for instance, when using the **Find in Other Structure** menu command or running an accountability check.

This mechanism is controlled by two preferences:

- **MECopyIdInContextToAssignedLine**

  If set to **True**, Teamcenter copies any existing in-context IDs to the target structure when assigning a product to a process or copying a process or operation from one structure to another. If an in-context ID does not exist, Teamcenter creates one on the source and copies it to the target object. Any generated IDs are unique within the source and target structures.

  If set to **False**, no in-context ID is copied.

- **MECopyIdInContextLowerLevels**

  If set to **True**, Teamcenter copies any existing in-context IDs of consumed items under subprocesses and suboperations to the target structure when copying a process or operation from one structure to another. If an in-context ID does not exist, Teamcenter does *not* create one.

  If set to **False**, no in-context ID gets copied for the consumed items under subprocesses and suboperations, even if one is present.

  Note:

  The **MECopyIdInContextLowerLevels** preference is considered only if **MECopyIdInContextToAssignedLine** is set to **True**.

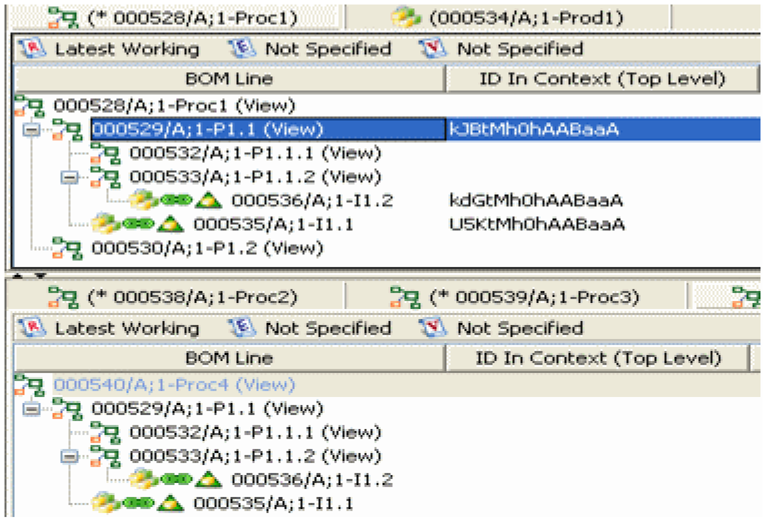
In the following example, if you copy process **P1.1** from **Proc1** in the upper pane to **Proc4** in the lower pane:

- Teamcenter only generates an in-context ID for the process that is being copied. It never generates an in-context ID for subprocesses, suboperations, or their consumed items, regardless of the settings for these preferences.

- If **MECopyIdInContextToAssignedLine** = **false** and **MECopyIdInContextLowerLevels** = **false**, Teamcenter does not copy any in-context ID.

Note:

For **P1.1**, the ID is not generated at the source if it is not present (in the following example, it is already generated).

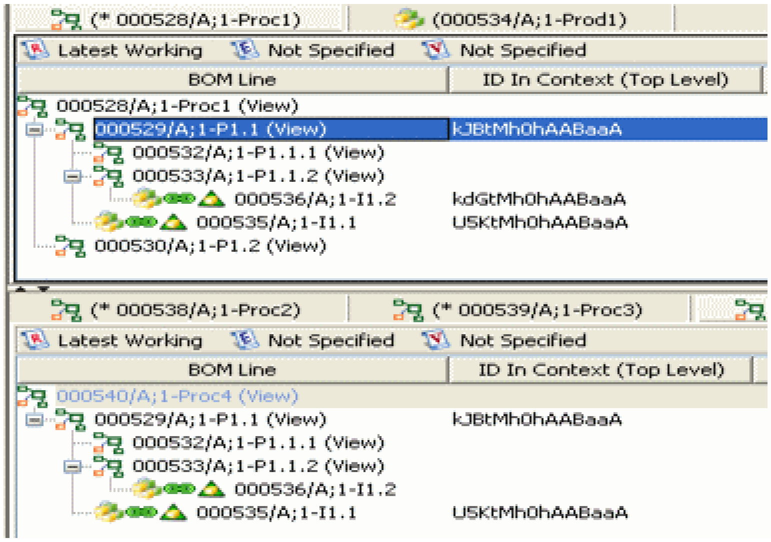


After copying, under the **Proc4** process, note that there are no in-context IDs in the **ID In Context (Top Level)** column.

- If **MECopyIdInContextToAssignedLine** = **true** and **MECopyIdInContextLowerLevels** = **false**, the in-context ID for **P1.1** and **I1.1** only are copied. The existing in-context ID for **I1.2** is not copied because **I1.2** is the consumed item of a lower level.

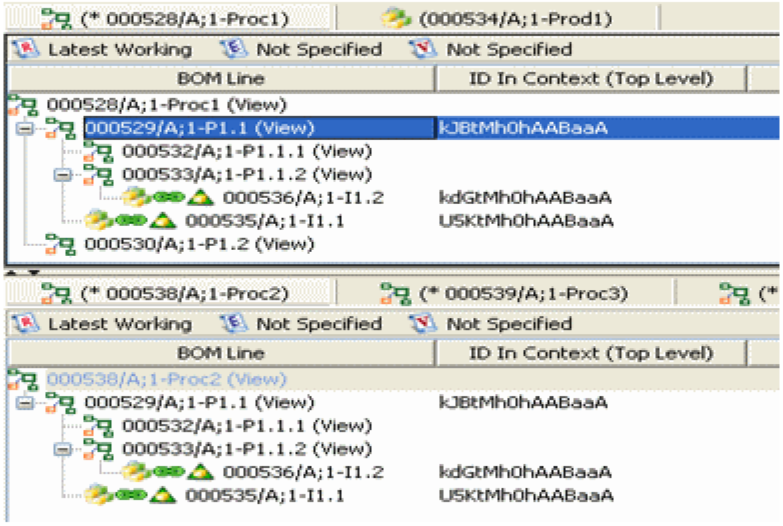
Note:

For **P1.1**, the in-context ID is generated at the source if it is not present and then copied. For **I1.1**, the ID is not generated if it is not present.



- If **MECopyIdInContextToAssignedLine** = **true** and **MECopyIdInContextLowerLevels** = **true**, the IDs for **P1.1**, **I1.1**, and **I1.2** are all copied.

> Note:
>
> For **P1.1** the ID is generated at the source if it is not present and then copied. For **I1.1** and **I1.2**, if the ID is not present, it is not generated, but if it is present, it is copied.



7. Associating the EBOM and MBOM

Assign occurrences between structures

1. Open the source and target structures in companion panes.

2. Configure the source and target appropriately. The root lines of the structures provide the context for assignments.

3. Choose **Tools→Link Structures**.

   Teamcenter links the source root and the target root. When these structures are linked, all further assignments into the target from the source create logically equivalent occurrences. The occurrences in the two are associated based on the **AbsOccID** property (also known as the *in-context ID*) and the defined properties copied from the source to the target.

   > Note:
   >
   > The **MEAlignedPropertiestoExcludeFromInitialization** preference defines the list of BOM line properties that are not copied to an aligned target occurrence when it is initialized.

4. Rearrange the target for manufacturing purposes. The aligned occurrences and their properties remain linked.

   > Note:
   >
   > If you assign a line containing children from the source to the target, only the parent line is given an IDIC. If you remove that parent line from that target, the children move up a level in the hierarchy, but because they do not have an IDIC, they do not show up as a match when running an accountability check between the two structures. Use the **MECreateIdInContextforAssignedchildlines** preference to specify that Teamcenter assigns an IDIC to the child lines when assigning the parent from the source to the target.

Carrying forward in-context attachments

If you work with source and target structures, when you assign structures from the MBOM to the EBOM, you can carry forward attachments that are associated in-context in the EBOM. The same information is available in the bill of processes (BOP), when MBOM occurrences with in-context information are assigned to the BOP.

Three preferences manage in-context attachments. One preference manages how in-context attachments from the MBOM are made available in the BOP. Your Teamcenter administrator sets the preference values. It is helpful to know how these preference values control the behavior of in-context attachments in your environment.

Caution:

If preference values are not set, attachments are not carried over when you perform an assign operation.

- *MEAssignAttachmentAndRelationToUseInCopyRule* – indicates which datasets are carried forward as in-context attachments, and whether the datasets are treated as a reference or a copy.

  For example, set the value to DirectModel:IMAN_Rendering:Reference to carry forward flexible (deformable) parts as in-context attachments referenced in the MBOM.

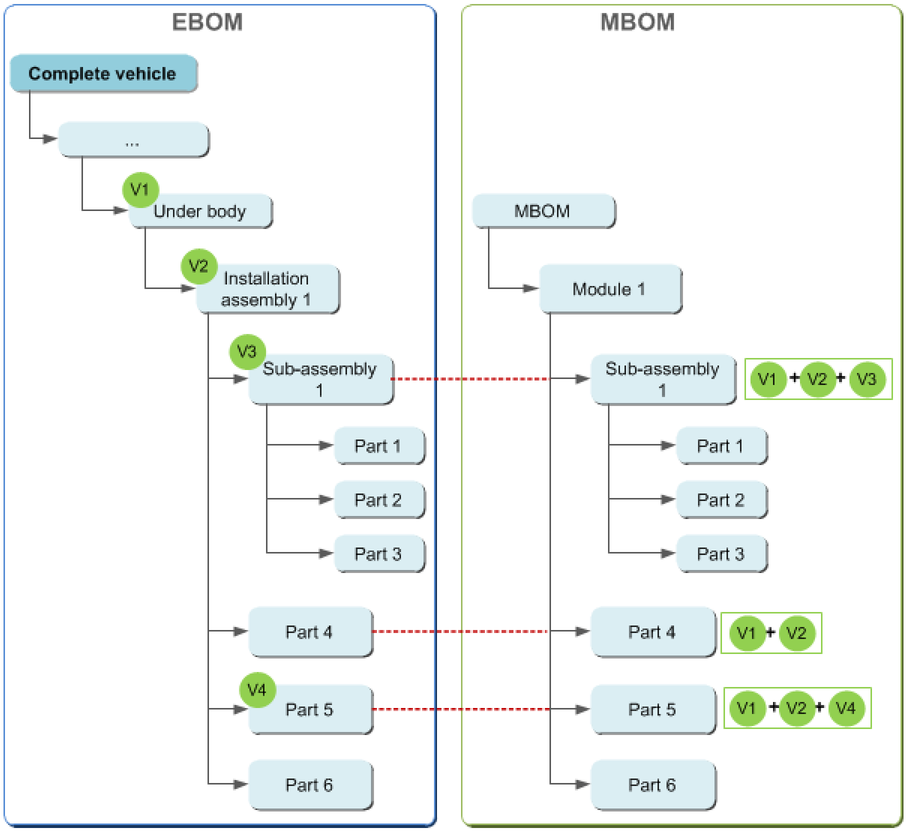
- *MEAssignAttachmentContext* – sets the context for the in-context attachment of an assigned occurrence from the EBOM to the MBOM, as either set the top line of the MBOM or a direct parent of the occurrence assigned from the EBOM to the MBOM.

- *MEAssignPropertiesInContext* – carries forward the in-context overridden value of a property on an occurrence or its child in an EBOM when assigning that occurrence from the EBOM to the MBOM. This feature is supported for the absolute transform matrix (bl_plmxml_abs_xform) only.

- *MEAssign_support_incontext_below_consumed* – makes in-context datasets available as attachments and transforms overrides for child lines of consumed lines from the MBOM to the BOP.

Rolling up variant conditions

You can optionally propagate **rolled-up variant conditions** when you assign parts from a source to a target part structure or from a product BOP to a plant BOP. As a result, the BOM lines in the target or plant BOP hold the same variant conditions as the corresponding BOM lines in the source or product BOP. Teamcenter copies the variant condition on the source line, rolls up the variant conditions of all parents of the source line, and then propagates the rolled-up variant condition to the target line, as shown.



The top levels of the source and target must be linked for correct propagation of rolled-up variant conditions. Teamcenter calculates the rolled-up variant condition by traversing from the source line to the linked top or up to the installation assembly level, and then adding together all the variant conditions found during the traversal.

If the source line does not have variant conditions, Teamcenter calculates the rolled-up variant condition by considering the variant conditions of the parent and all levels above.

The accountability check is modified to recalculate the rolled-up variant condition on the source line and compare it with the variant condition already stored on the associated target line. It then reports any partial match discrepancies between the variant conditions.

By default, rolling up of variant conditions is disabled and must be enabled by setting the **Rollup_Variant_Feature** site preference to **true**. You should also set the **RollUp_Variant_Traverse_Level_Is_InstallationAssembly** preference to determine the level to which rolled-up variant conditions are calculated. If this preference is set to **TRUE**, Teamcenter calculates the rolled-up variant condition by traversing up to the installation assembly level in the structure. If the preference does not exist or is set to **FALSE**, it calculates the rolled-up variant condition by traversing up to the linked top.

If the rolled up variant expression is too long, your administrator can create the **Rollup_Variant_Optimized_Format** preference and set it to **TRUE**. Teamcenter then optimizes the rolled up variant expression for storage and display.

The following installation assembly preferences must also be set:

- **PortalDesignContextIsInstallationAssemblyMethod**
- **PortalDesignContextIsInstallationAssemblyMethod.hasIRType.Type**
- **PortalDesignContextIsInstallationAssemblyMethod.has_bomline_prop.name**
- **PortalDesignContextIsInstallationAssemblyMethod.has_bomline_prop.value**

> Note:
>
> For the EBOM/MBOM scenario, Teamcenter calculates a rolled-up variant condition only if an assignment is made from the EBOM to the MBOM and both structures are linked.
>
> Rolled-up variant condition supports the Teamcenter Product Configurator and classic model, not with modular variants.
>
> The rolled-up variant condition is saved in optimized form in the database but, when you view it, you see a summation (**AND** calculation) of all variant conditions from the source line to the linked top. Consequently, the rolled-up variant condition displayed on the target line may contain some redundant clauses. This helps you decompose the variant condition to its constituent building block expressions.

Additional preference settings:

- Set **PSM_enable_product_configurator** to **true**.
- Set **Rollup_Variant_Feature** to **true**.
- Add **bl_formula** to the **MEAlignedPropertiesList** preference.
- Make sure **bl_formula** is not in any preferences beginning with **MEAlignedPropertiesToExclude...**

Run an alignment check

Perform an alignment check

If a source structure linked to a target structure is modified, broken links or other anomalies may occur. To identify and resolve such issues, run an alignment check to assess the alignment (logical equivalence) of occurrences in the source and target.

1. Open the two structures in separate structure views. Teamcenter considers all contexts for the lines in scope. The check compares specific properties of the logically equivalent occurrences that are under the designated scope.

2. If packed lines are present, unpack the structures before performing the alignment check.

3. Select a line in the source structure as scope for the alignment check.

4. Choose **Tools→Alignment Check**.

   Teamcenter opens the **Alignment Check** dialog box with the source structure already selected.

5. In the target structure, select the line you want as scope and click **Add selected** in the **Alignment Check** dialog box.

6. Click **OK**.

   Teamcenter initiates the assessment and, when it is complete, displays the **Structure Alignment Check** dialog box showing the results.

   The upper table shows all pairs of occurrences, regardless of whether they match. Pairs with matched data are marked with a ✔ symbol, while pairs with mismatched data are marked with a ✘ symbol.

   The lower table shows all the properties of the currently selected pair of occurrences, allowing you to visually identify mismatched properties.

   > Note:
   >
   > The **MEAlignedPropertiestoExcludeFromDetection** preference defines the list of any BOM line properties that are not compared between aligned occurrences.

7. (Optional) Click **Save As Report** in the dialog box.

   Teamcenter displays a **Structure Alignment Check Report** dialog box that allows you to choose a name or accept the default report name.

8. (Optional) Synchronize the data of all occurrence pairs or selected occurrence pairs, as follows:

   a. Choose each pair of occurrences whose data you want to synchronize by selecting the corresponding check boxes in the **V** column of the **Alignment Check Results** table in the **Structure Alignment Check** dialog window. To select all lines for synchronization, click .

   b. Click **Update**.

      Teamcenter updates the properties of the target lines of all selected pairs. After the update completes, the **Match** status of the selected pairs is updated and the corresponding check boxes disabled.

      If any of the selected pairs cannot be synchronized, Teamcenter displays an error message.

Note:

The **MEAlignedPropertiestoExcludeFromSync** preference defines the list of BOM line properties that are not copied to an aligned target occurrence when it is synchronized.

Note:

The results of the alignment check may be incorrect and an attempt to synchronize aligned occurrences may fail if the precision of aligned occurrences does not match, that is, one occurrence is precise and the other is imprecise.

Teamcenter assumes you use the same unit of measure (UOM) value for the same item throughout the system. The comparison does not check if the quantity differs between occurrences because different UOMs are used. In this case, the result may indicate a mismatch, but it would be incorrect to update the quantity without also updating the UOM value.

Compare properties

You can optionally identify individual properties that are mismatched between the source and target lines. This avoids the necessity to inspect all the properties of the mismatched lines to determine if synchronization is required.

1. Run the structure alignment check as described in *Perform an alignment check*.

   Teamcenter displays the **Structure Alignment Check** dialog box.

2. In the **Alignment Check Results** list, select the appropriate structure line and click **Show in Tree**.

   Teamcenter highlights the source line in the main pane.

3. Select a row in the **Alignment Check Results** list, and then select the **Show only mis-matched properties** check box.

   Teamcenter updates the **Properties Comparison** list to show only those properties that are mismatched.

   Note:

   If you do not select the **Show only mis-matched properties** check box, all properties are shown and mismatched properties are highlighted in bold. The properties are listed in alphabetic order after the **Object** property, which is always listed first.

4. (Optional) Click **Update Selected**.

   Teamcenter updates the mismatched properties, synchronizing the source and target line pairs selected in the **Alignment Check Results** list.

Finding and interpreting alignment reports

- Alignment reports are stored in the My Teamcenter **Newstuff** folder if the **MEAlignmentCheckReportLocation** preference is set to **False** or are attached to the item revision of the top line of the structure if it is set to **True**.

  You can retrieve an existing alignment check report for a selected occurrence (structure line) from the **Newstuff** folder or by clicking the **Attachments** tab in the data pane when the top line of the MBOM is selected.

- If a report with the specified name already exists, the **TC_CRF_overwrite_existing_dataset_content** preference controls if the existing report is overwritten. If this preference is set to **1**, the existing contents are replaced, otherwise the new report is appended.

- The creation and format of the report is determined by the following preferences:

  - **MEAlignmentCheckReportDefinition**

    This preference specifies the name of the report definition object that controls creation of the report. The default value is **AlignmentCheckReportDefinition**.

  - **MEAlignmentCheckReportStylesheet**

    This preference specifies the name of the style sheet used when creating alignment check reports. A default style sheet is provided, but you can create your own style sheet using the Report Builder application. The default value is **AlignmentCheckReport.xsl**.

- The report format is similar to that provided for the accountability check, as described in *Running accountability checks*. However, you should note the following differences:

  - The **Source** column includes no indentation because the alignment check only considers aligned nodes.

  - The **Target** column cannot contain multiple targets. Instead, multiple target lines may be listed for a source line.

  - The **Match** column may show a mismatch, even though the user already performed an update action. This occurs if the comparison properties differ from the synchronization properties. In this case, the column shows if the update action was performed successfully, not whether the lines now match.

Save and replace in context

The manufacturing engineer can create a new target substructure from an existing one, while preserving the occurrence information on the line. Typically, this is done to create a new subassembly when it is not possible to revise the existing subassembly, possibly because the existing target is still in use on the shop floor.

This situation arises in the aerospace industry to create a new kit from an existing one. It is also useful when manually creating an target from a source in cases where you do not want to use a different item type for manufacturing parts. Use this menu command on each level in the structure for which you want to create a manufacturing-specific part.

- Select the top line of the subassembly and choose **File→Save As→Replace Assembly In Context**.

  Teamcenter creates a copy of the subassembly and propagates existing alignments to the copy. All relationships of the items in the kit are preserved, regardless of GRM rules. Options and variant rules are *not* carried over from the original line.

  If this action is performed in the context of an incremental change, it is recorded.

8. Managing changes

Incremental change overview

You can control changes to a structure by revising the affected items. Because many changes may be small and not related to each other, Teamcenter allows you to create incremental changes to add components to and remove them from the structure. Each incremental change consequently comprises several individual and possibly unrelated revisions to a component, occurrence, or attachment in the structure.

An incremental change groups several individual changes that can be released simultaneously to a baseline of the process or product. You can define an effectivity for an incremental change, allowing (for example) all changes related to the production of a new model to be implemented simultaneously. You normally assign an effectivity expressed as a date range or sequence of serial numbers to the change, ensuring that all grouped additions and removals happen at the same time.

An incremental change may have revisions, and you can configure the various components, occurrences and attachments to a specific revision by applying appropriate revision rules.

Understanding change objects

You can create a change object to control changes within a collaboration context. The change object affects the structures shown in the collaboration pane and each structure pane. You can configure different effectivity dates or numbers for each of these panes with their revision rules. Any attachments to the structure are also affected by these revision rules.

You can make changes to any structure by adding an occurrence to it or removing an occurrence from it without creating a new revision through these incremental changes. The change object is identified by a unique change ID. The change ID is an effectivity identifier either in terms of a date or a serial number. Serial numbers are identified with an end item.

You can attach more than one change object for the same type of change to a structure. For example, you can attach a new dataset associated with the first change order, which is effective from 1-March-2011 to 30-March-2011, you can later add another dataset for a second change object of the same type, which is effective from 1-June-2011 to 30-June-2011. Teamcenter prevents you making duplicate changes by attaching the same change object more than once.

You can also create a baseline item revision by configuring all the incremental changes.

A single change can add or remove multiple objects from an item or item revision. A single object can be added to an item or item revision with different effectivities by several changes, and removed with different effectivities by several other change objects.

Show or hide incremental change management

Using incremental change management is optional. To use it, your administrator must set the **Incremental_Change_Management** preference to **true**. When this preference is set to **false**, the incremental change toolbar is not visible and any loaded items or relationships under incremental change control display in a different color.

Turn off incremental change tracking

Click the button in the incremental change toolbar.

Teamcenter changes the **Active IC** box to display **No Active IC**. No edits are tracked.

Setting up incremental change

Before using incremental change, you must complete several setup procedures, including creating the necessary change types, providing users with access, defining releases statuses, and writing revisions rules.

Customize buttons

Incremental changes are displayed by icons at the beginning of a structure line. When you add or remove a structure line, Teamcenter displays a plus or minus icon in front of the respective line.

- Customize when incremental change icons are displayed by choosing **Tools→Incremental Change→Display Icons** and selecting the contexts in which you want to see the icons.
- Choose **Tools→Incremental Change→Display Icons→Hide/Remove Icons** to always hide the display of the icons in the tree structure.
- If your administrator sets the **MoveICCreationToMenu** preference to **True**, the button on the incremental change toolbar is hidden. If this button is not visible, use the **Incremental Change→Create** menu command to create a new incremental change, unless this command is suppressed.

Create a new incremental change

1. Click the **Create Incremental Change** button .

   Teamcenter displays the **Create/Revise Incremental Change** dialog box.

2. Click the **IC Attributes** tab and set the following incremental change attributes:

- Type an ID and revision for the change object. Alternately, click **Assign** to let the system assign this information for you.

- (Optional) Type a description for the incremental change.

- Select a change type from the **Incremental Change Type** list. Note that some of these types may be for general changes, not incremental changes.

3. Click the **Effectivity** tab and specify whether to set effectivity for the incremental change using unit serial numbers or dates by doing one of the following:

> Note:
>
> You cannot specify an effectivity until the incremental change is released. An incremental change may be released by a workflow process that is specific for your company or site.
>
> If you do not specify an effectivity, Teamcenter creates the change object without a status.

The administrator determines the initial release status of all new incremental changes by setting a site preference. If the preference is not set, you cannot set effectivity while creating the incremental change. You must release the incremental change (revision) separately with the appropriate process. Once the release status is attached, you can set the effectivity on the incremental change.

- Click **Units** and specify the range of serial numbers to which the effectivity is to be applied. You can also click one of the following buttons:

  - **UP** button to define an unlimited effectivity from a starting number. For example, typing **1-UP** means the change is effective from unit 1 upward.

  - **SO** button to define an effectivity until all stock is exhausted. For example, typing **1-SO** means the change is effective from unit 1 until no stock remains.

  > Tip:
  >
  > The tooltip provides you with more information about the formatting for this entry.

- Click **Dates** to set effectivity based on calendar dates. Multiple date ranges can be entered. To set a date:

  - Type the start and end dates for the effectivity period into the **From Date** and **To Date** cells in the date table.

  - Select a date in the calendar table and click **Set Date** to specify both the **From Date** and the **To Date** entries.

When the correct effectivity is shown, click **OK**.

4. If unit effectivity is set, populate the **End Item** box on the **Effectivity** tab using one of the following methods:

   - From the list of most recently used end items
   - Using the **Search** function to open an item by name or ID
   - By pasting an item from the clipboard

5. Click **OK** to finish creating a new incremental change and close the dialog box, or click **Cancel** to cancel the operation.

   Teamcenter creates a copy of the new incremental change in your **New Stuff** folder.

6. At an appropriate time, the designated user or a workflow process approves the change object by adding the release status. The change object is now *locked* and you cannot use it to track further changes to the process or operation.

   > Note:
   >
   > You can use a Workflow handler that renames the status and retains the effectivity, for example, the **add_status** handler with a **–remove** option.

Showing unconfigured changes

You can configure the display of the tree table to show the following:

- All components and attachments.
- Only those components and attachments that are configured by the current revision rule.

To control the display of unconfigured changes:

- Choose **View→Show Unconfigured Changes** to toggle between showing all lines or only those set by the current revision rule.

  > Note:
  >
  > You can add a button to implement this function to the toolbar, allowing you to easily see the current mode. To do this, right-click the toolbar, choose **Customize**, and click the required button.

To identify changes made in the current context, click the **Changed by Current IC Edit Context** column header to re-sort the structure into changed and unchanged lines. This allows you to more easily identify the changes made to the structure in the current context.

Find and make active an existing change object

When an incremental change is active, all edits are made in the context of that incremental change. Teamcenter shows the ID and name of the incremental change in the incremental change toolbar. If the **Incremental Change** pane states **No Active IC**, no incremental change is active.

1. Click the **Select an Incremental Change context** button .

   Teamcenter displays the **Select an Incremental Change context** dialog box.

2. Type either the name or ID of the change object to be displayed. You can use wildcard search characters, if necessary.

3. Click **Find**.

   All change objects matching your selection criteria are displayed in the dialog box. Use the navigation buttons at the bottom of the dialog box to navigate the list.

4. To select an incremental change object for display, double-click the change object in the dialog box list.

View or edit information about an incremental change

Do one of the following:

- Click the **View/edit current IC information** button .

- Click **More IC Info** in the **Incremental Change** data tab.

Teamcenter displays the **View/edit Change** dialog box, which includes the following tabs:

- **IC Attributes** shows the change object name, description, and tag type.

- **Incremental Changes** shows the individual changes to components, attachments, created/deleted data, and occurrence notes that are tracked against this incremental change.

- **Effectivity** allows you to view and edit the effectivity of the change object if you have the access permission to do so. Double-click a specific release status to open a dialog box containing all the effectivity information for the selected release status.

- **Intents** displays the intents for which the incremental change is valid.

  You can create a new intent by clicking the **Intent** button and typing the appropriate information in the **Create Intent** dialog box. You can then add the intent to the incremental change by ensuring it appears in the **Intent to add** box and clicking **+**. You can also search for existing intents and add them to the incremental change.

> Note:
>
> To make the **Intents** tab visible, set the **EnableIntents** preference to **true**.

You can also use the icons on a structure line to identify adds, removes, and absolute occurrences. For attachments, these icons are displayed in the **Attachments** pane, not the main pane.

View incremental changes for a structure

To view all the incremental changes associated with a structure, select a line in the structure and click the **Incremental Change Info** data tab. For each line, this pane lists:

- **Type**

  For attachments only, specifies the type of incremental change, **create**, **delete**, **add**, or **remove**. Note that edits to attachments are shown as **create** types.

- **IC Context**

  Specifies the incremental change objects affecting the structure, listed in the order they are applied.

- **Release Status**

  Specifies the release status of the incremental change object, for example, **Production**.

- **Effectivity**

  Specifies the date or unit number effectivity of the incremental change.

- **IC Configured By**

  Specifies the revision rule that configures the incremental change for this structure. This allows you to see if an incremental change is configured and, if so, how it is configured.

For attachment changes, the affected lines and changed relationships are also listed. For occurrence attribute changes, the affected attributes and changed values are also listed.

To see more information about an incremental change, double-click the line in this pane; Teamcenter displays the changes made by the incremental change.

Find recently used change objects

Click the **Most Recently Used** button () to display a list of previously used incremental changes from which you can choose.

Track attachments with incremental changes

You can create an attachment to an item revision and track its status with an incremental change object, as follows:

1. Ensure you have created the appropriate incremental change object and that it is active. The active incremental change is shown in the **Incremental Change Edit Context** box in the incremental change toolbar.

2. Click the **Attachments** pane.

3. Select the structure line corresponding to the *item revision* under which you want to create the attachment.

4. Select the root node (item revision) in the **Attachments** pane.

5. Create a new attachment by choosing **File→New→Dataset/Form**.

   Alternatively, you can attach an existing object by copying the dataset or form to the clipboard, then pasting it to the root node (item revision) in the **Attachments** pane.

Note:

- If you open, check out, and then close a form associated with an item revision in the context of an incremental change, the checkout not retained on the form.

- When open, check out, save, and then close a form associated with an item revision in the context of an incremental change, the checkout is retained on the form.

Track changes to an attachment

To track changes (edits) made to an attachment, select the attachment (dataset or form) and choose **Tools→Incremental Change→Edit Attachment**.

Teamcenter also tracks edits if you double-click the dataset or form. With a dataset, the change is tracked when you open the form to edit; with a form, the change is tracked only when you click **OK** or **Apply**. Teamcenter tracks the changes by creating a copy of the dataset or form.

The **Attachments** pane displays the appropriate version of the attachment according to the configured incremental change against which the edits were tracked.

> Note:
>
> You can view the original, unchanged attachment in My Teamcenter.
>
> If you open an attachment, check it out, and then close it, the checkout lock is not retained. The checkout is retained only if you save the attachment at least once before closing it.

Track the creation or deletion of an attachment

You can track the creation of a dataset or form against an incremental change, so that the attachment itself has an effectivity that is derived from the effectivity of the incremental change; this is in addition to the effectivity applied by the incremental change that attaches the attachment to an item revision. This feature may be useful if the attachment is attached to more than one item revision.

- To track the creation of an attachment, select the attachment in the **Attachments** pane and choose **Tools→Incremental Change→Create on Object**.

- To track the deletion of an attachment, select the attachment in the **Attachments** pane and choose **Tools→Incremental Change→Delete on Object**.

Track changes retrospectively

If you forgot to activate an incremental change, you can retrospectively track changes by making the incremental change active and doing one of the following:

- Select the item or attachment that you wanted to track as *added* and choose **Tools→Incremental Change→Add**.

- Select the item or attachment that you wanted to track as *removed* and choose **Tools→Incremental Change→Remove**.

Teamcenter saves edits immediately to the database. It is not necessary to choose the **Save Changes** command.

You can only make changes to the *active* incremental change, that is, the one shown in the **Incremental Change Edit Context** box in the incremental change toolbar. If you try to edit an incremental change that is not configured by the current revision rule, Teamcenter displays an error message.

Remove incremental changes

You can remove individual incremental changes one of two ways, from the **Incremental Change Information** pane or with an **Incremental Change** menu command.

> Note:
>
> You require write access to edit structures with incremental changes in this way.

For structure and attachment changes:

- If the corresponding change is a remove, Teamcenter deletes it.
- If the corresponding change is an add and the user has write access to the parent BVR, Teamcenter deletes the add but not the occurrence. If you want to remove the occurrence, choose **Edit→Remove**. If the user does not have write access, the deletion request fails.

For occurrence attribute changes, if the change to undo is an add and it is the only change to the attribute, the change and the override value are both deleted. In other cases, only the change is deleted.

Remove changes from an item with the Remove Changes command

1. To remove changes to an occurrence, select the corresponding structure line.

   To remove changes to a dataset or form, select it in the **Attachments** pane.

2. Choose **Tools→Incremental Change→Remove Changes**.

   Teamcenter displays the **Remove Incremental Changes** dialog box.

3. Select the check box next to each change you want to remove, or click **Select All** to remove all changes, then click **OK**.

> Note:
>
> Occurrence attributes are not displayed in the **Remove Incremental Changes** dialog box; you can only undo them from the **Incremental Change Information** pane.

Remove an individual change from the incremental change information pane

1. In the **Incremental Change Information** pane, select the structure line of the occurrence or attachment whose changes you want to remove.

2. Select the change to undo and click **Undo Change**, depending on the change type that you want to remove. You can undo multiple changes in a single operation.

Split an incremental change

You may want to change the effectivity of some of the incremental change elements in an incremental change. As all elements of an incremental change have the same effectivity, you can only accomplish this by moving some of the incremental change elements into a different incremental change. To do this, choose **Tools→Incremental Change→Split**. You can move the incremental changes to an existing change object or create a new change object for the purpose.

Exporting and importing incremental change data

About exporting and importing incremental change data

You can export changes (deltas) to the structure if they are tracked by incremental changes in two formats—TC XML using a briefcase file or PLM XML. Teamcenter allows you to export the structure changes alone (not the entire structure) without needing to create a new revision. The exported changes contain all the relevant data required by the importing site to achieve the same structure configuration as exists at the exporting site. You can export multiple independent, dependent, or overlapping incremental changes in a single action.

When you use this feature, you must ensure the structure is configured with the required effectivity and revision rules before initiating the export. Effectivity and revision rules are not exported with the changes; you must ensure they are identical in the exporting and importing sites separately.

Teamcenter tracks and exports the following changes when they are tracked by incremental changes:

- Adding a new or existing line to the structure
- Adding a new or existing subassembly to the structure
- Removing a line or subassembly from the structure
- Modifying relative occurrence properties
- Creating or modifying absolute occurrence properties
- Adding a new or existing attachment to a line, for example, a form or dataset
- Deleting an attachment
- Modifying an attachment

When exporting incremental change data using PLM XML:

- The structure must be fully configured.

- Any related changes that are not tracked by an incremental change are not considered for export.
- Changes in the context of incremental changes are considered as export candidates. For example, if you add, modify or remove a structure line in the context of an incremental change, all of its parents up to the top level are exported in addition to the affected line. However, the siblings of lines affected by the incremental changes are not exported.
- If you add, modify, or remove a subassembly under an incremental change, its children exported even though they are not directly affected under the incremental change.

You can create an incremental baseline for a structure that was already exported. This action creates a new revision of the structure. As active changes are carried forward into the new incremental change baseline revision, you may add new incremental change elements (ICEs) affecting the new structure revision to the incremental change revision that is the parent of the original active ICEs. (This incremental change revision may already be exported for the original structure.) Because the new ICEs do not affect the revision of the structure that was exported when you perform a TC XML export, they are exported as a stub. The incremental baseline action has no additional effect on the export of the original structure and the incremental change revisions that affect it.

Export incremental change data using a briefcase file

1. Choose **Tools→Export→To Briefcase**.

   Teamcenter displays the **Export To Briefcase Via Global Services** dialog box.

2. Click the **Display/Set export options** button in the bottom right-hand corner of the dialog box.

   Teamcenter displays the **TIE Export Configured Export Default** dialog box.

3. Select the check box corresponding to each of the export options you want to use and then click **OK**.

   Teamcenter closes the **TIE Export Configured Export Default** dialog box.

4. In the **Export To Briefcase Via Global Services** dialog box, enter all the required information including **Reason**, **Target Sites**, **Option Set**, **Briefcase Package Name**, **Revision Rule**, and **Variant Rule**, and then click **OK**.

   > Note:
   >
   > Ensure you select the **TIEConfiguredExportDefault** transfer option set to export incremental change based deltas.

   Teamcenter displays the **Remote Export Options Setting** confirmation dialog box.

5. Click **Yes**.

Teamcenter starts the export of the product structure using the options you entered.

Import incremental change data using a briefcase file

1. Choose **Tools→Import→From Briefcase**.

   Teamcenter displays the **Import from Briefcase Without Global Services** dialog box.

2. Navigate to or type the path and file name of the briefcase file in the **Briefcase File** box. Select **TIEConfiguredImportDefault** from the **Option Set** list.

3. Click the **Display/Set export options** button and select the desired options.

4. (Optional) Select the **Site Check-In after import** box. If you select this box, all objects that are checked out to the unmanaged site are checked in during the import process. Otherwise, you must check them in individually after they are imported.

5. Click **Yes** to begin the import.

> Note:
>
> The importing site does not verify it has the same base structure against which the delta was calculated.
>
> If you select a collaboration context for export of incremental change deltas, the export file includes the structure context and configurator contexts contained in it, as well as the configured incremental change data.

Export incremental change data using PLM XML

1. Choose **Tools→Export→To PLMXML**.

   Teamcenter displays the **PLMXML Export** dialog box.

2. Enter the required export directory, file name, choose the appropriate IC delta transfer mode (for example, **ConfiguredDataExportDefault**), and then click **OK**.

   Teamcenter displays a confirmation message if the export is successfully completed. It generates the output PLM XML file in directory the location shown in the **PLMXML Export** dialog box.

Import incremental change data using PLM XML

1. Choose **Tools→Import→From PLMXML**.

   Teamcenter displays the **PLMXML Import** dialog box.

2. Enter the name of the PLM XML file to import, choose the appropriate IC delta transfer mode (for example, **ConfiguredDataImportDefault**), select the required incremental change context, and then click **OK**.

   Teamcenter displays a confirmation message if the import is successfully completed. It imports only changes to the structure, as captured in the exported PLM XML file.

Create an incremental change baseline item revision

Changes to a process plan can be managed by making incremental changes, which are tied to incremental change objects. This enables you to track and configure the changes without forcing you to create a new revision. After making several sets of incremental changes, you may want to roll up the changes made into a new baseline revision. The baseline item revision allows you to create a new revision of an item by capturing all the changes made using incremental change objects until the configuration date or unit number. The baseline item revision can be created at any stage.

> Note:
>
> Incremental change baselines are not the same as structure baselines created with **Tools→Baseline**.

1. Select an item revision and choose **Tools→Incremental Change→Incremental Change Baseline**.

   Teamcenter displays the **Baseline** dialog box.

2. Type a name and a description. Teamcenter displays the selected item revision and revision ID by default. These boxes cannot be edited.

3. Click **OK**.

Modify a process or plant structure

If a process structure or plant structure is write-protected, you can still modify its structure with incremental changes. You can also add datasets or forms to an item revision or remove them from a revision by defining an incremental change.

9. Managing variants

Working with variants—overview

Variant configuration allows you to create options (for example, color) and allowed values for each option. You can then associate these options with an item revision. For example, you might create an option called color with allowed values of red and blue. You usually implement variant configuration against a top-level assembly, but it is possible to implement them anywhere in the structure. You can then define a variant condition on those occurrences subject to variant rules. A variant rule is a set of options and values (for example, color = red, material = cotton) that is stored in the database. For example, you can specify only load IF option color = red in the variant rule. You can also set multiple variant rules. These are then evaluated using an **OR** expression. For example, color = red or color = green. To configure a particular variant of the assembly or product, you must set the appropriate variant rules.

Although Teamcenter provides you with two methods to create variants, modular or classic, Siemens Digital Industries Software recommends that you use only classic variants when working with manufacturing. To ensure that the variant mode always opens in the classic mode, set the **PSEVariantsMode** preference to **legacy**.

For more information about creating variants, see *Structure Management on Rich Client —Usage*.

Configure, view, or edit variant data

1. Choose **Tools→Variants**.

2. Choose one of the following commands:

   - **Configure**

     Allows you to configure or edit a variant structure for a selected top-level module. Applicable to classic variants and modular variants.

     For more information, see *Test product configuration*.

   - **Only configure root**

     Set to **on** to only display options for the top-level module, regardless of the line selected. Set to **off** to configure the structure for a lower level module. Only applicable to modular variants.

     When working with the manufacturing view of the product, you would not configure the structure for a lower level module. However, you may want to do this for debugging purposes to check that all options are set in the lower-level modules when the top-level module is completely set (this verifies all options have a value). To do this, set the **Only configure root** option to **off**.

Otherwise, you set **Only configure root** to **on**, and the **Configuration** dialog box only displays options for the top-level module, regardless of the BOM line selected.

- **Search**

  Allows you to search for a variant item. This option is only applicable to modular variants.

  For more information, see *Search for a variant item*.

- **Count Modules**

  Allows you to count the module defined for the selected variant structure. This option is only applicable to modular variants.

- **Unlink variant item**

  Allows you to unlink a variant item from the generic module item. This option is only applicable to modular variants.

  For more information, see *Unlink variant items*.

- **Update variant item**

  Allows you to manually propagate changes to associated variant items when you create a new item revision of a generic item.

Test product configuration

Before working with the manufacturing view of a product, you may want to test the product is completely authored. To do this, set all option values for the relevant variant of the module, select each lower-level module (possibly starting at the lowest-level modules), and check that all the option values are set correctly.

1. Select the BOM line representing a module and choose **Tools→Variants→Configure**.

   Teamcenter displays the **Configuration** dialog box, allowing you to confirm all the option values are set.

2. Repeat the previous step for each module in turn. The **Configuration** dialog box is updated dynamically, and it is not necessary to redisplay it each time you select a new module.

3. If any lower level module is not completely configured, see the *Structure Management on Rich Client —Usage* for information about how to define further constraints in the higher level modules or present lower level options to the top level module, as required.

Search for a variant item

A variant item is a specific variant of a completely configured module, for example, a door assembly. Variant items are physical parts with no variability and may be allocated a manufacturing part number.

You cannot manufacture modules themselves. Modules may have a large number of options, potentially resulting in a correspondingly large number of product permutations, not all of which can be manufactured. You may want to reuse permutations that have previously been manufactured, particularly if significant work was invested in creating the associated technical documentation, drawings, and manufacturing data. You can attach such associated data to the variant items.

1. Choose **Tools→Variants→Search**.

   Teamcenter displays the **Variant Item Search** dialog box. The dialog box contains a table that shows the public options of the selected module, including the option name and a default value (if set). You can display further details about the options (for example, the allowed values and option type) in a tool tip by positioning the cursor over the option name.

2. Define variant item requirements, that is, the option values to find, in the **Required Value** column. To increase the chances of finding the variant item, define search requirements as loosely as possible, as follows:

   - Do not provide requirements for nonessential options. Enter value requirements for logical options and freeform string options (allowable values not defined) in the same way as you set configuration values. Leave the value blank, select a single value for a logical option or type a string value.

   - Select multiple allowable values for enumerated string options from the list. Each time you click a value, Teamcenter adds it to the dialog box. Click a value again to remove it from the dialog box.

   - Enter ranges for numeric options. When you type in requirements for numeric options, a parser checks that the entered value conforms to the modular variant language (MVL) syntax. It also checks that the ranges are within the allowable values of the option. Examples of allowable numeric ranges are:

     - **<=200, >500**

     - **100200**

     - **-5–10, <20**

   For information about MVL, see the *Structure Management on Rich Client —Usage*.

3. After you specify the requirements, execute a query for matching variant items by clicking the **Search** button. Teamcenter displays the search results at the bottom of the dialog box showing the matching variant items.

If the query is successful, the identifiers and names of variant items whose values match the search criteria populate the list next to the **Search** button. If more than 25 variant items are found, Teamcenter displays a message recommending you refine the search requirements.

The search only finds *linked* variant items—unlinked variant items may have structure changes and would therefore not be applicable.

4. If the variant item search is successful, Teamcenter loads the first variant returned by the query and shows its values in the **Value Found** column. You can select a different variant item from the list, and Teamcenter loads it and updates the **Value Found** column. If you alter the search requirements in any way, Teamcenter changes the summary above the **Search** button to indicate you should execute the query again.

Unlink variant items

You may want to unlink the variant items from the generic module item so that you can change the variant item. This is desirable if you use the generic structure as a quick way to create variant items for a particular customer order and the generic order is then customized for the specific order.

1. Choose **Tools→Variants→Unlink Variant Item**.

   Teamcenter displays the **Unlink Variant Item** dialog box.

2. Click **Yes** to confirm deletion of the variant item. When you unlink variant items, they are not found during a variant item search, because they have evolved and may not be appropriate for the purpose. However, if appropriate, you can reuse it in the structure for a new order.

   > Note:
   >
   > You cannot relink a variant item after you have unlinked it from the generic module.

10. Searching structures

Searching a structure for items on the clipboard

You can search a currently active BOM structure for any item that you previously placed on the clipboard. To do this, choose **Tools→Find Clipboard Items** to search the structure for all instances of an item on the clipboard. Teamcenter selects and highlights the corresponding line in the structure if it finds a match.

If the item on the clipboard has no BOM information, the search is unsuccessful. For example, if you copy an item to the clipboard with the **Copy Line Item** menu command, no BOM information is copied and this search does not find a match. If you copy the item with the **Copy** menu command, the associated BOM information is also copied and the search finds a match.

You can search for occurrence groups in this way, in addition to individual items.

Searching for the closest match

When you search for a component across BOMs, Teamcenter looks for the *closest match*. This allows you to search for a component in one BOM that is a close match but not identical to a component in the other BOM. If it finds any instance of the component in the second BOM that has the same path from the top line item, it stops; otherwise, it detects if there are any instances of the component in the second BOM that share the same absolute occurrence of the component in the first BOM.

Search in context

The default *search context* with an opened BOM tree is the root line of the tree. However, you can choose to make any BOM line in the tree the search context by making it the absolute occurrence context. Once you have done this, the system searches in the context of this BOM line when it performs a search or accountability check. The result is the same as if the search or accountability check is done on a tree (with in context mode turned off) with this BOM line as the root. A BOM line has a valid context as long as occurrence paths with respect to the underlying item of this line have been stored for its children.

This rule is overridden if you choose the **search ALL LOADED contexts in target** option on the **Accountability Check** dialog box. When this option is set, the system searches all contexts it finds in the tree, no matter if the in context mode is set or not. In this case, the system checks every loaded BOM line to see whether it has a valid context associated, and then that context is searched.

1. Select the desired BOM line.

2. Click to turn on the in context mode.

3. Type the ID (name) of a predefined absolute occurrence in the text box next to the **In Context Search** button at the bottom of the pane.

4. Click .

Find related component in other structure

When a component has been assigned from one structure to another, you can find the related component in the source or target. You can search for occurrence groups in this way, in addition to individual items. To initiate a search:

1. Select a line in the structure.

2. Copy it to the clipboard.

3. Click the **Find Selected in Other Panel** ( ) button. Teamcenter selects and highlights the corresponding line in the alternate structure if it finds a match.

   When you search between structures in this way and an exact match is not found, the system identifies the closest match, as described in *Searching a structure for items on the clipboard*.

Search by name

You can search for and open a collaboration context or structure context by name or object ID.

1. Click one of the following:

Button	To open a
	Collaboration context
	Structure context

2. Type a new structure name or ID.

> Note:
>
> You can type an asterisk (*) as a wildcard character if you do not know the entire name or ID.

3. Click **Find** or press the Enter key.

   All products that match your search criteria are listed in a table in the open structure dialog box.

4. Double-click a structure in the table. It is opened in the structure pane.

Perform a where-used search

You can search a structure context or collaboration context to identify where an item selected in the structure hierarchy is used.

A where-used search must take into account the revision rule when searching the structures. You can choose to search for:

- All revisions

  Reports all item revisions that have an occurrence of the source item revision. This displays all possible combinations of usage that could possibly occur; depending on the revision rules, not all paths may be realized.

- Only the configured revision

  You select a revision rule to apply. The search result is filtered to include only those revisions that are configured by the selected revision rule. This rule is applied at each level of the structure, up to and including the top level. Any intermediate level nonconfigured revisions referenced by precise occurrences are also displayed.

1. Select an object in a structure tab.

2. Click the **Referencers** data tab and set the **Where** box to **Where Used**.

3. Set the **Where-Used Rule** box as required:

   - Click **All** to report all revisions.

   - Click the required **Revision Rule** from those listed to report only the configured revisions.

4. Set the **Where-Used Depth** box as required:

   - **One Level** to report immediate parent objects only.

   - **All Levels** to report all objects up to the top-level product.

   - **Top Level** to report final objects only.

5. On the **Referencers** tab, double-click the object for the search. The results of the search display on this tab.

6. Double-click any of the resulting objects to continue the where-used search.

Search by where-referenced criteria

You can search a structure context or collaboration context to identify where an item selected in the structure hierarchy is referenced.

1. Select an item from the tree hierarchy on a structure tab.

2. Click the **Referencers** data tab and set the **Where** box to **Referenced**.

3. Double-click the object for the search to display the results in this tab.

4. Double-click any of the resulting objects to continue the where-referenced search.

Searching appearance sets by spatial and attribute criteria

Searching for appearances

You can search large products by spatial and attribute criteria and display the results in the navigation tree and the viewer. You can search a configuration of an end item for which an appearance set is already defined. (An appearance set is a collection of objects that defines the usage of every part included in an end item.) Your Teamcenter administrator defines appearance sets, but typically only for a few end items that represent large assemblies to allow fast searches.

When you search BOM lines on a large product, you can restrict the search to a specific spatial region. For example, you may want to find all parts that are located within two centimeters of part X. To allow spatial searches, Teamcenter maintains spatial data in addition to the appearance set. Maintaining spatial data is optional and you can create appearance sets without spatial information).

You can only search if an appearance set exists that matches the active BOM. An appearance set matches the current BOM if the following are true:

- Your Teamcenter administrator has created the necessary appearance sets.

- The end item of the appearance set corresponds to the top (root) line of the BOM.

- The view of the appearance set is the same as the current BOM window.

- The revision rule (for example, **Pending**) of the appearance set corresponds to the revision rule of the current BOM window (for example, **Pending as of 1-Jan-200X**).

Start an appearance search

1. Click the **Appearance Search** button in the toolbar.

   Teamcenter displays the **Search** dialog box.

2. Use the **Search** dialog box to specify one or more of the following search criteria:

   - Item name
   - Classification family or attributes
   - Occurrence notes
   - Spatial information

   To specify search criteria, click the button to the right of the appropriate box and type the necessary information in the window. If you enter several criteria, all are included in the search. For example, you can search for all bolts with a name starting with **bo** and within 3 cm of another part.

3. Click the **Search** button to start the search.

   Teamcenter displays a list of results matching your search criteria.

   > Note:
   >
   > Click the **Clear All** button to clear any previously specified criteria.

4. If you choose an entry from the results list, the system highlights it in the current structure, if the item appears in the BOM.

You can hide or show the search criteria pane with the **Appearance Search** button on the toolbar.

Search by item identifier

- To search for an item when you know the item identifier, type the identifier in the **Item ID** box.
- Use *wildcards* if you do not know the item identifier. For example, you can type **57h*** in the **Item ID** box to find all items whose identifiers start with **57h**.
- To specify advanced item attribute criteria, click the button to the right of the **Item ID** box to display the **Item Attributes** dialog box.

Search by classification data

You can search for appearances that are assigned to a Classification category. Click the button to the right of the **Classification** box and Teamcenter displays the **Family Attributes** dialog box.

> Note:
>
> Classification searches are available only if you create two or more Classification categories.

To search by category:

1. Click the button at the top of the **Family Attributes** dialog box.

   Teamcenter displays a list of all available Classification classes.

2. Double-click a listed class to select it.

3. Repeat the previous steps as necessary if you want to search more than one class. For example, if you select the **Bolt** class and the **Nut** class, Teamcenter finds all items that are classified as a bolt or a nut.

If you select a single class, you can further refine the search to include specific attribute values. For example, if you select the **Bolt** class and want to locate a particular size of bolt, do the following:

1. Click the **Bolt** line in the **Family Attributes** dialog box.

   Teamcenter displays the **Classification Attribute Criteria** dialog box.

2. Click the **Add** button and specify additional attribute criteria. You can specify multiple attribute criteria; for example, you could specify **thread=.25** and **Lock_Wire=1**.

Searching by occurrence notes

Your Teamcenter administrator defines those occurrence notes that are mapped to appearance attributes for a given appearance set. You can use these mapped occurrence notes as search criteria.

For example, a mapped occurrence note may indicates if a given part is used on the interior or exterior of the product. You can search by occurrence notes to identify all brackets on the exterior.

Similarly, a mapped occurrence note may be a number that references a specific illustration in a service manual that describes how to disassemble the part. You can then search by occurrence notes for all parts illustrated in the appropriate section of the manual.

Searching by spatial data

Teamcenter supports two types of spatial filters:

- **Proximity**

Limits the search to parts that are within a given distance of a specified part. For example, you could search for all parts within ten centimeters of part X.

- **3D Box**

  Displays a translucent green box at a default location in the viewer. Use the **Spatial Filtering** dialog box to define the origin and size of the box. The search returns all parts partially or completely enclosed by the 3D box.

Use the **Search Type** buttons in the **Spatial Filtering** dialog box to select one of these search types.

> Note:
>
> You can use *altreps* to define different physical configuration shapes for a flexible part such as a tube or hose. Any spatial search takes into account the alternate geometric shape of a flexible part by accessing the dataset that corresponds to the altrep defined on the occurrence object.
>
> The **Spatial Searching** dialog box enables you to visualize mixed unit assemblies, that is, assemblies composed of parts defined in both inches and millimeters. The dialog box displays the units that are in effect when you enter dimensional values (for example, spatial distance in the **Spatial Searching** dialog box).

Define a spatial filter with the 3D box

1. Click the **Spatial Filter** button in the search pane.

   Teamcenter displays the **Spatial Filtering** dialog box.

2. In the **Spatial Filtering** dialog box, click the **Search Type** button labeled **3D Box**.

   Teamcenter displays a green box at a default location in the viewer.

3. Select one or more parts in the viewer, then click **Center to Selected**.

   Teamcenter repositions the 3D box so that it encloses the selected parts.

4. In the **Spatial Filtering** dialog box, edit the origin and size of the box, so that it is oriented with respect to the global axes of the end item.

5. Click **OK** to start the search.

   The 3D box remains visible during the search although the associated dialog box closes. The search returns all matching parts that are partially or completely enclosed in the 3D box.

Define a proximity filter

1. Click the **Spatial Filter** button in the search pane.

   Teamcenter displays the **Spatial Filtering** dialog box.

2. In the **Spatial Filtering** dialog box, click the **Search Type** button labeled **Proximity**.

3. Select graphically or in the navigation tree one or more base parts.

4. In the **Spatial Filtering** dialog box, type a proximity distance. The search is limited to those parts within the specified proximity distance. To satisfy the proximity condition, any portion of a part must be within the proximity distance; the complete part may not be within the proximity distance.

5. Click **OK** to start the search.

Performing advanced structure searches

About advanced structure searches

The **Structure Search** view helps you perform a multitude of searches. The search mechanism searches a structure using various properties of the structure's lines. The search is not limited to the loaded lines of the structure and can search an entire structure without loading it. It then reports the results in the **Structure Search Results** view and partially expands the structure to the found lines.

> Note:
>
> A partial expand occurs only if the **Expand to Selection** option in the **Manufacturing** section of the **Options** dialog box (**Edit→Options**) is selected.

You can:

- Search large process, product, plant, or occurrence group structures with spatial criteria, or with a combination of spatial and attribute criteria. Spatial searches are particularly useful for end items that represent large processes containing a large number of lines, allowing you to focus quickly on the manufacturing needs of a particular area or part of the product.

  > Note:
  >
  > The search does not return matches found in occurrence groups that are assigned to an occurrence group.

- Search for features in a structure based on different search criteria such as searching for weld points assigned to specific processes or arc welds connected to specific parts.

- Perform a search for objects found in a specific classification class or containing a specific classification attribute value.
- Store the search criteria and search results in the **Structure Search** view. These can then be reloaded or shared by different users.

For more information about common view features, see *About views*.

Making attribute searches

You can search structures for all objects that contain the following:

- Item and item revision attributes

  You can refine the search by including attributes of the item or item revision. Typically, this is the item ID, but you can use any attributes stored on the item master or revision master forms.

- Occurrence notes

  You can refine the search with values for occurrence attributes (occurrence notes).

- Attributes of forms

  You can refine the search with the attributes of forms that are attached to an item, item revision, in-context form, or their subclasses.

Making spatial searches

A spatial search, also referred to as a *cacheless* search, allows you to enter search criteria as numerical values or by dragging a search box in the viewer to find those objects that are within these spatial boundaries. Teamcenter displays the results of the search as a list of matching occurrences (structure lines). Selecting an entry in the list highlights the occurrence in the structure tree pane and in the embedded viewer.

You can refine spatial searches with other attribute searches.

You must complete certain installation and configuration steps before you can run spatial searches.

Making classification searches

You can extend your search to include classification attributes. This is called a *classification ad hoc* search. You can search through classified data and find objects contained within a class you specify and containing attribute values that you specify.

Perform a structure search

1. Open the structure and select the top line against which you want to search.

   You can select a process, operation, product, plant or occurrence group. You can also select multiple top lines in the same structure or substructure.

2. Do one of the following:

   - Choose **Tools→Structure Search**.

   - Choose **Structure Search** from the shortcut menu.

   Teamcenter displays the **Structure Search** view.

   The structure line you select represents the scope of the search and is listed in the **Scopes** box.

3. (Optional) Click ••• to add more lines to the search scope or clear the scope.

   - Select a line in the structure and click + in the **Scopes** dialog box to add a scope.

   - Select a line in the **Scopes** dialog box and click — to remove the line from the scope.

   - Click **Clear** in the **Scopes** dialog box to clear all scopes.

   The columns names and widths that are initially displayed in the scope list are configured by the **MEAdvancedSearchResultsViewColumnsShownPref** and **MEAdvancedSearchResultsViewColumnsShownWidthPref** preferences.

4. (Optional) Load an existing search by clicking **Open Search** to load a saved search.

5. From the **Query type** list, select a search type.

   > Note:
   >
   > The available search types depend on the structure type you are searching.

6. Use the criteria sections to specify the search criteria pertaining to the type of search you selected.

   Click the **...** button to the right of each individual search criteria box and enter search criteria in the resulting dialog box. All the criteria you enter are combined so that you can, for example, search for all bolts whose name starts with **bo** and are within 3 centimeters of another part.

7. Select **Show results in a new tab** if you want to display each set of results in its own tab in the **Structure Search Results** view. If this check box is not selected, Teamcenter overwrites the results of the last search in the same pane.

    Note:

    The **Show results in a new tab** check box is not visible on the **Structure Search** view until after the first structure search is performed.

8. Click **Search** to begin the search.

    Teamcenter starts the search and loads the lines into the **Structure Search Results** view.

    You can manage the search results in the **Structure Search Results** view.

9. (Optional) Select a line in the **Structure Search Results** view to highlight the corresponding item or item revision in the structure tree and the embedded viewer.

    Tip:

    The **Display** and **Blank** commands in the shortcut menu control the visibility of the search results in the embedded viewer.

10. (Optional) Click **Clear** to clear individual search criteria from the search, or click **Clear All** to clear all criteria from the **Structure Search** view.

11. (Optional) Save the structure search.

Save a structure search

You can store a search and, optionally, its results for future reuse. You can also allow other users access to this search.

Teamcenter saves the search in a **SearchStructureContext** object that includes a saved configuration. If you reload a saved search, the configuration in effect at the time of storage is also loaded.

Teamcenter saves the following configuration information at the time of storage:

- Current revision rule (with the effective date, end item, or unit number)
- Variant rule
- Effectivity group objects
- State of the **Show Unconfigured** buttons

- If the search is performed on a process structure and any part of the search contains lines from a composition structure, the configuration of those related composition structures

1. After entering search criteria and running a search, do one of the following:

   - Click on the toolbar of the **Structure Search** view, or choose **Save** from the **View Menu** to save a new search, or update a loaded search with new criteria and results.

   - Choose **Save As** from the **View Menu** to save the search under another name. This may be necessary if, for example, you do not have write access to the original saved search but still want to modify it.

2. Enter a name and, optionally, a description for the search.

3. Select one of the following.

Option	Action
Search definitions	Saves the entries in the **Structure Search** view.
Search definitions and consistent results	Saves the entries in the **Structure Search** view and additionally, all results that are compatible with the current scope of the search.

4. To grant read-only access to other users for this search, select the **Is shared?** check box.

   This allows other users to select and run this saved search when they load saved searches. Other users cannot modify this search. They must use the **Save As** command to save any modifications.

5. Specify the location in the database to store the search by clicking **Create in** and selecting a folder.

   By default, Teamcenter stores the search in the **My Saved Searches** folder in My Teamcenter. You can create other folders to organize your searches by clicking **New Folder**.

6. Click **OK**.

Rename an existing search

1. With a search open in the **Structure Search** view, choose **Save As** from the **View Menu**.

2. Click **Create in** to expand the **Save Search** dialog box.

3. Select the search that you want to rename from the **Existing Saved Searches** list and click **Rename**.

4. Type a new name for the search and click **OK**.

Assign access rights to a saved search

1. With a search open in the **Structure Search** view, choose **Save As** from the **View Menu**.

2. Click **Create in** to expand the **Save Search** dialog box.

3. Select the search for which you want to modify access rights from the **Existing Saved Searches** list and click **Access**.

4. Click the **Get access control list.** button in the lower-right corner of the **Access** dialog box.

   The system displays the **ACL Control List** dialog box.

5. In the **ACL Control List** dialog box, choose the entry that you want to modify.

   > Note:
   >
   > You can only change entries you have created or entries you have been given permission to change by the Teamcenter administrator.

6. Grant or deny privileges for the type of accessor by double-clicking in the column corresponding to the privilege you want to modify.

   - Select the check mark to grant a privilege.

   - Select to deny the privilege.

   > Note:
   >
   > To clear a privilege box, double-click in the box and choose the blank entry from the list.

7. Click **OK** to save the list.

Load a saved search

Teamcenter saves the search in a **SearchStructureContext** object that includes a saved configuration. If you load a saved search, the configuration in effect at the time of storage is also loaded.

1. Do one of the following:

   a. Load a recently used search.

      - In the **Structure Search** view, click the down arrow beside the **Open Search** .

Teamcenter displays the most recently used searches.

- Select one of the searches listed.

  Teamcenter displays the **Open Saved Search** dialog box where you can specify load options.

b. Load a search not recently used.

   A. In the **Structure Search** view, click **Open Search** .

      Teamcenter opens the **Open Saved Search** dialog box listing all the saved search objects belonging to you. The **Revision Rule**, **Variant Rule** and **Effectivity Group** columns show the information of the primary structure (for example, in the case of a process structure where configurations of composition structures are also stored).

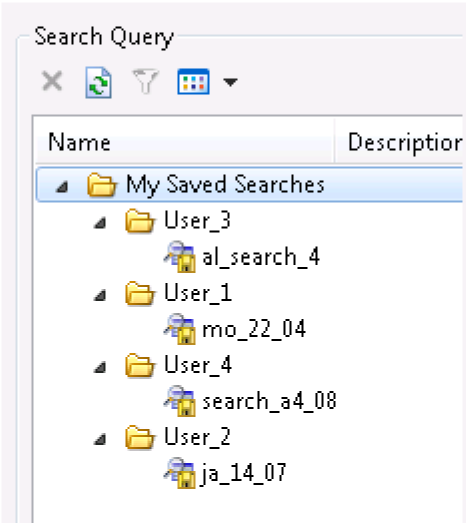
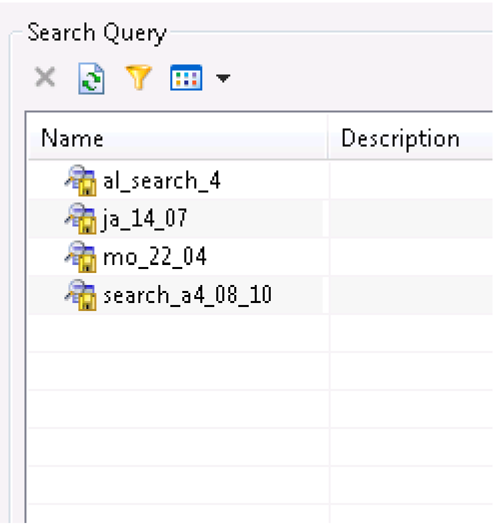
      If you want to see the saved searches belonging to other users, select **Show searches shared by other users**.

   B. (Optional) View the detailed configuration of a search object by right-clicking it in the list of searches and choosing **Show Configuration**.

      The resulting **Configuration** dialog box shows the configuration of all composition structures associated with the primary structure.

   C. (Optional) Filter the list of searches by clicking .

   D. (Optional) Click the arrow beside the **Change your view** button and select the format in which you want to display the saved searches. The tree view allows you to display the folders that you create in the **Save Search** dialog box, and the table view displays all the searches in list form.

Tree view	Table view
	

2. Select a load option.

   - **Load search criteria only**

     Loads only search definitions so you can reuse a complex definition on a different structure or scope. If the criteria includes the proximity search (and, therefore, a proximity part, which is structure dependent), you must have the same structure open to load the proximity part; otherwise, Teamcenter ignores the proximity criteria.

   - **Load search criteria and scope**

     Loads the search definitions and the original search scope so you can re-execute the search and to display refreshed results.

   - **Load search criteria, scope and results**

     Loads everything that is available in the saved search (scopes, definitions, and results). This option is selected by default. If the object selected in the table does not have results stored, Teamcenter loads only the search criteria and scope by default.

3. Click **OK**.

   Teamcenter loads the object including those parameters that you specified. The loaded structure lines represent the current state of the structure. These may differ from the lines that were saved with the object. Consider these situations:

   - If structure line properties or occurrence notes were changed after saving, the new values of the properties or occurrence notes are displayed in the loaded results. You do not receive any indication about changed values or inconsistent results.

- If the item revision was changed after saving the results and the **Latest Working** revision rule is set, the new revision is displayed. You do not receive any indication about changed item revision or inconsistent results.

- If the structure line was deleted or moved to other place after saving, the saved BOM line is loaded in the results. Teamcenter displays information about inconsistent results in a tooltip on the result tab. You must then update the saved search.

- If changes include a later revision of the top-line item,Teamcenter considers the structure to be the same structure and tries to find all the search result lines in the structure.

Open a copied search

When you save a search, by default, Teamcenter stores it in the **My Saved Searches** folder in My Teamcenter. You can copy this search and open it in Manufacturing Process Planner, Multi-Structure Manager, or Multi-BOM Management. You can also add the saved search to the **Favorites** list and copy it from there.

1. Find the desired search in My Teamcenter and copy it.

2. In the **Structure Search** view, click **Open the copied search object** .

   Teamcenter displays the **Load Search** dialog box asking if you want to apply the saved configuration to the search.

3. Choose **Yes** to run the copied search or **No** to select a new search.

Filter data in the Auto Filter dialog box

The **Auto Filter** dialog box narrows down the search results according to conditions that you create in the **Filter Condition Editor**.

- The **ALL** option displays properties for all the children of the object currently selected in the component view.

- You can use the **Filter Condition Editor** to create condition expressions for filtering the display.

- Expressions cannot be edited after they are listed in the **Auto Filter** dialog box, but they can be deleted.

- Teamcenter retains your filter condition expressions until you delete them.

To create conditions, click **Add a new search condition** to display the **Filter Condition Editor**.

- To create an initial condition expression, select a property column value and a logical operator, and then enter an object value or select one from the list of objects displayed in the table, and then click **Add a new search condition** .

> Note:
>
> The **= =** operator tests for an exact match. The **=** operator tests for a match but is not case sensitive.

- To expand the expression with additional conditions, use the **ADD** and **OR** operators.
- Click **Remove the selected condition(s)** to delete the selected condition line.
- Click **Clean all the conditions** to delete the entire expression.
- Click **...not meet the condition(s)** !{..} to negate the selected condition.
- Click **OK** to add the condition expression to the **Auto Filter** dialog box.

Update a saved search

After loading a search, do one of the following:

- Rerun the search to get the latest results.
- Modify the search definitions and click to update the same saved object with new data. If you loaded a shared search belonging to another user, you must have write access to update the search.
- If you load both search definitions and results and modify the search definition, rerun the search to update the saved search object.
- Save the modified search as a new object by using the **Save As** menu command.
- Change whether the search is shared.

  1. In My Teamcenter, find the search in the **My Saved Searches** folder.
  2. Edit the **Is Shared?** search object property.

Delete a saved search

Do one of the following:

- In My Teamcenter:

1. Expand the **My Saved Searches** folder.

2. Select the search object you want to delete.

3. Click ❌ in the toolbar.

- In the **Structure Search** view:

  1. Open the **Save Search** dialog box.

  2. Click **Create In**.

  3. Select the search object you want to delete.

  4. Click **Delete** on the right.

- In the **Structure Search** view:

  1. Open the **Load Search** dialog box.

  2. Select the search object you want to delete.

  3. Click ❌ in the **Load Search** dialog box.

     If you delete the search object currently loaded in the **Structure Search** view, the search context is cleared from the view.

Entering search criteria

About search criteria

Each type of query that you select has its own criteria that you can use to define a search. You can always refine your search by combining it with one or more of the criteria in the general criteria section.

Alternatively, you can load a saved search which populates the search criteria from the data stored in the search.

Enter item ID or item attributes search criteria

To search for items whose identifiers, names, attributes, or types match a specific pattern:

1. Type an item ID or item name directly into the boxes. For example, you can type **57h*** into the **Item ID** box to find all items whose ID starts with **57h**.

   When you click outside the box, Teamcenter enters the search criteria into the **Item attributes** box.

2. Click **...** beside the **Item attributes** box to specify additional attributes to be taken into consideration for the search. The search result must fulfill all specified search criteria.

   You can also immediately open the **Item Attributes** dialog box without previously specifying an item ID or name.

3. (Optional) Filter the search with saved search criteria by clicking **Change**.

   Teamcenter displays the **Change Search** dialog box. You can choose any of your saved searches or system-defined searches to filter the basic search results.

> Note:
>
> The **Search** and the **Clear All** buttons are available only after entering criteria in the **Item attributes** box. You cannot perform a search or save one until this box is populated.

Enter occurrence note search criteria

- Click the **...** button to the right of the **Occurrence Notes** box to search for specific occurrence note values.

  Your administrator can define occurrence notes and associate them with particular structure lines. You can use these mapped occurrence notes as search criteria.

  For example, a mapped occurrence note may contain an interior/exterior flag that indicates if a given part is used on the interior or exterior of the product. You could then search for all parts on the exterior of the product or, by refining the search with other criteria, for all exterior brackets.

  Similarly, a mapped occurrence note may contain a number that references an illustration in the work instruction manual that describes how to assemble the part. You can search for all parts illustrated in the appropriate section of the manual.

Enter spatial filter search criteria

Enter the spatial search criteria

1. Click the **...** button to the right of the **Spatial Filter** box.

   Teamcenter displays the **Spatial Criteria** dialog box, allowing you to define one of two types of spatial filters and optional target parts.

   > Note:
   >
   > The spatial filter option is disabled if Teamcenter is not configured for cacheless searches or if the necessary NX or JT files are not available.

2. (Optional) Select the **Use selections from table** check box above the **Target Parts** table if you want to search against specified target parts.

3. Use the **Proximity** and **3D box** radio buttons in the **Spatial Criteria** dialog box to select a search type, and then click **OK** to save the selections.

   - Proximity

     Limits the search to parts within a specified proximity distance, for example, all parts within 10 centimeters of part X.

   - 3D box

     Allows you to define a three dimensional box in the embedded viewer and search for parts completely inside, completely outside or intersecting the box. Use the **Spatial Criteria** dialog box to define the coordinates and size of the box.

     > Note:
     >
     > If you are making appearance searches, you can only search inside and intersecting the box when TruShape filtering is selected.

> Note:
>
> You can use *altreps* (alternative representations) to define different physical configurations or shapes of a flexible part such as a tube or hose. Spatial searching takes into account an alternate geometric shape of a flexible part by searching the dataset that corresponds to the altrep defined on the occurrence object.

Define a proximity filter

1. In the **Spatial Criteria** dialog box, select the **Proximity** button.

2. (Optional) Select **True Shape filtering** if you want to test items with intersecting bounding boxes to identify if they have TruShape volumes that intersect the TruShape volumes of the selected objects. Depending on the TruShape parameters configured, Teamcenter displays the geometry of each object as regular cubes (voxels) to provide a simplified representation of the actual shape. TruShape searches return more accurate results but may take longer to complete.

3. Define a proximity value in the **Distance** box in the **Spatial Criteria** dialog box and click **OK**.

Teamcenter limits the search to those parts within the defined proximity of the parts selected in the viewer or structure tree. A part is considered within the proximity if any portion of it is within the specified distance; the part may not be completely within the specified distance.

Define a spatial filter with a 3D box

> Note:
>
> This procedure requires a mockup license for the viewer and is not available with the base license.

1. In the **Spatial Criteria** dialog box, select the **3D box** button.

   Teamcenter displays a brown bounding box at a default location in the viewer.

2. (Optional) Select **True Shape Filtering** if you want to test items with intersecting bounding boxes to identify if they have TruShape volumes that intersect the TruShape volumes of the selected objects. Depending on the TruShape parameters configured, Teamcenter displays the geometry of each object as regular cubes (voxels) to provide a simplified representation of the actual shape. TruShape searches return more accurate results but may take longer to complete.

3. Make the following selections to define the location and size of the 3D box:

   - **Slider increment**

     Specifies the actual distance equivalent to one increment of the **Maximum** and **Minimum** sliders and spinners.

   - **Extents**

     Determines how Teamcenter constructs the bounding box from the values you specify, as follows:

     - **Centroid and size**

       Allows you to specify the bounding box with coordinates of the centroid and lengths in X, Y, and Z directions. It is oriented with respect to the global axes of the end item.

     - **Origin and size**

       Allows you to specify the bounding box with coordinates of the origin and lengths in X, Y, and Z directions.

     - **Minimum and Maximum**

       Allows you to specify the bounding box with minimum and maximum coordinates. This is the default selection.

   - **Maximum** and **Minimum** sliders and spinners

     Allow you to manually define the maximum and minimum extents of the bounding box.

- **Find Parts**

  Allows you to specify if parts returned by the search are fully contained inside or fully outside the bounding box.

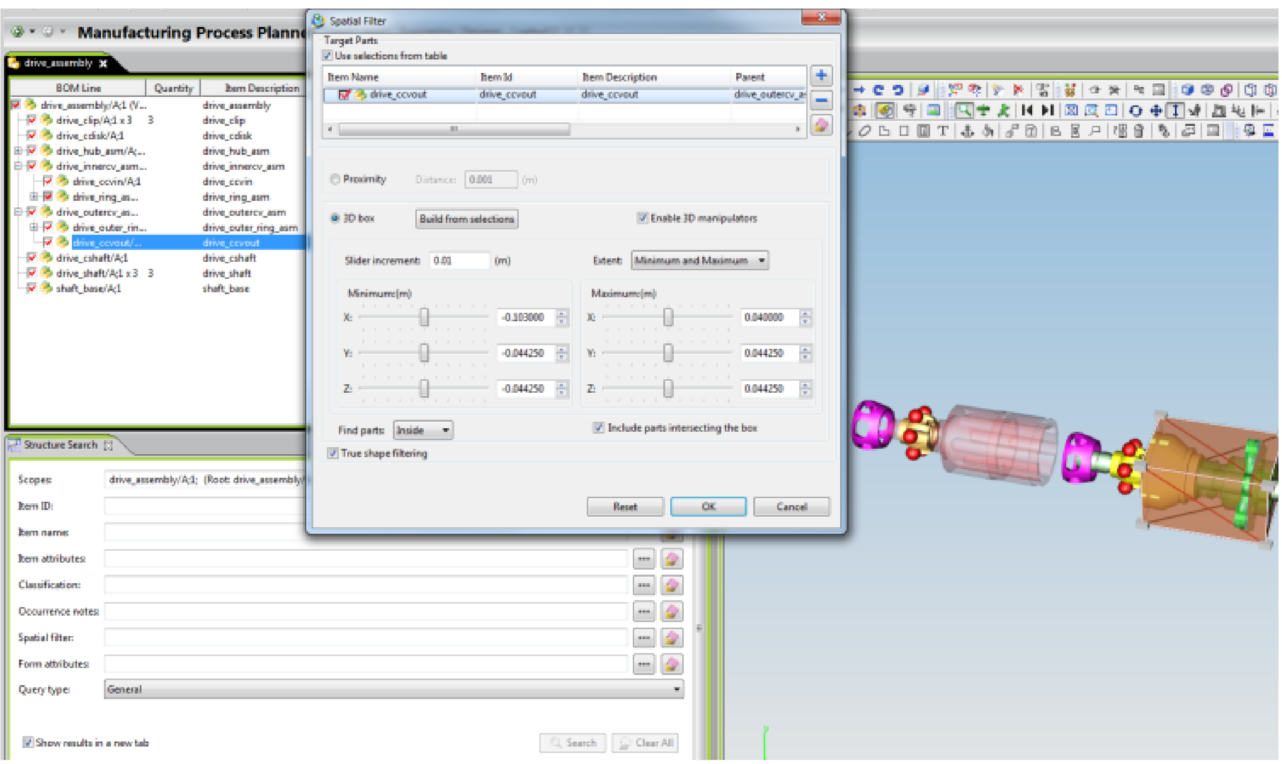
- **Include parts intersecting the box**

  If checked, the search returns parts that intersect the bounding box, as well as parts that are fully inside or outside it. This option is enabled only if you select the **True Shape filtering** option.

  > Note:
  >
  > If you use appearance searches, this option is always checked.

- **Enable 3D manipulators**

  If checked, drag handles are displayed on the bounding box, allowing you to move and resize it manually. You can then drag the 3D manipulator to resize or reposition the bounding box.



4. (Optional) Do any of the following to move and resize the bounding box with the manipulators:

To	Do this
Move the manipulator parallel to a face.	Drag the face of the manipulator.
Move the manipulator perpendicular to a face.	Press Ctrl as you drag the face.
Constrain the move to one axis.	Press Shift as you drag a face.
Resize the manipulator uniformly.	Drag a corner of the manipulator.
Resize the manipulator along one axis.	Press Ctrl as you drag a corner of the manipulator.

5. (Optional) Click **Build from selections** to construct a bounding box containing all target parts specified in the **Target Parts** table, or selected in the tree or viewer.

6. Click **OK** to save the search criteria.

   The 3D box remains visible while the search is active, even if the **Spatial Criteria** dialog box is not open.

> Note:
>
> You can visualize mixed unit assemblies in the **Spatial Search** dialog box, that is, assemblies composed of parts defined in both Imperial (English) and metric units. The dialog box uses the appropriate units when you type in dimensional values, for example, spatial distance in the **Spatial Criteria** dialog box.

Use target parts

As an alternative to manually generating the spatial search bounding box with the spinner and slider controls, you can construct a bounding box quickly and accurately from a table of target parts. You can use this method for proximity or 3D bounding box searches.

> Note:
>
> Generic objects such as GDE elements, GDE link lines, interface definitions, and processes are not valid participants in spatial searches. Consequently, they are not added to the target parts table. If you try to add a generic object to the target parts table, Teamcenter displays an error message indicating the BOM line is invalid.
>
> However, you can add valid generic objects such as signals and designs to the target parts table. If you select these objects in the table or perform a search on them, Teamcenter displays a warning message indicating that they do not have associated bounding boxes.

> Note:
>
> The target parts table is not available if you are making appearance-based searches.

1. Select the **Use selections from table** check box.

   Teamcenter enables the **Target Parts** table and its associated buttons.

   > Note:
   >
   > If you select **Use selections from table**, any selections in the tree or viewer are ignored.

2. Select the structure tab that is the current scope for the structure search, select a product line in the structure, and click the **+** button to add selected part in the **Target Parts** table.

   To remove a target part, select it in the table and click the **–** button.

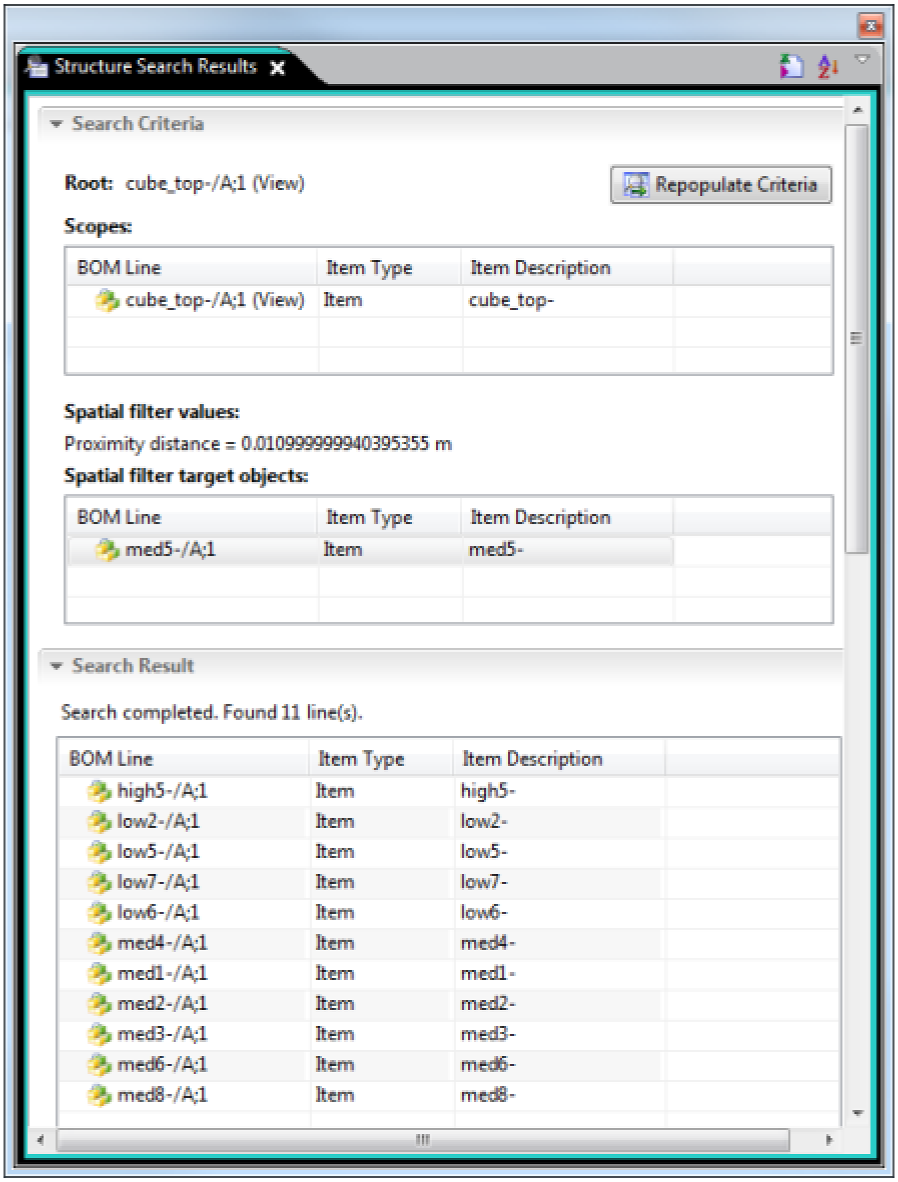
   To clear the table of all entries, click .

3. Once all the required target parts are listed to the table, click **OK**. Alternatively, if you are defined a 3D box search, click **Build from selections**.

   Teamcenter draws a bounding box enclosing all the target parts in the viewer.

4. Perform a spatial search.

   Teamcenter displays the **Search Results** pane containing the results of the spatial search.



Defining granularity of spatial searches

By default, spatial searches return piece parts, that is, parts rather than assemblies. However, you may want the search to return a higher level assembly. For example, if you have small assemblies consisting of parts welded together, you may want to treat the assembly as a unit, rather than returning some of its individual parts.

You can change the search granularity by modifying the TruShape voxel size in NX to only return larger assemblies. You can also disable TruShape voxel searches completely, if the results still provide useful information. The coarser the search results, the more quickly they are displayed.

Enter classification search criteria

1. Click the **...** button to the right of the **Classification** box.

Teamcenter displays the **Classification** dialog box.

2. Click  to open the classification hierarchy.

3. Double-click a class name to select it from the tree.

   Teamcenter adds a line to the table containing the name of the class you select.

4. Specify the system of measurement.

   The systems available here (metric, nonmetric, or both) depend on the system in which the class is stored in the Classification Admin application.

5. In the **Property Name** column, click the cell containing the name of the class.

   Teamcenter displays a list of all the attributes within the class.

6. Select the class and attribute with which you want to search.

7. Click the cell containing the **=** sign and select an operator.

8. In the **Searching Value** column, select the cell and type a value for the attribute for which you want to search.

9. (Optional) Click  to create an additional search parameter.

   The lines of the table, each representing an individual search parameter, are joined by the **AND** operator.

10. Click **OK**.

    Teamcenter displays the classification search parameters in the main section of the **Search** view.

Filter search with form attributes

You can filter searches using the criteria of forms attached to the items or item revisions.

1. Click the **...** button to the right of the **Form Attributes** box.

   Teamcenter displays the **Form Attributes** dialog box.

2. Enter the form attributes for the search, including any mathematical operators.

   a. Select the relation, parent, and form type for which you want to search.

b. Click + to add a line.

c. Enter or modify the property name, operator, or searching value by clicking in those cells in the table.

Teamcenter displays the form type and search values as a string in the format similar to the following example:

```
“ItemRev:BVRSyncInfo:last_struct_mod=value1 AND ItemRev:BVRSyncInfo:
last_Sync_date=value2”
```

Manage search results

About search results

Search results are displayed in the **Structure Search Results** view. This view has two sections:

- **Search Criteria** section

  This section displays the scope and the search criteria that you specified in the **Structure Search** view. The contents of this section vary depending on which type of search you ran and which criteria you entered.

- **Search Result** section

  This section contains a table of individual lines representing the search results. Teamcenter displays the search results as individual lines without indication of any structure.

Each time you run a new search in the **Structure Search** view, you can specify whether you want the search results to open in a new tab in the **Structure Search Results** view or replace the contents of the current tab. If you move from result to result (tab to tab), you can update the search criteria displayed in the **Structure Search** view using the **Repopulate Criteria** button.

When Teamcenter displays the result of a search, the selection in the search results table is synchronized with the selection in the structure view. When you select an object in the **Structure Search Results** view:

- If the object is expanded in the structure that is being searched, Teamcenter automatically selects and shows the object in the originating structure.

- If the object is not expanded, the synchronization depends on the **MEExpandToSelection** preference. If the value is **true**, the application partially expands the object and shows it in the originating tree. Otherwise, the selection is not synchronized in the originating structure.

The same part may be listed many times in the search results if it has multiple occurrences in the end item that match the search criteria. For example, the same bolt may be used seven times in the end item and, if all seven usages satisfy the defined proximity filter, the bolt appears seven times in the search results.

Lines in the search results table are actual BOM lines, and you can use the same shortcut menu commands for these objects as you do for any structure line in the structure pane.

The **Structure Search** view is dependent on the configuration changes applied to the originating tree structure, such as showing configured or unconfigured, revision rules, or configuration by occurrence group. Changing the configuration of the structure pane causes the **Structure Search Results** view to clear all relevant tabs.

Removing a line from the originating structure removes only this line from the results list. Unloading the originating tree structure from the application causes the **Structure Search** view to clear all relevant tabs.

If you unload the originating tree structure from the application, causes the **Structure Search** view to close all associated tabs. The same thing happens if you change the configuration of the originating structure.

View and manage the search results

In the **Structure Search Results** view, do one of the following:

- View search result lines in original structure.

  Use the **Find in Source Structure** and **Find in Other Structure** shortcut menu commands to find the search result line in the structures loaded in the structure pane.

- Copy or drag lines from the search results table.

  You can copy and paste lines from the search results table to structures in the structure view. In addition, you can drag lines from the search results table to structures in the structure view. When doing this, the behavior is the same as if you drag the line from the searched structure itself. If you drag the search result line to a structure other than the searched structure, it is as though you copied the line in the searched structure and pasted it into a new structure.

- In the **Search Criteria** section, click **Repopulate Criteria**. This is useful if you navigate between several search result tabs. As only one **Structure Search** view is available, you can use the **Repopulate Criteria** button to update the **Structure Search** view with the search criteria active for the current **Structure Search Results** tab.

- Customize the column display.

  1. Click the **View Menu** button ▾ and choose **Columns** from the view menu commands located in the top-right corner of the **Structure Search Results** view.

Teamcenter displays the **Column Management** dialog box.

2. Select the desired columns from the **Available Properties** list and move them to the **Displayed Columns** with the right arrow.

3. (Optional) Modify the order the columns appear in the search results table using the up and down arrows.

4. Click **Save**.

   The columns names and widths that are initially displayed in the search results list are configured by the **MEAdvancedSearchResultsViewColumnsShownPref** and **MEAdvancedSearchResultsViewColumnsShownWidthPref** preferences.

5. (Optional) Save the column layout by choosing **Save Column Configuration** in the view menu commands. You can restore a saved column layout by choosing **Apply Column Configuration** and selecting the saved configuration from the list.

- Find individual search results.

  Choose the **Find in Display** command from the view menu commands to define criteria and apply them to the results list. Objects fulfilling those criteria are selected in the results list.

- Copy selected table data to the operating system clipboard. You can then paste this into any document, for example a Word or Excel document.

- Export to Word and Excel.

  Choose the **Objects to Word** or **Objects to Excel View Menu** commands to export search results to Microsoft Word or Excel.

- Sort the search results.

  You can sort the search results by clicking on the column header or by clicking the **Sort** button  to open the **Sort** dialog box to define a more advanced sort. You can specify a primary, secondary, and tertiary sort order for the columns.

- Hide the display of an object in the viewer.

  You can hide or display a search result line in the assembly viewer. Select an object from the results list, and choose **Display** option from the shortcut menu. If the assembly viewer is open, the user sees the selected object in the graphical viewer beside the originating tree.

11. Releasing preliminary structures

About baselining or preliminary structures

You can release intermediate structure data for other users or suppliers to review or consume. An intermediate data release or baseline of in-progress data is sometimes called a preliminary data indicator (PDI).

You must create a baseline (PDI) of the related product structure and plant structure before you create a baseline of the process structure. This allows you to reproduce the process structure when necessary by applying the appropriate product and plant configuration rules that were applied when you created the PDI.

Creating PDIs

When you create a PDI, Teamcenter traverses each child of the structure, creates a new item revision under a specified baseline revision ID, and releases the new item revision. It does not include any occurrence groups in the structure in the PDI.

Creating a dry run

Before creating a new item revision for a PDI, you can optionally make a *dry run* to validate the baseline. Teamcenter provides detailed status information about the structure. If there are any errors in the structure, Teamcenter displays their details, halts the baseline process, and does not release the structure. Your administrator can set a preference that determines if validation is always required before you create the baseline, or if you can validate the structure only when you consider it necessary.

Creating precise and imprecise baselines

Depending on the configuration of your structure, you can create the baseline as a precise structure or an imprecise structure. If you want a precise structure of a process, you must also baseline the product structure and plant structure first to be able to reproduce the revision status of the PDI in the future. In this case, all the relevant structures (product, plant and process) must be precise to allow their accurate reproduction in future sessions.

Viewing a PDI

You can view a PDI immediately when the baseline is created. However, the revision rule is not automatically applied when the baseline is loaded, and you must apply it manually.

You can also view the baseline in My Teamcenter and choose the appropriate item revision from the list of available item revisions. You can distinguish baseline revisions from other released revisions by the specific revision ID format as described in *Create a baseline of a structure*.

After applying the proper configuration rule, you can save the baseline structure and view it in the collaboration pane.

Create a baseline of a structure

1. Open the structure revision.

2. Select the top line of the structure and choose **Tools→Baseline**.

   Teamcenter checks if you can create a baseline of the selected revision. If not, Teamcenter displays the reason (for example, you cannot create a baseline from an existing baseline). Otherwise, Teamcenter displays the **Baseline** dialog box, showing the item ID, baseline revision, and baseline name.

3. Enter the following information in the **Baseline** dialog box.

Box	Entry
Description	Type a description of the baseline.
Baseline Template	Choose a baseline release procedure template from the list of available procedures. Your administrator defines the available procedures with the **Baseline_release_procedures** preference.
Job Name	Note the job name. The job name is automatically generated and you cannot change it. Your administrator defines the naming scheme in the Business Modeler IDE application, as described in the *BMIDE for Data Model Design*.
Baseline Label	Type an alphanumeric string that represents the baseline label. Teamcenter uses the label you enter as the name of the baseline folder. This box is only displayed if your site uses baseline labels.
Job Description	Type a description of the PDI job.
Open On Create	Select this check box if you want Teamcenter to open the baseline for viewing when it is created. You must apply the revision rule manually when the baseline is open.
Dry Run Creation	Select this check box if you only want to validate the structure as suitable for creating a baseline. If you clear this check box, Teamcenter validates

Box	Entry
	the structure and creates an item revision for the baseline. Note: Your administrator can set the **Baseline_dryrun_always** system preference to determine if a dry run is always required.
Precise Baseline	Select the type of baseline to create— precise or imprecise. Your site may be configured to allow only precise baselines, depending on the setting of the **Baseline_precise_bvr** preference.

4. Click **OK** or **Apply** to create the baseline. Alternatively, you can click **Cancel** to exit without creating a baseline.

   Teamcenter optionally creates a baseline folder to hold the baseline. Your administrator specifies if a folder is created by setting the **baseline_create_snapshot_folder** preference.

   If the value of this preference is **0**, the baseline folder name is in the format *Baseline_ItemId_BaselineRevId* and may be truncated to 32 characters, if necessary. The folder is attached to the top structure.

   If the value of this preference is **1**, the baseline folder name is the alphanumeric string you entered in the **Baseline Label** box in the **Baseline** dialog box.

   Note:

   In addition to setting this preference, you must set the **Snapshot** relationship on the item revision to make the snapshot folder visible. Do this by choosing **Edit→Options→General→Item Revision** and adding **Snapshot** to the **Shown Relations** column of both the **General** and **Related Object** tabs.

   Caution:

   If you expand the baseline item revision below a certain level, the application displays duplicate objects.

5. Save the revision rule for the product structure, process structure, and plant structure by saving the structure as a collaboration context. After you do this:

   - The product root item is the baseline product.

- The plant root item is the plant baseline.
- The process root item is the process baseline.

12. Managing intermediate data captures

About intermediate data captures

An intermediate data capture (IDC) is a PLM XML file that contains an exported structure with the configuration in effect at the time the IDC is created. An IDC may contain any configured structure including a collaboration context, structure context, or group of BOM lines. You can manage the PLM XML file in the same way as any other workspace object, including assigning it to a workflow, assigning it a release status, running accountability checks, and controlling access privileges with Access Manager.

After you create an IDC, it appears as a separate tab in the data pane and an entry for it appears in the collaboration pane.

After creation, you can compare an IDC to existing structures. For example, if you create an IDC from a product structure, and then make modifications in that product structure, you can run an accountability check that compares the IDC to the modified structure to see the modifications.

To compare IDCs with each other or another structure, each line being compared must contain an in-context ID. Your administrator can run the **bom_expand** utility to ensure that each relevant line in the structure is stamped with an in-context ID.

When you create an IDC, Teamcenter uses transfer modes to export the structure and alias files to determine what to include in the IDC viewer. If you want to export custom objects or properties to the IDC, you must ensure that a transfer mode exists that contains clauses that includes these objects. You must also ensure that the alias files are modified to include the desired objects. If you want to see these objects or properties in the IDC viewer in the rich client, you must modify the alias files so that the viewer can extract them from the request object's XML. The location of the various alias files is found in the following preferences:

- **Structure_Alias_File**
- **Attachment_Alias_File**
- **Dataset_Alias_File**

For more information about using transfer modes, see *Tc XML and PLM XML Configuration for Data Import and Export*.

An intermediate data capture structure is view-only. You cannot make changes to this structure.

Capture structures in an IDC

1. Select the root object in the structure and choose **Tools→Intermediate Data Capture**. You can capture BOM lines, an occurrence group, a structure context with multiple roots, or a collaboration context containing multiple structures.

Teamcenter displays the **New Intermediate Data Capture** dialog box.

2. Select the type of IDC you want to create in the list on the left.

3. Type the name and optional description of the intermediate data capture, and select the appropriate transfer mode name from the list.

4. To open the IDC in Part Planner, select **Open on Create**. If you do not select this option, you can find the IDC in the **Newstuff** folder in My Teamcenter.

5. Click **OK** or **Apply**.

   Teamcenter validates the objects you selected. If any of the objects cannot be captured, Teamcenter displays an error message, otherwise it creates the PLM XML file containing the IDC and displays it in a structure view.

6. (Optional) Open the IDC in the **Viewer** view in My Teamcenter or in the **Object View** tab in Multi-Structure Manager to see a list of the captured states, including their descriptions and creation dates.

7. (Optional) If you make changes to the originally captured structure, create a new captured state in My Teamcenter or Multi-Structure Manager by clicking **Add State**.

Edit an IDC

You can edit the content of an IDC by adding or removing a root object, or by updating it to a new state.

If you change a file that an IDC references, Teamcenter keeps a copy of the original file so the integrity of the IDC is maintained.

1. Send the IDC to Multi-Structure Manager.

2. Click the **Viewer** tab. The viewer shows the state of the captured data and the root object that the IDC contains. You can then do any of the following:

   - Click **Add State** and create a new state from the captured root objects.

   - Click **Remove State** and remove a state from the captured root objects.

   - Click **Update State** to update the IDC from the currently selected root objects.

Save an IDC in a collaboration context

1. Select the IDC in the Multi-Structure Manager collaboration pane.

2. Do one of the following:

   - Drag the IDC and drop it onto the collaboration context object in the collaboration pane.

   - Copy the IDC and paste it into the collaboration context object in the collaboration pane.

Viewing the structure in an IDC

You can view the captured structure in an IDC with My Teamcenter or Multi-Structure Manager. When you send or copy an IDC from My Teamcenter to Multi-Structure Manager, you can paste it under the existing root object, if one is open. If no root object is open, the IDC itself becomes the root object. In this case, the IDC is visible in a new tab. If the IDC contains more than one state of the structure, you can choose the desired state from the **Captured States?** list.

You can send more than one capture of the same structure to Multi-Structure Manager in turn. In this case, Teamcenter creates a tab for each IDC, allowing you to select, view, and compare them.

View attachments in an IDC

- To view attachments in an IDC, select the appropriate node in the structure and choose **View→Show/Hide Data Panel** or click the **Show/Hide Data Panel** button on the toolbar.

  Teamcenter shows any attachments to the node such as datasets or forms in the **Attachments** pane. You can open an attachment for viewing or editing by double-clicking it.

View the properties of an IDC

- To view the attributes or properties of an selected node in the captured structure in an IDC, choose **View→Properties** or right-click on the node and choose **Properties**. Your administrator can define the properties that are visible.

Comparing captured structures

When running accountability checks, you can compare two structures. For example, you can compare the current structure with the structure in an IDC to identify changes to the structure, attachments or attributes. You can also compare two IDCs by running accountability checks.

13. Accountability check between structures

Running accountability checks

You can compare two structures to ensure all lines in the source structure are accounted for in the target structure. For example, you can compare the EBOM structure to the MBOM structure to ensure all parts and assemblies are assigned or compare the product structure and the process structure to ensure that all occurrences of product components and features are used in the process structure as consumed items. You can compare the entire assembly or only a subassembly to the process structure. These types of comparison are performed using an *accountability check*.

Any differences found during the comparison are reported, as they may indicate problems in manufacturing the product to its specification. However, an imbalance between the structures may not necessarily indicate a problem with the structure itself.

An accountability check or comparison:

1. Traverses the source structure.

2. For each line in the source, finds one or more matching lines in the target structure, according to defined equivalence criteria.

3. For each pair of equivalent lines, identifies if there is a full match or a partial match. A partial match exists if one or more aspects of the structures that you compare are not equal.

4. Colors each line in the structures and, if you have the correct license, opens the **Accountability Check Result** view displaying the full matches, partial matches, and unmatched lines.

The following differences are reported:

- Lines in the source structure that do not have counterparts in the target

- Lines in the source that have more than one counterpart in the target

- Lines in the target that do not have counterparts in the source

- Lines in the source whose counterparts in the target have some significant difference, for example, a different quantity

The analysis is done on the structures as they are configured in the rich client. You can run the analysis with any combination of configuration options on both structures.

When setting up the accountability check feature, a power user generally creates favorites—a collection of typical options and settings for different situations. An administrator can publish these favorites for different groups or roles so that regular users can then select one of them to quickly run the comparison.

Types of structures you can compare

Using an accountability check, you can compare the following pairs of source and target structures:

- EBOM and MBOM to see which of the EBOM parts are aligned to the MBOM
- Product and product
- Process and product to see if all parts are consumed
- Process and process
- Process and plant

The following is an overview of the types of structures you can compare.

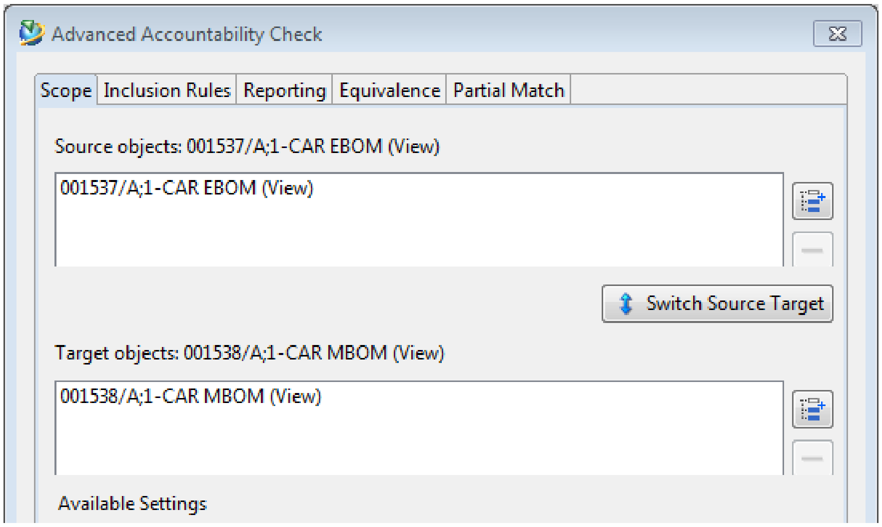
Run an advanced accountability check

As an advanced user, you can set a variety of options before you run an advanced accountability check. If you save these options as favorites, you can repeat the advanced accountability check using the same options.

> Note:
>
> To run an advanced accountability check, you must have two linked source and target structures to compare. These are typically a source engineering bill of materials (EBOM) generated from a design BOM that is exported from a CAD application such as NX or CATIA, and a target manufacturing BOM (MBOM) created for specific manufacturing needs from the EBOM. When the EBOM is updated, the MBOM must be compared and updated as well. This is the purpose of an advanced accountability check: the two structures must be examined to ensure that they share equivalent BOM lines.

1. Open a source and target structure in two different panes using the **Open Structure in Second Panel** menu command.

2. (Optional) Change the source or target object at any time by selecting the desired line in the structure and clicking the respective **Set/add current selection** button . You can add multiple scope lines from the same structure or remove a scope line by selecting it and clicking .



3. Ensure that you correctly selected the source and target objects. If not, switch the source and target by clicking the **Switch Source Target** button.

4. Click the **Inclusion Rules** tab, and do one of the following:

   - Select **Search currently expanded source lines** to run the accountability check on the selected lines and all visible lines below the selected lines. Additionally, you can choose to run the accountability check on all the lowest visible (expanded) lines under the selected scope line by selecting **Compare lowest visible level of source**.

   - a. Select **Search lines per filtering rule** to expand the source and target structures and only consider a subset of the lines during the accountability check.

     b. Select the **Source filtering rule**. For a description of the filtering rules, move your mouse over the list. The rules along with their short descriptions are displayed.

     You can specify to which level in a structure you want the check to consider by selecting **Limit search in source/target to first *x* levels** and typing a value for *x*.

     > Note:
     >
     > For information about filtering rules, see Managing filter rules in the Tc XML and PLM XML Configuration for Data Import and Export.

   > Note:
   >
   > When you set these options, the values take effect in all applications that support accountability checks.

5. (Optional) If you know the source and target scope lines to be different because these lines are source and target specific, select the **Do not compare selected lines** check box.

In the advanced accountability check results, the selected scope lines do not appear as missing in target and missing in source.

6. Click the **Reporting** tab and set the result reporting options.

7. Click the **Equivalence** tab and set the equivalence options.

8. Click the **Partial Match** tab and specify the partial match criteria.

9. Click **OK** to run the accountability check.

   Teamcenter displays the **Accountability Check** view.

   > Note:
   >
   > The number of lines returned in the accountability check is limited by the value of the **MEAccountabilityCheckAllowableReturnedLines** preference. If the number of lines to return exceeds the preference value, a message will be displayed notifying you that there are more lines to be returned, and that an Accountability Check Excel report has been created and stored, thus saving the work.

10. After running the accountability check, examine the results and make any necessary modifications to the structure.

11. Rerun the check using the same settings by clicking in the **Accountability Check** view.

   > Note:
   >
   > - Rerunning an accountability check does not recreate an accountability check report or a result reported in an occurrence group.
   >
   > - For information about narrowing the scope of the accountability check, see the *PLMXML Export Import Administration Guide*.

Set the result reporting options

The accountability check displays its results by highlighting the checked objects in the structure pane in a variety of colors that you can change, if desired. To help users who cannot differentiate colors well, a tool tip shows the name of the color. If the name is not available, the tooltip displays the RGB value.

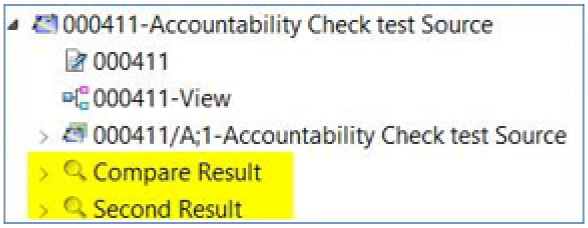
1. Open the accountability check dialog box.

2. Click the **Reporting** tab.

3. Select one of the following:

- **Report in occurrence groups**

  Teamcenter can store and display the result of the accountability check in an additional tab in the structure pane grouped by anomaly. This result is only computed for the source item and is stored in the database as a structure of **UsageCompareResultView** objects related to the item of the source revision. You can specify the name for the result of the check. By default, it is named **Compare Result**.



- **Report the selected check criteria**

  Teamcenter offers you two methods to visualize the results of the accountability check. You can select one or both of the following:

  - Select **Color the compared objects** to color the line and the matching lines according to the match results and color scheme that you set in the **Reporting** section.

  - Select **Printable report** to capture the results of the accountability check in an Excel spreadsheet.

4. Check the display options you require:

Option	Description
Full Match	If the object (occurrence) in the source structure has one and only one equivalent in the target structure, both objects are set to the same background color. If you also selected the **Partial Match** option, a full match also means that all partial match criteria of the equivalent objects match, for example, properties or relations, if you use enterprise BOP structures. The default color is green.
Partial Match	For equivalent objects (occurrences), if one or more partial match criteria are not identical, both objects are set to the same background color. The default color is yellow.
Multiple Match	If objects have more than a single equivalent in either structure and all properties of the source objects are identical to the properties of target objects, all objects are set to the same background color. The default color is orange.

Option	Description
	Only available when you do not use net effectivity.
Multiple Partial Match	If objects have more than a single equivalent in either structure and in addition, one or more properties are not identical, all objects are set to the same background color. The default color is pink. Only available when you do not use net effectivity.
Missing Target	If occurrences of the source structure are not found in the target, the source objects are set to this color. The default color is red.
Missing Source	If occurrences of the target structure are not found in the source structure, the target objects are set to this color. The default color is light blue.

5. (Optional) Change the default color by clicking ••• next to the color.

6. Set the colors by choosing a color swatch, and setting HSB (hue, saturation, brilliance) or RGB (red, green, blue) values.

Set the equivalence options

1. Open the accountability check dialog box.

2. Click the **Equivalence** tab.

3. Select the comparison options you require:

Option	Description
Equivalent Logical Designator	If you use enterprise BOP structures, the accountability check takes process logical designators into consideration as an additional comparison criteria when checking the process, operation, or partition lines for equivalence. This check box is available only when both structures are enterprise BOP structures.
Equivalent PublishLink Connection	If you use publish links, the accountability check highlights occurrences that are mapped using publish links. If a part occurrence is set to not require positioned design, it is also taken into consideration.

Note:

When checking accountability between structures, the direction of tracelinks is not considered.

Specify partial match criteria

You can specify which data to compare between equivalent lines. You can choose to compare a specific set of properties or, if you are comparing enterprise BOP structures, you can additionally compare any relation type of these lines to other lines. For example, you can compare assignment or predecessor relations.

1. Click the **Partial Match** tab.

2. On the **Properties** tab, select **Consider values of properties when searching for a partial match**.

3. Choose the properties that you want included in the accountability check by selecting them in the **Available Properties** list and clicking + to move them to the **Selected Properties** list.

   The accountability check matches lines in the source and target that have the same properties as those you select in the **Selected Properties** list. Your administrator determines which properties are available for selection in the **AdditionalAccountabilityCheckProperties** preference. Any differences in the selected properties are identified as differences between the structures.

   The values of the **DefaultAccountabilityCheckProperties** preference are ignored.

Viewing check results in the Accountability Check view

About the Accountability Check view

When you run the accountability check, Teamcenter displays the results in the **Accountability Check** view. This view lists the problematic lines in the source and target and provides a list of conflict details. Lines that are colored in the source and target structures are also colored in the view. Fully matched lines are not listed by default.

Note:

Displaying fully matched lines in large structures can clutter the view

Lines in the **Accountability Check** view behave in the same fashion as lines in the source and target structures. If you remove a line in the view, Teamcenter removes the line from the source or target. You can copy lines from the view into the clipboard, drag them to another structure, or send them to another application.

When you select or target line that is marked as having net effectivity or being a partial match, Teamcenter displays the conflicts in a third pane at the bottom of the view.

When you select a line in the source section of the **Accountability Check** view, you can click the **Equivalent Lines** tab in the target section of the view to find the lines in the target structure that match the selected source line, and vice versa. These lines are then selected in the visible structure views.

When you work through the accountability check results, resolving conflicts, the accountability check results are not updated—the lines remain highlighted in the original check colors. To update the lines, you must rerun the accountability check. You can do this using the same settings by clicking in the **Accountability Check** view.

> Note:
>
> The **Accountability Check** view is not displayed when one or both of the structures being compared is an intermediate data capture.

Display the partial compare results

After running an accountability check, you can view the partial compare results. Do one of the following:

- Select a partial match line in either the **Source** or **Target** section of the **Accountability Check** view.

  Teamcenter displays the partial compare results in the **Partial Match** section at the bottom of the view.

- Right-click a partial match line in the structure pane and choose **Partial Compare Results**, or choose **Tools→Accountability Check→Partial Compare Results**.

  Teamcenter displays the **Partial Compare Results** dialog box.

View settings used to run the accountability check

You can display a read-only listing of the settings in force when you ran the accountability check report.

- Click .

  Teamcenter opens the **Accountability Check Settings** dialog box displaying the scope and configuration in effect at the time the check was made. This is not necessarily the same as the currently active configuration.

Filter accountability check results

When you run the accountability check, you can select check criteria in the **Accountability Check** dialog box. After running the report, you may find that the **Accountability Check** view shows too many results and the display is cluttered. You can filter out some of the check criteria in the view to make it more readable without having to rerun the accountability check.

1. Click **Filter**.

2. Clear the categories that you want to hide in the view and click **OK**.

Teamcenter displays only those categories that are selected in the **Filter** dialog box. The filter button is turned on when you remove the check mark from any categories to indicate that filtering is applied.

Clear display

You can reset all background colors on objects in the active window and their corresponding objects in the process window to the default colors.

- Choose **Tools→Accountability Check→Clear Accountability Check Display**.

> Note:
>
> The command works only if either the source view or the target view is the active window.

Filtering and expanding source and target structures

You can narrow the scope of the accountability check by limiting it to only the lines pertinent to your use case.

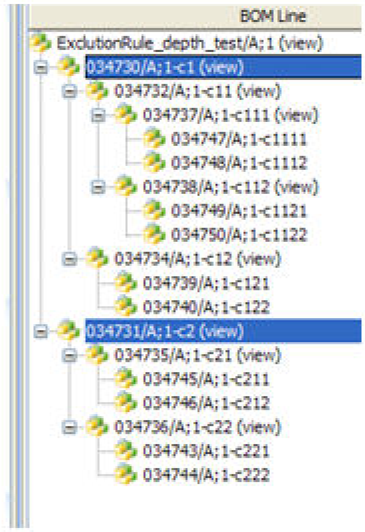
By default, Teamcenter presents you with a set of inclusion rules. Your administrator can modify these inclusion rules or create new ones to suit your business needs.

For more information about configuring the inclusion rules, see Configuring the inclusion rules.

> Note:
>
> When running the accountability check based on inclusion rules, there is no need to expand or unpack any of the structures. This improves the performance of the check.
>
> When running the accountability check without inclusion rules, you must first expand and unpack the compared lines in the source structure.
>
> For more information, see *Expanding structures to check*.

Specifying levels for comparison

If you use inclusion rules, you can limit the number of levels that the accountability check considers for comparison. In the following figure, processes **C1** (ID = **034730**) and **C2** (ID = **034731**) are selected as the source in an accountability check. To specify a level, run an advanced accountability check.



If you specify a level of **1**, the accountability check considers the following items for comparison:

c11, c12

c21, c22

If you specify a level of **2**, the accountability check considers the following items:

c11, c12, c21, c22

c111, c112, c121, c122, c211, c212, c221, c222

Accountability check of variant structure

If you optionally propagate rolled-up variant conditions from the EBOM to the MBOM or from the product BOP to the plant BOP, the accountability check recalculates the rolled-up variant condition on the source line and compares it with any occurrence variant condition already stored on the associated target line. It then reports any partial match discrepancies between the variant conditions. To allow this check, you must add the **Variant Formula** (**bl_formula**) property to the list of properties in the partial match criteria in the **MEAdditionalPropagatableProperties** preference. The comparison is based on logical equivalence and is not a string comparison, for example:

- If you compare **Color=red & Size=medium** with **Size=medium & Color=red**, these variant conditions are logically equivalent.
- If you compare **Color=red & Size=medium** with **Color=red & Size=medium & Color=red**, these variant conditions are logically equivalent.

In the following example, you assign the EBOM to the MBOM and roll up the variants:

EBOM:

```
EGen1.1  Load if Option A = “abc”
    EGen 1.1.1  Load if Option B = “fgh”
      Part 1
      Part 2
    EGen 1.1.2  Load if Option B = “ijk”
      Part 3
      Part 4
EGen1.2  Load if Option A = “cde”
    EGen 1.2.1  Load if Option B = “fgh”
      Part 5
      Part 6
    Part 7  Load if Option B = “ijk”
```

MBOM:

```
Part 1  Load if Option A = “abc” AND Option B = “fgh”
Part 2  Load if Option A = “abc” AND Option B = “fgh”
Part 4  Load if Option A = “abc” AND Option B = “ijk”
Part 5  Load if Option A = “cde” AND Option B = “fgh”
MGen 1.1
  Part 3  Load if Option A = “abc” AND Option B = “ijk”
  Part 4  Load if Option A = “abc” AND Option B = “ijk”
  Part 7  Load if Option A = “cde” AND Option B = “ijk”
```

If you perform an accountability check and specify parts only, all colors except full match, and rolled up variant condition as a partial match option, the result shows no differences.

You then modify the parts under **EGen 1.1.2** in the EBOM as follows:

```
Egen 1.1.2  Load if Option B = “lmn” – changed the variant condition
  Part 3  Load if Option C = “opq” –added the variant condition
  Part 4 – no change
  Part 8 – added the line
```

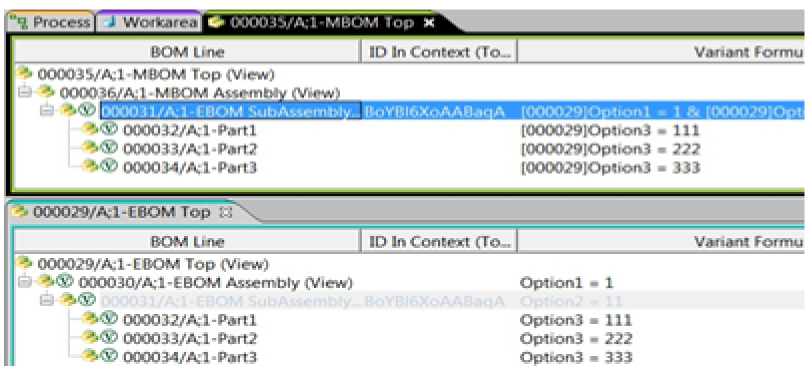
(You changed the variant condition to line 1, added the variant condition to part 3, made no changes to part 4, and added part 8.)

If you now perform an accountability check, it identifies that **Part 3** is a partial match, **Part 4** is also a partial match, and **Part 8** is missing in the target. A tabular report shows the following results for the checked objects.

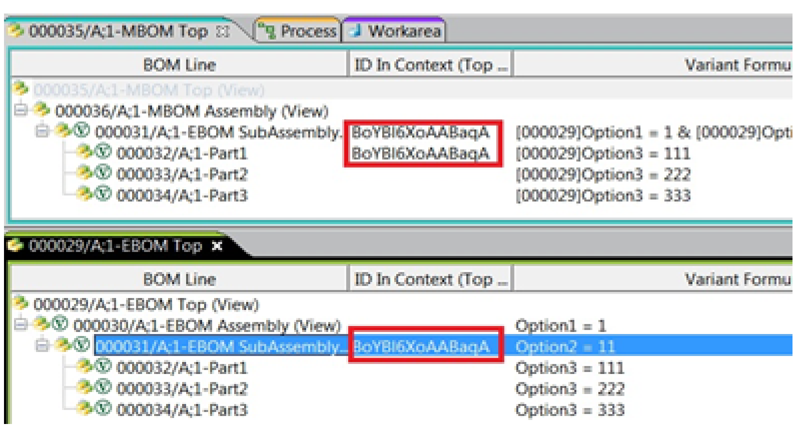
Source	Target	Match	Variant condition rollup
123456/A;1-Part 3	123456/A;1-Part 3	X	X
123457/A 1-Part 4	123457/A 1-Part 4	X	X
1234569/A 1-Part 8	*** Not Found	X	

The check assumes lines are equivalent due to a user performing an assign action (that is linking them) and not simply by having the same in-context ID. When you run an accountability check on equivalent lines with the same in-context ID, it considers rolled up variant conditions on the source line and compares them with the occurrence variant condition on the target line. This may give unexpected results when comparing the **Variant Formula** property, and you should take care when propagating such differences.

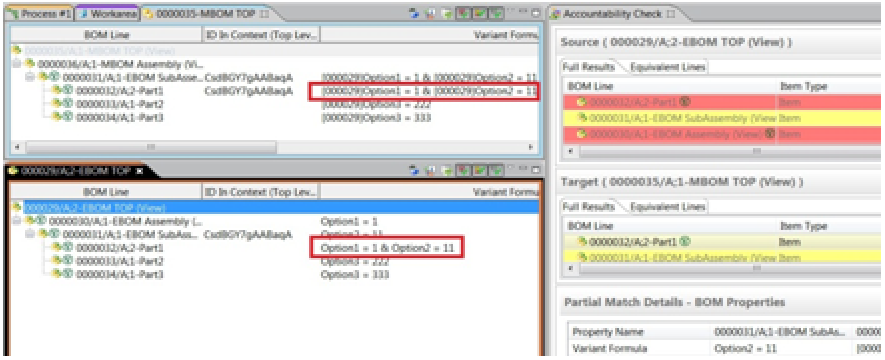
For example, **EBOM Top (000029)** and **MBOM Top (000035)** are linked. The assigned line **EBOM Sub Assembly (000031)** has a rolled-up variant condition.



If you change the in-context ID of **Part1** in the MBOM to make it equivalent to **SubAssembly** in the EBOM, the accountability check shows **Part1** as a mismatched line, even though it is not assigned. This occurs because the rolled up variant condition on the source line is compared with occurrence variant condition on the target line. As the target line is not assigned, it does not have a rolled-up variant condition.



If you select **Part1** and choose to propagate differences from the source to the target, **Part1** receives the rolled-up variant condition of the source. This occurs because, although the line is not assigned, it has the same underlying occurrence. **Part1** is now configured but not with the variant configuration you originally intended.



Expanding structures to check

Whether or not you need to expand a target structure before running an accountability check depends on the settings of the following two preferences:

MECopyIdInContextToAssignedLine

MECopyIdInContextLowerLevels

For more information, see *Understanding ID in context and assigned products*.

Note:

If there are packed lines in the source window, the accountability check may report incorrect results for the quantity of an absolute occurrence of a component that is packed to a sibling. To avoid this situation, always unpack all lines before starting an accountability check.

Create a printable Excel report

Teamcenter can create a printable Excel report containing the results of an accountability check. If you have write access to the target structure, Teamcenter stores the Excel file as a dataset on the top-level item revision of the target structure. If you do not have write access, Teamcenter stores the Excel file in the **Newstuff** folder.

1. Open the **Accountability Check** dialog box.

2. Select all necessary options to create the accountability report.

3. Click the **Reporting** tab and select **Report the selected check criteria**.

4. Select **Printable report**.

5. Assign a name for the new dataset.

   If a dataset of this name and type already exists in the item revision, Teamcenter opens a dialog box where you can change the name or replace the dataset with the new one. You can change this behavior in the **TC_CRF_overwrite_existing_dataset_content** preference. If this preference is set to **1** (true), Teamcenter does not remove the dataset but replaces the content.

6. Click **OK**.

   Teamcenter creates a report containing:

   - General information such as the date and time of the check and the user ID and name.

   - Compare options.

   - Context data such as the source top level item, the target top level item, incremental change, and revision and variant rules.

   - Accountability check results such as the source name, target name, match status, and all the checked properties. Multiple matched objects and missing source objects are displayed in separate sections.

   Teamcenter adds the Excel file to a dataset attached to the target structure.

> Note:
>
> If you use the **MEAccountabilityCheckEnableNetEffectivity** preference to report net effectivity mismatches, the Excel report also reports those mismatches.

Net Effectivity Mismatches										
Mismatched Sources			Mismatched Targets			Mismatch Details				
BOM Line	Occurrence Effectivity	Find No.	BOM Line	Occurrence Effectivity	Find No.	End Item	Units	# in Source	# in Target	Category
000054/A;1-a1	6-UP (000049) 1-9 (00005	10	000054/A;1-a1		10	000049-EBOM	1-5	0	1	Missing in Source
						000050-MBOM	10-UP	0	1	Missing in Source
000056/A;1-a3	9-15 (000050)	30	000056/A;1-a3		30	000049-EBOM	1-15, 21-UP	0	2	Missing in Source
000056/A;1-a3	5-8 (000050)	10	000056/A;1-a3	5-8 (000050)	20	000049-EBOM	16-20	0	3	Missing in Source
			000056/A;1-a3		30	000050-MBOM	1, 3, 16-UP	0	2	Missing in Source
			000056/A;1-a3	5-8 (000050)	10	000050-MBOM	2, 4	0	3	Missing in Source
			000056/A;1-a3		20	000050-MBOM	9, 11-15	1	2	Overlapping
			000056/A;1-a3	5-8 (000050) 16-20 (00	10	000050-MBOM	10	1	3	Overlapping
						000050-MBOM	6, 8	1	6	Overlapping
						000050-MBOM	5, 7	1	5	Overlapping
000058/A;1-a6	01-Aug-2015 00:00 to 28-(	10	000058/A;1-a6		20	000050-MBOM	1, 3, 5, 7, 9,	1	0	Missing in Target
000059/A;1-a8	6 (000050)	20	000059/A;1-a8	8 (000049)	30	000050-MBOM	6	1	0	Missing in Target
						000049-EBOM	8	0	1	Missing in Source

Customize the Excel report

1. Create your own XSL style sheet.

2. Add it to the **Accountability Check Report** (**TC_2007_00_CUS_RPT_0002**) report in the Report Builder application.

3. Modify the **AccountabilityCheckReportStylesheetName** preference to contain the name of the new style sheet.

> Note:
>
> If you created a custom style sheet prior to upgrading to Teamcenter 11.4 or greater, by default, the Excel report uses a new style sheet called **acc_chk_rpt_excel.xsl**. Your customized stylesheet must have a different, unique name (for example, **my_acc_chk_rpt_excel.xsl**). When the value of the preference **MEAccountabilityCheckReportCombineLines** is true (default), the generated xml file will not support legacy stylesheets. To generate legacy data xml files, change the preference value to **false**.

Reporting the check result in occurrence groups

Alternatively to reporting the accountability check results in colors, Teamcenter can report anomalies in occurrence groups that are displayed in an additional tab in the structure pane. These occurrence groups are stored as persistent objects in the database.

If you compare the base view of the entire product structure or a subassembly, the accountability check searches for every BOM line in the process plan. If you compare the manufacturing view of the product or a subassembly, the check only searches for a line in the process plan if the line's direct parent is an occurrence group. In the manufacturing view, if the BOM line's direct parent is not an occurrence group, you must allocate it to the view as a component of a subassembly in the original EBOM. For example, component **C** is part of subassembly **A** in the EBOM, while subassembly **A** is assigned to the manufacturing view under occurrence group **G**. Consequently, **C** also appears in the manufacturing view under **A**, then under **G**. The direct parent of **A** is an occurrence group, while the direct parent of **C** is **A**, which is not an occurrence group. When you compare structures, the utility searches for **A** but not for **C**. Typically, if you did not allocate to the manufacturing view, you would not expect to consume it in the process.

The scope of the comparison depends on the selections you made in the **Accountability Check** dialog box, as described in *Run an advanced accountability check*.

Generate the results grouped by anomaly

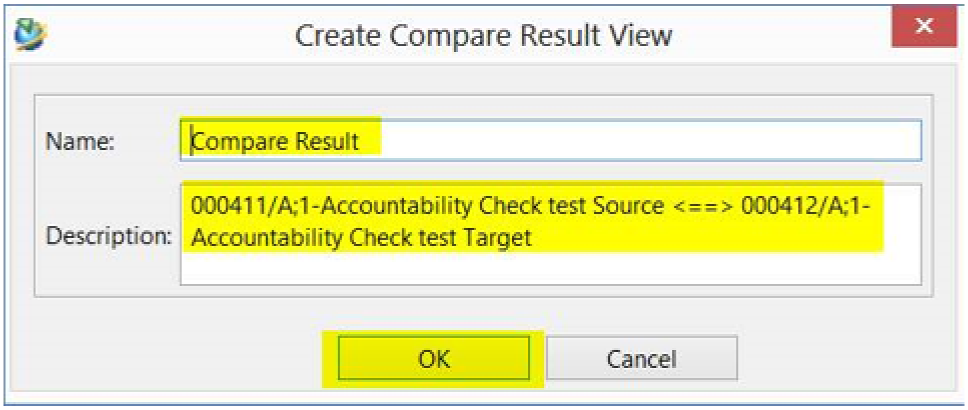
1. To generate the report:

    a. Open the **Accountability Check** dialog box.

    b. On the **Reporting** tab, click **Report in occurrence group**.

    c. Click **OK**.

The **Create Compare Result View** dialog is displayed.

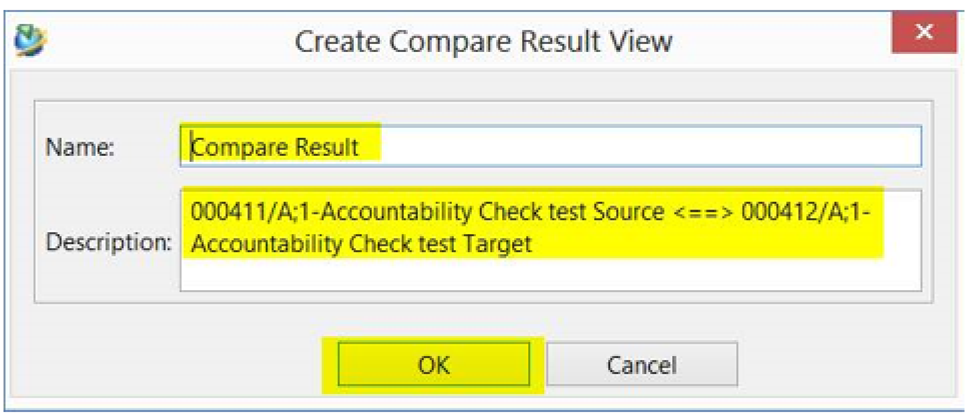


d. Modify the system generated **Name** and **Description** as required.

   The **Name** of the result view is displayed as the name of the additional tab. Multiple result views can be displayed at a time. If a view with the same name exists, the system displays a message asking if the result view should be overwritten or renamed. In this case, you must have write access to overwrite the existing view.

e. Click **OK**.

   Teamcenter creates **UsageCompareResultView** objects for each type of anomaly and displays them in the **Compare Result** tab.



Teamcenter creates occurrence groups for each type of anomaly and displays them in the **Compare Result** tab (an occurrence group tab). The names of the anomalies are fixed and are as follows:

- **Unused/Under-used**

  Contains all occurrences in the source pane that do not match an occurrence in the target pane.

- **Completely Used**

Contains all occurrences in the source pane that match a corresponding occurrence in the target pane.

- **Over-used**

  Contains all occurrences in the source pane that match more than one occurrence in the target pane.

- **Partial Match**

  Contains all occurrences in the source pane that have mismatched properties compared to their corresponding occurrence in the target pane.

2. (Optional) Expand the subgroups to view the items contained in these groups and take appropriate action.

   You must rerun the accountability check to view any changed results.

14. Configuring structures by occurrence effectivity

About occurrence effectivity

The effectivity of an occurrence can be expressed as a date range or a range of units with respect to an *end item*. An occurrence can have multiple expressions comprising date effectivity, unit effectivity, or both. Multiple unit effectivity expressions may reference the same end item or different end items. If no occurrence effectivity is specified, the occurrence is considered to be always effective; that is, it is not constrained by any effectivity definition.

Occurrence effectivity is used principally for two purposes:

- To reflect changes to the structure over time as new parts replace old ones.
- To explicitly state the content of a unit or range of units as a means of managing the variability of the product. This technique is an alternative to using options and variants to configure the parts needed to fulfill a particular offering.

Occurrence effectivity is frequently used by manufacturers of military and aerospace products. The end item may correspond to a serial number or the tail number of an aircraft.

For example, there may be different hydraulic cylinders in the landing gear of an aircraft, depending on whether the aircraft is certified for unimproved runways. There may be additional differences to the aircraft to meet this purpose, such as debris deflectors, wheels, and tires. Using options and variants, you could define an option called **RW_Class = Paved or Gravel**, and there would be a variant rule on stouter cylinder to configure it in for the **Gravel** option. Using occurrence effectivity, the unit number of each aircraft unit that is certified for operation on gravel runways (for example, units 3-6, 17, 33-45) would be used in the effectivity specified for parts such as stouter cylinders. The effectivity of the regular cylinder would be specified using the other units (unit 1-2, 7-16, 18-32, 46-up).

Understanding occurrence effectivity

Understanding occurrence effectivity

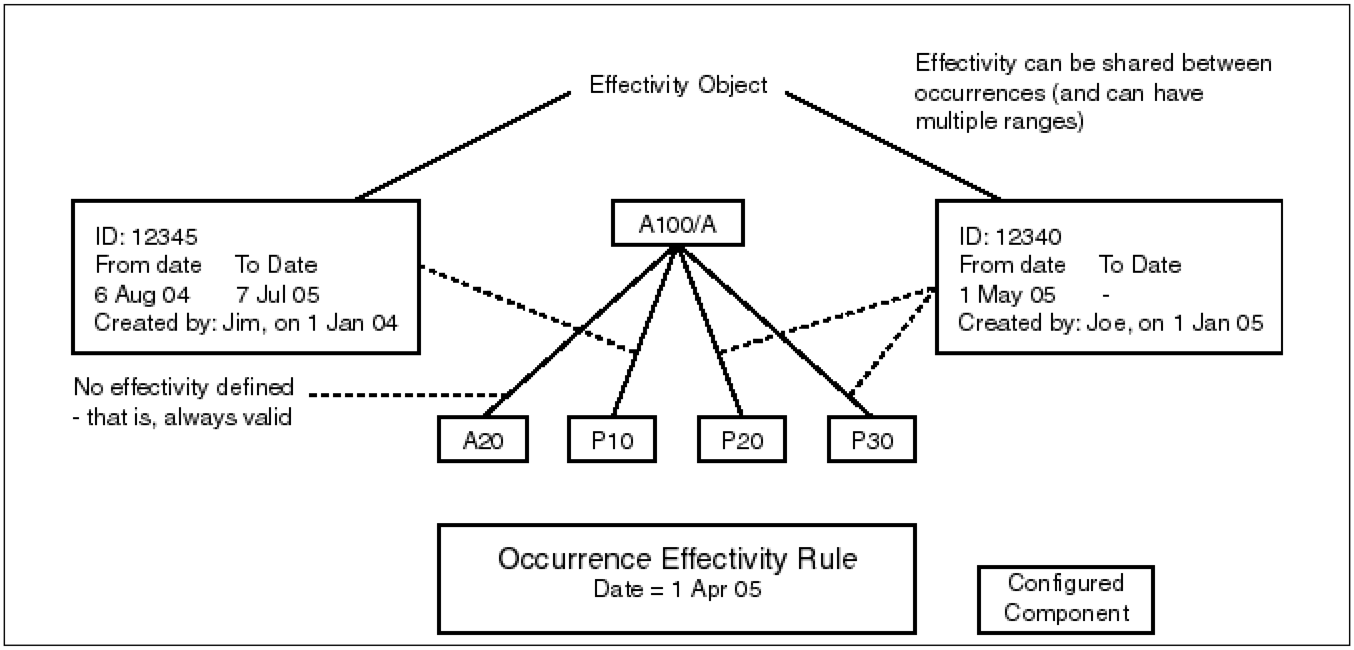
Several occurrences may share an effectivity. When you edit the effectivity range on one occurrence, Teamcenter applies the change to all occurrences. (This is generally the reason for sharing effectivity.)

You can also pack occurrences if they share the same unit or date range and access protection status. Packed occurrences are displayed in a similar way to packed structure lines.

You cannot import or export structures containing occurrence effectivity. If you require individual structure nodes to have effectivity, consider the use of incremental change.

If an occurrence does not have an associated effectivity object, Teamcenter assumes it is always effective and it is configured regardless of the date or unit number set by the revision rule, as shown in the following figure.

If you do not split effectivities, you can optionally use the **Configuration Item** check box to indicate the end item, although Teamcenter does not enforce this use.



Occurrence effectivity rule

When you create an effectivity condition on an occurrence, you change the parent BOM view revision. Consequently, you must have write access to the BOM view revision. However, you can make subsequent changes to the effectivity range if you have write access to the effectivity object, allowing you to edit effectivity data after the structure is released.

Note:

The import or export of a structure containing legacy occurrence effectivities is not supported. If you require individual structure nodes to have effectivity, consider using incremental change instead of occurrence effectivity. Structures managed with incremental change can be imported and exported using Multi-Site Collaboration.

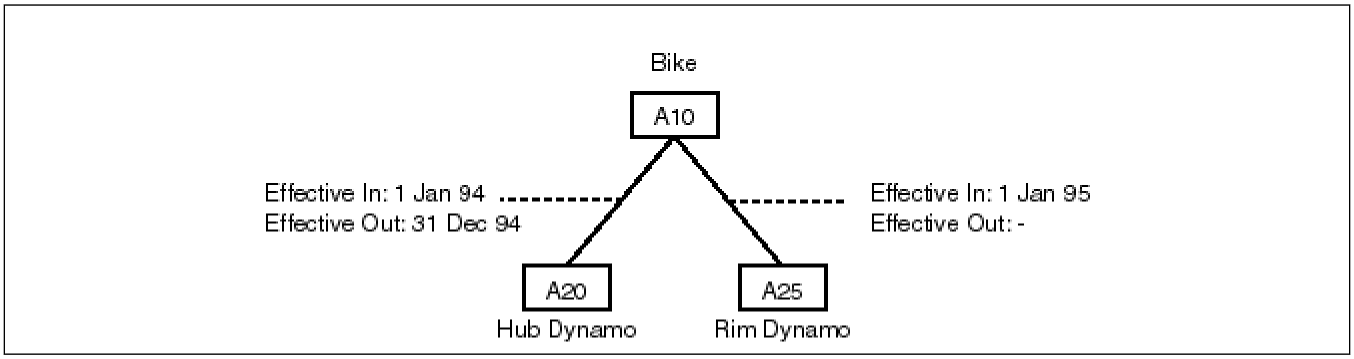
Validating effectivity

You should check that effectivity ranges are consistent within the whole structure, ensuring that effectivity ranges lower down the structure lie within ranges higher up. You may not be aware of the constraints higher up the structure when you initially specify effectivity ranges at lower levels.

Teamcenter does not perform this validation automatically but you can include it as part of a workflow process that approves the effectivity ranges. In certain cases, this validation may not be appropriate, for example, when the structure is shared between different products.

Defining mutually exclusive effectivity ranges

If you intend to define occurrences as mutually exclusive, manually check that they do not have overlapping effectivity ranges. For example, in the following figure, there are two different types of dynamo and it would be wrong to configure two dynamos at the same time.



Mutually exclusive effectivity ranges

When specifying effectivity, you can make the association between the occurrences clearer by using the same find number or attaching a special effectivity note to each.

Understanding unit net effectivity

For a large and complex structure, it is useful to understand the net effectivity of components within the structure. A lower level component may have been originally specified for any effectivity or a large range, but a narrower range applied at a higher level in the structure can reduce the net range for that component line.

Unit net effectivity can be considered as the intersection of an occurrence's unit occurrence effectivity with its parent's calculated unit net effectivity, from the specified structure line up to the top of the structure. For a line without an underlying occurrence (top line of a structure), there is no occurrence effectivity. This line is considered unconstrained and always configured. The unit net effectivity of a line that has no unit occurrence effectivity is equivalent to its parent's calculated unit net effectivity.

- If the line has only date effectivity expressions, these are ignored and the unit net effectivity is the same as its parent's calculated net effectivity.
- If there are multiple unit effectivity expressions with the same end item, these expressions are merged before intersection with the parent's calculated net effectivity.

- The intersection is taken with respect to the end item designations of the parent's unit net effectivity expressions. Unit effectivity expressions whose end items do not match any in the parent's unit net effectivity are ignored.

- If there is no intersection of the line's unit occurrence effectivity and the parent's unit net effectivity, the line's unit net effectivity is set empty (fully constrained).

- The unit net effectivity of a line whose parent's unit net effectivity is empty also has an empty unit net effectivity, regardless of the line's unit occurrence effectivity.

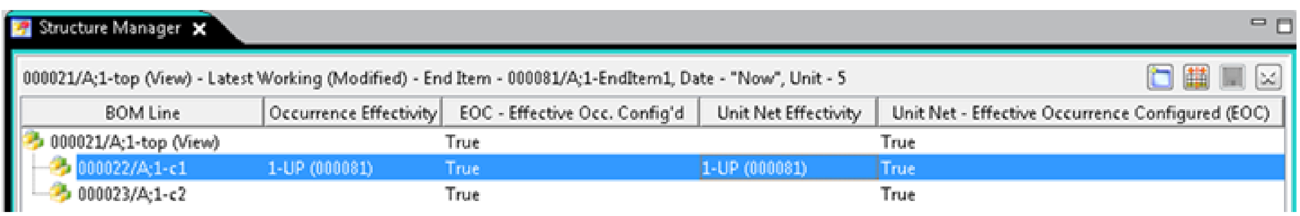
- The unit net effectivity of a particular component line is calculated when you display the line and is not persisted in subsequent sessions.

Effectivity flow-down reporting helps the user understand effectivity ranges and the impact of changes, especially as the complexity of the effectivity increases through the structure.

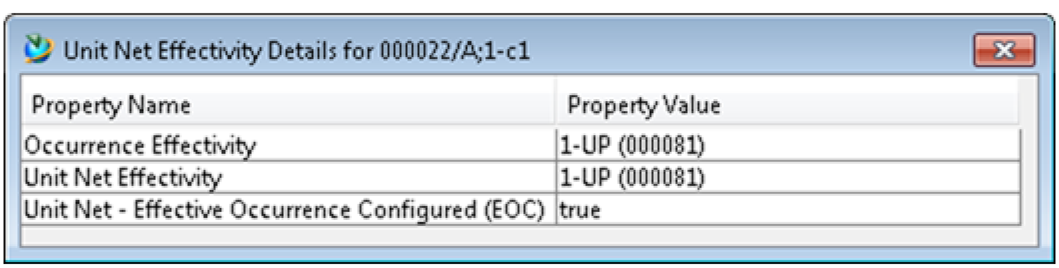
Calculate unit net effectivity

To calculate the net occurrence effectivity of a selected structure line, choose **Tools→Effectivity→Occurrence Effectivity→Calculate Net Effectivity**.

Teamcenter displays the occurrence effectivity, unit net effectivity, and net effective occurrence configured (EOC) information for the selected line.



The unit net EOC is set to **true** if the occurrence would be configured in based on the comparison of its calculated unit net effectivity with the revision rule occurrence effectivity entry. Teamcenter performs this comparison at run time and it is not persisted.



> Note:
>
> If you select a root line or more than one line, an error message is displayed.

Configuring by occurrence effectivity

If the revision rule controlling the configuration of a structure contains an entry for occurrence effectivity, occurrences for which no occurrence effectivity is specified are configured, together with occurrences whose effectivity expressions match some part of the revision rule occurrence effectivity entry. If **Show Unconfigured By Occurrence Effectivity** is selected, an occurrence may be shown or hidden, depending on occurrence effectivity (which may be a greater range than unit net effectivity).

The calculated net effectivity is also compared with the revision rule occurrence effectivity entry.

- If the unit net effectivity of a line is unconstrained, the unit net-EOC is **true**, regardless of any occurrence effectivity entry in the revision rule.
- If the unit net effectivity of a line is empty, the unit net-EOC is **false**, regardless of any occurrence effectivity entry in the revision rule.
- For a line whose unit net effectivity is not unconstrained or empty, its unit net-EOC is **false** if there is no occurrence effectivity entry in the revision rule.
- If there is an occurrence effectivity entry in the revision rule, the unit net-EOC is **true** only if the unit net effectivity matches some part of the revision rule occurrence effectivity entry.
- Any date effectivity expressions in the revision rule occurrence effectivity entry are ignored for the unit net-EOC comparison. A date range is not considered as a scope for unit net effectivity,

You may explicitly set an occurrence effectivity entry in the existing revision rule by choosing **Revision Rule→Set Date/Unit/End Item...**. You can then set a unit range defining the scope of effective occurrences you want to review. The **Unit Net-EOC** property shows whether the computed net effectivity is in that scope.

Using effectivity cutback

While defining a product managed with occurrence effectivity, the effectivity decisions evolve as the product content itself is developed. The design engineer makes decisions for effectivity ranges that reflect the implementation plan for when additional or replacement parts should be included in the bill of materials.

In general, there are many technical and logistical decisions that go into setting the date or unit range of the effectivity. To support this process, the engineer must understand the chain of effectivity for a given part. The engineer may choose to adjust the effectivity ranges when necessary. Over the life cycle of development and service of the product, customers using occurrence effectivity replace parts with other parts. As these changes are made, the historical chain of effectivity must remain consistent.

When a new occurrence of a part is specified as a replacement for an existing occurrence in a structure, the effectivity of the replaced part should be reduced (cut back) so that it does not overlap with the effectivity of the replacing part.

When a part with occurrence effectivity is replaced and cut back, prior generations that were replaced by the cutback part should also be considered for cutback, if the range of the newest replacement overlaps effectivity.

> Note:
>
> Effectivity cutback is only supported with unit effectivity, not with date effectivity.

The following actions are supported by effectivity cutback:

- Replacing N parts with M replacements and updating ranges of effectivity. The historical chain of effectivity retains the N:M relationship, in case a future cutback operation needs to fully span the content of a link in the chain to cut it back.
- Validating prior replacements in the history of effectivity and updating accordingly.
- Enabling efficient updates to effectivity ranges after a replacement.

The following example shows how effectivity cutback occurs when an engineer modifies an assembly that is managed with occurrence effectivity.

1. The engineer specifies replacement parts P21, P22, and P23 for parts P11 and P12 with a unit range of 10-up.

   The system adds the occurrences P21, P22, and P23 effective unit 10-up The effectivity of P11 and P12 is cut back to the portion of the range not set on the replacements, namely units 1-9.

2. The engineer indicates parts P31,P32, and P33 are specified as replacements to P21, P22, and P23 for a range starting at unit 5.

   The system determines from the chain of effectivity and replacements that P21, P22, and P23 are replacements.

   The full range of effectivity is overlapped, so P21, P22, and P23 are no longer in effect. The span of replacement is complete, so the parts previously replaced are considered and P11 and P12 are cut back accordingly to 1-4.

3. The engineer specifies P42 as a replacement for P32 for a range within the span of effectivity of P32.

   P42 is effective for the range specified (units 20-30) and the replaced occurrence split to 5-19, and 31-up.

4. The engineer adjusts the effectivity range of P42 to units 22-32.

   The effectivity of P42 is updated to the new range.

5. A reviewer or the engineer validates the effectivity chain of P42.

   The system evaluates the effectivity of P42 against the parts it replaced or is replaced by. It identifies:

   - A gap

     Unit 20,21 does not include replaced (P32) or replacing (P42) parts.

   - An overlap

     Units 31 and 32 include both replaced (P32) and replacing (P42) parts.

6. The engineer replaces a part where only a portion of the historical replacement chain is changing.

   While a cutback of P33 by replacing part P43 is unambiguous, there is not an unambiguous action to take on P11 and P12 because P33 is only a subset of the historical chain:

   (P11,P12):(P21, P22, P23):(P31, P32, P33)

After replacing an occurrence and performing a cutback of the replaced part, the effectivity range of a part can be adjusted. If the new range overlaps with the effectivity of any parts in the historical chain of effectivity, the system issues a warning.

The following table shows how effectivity cutback occurs in this scenario.

Step	Task	Part P11	Part P12	Part P21	Part P22	Part P31	Part P32	Part P33	Part P42	Part P43
1	Initial state	1-up	1-up							
2	Replace P11 & P12 with P21, P22,P23 at unit 10	1-9	1-9	10-up	10-up					

Step	Task	Part P11	Part P12	Part P21	Part P22	Part P31	Part P32	Part P33	Part P42	Part P43
3	Replace P21, P22, P23 with P31, P32, P33 at unit 5	1-4	1-4			5-up	5-up	5-up		
4	Replace P32 with P42 for units 20-30	1-4	1-4			5-up	5-up	5-up	20-30	
5	Adjust effectivity of P42 to units 22- 32						Warning		22-32	
6	Replace P33 with P43 for units 3-7	Error	Error					8-up		3-7

When a link in a chain of occurrence effectivities is completely overlapped (that is, a complete cutback is made of its entire range) it is logically removed from the structure. The system informs the user there is no effectivity for that occurrence. A logically removed occurrence can be removed from the structure and removed from historical chains of effectivity used for evaluation of future cutback operations. In this situation, the change history is the only way to know the part ever existed in the structure.

Editing occurrence effectivity

To edit occurrence effectivity data, your Teamcenter user name must be included in the appropriate effectivity user group and role that the administrator defines.

Associate existing effectivity to an occurrence

> Note:
>
> Use this approach only when you want the effectivity to be the same for all occurrences sharing this effectivity object. If you edit the effectivity object's date or unit number ranges, Teamcenter applies this change to all occurrences that reference it.

1. Select the line in the structure representing the occurrence with which you want to associate effectivity.

2. Choose **Tools→Effectivity→Occurrence Effectivity→View, Create and Edit**.

   Teamcenter opens the **Occurrence Effectivity** dialog box.

3. In the **Effectivity ID** box, type the identifier of the effectivity object you want to associate with the occurrence, and press the Enter key. Alternatively, you can search for the effectivity object by clicking **Search** adjacent to the **Effectivity ID** box.

   Teamcenter populates the date or unit number table with the ranges from the effectivity object.

4. Click **OK** and Teamcenter associates the effectivity with the occurrence.

Create effectivity on multiple occurrences

Create and associate the same effectivity with several occurrences by selecting the appropriate line in the structure and choosing **Tools→Effectivity→Occurrence Effectivity→Create on Multiple BOM Lines**. The effectivity may be:

- Shared

  Shared effectivity must have an ID. If you are creating shared effectivity, ensure the **Use shared effectivity** check box is selected.

- Unshared

  Unshared effectivity has no ID. If you are creating unshared effectivity, ensure the **Use shared effectivity** check box is cleared.

Modify the effectivity of an occurrence

> Note:
>
> Any changes you make affect all occurrences sharing the same effectivity object.

1. Select the line in the structure representing the occurrence whose effectivity you want to modify.

2. Choose **Tools→Effectivity→Occurrence Effectivity→View, Create and Edit**.

   Teamcenter opens the **Occurrence Effectivity** dialog box.

3. In the **Occurrence Effectivity** dialog box, choose **Units** or **Dates** effectivity, as appropriate, and define the effectivity range.

   - If defining unit effectivity, type the desired effectivity range in the **Units** box. Use the **-** character within a continuous range, and the **,** character to separate discontinuous ranges. For example, the unit range **1-5,7-9** defines effectivity for units 1 through 5, and 7 through 9 (but not effective for unit 6).

   - If defining date effectivity, select a cell in the **From** or **To** column, select a date from the calendar (and optionally type a time), and click **Set Date** to place that date in the selected cell. Click the **Clear Date** button to remove the date from the currently selected cell. Repeat this step for additional cells until you have entered all the desired date ranges.

   - Click the **UP** button to add the **and up** (open-ended effectivity) condition to the end of the unit or date effectivity range. If you are defining date effectivity,

   - Click the **SO** button to add the **stock out** condition to the end of the unit or date effectivity range.

     > Note:
     >
     > Teamcenter interprets **UP** and **SO** conditions as open-ended for revision configuration purposes. The revision is considered effective for any value greater than or equal to the unit or date value immediately preceding the **UP** or **SO**. *Stock out* indicates that existing stocks of a component revision should be used up before the next revision.

   - Check the **Apply Access Manager effectivity protection** check box to apply the predefined access rules to this effectivity.

   - (Optional) For date effectivity, use the **End Item** dialog box to define an end item to qualify the effectivity range. You *must* use this with unit effectivity to specify a product, module, or subsystem that carries the unit number to which this effectivity refers. You can select an end item in one of the following ways:

- Clicking **Open by Name** adjacent to the **End Item** box and searching for an item by identifier and/or name.

- Copying an item to the clipboard before opening the **Occurrence Effectivity** dialog box and clicking **Paste** adjacent to the **End Item** box.

- Clicking **MRU** adjacent to the **End Item** box.

> Note:
>
> If you want to remove the entered end item, click **Clear** adjacent to the **End Item** box.

4. Click **OK** to save the occurrence effectivity data you entered.

Remove effectivity from an occurrence

1. Select the line in the structure representing the occurrence whose effectivity you want to remove.

2. Choose **Tools→Effectivity→Occurrence Effectivity→View, Create and Edit**.

   Teamcenter displays the **Occurrence Effectivity** dialog box.

3. Click **Remove** to clear all boxes, including the identifier.

4. Click **OK** and Teamcenter removes the effectivity object from the selected occurrence. Any other occurrences sharing this effectivity retain their references to the effectivity object.

Copying occurrences with effectivity

When you save a BOM view revision with a different name (perform a **Save As** action), Teamcenter copies any occurrences that reference an effectivity object to the new BOM view revision. Thus, the same effectivity ranges apply to the copied structure.

When you copy, cut or paste, Teamcenter does not reproduce any references to effectivity objects in the copy occurrences.

Setting the date for occurrence effectivity

Teamcenter configures the occurrence effectivity by the date defined in the current revision rule. Teamcenter uses an explicit date entry, if the current rule contains one. If the rule has no date entry, the effective date defaults to **today**, but you can manually set a different date using the **Tools→Revision Rule→Set Date/Unit/End Item** menu command.

You can choose to show only the configured occurrences, or all occurrences. You can toggle this setting by choosing **View→Show Unconfigured by Occurrence Effectivity**. If you display the **EOC - Effective**

Occ. Config'd column in the structure properties, occurrences that are configured show a **Y**. If the occurrences are not configured, the column is blank.

Occurrences are configured if:

- The effectivity range encompasses the date specified by the current revision rule.

- They have no effectivity object. Such occurrences are always configured, regardless of date.

Combining occurrence effectivity and variant configuration

Variant and occurrence date effectivity are occurrence-based configuration methods that operate independently. The **View** menu includes separate commands to show or hide occurrences that are unconfigured by the two methods. In some cases, you may want to view a specific variant of the product at a particular effective date. In this case, you hide occurrences that are unconfigured by *both* date and variants. Similarly, you may want to view a generic product at a particular date, in which case, you would hide occurrences unconfigured by date only. To show how a single variant changes with effective date, you can hide unconfigured variants only.

Configuring occurrences with multi-unit configuration

About multi-unit configuration

Teamcenter allows you to configure product structure occurrences of an assembly based on specified multiple end items and the unit effectivity ranges for each of those end items. You can do impact analysis and eliminate the duplicate work required to maintain different product structures and complicated manual reconciliation.

A combination of multiple end items and range of units for each end item used to configure product structure occurrences is referred to as a *multi-unit configuration*.

The administrator at your site enables this feature. It allows you to:

- Specify multi-unit configurations and save them as effectivity groups.

- Save a combination of effectivity groups and revision rule as a configurator context. You can use the saved configurator context to apply the effectivity groups and revision rule to configure occurrences.

- View the configured structure in Lifecycle Visualization, CAD tools, and the embedded viewers of appropriate rich client applications.

- Configure occurrences by matching the occurrence effectivity with the multi-unit configuration.

- Configure occurrences that are added and deleted by incremental changes by matching the incremental change effectivity with the multi-unit configuration.

Note:

Teamcenter displays the **Revision Rule Entry** value for an incremental change (IC) configured by a multi-unit configuration as **Effectivity Group**. Therefore, ignore the status of this check box in the **IC Information** pane.

When an occurrence has occurrence effectivity and it is removed in the context of an IC, the occurrence is not configured if the multi-unit configuration matches the effectivity of the removing IC. This occurs whether the occurrence effectivity matches partially or completely with the multi-unit configuration.

Multi-unit configuration does not support nested effectivity and effectivity mapping.

Create a new effectivity group

1. In My Teamcenter, choose **File→New→Item**.

   Teamcenter displays the **New Item** dialog box.

2. Select **Effectivity Group**, enter the necessary name, description, and identifier, and then click **Finish**.

   Teamcenter creates the base revision of the new effectivity group. (Effectivity groups cannot be revised, and you are unable to create further revisions of the new group.)

Capture a multi-unit configuration and save it to an effectivity group

1. In My Teamcenter, right-click an effectivity group revision and choose **View/Edit Multi-Unit Configuration**.

   Teamcenter displays the **View/Edit Multi Unit Configuration** dialog box with the **View/Edit Multi Unit Configuration** pane visible.

   Note:

   The **Most Recently Used** option is not available in this dialog box. Also, the **Open By Name** box is not available on the **Effectivity Groups** pane in this dialog box.

   Caution:

   This is a modeless dialog box. It allows you to copy items from other locations, such as your **Favorites** folder, and paste them into the dialog box. However, it also allows you to perform other actions, such as **Revise** and **Close** commands in My Teamcenter with the dialog box open.

If you open this dialog box using **View/Edit** in the **Set Date/Unit/End Item** dialog box (**Effectivity Groups** tab), the dialog box is modal and does not allow you to paste between applications.

2. Enter the necessary end item and unit range information, and then click **Add**, **Edit**, **Remove**, or **Undo** to update the effectivity group, as follows:

   - To add an end item unit range, enter the end item ID and the effective unit range and click the **Add** button. You can also search or browse for an end item to populate the **End Item** box. You can also copy the end item from your **Favorites** folder in My Teamcenter and paste it here. You can specify a combination of units or unit ranges in comma-separated format.

   - To remove an end item unit range, select it in the table and click **Remove**.

   - To edit an end item unit range, select it in the table and the system populates the **End Item ID** and **Unit Range** boxes from the selected entry. After you make the required changes, click **Modify**.

   - To revert the last change made in the dialog box, click **Undo**.

   Note:

   Undo allows you to go back one level to the previous state in the dialog box. Thereafter, any subsequent clicks on the **Undo** button cause the dialog box to toggle between its current state and previous state.

Note:

You can view and edit effectivity groups with certain limitations. Use the **View/Edit** button in the **Effectivity Groups** pane of the **Set Date/Unit/End Item** dialog box to add or modify the end items by manually typing the necessary data. You cannot search for or copy and paste end items here.

Set an effectivity group to configure occurrences

You set an effectivity group or groups to configure the product structure occurrences in addition to the revision rule.

1. Load the assembly to configure and choose **Tools→Revision Rule→Set Date/Unit/End Item**.

   Teamcenter displays the **Set Date/Unit/End Item** dialog box.

2. Enter the effectivity group identifier in the **Effectivity Group** box, and then click **Replace**, **Insert**, or **Append** to update the list of groups.

> Note:
>
> To remove an effectivity group from the list, select it and click **Remove**.

3. (Optional) To view the multi-unit configuration on an effectivity group, select it and click **View/Edit**. The system displays the **View/Edit Multi Unit Configuration** dialog box, as described previously. If you have the necessary access privileges, you can also modify the configuration.

When you apply the configuration, the system matches the occurrence effectivities configured for each occurrence with the multi-unit configuration set in the effectivity groups. Any occurrence whose occurrence effectivity is valid for any of the end item and unit range entries in the effectivity groups is displayed. An occurrence is loaded only once even if its effectivity matches more than one end item entry in the effectivity groups set in the session.

> Caution:
>
> You can configure product structures with incremental changes using effectivity groups. However, only limited support is provided to configure occurrences with incremental changes using multi-unit configuration and the following limitations apply.
>
> - You can configure only the addition and deletion of occurrences using effectivity groups. Other edits in the context of incremental change cannot be configured.
> - An **add** occurrence edit is effective if the multi-unit configuration partially overlaps the effectivity of the incremental change.
> - A **remove** occurrence edit is effective if the multi-unit configuration completely overlaps or is within the limits of the effectivity of the incremental change. That is, a partial overlap is not sufficient to configure the **remove** edit. If there are multiple **remove** incremental changes, Teamcenter compares each of them with the multi-unit configuration separately. (It does not calculate the total **remove** effectivity and compare a single value with the multi-unit configuration.)
> - Teamcenter evaluates the configuration of an occurrence based on an incremental change independently of its occurrence effectivity.
> - If Teamcenter finds competing incremental changes (one adding the occurrence and the other removing it) and both can be configured with effectivity groups, it gives precedence to the **add** occurrence edit.

The following examples show how occurrence effectivity and incremental change interact.

Structure line number	Type	Occurrence effectivity (explicit or implied)	Effectivity on removing IC1 and removing IC2	Multi-unit configuration set on BOM window	Result
1	Component	**EndItem(1-20)**	**IC1(-) → EndItem1(1-9)** **IC2(-) → EndItem(10-20)**	**EndItem1(1-9)**	Occurrence *not* configured.
2	Component	**EndItem(1-20)**	**IC1(-) → EndItem1(1-9)** **IC2(-) → EndItem(10-20)**	**EndItem1(1-20)**	Occurrence configured as Teamcenter checks occurrence effectivity, multi-unit configuration, and each incremental change individually.

Customizing occurrence effectivity

You can customize Teamcenter behavior when the user applies or sets occurrence effectivity on a BOM line.

To allow customization of the behavior when setting effectivity on an occurrence, the **bl_occ_effectivity** BOM line property is modifiable, and a setter method is provided on this property. Use the setter method of the property to attach an extension point if required.

15. Creating, viewing, and editing manufacturing documentation

About manufacturing documentation

Teamcenter manufacturing documentation provides rich work instructions and collaboration between departments, integrated with the planning environment, leveraging Teamcenter data management capabilities.

Teamcenter Publish provides an environment for creating work instructions for manufacturing operations. It enables you to author, distribute, and visualize the most current product and process data. Its main features include:

- Technical illustrations including text, 2D images, 3D graphics, table, text, and hyperlinks (for example, a link to a movie file) to improve clarity and enhanced quality on the shopfloor.
- Easy update based on the most current planning data in Teamcenter, reducing rework and update times.
- Batch processing and scheduling of reports.
- Familiar Microsoft Visio authoring environment allowing WYSIWYG editing.

  For more information, see *Using Teamcenter Publish*.

Using Teamcenter Publish

To create or view manufacturing documentation using Teamcenter Publish, install Microsoft Visio. Both Visio Standard and Visio Professional are certified. You can install Visio before or after the Teamcenter installation.

The **Save as PDF** feature is included with Visio and does not require installing the separate PDF add-in.

The administrator creates an alias file that determines the permissible contents of the documentation. For example, if the administrator uses the default alias file, you can create work instructions and product manuals, and a tab for each of these is available in the data pane.

When you first select a documentation view, Teamcenter loads the Visualization Illustration and Visio components. Depending on your workstation, this process may take several seconds to complete and Teamcenter displays a progress dialog box until it is complete.

Working with publishing tools

You can create publishing pages in the embedded viewer and collect them into portfolios. A typical publishing page is a work instruction document, and a portfolio may contain all the work instructions needed at a particular assembly station. By default after installation, Teamcenter provides you with sample files. To use publishing tools in your environment, you must configure it to suit your needs.

Publishing pages are Visio files that are saved as datasets with the selected BOM line.

Visio documents are constructed using shapes that can appear as text and graphics. A rich library of shapes are provided in the Visio installation.

The Teamcenter publishing tools extend the shape library to include shapes called *assets* that you can link to data in Teamcenter. Assets can display text, tables, images, or a link to a Microsoft Word file or master form. For example, in Teamcenter you can configure a product assembly, view it, add markups, and capture the graphics in a product view (snapshot) that you can then display in a 3D asset. If the data in Teamcenter is subsequently updated, you can update the publishing page to show the changes.

You can organize collections of publishing pages into portfolios, which you can view, publish to HTML for a Web server or publish to PDF, or print in My Teamcenter using the options that appear in the viewer tab after you select the portfolio object. A portfolio can contain multiple work instructions, generic pages, header and footer information, a table of contents, and cover and trailer pages.

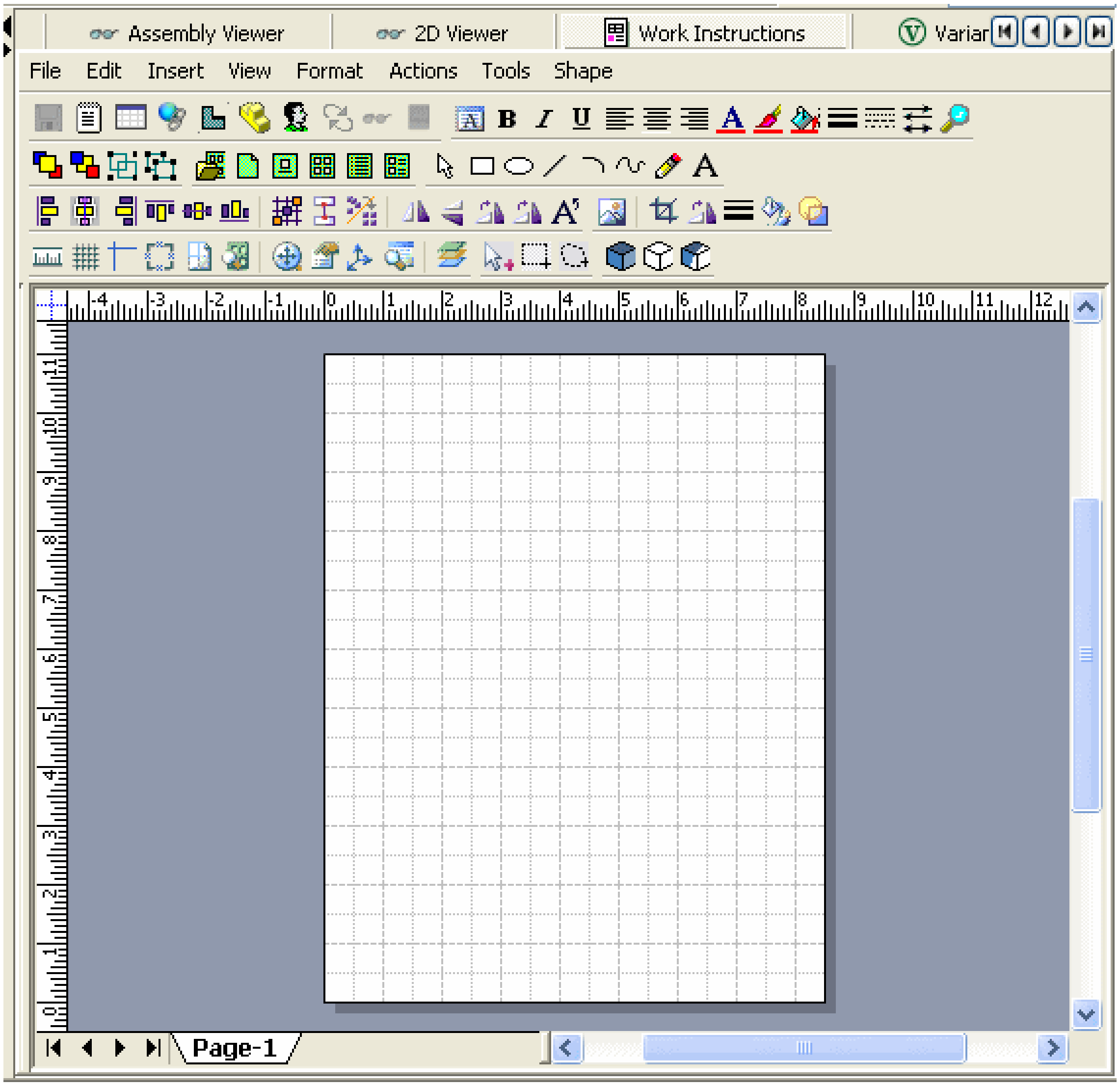
Publishing page roles

Publishing page documents can be used for any number of purposes. By default, two roles are provided, **Work Instructions** and, when a product structure is selected, **Product Manual**. Your database may be configured to support any number of roles. This documentation refers to the **Work Instructions** role, but the behavior of the pane is the same for each role.

Creating and editing publishing pages

Creating and editing publishing pages overview

When you first open the **Work Instructions** pane, you see a blank page.



You can immediately begin to create a work instruction on this page or you can load a template and work from there.

The following is an overview of the process for creating a publishing page.

1. Add any static Visio shapes, text or graphics you need to the page.

2. Associate the page with an alias file.

   Alias files tell Teamcenter what data to display in different assets on the page and how to find that data. This step is optional; a default file is loaded.

3. Place the required assets on the page. These are placeholders. You can place the following objects in a work instruction page, each embedded in an asset of the same name:

- Text that is bound to a property of an object in Teamcenter.
- Tables whose cells map to object properties in Teamcenter.
- 2D images (for example, BMP, GIF or JPEG files)
- 3D geometry assets

  These are objects that you create or view in the embedded viewer, such as a factory view or the desired state of the product at a certain assembly station.

- 2D snapshots

  These are dynamic objects that represent a 2D scene (a view of the base image and markups) that are associated with a BOM line in your product structure.

- Links

  You can create a link to a Microsoft Word file or text file.

4. Associate the asset with a transfer mode and an alias name.

   The transfer mode and the alias tell Teamcenter how to find the data in the database that is displayed in the asset.

5. (Optional) Save this page as a template for reuse.

6. Select one or more assets and an object in Teamcenter to populate the assets.

   This step traverses the structure to find the desired data or files and places them in the selected assets.

You can detach the **Work Instructions** tab to get a movable window. You can then select a different structure line in the Teamcenter window that you can use to create assets on the publishing page.

> Caution:
>
> While the **Work Instruction** tab is still attached, you cannot select a new structure line from which to create assets. Until you detach the tab, all assets in the page are populated with objects attached to the selected BOM line.

Create a publishing page

1. Select the BOM line with which you want to associate the work instructions, for example, the item revision of an assembly or operation.

2. Click the **Work Instructions** tab in the data pane.

3. From the menu commands in the **Work Instructions** pane, choose **File → New TI Dataset**.

   Teamcenter displays the **New Dataset** dialog box.

4. Type a name and description in the boxes at the bottom of the dialog box and click **OK**.

   Teamcenter creates the new publishing page dataset.

5. To add data placeholders (assets) to the template:

Click	To add
	Data found in a **text file** attached to a structure line.
	A collection of **data** found in various properties in tabular form.
	A **link** to a Microsoft Word file or a text file.
	A **2D image** or a **2D snapshot** attached to a structure line.
	A **3D image** attached to a structure line.

6. Drag these placeholders to the desired spot on the page, resizing if necessary.

7. Right-click the asset and choose **Bind**.

   Teamcenter displays the **Bind Table Placeholder** dialog box.

8. Select the transfer mode and alias to use for the data to populate this asset and click **OK**.

> Note:
>
> The work instructions are attached to the BOM line with a **IMAN_MEWorkInstruction** relation.

Binding assets

Binding assets overview

There are several different types of placeholders (assets) that you can place on a publishing page. Each of these must be bound with data from a structure. When you bind the asset, the **Bind** dialog box contains a list of transfer modes and a number of choices, called aliases, from which you can select.

The choice you make for each asset defines how Teamcenter finds the data that is displayed in the asset when you populate it.

Bind textual information

You can bind information found in the text field of an object's properties. You can enter free-form text within the asset to complement the bound information. For example:

> Operator must tighten **&&SUM(<alias_1>)&&** bolts with torque **&&MAX(<alias_2>)&&** and any other **&&alias_3&&**.

1. Detach the **Work Instructions** tab.

2. In the detached tab, click .

   Teamcenter creates a placeholder for the text on the work instruction page.

3. Save the work instruction.

   You must always save a work instruction once to create the dataset before you can populate an asset.

4. Click the **Text Tool** button A to add free-form text to the asset.

5. Right-click the placeholder and select **Bind**.

   Teamcenter displays the **Bind Text Placeholder** dialog box.

6. From the **Transfer Modes** list, select **tcm_export** transfer mode.

   You can select only one transfer mode per text alias.

7. In the **Aliases** list, open the **ObjectProperties** entry and select the piece of textual information that you want to embed. You can choose to manipulate the asset data using the list of simple formula.

   Each piece of bound data is added to the end of the text asset. You may have to rearrange the information after binding the data.

8. Click **Add**.

   > Tip:
   >
   > - You can also type the binding directly into the text asset if you know the format.

- You can bind multiple times to create free-form text plus embedded text in one asset. Switch back and forth between binding and typing free-form text by doing the following:
  - Click the **Arrow Tool** button and right-click the text asset to access the bind dialog.
  - Click the **Text Tool** button and select the text asset to type free-form text.

9. With the **Work Instruction** tab still detached, select the object in the structure pane containing the text that you want to embed in the Teamcenter window. For example, if you want to embed the description of a particular item revision, select that item revision in the structure pane.

10. In the detached **Work Instruction** tab, with the text placeholder still selected, click the **Populate Asset** button .

    Teamcenter displays the specified text on the work instructions page.

Bind data to display in a table format

Use the table asset to embed multiple pieces of information about a selected object.

1. Detach the Work Instructions tab.

2. In the detached tab, click .

   Teamcenter creates a placeholder for the table on the work instruction page.

3. Save the work instruction.

   You must always save a work instruction once to create the dataset before you can populate an asset.

4. Right-click the placeholder and select **Bind**.

   Teamcenter displays the **Bind Table Placeholder** dialog box.

5. From the **Transfer Modes** list, select **tcm_export** transfer mode.

6. In the **Aliases** list, open the appropriate alias, and select the type of information you want in the list and click the plus sign.

   If you select multiple entries, the selected objects appear as columns of the table in the same order as in the **Aliases** pane.

7. Click **OK**.

8. With the **Work Instruction** tab still detached, select the revision in the structure pane containing the objects that you want to embed in the Teamcenter window. For example, if you want to embed the ID, name, and description of all members of an assembly, select the assembly root structure in the structure pane.

9. In the detached **Work Instruction** tab, with the table placeholder still selected, click the **Populate Asset** button .

   Teamcenter displays the specified information on the work instructions page.

Bind linked data

To bind linked data, a dataset with a **.txt** file imported into it must exist. In addition, you must be able to open this **.txt** file in an associated text editor.

1. Detach the Work Instructions tab.

2. In the detached tab, click .

   Teamcenter creates a placeholder for the link on the work instruction page.

3. Save the work instruction.

   You must always save a work instruction once to create the dataset before you can populate an asset.

4. Right-click the placeholder and choose **Bind**.

   Teamcenter displays the **Bind Link Placeholder** dialog box.

5. From the **Transfer Modes** list, select the **ExportGraphic** transfer mode.

6. From the **Aliases** list, select **LinkedDataset**.

7. In the **Attachment** tab of the Teamcenter window, select the text dataset and click **Populate**.

   Teamcenter displays the link on the work instructions page.

Bind a 2D image

You can bind a 2D image that is attached to a revision.

1. Detach the Work Instructions tab.

2. In the detached tab, click .

Teamcenter creates a placeholder for the image on the work instruction page.

3. Save the work instruction.

   You must always save a work instruction once to create the dataset before you can populate an asset.

4. Right-click the placeholder and select **Bind**.

   Teamcenter displays the **Bind Image Placeholder** dialog box.

5. From the **Transfer Modes** list, select **ExportGraphic** transfer mode.

6. In the **Aliases** list, open the **2DGraphic** entry and select **file**.

7. With the **Work Instruction** tab still detached, open the **Attachments** tab in the Teamcenter window.

8. Select the image that you want to embed.

9. In the detached **Work Instruction** tab, with the image placeholder still selected, click the **Populate Asset** button .

   Teamcenter displays the selected image on the work instructions page.

Bind a 2D snapshot

If you embed a 2D snapshot, a **2D geometry asset**2D geometry asset must exist for it.

1. Detach the **Work Instructions** tab.

2. In the detached tab, click .

   Teamcenter creates a placeholder for the image on the work instruction page.

3. Save the work instruction.

   You must always save a work instruction once to create the dataset before you can populate an asset.

4. Right-click the placeholder and select **Bind**.

   Teamcenter displays the **Bind Image Placeholder** dialog box.

5. From the **Transfer Modes** list, select **ExportGraphic** transfer mode.

6. In the **Aliases** list, open the **2DSnapshot** entry and select **file**.

7. With the **Work Instruction** tab still detached, but working In the Teamcenter window, do one of the following to specify which 2D snapshot should be populated:

   - In the **Attachments** tab, select the snapshot.

   - In the **2D Viewer** tab, open the **2D Snapshots Gallery** dialog window and select an existing snapshot.

   - In the **2D Viewer** tab, arrange the snapshot. When you populate the asset, Teamcenter automatically creates the snapshot for you.

8. In the detached **Work Instruction** tab, with the image placeholder still selected, click the **Populate Asset** button .

   Teamcenter displays the 2D snapshot on the work instructions page.

   > Note:
   >
   > If you receive an error saying **Failed to load Error document (2DSnapshot & file)** when populating a 2D asset, the 2D snapshot does not contain a 2D geometry asset.
   >
   > Recapture the 2D snapshot with the option to capture 2D geometry asset data turned on.

Bind a 3D asset

1. Open a structure to which you want to attach a work instruction.

2. Detach the **Work Instructions** tab.

3. In the detached tab, click the **3D Graphic** button.

   Teamcenter creates a placeholder on the work instruction page.

4. In the detached tab, select **File** → **Save TI Illustration**.

   You must save the work instruction once to create the dataset. If you do not save first, you receive an error when populating the asset. Once the dataset exists, this step is no longer required, unless you want to save changes to the work instruction page.

5. Right-click the placeholder and select **Bind**.

   Teamcenter displays the **Bind Geometry Asset Placeholder** dialog box.

6. From the **Transfer Modes** list, select **ExportGraphic** transfer mode.

7. In the **Aliases** list, open the **3DGeometryAsset** entry and select **file**.

8. With the **Work Instruction** tab still detached, but working in the Teamcenter window, do one of the following to specify which 3D geometry should be populated:

   - In the **Assembly Viewer** tab, open the **3D Product View Gallery** dialog box, create a snapshot, then select it.

     > Caution:
     >
     > You must ensure that the **Add or Update 3D Geometry Asset** option is selected before you create a snapshot.

   - In the **Attachments** tab, select the 3D snapshot.

   - In the **Assembly Viewer** tab, arrange the snapshot. When you populate the asset, Teamcenter automatically creates the snapshot for you.

9. In the detached **Work Instruction** tab, with the placeholder still selected, click the **Populate Asset** button.

   Teamcenter displays the 3D geometry asset on the work instructions page.

Populate an empty asset

When you populate an asset, you associate Teamcenter data with it.

1. Select the asset.

2. Select the object in Teamcenter to which you want to link the asset.

3. Detach the **Work Instruction** tab by right-clicking it and selecting **Detach data tab**.

4. Click the **Populate Asset** button or menu command.

Creating a publishing page template

Your site may provide publishing page templates whose content can be used as the starting point for the creation of a new publishing page. A publishing page template is a publishing page dataset that is not populated with actual data.

A page template may contain standard data such as a company logo, pictures, and required text. It may also contain empty placeholders, whose content you must fill for each instance of a publishing page you create from the template.

You can classify templates in the Classification application for easy retrieval.

Classify a template

1. Add the **TCPublishingPage** business object type to the **ics_classifiable_types** preference.

2. Create a publishing page template.

3. In the **Attachments** view, select the template and choose **Send to→Classification**.

4. In Classification, classify the template.

The template is now available when you create a new publishing page from a template.

Create a publishing page from a template

1. Click the relevant tab in the data pane (for example, **Work Instructions**) and choose **File→New TI Dataset**.

   Teamcenter displays the **New Dataset** dialog box.

2. If you know the name of the required template, type it in the **Template name** box.

   If you do not know the name of the template, you can search the database for it. In the **Templates** pane at the top of the dialog box, click the **Find a Template by name** button next to the **Template name** box.

   Teamcenter displays the **Find by Name** dialog box, and you can search by part of the name and with wildcard (*) characters.

   If templates are classified, you can click Classification Search Dialog to find the template you require.

3. When you identify the publishing page you want to use as a template, double-click the name to select it and return to the **New Dataset** dialog box.

4. (Optional) Click the **Add To Favorites** button to add the selected template to the list in the **Templates** pane above it.

5. (Optional) Click the **Use as Default** button to use the specified dataset as the default template if no TI dataset is loaded.

6. In the **File** section, select **Use Template**.

7. Type a name and description in the relevant boxes.

8. Click **OK**.

Teamcenter creates the new publishing page dataset.

Using default templates

All of the default templates contain 3D geometry assets. You can add the following details to specific page templates.

Template	Purpose
TCPartList	Specifies the part list table. When populated, it lists all the parts under the selected BOM line. It includes the item identifier, item name, revision identifier, description, and find number of each part in the list.
TCAssemblyOperation	Use this template at the operation level in a manufacturing structure. It briefly describes the operation, its activities, the consumed parts, and tools required to perform the operation. The **Activities** table lists all the activities under the selected operation, their descriptions and durations. The consumed parts table lists the parts consumed by the selected operation, their identifiers, names, revision identifiers, descriptions, and logical identifiers. The **Tools** table lists the set of tools required by the operation, their identifiers, names, and descriptions.
TCOperationRouting	This template lists manufacturing process details, including the operations under it, the consumed parts of those operations and the list of tools used in those operations. Use this template at the process level. The **Operations List** table lists all the operations under the selected process. The consumed parts table lists all the consumed parts under all the operations below the process. The **Resource List** table lists all the resources under all the operations below the process.
TCActivityDetails	This template describes the activities under an operation. Use this template at the operation level of a structure. For each activity, the name, description, start time, duration, calculated start time, and calculated duration are listed.
TCActivityRouting	This template lists manufacturing activity details, including the operations under it. Use this template at the operation level.
TCActivityToolList	This template contains detailed description of the activities in the structure. It may also be used at the operation level. It lists the following activity details: • The **Activities Consumed Parts** table lists all the activities, their descriptions, and the parts consumed in each of these activities.

Template	Purpose
	• The **Activities Used Resources** table lists all the activities, their descriptions, and resources used in each of the activities.

Example — Populate assets using the TcPartList template

Teamcenter delivers several templates that are ready for you to use. The following is an example of how to use the **TcPartList** template.

1. Load a product assembly. To use the 3D asset, you must load an assembly that displays parts in the assembly viewer.

2. Select a BOM line to which you want to add a publishing page. You can select the top line, if necessary.

3. Turn on the data tab and click the **Work Instruction** tab or some other publishing page tab.

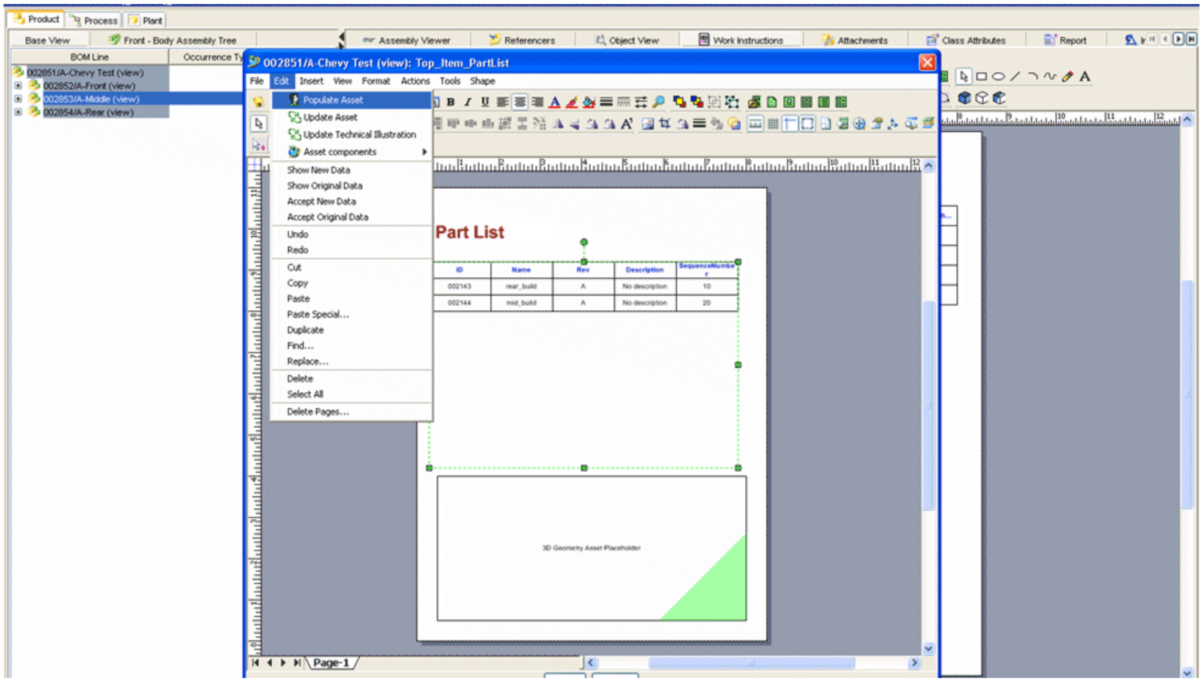
4. Detach the **Work Instruction** tab by right-clicking it and choosing **Detach data tab**.

5. In the publishing page tab, select **File→New TI Dataset**.

6. In the dialog box, find the **TcPartList** template by name and use it as the starting template.

7. Specify a dataset name and click **OK**. The template should appear in the publishing page viewer.

8. Populate the table assets by selecting the node (BOM line) whose data you want to populate in the table asset component in the left-hand navigation tree. Then select the table asset component in the publishing page pane and choose **Edit→Populate Asset**.



9. Populate the 3D geometry asset as follows:

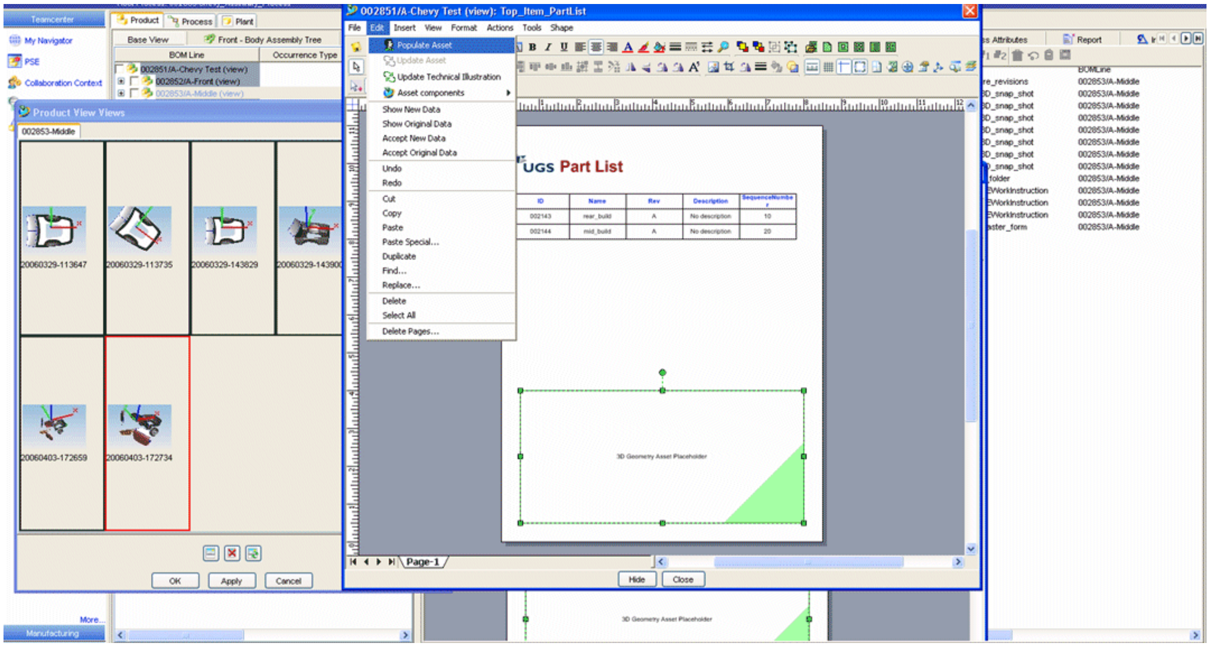
   a. Select the viewer tab.

   b. Turn on parts and use the 3D viewer to manipulate the view until it shows what you want to see in the asset. Include markups if desired.

   c. Ensure that a BOM line is still selected, then select the 3D asset in the publishing page viewer and select the **Populate** button. This creates a new snapshot (product view) dataset and populates the asset with it. You can also populate a 3D asset from an existing snapshot. However, the dataset must have an asset file attached to it. Asset file creation is an option; use the named reference dialog to determine whether or not the dataset has an asset file.

      - Select a snapshot dataset in the **Attachments** tab or in another application.

      - Select a 3D snapshot (product view) in the **Product Views** dialog box of the assembly viewer. Asset file creation is controlled by a menu in this dialog box.



Updating publishing pages

When an asset is populated, a reference to the selected Teamcenter populating object is stored in the asset. If the data in Teamcenter changes, you can update the asset to show the changes. Updating is not automatic; you must explicitly perform an update.

Take, for example, the **TcPartList** template's table. Long after you create the publishing page and populate the table asset, the product structure can be modified. Item names can change or BOM lines can be added or removed from the line that was used to populate the table. After this happens, you can update the publishing page to show the changes.

Update an asset

1. Open the page dataset in a publishing page viewer anywhere in Teamcenter.

2. Select the asset and choose **Edit → Update Asset** from the page viewer menu.

   The new contents of the asset are displayed, along with a triangle indicating that the display shows new (and so far unaccepted) data.

3. Switch between displaying the old and the new data by choosing **Show Original Data** and **Show New Data** from the asset's shortcut menu. The asset is in an uncommitted state. You cannot update the asset again or repopulate it while it is in this state.

4. Accept or reject the change by choosing **Accept New Data** or **Accept Original Data** from the asset's shortcut menu. All of the assets on a page can be updated at once using the publishing page **Edit → Update Technical Illustration** menu. Other **Edit** menus let you toggle the display and accept or reject the changes for all of the assets on the page at once.

> Note:
>
> You cannot update data in the database (other than the publishing page itself) by updating an asset. Assets can only display what is already in the database. To update a 3D asset, you must first update the snapshot dataset in the assembly viewer.

Repopulate an asset

An asset that has been populated can be repopulated with a different Teamcenter component.

1. Select the asset in the detached publishing page viewer.

2. Select the component in the rich client window, and choose **Edit → Populate Asset** in the publishing page window.

3. Switch between displaying the old and the new data by choosing **Show Original Data** and **Show New Data** from the asset's shortcut menu. The asset is in an uncommitted state. You cannot update the asset again or repopulate it while it is in this state.

4. Accept or reject the change by choosing **Accept New Data** or **Accept Original Data** from the asset’s shortcut menu. All of the assets on a page can be updated at once using the publishing page **Edit → Update Technical Illustration** menu command. Other **Edit** menus let you toggle the display and accept or reject the changes for all of the assets on the page at once.

   > Note:
   >
   > You cannot update data in the database (other than the publishing page itself) by updating an asset. Assets can display only what is already in the database. To update a 3D asset, you must first update the snapshot dataset in the assembly viewer.

View populating and end objects

The populating object is the one that was selected when the asset was populated. The end object is the object that is actually displayed in the asset after it is populated. These can be the same object, or different ones, depending on your alias definition.

You can view these objects.

1. Select the asset in the **Work Instructions** pane.

2. Do one of the following:

   - To show the populating object in My Teamcenter, choose **Edit → Asset Components → Send to My Teamcenter → Populating Components**.

- To show the end object in My Teamcenter, choose **Edit** → **Asset Components** → **Send to My Teamcenter** → **End Object**.
- To view the populating object in the default viewer without switching applications, choose **Edit** → **Asset Components** → **View Populating Components**.
- To view the end object in the default viewer without switching applications, choose **Edit** → **Asset Components** → **View End Object**.

> Note:
>
> These menu commands may not work depending on how the alias file is implemented. For more information, contact your administrator.

Create a new work instruction

1. Select the BOM line with which you want to associate the work instructions, for example, the item revision of an assembly or operation.

2. Click the **Work Instructions** tab in the data pane.

3. In the **Work Instructions** tab, choose **File** → **New TI Dataset**.

   Teamcenter displays the **New Document** dialog box.

4. If your site uses templates, select the name of a template, enter a dataset name, and click **OK**.

   > Note:
   >
   > The work instructions are attached to the BOM line with a **IMAN_MEWorkInstruction** relation.

Add new pages to the work instructions or product manual

- Choose **Insert** → **New Page**.

  Teamcenter adds a new, blank page to the active work instructions or product manual. You can also search for an existing page by name or use a Classification search to find a classified page.

Delete pages from the work instructions or product manual

1. Choose **Edit** → **Delete Pages**.

   Teamcenter displays the **Delete Pages** dialog box containing a list of available pages.

2. Select the page to delete and click **OK**.

   Teamcenter deletes the page from the work instructions or product manual.

Save changes to the work instructions or product manual

- Choose **File** → **Save**.

  Teamcenter saves any changes that you made.

Reserve space for headers and footers

You reserve space for headers and footers on a publishing page. When you print or export the work instructions or product manual, any shapes on the publishing page are clipped to the defined margins.

1. Open the work instructions.

2. Choose **View** → **Page Margins**.

   Teamcenter adds a gray-shaded background at the top, bottom, left, and right of the page.

Add export tags

You can add export tags to a page that are replaced with actual information when you print or export it. For example, if you select **page**, the actual page number appears. Additional export tags include date, long date, document file name, portfolio file name and total number of pages.

1. Open the work instructions or product manual.

2. Choose **Insert** → **Portfolio Export Tag** and select a tag from the displayed list. The tag you select appears on the work instructions or product manual.

3. (Optional) Move or resize the export tag on the work instructions or product manual.

Navigate to another publishing page

Use one of the following methods to navigate to another publishing page:

1. Choose **View** → **Page** → **Go to**.

   Teamcenter displays the **Select Page** dialog box.

2. Select the page to you want to navigate.

\- or -

Use the navigation arrow buttons to browse through the available pages.

Export publishing pages to HTML

1. Choose **File** → **Save as Web Page**.

   Teamcenter displays the **Save As** dialog box.

2. Type a name for the exported file and click **Save**.

   Teamcenter displays the **Save as Web Page** dialog box.

3. Change settings for the following options:

Tab	Options	Description
General tab	**Pages to Publish**	Choose **Select All** to print all pages or **Select Pages from** and then type the page span.
	Publishing options	Select any of the publishing options, which appear in the finished Web page to aid navigation and searching.
	Additional options	Choose any of the following: • **Automatically open Web page in browser** • **Organize supporting files in a folder** • Type text in the **Page title** box to name the exported HTML output.
Advanced tab	**Output formats**	Select a format for the HTML output.
	Provide alternate format for older browsers	Choose a format from the list.
	Target monitor	Choose the monitor size.
	Host in Web page	Select a Web page from the list or browse to a file.
	Style sheet	Select a style sheet from the list or browse to a file.

4. Click **OK**.

   Teamcenter displays the publishing pages as a Web page in your default browser.

Export publishing pages to PDF

You can print a portfolio to PDF in My Teamcenter. Before you do this, you must install third party software capable of creating PDF output.

1. Create a portfolio.

2. Open My Teamcenter.

3. In the **File** menu on the viewer tab, choose **Publish PDF to Database**.

Detach the Work Instructions tab

Detaching the **Work Instructions** tab allows you to change the source of the assets. Until you detach this tab, all assets that you populate pertain to the originally selected structure line.

1. Right-click the tab on the data pane.

2. Choose **Detach data tab**.

   Teamcenter separates the tab as a floating window on top of the application that you can enlarge and reposition as necessary.

   The detached tab remains visible unless you delete the component tracked by the tab or select another component in the navigation tree. You can also close the detached window manually by clicking the **x** button in the corner of the window. Teamcenter does not remember the selection of detached tabs between sessions.

Creating a portfolio

About portfolios

Portfolios act as a container for work instructions or product manuals and supporting documents, such as a table of contents, cover or trailer pages, and header and footer information. Portfolios may contain a reference to a publishing page or generic page or to an embedded generic page. You can use portfolios to store document structure information, print multiple publishing pages, and export portfolio contents to HTML or PDF.

You generate portfolios in Manufacturing Process Planner, Part Planner, Multi-Structure Manager, Service Planner, or Plant Designer. You manage portfolios in My Teamcenter only.

When managing a portfolio:

- Use container nodes to add an organizational hierarchy to the portfolio. Think of container nodes as chapters in a book, in which you can separate and group documents. Container nodes are useful for multiple levels in the table of contents.
- During printing operations, Teamcenter creates the table of contents information in a dynamic page.
- Create generic pages for any information page to add to the portfolio, such as cover or trailer pages. Generic pages are not considered publishing pages and Teamcenter does not apply headers and footers to them.
- Add header and footer information to portfolios by creating a special page. Teamcenter copies the shapes in this page to the published pages during printing and export operations. The same header and footer appears on every page.
- When adding supporting documents to portfolios, choose from the following options:
  - **Insert Reference**

    Select a supporting document for the portfolio to reference.
  - **Create**

    Add a new supporting document that Teamcenter embeds in the portfolio. You can only create and embed generic pages.
  - **Embed**

    Copy a supporting document into the portfolio.

Create a portfolio

1. Select the BOM line to which you want to associate the portfolio, which may be a configured item or process revision or occurrence in the structure. The portfolio contains the publishing pages that are attached to the BOM line's child lines.
2. In the Teamcenter window, choose **Tools → Generate Portfolio**.

   Teamcenter displays the **Generate Technical Portfolio** dialog box.
3. In the dialog box, enter a name and select a role such as **Work Instructions** and click **OK**.

   Teamcenter creates a portfolio dataset that contains all of the appropriate pages. The portfolio is created under an intermediate data capture (IDC). If a structure context is opened, the IDC is attached to the structure context. Otherwise it is stored in the **New Stuff** folder.
4. (Optional) To view the portfolio, select it in My Teamcenter and click the viewer tab.

Tip:

Note the menu and toolbars in the **Viewer** pane. These commands help you manage portfolios.

Create container nodes

You can create one or more container nodes in the portfolio in My Teamcenter in the viewer.

1. Select the portfolio in the **Newstuff** folder in My Teamcenter.

   Teamcenter opens the viewer.

2. Using the menu commands within the **Viewer** view, do one of the following:

   - Choose **Actions** → **Create** and select **Container Node**.
   - On the **Technical Portfolio** toolbar, click the **Create container** button.

Create the table of contents

You can create the table of contents for a portfolio in My Teamcenter in the viewer.

1. Select the portfolio in the **Newstuff** folder in My Teamcenter.

   Teamcenter opens the viewer.

2. Using the menu commands in the viewer, do one of the following:

   - Choose **Actions** → **Create** and select **Table of Contents Placeholder**.
   - On the **Technical Portfolio** toolbar, click the **Create table of contents** button .

Add a generic page

You can add a generic page to a portfolio in My Teamcenter in the **Portfolio** pane.

1. Select the portfolio in the **Newstuff** folder in My Teamcenter.

   Teamcenter opens the **Portfolio** pane.

2. Select an area to place the generic page.

3. Using the menu commands within the **Portfolio** pane, do one of the following:

- Choose **Actions** → **Create**, **Actions** → **Insert Reference** or **Actions** → **Embed**, and select **Generic Page**.

  > Note:
  >
  > You cannot search using the classification search if working in My Teamcenter.

- On the **Technical Portfolio** toolbar, click the **Create generic page** button .

Create a header and footer page

You can create a header and footer page in a portfolio in My Teamcenter in the viewer. Teamcenter copies the shapes in this page to the published pages during printing and export operations. The same header and footer appears on every page.

1. Select the portfolio in the **Newstuff** folder in My Teamcenter.

   Teamcenter opens the viewer.

2. Select an area in the portfolio to place the header and footer page.

3. Using the menu commands within the viewer, do one of the following:

   - Choose **Actions** → **Create**, **Actions** → **Insert Reference** or **Actions** → **Embed**, and select **Header/Footer Definition Page**.

   - On the **Technical Portfolio** toolbar, click the **Create header/footer data** button .

   Teamcenter opens a new viewer window with a blank page.

4. Using the commands in the new window, choose t **Insert** → **Portfolio Export Tag** and select one of the following:

   - **Date**
   - **Long Date**
   - **Document File Name**
   - **Portfolio File Name**
   - **Pages**
   - **Total Number of Pages**

   Teamcenter creates a placeholder for the object on the page.

5. Move the placeholder to the desired position.

6. When you have placed all desired export tags, choose **File** → **Post to Technical Portfolio**.

7. Click **Close**.

8. In the viewer, click **File** → **Save**.

Modify header and footer information

1. Select the portfolio in the **Newstuff** folder in My Teamcenter.

   Teamcenter opens the viewer.

2. Right-click the header and footer page in the portfolio tree and choose **Open**.

3. Make any necessary changes.

4. Choose **File** → **Post to Technical Portfolio**.

5. Click **Close**.

6. In the viewer, click **File** → **Save**.

Add a work instruction

1. Select an area in the portfolio to place the work instructions.

2. Do one of the following:

   - Choose **Actions** → **Insert Reference** and select **Technical Illustration**.

   - On the **Technical Portfolio** toolbar, click the **Technical Illustration** button.

   The system displays the **Insert Page** dialog box.

3. Click the **Find a page by name** button and type the name of the work instruction that you want to add.

4. Click **Open**. The work instruction you chose appears in the tab.

Publish a portfolio to HTML

You can publish a portfolio on a Web server by exporting its contents in HTML format. This allows consumer users access to work instructions or product manuals from any Web browser.

1. Choose **File** → **Publish Zip to Database**.

   The system displays the **Publish to HTML Options** dialog box.

2. Edit the export options in these ways:

Tab	Options	Description
General tab	**Destination Folder**	Specify the destination folder where the export data is written by clicking **Save**. Note: Specifying the destination folder is the only required selection in this dialog box. All other options in this dialog box are discretionary selections.
	Create zip file	Create a ZIP file of all export data. Click the **Browse** button to specify the location of the ZIP file. Use this option to allow users without access to Teamcenter to view the data.
	Use title page template	Use a template file for the main HTML title page. Click the **Browse** button to choose the HTML file.
	Replace or remove logo	By default, the HTML output includes the Siemens Digital Industries Software logo. To replace the default Siemens Digital Industries Software logo graphic, click the **Browse** button to locate a replacement graphic. To remove the default Siemens Digital Industries Software logo graphic, click the **Remove** button.
Export Options tab	**Stop if error occurs**	Stop the export operation if an error is encountered.
	Produce flat output	Remove the portfolio structure and document hierarchy.
	Publishing options	Indicate specific control panes to be included in the HTML output for each published page.

Tab	Options	Description
		• Choose **Show Details** to display custom shape properties. • Choose **Go to Page** to include navigation for multi-page work instructions or product manual. • Choose **Search** to enable the ability to search shapes. • Choose **Pan and Zoom** to enable panning and zooming on a page. Note: The **Publishing Options** option is only applicable if you select **VML** for the **Output** format (**VML** is the default). VML output only displays **Publishing Options** if you use the Internet Explorer browser.
Advanced Options tab	**Output formats**	Choose the primary output format for the exported published pages.
	Provide alternate format for older browsers	Indicate a secondary output format for exported published pages, used for older browsers.
	Display options	Select a target monitor size.

3. Click **OK**.

   The Report Definition wizard displays the status of the export operation.

   Note:

   Name lists the supporting documents in the portfolio; **Status** indicates if the supporting documents were exported.

4. Click **Next**.

   The system displays the **Create Report Output** dialog box.

5. Create a standard or custom report output format.

Publish a portfolio to PDF

You can create a PDF file from the portfolio that is attached as a dataset provided you have Microsoft Office installed.

1. Select the portfolio in the **Newstuff** folder in My Teamcenter.

   Teamcenter opens the viewer.

2. Using the menu commands in the viewer, choose **File → Publish PDF to Database**

   Teamcenter creates the PDF and attaches it to the portfolio dataset. You can view it in the viewer.

Creating manufacturing documentation in batch mode

Creating manufacturing documentation in batch mode overview

You can create and update Teamcenter work instructions and portfolios in batch mode, processing multiple documents using the **Teamcenter Publish Batch** dialog box. You do not need to process individual documents manually. You can schedule these tasks to take place immediately or at a later date.

Batch processing uses the Dispatcher infrastructure for scheduling create and update features. Additionally, Dispatcher has built-in status, logging, and error reporting features.

Create or update publishing pages in batch mode

1. Select one or multiple lines in a structure.

   These objects are typically processes, operations, items, or activities that can have publishing pages associated with them. You can select one or more Teamcenter objects for direct batch processing or specify that each object is to be treated as a root object and its children traversed.

2. In Manufacturing Process Planner, choose **Advanced → Publish Batch**.

   Teamcenter opens the **Publish Batch** dialog box.

3. Enter the parameters for the **Set Role and Scope** step.

   a. Select the paste relation used between the new page and its associated end object from the **Publishing Page Role** list.

      The roles available are set in the **TCPUBLISH_BATCH_ROLE** preference.

      This information is required.

b. Select the type of action you want to perform from the **Batch Task** section.

  - Select **Create and Update** to initiate a create task with an update option. The batch task creates pages where they do not exist and updates pages that do exist.

  - Select **Update Only** to only update existing pages.

c. Specify the scope of the page creation in the **Batch Process Scope** section.

  - Select **Process entire structure** to have the create task traverse the entire structure of each selected structure, even if a child line of a structure is selected.

  - Select **Process selected lines** to create a page for the selected object(s) only. If you want to create a page for the selected object and all its child objects, additionally select **Process selected lines substructure**.

4. Enter the parameters for the **Set Update Parameters** step.

   - Select **Update All** to:

     - Generate all missing pages.

       Teamcenter generates a new page for each new object it encounters.

     - Update populated assets.

       Teamcenter checks that all assets display the most current data.

     - Populate unpopulated assets.

       Teamcenter associates data with any empty assets.

     - Process all asset types.

       Teamcenter performs these activities on all asset types found in the work instruction.

   - Select **Selective Update Options** to only perform specific update actions.

5. Associate classes with templates in the **Select Types and Templates** step.

   The **Mark class types to process** list displays the types of objects that can have publishing pages associated with them.

   The **Mark templates to be used with** list contains templates that you associate with a class or type by selecting both the class and the template.

If you select **None** in the templates list, the class or type is not processed.

A type level association overrides the class level definition.

6. (Optional) Add more templates to the templates list.

    a. Click **Add Templates**.

    b. Type a template name in the **Template Name** box.

    c. Click **Search by Name** to search in the database for a template or **Search by Class** to search the classification hierarchy for a classified template.

    d. (Optional) If you are going to use this template repeatedly, add it to a favorites list by clicking **Add to Favorites**.

    e. Do one of the following:

        - Click **Add** to add the current selection to the **Mark templates to be used with class/type** list.

        - Click **OK** to close the dialog box and keep changes to the favorites list.

        - Click **Cancel** to close the dialog box without keeping changes to the favorites list.

7. (Optional) Enter the parameters for the **Define Portfolio Parameters** step.

    A *portfolio* is a container for work instructions. You can use portfolios to store document structure information, print multiple publishing pages, and export portfolio contents to HTML.

    a. Select **Generate a Portfolio**.

    b. Type a name for the portfolio in the **Portfolio Name** box.

    c. Type a description of the portfolio in the **Portfolio Description** box.

    d. (Optional) Select **Use a template** to select a template from the database.

        For more information about using templates, see step 6.

8. Enter the parameters for the **Schedule the Batch Process** step.

    You can schedule the batch process for a specific date and time.

    - Select **Immediate** to initiate the task at the current date and time. Clicking **Finish** on any page without previously selecting scheduling parameters also initiates the task immediately.

- Select **Scheduled** to select a specific start date and time.
- Select **Periodical** to schedule a task that recurs at a specific date and time. You can specify a recurrence pattern on a daily, weekly, monthly, or yearly basis.

9. Click **Finish**.

Update a portfolio in batch mode from My Teamcenter

You can schedule a portfolio for updating in batch mode in My Teamcenter.

1. Open My Teamcenter.
2. Right-click a portfolio dataset and choose **Batch Update Pages**.

   Teamcenter opens the **Publish Batch** dialog box where you can schedule the batch process for a specific date and time.
3. Enter the parameters for the **Schedule the Batch Process** step.
   - Select **Immediate** to initiate the task at the current date and time. Clicking **Finish** on any page without previously selecting scheduling parameters also initiates the task immediately.
   - Select **Scheduled** to select a specific start date and time.
   - Select **Periodical** to schedule a task that recurs at a specific date and time. You can specify a recurrence pattern on a daily, weekly, monthly, or yearly basis.

16. Working with allocations

Allocations overview

An allocation represents a directional relationship between a specific instance of an item revision in one product structure and one or more item revisions in a related structure. For example, you might relate lines in the functional structure to the logical structure or the logical structure to lines in the physical structure. These relationships may span multiple configurations and revisions of both structures. They may change according to the overall configurations or the specific revisions that are configured into the structures.

A group of allocations that map together two or more structures is referred to as an *allocation map* or allocation context. An allocation map is a Teamcenter object that can be revised separately from the structures that it maps. However, depending on your business rules, you may want to revise the allocation map at the same time as you revise the associated structures.

For more information about allocations, see *Getting Started With Product Structure*.

Set up Multi-Structure Manager to use allocations

Siemens Digital Industries Software recommends that you create a collaboration context containing structure contexts representing each of the product representations that you want to associate with allocations. The advantage to doing this is that you automatically save the product configuration of each representation with the collaboration context so that when you reopen it, you have the same state that you had when creating the allocations.

1. Create a new collaboration context of type **CCObject**.

   > Caution:
   >
   > Do not use the **MECollaborationContext** type as this does not support the creation of allocations.

2. For each product representation that you have for your product, create a structure context.

3. In My Teamcenter, copy the root items for each product representation and paste them into the structure contexts in Multi-Structure Manager.

Activate the allocation navigator pane

1. Choose **Edit→Toggle In Allocation Context Mode**.

2. Click **Show Allocation Navigator Panel** .

Find allocations belonging to a BOM revision

1. In My Teamcenter, right-click the BOM view and choose **Where Allocated**.

   The BOM view is displayed in the **Where Allocated** view.

2. Double-click the BOM view.

   The **Where Allocated** view displays all allocation maps associated with that BOM view as well as the other BOM views participating in the allocations.

3. Specify the depth of the search by selecting a level from the **Depth** list.

4. (Optional) Right-click an allocation context object and choose **Send to→Multi-Structure Manager** from the shortcut menu.

   Teamcenter launches Multi-Structure Manager and loads the products structures and allocation sets associated with the selected allocation context object.

Find all allocation map revisions

1. Click **List Allocation Context Revisions** .

   A list of all allocation map revisions associated with a specific allocation map is displayed.

2. Double-click the desired allocation map revision.

Find an existing allocation map

1. Click **Search and Set Existing Allocation Context** .

2. Type a name or ID in the boxes. You can use wildcard characters.

3. Click **Find** .

Create an allocation map

Before you create individual allocations, you must create an allocation map that serves as a container to hold all related allocations.

1. In the **Allocation** pane, click .

   Teamcenter displays the **New AllocationMap** dialog box.

2. Select the type of allocation that you want to create. By default, this list contains only **AllocationMap**. Your administrator can add more allocation types as necessary.

3. Click **Next**.

4. Type an allocation map ID and revision level.

5. (Optional) Type a name and description.

6. (Optional) Enter a unit of measure.

7. Click **Finish**.

   The new allocation map appears in the allocation navigator. Each allocation you create appears as a child of this allocation map.

Create allocations between occurrences

1. Select one or more lines in the structure as *source* components from one or more products structures.

2. Choose **Allocate from** from the shortcut menu.

3. Select one or more lines as *target* components from one or more products structures.

4. Choose **Allocate to** or **Allocate to...** from the shortcut menu.

   - If you choose **Allocate to**, the system automatically generates a name and uses the default allocation subtype.

   - If you choose **Allocate to...**, you are prompted to specify a name for the allocation. Type a name or leave the box blank and the system generates one for you.

   You cannot select source and target from the same structure.

5. (Optional) Enter allocation properties.

   For more information, see *Specify and edit allocation properties*.

6. Click **OK**.

   Teamcenter displays the allocated from symbol in front of the source occurrence and the allocated to symbol in front of the target occurrence in the structures.

Create allocations using drag-and-drop

1. Choose **Tools→Toggle In Allocation Drag N Drop Mode**. If you neglect to activate this menu command, the drag-and-drop action creates manufacturing assignment relationships.

2. Select an occurrence as *source* components from a structure.

3. Drag-and-drop the occurrence onto a *target* occurrence in another structure.

   Teamcenter automatically generates a name for the allocation.

Create allocations between any absolute occurrences in context

By default, Teamcenter creates allocations at the top-level context, but you can create allocations in a subassembly in context by setting the absolute occurrence context in the BOM window to the desired context.

1. Select the occurrence that you want to have as the top-level context and click **In Context Mode**. In-context editing mode is enabled for this line and all its children.

2. Select the source occurrences and choose **Allocate from** from the shortcut menu.

3. Select the occurrence that you want to have as the top-level context in another structure and click **In Context Mode**. In-context editing mode is enabled for this line and all its children.

4. Select the target occurrences and choose **Allocate to** from the shortcut menu.

This is equivalent to opening the individual subassemblies at the desired context level separately and creating allocations between them.

Modify allocations

Modifying allocations allows you to add an additional target or source to the existing allocation.

1. Ensure that **Highlight Allocated Lines Automatically** is turned off.

2. In the allocation navigator pane, select the allocation that you want to modify.

3. Right-click the source or target of the allocation that you want to modify.

4. Choose **Modify Allocation→Add Allocate From** or **Add Allocate To** to add a new source or target.

   -or-

If the allocation exists, choose **Modify Allocation→Remove Allocated From** or **Remove Allocated To** to remove a source or target.

Revise allocation maps

1. In the allocations pane, click .

2. Click **Yes** in the **AllocationContext Revise confirmation** dialog box.

   Teamcenter opens the **New AllocationContext** dialog box with the next revision level automatically displayed.

3. (Optional) Type a new name, description, or select a new unit of measure.

4. Click **Finish**.

5. Click **Close**.

   The next revision of the allocation map opens in the allocation navigator. By default, this contains all the allocations from the previous revision. Your system administrator can change this behavior in the **ALLOC_map_copy_allocations** preference.

Specify and edit allocation properties

1. Select the allocation whose properties you want to edit.

   > Tip:
   >
   > If you click **Highlight Allocated Lines Automatically** , the source and target occurrences, as well as the related allocation in the allocation navigator, all highlight automatically when you select any of the others.

2. Choose **Properties** from the shortcut menu.

   The **Properties** dialog box is displayed where you can add or modify properties.

Delete allocations

1. Right-click desired allocation in the allocation navigator.

2. Choose **Remove Allocation Line** from the shortcut menu.

   The allocation is removed from the list of allocations and the symbols are removed from the occurrences.

Delete allocation maps

1. Click **Clear Allocation Context** .

   Teamcenter asks if you to confirm that you want to remove the allocation map.

2. Click **OK**.

Associating allocations with an incremental change

1. Ensure that incremental change is enabled by checking that the **Incremental_Change_Management** preference is set to **true**.

   For more information about working with preferences, see *Teamcenter Environment Variables*.

2. Open or create a new incremental change.

   For more information about incremental change, see *Incremental change overview*.

3. Add, modify or remove allocations.

4. Optionally, click **View/edit current IC information** on the incremental change context bar to view the recorded allocation changes.

Edit allocations in an incremental change

1. Ensure allocations incremental change is enabled (the **Incremental_Change_Management** preference is set to **true**).

2. Create a new incremental change or open an existing one.

3. Select the occurrence for which you want to see associated allocations and choose **Show Allocations in Allocations Navigator** from the shortcut menu.

   The allocation navigator pane shows a list of allocations associated with the selected occurrence.

4. Select the desired allocation.

   The corresponding source and target components are highlighted in the product structure.

5. Modify or delete source or target components associated with the allocation, or delete the allocation. These modifications are shown in the incremental change.

Compile a traceability report

1. Choose a source or target allocation.

2. Click **Show/Hide the data panel** .

3. In the data pane, click the **Allocations Traceability** tab.

4. Select **To** or **From** in the **Allocated As** box.

5. Double-click the allocation in the **Allocations Traceability** pane to reveal the source/target and the allocation to which these belong.

Filter allocations by type

You can limit the type of allocations shown in a structure as follows:

1. Choose **View→Show Only Selected Allocation Types** or click .

   Teamcenter displays the **Filter Allocations by Type** dialog box.

2. Select the allocation types that you want to see from the **Available Allocation Types** list.

3. Click the plus sign to add these types to the **Selected Allocation Types** list.

4. Click **OK**.

   Only those allocation types that you selected in the **Filter Allocations by Type** dialog box are shown in the allocation navigator.

Submit allocations or allocation maps to a workflow

You can send an allocation or an allocation map through a workflow. If you release an allocation map, you cannot modify existing allocations, nor add or remove any allocations from the allocation map. Releasing an allocation map does not add all allocations to the workflow process as targets unless the process templates are set up to do this. Once the allocation map is released, the status flag only appears for the allocation map and not for the individual allocations. Releasing an allocation does not prevent the allocation map from being modified; you can add new allocations or remove existing allocations from the allocation map. You cannot, however, modify or delete the released allocation.

Releasing an allocation does not prevent the allocation map from being modified; you can add new allocations or remove existing allocations from the allocation map. You cannot, however, modify or delete the released allocation.

Submit an allocation map to a workflow

1. Select the desired allocation map from the allocation navigator pane.
2. Choose **Insert→Process** from the menu.

   The **Workflow process** dialog box is displayed.
3. Select the appropriate process template for your needs.

Submit an allocation to a workflow

1. Select the occurrence associated with the allocation to be released.
2. Choose **Show Allocations** from the shortcut menu.
3. Select the allocation to be released from the allocation navigator pane.
4. Choose **Insert→Process**.

   The **Workflow process** dialog box is displayed.
5. Select the appropriate process template for your needs.

Apply effectivity to an allocation

1. Select the occurrence associated with the allocation for which you want to add effectivity.
2. Choose **Show Allocations** from the shortcut menu.
3. Select the released allocation from the allocation navigator pane.
4. Choose **Tools→Effectivity** from the menu.

   For more information about setting effectivity, see *About occurrence effectivity*.

Sharing allocations to other sites

You can share allocations to other sites using Multi-Site Collaboration.

For more information about using this, see *Multi-Site Collaboration*.

Importing and exporting allocations

You can import and export allocations using PLM XML.

For more information about using PLM XML, see *Tc XML and PLM XML Configuration for Data Import and Export*.

Configuring allocations

You can configure an allocation just as you can configure a structure. By associating conditions with the allocation relationships, you can configure various allocations in and out of a product.

For more information about configuring allocations, see *Getting Started With Product Structure*.

17. Importing and exporting structures and items

Exporting items or structures

Multi-Structure Manager uses PLM XML to export and import data. To use this, appropriate transfer modes must be created that select the correct data to export. You create these transfer modes in the PLM XML application.

For more information, see *Tc XML and PLM XML Configuration for Data Import and Export*.

You can export any of the following from a collaboration context:

- BOM lines

  Any components attached to the BOM line are also exported.

- Product structure

  If the product structure includes multiple views, all the views are also exported.

- Operations

  Any consumed items, resources, and plant data attached to the process structure are also exported.

- Process structure

- Plant structure

- Structure context

- The complete collaboration context and all the structure contexts it contains

There are various methods used to export structures.

For more information about importing structures, see *Teamcenter Basics*.

Importing a structure

You can import any of the following into a collaboration context:

- A product structure and its assembly views

- A process (BOM) structure
- A plant (BOM) structure
- A collaboration context and the structure contexts it contains

There are various methods used to import structures.

For more information about importing structures, see *Teamcenter Basics*.

Importing and exporting collaboration contexts using Multi-Site Collaboration

You can use Multi-Site Collaboration to share structures with other sites. If you use it to share collaboration context objects, take the following into consideration:

- When using saved revision rules, export all revision rules at the original site using **plmxml_export –xml_file=file_name –class=revisionrule** and use **plmxml_import –xml_file=file_name** at the importing site before using Multi-Site Collaboration with collaboration or structure context objects. Unsaved or modified revision rules are handled automatically.
- Export individual structures prior to exporting a collaboration or structure context to get the proper revisions of the objects in the structures.
- The configuration context does not affect which revisions are exported if you export a BOM with a collaboration or structure context.

Using the Application Interface Viewer

About the Application Interface Viewer

The Application Interface Viewer allows you to monitor and administer data exchanges between Teamcenter and an external application using the Application Interface (AI) service functionality.

For more information about the AI Service, see *Services Reference* on Support Center.

The data exchanges between Teamcenter and the external application are in PLM XML format, and the data may represent a project, product, process, or other data structure. The Application Interface Viewer is intended for use by administrators and other skilled users who have an understanding of the AI service functionality and PLM XML syntax.

The Application Interface Viewer allows you to do the following:

- View an application interface object that manages the data in an import or export transaction.

- Create a synchronization request and track its state and status. The synchronization request captures the data to export to the external application.
- Create a publish request and track its state and status. The publish request captures the data to import into Teamcenter.

Understanding Application Interface Viewer objects

The following objects are used in the Application Interface Viewer:

Object	Description
Application interface object	A persistent workspace object that is the repository for the import and export transactions between Teamcenter and the external application for a predefined and configured structure. It contains: • An ordered list of request objects. • The transfer mode (import or export). • The root or top-level object of the structures to exchange. This may be any object that is valid to import into or export from Teamcenter, for example, a structure context, a folder, or an item (including all its revisions). • Tracking information to allow updates of changed data (*deltas*).
Master record object	A persistent POM object that captures information about import and export data. Teamcenter can detect changes to his information and export only changed data.
Sync request object	A persistent workspace object that tracks the data, state, and status of a request to export data from Teamcenter. The synchronization request contains the PLM XML file holding the imported data. It also contains state and status information that allows you to monitor the request from creation to completion.
Publish request object	A persistent workspace object that tracks the data, state, and status of a request to publish data in Teamcenter. The publish request contains the PLM XML file holding the imported data. It also contains state and status information that allows you to monitor the request from creation to completion.
Transfer mode object	A persistent workspace object that is a repository of details of one type of translation. It captures a set of filters, and property sets that define a PLM XML translation on import or export.

Types of tracking requests

The Application Interface Viewer allows you to track three types of requests:

- **Synchronization** request

  This is associated with a single data export transaction.

- **Publish** request

  This is associated with a single data import transaction.

- **Notify** request

  This informs the Teamcenter and external application users of the success or failure of the transaction.

The import or export of data may take significant time, depending on the size of the structure. Each request transitions through several states and you can monitor these states to determine the status of the request. The possible request states are:

State	Request status
New	The request is created but not yet processed.
Processing	PLM XML data creation is in progress, or a PLM XML file import has begun.
Pending	Processing is complete and communication of the synchronization request is in progress, or the synchronization request is complete, but the **Publish** request is not processed.
Communicating	Teamcenter and the external application are exchanging data.
Completed	Processing of the transaction request is complete but not necessarily successful.
Rejected	The transaction request is rejected. Teamcenter maintains the history of requests, unless you explicitly delete them.

Interpreting request status

Each request may have one of the following status values:

Status value	Meaning
Normal	No errors have been detected.
Warning	An error was detected, but processing continued.

Status value	Meaning
Severe	A failure occurred and processing terminated.
Abort	The transaction was interrupted.

The following table lists the possible status transitions and the resulting actions.

Cause	New state	New status	Actions taken
Severe failure during processing. Transaction cannot recover.	**Completed**	**Severe**	For a synchronization request, Teamcenter deletes the request. For a publish request, the completed processing is undone and the request remains in the queue.
Recoverable failure during processing.	**Pending**	**Warning**	For a synchronization request, Teamcenter deletes the request. For a publish request, the completed processing is undone. You may resume the transaction at any time when the cause is rectified.
Failure during communication.	**Communicating** (unchanged)	**Warning**	You may resume the transaction at any time.
The user aborted communication.	**Communicating** (unchanged)	**Abort**	You may resume the transaction at any time.
A reject request is initiated by a user with write permission to the request.	**Rejected**	**Normal**	You can delete the request from the queue.
Invalid access rights or the object is locked.	**Unchanged**	**Warning**	You may resume the transaction at any time when the cause is rectified.

Allowable states transitions

The following table lists the permissible state transitions for a synchronization request. It also shows when application interface objects and requests are locked for update.

Initial state	New state	Changed by	Preconditions	Object locking
None.	**New**	An application interface object when a request creation is initiated by a user or workflow action.	The requestor must have write access to the application interface object.	None.
New	**Processing**	An application interface object during generation of PLM XML for the request.	None.	The application interface object is locked for updating.
Processing	**Pending**	An application interface object after processing is complete.	The request is successfully processed.	The application interface object is unlocked.
Pending	**Communicating**	AI service on a call to start data exchange.	The request has export access rights.	The request is locked to update and to retrieve files.
Communicatin g	**Completed**	AI service on a call to end data exchange.	The file transfer is complete.	The request is unlocked.

The following table lists the permissible state transitions for a **Publish** request. It also shows when application interface objects and requests are locked for update.

Initial state	New state	Changed by	Preconditions	Object locking
None.	**New**	An application interface object when a request creation is initiated by a user or an AI service request to create a **Publish** request.	The requestor must have write access to the application interface object. There must be no pending synchronization request.	None.
New	**Communicatin g**	AI service on a call to start a data exchange.	None.	The request is locked to update

Initial state	New state	Changed by	Preconditions	Object locking
				and to retrieve files.
Communicatin g	**Pending**	AI service on a call to end a data exchange.	The file transfer is complete.	The request is unlocked.
Pending	**Processing**	An application interface object triggered by a user or workflow action.	The request has import access rights to the request object. There must be no pending synchronization request.	The application interface object is locked for updating.
Processing	**Completed**	An application interface object after processing is complete.	Processing is complete.	The application interface object is unlocked.

Share data with the external application

1. Select one or more BOM lines.

2. Request that the associated data is sent to the external application by choosing **Tools→Export objects→AppInterface**.

3. Select the relevant application interface type from the list.

   Teamcenter:

   a. Creates a new structure context containing an occurrence group for the selected BOM lines, and assigns the window configuration to the structure context.

   b. Creates a new application interface object and attaches the structure context to it.

   c. Attaches the import and export transfer modes associated with the external application to the application interface object.

   d. Traverses the structure context according to its configuration and export transfer mode, then creates the necessary PLM XML data.

   e. Creates a master record of all the objects it created and attaches them to the application interface object.

f. Creates a synchronization request and attaches the PLM XML file to this request.

g. Attaches the synchronization request to the application interface object.

4. The external application is launched and Teamcenter passes it the application interface object and user identifications. It then:

   a. Logs on using the AI service.

   b. Retrieves the PLM XML file and the corresponding datasets.

   c. Sets the synchronization request state to **Completed**.

   d. Logs off using the AI service. The application interface object, synchronization request, and corresponding data are deleted.

You can monitor the progress of these transactions with the Application Interface Viewer.

Open the Application Interface Viewer

1. Select an application interface in the navigation tree.

2. Click the **Viewer** tab.

   Teamcenter opens the Application Interface Viewer showing details about the selected application interface transactions.

   When the Application Interface Viewer opens, it shows a table of all request transactions with the external application. For each request object, the following information is shown by default:

   - **Name**
   - **Request Type**
   - **Last Modified Date**
   - **Last Modified By**
   - **Processed Date**
   - **Processed By**
   - **Status**
   - **Status Description**

- **State**
- **State Description**

Note:

You can customize how the table of requests displays by right-clicking in the table columns. You can then add, remove, and reposition columns in the table. You can also define criteria for sorting data in the table, and create and modify data display filters.

Control transactions

1. Open the Application Interface Viewer.
2. Use the following buttons on the viewer to control transactions:

   Add Sync

   Allows you to create a new synchronization request and add it to the table of requests.

   Add Publish

   Allows you to create a new publish request and add it to the table of requests.

   Process

   Allows you to accept the request currently selected in the table. It is disabled if a request is not selected.

   Reject

   Rejects the currently selected request.

   Delete

   Deletes the currently selected request.

   Refresh

   Refreshes the status of all requests in the table.

   Export

   Allows you to export the PLM XML file associated with the request to a specified folder.

Using incremental changes with requests

You can use incremental change orders to manage changes to the application interface data.

- Any such incremental change data is sent to the external system when the user initiates a synchronization request.
- Similarly, data changes caused by a publish request may result in incremental changes.

> Note:
>
> If a request object in the viewer has incremental changes associated with it, the corresponding entry in the table is colored blue.

Administering data transfers

Export data through the application interface

To send structure data to synchronize with the external application, you can create a new synchronization request and append it to a new or available application interface object, as follows:

1. Choose **Tools→Export→AppInterface** and choose the appropriate application interface type for the external application.

   The system displays the **Application Interface Export** dialog box.

2. In the dialog box, specify the following data:

   - **Request Name**

     Type a unique name for the synchronization request.

   - **Request Description**

     Type a unique description for the synchronization request.

   - **Root Objects**

     Displays the list of root objects such as structures to export.

   - **Check Out Objects?**

     Select this check box to check out affected objects (structures) when data export commences. By default, the objects are *not* checked out.

   - **Complete or Delta**

     By default, only changed data is exported, depending on how your preferences are set. Select this check box to export all data.

     > Note:
     >
     > If you create a new application object, only complete data may be exported.

- **Set Request State on Completion**

  Select if the request state is set to **Pending** or **Complete** when the export process is complete. This allows you to track import and export activity with the Application Interface Viewer when the user manually updates data with import or export actions.

- (Optional) Select the **Is Incremental Export** check box to export only changes to large structures. This check box is only available if the **AI_Incremental_Export** preference is set to **true**.

3. Click the **Existing AI Objects** button to display and choose from a list of objects to export, or click **New** to create a new application interface object. If you create a new object, the system displays a **New AI Object** dialog box, where you must define the following:

   - **Name**

     Type a unique name for the new application interface object.

   - **Request Description**

     Enter a type for the new application interface object.

   - **Transfer Mode**

     Choose a transfer mode from a list of all transfer modes in the database that are marked as *incremental*.

   - **Site Name**

     Choose a site name from the list of available sites.

   - **Check Out Objects?**

     Select this check box to check out affected objects when data export commences. By default, the objects are *not* checked out.

4. After you define the necessary data, click **OK** or **Apply** to create a new publish request, generate PLM XML data, and append it to the queue of requests in the specified application interface object.

Import data through the application interface

To import structure data and update Teamcenter with the imported data, you can create a new publish request and append it to a new or existing application interface object, as follows:

1. Choose **Tools→Import→Import Through AI**.

Teamcenter displays the **Application Interface Import** dialog box.

2. In the **Application Interface Import** dialog box, specify the following data:

   - **Request Name**

     Type a unique name for the publish request.

   - **Request Description**

     Type a unique description for the publish request.

   - **Check In Objects?**

     Check this check box to check in affected objects when data import commences. By default, the objects are *not* checked in.

   - **Change Order**

     Optionally, you can create a new change order or associate an existing one with the import process to track the incremental changes resulting from the imported data.

3. Click the **Existing AI Objects** button to display and choose from a list of existing objects to import, or click **New** to create a new application interface object.

   If you create a new object, Teamcenter displays a **New AI Object** dialog box, where you must define the following:

   - **Name**

     Type a unique name for the new application interface object.

   - **Description**

     Enter a type for the new application interface object.

   - **Transfer Mode**

     Choose a transfer mode from a list of all transfer modes in the database that are marked as *incremental*.

   - **Site Name**

     Choose a site name from the list of available sites.

4. After you define the necessary data, click **OK** or **Apply** to create a new publish request and append it to the queue of requests in the specified application interface object.

Create a synchronization request

1. To create a new synchronization request, click the **Add Sync** button.

   The system displays the **Request Creation** dialog box.

2. Define the following:

   - **Request Name**

     Type a unique name for the synchronization request.

   - **Request Description**

     Type a unique description for the synchronization request.

   - **Full Update or Partial Update**

     Choose **Full Update** to update all the data you specified when you created the application interface. Choose **Partial Update** to update only preselected structures.

   - **Complete or Delta**

     By default, only changed data is exported, depending on how your preferences are set. Select this check box to export all data.

     > Note:
     >
     > If you create a new application object, only complete data may be exported.

   - **Check Out Objects?**

     Check this check box to check out affected objects when data export commences. By default, the objects are *not* checked out.

3. Click **OK** or **Apply** to create a new synchronization request.

Process a publish request

1. Click the **Process** button.

   Teamcenter displays the **Publish Request Process** dialog box.

2. Define the following:

   - **Request Name**

     Type a unique name for the publish request.

   - **Request Description**

     Type a unique description for the publish request.

   - **Request State for read only**

     Enter the required state of the publish request for a read-only transaction.

   - **Request Status for read only**

     Enter the required status of the publish request for a read-only transaction.

   - **Change Order**

     Optionally, you can create a new change order or associate an existing one with the import process, to track the resulting incremental changes.

   - **Effectivity**

     Click this tab to edit the effective units or dates.

3. Click **OK** or **Apply** to process a publish request.

18. Releasing a collaboration context

Releasing a collaboration context

Teamcenter does not provide any default workflow processes for releasing collaboration contexts and structure contexts. Your administrator must create the necessary workflows for your site, as described in the *Workflow Designer on Rich Client*.

> Caution:
>
> If a collaboration context or a structure context is referenced by another object, it may be released when that object is released.

19. Aligning CAD and BOM

Introduction to aligning CAD and BOM

Anyone who manages parts and designs separately must align the CAD designs and the BOM at appropriate times, using the techniques described in *Aligning CAD designs and parts*.

If you use Teamcenter product master management (Product Master Management), you must use the specific methods described in *Aligning CAD and BOM for BOM-Driven Digital Mockups*.

For information about Product Master Management, see *Managing Your Product Master* in the Product Master Management collection.

Reconciling two views of a product

Aligning CAD designs and parts

At some stage of its life cycle, a business part typically has a design solution developed for it. The business part and the design solution may have different life cycles.

- One part may have several corresponding design representations, for example, flexible parts.
- Conversely, a single design model can represent multiple parts, for example, colored parts. Also, you may want to organize the part structure and the design structure differently, depending on your business practices.

When the part and the design structures are independent, you must reconcile these two views of the product. For an occurrence of part, you must know the corresponding positioned design; that is the occurrence of the design positioned in the context of the product. Likewise, you may want to visualize the positioned design from the part structure; that is, reconcile the position and shape needed from the design.

You can align any types of items that are appropriate for your business practices, for example, parts with CAD designs, or parts with documents.

- You can globally associate a part and a design, in which case all revisions of the part and design are automatically associated. The association between the items is revision independent.
- Alternatively, you can choose to evaluate the alignment each time the part or design is revised. This configuration ensures the design can always be correctly visualized wherever it occurs in the structure.

> Caution:
>
> Before aligning items, ensure that master forms are attached to all item and item revision business objects. Otherwise, the alignment process may be unsuccessful.

You can optionally automate the alignment so that when the user creates a design, Teamcenter automatically creates the corresponding part. To do this, you define the source, target, and relationship of the automated creation process in the Business Modeler IDE, for example, **Part**, **Design** and **TC_Is_Represented_by**. You can also use custom source and target types. Alternatively, you can configure the creation of a design to trigger a workflow that notifies a part engineer to manually create the corresponding part.

- When you revise a part, you decide whether to carry forward existing associations with design revisions. By default, all associations with **Represented By** relationships are carried forward. Conversely, when you create a new revision of a design, the existing associations with parts are *not* carried forward by default. This allows the designer to determine manually when to make the new revision visible to the BOM engineer.

- To allow automatic propagation of a new design revision to the associated part revision, add a **TC_Is_Represented_By,Part Revision,LookLeft** string to the **AutoCopyRel** business object constant on the design revision object with the Business Modeler IDE. However, propagating the design revision to the part revision does not automatically make it the *primary* revision, that is, the revision displayed in the viewer. The primary revision is controlled by the maturity level, as described later.

> Note:
>
> Automatic propagation assumes an association between a single design and a single part. If a design revision is associated with several revisions of the same part, the latest mature revision is carried forward. If a design revision is associated with revisions of different parts, nothing is propagated.

After aligning the structures, you *publish* the occurrence data.

- You publish occurrence data between source and destination absolute occurrences of two representations. Teamcenter takes a snapshot of the source occurrence data and creates a publish link to the destination occurrence. For example, you can publish transform and shape information from a source design occurrence to a destination part occurrence. If the source occurrence data is already published, Teamcenter updates the snapshot with the new information.

- A publish link may associate a source design occurrence with more than one target part occurrence. For simplicity, the following procedures assume you are working with a single target part occurrence, but multiple targets are permitted depending on your product structure.

> Note:
>
> If you associate multiple targets, Teamcenter may automatically mark one of the part occurrences as *primary*, based on an assessment of the maturity of the design occurrence and its latest revision.

You publish links in Multi-Structure Manager, but you can also create and view associations in My Teamcenter.

The parts and designs may be included in a collaboration context, but this is not required.

Create a publish link

When you align a part occurrence and a design occurrence, you create a publish link between them, and Teamcenter copies information from the source occurrence to the target occurrence.

1. Open the structures containing the part and design in two different structure panes.

2. Set any equivalent absolute occurrence context needed on each structure.

3. Select the design line and the part line, ensuring the source line is dimly highlighted and the target line is brightly highlighted. That is, when you create a publish link *from* a design occurrence *to* a part occurrence, the line representing the design is dimly highlighted and the line representing the part is brightly highlighted.

4. Choose **Tools→Structure Alignment→Create Publish Link**.

   Teamcenter create a publish link between the selected occurrences, indicating they are now aligned.

   If you select an inappropriate occurrence type, the system displays an error message that a publish action is not supported for one of the selected types.

   > Note:
   >
   > Configure alignable types by setting the **PUBLISH_AlignableSourceTypes** and **PUBLISH_AlignableTargetTypes** preferences.

5. To add another target part occurrence to this publish link, select the design occurrence and choose **Tools→Structure Alignment→Add Targets to Publish Link**.

Publish occurrence information

You can capture transformation and shape information on a source design occurrence and publish it to the destination part occurrence.

1. Select the structure line corresponding to the source design occurrence.

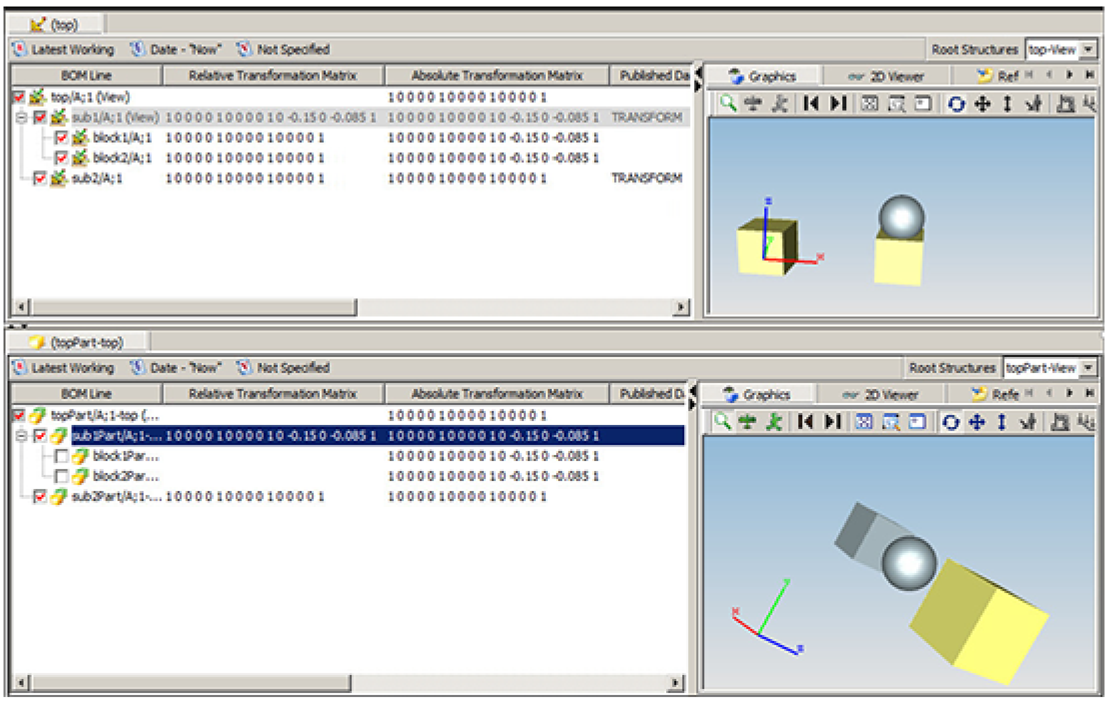
2. Choose **Tools→Structure Alignment→Publish Data**.

   The system displays the **Publish Data** dialog box.

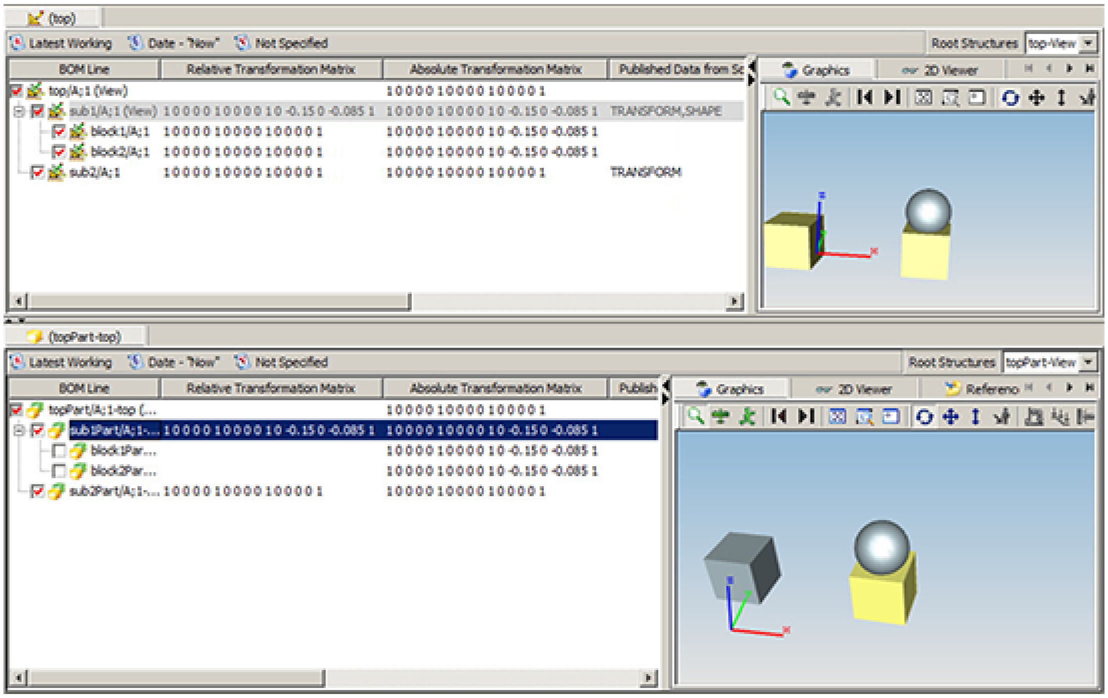
3. Select the **transform** check box to publish transform data or the **shape** check box to publish shape data and click **OK**. You can select both transform and shape data, if appropriate.

   Tip:

   When you publish only transform data, the transformation values for the design and part structures match, but the transformation is not applied to the part in the graphics window.

   When you publish both transform and shape data, both are updated.



Teamcenter checks if a publish link already exists for the selected source. If it exists, Teamcenter locates the destination occurrence with the same logical identify and publishes a snapshot of the selected information to it. If it does not exist, you are prompted to create the necessary publish link, as described in *Create a publish link*.

4. If the underlying revisions of the part occurrence and design occurrence are not already associated globally, Teamcenter prompts you to associate them. Click **Yes** to create the global association; otherwise click **No**.

Note:

Teamcenter validates that the logical identity of the part and design occurrences are the same if a logical identity is defined for the design occurrence. If not, it terminates the publish process.

If the design occurrence has no logical identity, Teamcenter sets the usage address and position designator to the same as that of the part occurrence.

Find occurrence with publish link

1. Open the structures containing the part occurrences and design occurrences in two different structure panes.

2. Select a structure line that represents a part occurrence or design occurrence.

3. Choose **Tools→Structure Alignment→Find Publish Link Source** to identify the source design occurrence, or choose **Tools→Structure Alignment→Find Publish Link Targets** to identify the target part occurrence.

   Teamcenter identifies all publish links for which the selected occurrence is a source or destination, as applicable. It highlights the linked occurrences in the companion pane. If it does not find any publish links, it displays an error message.

> Note:
>
> You can also use the accountability check to identify linked occurrences, as described in *Checking the integrity of the structure*. Select the **Treat occurrences with Publish Link as SAME** check box if you use this method.

Remove target from publish link

1. Open the structures containing the part occurrence and design occurrence in two different structure panes.

2. Set the appropriate absolute occurrence context needed on each structure.

3. Select the part occurrence with the publish link to remove.

4. Choose **Tools→Structure Alignment→Remove Target from Publish Link**.

   Teamcenter removes the target part occurrence from the selected publish link. Removing the target of the publish link does not delete the part occurrence or the publish link.

   To add a new target part occurrence to this publish link, select the design occurrence and choose **Tools→Structure Alignment→Add Targets to Publish Link**.

Delete publish link from source

1. Select the source design occurrence and choose **Tools→Structure Alignment→Delete Publish Link for Source**.

   Teamcenter displays the **Unpublish data** dialog box.

2. Select **Transform** or **Shape** to unpublish the corresponding data and then click **OK**.

   Teamcenter deletes the publish link associated with the selected design occurrence. It does not delete the design occurrence or the part occurrence.

Find occurrences with the same logical identity

1. Open the structures containing the part occurrences and design occurrences in two different structure panes.

2. Select a part occurrence or design occurrence.

3. Choose **Tools→Structure Alignment→Find Lines with Same Logical Identity**.

   Teamcenter highlights all lines with the same logical identity as the selected line. These lines *may* be associated with it by a publish link.

Checking the integrity of the structure

You can run the following checks to verify the integrity of the structure you built:

- Accountability check

  You can open two associated structures and run an accountability check to verify if all occurrences in the publish link are mapped.

  For information about how to make an accountability check, see *Running accountability checks*.

  When running an accountability check for this purpose, select the **Treat occurrences connected via Publish Link as same** check box and clear the **Treat same absolute occurrence as same** check box.

  Occurrences of a part that do not require a design have publish links and are shown as **Missing source**. Use the **Requires Positioned Design** column in one of the structure editor applications to identify such occurrences. Take care to differentiate occurrences that require a positioned design and do not yet have a publish link from those that do not require a design at all.

  > Note:
  >
  > The default properties for the accountability check are controlled by the **DefaultAccountabilityCheckProperties** preference. Select the exact properties for comparison in the **Accountability Check** dialog box.

- Completeness check

  You can run a completeness check on a part structure to identify if all part occurrences that require aligned designs have them. The check also identifies if a transform or shape is published and a primary design is associated with the part.

  The number of levels in the structure that the completeness check traverses is determined by the value of the **PartStructureDepthForCompletenessCheck** preference.

Perform completeness check on part structure

- Open the part structure and choose **Tools→Structure Alignment→Completeness Check→Verify Part Structure**.

  Teamcenter highlights all part occurrences in one of the following colors:

  - Red

    Part occurrences that require a positioned design that is not yet aligned.

  - Green

    Part occurrences that have the required positioned design or do not require a positioned designed.

  - No color change

    Skipped occurrence (an occurrence that is not a part type).

> Caution:
>
> This check does not check the completeness of the structure, except for the complete alignment required for a positioned design.

Viewing the positioned design from the part structure

Checking the integrity of the structure

Checking the integrity of the structure

You can run the following checks to verify the integrity of the structure you built:

- Accountability check

  You can open two associated structures and run an accountability check to verify if all occurrences in the publish link are mapped.

  For information about how to make an accountability check, see *Running accountability checks*.

  When running an accountability check for this purpose, select the **Treat occurrences connected via Publish Link as same** check box and clear the **Treat same absolute occurrence as same** check box.

  Occurrences of a part that do not require a design have publish links and are shown as **Missing source**. Use the **Requires Positioned Design** column in one of the structure editor applications to identify such occurrences. Take care to differentiate occurrences that require a positioned design and do not yet have a publish link from those that do not require a design at all.

> Note:
>
> The default properties for the accountability check are controlled by the **DefaultAccountabilityCheckProperties** preference. Select the exact properties for comparison in the **Accountability Check** dialog box.

- Completeness check

  You can run a completeness check on a part structure to identify if all part occurrences that require aligned designs have them. The check also identifies if a transform or shape is published and a primary design is associated with the part.

  The number of levels in the structure that the completeness check traverses is determined by the value of the **PartStructureDepthForCompletenessCheck** preference.

Perform completeness check on part structure

- Open the part structure and choose **Tools→Structure Alignment→Completeness Check→Verify Part Structure**.

  Teamcenter highlights all part occurrences in one of the following colors:

  - Red

    Part occurrences that require a positioned design that is not yet aligned.

  - Green

    Part occurrences that have the required positioned design or do not require a positioned designed.

  - No color change

    Skipped occurrence (an occurrence that is not a part type).

> Caution:
>
> This check does not check the completeness of the structure, except for the complete alignment required for a positioned design.

A. Multi-Structure Manager preferences

ALLOC_Group_Allocation_Types

DESCRIPTION

For use with allocation functionality. Specifies the allocation types that can be used in the specified allocation map. For example, ensure the **Allocation_One** allocation type is created only in association with the **AllocationMap_one** allocation map by setting this preference to:

> **AllocationMap_one**:**Allocation_One**

VALID VALUES

*Allocation map type***:***Allocation type***,***Allocation type*

Where *Allocation map type* is a valid Teamcenter allocation map type, and all *Allocation type* entries are valid Teamcenter allocation types.

DEFAULT VALUES

AllocationMap:Allocation

DEFAULT PROTECTION SCOPE

Site preference.

ALLOC_Product_Representation_Types

DESCRIPTION

For use with allocation functionality. Specifies which BOM view types can be used to create allocations in the specified allocation map. For example, ensure allocations are created only between **Process** and **View** types for the **AllocationMap_one** allocation context by setting this preference to:

AllocationMap_one:Process,View

VALID VALUES

Allocation map type:*View type1*,*View type2*

Where *Allocation map type* is a valid Teamcenter allocation map type, and all *View type* entries are valid subtypes of Teamcenter views.

DEFAULT VALUES

AllocationMap:view,CAEAnalysis,Process,Setup

DEFAULT PROTECTION SCOPE

Site preference.

ALLOC_Target_Occurrence_Types

DESCRIPTION

For use with allocation functionality. Specifies which components can be used as target components for a given allocation type.

VALID VALUES

Allocation type::*Target component type*

Where *Allocation type* is a valid Teamcenter allocation type, and *Target component type* is a valid Teamcenter object type used in a product structure.

DEFAULT VALUES

Allocation:Item,PSConnection,PSSignal,RouteLocation,GeneralDesign Element, GeneralDesignElementLink

DEFAULT PROTECTION SCOPE

Site preference.

ALLOC_Source_Occurrence_Types

DESCRIPTION

For use with allocation functionality. Specifies the components that can be used as source components for a given allocation type.

VALID VALUES

Allocation type::*Source component type*

Where *Allocation type* is a valid Teamcenter allocation type, and *Source component type* is a valid Teamcenter object type used in a product structure.

DEFAULT VALUES

Allocation:Item,PSConnection,PSSignal,RouteLocation,GeneralDesign Element, GeneralDesignElementLink

DEFAULT PROTECTION SCOPE

Site preference.

ALLOC_source_target_cardinality

DESCRIPTION

For use with allocation functionality. Specifies the cardinality permitted between a given allocation type and other product structure object types.

> Note:
>
> Specify valid target components for a particular allocation type using the **ALLOC_Target_Occurrence_Types** preference. Specify valid source components for a particular allocation type using the **ALLOC_Source_Occurrence_Types** preference.

The system supports multiple sources and targets for allocation using cardinality functionality. The system supports the following allocation relationships:

One-to-one
Many-to-one
One-to-many
Many-to-many

> Example:
>
> For example, you can use this preference to enforce a cardinality allowing the **Network_Port** type allocation to participate only in one-to-one relationships. Allocations using this type can contain only a single source and a single target. To do so, set this preference to:
>
> **Network_Port::1,1**

VALID VALUES

Allocation subtype::**1,1**	Where *Allocation subtype* specifies the allocation type; this specified allocation type can only be used in one-to-one relationships.
Allocation subtype::**1,***n*	Where *Allocation subtype* is a valid Teamcenter object type; this specified object type can be used in one-to-many relationships.
Allocation subtype::*n*,**1**	Where *Allocation subtype* is a valid Teamcenter object type; this specified object type can be used in many-to-one relationships.
Allocation subtype::*n*,*n*	Where *Allocation subtype* is a valid Teamcenter object type; this specified object type can be used in many-to-many relationships.

DEFAULT VALUES

Allocation::n,n

DEFAULT PROTECTION SCOPE

Site preference.

ALLOC_map_copy_allocations

DESCRIPTION

For use with allocation functionality. Determines whether the allocation set is carried forward when the allocation map is saved as a new allocation map, or revised. By default, the allocation set is carried forward during either of these actions. Prevent the allocation set from being carried forward by setting this preference with the names of the revision action (**saveAs**, or **Revise**) which you do *not* want to carry forward the allocation set.

VALID VALUES

saveAs	The allocation set is not carried forward when the allocation map is saved as a new allocation map.
Revise	The allocation set is not carried forward when the allocation map is revised.

DEFAULT VALUES

saveAs
Revise

DEFAULT PROTECTION SCOPE

Site preference.

Default_StructureContext_Type

DESCRIPTION

Determines which type of structure context is created when saving a loaded object as a context.

VALID VALUES

Accepts one or more strings as values; each string must be a valid type and be of the following format:

item_type:*structure_context_type*

DEFAULT VALUES

Process:ProcessContext

OP:ProcessContext

Workarea:PlantContext

Item:ProductContext

GenericBOP:ProcessContext

ProductBOP:ProcessContext

Mes0STXLibrary:ProcessContext

DEFAULT PROTECTION SCOPE

Site preference.

PartStructureDepthForCompletenessCheck

DESCRIPTION

Determines how many levels Teamcenter traverses when you perform a completeness check of the part structures resulting from CAD BOM alignment.

VALID VALUES

Accepts any numeric value. If you enter **0** or a negative value, a completeness check is not performed.

DEFAULT VALUES

10000

DEFAULT PROTECTION SCOPE

User preference.

NOTES

If you change the value of this preference, you must restart the Teamcenter server for the change to take effect.

MEDataPanelPosition

DESCRIPTION

Specifies where to open the data pane of a structure, either to the right of the structure or below the structure.

VALID VALUES

right	Displays the data pane to the right of the structure.
bottom	Displays the data pane below the structure.

DEFAULT VALUES

bottom

DEFAULT PROTECTION SCOPE

All.