TEAMCENTER

Service Planner

Service Lifecycle Management 2412

SIEMENS

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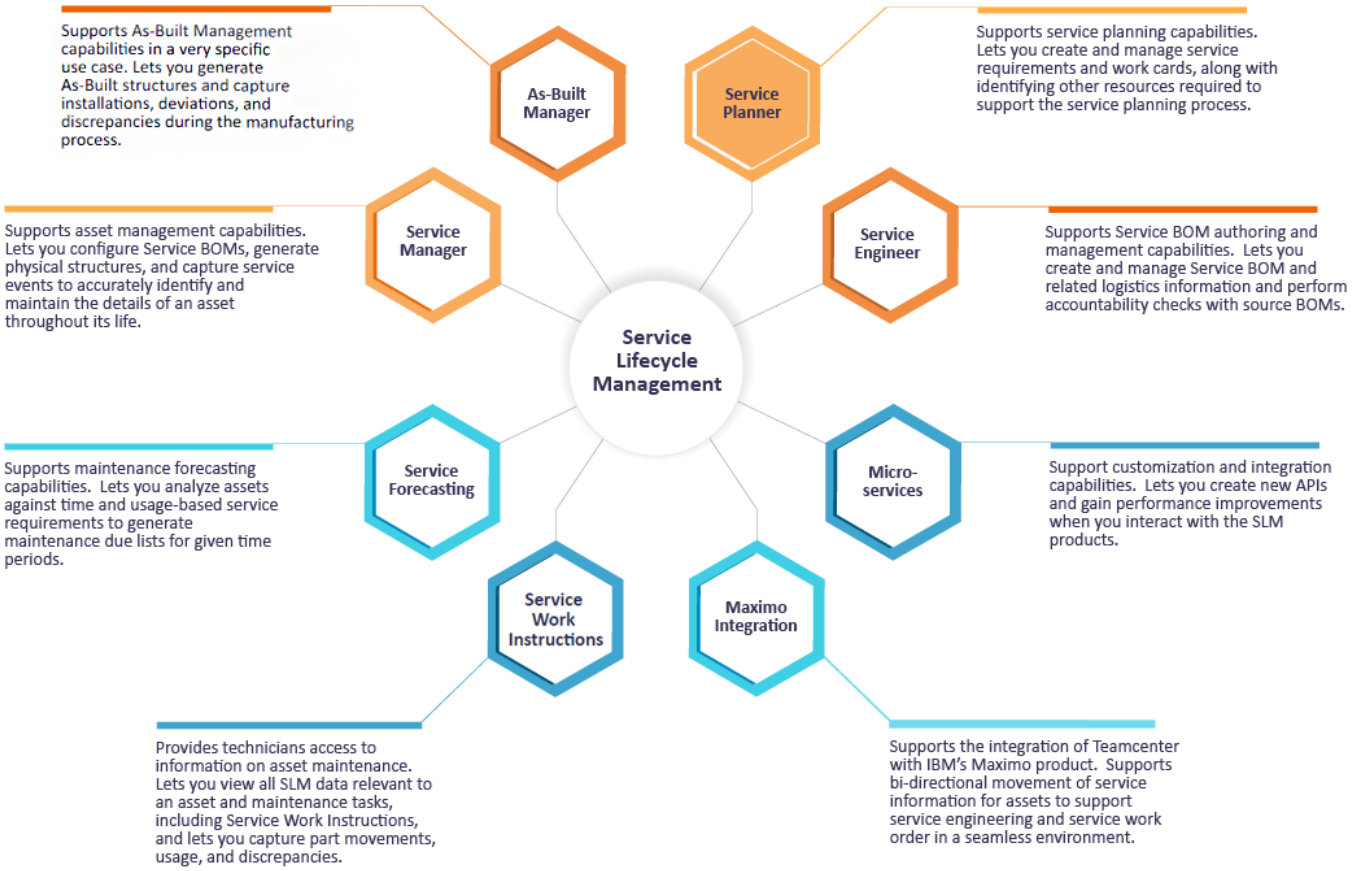
1. Service Lifecycle Management

Service Planner

Capitalize on the re-use of product knowledge from engineering and manufacturing to improve service planning and execution. Provide feedback to engineering to improve product designs for serviceability and reliability. Communicate and coordinate operational activities for greater compliance, faster service, and lower costs.



Service Lifecycle Management products

Select a link below to access the help documentation for each product.

Service Lifecycle Management on web client

Service Engineering

Service Work Instruction

Service Manager

As-Built Manager

Service Planner

Maximo Integration

Microservices for Service Lifecycle Management Integration

2. What's new in Teamcenter Service Planner

What's new in Service Planner 2412

You can now change the ownership of an assigned work card so another person can work on it to finish the related service requirement.

- You can now change the ownership of the related data in a work card.

  The utility **Change Owner** is available to **Change the ownership of data in a work card**.

What's new in Service Planner 2312

- Existing service plans that were created in Service Planner likely contain partitions, which are used to group together service requirements within a service plan. Partitions are not applicable in the Active Workspace web client and are replaced with containers.

  The utility **convert_partition_to_container** is available to **facilitate migrating partitions to containers**.

What's new in Service Planner 13.2

- Teamcenter Environment Manager (TEM) is deprecated and will be obsolete in a future version of Teamcenter.

- You now can create service plans from **configured neutral structures** in Service Planner. You apply variants to the service bill of materials to define configured product structures. The service requirements in the service plan are based on the configured product structures.

What's new in Service Planner 13.1

- The Service Planner user interface is enhanced in Teamcenter 13.1 to make **finding other part occurrences** much easier.

- The **Advanced Accountability Check** has been added to Service Planner in Teamcenter 13.1, allowing the service technician verify that all parts from the engineering BOM (EBOM) that need to be consumed in the SBOM are correctly copied.

- **Service containers** are added to Service Planner in 13.1. Service containers are similar to service partitions but have additional benefits.

  - They have improved performance.

- Service containers an be revised.
- They are supported in Active Workspace.
- Service containers can be copied and pasted, along with their contents.

- Service plans often contain service requirements that are similar to or the same as service requirements in other service plans.

  Beginning with Teamcenter 13.1, you are able to clone service requirements and most of their contents within a service plan, between service plans, and between partitions. The items contained in a service requirement, by default, are cloned, with the exception of the consumed parts. For more information see:

  - **Duplicating a service requirement behavior**
  - **Duplicate a service requirement–Clone**
  - **Duplicate a service requirement–Reference**

3. Getting started with Service Planner

Getting started with Service Planner

The Service Planner application supports service planning capabilities within Teamcenter. Service Planner is a separately licensed application that is installed as an optional overlay on top of the standard Teamcenter product. Service Planner lets users create and manage service plans, service requirements, work cards, activities, and other information to support the service planning process.

You can use Service Planner to:

- Create and manage service plans for a neutral product.
- Create service partitions within a service plan to organize service requirements.
- Create and manage service requirements to define the maintenance that can be performed on a product.
- Create service requirements to address particular fault codes.
- Define frequencies for service requirements to determine when the work needs to be done.
- Set up dependencies or relations between service requirements.
- Define applicability between service requirements and neutral parts.
- Create and manage work cards to determine how the work needs to be done.
- Manage the work process flow by sequencing work cards to be done in a particular order or determine work that can be done in parallel.
- Create and manage activities that provide more detailed information about the planned work.
- Create characteristic definitions and attach them to neutral parts, work cards, or activities to define data that should be recorded as part of the maintenance.
- Define the particular skill level needed to perform or sign off the service work.
- Define any expendable materials or tools needed to perform the service work.
- Create notices and attach them to work cards or activities to provide additional information, such as any notes, warnings, or cautions related to the planned work.
- Manage the time estimates for the planned work.

- Create and manage the work instructions.
- Import and export Service Planner data in PLM XML format.
- Manage Service Planner data in a Multi-Site Collaboration environment.

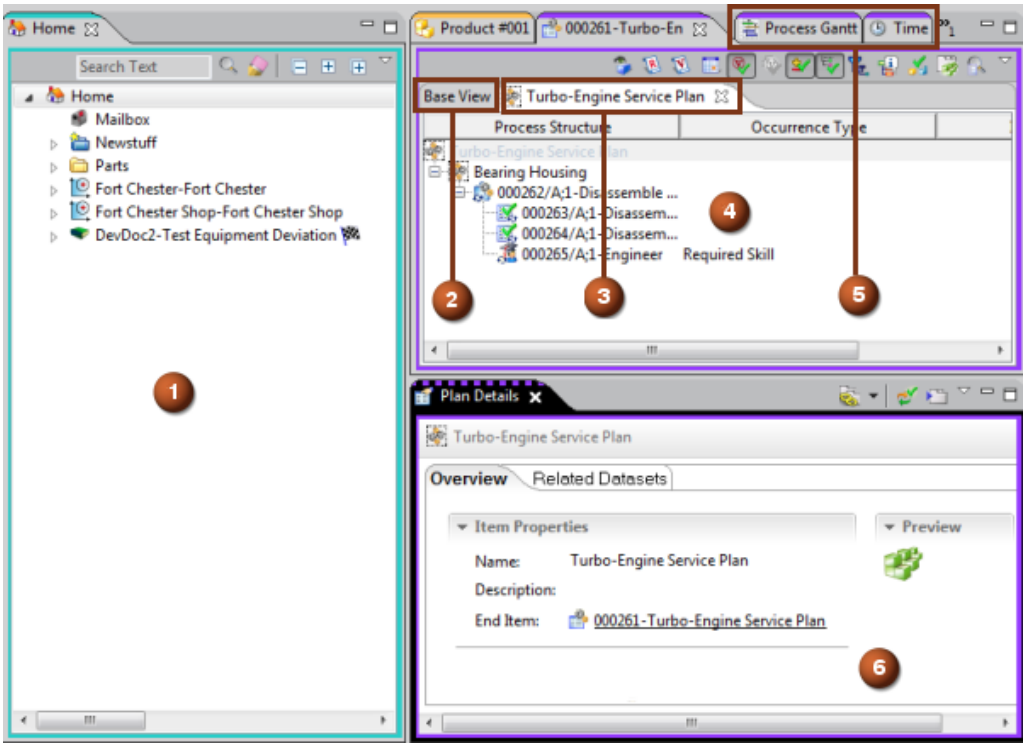
Before you begin

Prerequisites	The Service Planner application requires a separate license in addition to the standard Teamcenter product license. You must obtain and install the appropriate license required to run the Service Planner application.
Enable Service Planner	Service Planner does not need to be enabled before you use it, but you must select the appropriate components during **installation**. If you have trouble accessing Service Planner, see your system administrator; it may be a licensing issue. The Service Planner application requires a separate license in addition to the standard Teamcenter product license.
Configure Service Planner	There are additional steps that you can perform to configure Service Planner before you can use it.
Start Service Planner	Click **Service Planner**  in the navigation pane.

Service Planner interface

Service Planner perspective

Service Planner uses the Teamcenter rich client interface and provides the **Service Planner** and **Plan Details** views. Interface items for Service Planner are described in the Service Planner menus and buttons and symbols topics.



1	Teamcenter component pane	Shows the **Home** view.
2	**Base View** tab	Contains only the service plan and is used only for reference. It is not used to manage the service plan. You *cannot* expand the service plan in this tab.
3	*Partition name* tab	Contains the service partitions and is used to create and modify the service plans. You can expand the service plan in this tab.
4	**Service Planner** view	Contains the **Service Plan** tab that displays the service plan and all related information. Contains the **Product** tab that displays the as-maintained neutral and physical structures.
5	Additional views	Displays all the views pertaining to activities, time management, variants, and work instructions.
6	**Plan Details** view	Displays service plan details.

Service Planner menus

File menu

Command	Description
New → Fault Code	Creates a new fault code.
New → Dataset	Creates a new dataset.
New → Service Plan	Creates a new service plan.
New → Service Partition	Creates a new service partition.
New → Service Requirement	Creates a new service requirement.
New → Work Card	Creates a new work card.
New → Activity	Creates a new activity.
New → Frequency	Creates a new frequency.
New → Skill	Creates a new skill.
New → Notice	Creates a new note, caution, or warning.
New → Life Characteristic	Creates a new life characteristic.
New → Date Characteristic	Creates a new date characteristic.
New → Observation Characteristic	Creates a new observation characteristic.
Revise	Revises the selected item.
Most Recently Used Structures	Displays a list of structures that you recently closed. Use this as a way to quickly open desired structures.
Open By Name → Open Product	Browses for and opens a specific product by name.
Open By Name → Open CC	Browses for and opens a specific collaboration context by name.
Open By Name → Open Structure Context	Browses for and opens a specific structure context by name.
Close	Closes the Service Planner application.
Unload All	Removes all structures from the collaboration pane.
Exit	Ends the rich client session.

Edit menu

Command	Description
Cut (Ctrl+X)	Marks the selected lines for removal and copies the content to the clipboard. Cut lines are only removed once pasted elsewhere in the structure.
Copy (Ctrl+C)	Copies the selected lines to the clipboard.
Paste (Ctrl+V)	Inserts the Clipboard contents below the selected item.
Paste Special	Pastes components on the clipboard to the selected assembly (line).
Remove	Removes the selected lines from the structure. The lines removed by this method are not placed on the clipboard.
Delete	Deletes the selected object from the database.
Properties	Views and edits all properties of the selected line.
User Setting	Displays the **User Settings** dialog box, where you can change your group, role, or volume assignments, and your application logging and journaling options.
Options	Changes your user interface settings that affect all applications, not only Service Planner.
Variant Condition	Creates a variant condition on the selected line.
Show/Hide In-Context BOM Line	Shows or hides the line that is the context of a particular in-context edit.

View menu

Command	Description
Refresh (F5)	Updates the information displayed for a selected line and all of its children.
Refresh Window	Synchronizes the currently displayed 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 structure.
Open CC Tree	Opens the collaboration context tree view.
Access	Allows you to view, change, and apply access permissions for a selected object.

Command	Description
Pack Unpack → Pack (Ctrl+Shift+M)	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.
Pack Unpack → Pack All	Packs all packable lines in the displayed structure.
Pack Unpack → Unpack (Ctrl+Shift+N)	Unpacks the selected packed lines so that they are displayed as separate lines, one for each occurrence.
Pack Unpack → Unpack All	Packs all packable lines in the displayed structure.
Expand Options → Expand	Expands the substructure immediately below the selected lines.
Expand Options → Expand Below	Expands the complete substructure below the selected lines.
Expand Options → 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).
Expand Options → Expand to Type	Expands the substructure below the selected lines to a user-selected type.
Collapse Below	Collapses the complete substructure below the selected lines (hide all child lines).

Tools menu

Command	Description
Check-In/Ou → Check-Out	Checks a selected component out of the database.
Check-In/Ou → Check-In	Checks a selected component into the database.
Check-In/Ou → Cancel Check-Out	Cancels a request checkout action.
Check-In/Ou → Transfer Check-Out	Transfers a selected, checked-out component to another user.
Check-In/Ou → Notification List	Allows you to view or edit the list of users who are informed if the selected component is checked in or checked out.
Check-In/Ou → Check-Out History	Allows you to view the history of checkout actions for the selected component.
Revision Rule → View/Set Current	Allows you to view or set the revision rule for the currently displayed structure.
Revision Rule → Set Date/Unit/End Item	Sets the date, unit number, or end item to configure the structure, if the current rule allows.

Command	Description
Revision Rule → Set Override folder	Sets an override folder to override item revisions that would otherwise be selected by other criteria.
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.
Revision Rule → Create/Edit	Creates or edits a revision rule.
Effectivity → Revision Effectivity	Allows you to view, edit, create, or copy effectivity data for the item revision of the selected line. You must have the appropriate permissions to create or edit effectivity data.
Effectivity → Effectivity Mapping	Allows you to view, edit, create, or copy effectivity mapping for an end item. Effectivity mappings are needed if you implement nested effectivity.
Multi-Site Collaboration	Controls the data shared with participating sites in a distributed network. Multi-Site Collaboration allows you to publish and unpublish objects.
Variants → Configure Variants	Allows you to configure or edit a variant structure for the selected top-level module.
Variants → Only Configure Root	Allows you to 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.
Variants → Search	Searches for an existing variant item.
Variants → Count Modules	Counts the modules defined for the selected variant structure.
Variants → Count Modules	Counts the modules defined for the selected variant structure.
Variants → Count Modules	Counts the modules defined for the selected variant structure.
Export → Objects	Exports selected objects in Teamcenter format, STEP format or a new or available application interface. When you export an object in Teamcenter or STEP format, you move all internal data associated with that object.
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. If you export a structure in which substitute components are defined, the substitutes are also exported.
Export → Objects to Excel	Exports the selected structure lines to an Excel spreadsheet.
Import → Templates	Imports a specification, object or excel template.

Command	Description
Import → Objects	Imports objects in a Teamcenter format or STEP format to your Teamcenter database.
Import → From PLMXML	Imports objects in PLM XML format to your Teamcenter database.
Import → Remote	Imports objects from a remote site using Multi-Site Collaboration.
Import → Objects	Imports the selected structure and its attachments in PLM XML format to a selected import directory. You must choose the appropriate transfer mode for the destination system.
Setup Upgrade	Defines an **upgrade work card**.
Define Part Applicability	Defines **part applicability** for a service requirement.
Repairs Broken Links	Identifies broken links and searches for possible repair candidates.
Re-Sequence Structure	Reorders the process to reflect a change in the process step numbers.
Update Flows	Updates PERT flows according to the find number of the selected component's children, or in the case of multiple selections, of the selected components.
Populate Allocated Time	Updates the allocated time of all the descendants of the selected process or operation.

Advanced menu

Command	Description
Generate Portfolio	Creates a technical portfolio that acts 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.

Service Planner buttons and symbols

Note:

You can add buttons that are not displayed on the main toolbar by right-clicking the toolbar, choosing **Customize**, and selecting the buttons you want to add. Once you add 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**.

Button		Purpose
These standard buttons are located on the main toolbar at the top of the Service Planner pane.		
	Soft abort	If enabled, allows you to terminate the current operation without closing Service Planner or losing data.
	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.
	Delete	Deletes the selected object from the database.
	Toggle in context mode	Enables and disables in-context editing, allowing creation of absolute occurrences for the selected assembly.
	Remove	Removes the selected lines from the structure completely and does not place them on the clipboard.
	Open Collaboration Context Tree	Opens the **Collaboration Context Tree** view that displays all the open structures. You can use this view to make structures visible in the structure pane or to unload structures.
	Create a service plan	Creates a new service plan.
	Create a service partition	Creates a new service partition.
	Create a service requirement	Creates a new service requirement.
	Create a work card	Creates a new work card.
	Create an activity	Creates a new activity.

Button		Purpose
	Create a frequency	Creates a new frequency.
	Create a skill	Creates a new skill.
	Create a notice	Creates a new notice.
	Create a fault code	Creates a new fault code.
	Set up upgrade	Sets up an upgrade work card to identify a different revision of the neutral product or an entirely new neutral product that is defined for the parent service requirement.
	Resequence structure	Reorders the work card to reflect a change in the work card step numbers.
	Edit variant condition	Allows you to view or edit the variant condition on the selected lines.
	Pack selected line	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.
	Unpack selected line	Unpacks the selected packed lines so that they are displayed as separate lines, one for each occurrence.
	Navigation Pane	Displays or hides the navigation pane.
	Advanced Search	Allows you to select a search form that includes multiple search criteria relevant to the type of information or object being sought.
	View/set current	Allows you to view or set the revision rule on the current line.
	Configure variants	Allows you to view and configure the variant option values for the selected line.
	Show/hide the collaboration pane	Displays or hides the collaboration pane, which provides advanced features for configuring structures. These features relate primarily to Multi-Structure Manager.
	Show/hide the lower structure pane	Displays a second structure pane below the first. You can set the size of each structure pane by moving the horizontal split bar between the panes.

Button		Purpose
		If the second structure pane is displayed, this button hides the lower pane.
	Assign resource from library/classification	Opens the Classification Search Dialog that you can use to assign a specific resource to a selected line in your structure.
	Show/hide data pane	Shows or hides the data pane containing, for example, properties data or the embedded viewer.
	Open By Name	Browses for and opens a specific product, collaboration context or structure context by name.
	Most recently used (MRU) list	Shows a list of your most recently accessed structures. If you select an entry from the list, Service 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.
	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.

If your Teamcenter administrator has set the **Incremental_Change_Management** preference to **true**, the incremental change toolbar is available and located at the bottom of the Service Planner application window. The incremental change toolbar includes the following buttons.

	Create an incremental change context	Creates a new incremental change.
	Select an incremental change context	Searches for an incremental change order.
	Most recently used Incremental Changes	Displays the MRU list containing the most recently used incremental changes.
	View/edit most recent IC information	Displays the incremental change **Information** dialog box.
	Clear IC context	Clears the active incremental change and turns off incremental change tracking.

The following buttons are located in the structure views.

		Opens the **Graphics** view to display visualization data associated with the structure.

Button	Purpose
	Shows lines that are hidden because they are configured out using variants and options.
	In a process structure view, shows lines that are configured out because they are assigned occurrences that are configured out for any reason in the original structure.
	Shows lines that are configured out because an incremental change associated has an effectivity on it and the lines are not currently effective.
	Shows lines that are configured out because they have an occurrence effectivity associated with them and the lines are not currently effective.
	Displays configuration information about the open structure.
	Enables you to show or hide any related occurrence groups.
The following symbols are displayed at the bottom right corner of the product structure pane and show the current status of the selected line.	
	Shows if you have write access permissions for the selected line.
	Shows if you have delete access permissions for the selected line.
	Shows if you have access permissions to change the selected line.
	Shows if the item revision represented by the line is currently in a workflow process.
	Shows if the item revision represented by the line is currently checked in or checked out.
	Shows if the item revision represented by the line is currently released.
	Shows if the item represented by the line is currently published.
	Shows if the item or revision represented by the line is currently classified.

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 application and view help from the rich client **Help** menu or by pressing F1.

Basic concepts for using Service Planner

To take full advantage of Service Planner, you should be familiar with the Teamcenter elements that are used to define and present product structure and manage multiple product views.

Before creating or modifying the product structure, read **Getting Started with Product Structure**, which describes the basic concepts behind product structure and includes advanced information on how to use and administer it.

You use Service Planner to define how a neutral product will be serviced. It consists of the following elements:

- The *service plan* for the neutral product to be serviced. A service plan is a high-level container for service requirements for parts or assemblies in a neutral product structure. A neutral product can have multiple service plans. For example, you can have one service plan for the entire parent assembly and a separate service plan for an individual part of that assembly.

- When you create a service plan, there is one *service partition* created by default. A service plan has only one root service partition. You can create one or more additional service partitions within the root partition to organize service requirements that make up the service plan.

- The *service requirements* within a service plan. A service requirement defines maintenance for a neutral part or assembly that needs to be performed on a scheduled or conditional basis. A service requirement defines the type of service, when the service should occur, and other information for fulfilling the requirement. You can set dependencies or relations between two service requirements, such as defining that a particular service requirement has to be completed before another service requirement is done or that the completion of one service requirement fulfills another service requirement.

- The *frequency* associated with each service requirement. The frequency determines when the service work needs to be performed; on a scheduled or conditional basis.

- The *work card* attached to a service requirement to define how the work is to be done. Work cards define information about the activities, effort and cost estimates, and required resources for the service work.

- The *activities* attached to a work card to define breakdown of the work details. An activity defines a specific step, or series of steps, required for completing all or part of a work card.

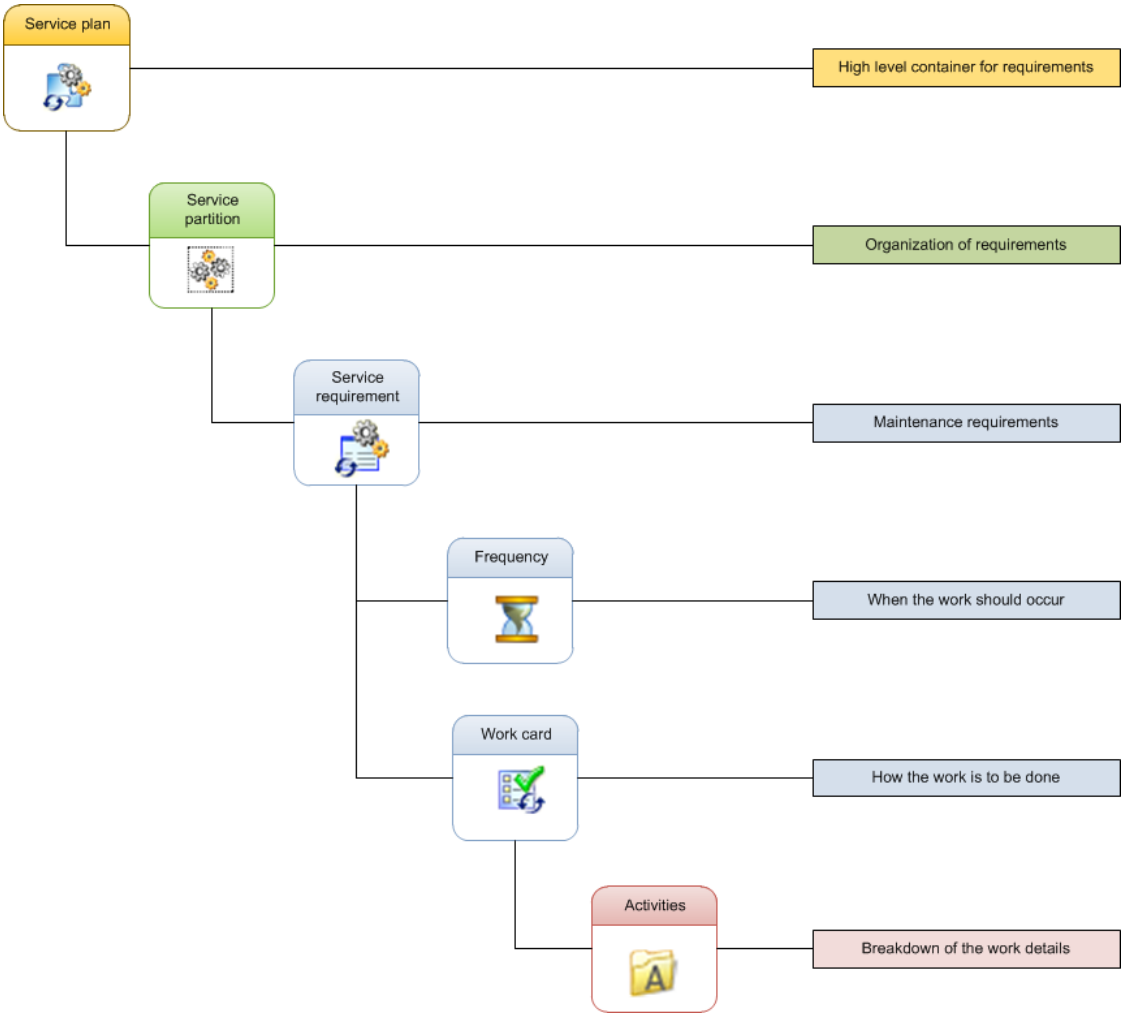
You can also assign resources to service requirements, work cards, and activities. Resources include skills, part movements, expendable materials, and tools.

- A *skill* is a qualification that a person needs for performing or signing off service work. The skill level assignment for a service requirement is the skill level needed for signing off the requirement. Work cards and activities can have skill level assignments for performing or signing off the work.

- A *part movement* resource indicates whether a neutral item is installed, uninstalled, or replaced when the maintenance is performed.

- An *expendable material* resource is any material needed to complete the work that will be consumed during the process of performing the work, such as paper towels. An expendable material does not become part of the configuration and is not tracked.

- A *tool* resource is any part or tool needed to complete the work that is not consumed during the process of performing the work, such a screwdriver. A tool does not become part of the configuration and is not tracked.



Search for Service Planner objects

You can search for the following Service Planner objects using advanced search:

- **MRO Date Characteristics**
- **MRO Fault Code**
- **MRO Item**
- **MRO Life Characteristics**
- **MRO Neutral Part**
- **MRO Observation Characteristics**
- **MRO Service Partition**
- **MRO Service Plan**
- **MRO Service Requirement**
- **MRO Skill**
- **MRO Work Card**

1. Choose **Advanced** from the quick **Search** menu at the top of the navigation pane.

2. On the **Search** pane toolbar, click  to select a search type.
3. Click **More** to display the system defined searches.
4. Under **System Defined Searches**, select the object you want to search for.
5. Click **OK**.

   The dialog box that contains the object properties appears.
6. Type the values for the object properties that you want to search for.
7. Click the  button to search.

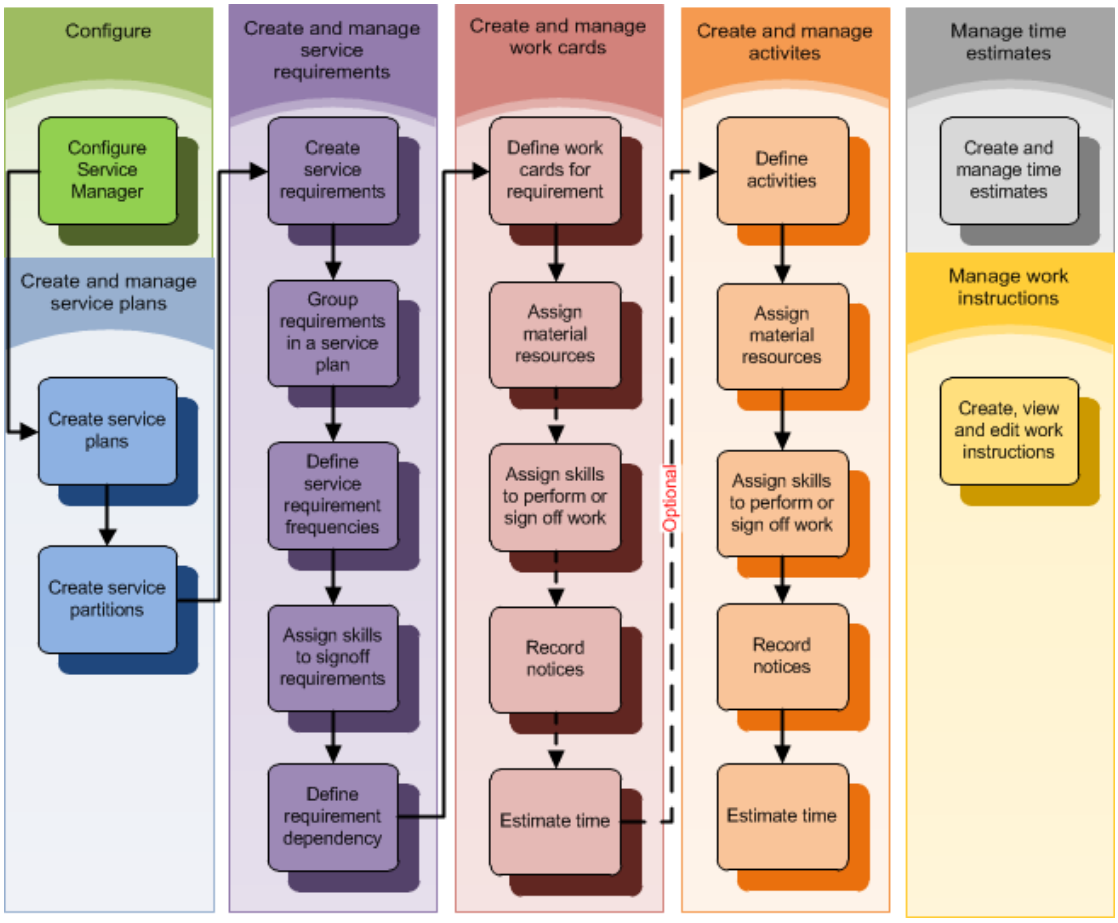
Basic tasks for using Service Planner

The basic tasks for using Service Planner are:

1. Configuring Service Planner LOVs.
2. Setting up and managing the service plans for a neutral product.
3. Optionally, setting up additional service partitions within the service plan to organize the service requirements.
4. Creating and managing service requirements.
5. Creating and managing work cards.
6. Creating and managing activities.
7. Managing time estimates for service requirements, work cards, and activities.
8. Creating, viewing, and editing work instructions.

Service Planner process task flow

The following graphic shows the Service Planner process task flow.



4. Displaying information

Displaying information

You can display a variety of information in the primary and secondary views of Service Planner. Many of the secondary views are only available if you select an object in a primary view that provides valid input. For example, you can only open the **Activities** view if you select a work card.

Managing Service Planner data

Working with Service Planner views

Teamcenter presents Service Planner data in views, each view providing its own specific way of managing or modifying the data. There are *primary* views and *secondary* views.

There are primary views and secondary views.

- A primary view shows one configurable structure. That structure can contain a base view and several occurrence groups.

- A secondary view shows specific types of data related to the primary view with which it is associated. It can, depending on your needs, change its content if you select a new object in a primary view. Many of the secondary views are available only if you select an object in a primary view that contains valid input.

In addition to primary and secondary views, you can use the following:

- **Collaboration Context Tree** view to show all loaded objects.

- **Structure Search** view that allows you to search for any object regardless of view.

- **Graphics** view to display any visualization data associated with the structure. The **Graphics** view is closely associated with the primary view from which you open it.

You can open multiple views simultaneously. You can undock views and move them to a convenient position. You can open the same structure multiple times in different views. To assist you in keeping track of which views are associated, primary views and secondary views are color-coded. Primary and associated secondary views have the same framed color. In addition, Teamcenter frames the active view (the one in which you are currently working) in black.

Each view has a toolbar with buttons to execute the common tasks pertaining to that particular view. The view menu contains additional menu commands pertaining to that view. More complex tasks or tasks pertaining to several views simultaneously are found on the main application toolbar. The views have some features in common, such as the ability to change the displayed columns or filtering the results. You find these features in the view menu.

Behavior of selected objects in active views

If you select an object in the active view, the selections in the other views change as follows. This is known as *selection synchronization*.

- Primary views can change their inner selection (highlight) to suit the active selection. The following situations can cause them not to do so:
  - The selection does not correspond to any object in the view.
  - The corresponding object is not currently expanded, and the **MEExpandToSelection** preference is set to false.
  - An expensive search is required to find the corresponding line. In this case, use one of the **Find** commands.
- Secondary views can change their inner selection (highlight) to suit the active section when that selection occurs in a primary view or in another secondary view that is associated to the same primary view. The following situations can cause them not to do so:
  - The selection does not correspond to any object in the view.
  - The **Disable response to selections** button is turned on.

Managing loaded objects with the Collaboration Context Tree view

The **Collaboration Context Tree** view displays all structures that are loaded in your session. You can use this view to load or unload structures or to make structures that have moved behind other structures in the structure view area visible. Additionally, you can use this view to create structure contexts from loaded structures, to create configuration contexts, and to save contexts into new or existing collaboration contexts.

The **Collaboration Context Tree** view is not a primary or secondary view. It is not associated with other views and does not respond to selection in other views. You can display this view by clicking the **Open CC Tree** button in the toolbar.

You can drag a collaboration context from your **Home** folder into the **Collaboration Context Tree** view.

Open the Graphics view

The **Graphics** view is associated with the structure view from which you open it. You cannot change this association.

- In a structure view, click .

Teamcenter opens the **Graphics** view displaying the structure. The **Graphics** menu is displayed in the main menu bar if there is at least one **Graphics** view open.

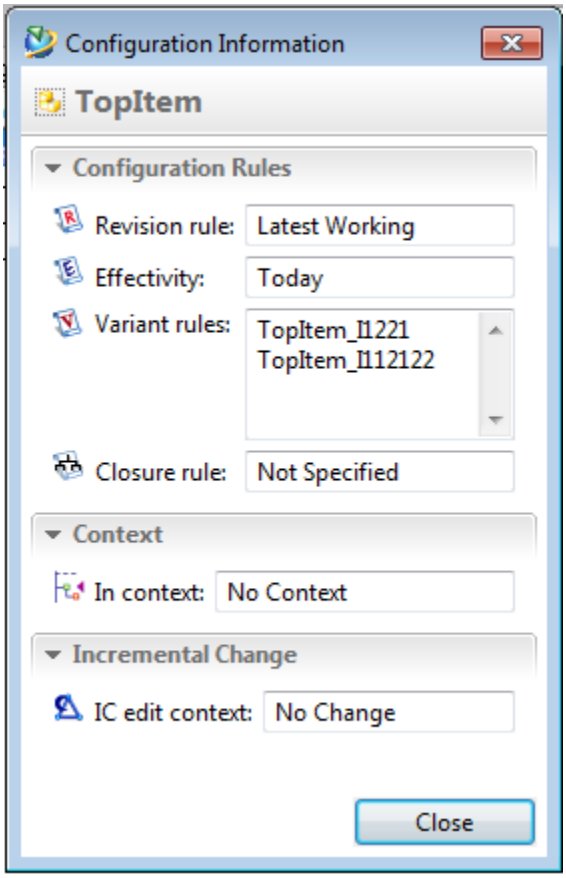
- When you close the primary view from which you opened the **Graphics** view, the **Graphics** view closes with it.
- If you unload data from the primary view, the **Graphics** view remains open, but empty.
- If you load a new structure into the primary view, the **Graphics** view is available, but the structure is only loaded when you select a structure to view.

Display configuration information for a primary view

Do one of the following:

- Click in a primary structure view to see configuration information about that structure.

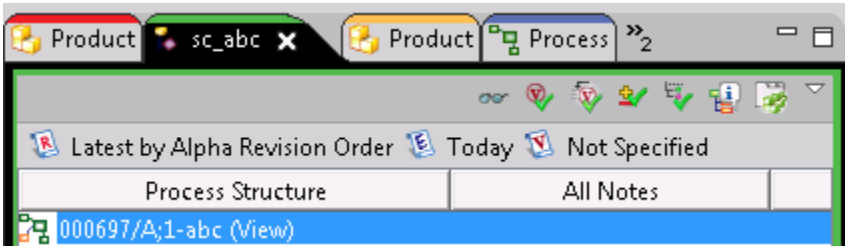
  The **Configuration Information** dialog box displays the following:



  - The revision rule.

- The effectivity.
- The variant rule or rules currently in effect.
- Which structure is configuring the current structure.
- In-context information.
- Currently active incremental change.

- Ensure that the **MEShowConfigurationHeader** preference is set to **true**. This displays the current revision rule, effectivity, and variant rule at the top of the structure view. These entries are links that you can click to open the dialog boxes used to change the configuration.



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, **MEOP** 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:

   a. Sort by default order by selecting **Select default order**.

   b. 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 modify the column display by inserting or removing columns from tables.

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.

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 All Visible Views** menu command depends on the settings of the following two preferences:

MECopyIdInContextToAssignedLine
MECopyIdInContextLowerLevels

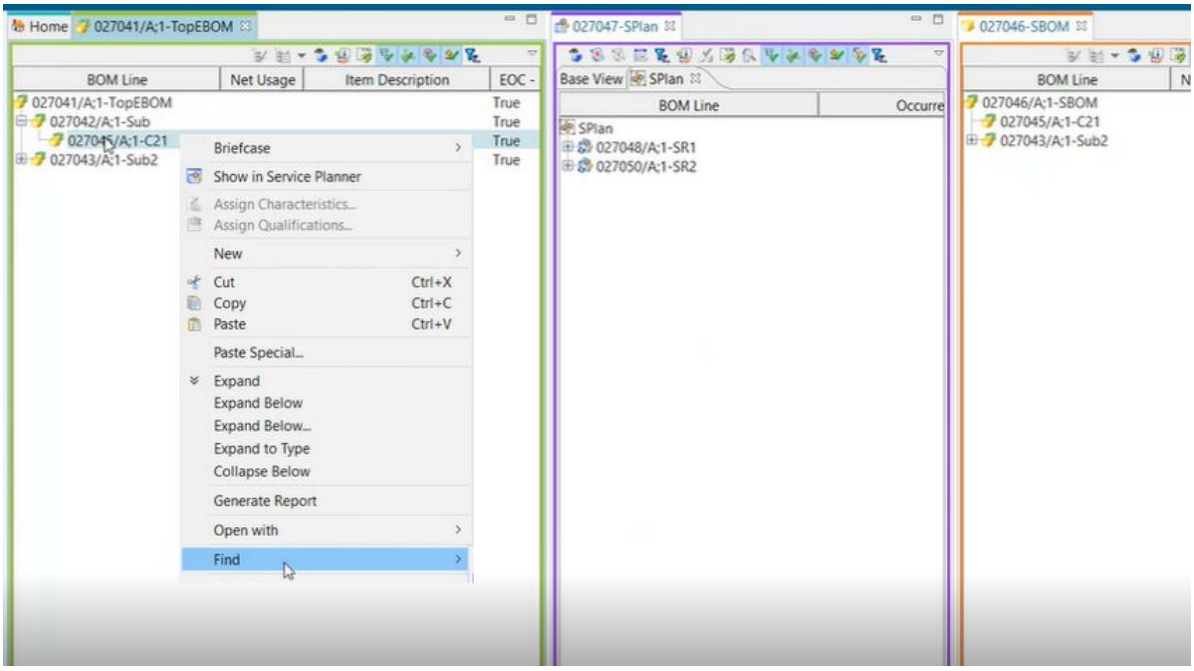
> Note:
>
> Whether you need to expand a structure before a found component can be highlighted within it depends on the value of the **MEExpandToSelection** preference. If this preference is set to **false**, you must manually expand the target structure to highlight lines found within that structure.

Find related part occurrences in loaded structures

Select one or more objects in different areas of the user interface listed below and search for them in different structures.

- Lines in a view
- Assigned parts in a service plan
- 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

1. Right-click the part and select **Find**, to find other occurrences.

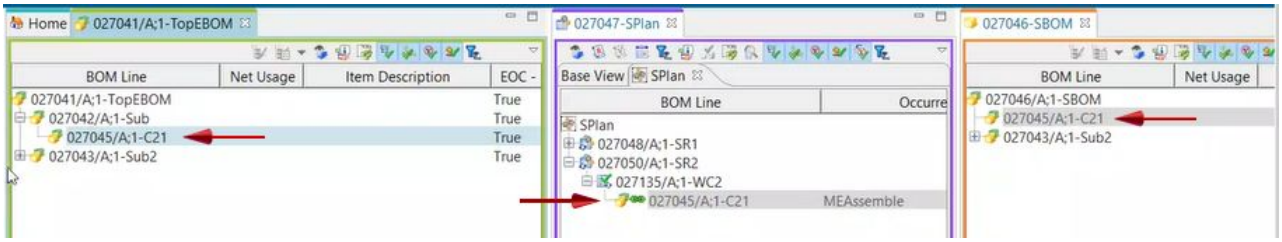


Note:

Service Planner displays all occurrences in structures that are loaded. If there are occurrences in structures that are not loaded, they do not display for selection.

2. Select a specific structure or select **Find in All Visible Views**.

All occurrences in the structures that are loaded are highlighted. If the part occurrence is within a structure that is collapsed, Service Planner expands the structure.



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.

     > 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.

3. If you chose **View** → **Expand Options** → **Expand to Type**, 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**.

4. If you chose **View** → **Expand Options** → **Expand to Type**, click **OK** after choosing a type.

   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.

5. (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.

Load data to Service Planner

Do one of the following:

- Use the **Send to** menu command in any other application.
- Use the **Open By Name** buttons.
- Use the **MRU** (**Most Recently Used Structures**) button.
- Use the **Quick Search** feature.
- Use the **Open Items** list.

The **Open Items** section of the navigation pane lists all items that are currently open in the perspective.

- Use the **History** list.

  The **History** list in the navigation pane displays links to objects that you opened. Links are displayed in reverse order; the last object you opened is the first displayed in the list.

- Use the **Favorites** feature.

- Drag a collaboration context from your **Home** folder to the **Collaboration Context Tree** view.

> Tip:
>
> Use the **Open Items** list in the navigation pane to activate a structure that is already loaded but not currently visible.

Unload data

- Select the structure in the **Collaboration Context Tree** view and choose **Unload** from the shortcut menu or from the view menu.

  This unloads the selected structure from the perspective.

- In the structure view, choose **Unload** from the view menu.

  This unloads the selected structure from the perspective.

- In the **Collaboration Context Tree** view, choose **Unload All** from the view menu or **File → Unload All**.

  This unloads all structures from the perspective.

- In the **Open Items** section of the navigation pane, right-click the structure you want to unload and choose **Unload**.

  This unloads the selected structure from the perspective.

- In the **Open Items** section of the navigation pane, click **Unload All** to unload all the structures open in the perspective.

  This unloads all structures from the perspective.

Note:

- When you close the primary view without unloading data, the structure is still open. You can activate it from the **Collaboration Context Tree** view.
- You can only unload a structure context object separately if you loaded it separately. You can unload only an entire collaboration context object—not parts of it.

Displaying activities in the Activities view

You display activities associated with a work card in the **Activities** view. Activities can have associated objects such as other activities or attachments. You can filter out which types of attachments are displayed in the **Activities** view using the **MEOperationActivitiesFilteredComponents** preference. To see all attachments, you can open the **Attachments** view on an activity in the **Activities** view.

Open structure by name

You can search for and open a product, process or operation, work area, collaboration context or structure context by name or object ID.

1. In the toolbar, click **Open by Name** .

2. Click one of the following:

Button	To open a
	Product
	Process or operation
	Work area
	Collaboration context
	Structure context

   If a structure is currently open in a structure view, it is listed in the **Association to** box.

3. To find structures associated with the listed structure, select the **Association to** option and skip to step 4, otherwise, do one of the following:

   - If there is no structure identified or if you want to search for structures associated with a different structure, select the new structure and click the **Set to selected** button .

     You can use this option to search for structures that are not associated to loaded root structures.

- Select the **Attributes** option and type a structure name or ID.

  Note:

  You can type an asterisk (*) as a wildcard character if you do not know the entire name or ID.

4. Click **Search** or press the Enter key.

   All structures that match your search criteria are listed in a table in the open structure dialog box.

5. Double-click a structure in the table. It is opened in a structure view.

Opening the most recently used object

You can click the **MRU** (most recently used) button  to open any of the last few top-level structures you opened. This list is saved across sessions and is an easy way to reopen structures you were previously working on. Click an item revision in the MRU list to open it.

Note:

If the business object display rule for the **Item** business object is hidden in the Business Modeler IDE, **Service Plan** does not show up in the most recently used (MRU) list.

Locking objects in the database

Locking objects

When you check out an object from the database, Teamcenter locks the object in the database so that only you can change it. When you check in the object, it is unlocked and available for someone else to check out.

The types of objects you can check out of the database are:

- Items and item revisions
- BOM views and BOM view revisions
- Folders
- Activities
- Datasets

- Forms
- Occurrence groups

Manage checked-out objects

You manage checked out objects by doing one of the following:

- Check in the object by clicking **Check In**.
- Return the object to the database without saving any of the changes you made by clicking **Cancel Check Out**.
- Transfer the checkout ownership to another user by clicking **Transfer Check Out**.
- If you have only one object selected, view a listing of previous checkout activity by clicking **View Check Out History**.

> Note:
>
> You can configure the columns that appear in the **Checked Out Objects** dialog box and filter its content.

Pack/Unpack a bill of materials

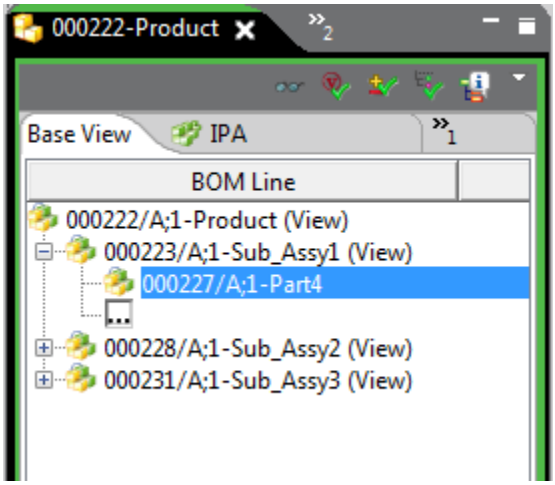
- Click one of the following two buttons on the toolbar to group or ungroup multiple, identical components in one level of the assembly to pack and unpack the BOM.
  - Click  to pack.
  - Click  to unpack.

> Note:
>
> When lines are packed, one of the packed lines is always designated the master packed line. If the **TCVIS_Selection_From_Viewer** preference is set to true, you can select packed objects in the viewer using the buttons available in the **3D Selection** toolbar. However, if you select the master packed line, all packed lines are selected. If you do not want this behavior, you must unpack the packed lines before selecting the individual objects in the viewer.

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 BOM. In this example, three nodes are hidden and these nodes are siblings of the **000227/A;1-Part4** node found by the search.

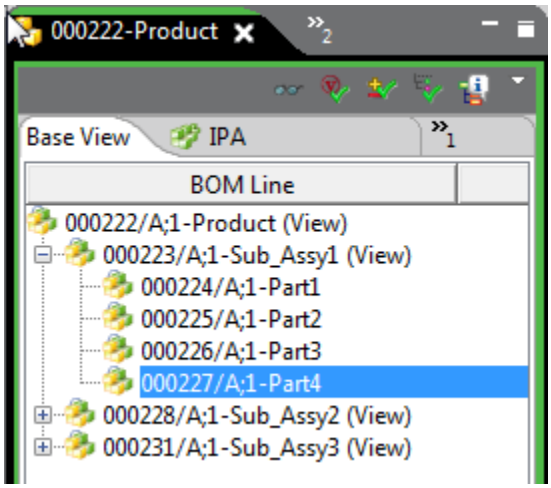


Partially loaded structure displayed as a result of a search

To expand this structure:

- Click ....

  Teamcenter expands the structure showing the siblings of the search result.



Expanded structure

View only specific occurrence types

You can use the occurrence type filter to specify which occurrence types to display in the structure. The occurrence type filter is available on all loadable structures.

1. Select the desired structure root (product, process, or plant).
2. Choose **Select Occurrence Type Filters** from the view menu.
3. Choose the types of occurrences that you want to appear in the selected structure.
4. Click **OK**.

   Only the occurrence types that you selected are shown in the structure.

   > Note:
   >
   > You can turn the filter on and off by choosing **Apply Occurrence Type Filter** from the view menu or clicking in the view toolbar.

Identify differences between two structures

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. Apply any revision rules or effectivity needed to configure the structures you want to compare.

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

   Teamcenter displays the **Graphical BOM Compare...** dialog box listing all loaded structures in both the **First Structure** and **Second Structure** boxes.

3. Select a first and second structure for compare from the lists and click **OK**.

   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.

4. 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.

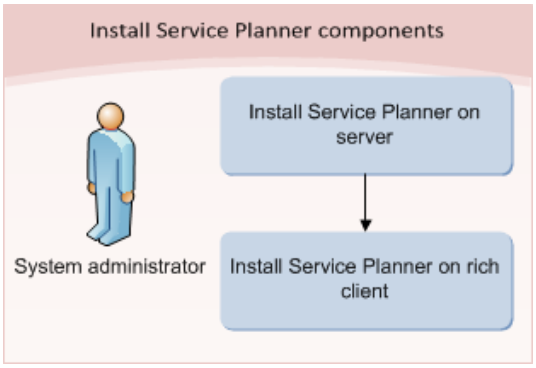
Saving changes

Teamcenter saves changes to the structure automatically. You do not need to save them manually.

5. Installing and configuring Service Planner

Install Service Planner

As a system administrator, you must install and configure Service Planner using Teamcenter Environment Manager (TEM). As the following figure shows, you install Service Planner on the server and on the rich clients that use the application.



1. Start Teamcenter Environment Manager (TEM).

2. Select appropriate options until you reach the **Features** panel.

   > Note:
   >
   > The configuration installed is dependent on the options that you choose in the **Solutions** panel of the TEM installation windows, such as **Corporate Server**, **Rich Client 2–Tier** or **Rich Client 4–Tier**, and **Business Modeler IDE**. You can also add any of the options available in the **Solutions** panel from the **Features** panel.

3. In the **Features** panel, under **Extensions**, expand **Service Lifecycle Management** and select from the following features.

Feature	Description	Prerequisite features
Service Planning	Installs the Service Planner functionality.	**Teamcenter Foundation**
Service Planning and Service Processing Alignment	Installs the Service Planning and Service Processing Alignment module to support using discrepancies in Service Planner.	**Teamcenter Foundation** **Service Planning** **Service Event Management**

4. If you want to configure your system using the Business Modeler IDE:

   a. Click **Next**. Select appropriate options until you reach the **Business Modeler IDE Templates** panel.

   b. In the **Business Modeler IDE Templates** panel, select the following templates.

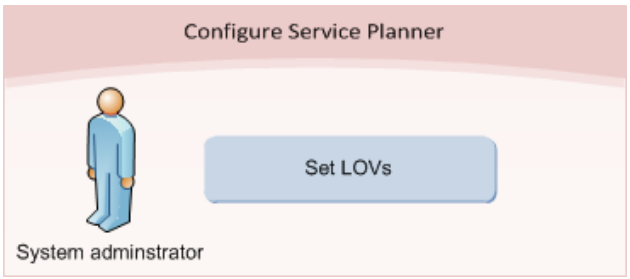
Template	Description
Teamcenter Foundation	Installs the Teamcenter Foundation template.
Service Planning	Installs the Service Planner templates.

5. Click **Next**.

   Select appropriate options until you complete the installation.

Configuring Service Planner

The Teamcenter administrator configures Service Planner according to company needs and organization requirements as shown in the following figure.



You can configure lists of values (LOVs) that define the type of service to be done and the types of notices to describe any notes, cautions, warnings, and hazardous materials associated to the planned service work.

Setting Service Planner lists of values (LOVs)

To configure Service Planner lists of values (LOVs), an administrator creates and configures a custom template based on the **mrocore** template that is provided with Service Planner. As an administrator, you can set LOVs located in the LOV folder in the **Extensions** view. LOVs are commonly accessed by Teamcenter users from a menu at the end of a data entry box. After you create a list of values, you must attach it to a property on a business object. You use the Business Modeler IDE to set the LOVs in a custom template that you define. You must deploy the custom template after making the changes.

You can configure the following Service Planner LOVs:

- **MRO Transaction Types**

  This list of values defines the type of service for the service requirement. This LOV is not editable, but contains values for the following LOVs. The values for the **MRO Transaction Types** LOV correspond to the **Category** attribute available.

  - **sem_inspection_types**

    Set this list of values to define the type of inspection.

  - **sem_overhaul_types**

    Set this list of values to define the type of overhaul.

  - **sem_repair_types**

    Set this list of values to define the type of repair.

  - **sem_other_types**

    Set this list of values to define the type of work that is not an inspection, overhaul, or repair.

- **SmrOWarningType**

  This list of values defines the types of notices that can be attached to the service requirements, such as any notes, cautions, warnings, and hazardous materials information.

- **Smr0ActivityExecutionType**

  This list of values defines the activity execution types used for work cards or activities.

- **SSP0AvailableDisciplines**

  This list of values defines the list of available disciplines used for skills.

Define the type of service

The **MRO Transaction Types** LOV is an uneditable list of valid types of service for the service requirement. The service types, **Inspection**, **Overhaul**, **Other**, and **Repair**, are available as default values for this LOV. You can define more specific types within these categories using the **sem_inspection_type**, **sem_other_type**, **sem_overhaul_type**, and **sem_repair_type** LOVs. The values for the **MRO Transaction Types** LOV are available as **Requirement Type** when creating a service requirement.

LOV	Description	Default value
sem_inspection_types	Specifies the type of inspection.	**Inspection**
sem_other_types	Specifies the user-defined type of service.	**Other**
sem_overhaul_types	Specifies the type of overhaul service.	**Overhaul**
sem_repair_types	Specifies the type of repair service.	**Repair**

Define notices

As an administrator, you can set the **SmrOWarningType** LOV to define specific types of notices for a service requirement. Notices are any notes, cautions, warnings, and hazardous materials associated to the service requirement.

LOV	Description	Default value
SmrOWarningType	Specifies the type of notice to attach to the service requirement.	**Smr0Caution** **Smr0WarningValue** **Smr0Note** **Smr0HazardousMaterial**

Define activity execution types

As an administrator, you can set the **Smr0ActivityExecutionType** LOV to define the activity execution types used for work cards or activities.

LOV	Description	Default value
Smr0ActivityExecutionType	Specifies the activity execution types used for word cards or activities.	**Smr0Perform** **Smr0Sign-Off**

Define available disciplines

As an administrator, you can set the **SSP0AvailableDisciplines** LOV to define the available disciplines used for skills.

LOV	Description	Default value
SSP0AvailableDisciplines	Specifies the available disciplines used for skills.	NULL

6. Creating characteristic definitions

What is a characteristic definition?

A *characteristic definition* is used to collect and record information during maintenance. You can create characteristic definitions that contain information such as how many hours a part has been used, the date the asset was put into commission, or the operating temperature of the part.

You can create characteristic definitions that define life, date, and observation characteristics. You can also create derived characteristics which are characteristics values that are calculated by the system based on formulas or expressions. Only life and observation characteristics can be defined as derived characteristics by specifying the evaluation expression.

The characteristic definitions can be assigned to the following objects:

- Neutral parts
- Work cards
- Activities

Create a life characteristic

A *life characteristic* defines the individual characteristics that measure the life of a part.

> Example:
>
> You can track the number of landings for an aircraft using a life characteristic. When the number of landings reaches a specific value, scheduled maintenance on the aircraft is performed.

1. From the navigation pane, click **Service Planner**.
2. Do one of the following:
   - Select a folder where you want to create the new life characteristic.
   - Select one or more neutral parts from your home folder or from the **Service Planner** view where you want to assign the life characteristic.
   - Select the work card that you want to relate the characteristic to.
   - Select the activity that you want to relate the characteristic to.
3. Choose **File** → **New** → **Life Characteristic**.

4. In the **New Life Characteristic** dialog box, enter the following information for the life characteristic.

Field name	Definition	Format
Characteristic Name	Name of the life characteristic.	Alphanumeric (1–128 characters)
Unit	Unit of measure for the recorded value.	Alphanumeric (1–128 characters)
Precision	The number of decimal places.	Integer

5. In the **Derived Expression** box, type the expression or formula for the **derived characteristic** or click the ▸ button to use the wizard.

6. Click **OK** to create the life characteristic. Alternatively, click **Cancel** to exit.

Create a date characteristic

A *date characteristic* defines the date when a specific action occurred.

> Example:
>
> You can capture the commission date or warranty date.

1. From the navigation pane, click **Service Planner**.

2. Do one of the following:

   - Select a folder where you want to create the new date characteristic.
   - Select one or more neutral parts from your home folder or from the **Service Planner** view where you want to assign the date characteristic.
   - Select the **work card that you want to relate the characteristic to**.
   - Select the **activity that you want to relate the characteristic to**.

3. Choose **File** → **New** → **Date Characteristic**.

4. In the **New Date Characteristic** dialog box, enter the following information for the date characteristic.

Field name	Definition	Format
Characteristic Name	Name of the date characteristic.	Alphanumeric (1–128 characters)

5. Click **OK** to create the date characteristic. Alternatively, click **Cancel** to exit.

Create an observation characteristic

An *observation characteristic* defines the operational characteristics observed during maintenance.

> Example:
>
> You can record any cracks or record the operating temperature during maintenance.

1. From the navigation pane, click **Service Planner**.
2. Do one of the following:
   - Select a folder where you want to create the new observation characteristic.
   - Select one or more neutral parts from your home folder or from the **Service Planner** view where you want to assign the observation characteristic.
   - Select the work card that you want to relate the characteristic to.
   - Select the activity that you want to relate the characteristic to.
3. Choose **File** → **New** → **Observation Characteristic**.
4. In the **New Observation Characteristic** dialog box, enter the following information for the observation characteristic.

Field name	Definition	Format
Characteristic Name	Name of the observation characteristic.	Alphanumeric (1–128 characters)
Unit	Unit of measure for the recorded value.	Alphanumeric (1–128 characters)
Precision	The number of decimal places.	Integer

5. In the **Derived Expression** box, type the expression or formula for the derived characteristic or click the ▸ button to use the wizard.

6. Click **OK** to create the observation characteristic. Alternatively, click **Cancel** to exit.

Create a derived characteristic

Derived characteristic values are calculated by the system based on formulas or expressions. You can use existing life or observation characteristics when you define the formula for the derived characteristic.

> Example:
>
> An aircraft engine can have different life characteristics, such as in-flight usage and number of landings, while in use. The actual life of the engine is a combination of these values based on some predefined formulas. You can define a formula to calculate the derived life characteristic value based on the two base life characteristic values that you provide. The derived life characteristic value can then be used for calculating maintenance schedules.

1. From the navigation pane, click **Service Planner**.

2. Create a new life or observation characteristic and enter information in the required fields.

> Note:
>
> If you want to use a life or observation characteristic in the formula for the derived characteristic, you must create those characteristics before defining the derived characteristic.

3. In the **Derived Expression** box, do one of the following:

   a. Type the expression or formula for the derived characteristic.

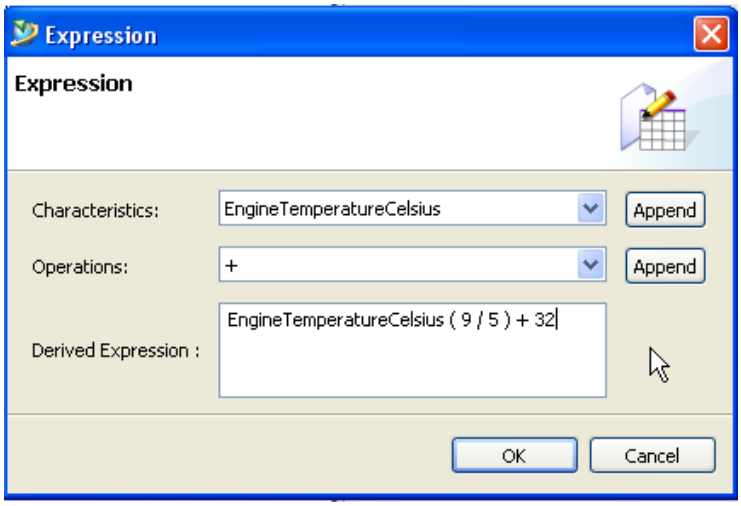
   b. Click the ▸ button.

      A. In the **Expression** dialog box, enter the following information.

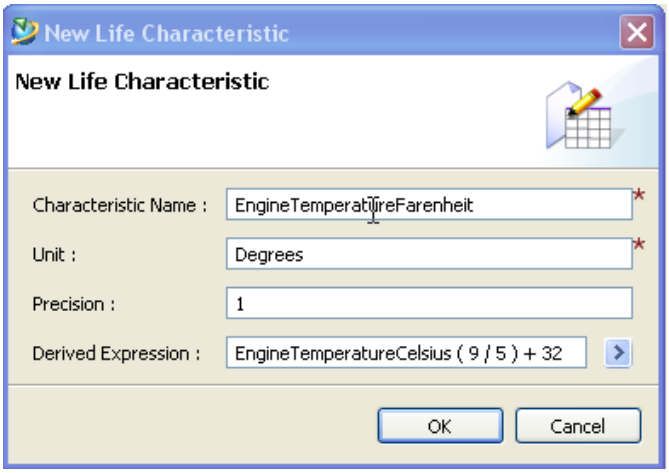
Field name	Definition	Action
Characteristics	Names of existing life or observation characteristics you want to use in the formula for the derived expression.	Click the ▸ button and select the life or observation characteristic you want to use in the expression. Click **Append** to append the characteristic definition in the **Derived Expression** box.
Operations	The Boolean operation you want to use in the expression.	Click the ▸ button and select one of the following operations to use in the expression:

Field name	Definition	Action
		• Select **+** for addition. • Select **–** for subtraction. • Select ***** for multiplication. • Select **/** for division. • Select **(** or **)** to group expressions. Click **Append** to append the operation in the **Derived Expression** box.
Derived Expression	The derived expression that is used for the derived characteristic.	Click **Append** next to the **Characteristics** and **Operations** boxes to create your expression or type those values and any other values needed to complete the expression.

B. Click **OK** to create the derived characteristic.



4. Click **OK** to create the life or observation characteristic using the derived characteristic.



Assign characteristics to a neutral part

1. From the navigation pane, click **My Teamcenter** or **Service Planner**.
2. Select the characteristic definition in your home folder.
3. Right-click and choose **Copy**.
4. Select one or more neutral parts from your home folder or from the **Service Planner** view where you want to assign the characteristic definition.
5. Right-click and choose **Paste**.

   The characteristic definitions are related to the selected neutral parts, as shown in the following figure:

   BH001–01–Bearing Housing Assembly
   - **BH001–01/A;1–Bearing Housing Assembly**
   - **BH001**
   - **EngineHours**
   - **OperatingTemperature**
   - **LastInspectionDate**

Update characteristic definition properties

1. From the navigation pane, click **My Teamcenter** or **Service Planner**.
2. Select the characteristic definition.
3. Right-click and choose **View Properties**.

4. In the **Properties** dialog box, change the available properties.

5. Click **OK** or **Apply** to change the characteristic definition properties. Alternatively, click **Cancel** to exit.

Set the tolerance for an observation characteristic

1. Select the work card or activity that has an observation characteristic.

2. In the **Plan Details** view, scroll to the **Measurement Characteristics** section, right-click an assigned observation characteristic, and choose **View/Define Characteristic Tolerance**.

3. Set the minimum value and maximum value allowed for the characteristic and click **OK**.

Delete a characteristic definition

You can delete a characteristic definition if it is not attached to a neutral part.

1. From the navigation pane, click **My Teamcenter** or **Service Planner**.

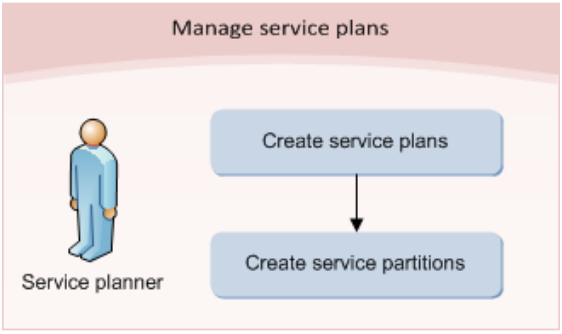
2. Select the characteristic definition.

3. Choose **Edit** → **Delete**.

7. Creating and managing service plans

Setting up and managing service plans

As a service planner, you create and manage the service plans related to the neutral parts.



Service plans contain information such as the service requirements, frequency of service, and service activities that contain information about:

- The service to be performed.
- When the service should be performed.
- How the service should be performed.
- The resources that are required to perform the service.

You create service partitions to group together service requirements within a service plan.

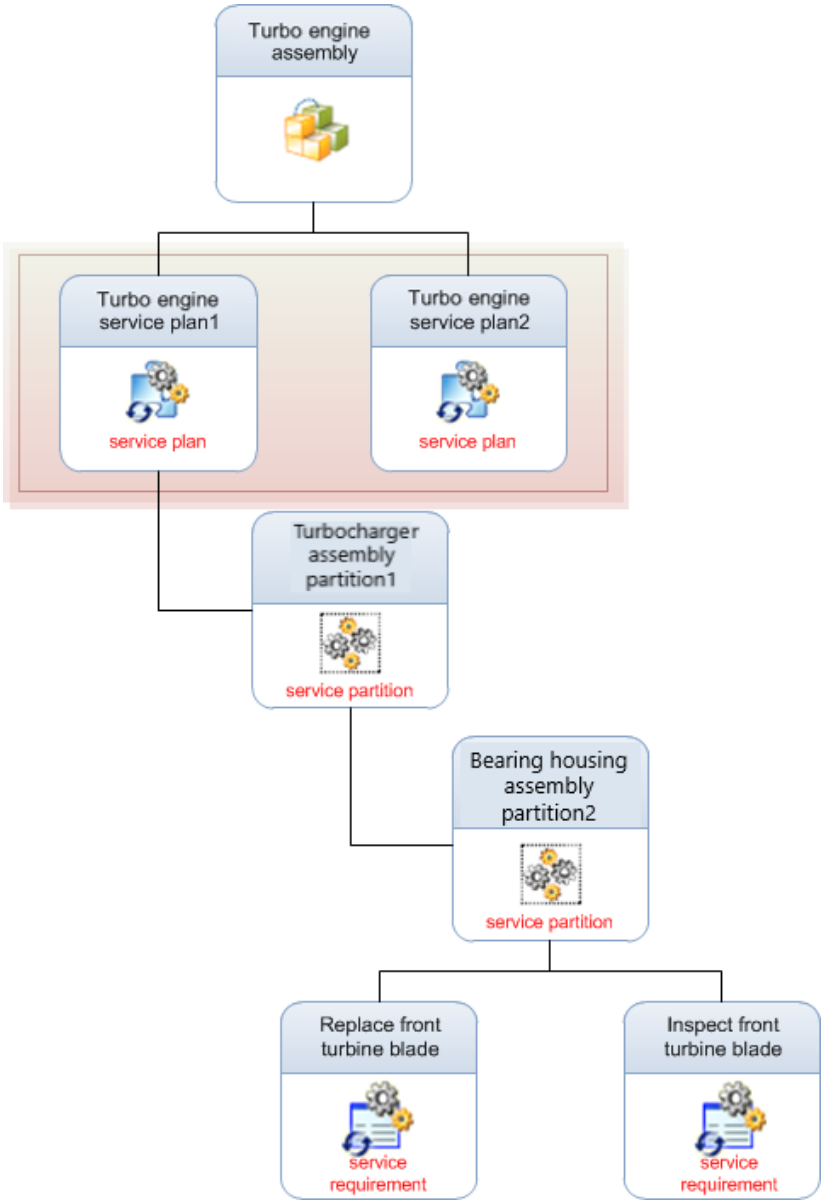
Creating service plans

Service plan

A *service plan* is related to a neutral part and is the high-level container for the service partitions that group together service requirements. A root partition is automatically created when you create the service plan.

You can create multiple service plans for a neutral part.

The following figure shows an example of a turbo engine assembly that contains multiple service plans. The service partitions group together all the service requirements for the turbocharger assembly.



When you create the service plan, the following tabs are created:

- Base View

  This tab contains only the service plan and is used only for reference. It is not used to manage the service plan. You *cannot* expand the service plan in this tab.

- *Plan/Partition name*

  This tab contains the service partitions and is used to create and modify the service plans. You can expand the service plan in this tab.

Create a service plan

1. From the navigation pane, click **Service Planner**.

2. From the **Service Planner** view, click **Open By Name**  on the main toolbar at the top of the **Service Planner** pane, to open the neutral structure or part.

3. Select the neutral part to relate to the service plan and do one of the following to create a new service plan:

   - Choose **File** → **New** → **Service Plan**.
   - Click the **New Service Plan** button  at the top of the **Service Planner** pane.
   - Right-click the neutral part and choose **New** → **Service Plan**.

4. In the **New Service Plan** dialog box, select **Service Plan** from the list and click **Next**.

   > Note:
   >
   > If the business object display rule for the **Item** business object is hidden in the Business Modeler IDE, **Service Plan** does not show up in the most recently used (MRU) list.

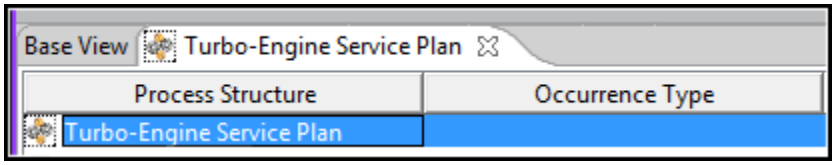
5. Enter the following information for the service plan.

Field name	Definition	Valid Values
ID	The service plan ID (required). Leave the field blank to automatically assign an ID.	Alphanumeric string (1–128 characters)
Revision	The service plan revision (required). Leave the field blank to automatically assign a revision.	Alphanumeric (1–32 characters)
Name	The service plan name (required). Leave the field blank to automatically assign a name.	Alphanumeric string (1–128 characters)
Description	Description of the service plan.	Alphanumeric string (1–240 characters)

6. Click **Finish**.

The service plan and the root partition are created.

The following tabs are displayed:



- **Base View**
  This tab contains the only the service plan.

- *Partition name*
  This tab contains the service partitions. You can only expand the service plan in this tab.

Locate a service plan

1. From the navigation pane, click **Service Planner**.

2. Locate a service plan by doing one of the following:

   - From the **Service Planner** view, click **Open By Name** on the main toolbar at the top of the **Service Planner** pane, to open the service plan.

   - Using advanced search, search for the service plan. Right-click the service plan from the results list and choose **Send to → Service Planner**.

3. From the **Service Planner** view, click the service plan name tab next to the **Base View** tab to expand the service plan.

Locate all service plans related to neutral part

1. From the navigation pane, click **My Teamcenter** or **Service Planner**.

2. Search for the neutral structure or part where you want to find all related service plans.

3. Select the neutral or part.

4. Choose **Window → Show View → Other**.

5. In the **Show View** dialog, expand the **Teamcenter** folder and select **Impact Analysis**.

6. Click **OK** to show the view.

7. In the **Impact Analysis** view, choose **References** in the **Where** box.

8. In the **Depth** box, choose **Top Level**.

   The service plans related to the neutral part are displayed.

Update service plan properties

1. From the navigation pane, click **My Teamcenter** or **Service Planner**.
2. Locate and open the service plan that you want to update.
3. Select the service plan.
4. Right-click and choose **Properties**.
5. In the **Properties** dialog box, change the available properties.
6. Click **OK** or **Apply** to change the service plan properties. Alternatively, click **Cancel** to exit.

View plan details for a service plan

You can use the plan details view to display and edit information for a service plan.

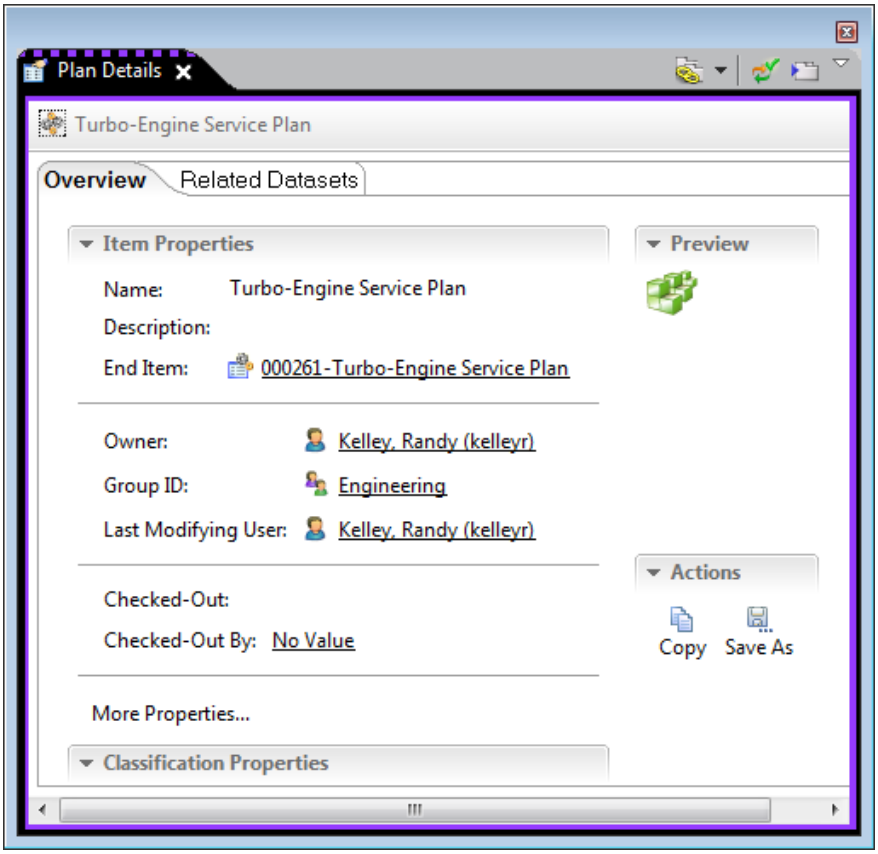
The following information is displayed for a service plan:

- Item properties for the service plan.
- Attached files to the service plan.

1. From the navigation pane, click **Service Planner**.
2. From the **Service Planner** view, open the service plan where you want to view the plan details.
3. In the Service Planner view, click the service plan name tab next to the **Base View** tab to expand the service plan.
4. Select the service plan and do one of the following:

   - Choose **Window** → **Show View** → **Plan Details**.
   - Right-click the service plan and choose **Show Plan Details**.

   The **Plan Details** tab is displayed.



5. To edit properties of the service plan, click the **Overview** tab and click **More Properties**.

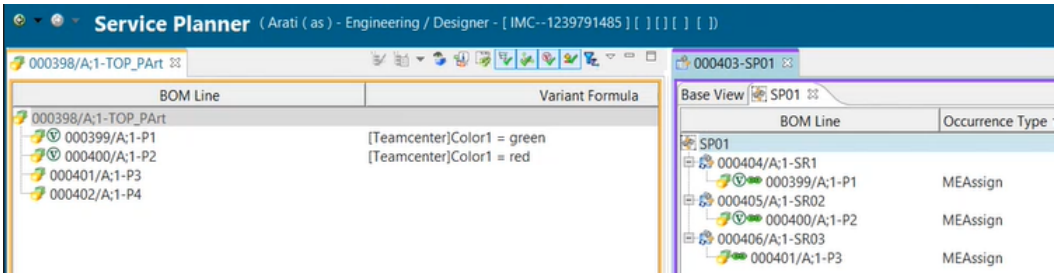
6. To add or remove attached files, click the **Attached files** tab and choose one of the following:

   - Click **Add New** to add a new dataset.
   - Click **Paste** to add a dataset that you have copied to the clipboard.
   - Select a dataset and click **Cut** to remove a dataset.

Configure service plan based on conditions applied to consumed parts

> Note:
>
> You must set certain preferences to support this procedure. See **Setting preferences for configuring service plans**.

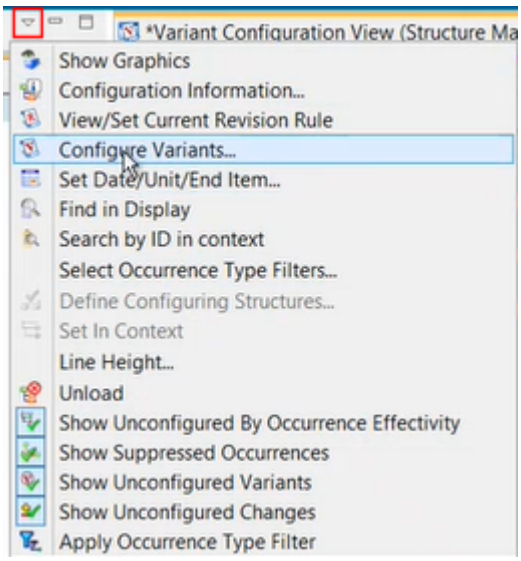
1. Open a service bill of material (sBOM) and the service plan in Service Planner.



In this example, the sBOM contains four parts, two of which have variants applied to them. The service plan on the right contains service requirements for the first three parts.

> Note:
>
> The service plan is created from the sBOM before it is configured. You apply variants to the sBOM to define configured product structures. The service requirements in the service plan are based on the configured product structures.

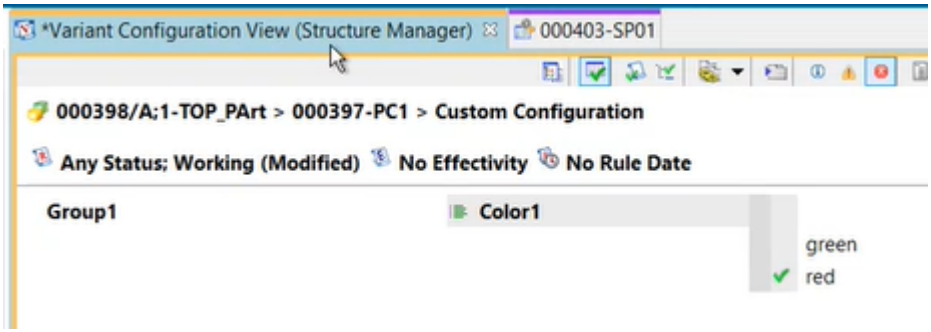
2. Click **View Menu** on the top tool bar of the sBOM window and select **Configure Variants**.



> Note:
>
> You can also configure variants by choosing **Tools** → **Variants** → **Configure Variants**.

3. Select the variant to apply to the sBOM and click **Apply**.

   In this example, the variant **Color1** is set to **red**.

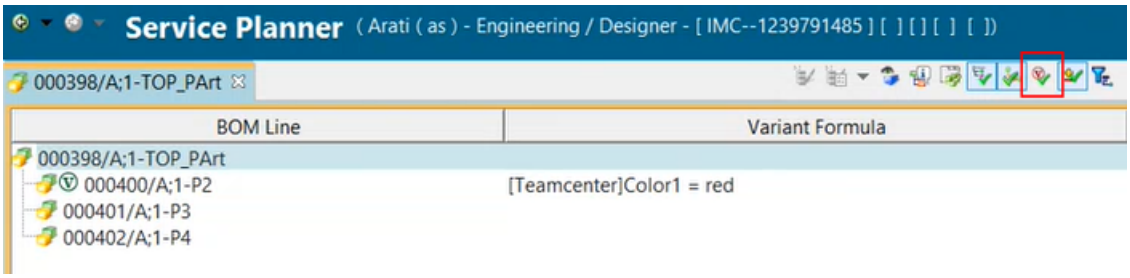


4. Click **Show Unconfigured Variants** in the sBOM panel to deselect it.

   This lets you see the configured sBOM.

   > Note:
   >
   > The icon is outlined with a blue box when it is selected.

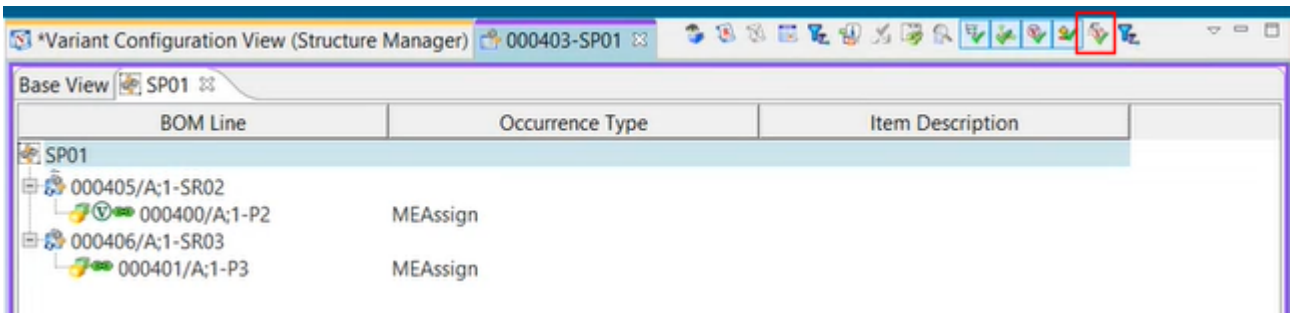
   In this example, the part with the variant condition *green*, **000399/A;1-P1**, is removed from the sBOM.



5. Click **Show Unconfigured Assigned Occurrences** in the service plan panel to deselect it.

   This lets you see the configured service plan.

   In this example, the part with the variant condition *green*, **000399/A;1-P1**, is removed from the configured service plan.



Setting preferences for configuring service plans

You must set the following preferences to support the configuration described in **Configure service plan based on conditions applied to consumed parts**:

Preference	Value	Impact
controllingOccsForProcessConfiguration	MEAssign	This preference controls automatic configuration of operations and processes. If no value is set, the configuration of operations is not affected by the configuration of consumed items. Accepts multiple strings as values. Each string must be a valid occurrence type.
typeAndRuleForProcessConfiguration	SSPOServiceReq:One	This preference configures process or compositions in the bill of process. See details for this preference below.

Preference **typeAndRuleForProcessConfiguration** details:

- This preference specifies which parent types in the process should be configured out depending on the child occurrences of controlling types, as defined by the **controllingOccsForProcessConfiguration** preference. You can also use this preference to configure out processes based on child relationships. If you do this, the **controllingOccsForProcessConfiguration** preference is ignored.

- Valid Values:

  - *parent-item-subtype*—Specifies the item, operation, or process subtype as defined in the Business Modeler IDE application. This value is case sensitive and must exactly match the business object specified in Business Modeler IDE.

    The second string after the colon must be one of the following:

    - One—The parent is configured out if any one of its controlling occurrences is configured out.

    - All—The parent is configured out only if all its controlling occurrences are configured out.

    - All Loaded—The parent is configured out only if all its loaded controlling occurrences are configured out. *Loaded occurrences* are occurrences that are referenced from another top line that is defined as the configuring structure. This parameter is not relevant for defining child types.

- OneLoaded—The parent process is configured out if one of its loaded controlling occurrences is configured out. This parameter is not relevant for defining child types.

- *OCCType:occurrence-type* | *CHILD:child-type*–Specifies that the filtering is based on the designated occurrence types or the designated child types. You can enter multiple occurrence types or multiple child types separated by a comma. Specifying this optional group of values for the preference causes the configuration mechanism to ignore the value of the **controllingOccsForProcessConfiguration** preference.

Advanced accountability check

Advanced accountability check

You can use the advanced accountability check to verify that all parts from the engineering bill of materials (eBOM) that need to be consumed in the service bill of materials (sBOM) are correctly copied, including the required properties. The results of an advanced accountability check identify full matches, partial matches and missing parts in either the source or target structures.

If the advanced accountability check finds any differences during the comparison, that may indicate problems that would impact manufacturing the product to its specification. However, differences between the structures do not necessarily indicate a problem with the structure itself.

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 SBOM structure to ensure all parts and assemblies are assigned or compare the product structure and the service plan to ensure that all occurrences of product components and features are used in the service plan as assigned, assembled, or disassembled. You can compare the entire assembly or only a subassembly to the service plan. 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 and propagate

Using an accountability check, you can compare the following pairs of source and target structures:

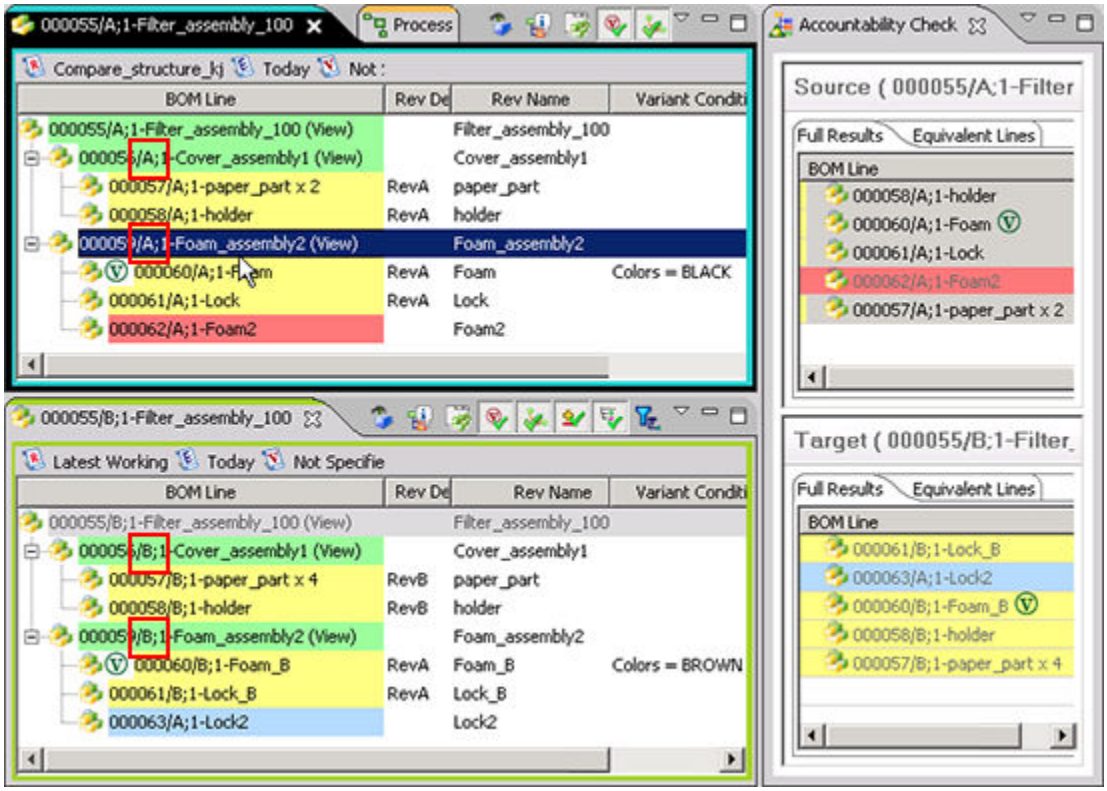
- EBOM and SBOM to see which of the EBOM parts are aligned to the SBOM
- Product and product
- Service plan and product to see if all parts are assigned, assembled, or disassembled
- Service plan to service plan

After comparison, you can propagate changes between the compared structures.

> Note:
>
> BOM-service plan propagation depends on the properties mentioned in the **MEAssignProperties** preference.

> Note:
>
> You can compare two revisions of the same BOM or service plan. You can compare item IDs, item revisions, item revision and BOM line attributes and properties, and quantity for pack/unpack lines. This provides a better understanding of what has changed from one structure event to another,

including which objects were added or changed, which were updated, and which remain the same. To compare two revisions of the same structure, open each in its own structure and run an advanced accountability check using the top lines as source and target.



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 check using the same options.

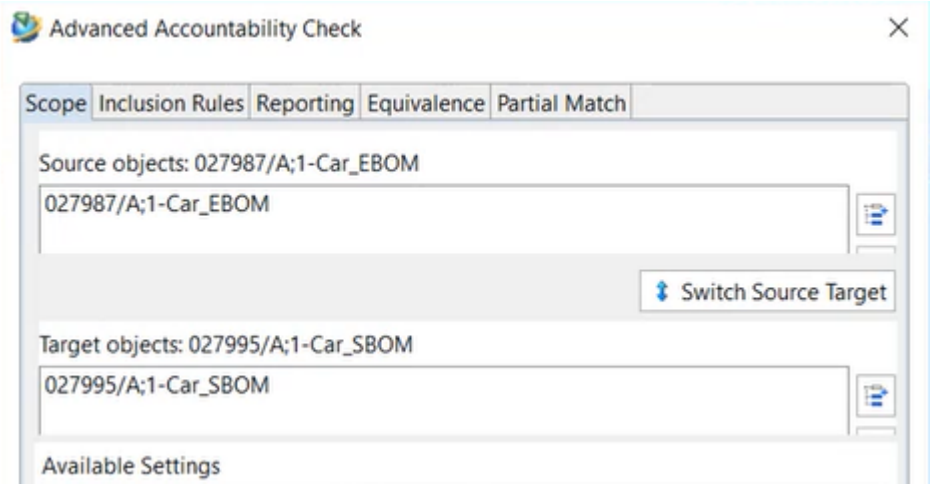
Note:

To run an advanced accountability check, you must have two linked structures to compare, a source structure and a target structure. In Service Planner, you need a source engineering bill of materials (eBOM) generated from a CAD bill of materials (BOM) that is exported from a CAD application such as NX or CATIA, and a target service BOM (sBOM) created for specific service needs from the eBOM. When the eBOM is updated, the sBOM must be compared and updated as well. This is the purpose of an **Advanced Accountability Check**: to help you make sure that the two structures share equivalent BOM lines.

1. Select source and target objects in structure views and open the **Advanced Accountability Check** dialog box by choosing **Tools→Accountability Check→Advanced Accountability Check**.

Tip:

As long as the source and target views only are open, Service Planner auto-detects and adds the correct source and target lines to the **Source objects** and **Target objects** boxes.



2. (Optional) Adjust the scope setting for either the source or target by selecting the line in the applicable structure.

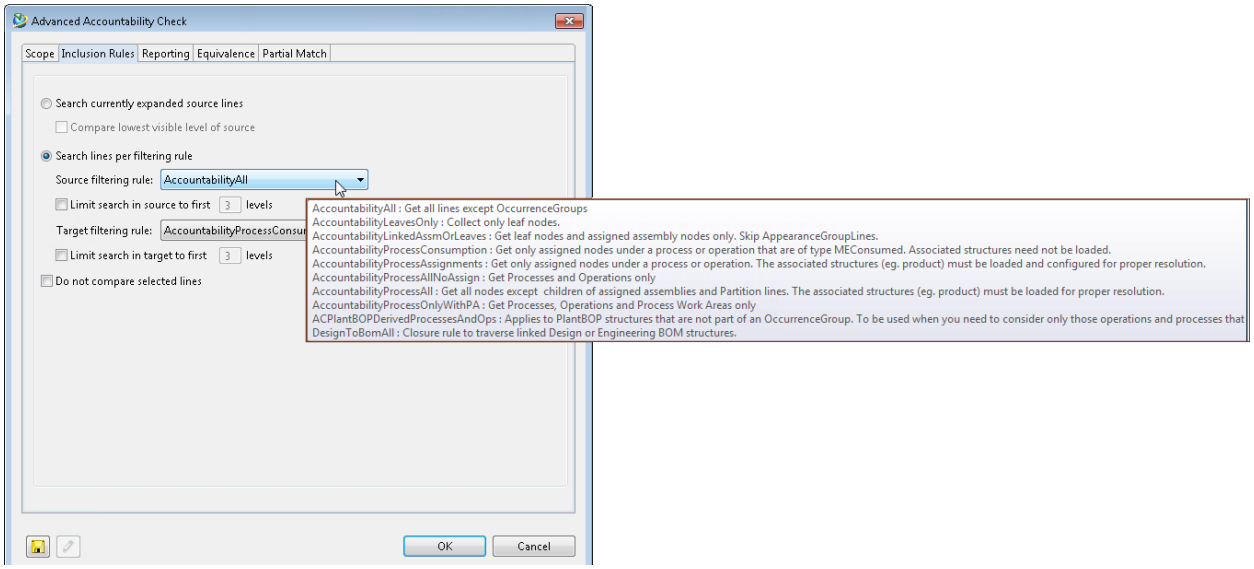
3. Confirm that you correctly selected the source and target objects. If needed, switch the source and target by clicking the **Switch Source Target** button.

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 select **Compare lowest visible level of source** to run the accountability check on all the lowest visible (expanded) lines under the selected scope line.

   - Select **Search lines per filtering rule** to expand the source and target structures, and to consider only a subset of the lines during the accountability check.

   - Select the **Source filtering rule**. To see short descriptions of the filtering rules, move your mouse over the list.



- To specify the level in a structure to which you want the accountability check to search, select **Limit search in source/target to first** *x* **levels** and type a value for *x*.

> Note:
>
> For information about filtering rules, see **Managing filter rules** in the **Sharing Data** documentation.
>
> 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-specific 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 the target and missing in the 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 notifies you that there are more lines to be returned, and that an **Accountability Check Excel** report has been created and stored.

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.

    Rerunning an accountability check does not create a new 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.

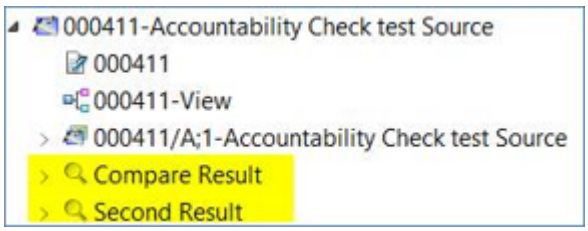
1. Open the accountability check dialog box.

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. 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.
Effectivity mismatch	Only available when you use net effectivity. For equivalent objects (occurrences), if the net effectivities differ, both objects are set to the same background color. The default color is orange.
Partial & effectivity mismatch	Only available when you use net effectivity.

Option	Description
	For equivalent objects (occurrences), if one or more properties are not identical and the net effectivities differ, both objects are set to the same background color. The default color is pink.
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 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 a source 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. The tabs shown in the **Partial Match** section of the view are dependent on which partial match criteria you selected in the **Partial Match** pane during the check. The table can display information about:

- Properties

- Predecessors (enterprise BOP structures only)
- Assignments (enterprise BOP structures only)
- Hierarchy (enterprise BOP structures only)

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.

The filter mechanism is based on closure rules that traverse the structures and take only those objects specified in the closure rules into consideration. The closure rules that are used in the accountability check are referred to as *inclusion rules* and are not available to use for importing and exporting.

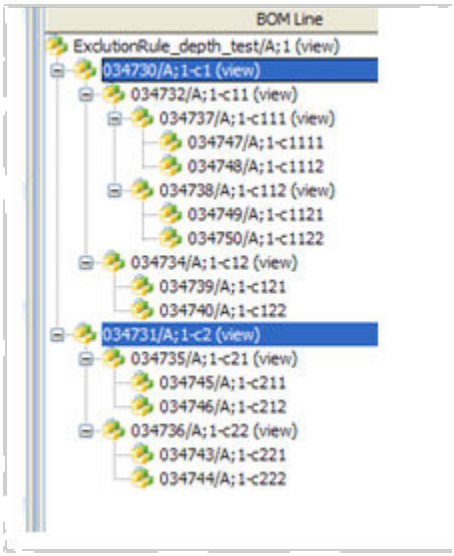
By default, Teamcenter presents you with a set of inclusion rules. Your administrator can modify these inclusion rules or create new ones to suit your business needs.

> 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*.

Expanding a structure based on closure rules also plays a role in which objects are taken into consideration in the accountability check. If you expand using an appropriate closure rule, you may not have to set an inclusion rule when running an accountability 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 SBOM 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”
```

SBOM:

```
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
```

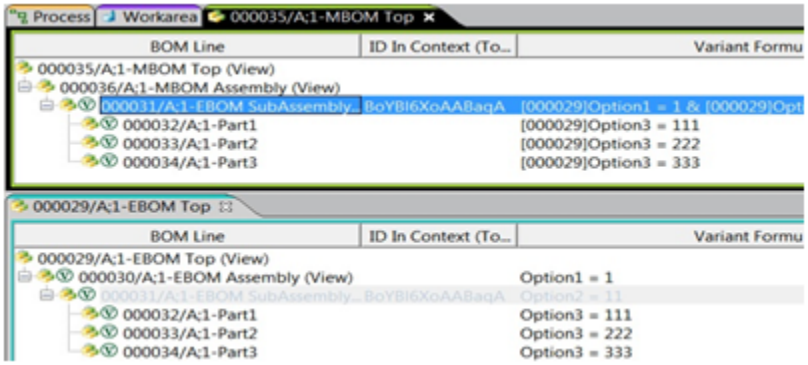
(You changed the variant condition to line 1, added the variant condition to part 3, made no changes to part 4, and added part 8.)

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.

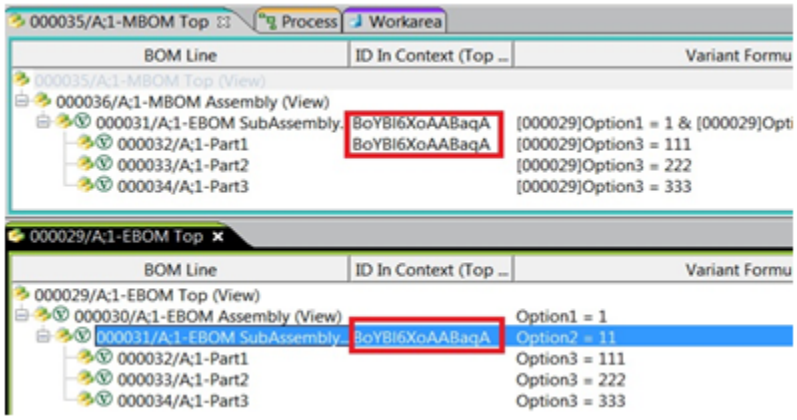
Source	Target	Match	Variant condition rollup
123456/A;1-Part 3	123456/A;1-Part 3	X	X
123457/A 1-Part 4	123457/A 1-Part 4	X	X
1234569/A 1-Part 8	*** Not Found	X	

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.

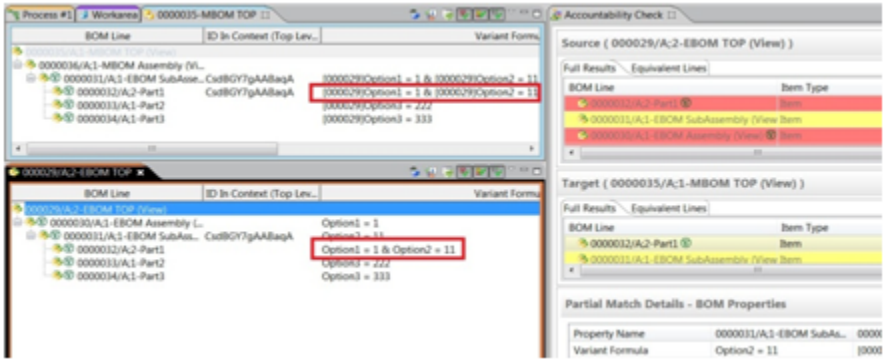
For example, **EBOM Top (000029)** and **SBOM Top (000035)** are linked. The assigned line **EBOM Sub Assembly (000031)** has a rolled-up variant condition.



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.



When Teamcenter calculates the variant condition when allocating from a product BOP to a generic BOP, it only calculates for the line being allocated. Therefore, if you allocate a process with child processes or operations, it does not calculate the rolled-up variant condition for any children of the process being allocated. This results in a mismatch if you run an accountability check between the product BOP and the plant BOP. You have two choices in this case:

- Do not run the accountability check for a level lower than the one you allocate.
- Propagate the mismatch between the children of the process from the product BOP to the plant BOP.

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

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.

Expanding a structure based on closure rules also plays a role in which objects are taken into consideration in the accountability check. If you expand using a closure rule, it may have the same effect as setting an inclusion rule.

Inclusion rules

Inclusion rule	Description
AccountabilityAll	Includes all lines.
AccountabilityLeavesOnly	Includes only leaf nodes; excludes all hierarchy nodes.
AccountabilityLinkedAssmOrLeaves	Includes assigned assembly nodes but excludes their children. If an assembly is not assigned, includes its leaf nodes.
AccountabilityProcessConsumption	Includes assigned nodes under a process or operation that are of occurrence type **MEConsumed**. Excludes all process and operation nodes.
AccountabilityProcessAssignments	Includes assigned nodes (including work areas, parts, and tools) under processes and operations. Excludes all processes and operations nodes. If the assigned-from structure is not loaded, those nodes are also excluded.
AccountabilityProcessAllNoAssign	Include process and operation nodes.
AccountabilityProcessAll	Include process and operation nodes and all of their assigned nodes. If the assigned structure is not loaded, their nodes are excluded.
AccountabilityProcessOnlyWithPA	Includes processes, operations, and process areas only.
ACPlantBOPDerivedProcessesAndOps	Includes only operations and processes that are linked to the source (for example, in a product BOP). This rule is used when comparing a product BOP to a plant BOP and skips plant-specific operations.

Note:

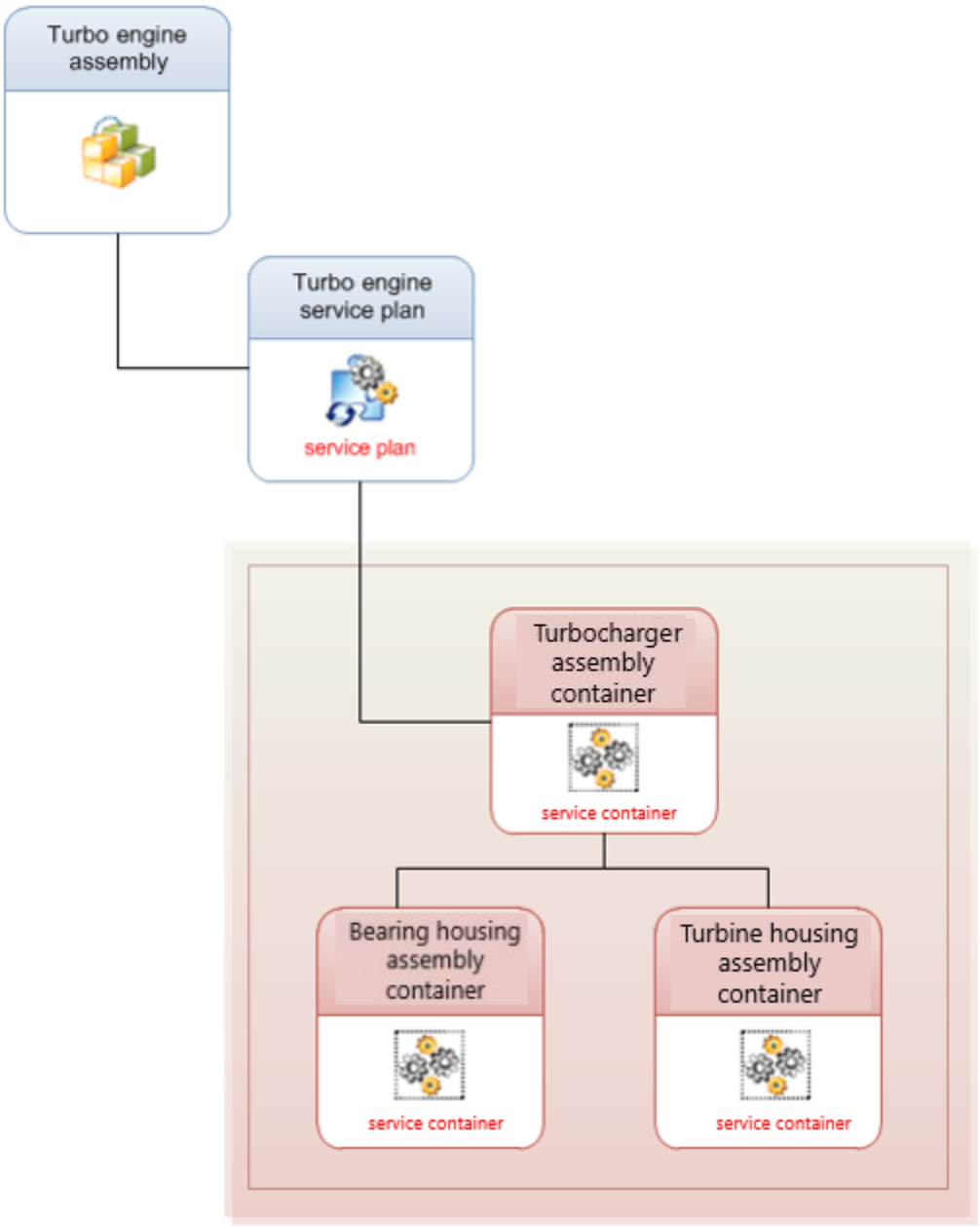
None of the inclusion rules include occurrence group nodes, but they can include the children under those nodes.

Creating service containers

Service containers

A *service container* is the hierarchical grouping of service requirements. A service plan can contain many service containers. You can also nest service containers by creating service containers under another service container.

The following figure shows an example of a service plan for a turbo engine assembly that contains nested containers to group together the bearing housing assembly and turbine housing assembly requirements for the turbocharger subassembly.



Note:

Service containers are very similar to service partitions. However, service containers are more beneficial than service partitions in several ways. Service containers:

- Have improved performance
- Can be revised

- Are supported in Active Workspace
- Can be copied and pasted, along with their contents

You can use either a service partition or a service container in a single structure, but not both.

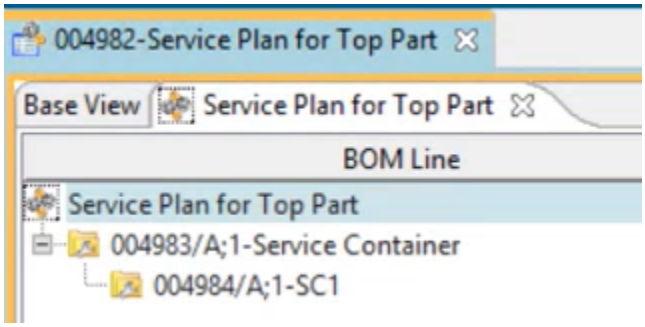
Create a service container

1. From the navigation pane, click **Service Planner**.
2. From the **Service Planner** view, open the service plan to which you want to add the service container.
3. From the **Service Planner** view, click the service plan name tab next to the **Base View** tab, to expand the service plan.
4. Right-click the service plan and choose **New → Service Container**.
5. In the **New Business Item - Service Container Information** dialog box, enter the following information for the service container.

Field name	Definition	Valid Values
Name	The service partition name (required).	Alphanumeric string (1–128 characters)
Description	Description of the service partition.	Alphanumeric string (1–240 characters)

6. Click **Finish**.

The service container is created under the service plan.



Update service container properties

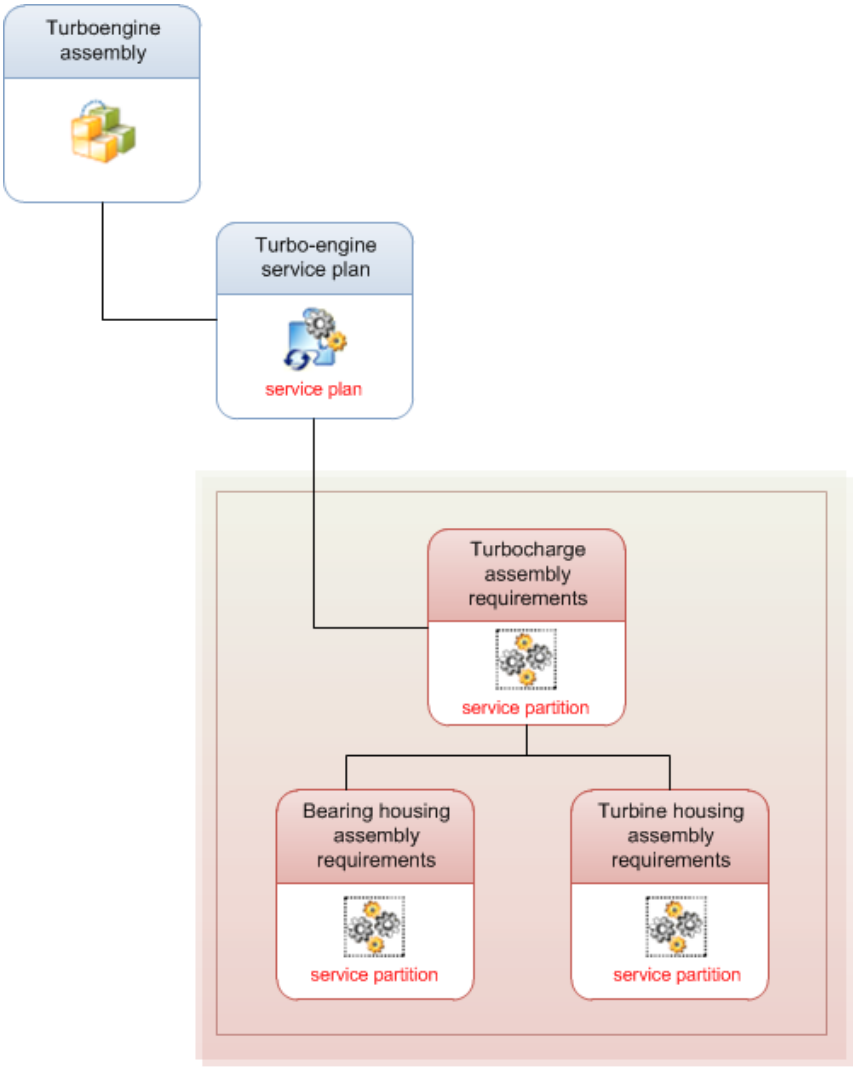
1. From the navigation pane, click **My Teamcenter** or **Service Planner**.
2. Open the service plan that includes the container you want to update.
3. From the **Service Planner** view, click the service plan name tab next to the **Base View** tab, to expand the service plan.
4. Select the container.
5. Right-click and choose **Properties**.
6. In the **Properties** dialog box, change the available properties.
7. Click **OK** or **Apply** to change the service partition properties.

Creating service partitions

What is a service partition?

A *service partition* is the hierarchical grouping of service requirements. A service plan has only one root service partition, but the root service partition can have many service partitions. You can also nest service partitions by creating service partitions under another service partition.

The following figure shows an example of a service plan for a turbo-engine assembly that contains nested partitions to group together the bearing housing assembly and turbine housing assembly requirements for the turbocharger subassembly.



Create a service partition

1. From the navigation pane, click **Service Planner**.

2. From the **Service Planner** view, open the service plan where you want to add the service partition.

3. From the **Service Planner** view, click the service plan name tab next to the **Base View** tab to expand the service plan.

4. Select the service plan and do one of the following:

   - Choose **File** → **New** → **Service Partition**.

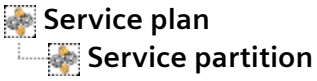
- Click the **New Service Partition** button  on the main toolbar at the top of the **Service Planner** pane.
- Right-click the service plan and choose **New** → **Service Partition**.

5. In the **New Service Partition** dialog box, select **Service Partition** from the list and click **Next**.
6. Enter the following information for the service partition.

Field name	Definition	Valid Values
Name	The service partition name (required).	Alphanumeric string (1–128 characters)
Description	Description of the service partition.	Alphanumeric string (1–240 characters)

7. Click **Finish**.

The service partition is created under the service plan.



Update service partition properties

1. From the navigation pane, click **My Teamcenter** or **Service Planner**.
2. Open the service plan that contains the partition you want to update.
3. From the **Service Planner** view, click the service plan name tab next to the **Base View** tab to expand the service plan.
4. Select the partition.
5. Right-click and choose **Properties**.
6. In the **Properties** dialog box, change the available properties.
7. Click **OK** or **Apply** to change the service partition properties. Alternatively, click **Cancel** to exit.

View plan details for a service partition

You can use the plan details view to display and edit information for a service partition.

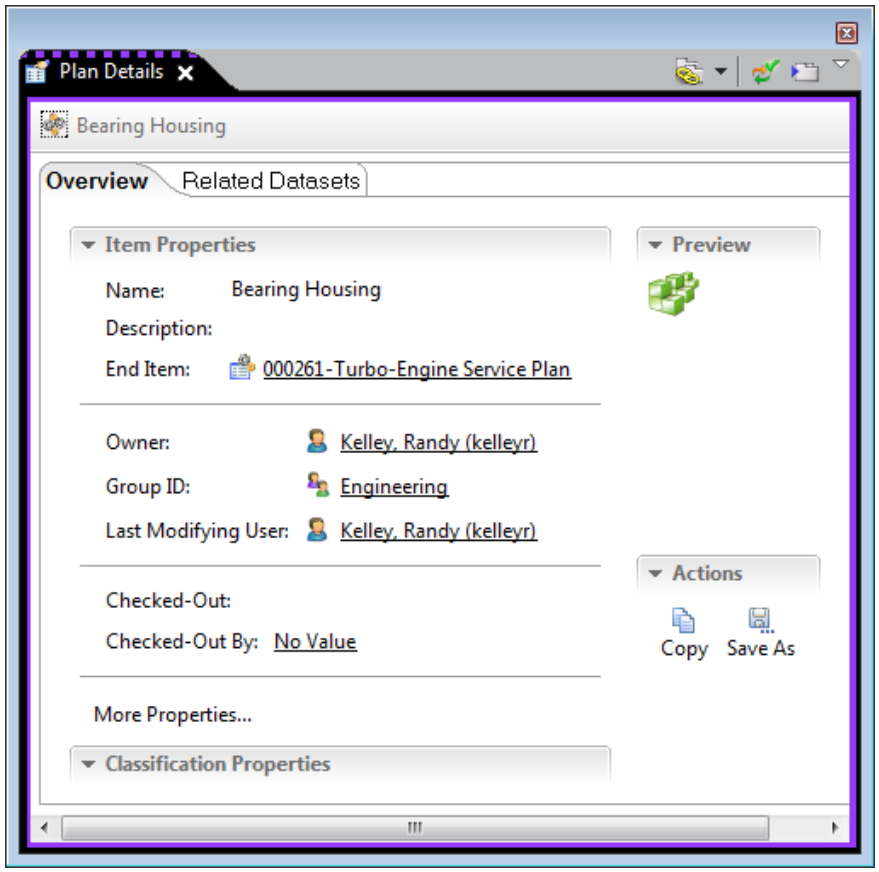
The following information is displayed for a service partition:

- Item properties for the service partition.
- Attached files to the service partition.

1. From the navigation pane, click **Service Planner**.
2. From the **Service Planner** view, open the service plan that contains the partition where you want to view the plan details.
3. In the Service Planner view, click the service plan name tab next to the **Base View** tab to expand the service plan.
4. Select the service partition and do one of the following:

   - Choose **Window** → **Show View** → **Plan Details**.
   - Right-click the service partition and choose **Show Plan Details**.

   The **Plan Details** tab is displayed.



5. To edit properties of the service partition, click the **Overview** tab and click **More Properties**.

6. To add or remove attached files, click the **Attached files** tab and choose one of the following:

   - Click **Add New** to add a new dataset.
   - Click **Paste** to add a dataset that you have copied to the clipboard.
   - Select a dataset and click **Cut** to remove a dataset.

Migrating service plans that contain partitions

Existing service plans that were created in Service Planner likely contain partitions, which are used to group together service requirements within a service plan. Partitions are not applicable in the Active Workspace web client and are replaced with containers.

The scope and limitations to this utility are:

- A service plan that has custom partitions does migrate, but the custom partitions are migrated as out-of-the-box containers.
- Custom properties are not migrated and must be added to the new service container manually.
- Empty partitions do migrate.

The utility **convert_partition_to_container** is available to facilitate migrating partitions to containers.

Syntax

convert_partition_to_container -u=*user-id* **-p=***password* **-g=***Engineering* **-inputfile=***/path/filename*

Arguments

-u

Specifies the user ID

-p

Specifies the password

-g

Specifies the group associated with the user.

-inputfile

Path and name of the file that contains the list of service plans you are migrating.

Input file

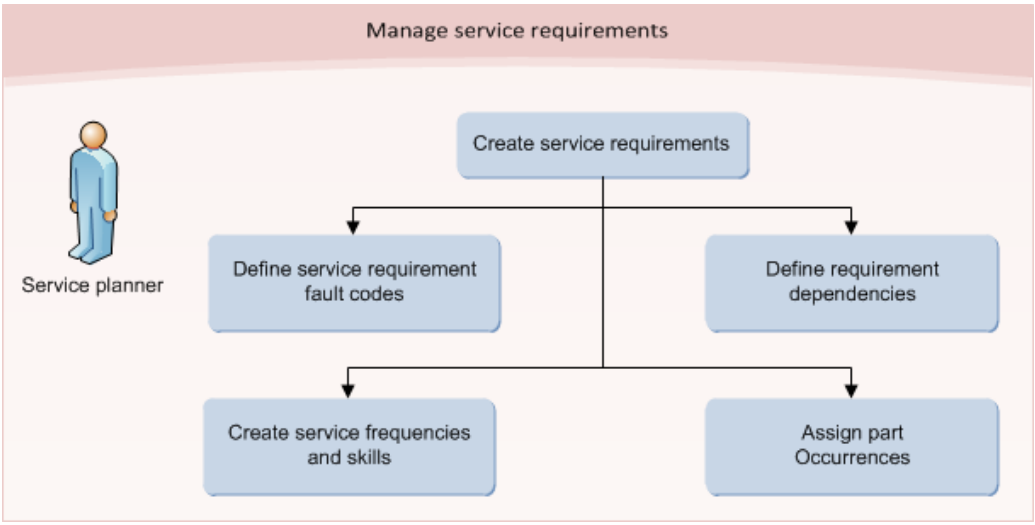
The input file is a text file that contains a list of the service plans you want to migrate. Each service plan is on its own line in the text file.

```
item_id=nnnnnnn
```

8. Setting up and managing service requirements

Setting up and managing service requirements

As a service planner, you create and manage the service requirements that are part of the service plan. Service requirements determine *what* service must be performed. They define the maintenance that can be performed on a part or assembly. Service requirements are grouped under service partitions or service containers.



You create and manage service requirements by:

- Creating the service requirements.
- Creating service frequencies that determine the interval or period for performing maintenance.
- Creating required skills that determine who should perform or sign off on the service requirement.
- Assigning the neutral part occurrences that are impacted by the service requirement.
- Defining service requirement relationship dependencies.

Creating service requirements

Service requirement

A *service requirement* is the maintenance requirement for an assembly or part. Service requirements are grouped together under service partitions or service containers.

You can perform the following actions on service requirements:

- Assign states to a service requirement.

  You can assign the following states to a service requirement by submitting it to an approval workflow:

  - **in-work**
  - **approved**
  - **deprecated**

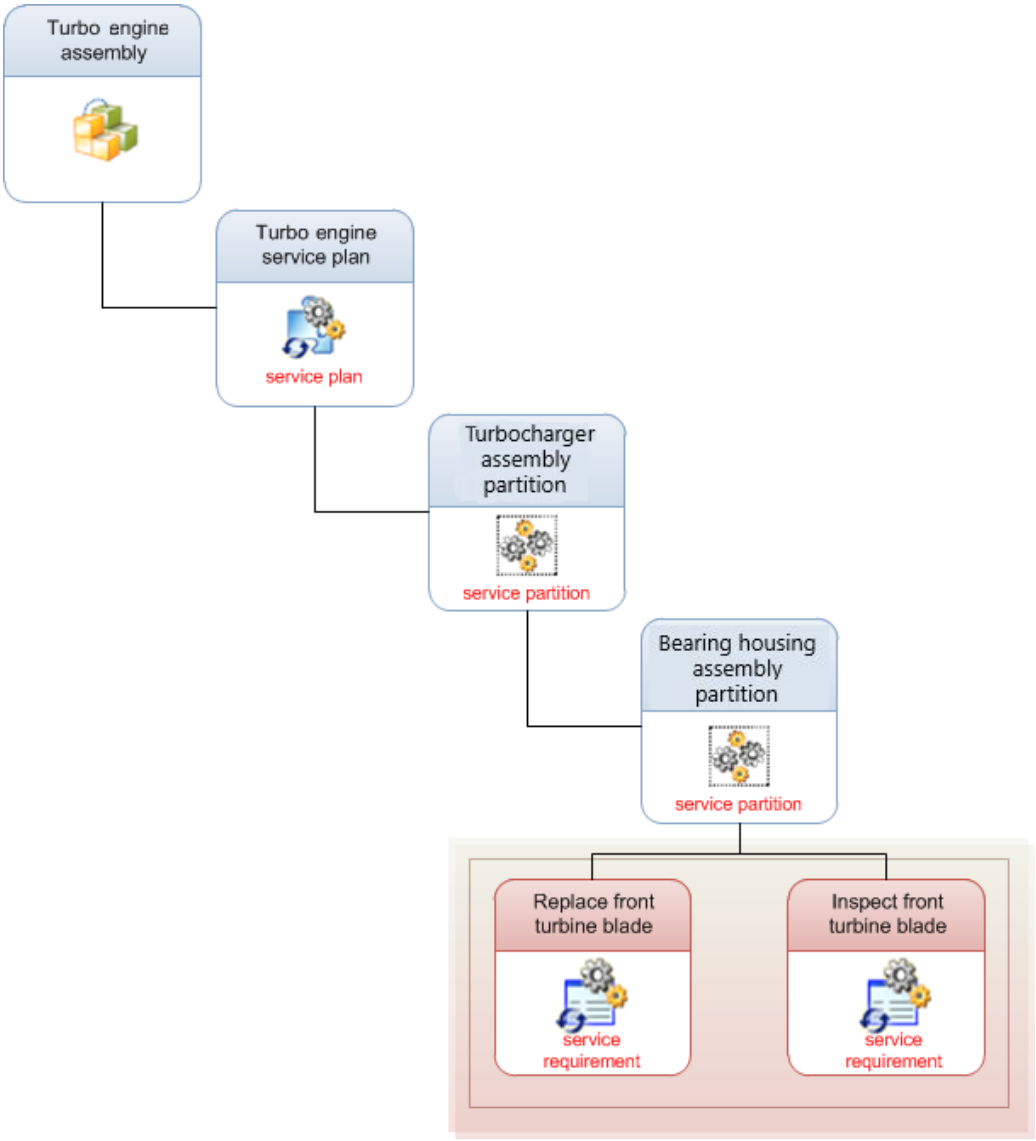
- Revise service requirements to create new revisions.

  You can revise service requirements to create new revisions. If a work card is related to a service requirement, those relations are carried forward when the new revision of the service requirement is created. Only the latest approved service requirement is part of the active service plan.

- Use options and variants to configure a service requirement.

  > Example:
  >
  > You may want to setup a variant to indicate whether the service requirements are war time or peace time requirements.

The following figure shows an example of a turbo engine assembly that has multiple service requirements for the bearing housing sub assembly. The service requirements include inspecting and replacing the right turbine blade that is a component of the bearing housing assembly. The service requirements for the bearing housing sub assembly are grouped together under the service partition or container for the turbocharger assembly requirements.



Create a service requirement

1. From the navigation pane, click **Service Planner**.

2. From the **Service Planner** view, open the service plan to contain the service requirement.

3. Click the service plan name tab next to the **Base View** tab to expand the service plan.

4. Select the service partition or service container to contain the service requirement, and do one of the following:

   - Choose **File** → **New** → **Service Requirement**.

   - Click the **New Service Requirement** button at the top of the **Service Planner** pane.

- Right-click the neutral part and choose **New** → **Service Requirement**.

5. Select **Service Requirement** from the list and click **Next**.

6. In the **New Service Requirement** dialog box, enter the following information for the service requirement.

Field name	Definition	Valid Values
ID	The service requirement ID (required). Leave the field blank to automatically assign an ID.	Alphanumeric string (1–128 characters)
Revision	The service revision (required). Leave the field blank to automatically assign a revision.	Alphanumeric string (1–128 characters)
Name	The service requirement name (required).	Alphanumeric string (1–128 characters)
Description	Description of the service requirement.	Alphanumeric string (1–240 characters)
Requirement Category	Category for service requirement (read-only). This field is populated after you set the requirement type in the **Requirement Type** field.	Alphanumeric string (1–128 characters)
Requirement Type	The type of service requirement (required).	Valid values already defined by the system: • **Inspection** • **Repair** • **Overhaul** • **Other**
Upgrade	Defines if the service requirement represents an **upgrade or modification** to an existing product (required). If **Upgrade** is set to **True**, you can indicate that the purpose of the work card is to upgrade a physical part from one configuration to another. It also specifies that a rebase of the impacted physical part is to be performed as part of the completion of the work card.	Boolean

7. Click **Finish**.

   The service requirement is created under the service partition or service container.

Duplicating a service requirement behavior

Service plans often contain service requirements that are similar to or the same as service requirements in other service plans.

You are able to clone service requirements and most of their contents within a service plan, between service plans, and between partitions. The items contained in a service requirement, by default, are cloned, with the exception of the consumed parts.

> Note:
>
> You change the default behavior by adjusting the values of the preference **SSP0ServicePlan.SSP0ServicePlan.PasteDuplicateTemplate**.
>
> The preference **SSP0ServicePlan.SSP0ServicePlan.PasteDuplicateTemplate** is already defined in the software. The values available include:
>
> - ***.*.Attribute.items_tag:Clone**
> - ***.*.Attribute.structure_revisions:Clone**
> - ***:*:Attribute.bom_view:Clone**
> - ***.*.Attribute.parent_item:Clone**
> - ***.class.SSP0WorkCardRevision:OccType.*.Clone**
> - ***:class.SSP0FrequencyRevision:OccType.*:Clone**
> - ***.class.SSP0SkillRevision:OccType.*.Reference**
> - ***.class.Mfg0MEResourceRevision:OccType.*.Reference**
> - ***.class.DocumentRevision:OccType.MEAssemble:Ignore**
> - ***.class.DocumentRevision:OccType.MEDisassemble:Ignore**
> - ***.class.DocumentRevision:OccType.SSP0Replace:Ignore**
> - ***.class.DocumentRevision:OccType.Null:Reference**
> - ***.class.DocumentRevision:OccType.*:Reference**
> - ***:class.ItemRevision:OccType.*:Ignore**
> - ***:*:Relation.IMAN_specification:Clone**
> - **class.Folder:*:Attribute.contents:Reference**
> - ***:*:Attribute.variant_expression_block:Clone**
> - ***:class.PartRevision:OccType.*:Reference**

Service Requirement contents

The following table shows the items that are contained within a service requirement and whether or not the item is cloned when you perform a **Copy** and **Paste Duplicate** action. The actions listed are the default actions and can be changed with the preference.

Item	Cloned
Service Requirements	Yes
Work Cards	Yes
Activities	Yes
Part Consumed in the Service Requirement	No

> Note:
>
> The cloned service requirement is a copy of the original. There is no association between the original and the cloned service requirement. Any changes made to one of the service requirements is not reflected in the other.

Duplicating service requirements options

The following scenarios are supported with the **Paste Duplicate** action.

Location of Service Requirement	Target
Partition	Partition within the same service plan
Partition	Partition in a different service plan
Activities	Yes
Part Consumed in the Service Requirement	No

Duplicate a service requirement–Clone

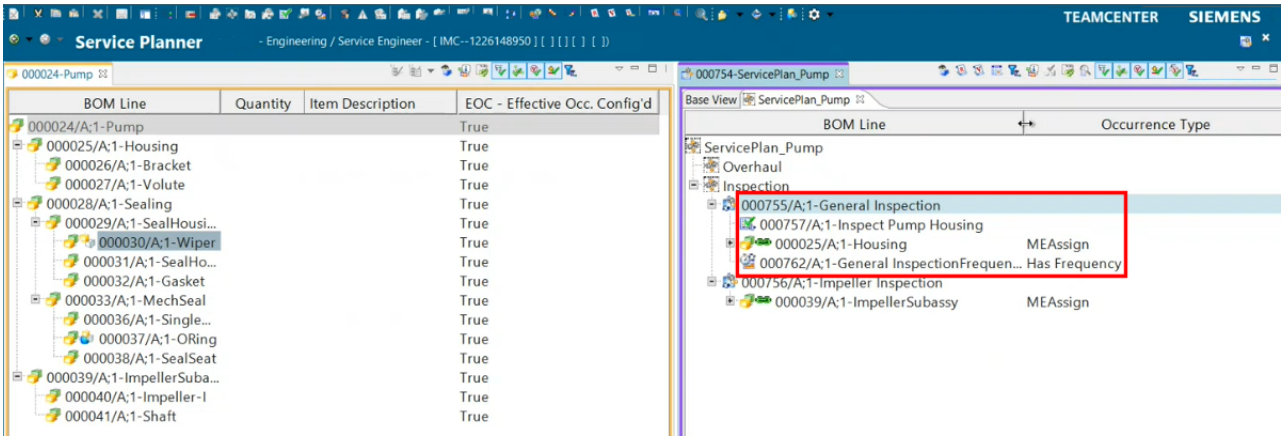
You can use **Copy** and **Paste Duplicate** to clone a service requirement, saving time and promoting consistency.

> Note:
>
> This example demonstrates copying a service requirement from one partition to another.
>
> Please see **Duplicating a service requirement behavior** for a list of applicable sources and targets.
>
> In this example, the preference **SSP0ServicePlan.SSP0ServicePlan.PasteDuplicateTemplate** includes the following values; ***:class.SSP0WorkCardRevision:OccType.*:Clone** and ***:class.SSP0FrequencyRevision:OccType.*:Clone** which are set to clone.

Procedure

1. Arrange your workspace to display the source and target items.

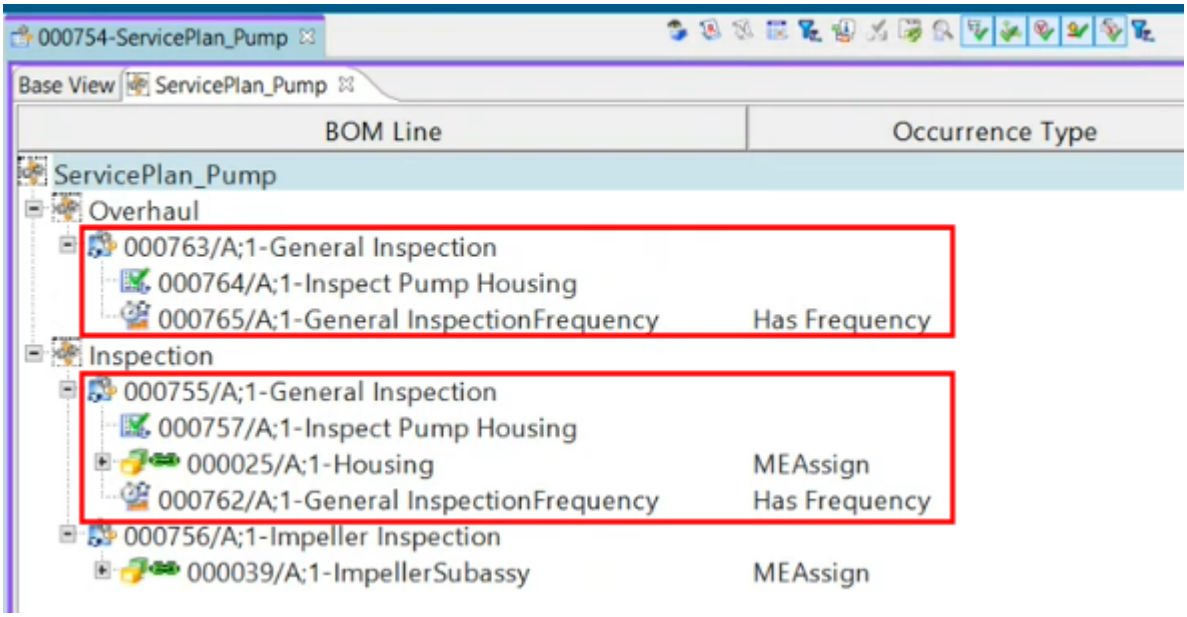
2. Select the service requirement **000755/A;1-General Inspection** in the **Inspection** partition and choose **Copy**.



3. Right-click the partition **Overhaul** and choose **Paste Duplicate**.

The service requirement **000755/A;1-General Inspection** is copied from the **Inspection** partition to the **Overhaul** partition and has a new item number **000763/A;1-General Inspection**.

Because the preference values ***:class.SSP0WorkCardRevision:OccType.*:Clone** and ***:class.SSP0FrequencyRevision:OccType.*:Clone** are set to clone, the work card **000755/A;1-Inspect Pump Housing** and the **Frequency** are both cloned and have been given new item IDs (**000764/A;1-Inspect Pump Housing** and 000765/A;1-General Inspection Frequency, respectively).



Duplicate a service requirement–Reference

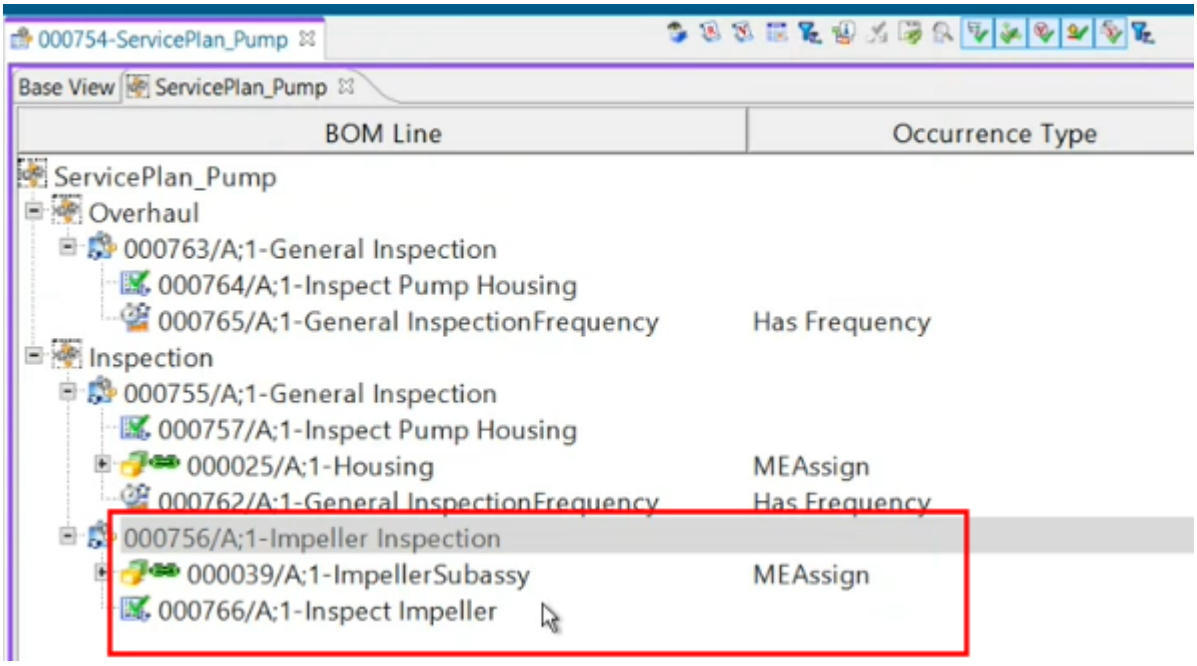
You can use **Copy** and **Paste Duplicate** to clone a service requirement, saving time and promoting consistency.

> Note:
>
> This example demonstrates copying a service requirement from one partition to another.
>
> Please see **Duplicating a service requirement behavior** for a list of applicable sources and targets.
>
> In this example, the preference **SSP0ServicePlan.SSP0ServicePlan.PasteDuplicateTemplate** includes the following values; ***:class.SSP0WorkCardRevision:OccType.*:Reference** set to reference and ***:class.SSP0FrequencyRevision:OccType.*:Clone** set to clone.

Procedure

1. Arrange your workspace to display the source and target items.

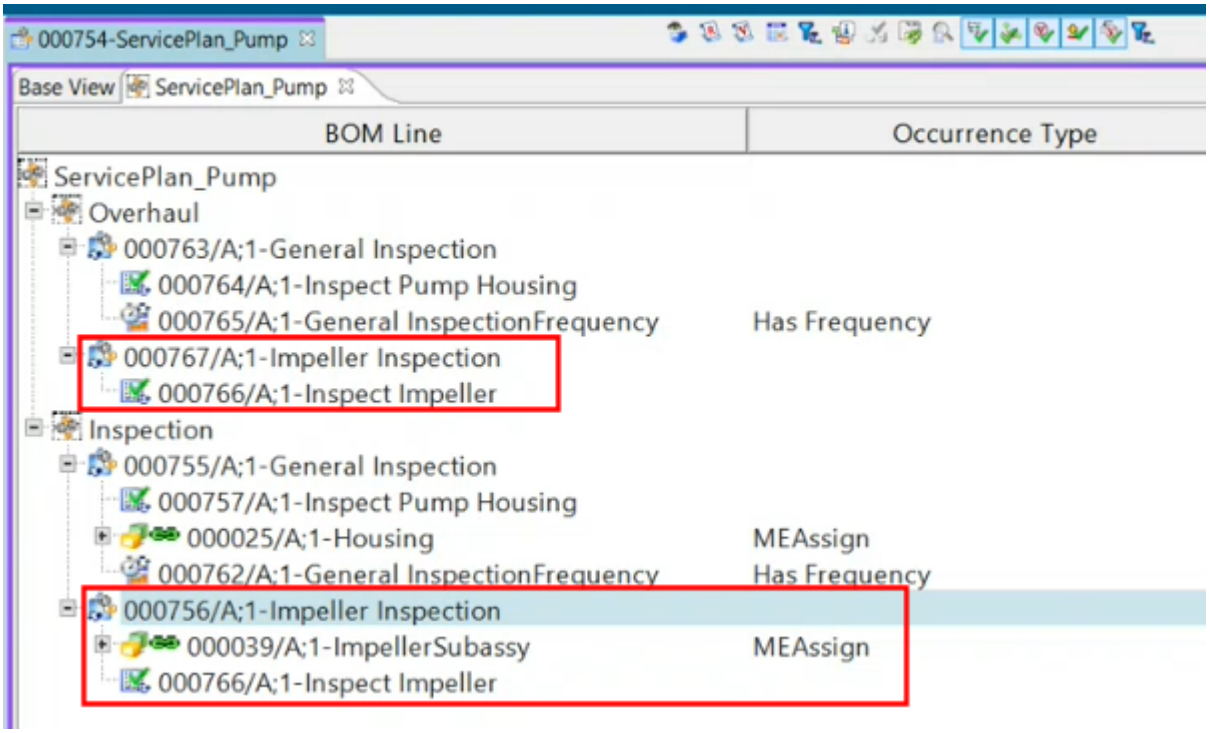
2. Select the service requirement **000756/A;1-Impeller Inspection** in the **Inspection** partition and choose **Copy**.



3. Right-click the partition **Overhaul** and choose **Paste Duplicate**.

   The service requirement **000756/A;1-Impeller Inspection** is copied from the **Inspection** partition to the **Overhaul** partition and has a new item number **000767/A;1-Impeller Inspection**.

Because the preference value ***:class.SSP0WorkCardRevision:OccType.*:Reference** is set to reference, the work card **000766/A;1-Inspect Impeller** is referenced in the **Overhaul** partition and the item ID is not changed.



Update service requirement properties

1. From the navigation pane, click **My Teamcenter** or **Service Planner**.
2. In the **Service Planner** view, select the service requirement.
3. Right-click and choose **Properties**.
4. In the **Properties** dialog box, change the available properties.
5. Click **OK** or **Apply** to change the service requirement properties. Alternatively, click **Cancel** to exit.

Locate a service requirement

1. From the navigation pane, click **Service Planner**.
2. Locate a service requirement by doing one of the following:

    a. From the **Service Planner** view, click **Open By Name** on the main toolbar at the top of the **Service Planner** pane, to open the service plan that contains the service requirement.

A. From the **Service Planner** view, click the service plan name tab next to the **Base View** tab to expand the service plan.

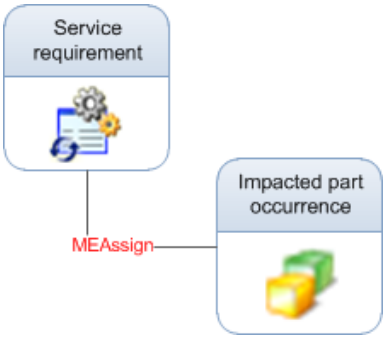
B. Expand the service partition that contains the service requirement.

b. Using advanced search, search for the service requirement. Right-click the service plan from the results list and choose **Send to** → **Service Planner**.

Assign an impacted part occurrence to a service requirement

You can assign impacted neutral part occurrences to service requirements to identify the impacted parts. The impacted part represents the part or assembly that is most directly impacted by the service requirement. If there is *no* relationship created between a neutral part occurrence and a service requirement, the impacted part is assumed to be the neutral part related to the parent service plan.

When you assign a neutral part occurrence to a service requirement, the **Occurrence Type** for the neutral part is set to **MEAssign**.



1. From the navigation pane, click **Service Planner**.

2. Locate and open the neutral structure or part you want to assign as an impacted part to the service requirement.

3. From the **Product** view, right-click the neutral part and choose **Copy**.

4. Locate and open the service requirement that you want to assign the neutral part occurrence to.

5. From the **Service Plan** view, right-click the service requirement and choose **Paste** or **Paste As** → **MEAssign**.

   The neutral part is assigned to the service requirement with the **Occurrence Type** set to **MEAssign**.

Process Structure	Occurrence Type
Service plan	
Service partition	

Service requirement
Neutral part MEAssign

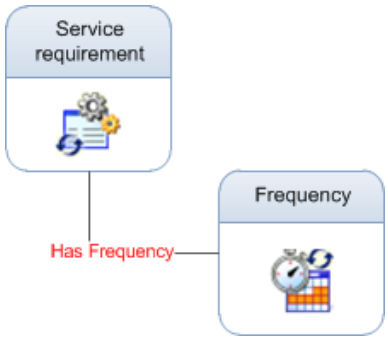
Creating service requirement frequencies

Service requirement frequency

The *frequency* for a service requirement defines the interval or period for performing the maintenance. It defines *when* the service needs to be performed.

> Example:
>
> You can create a frequency that specifies an inspection maintenance requirement be performed every two months.

As the following figure shows, frequencies are associated to the service requirement with a **Has Frequencies** relationship. After creating the frequency for a service requirement, the **Occurrence Type** for the frequency is set to **Has Frequency**.



You create a frequency by defining an expression. The expression can be made up of keywords and characteristic definitions. The evaluation of the frequency expression always returns a Boolean.

A frequency expression may contain more than one phrase using phrase separators such as **AND** or **OR**.

Keywords indicate whether a frequency is threshold or repetitive.

> Example:
>
> You use the keyword **At** to define that maintenance has to be performed at a specific date only.
> You use the keyword **Every** to define that maintenance has to be performed every three days.

The characteristics values that are available to use in the frequency expression are determined by the following:

- Any life, observation, or date characteristics related to the neutral parts assigned to the service requirement with the **MEAssign** relationship are available as valid characteristics to use in the frequency expression.

- Any life, observation, or date characteristics related to the neutral part assigned to the parent service plan are available as valid characteristics to use in the frequency expression. This is only true if there are *no* assigned or impacted parts assigned to the service requirement with the **MEAssign** relationship.

> Example:
>
> You defined a life characteristic to record the engine hours for a turbo-engine. The turbo-engine is assigned to a service requirement for inspection. You use engine hours in the frequency expression to perform the inspection requirement every one thousand engine hours.

The system provides the following options in addition to any life, observation, or date characteristics:

- **Calendar**

  Used for adding calendar time to the expression.

- **Installation Date**

  Indicates that the installation time of a part in a structure should be used.

- **Manufacturing Date**

  Indicates that the date of manufacture should be used.

- **Days**

  Indicates the number of days.

- **Months**

  Indicates the number of months.

- **Years**

  Indicates the number of years.

Create a service frequency

1. From the navigation pane, click **Service Planner**.

2. From the **Service Planner** view, select the service requirement where you want to add the frequency and do one of the following:

   - Choose **File** → **New** → **Frequency**.
   - Click the **Create a new Frequency** button  on the main toolbar at the top of the **Service Planner** pane.
   - Right-click the service requirement and choose **New** → **Frequency**.

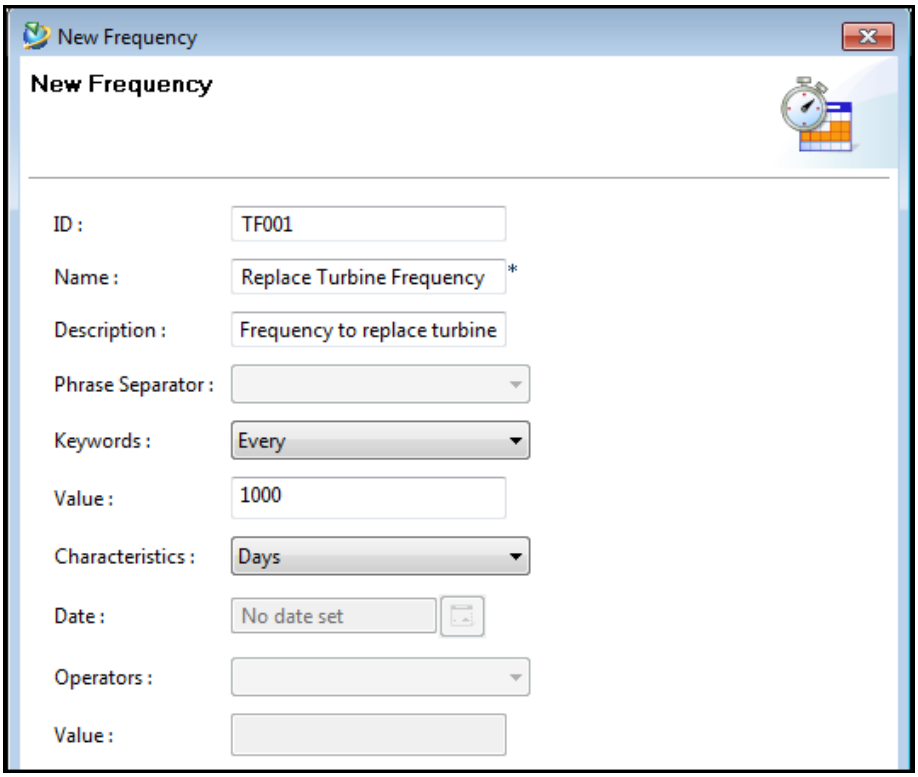
3. In the **New Frequency** dialog box, select **Frequency** from the list and click **Next**.

4. Enter the following information for the frequency.

Field name	Definition	Valid Values
ID	The service frequency ID.	Alphanumeric string (1–128 characters).
Name	The service frequency name (required). The service frequency name is automatically named with the service requirement name suffixed with the word **Frequency**. You can use this value or type in a new value.	Alphanumeric string (1–128 characters).
Description	Description of the service frequency.	Alphanumeric string (1–240 characters)
Phase Separator	Conditional keywords that separate the phrases. This option is available when you add a frequency expression in the **Frequency Expression** box.	Valid values are: • **And** • **Or** • **Then**
Keywords	Indicates whether the frequency is a threshold or a repetitive one.	Valid values are: • **Every** • **Within** • **When** • **At**
Value	Numeric value used in the expression. This field is only available after you select the	Floating point value.

<table>
<tr><th>Field name</th><th>Definition</th><th>Valid Values</th></tr>
<tr><td></td><td>keyword in the Keywords box.</td><td></td></tr>
<tr><td>Characteristics</td><td>The life, observation, or date characteristics used in the expression.</td><td>The valid values depend on the selected keyword in the Keywords box.
<table><tr><th>Selected Keyword</th><th>Valid Values</th></tr><tr><td>Every</td><td>Any valid life characteristic value, Days, Months, Years.</td></tr><tr><td>Within</td><td>Any valid life characteristic value.</td></tr><tr><td>When</td><td>Any valid observation characteristic value.</td></tr><tr><td>At</td><td>Any valid life or date characteristic value, Calendar, Days, Months, Years, Install Date, or Manufacturing Date.</td></tr></table></td></tr>
<tr><td>Date</td><td>The date when the maintenance should take place. This field is only available if a date characteristic or the Calendar option is selected in the Characteristics box.</td><td>Date.
Click the  button to set the date.</td></tr>
</table>

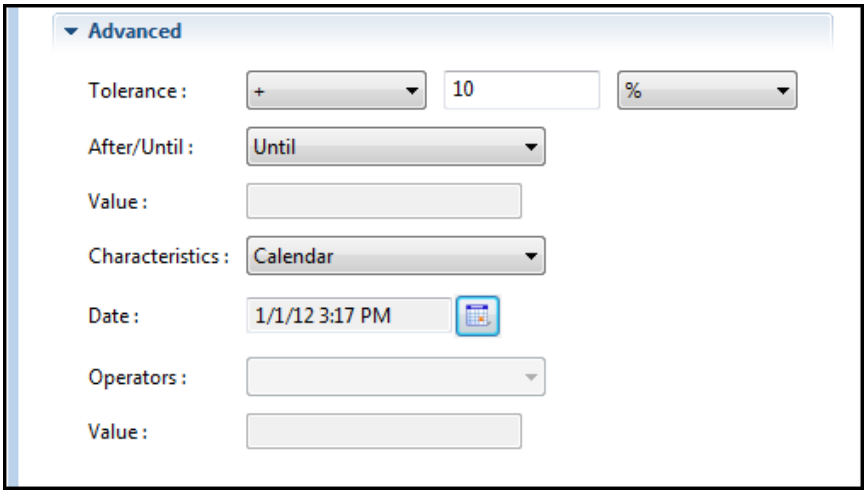
Field name	Definition	Valid Values
	Note: The **Calendar** option is only when **Keywords** is set to **At**.	
Operators	Operator used in the expression when **Keywords** is set to **When**.	Valid values are **<** and **>** (indicating less than and greater than).
Value	Numeric value to be used in the expression. This field is only available after you select the operator in the **Operators** box.	Floating point value.



5. Click **Advanced** to add the following optional information in the frequency expression.

Field name	Definition	Valid Values
Tolerance	Tolerance value added to the expression.	For the first field, valid values are: **+**, **.-**, or **+-**.

Field name	Definition	Valid Values
		Type a numeric value for the second field. For the third field, valid values are **%**.
After/Until	Specifies if the maintenance is performed after or until a specific value.	Valid values are: • **After** • **Until**
Value	Numeric value used in the expression.	Floating point value.
Characteristics	The life, observation, or date characteristics used in the expression.	Any valid life, date, or observation characteristic value, **Calendar**, **Days**, **Months**, **Years**, **Install Date**, or **Manufacturing Date**.
Date	The date after or until the maintenance takes place. This field is only available if a date characteristic or the **Calendar** option is selected in the **Characteristics** box.	Date. Click the  button to set the date.
Operators	Operator used in the expression when **Keywords** is set to **When** and **Characteristics** is set to an observation characteristic.	Valid values are **<** and **>** (indicating less than and greater than).
Value	Numeric value to be used in the expression. This field is only available after you select the operator in the **Operators** box.	Floating point value.



6. For the **Frequency Expression** box, do one of the following:

   - Click + to add the expression created from the values you selected in the previous step.
   - Click — to remove the expression.
   - Select the expressions you want to edit and click **Edit**. Edit the expression and click **Save** to save the changed expression or click **Cancel** to cancel the changes.
   - Select the expressions you want to group together using parentheses and click **Group**.
   - Select the expressions that you want to remove from the group and click **UnGroup**.

   > Tip:
   >
   > To select multiple expressions, press the Shift key and select the expressions.

7. Click **OK** to create the frequency.

   The frequency is created for the service requirement with the **Occurrence Type** set to **Has Frequency**.

Process Structure	Occurrence Type
Service plan	
Service partition	
Service requirement	
Frequency	Has Frequency

Edit a service frequency

1. From the navigation pane, click **Service Planner**.

2. Select the service frequency to edit.

3. Right-click and choose **Edit Frequency**.

4. In the **Edit Frequency** dialog box, change the service frequency expression.

5. Click **OK** to change the service frequency. Alternatively, click **Cancel** to exit.

Assign a service frequency to other service requirements

1. From the navigation pane, click **Service Planner**.

2. Right-click the frequency you want to relate to the service requirement and choose **Copy**.

3. From the **Service Planner** view, right-click the service requirement to add the frequency to and choose **Paste**.

   The frequency is created for the service requirement with the **Occurrence Type** set to **Has Frequency**.

Process Structure	Occurrence Type
Service plan	
Service partition	
Service requirement	
Frequency	**Has Frequency**

Service frequency examples

The following table contains examples of service frequencies using the following keywords, characteristics, and phrase connectors.

Keywords	**At**, **Every**, **Within**, **When**, **Install Date**, **Manufacturer Date**, **Calendar**
Characteristics defined	**Landings**, **Months**, **Flight Hours**, **Oil Pressure**, **Tire Change**
Phrase Connectors	**Or**, **Then**, **And**

At 100 **Landings +–** 10 **Landings**

At 100 **Landings Or At** 2 **Months**

At 120 **Months After Manufacture Date**

At 10 **Landings After Calendar** "3/22/2010"

At 10 **Landings After Calendar** "3/22/2010"

Within 50 **Cycles After Oil Pressure** > 1000 PSI

Within 50 **Cycles After Calendar** "3/22/2010"

Within 50 **Cycles After Manufacture Date**

Every 100 **Flight Hours Until** 10000 **Flight Hours**

Every 100 **Flight Hours +–** 10 **Flight Hours Until** 10000 **Flight Hours**

Every 100 **Flight Hours +–** 10 **Flight Hours Until** 10000 **Flight Hours** After Calendar "3/22/2010"

Every 100 **Flight Hours +–** 10 **Flight Hours Until** 10000 **Flight Hours After Install Date**

Every 100 **Flight Hours Until** 10000 **Flight Hours** Then **Every** 80 **Flight Hours Until** 20000 **Flight Hours**

Every 100 **Flight Hours Until** 10000 **Flight Hours**

When Oil Pressure > 1000 PSI **+–**100 PSI **And When Oil Pressure** < 2000 PSI

Defining service requirement dependencies

Creating relations between two service requirements

You can define service requirement dependencies by creating relations between two service requirements.

The following relations can be defined:

- **Requires**

  This relation is used when one service requirement requires another service requirement.

Example:

You created a service requirement to change the oil every month in a service plan for a truck. Another service requirement in the same service plan is defined to replace the oil filter which is needed before changing the oil. You create a **Requires** relation between the requirement for

changing the oil and the requirement to replace the oil filter to indicate the first requirement requires the second.

- **Satisfies**

  This relation is used when one service requirement satisfies another service requirement.

Example:

You created a service requirement to replace the brake pads every 1000 engine hours in a service plan for a truck. Another service requirement in the same service plan is defined to perform a complete brake system overhaul every 4000 engine hours, which includes changing the brake pads. You create a **Satisfies** relation between the requirement for the brake overhaul and the requirement to replace the brake pads to indicate the second requirement satisfies the first.

Define a requires relation

1. From the navigation pane, click **Service Planner**.
2. Locate and open the service plan that contains the service requirements that you want to relate to each other.
3. Press the Ctrl key and select the two service requirements you want to relate.
4. Right-click and choose **Setup Requires Service Requirement Relation**.
5. In the **Setup Requires Service Requirement Relation** dialog box, click **Swap** to change the order of the service requirements.
6. Click **OK** to create the relation.
7. To display the relationship, select the service requirement and choose **Window → Show View → Plan Details** or right-click the service requirement and choose **Show Plan Details**.

Define a satisfies relation

1. From the navigation pane, click **Service Planner**.

2. Locate and open the service plan that contains the service requirements that you want to relate to each other.

3. Press the Ctrl key and select the two service requirements you want to relate.

4. Right-click and choose **Setup Satisfies Service Requirement Relation**.

5. In the **Setup Satisfies Service Requirement Relation** dialog box, click **Swap** to change the order of the service requirements.

6. Click **OK** to create the relation.

7. To display the relationship, select the service requirement and choose **Window** → **Show View** → **Plan Details** or right-click the service requirement and choose **Show Plan Details**.

Remove service requirement dependencies

1. From the navigation pane, click **Service Planner**.

2. Locate and open the service plan that contains the service requirements that you want to delete the dependencies.

3. Select one of the service requirements that contains a dependency.

4. Choose **Window** → **Show View** → **Plan Details** or right-click the service requirement and choose **Show Plan Details**.

5. In the **Plan Details** dialog box, select the service requirement dependency.

6. Click **Cut** to remove the dependency.

   The service requirement dependencies are removed.

Managing fault codes

What is a fault code?

A *fault code* is an identifier that indicates an itemized fault or problem that a manufacturer has identified with a part. You can identify resolved fault codes that are rectified by the service requirement. If there is an impacted neutral part assigned to the service requirement using the **MEAssign** relationship, the fault code must be related to the impacted part. If there is no impacted part defined, the fault code must be related to the neutral part assigned to the service plan.

Create a fault code

1. From the navigation pane, click **Service Planner**.
2. Select the folder where you want to create the new fault code and choose **File** → **New** → **Fault Code**.
3. In the **New Fault Code** dialog box, select **Fault Code** from the list and click **Next**.
4. In the **New Fault Code** dialog box, enter the following information for the service partition.

Field name	Definition	Valid Values
Name	The fault code name (required).	Alphanumeric string (1–128 characters)
Description	Description of the fault code.	Alphanumeric string (1–240 characters)

5. Click **OK** to create the fault code.

Relate a neutral part to a fault code

1. From the navigation pane, click **Service Planner** or **My Teamcenter**.
2. Right-click the neutral part you want to relate to the fault code and choose **Copy**.
3. Right-click the fault code and choose **Paste**.

   The neutral part is related to the fault code.

   Fault code
   Neutral part

Define a service requirement to resolve a fault code

1. From the navigation pane, click **Service Planner**.

2. Locate and open the service requirement that you want to use to resolve the fault code.

3. From the **Service Planner** view, select the service requirement.

4. Right-click and choose **Identify Resolved Fault**.

5. In the **Identify Resolved Fault** dialog box, select the fault codes from the list of available fault codes.

6. Click **OK** to create the relation.

7. To display the relationship, select the service requirement and choose **Window** → **Show View** → **Plan Details** or right-click the service requirement and choose **Show Plan Details**.

Remove a fault code from a service requirement

1. From the navigation pane, click **Service Planner**.

2. From the **Service Planner** view, select the service requirement to remove the fault code from.

3. Choose **Window** → **Show View** → **Plan Details** or right-click the service requirement and choose **Show Plan Details**.

4. In the **Plan Details** dialog box, select the fault code under the **Fault** section.

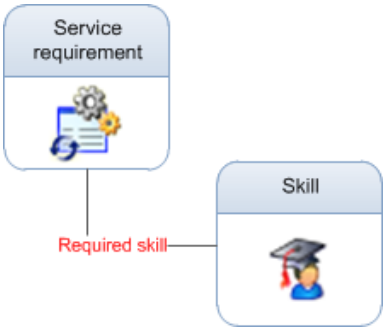
5. Click **Cut** to remove the fault code.

Creating required skills

What is a required skill?

A *required skill* is the qualification that a person must have for performing or signing off on a service requirement. The workflow that the workflow designer builds to approve or perform the service requirement accesses the required skill to ensure the correct person performs or signs off on the service requirement.

After you create the skill for a service requirement, the **Occurrence Type** for the skill is set to **Required Skill**.



Create a skill

1. From the navigation pane, click **Service Planner**.
2. Locate and open the service requirement where you want to relate the required skill.
3. From the **Service Planner** view, select the service requirement and do one of the following:
   - Choose **File** → **New** → **Skill**.
   - Click the **Create a new Skill** button on the main toolbar at the top of the **Service Planner** pane.
   - Right-click the service requirement and choose **New** → **Skill**.
4. In the **New Skill** dialog box, select **Skill** from the list and click **Next**.
5. Enter the following information for the skill.

Field name	Definition	Valid Values
ID	The skill ID (required). Leave the field blank to automatically assign an ID.	Alphanumeric string (1–128 characters)
Revision	The revision of the skill (required). Leave the field blank to automatically assign a revision.	Alphanumeric (1–32 characters)
Name	The name of the skill (required).	Alphanumeric string (1–128 characters)

Field name	Definition	Valid Values
Description	Description of the skill.	Alphanumeric string (1–240 characters)
Discipline	Discipline associated with the skill.	Valid values are the list of defined disciplines.

6. Click **Finish**.

   The skill is created for the service requirement with the **Occurrence Type** set to **Required Skill**.

Process Structure	Occurrence Type
Service plan	
Service partition	
Service requirement	
Skill	Required Skill

Assign a skill to other service requirements

1. From the navigation pane, click **Service Planner**.

2. From the **Service Planner** view, right-click the skill that you want to relate to the service requirement and choose **Copy**.

3. From the **Service Planner** view, right-click the service requirement and choose **Paste**.

   The skill is created for the service requirement with the **Occurrence Type** set to **Required Skill**.

Process Structure	Occurrence Type
Service plan	
Service partition	
Service requirement	
Skill	Required Skill

Define part applicability

Part applicability is defined between a service requirement and an item or part. When the service is performed, the items that are applicable to the service requirement are used to determine the physical parts that have service requirements. If there are no applicable parts defined for the requirement, then all serials numbers and part numbers of the impacted parts are used to identify the physical parts.

You can define part applicability by:

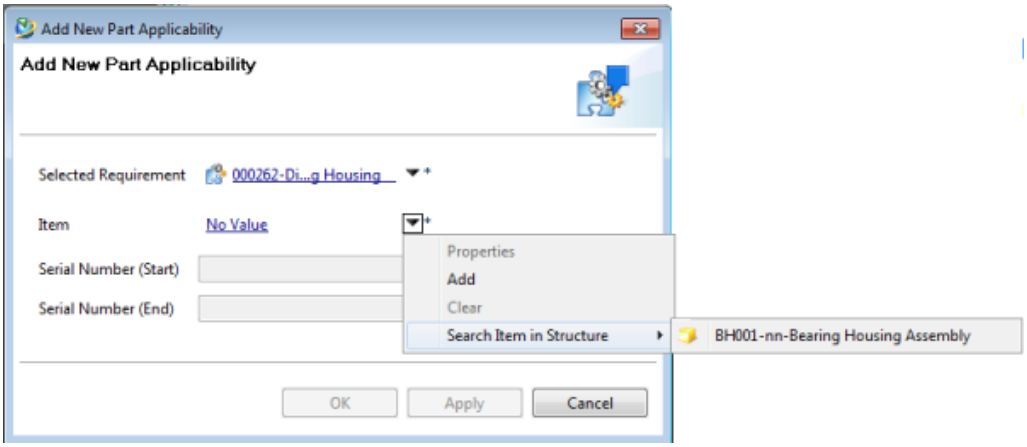
- Specifying the part number and the serial number ranges of the part.

The serial numbers in the specified range for the part number are identified as applicable parts for the service requirement.

- Specifying the part number with no serial range.

  All serial numbers for the part number are identified as applicable parts for the service requirement.

1. From the navigation pane, click **Service Planner**.
2. Locate and open the service requirement to assign the part applicability to.
3. From the **Service Planner** view, right-click the service requirement in the process view and choose **Define Part Applicability**.
4. In the **Define Part Applicability** dialog box, click **Add New** to add a new part applicability.
5. Click ▼ and select one of the following values:



   a. **Properties** to display the properties of the item that is contained in this field.

   b. **Add** to search for an existing item.

      A. In the **Search** dialog box, type the values for the properties to filter your search and click **Find**.

      B. Select the item in the search results list and click **OK**.

         The part applicability dialog box reappears with the selected item.

   c. **Clear** to clear any item that is contained in this field.

d. **Search Item in Structure** to search for the item in a structure that is displayed and expanded in the **Product** view.

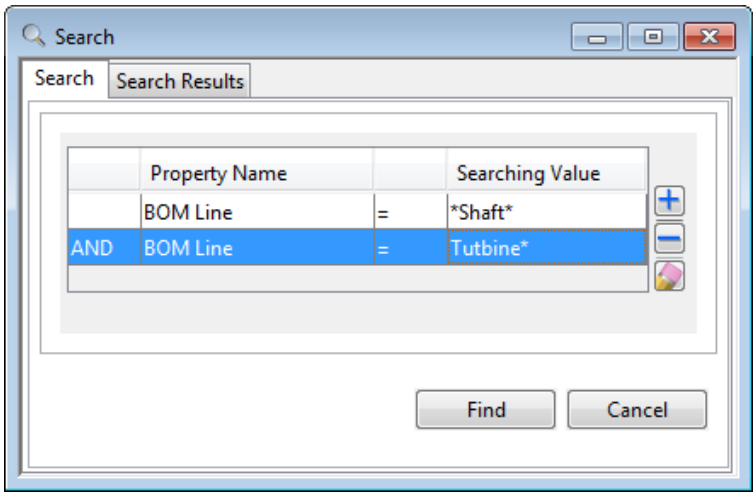
> Note:
>
> This option is not available if there is no structure that is displayed in the **Product** view.

A. In the **Search** dialog box, double-click the **Searching Value** column and type a value.

You can use wild cards in this field.

B. Choose one of the following:

i. Click + to add an additional condition. The conditional separator used is **AND**.



ii. Click − to remove an existing condition.

iii. Click to remove all conditions.

C. Select the item in the search results list and click **OK**.

6. In the **Define Part Applicability** dialog box, enter the following optional information to add the new part applicability.

Field name	Definition	Valid Values
Serial Number (Start)	The starting value for the serial number range. If you do not type an ending	Alphanumeric (1–128 characters)

Field name	Definition	Valid Values
	value, only the starting serial number is used.	
Serial Number (End)	The ending value for the serial number range.	Alphanumeric (1–128 characters) The number of digits for the ending value must be the same as the starting value.

7. Click **OK**.
8. In the **Define Part Applicability** dialog box, choose one of the following options:
   a. Click **Add New** to add a new part applicability.
   b. Select an existing part applicability and click **Edit** to edit an existing part applicability.
   c. Select an existing part applicability and click **Delete** to delete the part applicability.
9. To display the relationship, select the service requirement and choose **Window** → **Show View** → **Plan Details** or right-click the service requirement and choose **Show Plan Details**.

Edit part applicability

1. From the navigation pane, click **Service Planner**.
2. Locate and open the service requirement to edit the part applicability for.
3. Select the service requirement and do one of the following:
   - Right-click the service requirement in the process view and choose **Define Part Applicability**.
   - Choose **Window** → **Show View** → **Plan Details** or right-click the service requirement and choose **Show Plan Details**. Click **Define Part Applicability** under the **Define Part Applicability** header.
4. In the **Define Part Applicability** dialog box, select an existing part applicability and click **Edit** to edit the part applicability.
5. In the **Edit Part Applicability** dialog box, enter the following optional information.

Field name	Definition	Valid Values
Serial Number (Start)	The starting value for the serial number range.	Alphanumeric (1–128 characters)

Field name	Definition	Valid Values
	If you do not type an ending value, only the starting serial number is used.	
Serial Number (End)	The ending value for the serial number range.	Alphanumeric (1–128 characters) The number of digits for the ending value must be the same as the starting value.

6. Click **OK**.

7. In the **Define Part Applicability** dialog box, do one of the following:

   - Click **Add New** to add a new part applicability.
   - Select an existing part applicability and click **Edit**.
   - Select an existing part applicability and click **Delete**.

8. To display the part applicability, select the service requirement and choose **Window** → **Show View** → **Plan Details** or right-click the service requirement and choose **Show Plan Details**.

Creating upgrade service requirements

An upgrade **service requirement** defines if the service requirement represents an upgrade or modification to an existing product. You create an upgrade service requirement by setting the update option to **True**.

When you create an **upgrade work card** related to an upgrade service requirement, the purpose of the work card is to upgrade a physical part from one configuration to another. You can create only one upgrade work card for an upgrade service requirement.

An upgrade service requirement also specifies that a rebase of the impacted physical part is performed as part of the completion of the work card. *Rebasing* a physical part relates the physical structure to a different configuration of a neutral structure. The new rebased structure uses the new configuration for its structure context.

> Example:
>
> You create a variant for a bearing housing assembly to determine if a regular bearing housing or heavy-duty bearing housing is used in a neutral structure. The neutral structure assigned to the service plan has the variant set to use the regular bearing housing. However, the conditions have changed requiring you to use the heavy duty bearing housing. If you plan to replace the

regular bearing housing with the heavy duty bearing housing, you must create an update service requirement and work card to set the variant to use the heavy duty bearing housing configuration.

View plan details for a service requirement

You can use the plan details view to display and edit information for a service requirement.

The following information is displayed for a service requirement:

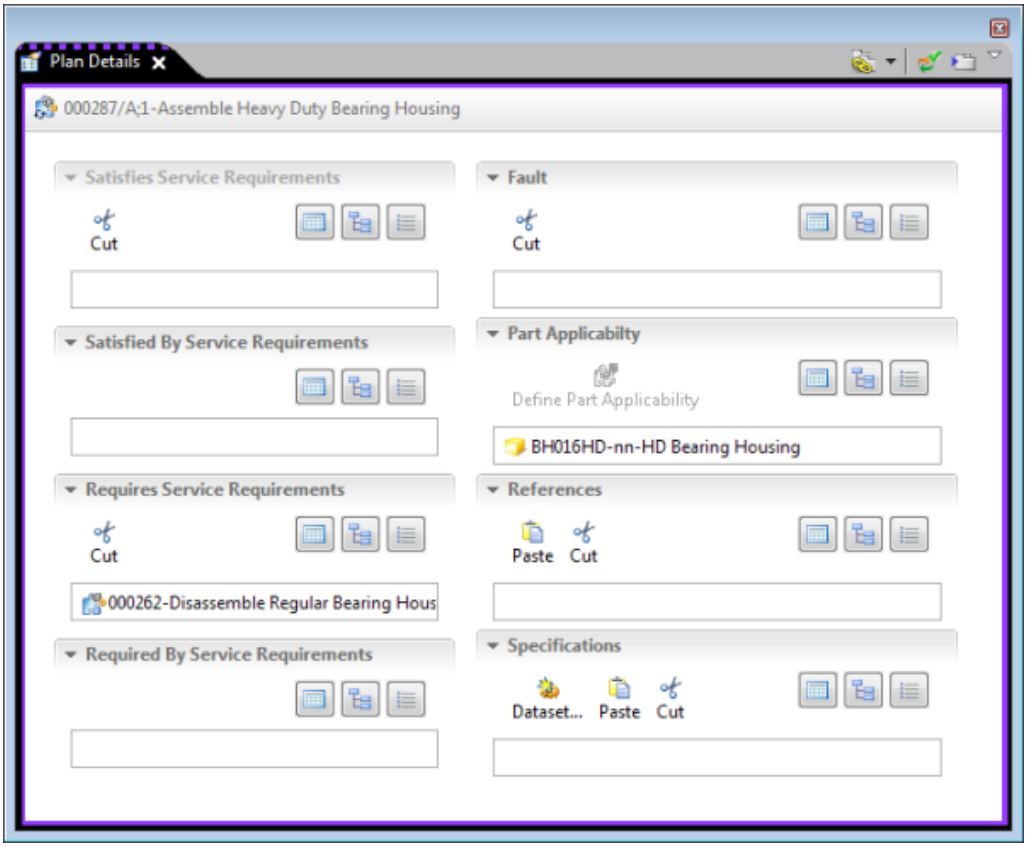
- Service requirements that are satisfied by the service requirement.
- Service requirements that the service requirement satisfies.
- Service requirements that are required by the service requirement.
- Service requirements that the service requirement requires.
- Reference files for the service requirement.
- Fault codes that the service requirement.
- Part applicability for the service requirement.

The following table shows the available buttons when displaying property lists:

Button	Purpose
	Displays properties using a tree layout.
	Displays properties using a table layout.
	Displays properties using a list layout.

1. From the navigation pane, click **Service Planner**.
2. From the **Service Planner** view, select the service requirement and do one of the following:
   - Choose **Window** → **Show View** → **Plan Details**.
   - Right-click the service requirement and choose **Show Plan Details**.

   The **Plan Details** tab is displayed.



3. Under the **Satisfies Service Requirements**, **Satisfied By Service Requirements**, **Requires Service Requirements**, or **Required By Service Requirements** sections, select the requirement dependency and click **Cut** if you want to remove the dependency.

4. Under the **Fault** section, select the fault code and click **Cut** if you want to remove the fault code that resolves the service requirement.

5. Under the **Part Applicability** section, choose one of the following:

   - Click **Add Part Applicability** to define a new part applicability.
   - Select an existing part applicability and click **Cut** if you want to remove it.

6. Under the **Specifications** section, choose one of the following:

   - Click **Dataset** to add a new dataset.
   - Click **Paste** to add a dataset that you have copied to the clipboard.
   - Select an existing dataset and click **Cut** if you want to remove it.

7. Under the **References** section, choose one of the following:

- Click **Paste** to add a reference that you have copied to the clipboard.
- Select an existing reference and click **Cut** if you want to remove it.

9. Creating and managing work cards

Setting up and managing work cards

As a service planner, you create and manage the work cards that are related to service requirements. Work cards define *how* you will address the service requirement.

You create and manage work cards by:

- Creating work cards that are related to service requirements.
- Sequencing work cards.
- Assigning resources to work cards such as:
  - Required skills for a work card that determine who performs or signs off the work card.
  - Part movements for a work card.
  - Expendable materials to a work card.
  - Tools to a work card.
- Defining characteristics for a work card.
- Generating work instructions for a work card.
- Defining notices for a work card.
- Defining time and cost estimates for a work card.
- Defining upgrade work cards.

Creating work cards

Work card

A *work card* defines how to accomplish a service requirement. The work card contains information about the tasks, effort, and cost estimates and the resources required to perform the tasks. You can create multiple work cards for a service requirement to define the tasks. You can optionally assign activities to the work card to break down the tasks. If there are no activities, all the tasks are performed at the work card level.

You can perform the following actions on work cards:

- Assign states to a work card.

  You can assign states to a work card by submitting it to an approval workflow. A work card can be assigned the following states:

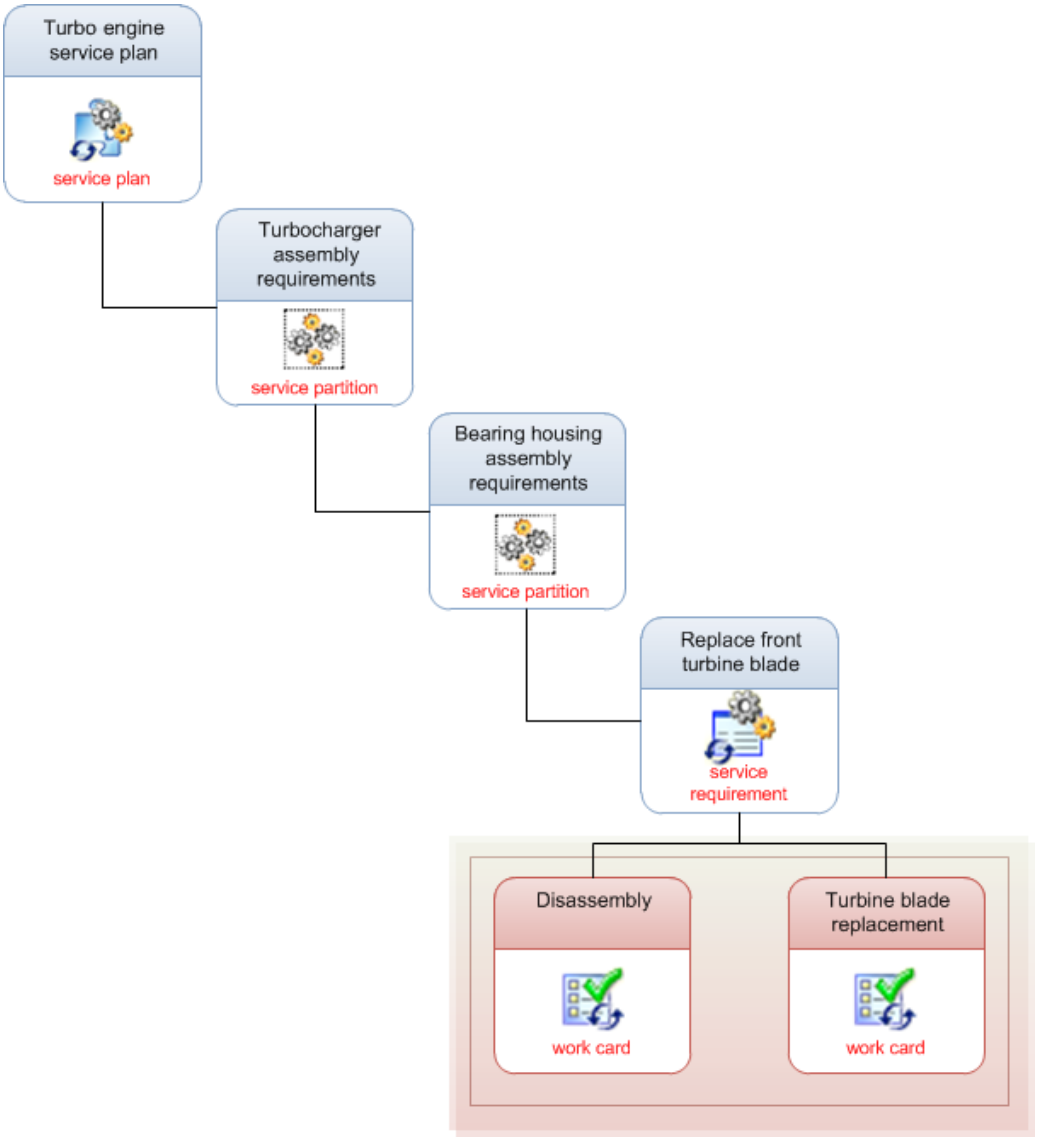
  - **in-work**
  - **approved**
  - **deprecated**

- Revise work cards to create new revisions.
- Define the revision effectivity for a work card.
- Use options and variants to configure a work card.

  For example, you may want to set an option or variant to distinguish work cards that are war time or peace time work cards for a service plan assigned to a missile.

The following figure shows an example of a bearing housing assembly for a turbo engine that has a service requirement to replace the rear turbine blade. Work cards are created to:

- Disassemble the turbine blade and other components of the bearing housing assembly that are in close proximity to the blade.
- Assemble the replacement turbine.



Create a work card

1. From the navigation pane, click **Service Planner**.
2. Locate and open the service requirement where you want to assign the work card.
3. Select the service requirement and do one of the following:
   - Choose **File** → **New** → **Work Card**.
   - Click the **Create a new Work Card** button on the main toolbar at the top of the **Service Planner** pane.

- Right-click the neutral part and choose **New → Work Card**.

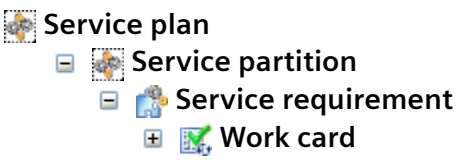
4. Select **Work Card** from the list and click **Next**.

5. In the **New Work Card** dialog box, enter the following information for the work card.

Field name	Definition	Valid Values
ID	The work card ID (required). Leave the field blank to automatically assign an ID.	Alphanumeric string (1–128 characters)
Revision	The revision of the work card (required). Leave the field blank to automatically assign an ID.	Alphanumeric string (1–32 characters)
Name	The work card name (required).	Alphanumeric string (1–128 characters)
Activity Execution Type	Defines if the assigned skill resource will perform or sign off on the work card.	Valid values are: • **Perform** • **Sign-off**
Description	Description of the work card.	Alphanumeric string (1–240 characters)
Labor Cost	The total labor cost for the work card.	Number limited to two decimal places
Material Cost	The total material cost for the work card.	Number limited to two decimal places
Narrative	Narrative description for the work card. The narrative can be used as input for work instructions.	Long string

6. Click **Finish**.

The work card is created under the service requirement.



After all work cards are added, the next step is to **put them in sequence**.

Update work card properties

1. From the navigation pane, click **My Teamcenter** or **Service Planner**.
2. Select the work card.
3. Right-click and choose **Properties**.
4. From the **Properties** dialog box, change the available properties.
5. Click **OK** or **Apply** to change the work card properties. Alternatively, click **Cancel** to exit.

Locate a work card

1. From the navigation pane, click **Service Planner**.
2. Locate a work card by doing one of the following:
    a. From the **Service Planner** view, click **Open By Name** on the main toolbar at the top of the **Service Planner** pane to open the service plan that contains the work card.
        A. From the **Service Planner** view, click the service plan name tab next to the **Base View** tab to expand the service plan.
        B. Expand the service requirements to display the work card.
    b. Using advanced search, search for the work card. Right-click the work card from the results list and choose **Send to** → **Service Planner**.

Sequence work cards

After you create the work cards you can sequence the work cards in the order that they should be performed.

As you sequence the work cards, identify:

- Preceding work cards (those that must be completed before others can be started).
- Parallel work cards (those that can be completed at the same time as others).

1. From the navigation pane, click **Service Planner**.
2. From the **Service Planner** view, locate and open the service requirement that contains the work cards you want to sequence.

3. Right-click the service requirement and choose **Open with** → **Pert**.

   Each work card that exists as part of the service requirement is depicted in the PERT chart within its own box or frame.

4. Click the **Draw Flow** button on the **Pert** toolbar.

   The draw flow mode is activated and the cursor changes to  .

5. Click the first work card box.

6. Click the second work card box to draw the flow.

   An arrow is drawn between the first box and the second box, showing the flow from the first work card to the second work card.

7. Continue sequencing the work cards until the sequence is complete.

8. Exit the draw flow mode using one of the following methods:

   - Press the ESC button.
   - Click the **Select** button on the PERT toolbar.

9. To close the **Pert** view, click the button on the **Pert** tab.

Assign qualifications to a work card

You can assign qualifications to a work card to specify the skills, certificates, training, or other aspects needed to perform the service work.

1. Either choose **Tools** → **Assign Qualifications** or right-click the work card and choose **Assign Qualifications**.

2. Select the qualification and level that you want to assign to the work card.

3. Click the **Assign** button.

4. (Optional) Assign other qualifications and levels as necessary.

5. (Optional) To remove an assigned qualification from a work card, select it from the **Existing Qualifications** list and click **Remove**.

6. Click **OK**.

The qualifications are listed in the work card's **Plan Details** view.

Assign work zone to a work card

You can assign a work zone, which is an occurrence group that identifies the area on the structure where the maintenance occurs. You can specify more than one zone. The zone can be already defined on the neutral product.

> Note:
>
> You must paste part of the neutral structure under the zone's top level BOM line. If top level BOM line does not have any children, the entire neutral structure is assigned as the zone to the work card.

1. From the navigation pane, click **Service Planner**.
2. Locate the work zone occurrence group that you want to assign.
3. Right-click the work zone and choose **Copy**.
4. In the **Service Plan** view, right-click the work card where you want to apply the zone and choose **Paste As → Work Zone**.

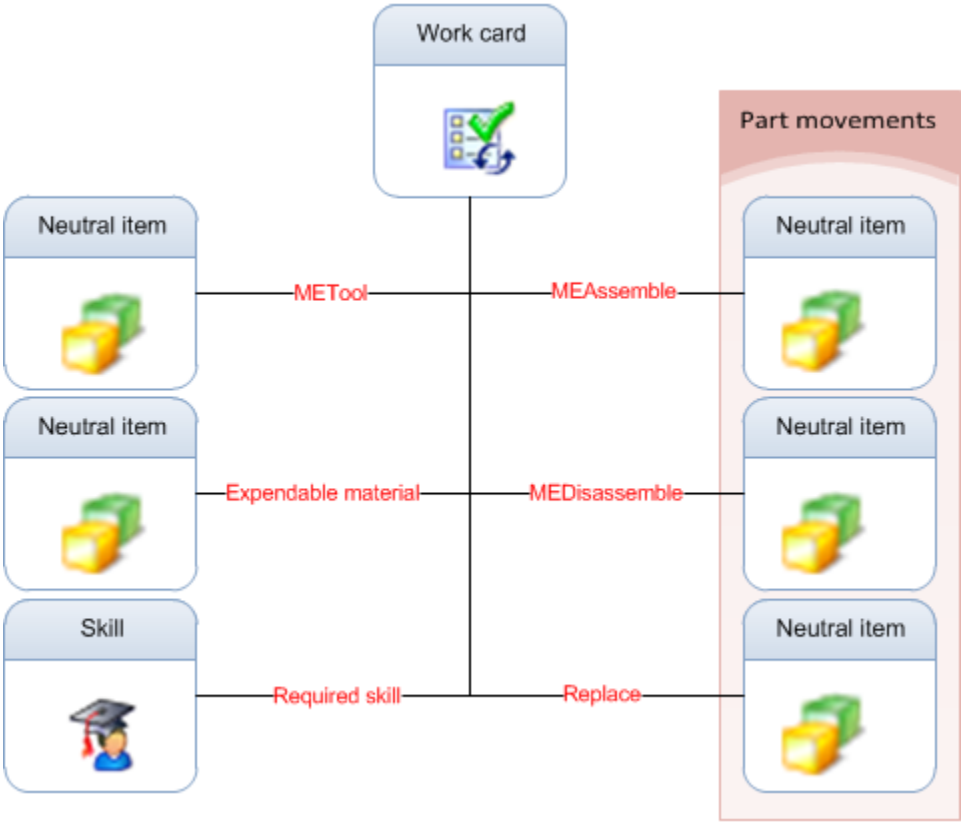
If you create a service schedule from the service requirements in a service plan, the work zone is automatically transferred to the schedule job card. You cannot assign work zones to an activity, and zones do not appear on job tasks.

Assigning resources to a work card

Types of resources you can assign to a work card

You can assign resources to a work card that are required to complete the work card. You assign resources by relating an occurrence to the work card where the occurrence type represents the type and usage of the resource.

As the figure shows, the following resources can optionally be assigned:



- Skills

  You can assign skills to a work card, that determines who performs or signs off the work card.

- Part movements

  You can create part movements for a work card to indicate whether a neutral item is installed, uninstalled, or replaced.

- Tools

  You can assign tools to a work card.

- Expendable materials

  You can define expendable materials for a work card that are utilized during the tasks performed for the work card, but not tracked when the operation is completed.

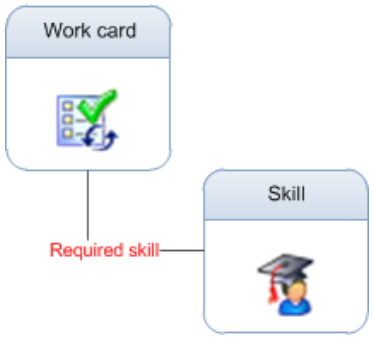
- Classified resources

  You can assign resources that are classified using the Classification application.

Create a skill

A *required skill* is the qualification that a person must have for performing or signing off on a work card. The workflow that the workflow designer builds to approve or perform the work card tasks accesses the required skill to perform the action.

After creating the skill for a work card, the **Occurrence Type** for the skill is set to **Required Skill**.



1. From the navigation pane, click **Service Planner**.
2. Locate and open the work card where you want to relate the required skill.
3. From the **Service Planner** view, select the work card and do one of the following:
   - Choose **File** → **New** → **Skill**.
   - Click the **Create a new Skill** button on the main toolbar at the top of the **Service Planner** pane.
   - Right-click the work card and choose **New** → **Skill**.
4. In the **New Skill** dialog box, select **Skill** from the list and click **Next**.
5. Enter the following information for the skill.

Field name	Definition	Valid Values
ID	The skill ID (required). Leave blank to automatically assign an ID.	Alphanumeric string (1–128 characters)
Revision	The revision of the skill (required). Leave blank to automatically assign a revision.	Alphanumeric (1–32 characters)

Field name	Definition	Valid Values
Name	The name of the skill (required).	Alphanumeric string (1–128 characters)
Description	Description of the skill.	Alphanumeric string (1–240 characters)
Discipline	Discipline associated with the skill.	Valid values are the list of defined disciplines.

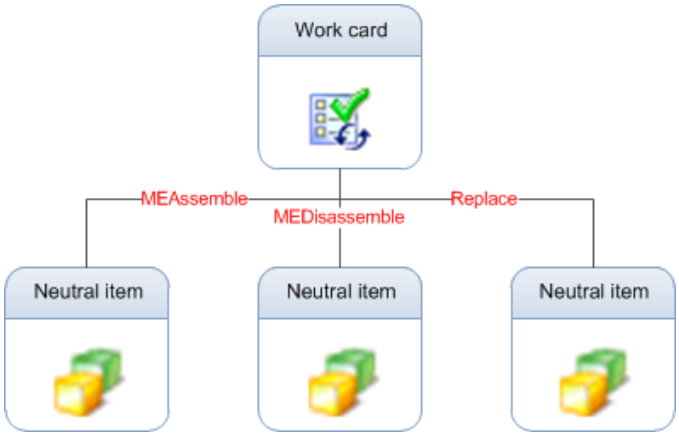
6. Click **Finish**.

The skill is created for the work card with **Occurrence Type** set to **Required Skill**.

Process Structure	Occurrence Type
Service plan	
Service partition	
Service requirement	
Work Card	
Skill	**Required Skill**

Define a part movement for a work card

You can create part movements for a work card to indicate whether a neutral item is installed, uninstalled, or replaced. You relate the neutral item to the work card and assign the part occurrence type as one of the following:



- **MEDisassemble**

  Used to indicate the neutral item is uninstalled.

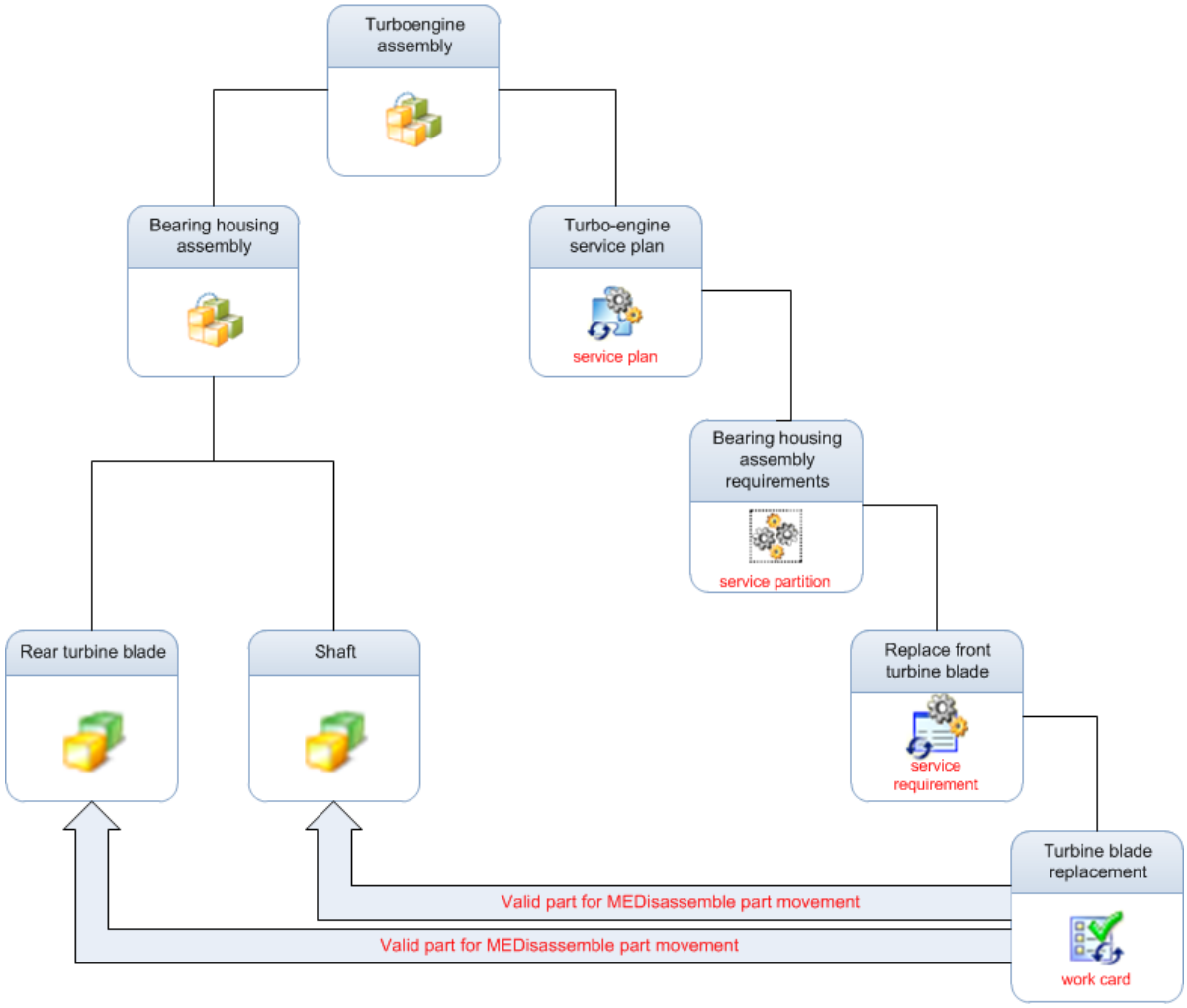
- **MEAssemble**

Used to indicate the neutral item is installed.

- **Replace**

  Used to indicate the neutral item is replaced.

The neutral items used to represent part movements must be contained within the neutral structure related to the service plan. As the following figure shows, the shaft and rear turbine blade neutral parts are assigned to the disassembly work card with the occurrence type set to **MEDisassemble** to represent the part movements used for the disassembly of the turbine blade. The rear turbine and shaft are components of the bearing housing assembly which is contained in the turbo-engine assembly assigned to the service plan.



Note:

You cannot create part movements for a work card if there is life, observation, or date characteristics assigned to the work card.

1. From the navigation pane, click **Service Planner**.
2. Locate and open the neutral part you want to assign to the work card to represent part movement.

   > Note:
   >
   > You can only create part movements for neutral items that are components of the neutral structure related to the service plan.

3. From the **Product** view, right-click the neutral part and choose **Copy**.
4. Locate and open the work card that you want to relate the part movement to.
5. From the **Service Plan** view, right-click the work card and choose **Paste As** and choose one of the following:

   - **MEAssemble**

     Indicates the neutral item will be installed.

   - **MEDisassemble**

     Indicates the neutral item will be uninstalled.

   - **Replace**

     Indicates the neutral item will be replaced.

   The neutral part is assigned to the work card with the **Occurrence Type** set to the part movement occurrence type that you specified in the previous step.

Process Structure	Occurrence Type
Service plan	
Service partition	
Service requirement	
Work card	
Neutral part	MEAssemble

Change a part movement for a work card

1. From the navigation pane, click **Service Planner**.
2. Locate the work card to where you want to change the part movement.

3. Select the neutral item that represents the part movement.

4. Click the cell under the **Occurrence Type** column.

5. Choose one of the following:

   - **MEAssemble**

     Indicates the neutral item will be installed.

   - **MEDisassemble**

     Indicates the neutral item will be uninstalled.

   - **Replace**

     Indicates the neutral item will be replaced.

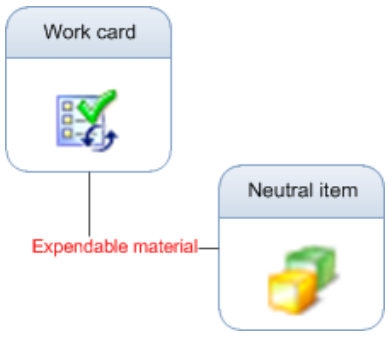
   The part movement is updated with the new value.

Define expendable material for a work card

An *expendable material* is used and may be consumed during the tasks performed for the work card, but is not tracked when the operation is completed.

> Example:
>
> Shop towels or paint may be defined as expendable materials.

When you assign an expendable material to a work card, you set the occurrence type for the neutral item to **Expendable Material**.



1. From the navigation pane, click **Service Planner**.

2. Locate and open the neutral structure or part that you want to assign as the expendable material.

3. From the **Product** view, right-click the neutral part and choose **Copy**.

4. Locate and open the work card that you want to relate the expendable material to.

5. From the **Service Plan** view, right-click the work card and choose **Paste As → Expendable Material**.

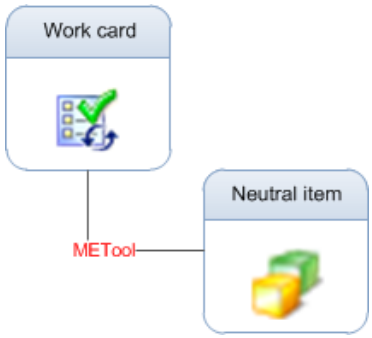
   The neutral item is assigned to the work card with the occurrence type set to **Expendable Material**.

Process Structure	Occurrence Type
Service plan	
Service partition	
Service requirement	
Work card	
Neutral part	Expendable Material

Define tools for a work card

A *tool* identifies any item based resources such as hand tools.

When you assign a tool to a work card, you set the occurrence type for the neutral item to **METool**.



1. From the navigation pane, click **Service Planner**.

2. Locate and open the neutral structure or part that you want to assign as the tool.

3. From the **Product** view, right-click the neutral part and choose **Copy**.

4. Locate and open the work card that you want to relate the expendable material to.

5. From the **Service Plan** view, right-click and choose **Paste → METool**.

   The neutral item is assigned to the work card with the occurrence type set to **METool**.

Process Structure	Occurrence Type
Service plan	
Service partition	
Service requirement	
Work card	
Neutral part	METool

Defining resources for work cards using classification

You can classify resources such as tools, materials, and skills. You can assign these resources using the Classification interface.

Relate resources to other work cards

1. From the navigation pane, click **Service Planner**.
2. Locate and open the work card that contains the resource you want to copy.
3. Right-click the resource and choose **Copy**.
4. Locate and open the work card where you want to copy the resource.
5. Right-click the work card and choose **Paste**.

   The resource is assigned to the work card.

Adding characteristics to a work card

Define characteristics for a work card

A *characteristic definition* is used to collect and record information during maintenance. You can create characteristic definitions that contain information such as how many hours a part has been used, the date the asset was put into commission, or the operating temperature of the part. You can create and assign life, observation, and date characteristic definitions to a work card.

The characteristic definitions that are available to be assigned are determined by the following:

- Any life, observation, or date characteristics related to the neutral parts assigned to the parent service requirement with the **MEAssign** relationship are available as valid characteristics.
- Any life, observation, or date characteristics related to the neutral part assigned to the parent service plan are available as valid characteristics. This is only true if there are no assigned or impacted parts assigned to the parent service requirement with the **MEAssign** relationship.

Note:

You cannot relate characteristics to a work card that contains part movements.

1. From the navigation pane, click **Service Planner**.

2. From the **Service Planner** view, select the work card where you want to create the characteristic and do one of the following to create the characteristic:

To create this type of characteristic	Do one of the following

Life	• Choose **File** → **New** → **Life Characteristic**.
	• Right-click the work card and choose **New** → **Life Characteristic**.
	• Do the following:
	  • Right-click the work card and choose **Show Plan Details**.
	  • In the **Plan Details** view under the **Measurement Characteristics** section, click **Life Characteristic**.

Observation	• Choose **File** → **New** → **Observation Characteristic**.
	• Right-click the work card and choose **New** → **Observation Characteristic**.
	• Do the following:
	  • Right-click the work card and choose **Show Plan Details**.
	  • In the **Plan Details** view under the **Measurement Characteristics** section, click **Observation Characteristic**.

Date	• Choose **File** → **New** → **Date Characteristic**. • Right-click the work card and choose **New** → **Date Characteristic**. • Do the following:

To create this type of characteristic	Do one of the following
	• Right-click the work card and choose **Show Plan Details**. • In the **Plan Details** view under the **Measurement Characteristics** section, click **Date Characteristic**.

3. To display the characteristics assigned to the work card, select the work card and choose **Window → Show View → Plan Details** or right-click the work card and choose **Show Plan Details**.

Assign characteristics to a work card

1. From the navigation pane, click **Service Planner**.
2. From the **Service Planner** view, right-click the work card and choose **Assign Characteristics**.
3. In the **Assign Characteristics** dialog box, select the characteristics you want to assign and click **OK**.

   The characteristics are assigned to the work card.
4. To display the characteristics assigned to the work card, select the work card and choose **Window → Show View → Plan Details** or right-click the work card and choose **Show Plan Details**.

Remove an assigned characteristic

1. From the navigation pane, click **Service Planner**.
2. Select the work card that you want to remove the characteristic from.
3. Choose **Window → Show View → Plan Details** or right-click the work card and choose **Show Plan Details**.
4. In the **Plan Details** dialog box under the **Measurement Characteristics** section, select the characteristics that you want to remove.
5. Click **Cut** to remove the characteristic.

Adding a notice to a work card

Define a notice for a work card

A *notice* is an informative message that identifies safety or hazardous material instructions. You can define a notice for a work card.

The following notice types are available when you create a notice:

- **Caution**
- **Warning**
- **Note**
- **Hazardous Material**

1. From the navigation pane, click **Service Planner**.
2. In the **Service Planner** view, select the work card that you want to define the notice for and do one of the following:
   - Choose **File** → **New** → **Notice** or click the **Create a new Notice** button on the main toolbar at the top of the **Service Planner** pane.
   - Right-click the work card and choose **New** → **Notice**.
   - Right-click the work card and choose **Show Plan Details**. In the **Plan Details** view, click **Notices**.
3. In the **New Notice** dialog box, select **Notice** from the list and click **Next**.
4. Enter the following information for the notice.

Field name	Definition	Valid Values
Long Description	The description of the notice.	Alphanumeric string (1–128 characters)
Name	The name of the notice (required).	Alphanumeric string (1–128 characters)
Notice Type	Type of notice.	Valid values are: • **Caution** • **Warning** • **Note**

Field name	Definition	Valid Values
		• **Hazardous Material**

5. Click **Finish**.

6. To display the notice, select the work card and choose **Window** → **Show View** → **Plan Details** or right-click the work card and choose **Show Plan Details**.

Assign a notice for a work card

1. From the navigation pane, click **Service Planner**.

2. In the **Service Planner** view, select the work card that you want to assign the notice to and do one of the following:

   - Right-click the work card and choose **Assign Notices**.

   - Right-click the work card and choose **Show Plan Details**. In the **Plan Details** view, click **Assign Notices**.

3. In the **Search** dialog box, type the values for the properties to filter your search for the notices and click **Find**.

   The notices are assigned to the work card.

4. Select the notices from the results list and click **Relate**.

   The notices are assigned to the work card.

Remove notices from work cards

1. From the navigation pane, click **Service Planner**.

2. Select the work card that you want to remove the notice from.

3. Choose **Window** → **Show View** → **Plan Details** or right-click the work card and choose **Show Plan Details**.

4. In the **Plan Details** dialog box under the **Notices** section, select the notices you want to remove.

5. Click **Cut** to remove the notices.

   The notices are removed from the work card.

Define time estimates for a work card

You can define time estimates for work cards for estimating the time it takes to perform the activities related to the work card. You can refine the time information by defining activities for the work cards that hold the time information. The time specified for the activities is rolled up into the total time for the work card.

You can define the time as one of the following three types that your administrator can configure to suit your needs:

- Value-added (VA)
- Non-value-added (NVA)
- Non-value-added, but required (NVABR)

1. From the navigation pane, click **Service Planner**.
2. From the **Service Planner** view, locate and open the work card that you want to enter estimates for.
3. Right-click the word card and choose **Open with** → **Time**.

   The **Time** view appears.
4. From the **Time** view, enter the time estimates.
5. To close the **Time** view, click the ✕ button on the **Time** tab.

Generate work instructions for a work card

Work instructions contain all the information necessary to perform the work. This may include information about tools, setup, and any necessary actions to perform the work card. If the work area is not explicitly defined, the requirements for the work area are specified as part of the work instructions. You can create work instructions for a work card.

1. From the navigation pane, click **Service Planner**.
2. From the **Service Planner** view, locate and open the work card that you want to generate work instructions for.
3. Right-click the word card and choose **Open with** → **Work Instruction**.

   The **Work Instruction** view appears.

4. From the **Work Instruction** view, enter the work instructions.

5. To close the **Work Instruction** view, click the ⤫ button on the **Work Instruction** tab.

Change the ownership of data in a work card

You can change the ownership of an assigned work card so another person can work on it to finish the related service requirement.

To do this, use the **Change Owner** option.

After you change the owner, you can change the related objects, such as time analysis.

> Note:
>
> The change ownership functionality is applicable to all service plan objects.

1. On the navigation pane, click **Service Planner**.

2. On the **Service Planner** view, locate the work card for which you want to change the owner.

3. Select the work card and from the top border bar, click **Change Owner**.

   The **Change Owner** view appears.

4. From the **Change Owner** view, type or search for the name of the person to whom you want to assign ownership.

5. Check the related objects section and mark the object list for which you want to change the ownership.

6. Click **Close** ⤫ on the **Change Owner** tab to close the **Change Owner** view.

7. View the changed owner in the **References** section in the **Attachments** tab.

Define an upgrade work card

You can define work cards to specifically handle upgrades by identifying a different neutral configuration assigned to the parent service requirement. Upgrades include upgrading to a different revision of the same neutral product or to an entirely new neutral product.

When you create an update work card, you need to relate it to an upgrade service requirement. An upgrade service requirement can only contain one upgrade card.

Example:

You create a variant for a bearing housing assembly to determine if a regular bearing housing or heavy-duty bearing housing is used in a neutral structure. The neutral structure assigned to the service plan has the variant set to use the regular bearing housing. However, the conditions have changed requiring you to use the heavy duty bearing housing. If you plan to replace the regular bearing housing with the heavy duty bearing housing, you must create an update service requirement and work card to set the variant to use the heavy duty bearing housing configuration.

1. Locate and open the upgrade service requirement that you want to assign the upgrade work card to.

2. Select the service requirement and create a new work card to define the upgrade or use an existing work card.

3. In the **Service Planner** view, select the work card and do one of the following:

   a. Choose **Tools** → **Setup Upgrade** or click the **Setup Upgrade** button on the main toolbar at the top of the **Service Planner** pane.

   b. Right-click the work card and choose **Setup Upgrade**.

4. In the **Setup Upgrade** dialog box, choose one the following options:

   a. To reconfigure the neutral structure using revision rule and variants configuration, perform the following steps:

      A. Click **Reconfigure Neutral Item** and click **OK**.

      B. The neutral structure for the parent service plan appears in the **Search`** dialog box under the **Configure** tab.

   b. To search for a different neutral revision or configuration, perform the following steps.

      A. Click **Advanced**.

      B. Click **Search New Neutral Item Revision and Configure** and click **OK**.

      C. In the **Search** dialog box, type the values for the properties to filter your search and click **Find**

         You can use wild cards in any of the property fields for searching.

      D. Select the part revision from the results list and click **Configure**.

c. To search for a different neutral configuration using the saved structure context name, perform the following steps.

A. Click **Advanced**.

B. Click **Search Saved Structure Context** and click **OK**.

C. In the **Search** dialog box, type the structure context name and click **Find**.

You can use wild cards for searching.

D. Select the part from results list and click **Configure**.

5. Click **Latest Working** to optionally set a revision rule and click **OK**.

6. Select a part in the structure and click **Click to add a variant rule** to optionally set a variant rule and click **OK**.

7. Click **Finish** to upgrade to a new revision of the neutral structure or a different neutral structure.

8. To display the properties of the upgrade work card, select the work card and choose **Window** → **Show View** → **Plan Details** or right-click the work card and choose **Show Plan Details**.

View plan details for a work card

You can use the plan details view to display and edit information for a work card.

The following information is displayed for a work card:

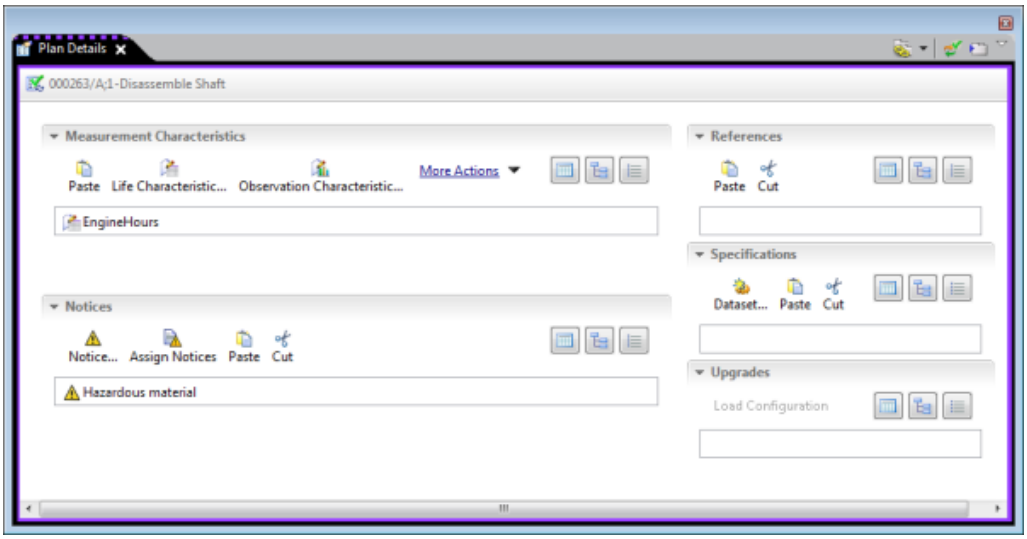
- Characteristics assigned to the work card.
- Notices assigned to the work card.
- Reference files for the work card.
- Specifications for the work card.
- Upgrade configurations for the work card.

The following table shows the available buttons when displaying property lists:

Button	Purpose
	Displays properties using a tree layout.
	Displays properties using a table layout.
	Displays properties using a list layout.

1. From the navigation pane, click **Service Planner**.
2. From the **Service Planner** view, select the work card and do one of the following:
   - Choose **Window** → **Show View** → **Plan Details**.
   - Right-click the work card and choose **Show Plan Details**.

   The **Plan Details** tab is displayed.



3. Under the **Measurement Characteristics** section, choose one of the following:
   - Click **Life Characteristic** to define a new life characteristic for the work card.
   - Click **Observation Characteristic** to define a new observation characteristic for the work card.
   - Click **Date Characteristic** to define a new date characteristic for the work card.
   - Select a characteristic and click **Cut** if you want to remove it.
4. Under the **Notices** section, choose one of the following:

- Click **Notice** to define a new notice for the work card.
- Click **Assign Notice** to assign an existing notice to the work card.
- Select a notice and click **Cut** if you want to remove it.

5. Under the **References** section, choose one of the following:
   - Click **Paste** to add a reference that you have copied to the clipboard.
   - Select an existing reference and click **Cut** if you want to remove it.
6. Under the **Specifications** section, choose one of the following:
   - Click **Dataset** to add a new dataset.
   - Click **Paste** to add a dataset that you have copied to the clipboard.
   - Select an existing dataset and click **Cut** if you want to remove it.
7. Under the **Upgrades** section, select the upgrade work card and click **Load Configuration** to load the upgraded configuration in the **Service Planner** view.

Add deliverables to a work card

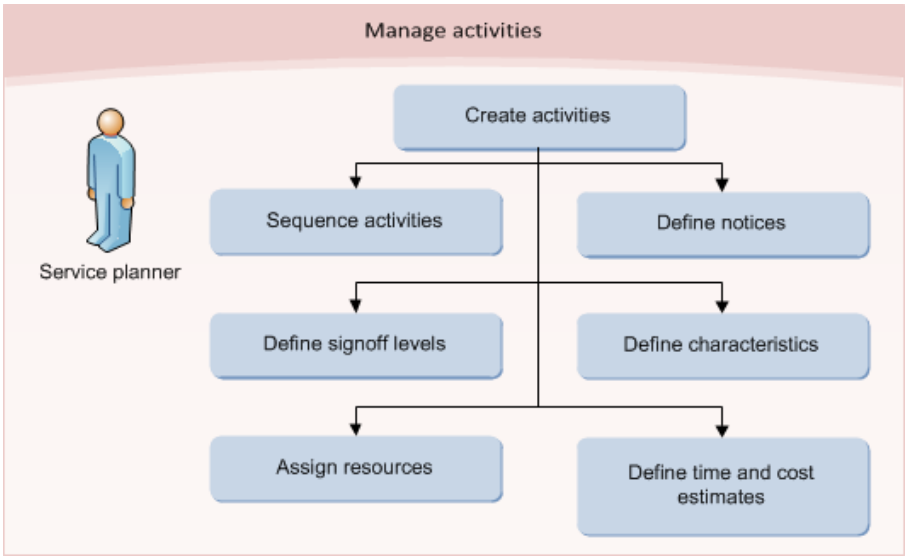
You can add data collection objects to the work card as required deliverables. The objects can be documents, workspace objects, forms, or datasets. These objects allow you to have a place to collect the data you need to correctly service the part.

1. Right-click the work card and choose **Show Plan Details**.
2. In the **Plan Details** view under the **Required Resulting Information** section, you can either add a new object or paste an object from the clipboard with the **Paste** button.
3. To create a new object, click **Add New**.
4. Select a business object type and click **Next**.
5. Type a name and fill in all other required information. Ensure that **SSP0RequiredResultingInfo** is the selected relation.
6. Click **Finish**.

10. Creating and managing activities

Setting up and managing activities

As a service planner, you create and manage the activities that are related to work cards. Activities define the specific steps for *how* to perform the service.



You create and manage activities by:

- Creating activities that are related to work cards.
- Sequencing activities.
- Assigning resources to activities such as:
  - Required skills for an activity that determines who performs or signs off the activity.
  - Part movements for an activity.
  - Expendable materials for an activity.
  - Tools for an activity.
- Defining characteristics for an activity.
- Defining notices for an activity.

- Defining time and cost estimates for an activity.
- Defining signoff levels for an activity.

Creating activities

Creating activities

Creating activities

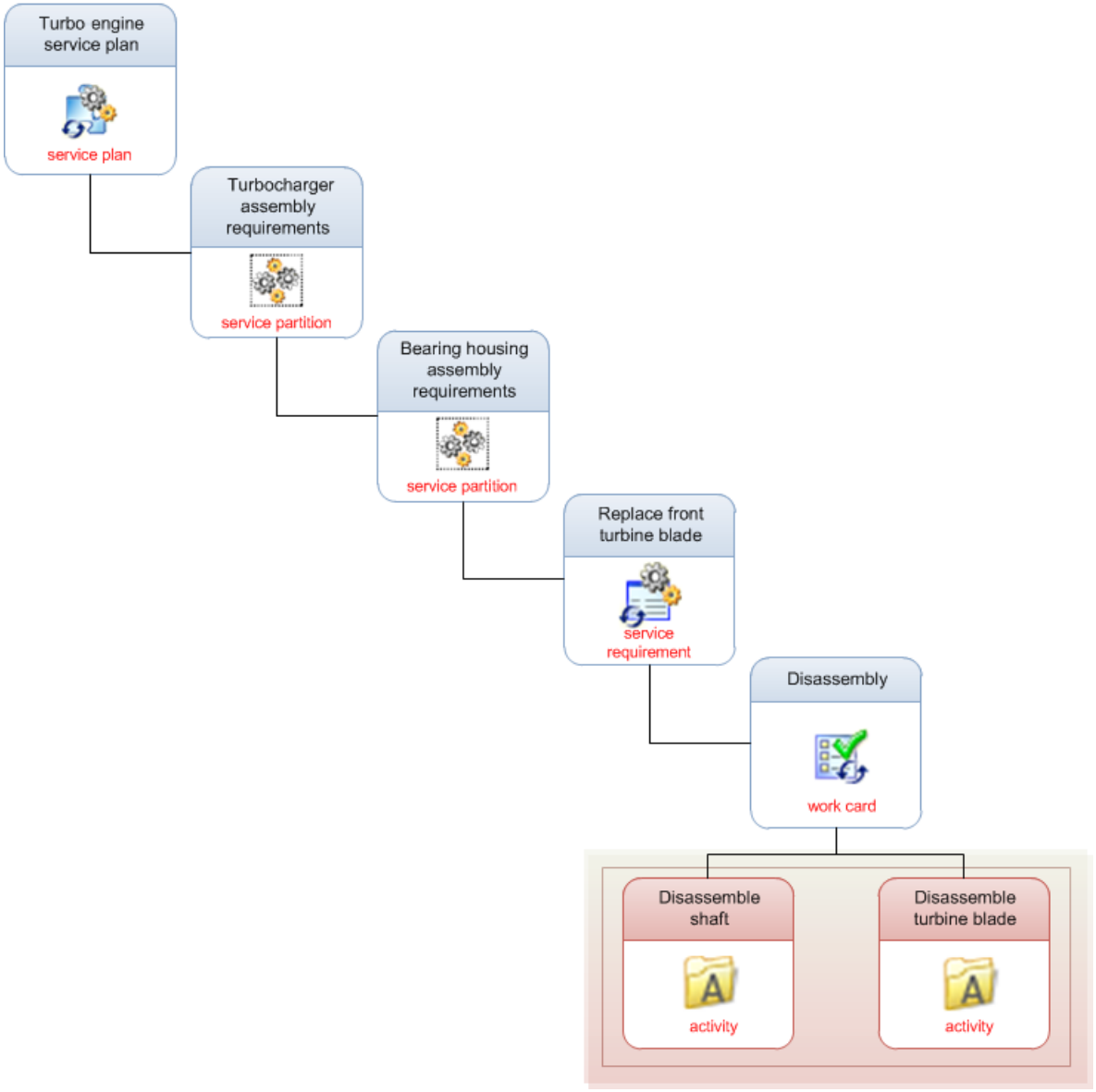
An *activity* defines the specific steps a service technician must perform to complete required service tasks.

The activity is created as a child of the work card. You can also create subactivities that are children of a parent activity.

Each activity is defined by its type, description, start time, and duration. An activity can also reference Teamcenter objects. This allows you to attach any forms to the activity that represents features and their associated tooling and instructions.

> Note:
>
> You cannot create revisions of activities.

The following figure shows an example of a bearing housing assembly for a turbo engine that has a service requirement to replace the rear turbine blade. A work card is created to disassemble the turbine blade and other components of the bearing housing assembly that are in close proximity to the blade. The activities are created to disassemble the shaft first and then disassemble the turbine blade.



Create an activity

1. From the navigation pane, click **Service Planner**.

2. From the **Service Planner** view, locate and open the work card where you want to add the activities.

3. Right-click the work card and choose **Open with** → **Activities**.

   The **Activities** view appears.

4. From the **Activities** view, select the work card or an existing activity and do one of the following:

- Choose **File** → **New** → **Activity**, or click the **Create New Activity** button on the **Activities** view toolbar.

- Right-click the parent object and choose **New** → **Activity**.

5. Select **MEActivity** from the list and click **Next**.

6. In the **New Activity** dialog box, enter the following information for the activity.

Field name	Definition	Valid Values
Name	The activity name (required).	Alphanumeric string (1–128 characters)
Activity Execution Type	Defines if the skill resource will perform or sign off the activity.	Valid values are: • **Perform** • **Sign-off**
Start time	The time the activity needs to start.	Floating point value
Duration	The total duration of the activity.	Floating point value
Description	The description of the activity.	Alphanumeric string (1–240 characters)

7. Click **Finish**.

   The activity is created.

8. To close the **Activities** view, click the button on the **Activities** tab.

After all activities are added, the next step is to put them in a sequence.

Update activity properties

1. From the navigation pane, click **Service Planner**.

2. From the **Service Planner** view, locate and open the work card that contains the activity you want to edit the properties for.

3. Right-click the work card and choose **Open with** → **Activities**.

   The **Activities** view appears.

4. From the **Activities** view, select the activity.

5. Right-click and choose **Properties**.

6. In the **Properties** dialog box, change the available properties.

7. Click **OK** or **Apply** to change the activity properties. Alternatively, click **Cancel** to exit.

8. To close the **Activities** view, click the ✕ button on the **Activities** tab.

Edit start time and duration for an activity

1. From the navigation pane, click **Service Planner**.

2. From the **Service Planner** view, locate and open the work card that contains the activity you want to edit the start time and duration for.

3. Right-click the work card and choose **Open with** → **Activities**.

   The **Activities** view appears.

4. From the **Activities** view, select the activity.

5. Double-click the cells containing the start and duration times.

6. Type the new value.

7. To close the **Activities** view, click the ✕ button on the **Activities** tab.

Sequence activities

After you create the individual activities to be completed as part of an operation, you can modify the sequence in which these activities are performed. This sequence is called the *activity flow*.

As you sequence the activity flow, identify:

- Preceding activities (those that must be completed before others can be started).
- Parallel activities (those that can be completed at the same time as others).

1. From the navigation pane, click **Service Planner**.

2. From the **Service Planner** view, locate and open the work card that contains the activities you want to sequence.

3. Right-click the work card and choose **Open with** → **Activities**.

The **Activities** view appears.

4. From the **Activities** view, right-click the root activity and choose **Open with** → **Pert**.

   Each activity that exists as part of the root activity is depicted in the PERT chart within its own box or frame. By default, the activities are sequenced in the order they are created.

5. To change the default sequence, perform the following:

   a. From the **Pert** view, select the flow you want to change by clicking it.

   b. Click the ✕ button on the **Pert** toolbar to delete the flow.

   c. Click the **Draw Flow** button on the **Pert** toolbar.

      The draw flow mode is activated and the cursor changes to  .

   d. Click the first activity box.

   e. Click the second activity box to draw the flow.

      An arrow is drawn between the first box and the second box, showing the flow from the first activity to the second activity.

   f. Continue sequencing the activities until the sequence is complete.

   g. Exit the draw flow mode using one of the following methods:

      - Press the ESC button.
      - Click the **Select** button on the PERT toolbar.

   h. To close the **Pert** view, click the button on the **Pert** tab.

Assign qualifications to an activity

You can assign qualifications to an activity to specify the skills, certificates, training, or other aspects needed to perform the service work. Qualifications limit the users who can be assigned to the activity to the ones who possess the required qualifications in Teamcenter.

1. Either choose **Tools** → **Assign Qualifications** or right-click the activity and choose **Assign Qualifications**.

2. Select the qualifications and levels that you want to assign to the activity.

3. Click the **Assign** button.

4. (Optional) Assign other qualifications and levels as necessary.

5. (Optional) To remove an assigned qualification from a work card, select it from the **Existing Qualifications** list and click **Remove**.

6. Click **OK**.

The qualifications are listed in the activity's **Plan Details** view.

Assigning resources to an activity

Assigning resources to an activity

You can assign resources to an activity that is required to complete the activity. In order to use a resource for an activity, the resource must be created for the parent work card.

The following resources can optionally be assigned from the parent work card:

- Skills

  Determines who performs or signs off the work card.

- Part movements

  Indicates whether a neutral item is installed, uninstalled, or replaced.

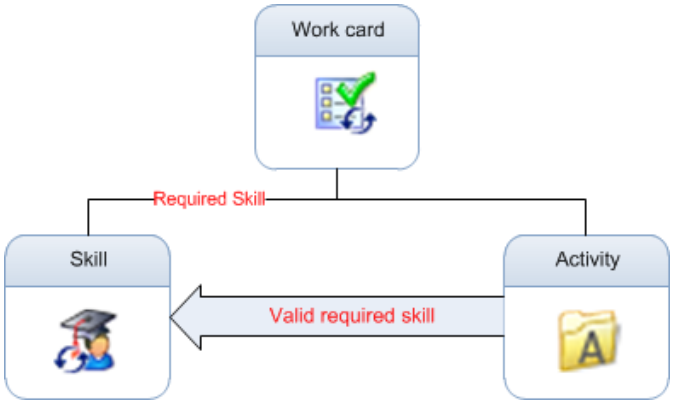
- Expendable materials

  Used and may be consumed during the tasks performed for the work card, but not tracked when the operation is completed.

Assigning required skills

A *required skill* is the qualification that a person must have to perform or sign off on an **activity**. The workflow that the workflow designer builds to approve or perform the activities accesses the required skill to perform the action. When you create the activity, the activity type determines if it is a perform or signoff action.

You can assign the required skills for the activity only if the skills are assigned to the parent work card. After assigning the skill from the work card for an activity, the **Occurrence Type** for the skill is set to **Required Skill**.

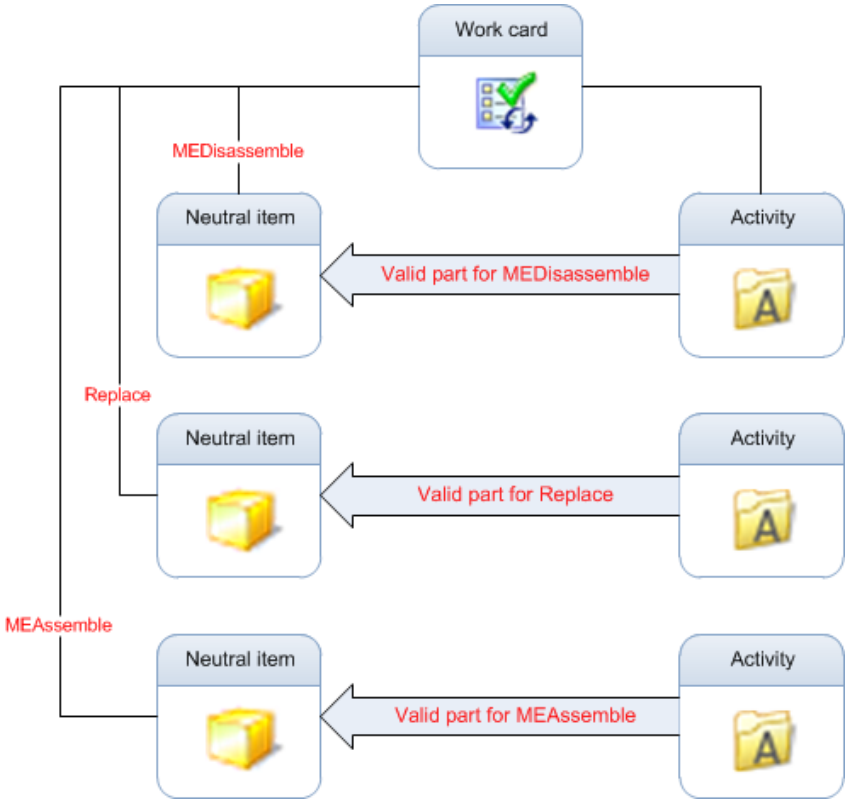


You assign the skill as you would assign any resource.

Assigning part movements for activities

You can assign part movements for an activity to indicate whether a neutral item is installed, uninstalled, or replaced. You can assign the part movements for the activity only if the part movements are assigned to the parent work card.

The following figure shows three part movements assigned to a work card. It contains three activities to break down the tasks. The part movements assigned to the work card are each assigned to an individual activity.



The following occurrences types are used:

- **MEAssemble**

  Indicates the neutral item is installed.

- **Replace**

  Indicates the neutral item is replaced.

- **MEDisAssemble**

  Indicates the neutral item is uninstalled.

You assign the part movements as you would assign any resource.

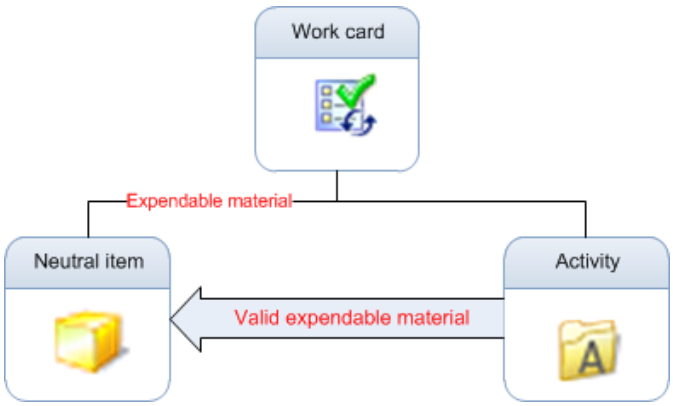
> Note:
>
> You cannot create part movements for an activity if there are life, observation, or date characteristics assigned to the activity.

Assigning expendable materials for activities

An *expendable material* is used and might be consumed during the tasks performed for an activity, but is not tracked when the activity is completed.

> Example:
>
> Shop towels or paint can be defined as expendable materials.

You can assign the expendable materials for the activity only if the expendable materials are assigned to the parent work card. After assigning the expendable materials from the work card for an activity, the **Occurrence Type** for the skill is set to **Expendable Material**.

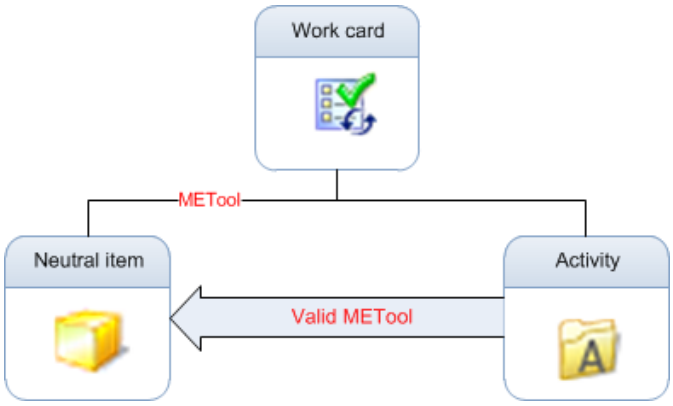


You assign the expendable materials as you would assign any resource.

Assigning tools for activities

A *tool* identifies any item-based resources such as hand tools.

You can assign the tools for the activity only if the tools are assigned to the parent work card. After assigning the tools from the work card for an activity, the **Occurrence Type** for the skill is set to **METool**.



You assign the tools as you would assign any resource.

Assign or remove resources

1. From the navigation pane, click **Service Planner**.
2. From the **Service Planner** view, select the parent work card that contains the activities where you want to assign or remove resources.
3. Right-click the work card and choose **Open with** → **Activities**.

   The **Activities** view appears.
4. Select the activity and click the **Activity Assignments** button on the **Activities** view toolbar.
5. In the **Activity Assignments** dialog box, do one of the following:

   - Select the resource from the work card and click the [>] button to assign the resource to the activity.
   - Click the [>>] button to assign all resources from the work card to the activity.

- Select the resource from the activity and click the < button to remove the assigned resource.
- Click the << button to remove all assigned resources from the activity.

6. Click **OK**.

Defining characteristics for an activity

Define characteristics for an activity

A *characteristic definition* is used to collect and record information during maintenance. You can create characteristic definitions that contain information such as how many hours a part has been used, the date the asset was put into commission, or the operating temperature of the part. You can assign life, observation, and date characteristic definitions to an activity.

In addition, any life, observation, or date characteristics related to the parent work card can be assigned to the activity.

1. From the navigation pane, click **Service Planner**.
2. From the **Service Planner** view, select the work card that contains the activity that you want to define characteristics for.
3. Right-click the work card and choose **Open with** → **Activities**.

   The **Activities** view appears.
4. From the **Activities** view, select the activity and do one of the following to create the characteristic:

To create this type of characteristic	Do one of the following
Life	• Choose **File** → **New** → **Life Characteristic**. • Right-click the work card and choose **New** → **Life Characteristic**. • Do the following: • Right-click the work card and choose **Show Plan Details**.

To create this type of characteristic	Do one of the following
	• In the **Plan Details** view under the **Measurement Characteristics** section, click **Life Characteristic**.

Observation	• Choose **File** → **New** → **Observation Characteristic**.
	• Right-click the work card and choose **New** → **Observation Characteristic**.
	• Do the following:
	  • Right-click the work card and choose **Show Plan Details**.
	  • In the **Plan Details** view under the **Measurement Characteristics** section, click **Observation Characteristic**.

Date	• Choose **File** → **New** → **Date Characteristic**.
	• Right-click the work card and choose **New** → **Date Characteristic**.
	• Do the following:
	  • Right-click the work card and choose **Show Plan Details**.
	  • In the **Plan Details** view under the **Measurement Characteristics** section, click **Date Characteristic**.

5. To display the characteristics assigned to the activity, select the activity and choose **Window** → **Show View** → **Plan Details** or right-click the activity and choose **Show Plan Details**.

Assign characteristics for an activity

1. From the navigation pane, click **Service Planner**.

2. From the **Service Planner** view, select the work card that contains the activity that you want to assign characteristics for.

3. Right-click the work card and choose **Open with** → **Activities**.

   The **Activities** view appears.

4. From **Activities** view, right-click the activity and choose **Assign Characteristics**.

5. In the **Assign Characteristics** dialog box, select the characteristics you want to assign and click **OK**.

   The characteristics are assigned to the activity.

6. To display the characteristics assigned to the activity, select the activity and choose **Window** → **Show View** → **Plan Details** or right-click the activity and choose **Show Plan Details**.

Remove an assigned characteristic

1. From the navigation pane, click **Service Planner**.

2. From the **Service Planner** view, select the work card that contains the activity that you want to remove the characteristic from.

3. Right-click the work card and choose **Open with** → **Activities**.

   The **Activities** view appears.

4. Select the activity.

5. Choose **Window** → **Show View** → **Plan Details** or right-click the activity and choose **Show Plan Details**.

6. In the **Plan Details** dialog box under the **Measurement Characteristics** section, select the characteristics that you want to remove.

7. Click **Cut** to remove the characteristic.

Adding a notice to an activity

Define a notice for an activity

A *notice* is an informative message that identifies safety or hazardous material instructions. You can define a notice for an activity.

The following notice types are available when you create a notice:

- **Caution**

- **Warning**
- **Note**
- **Hazardous Material**

1. From the navigation pane, click **Service Planner**.
2. From the **Service Planner** view, select the work card that contains the activity that you want to define a notice for.
3. Right-click the work card and choose **Open with** → **Activities**.

   The **Activities** view appears.
4. Select the activity and do one of the following to create the notice:

   - Choose **File** → **New** → **Notice** or click the **Create a new Notice** button  on the main toolbar at the top of the **Service Planner** pane.
   - Right-click the activity and choose **New** → **Notice**.
   - Right-click the activity and choose **Show Plan Details**.
   - In the **Plan Details** view, click **Notices**.
5. Select **Notice** from the list and click **Next**.
6. In the **New Notice** dialog box, enter the following information for the notice.

Field name	Definition	Valid Values
Long Description	The description of the notice.	Alphanumeric string (1–128 characters)
Name	The name of the notice (required).	Alphanumeric string (1–128 characters)
Notice Type	Type of notice.	Valid values are: • **Caution** • **Warning** • **Note** • **Hazardous Material**

7. Click **Finish**.

8. To display the notice, select the activity and choose **Window** → **Show View** → **Plan Details** or right-click the notice and choose **Show Plan Details**.

Assign a notice for an activity

1. From the navigation pane, click **Service Planner**.

2. From the **Service Planner** view, select the work card that contains the activity that you want to assign a notice to.

3. Right-click the work card and choose **Open with** → **Activities**.

   The **Activities** view appears.

4. Select the activity and do one of the following:

   - Right-click the activity and choose **Assign Notices**.
   - Right-click the activity and choose **Show Plan Details**.
   - In the **Plan Details** view, click **Assign Notices**.

5. In the **Search** dialog box, type the values for the properties to filter your search for the notices and click **Find**.

6. Select the notices from the results list and click **Relate**.

   The notices are assigned to the activity.

7. To display the notice, select the activity and choose **Window** → **Show View** → **Plan Details** or right-click the notice and choose **Show Plan Details**.

Remove notices from activities

1. From the navigation pane, click **Service Planner**.

2. From the **Service Planner** view, select the work card that contains the activity that you want to remove a notice from.

3. Right-click the work card and choose **Open with** → **Activities**.

   The **Activities** view appears.

4. Select the activity that you want to remove the notice from.

5. Choose **Window** → **Show View** → **Plan Details** or right-click the activity and choose **Show Plan Details**.

6. In the **Plan Details** dialog box under the **Notices** section, select the notices you want to remove.

7. Click **Cut** to remove the notices.

   The notices are removed from the activity.

Define time estimates for an activity

You can define time estimates for activities to estimate the time it takes to perform the activities related to a work card. The time specified for the activities is rolled up into the total time for the work card.

You can define the time as one of the following three types that your administrator can configure to suit your needs:

- Value-added (VA)
- Non-value-added (NVA)
- Non-value-added, but required (NVABR)

1. From the navigation pane, click **Service Planner**.

2. From the **Service Planner** view, select the work card that contains the activity that you want to add a time estimate.

3. Right-click the work card and choose **Open with** → **Time**.

   The **Time** view appears.

4. To close the **Time** view, click the ✕ button on the **Time** tab.

Defining signoff levels for activities

You can define signoff levels for activities by following this process:

1. Assign a required to skill to the activity.

   The workflow that the workflow designer builds to approve or perform the activities accesses the required skill to perform the action.

2. Set the **Activity Execution Type** when you create the activity to either **Perform** or **Sign-off**.

This defines if the skill resource will perform or sign off on the activity.

View plan details for an activity

You can use the plan details view to display and edit information for an activity.

The following information is displayed for an activity:

- Item properties for the activity.
- Notices assigned to the activity.
- Characteristics assigned to the activity.

The following table shows the available buttons when displaying property lists:

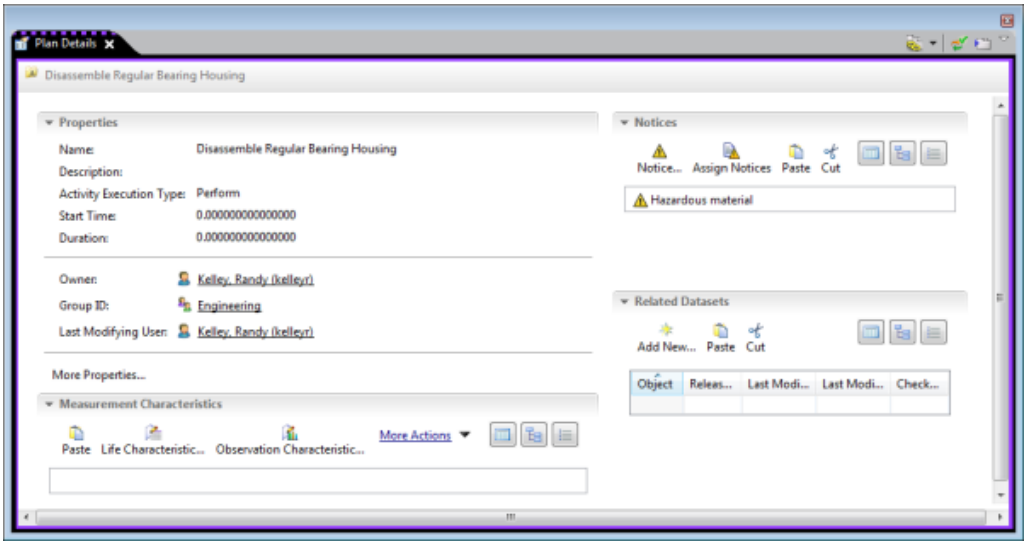
Button	Purpose
	Displays properties using a tree layout.
	Displays properties using a table layout.
	Displays properties using a list layout.

1. From the navigation pane, click **Service Planner**.
2. From the **Service Planner** view, select the work card that contains the activity that you want to view the plan details for.
3. Right-click the work card and choose **Open with** → **Activities**.

   The **Activities** view appears.
4. Select the activity and do one of the following:

   - Choose **Window** → **Show View** → **Plan Details**.
   - Right-click the activity and choose **Show Plan Details**.

   The **Plan Details** tab is displayed.



5. To edit properties for the activity, under the **Properties** section click **More Properties**.

6. Under the **Measurement Characteristics** section, choose one of the following:

   - Click **Life Characteristic** to define a new life characteristic for the activity.
   - Click **Observation Characteristic** to define a new observation characteristic for the activity.
   - Click **Date Characteristic** to define a new date characteristic for the activity.
   - Select a characteristic and click **Cut** if you want to remove it.

7. Under the **Notices** section, choose one of the following:

   - Click **Notice** to define a new notice for the activity.
   - Click **Assign Notice** to assign an existing notice to the activity.
   - Select a notice and click **Cut** if you want to remove it.

Add deliverables to an activity

You can add data collection objects to the activity as required deliverables. The objects can be documents, workspace objects, forms, or datasets. These objects allow you to have a place to collect the data you need to correctly service the part.

1. Right-click the work card with the activity and choose **Open with** → **Activities**.

2. Right-click the activity and choose **Show Plan Details**.

3. In the **Plan Details** view under the **Required Resulting Information** section, you can either add a new object or paste an object from the clipboard with the **Paste** button.

4. To create a new object, click **Add New**.

5. Select a business object type and click **Next**.

6. Type a name and fill in all other required information. Ensure that **SSP0RequiredResultingInfo** is the selected relation.

7. Click **Finish**.

11. Managing time

Managing time

Using the **Time** view, you can manage time information on activities, work cards, and service requirements. You can start by estimating the time it takes to perform work cards. Later, you can refine the time information by defining activities holding time information. You can define the category of each activity, for example, **Value Added** or **Non-Value Added**, and later analyze how much time in your overall service requirement structure (or any other service requirement level) is spent on each category. This view also lets you roll up the time information from lower levels to upper levels and define the allocated time of each of the leaves.

The **Time** view provides information specific to the service requirement or work card so that its appearance varies depending on which of these you select.

Times are stored in the **Time Analysis** form on the service requirement or work card. Activity times are stored as fields directly on the class. In contrast to service requirement or work card, there is no additional activity time form. You can modify times in the **Time** view and these changes are then reflected in the forms.

Time units are stored in seconds in the database. You can configure which units are shown in the **Time** view.

Open the Time view

1. Select a service requirement or work card.

2. Choose **Open with** → **Time**.

   Teamcenter opens the **Time** view.

   - If a service requirement is selected, the **Time** view contains the **Time Values** and **Time Analysis** sections.

Use this section	To
Time Values	Edit allocated, estimated and simulated times for a service requirement or work card. Use the **Calculate** button to populate the allocated time and roll up the summary to upper levels.
Time Analysis	See the analysis of the activities for the selected object. The total work, total duration, and pie chart are calculated for the activities of all descendents of the selected service requirement or work card.

- If a work card is selected, the **Time** view additionally contains the **Work Content** and **Activities** sections.

Use this section	To
Work Content	Display the work content of the work card. This is customer-specific information and is not used for any calculation. You can expand or collapse this section to suit your needs.
Activities	Define activities with time information and classify them into time categories.

Edit work card activities

Activities are intended to break down a work card to define its detailed time information. Each activity can have the following time information:

- **Code**

  The code of an activity is defined in a time standard or in your company's standard.

- **Unit Time**

  The unit time is the time it takes to perform this activity.

- **Frequency**

  Frequency represents how many times this activity is performed. The default is 1.

- **Work Time**

  The total time it takes to perform this activity. This work time is the result of multiplying the unit time by the frequency.

- **Category**

  The time category to which this activity belongs (for example, **Value Added**).

With the **Time** view open for a work card, do any of the following:

Use	To
Add Below	Add a new activity as a descendent of the selected activity.
Add After	Create a new sibling activity after the selected activity.

Use	To
Data Card	Open the **Data Card** dialog box.
Time System	Open the **TiCon Search** view to search for elements in the TiCon time system.
Remove	Delete an activity.
Properties	Open the activities **Properties** form.
Move Up **Move Down**	Change the order of the activities. This order is also reflected in the **Activity Flow** PERT chart. Note: Use these buttons to change the order of a linear flow of activities only. If you use these on parallel flows, the changed order can lead to incorrect flows.
F2 key or select the cell	Edit the cell contents, including the name.
Shortcut menu	Obtain additional commands to perform on a selected activity: • **Cut/Copy/Paste** • **Expand** • **Expand Below** • **Collapse Below** • **Refresh** • **Properties** • **Activity Assignments**

Note:

If an activity in the **Activities** table of the **Time** view contains child activities, the time displayed for it is the cumulative time of all the child activities. For this reason, you cannot use **Add Below** if an activity already contains a time, and you cannot use **Replace** if the activity already has children.

Performing a time analysis

When Teamcenter performs a time analysis, it calculates total work and total duration of descendents of the selected object. In addition, it calculates the time required for each category of time and displays these in a pie chart. By default, Teamcenter provides you with three categories of activities, value-added (VA), non-value-added (NVA), non-value-added but required (NVABR). Your administrator can configure these to suit your needs.

- If you select a work card, Teamcenter performs a time analysis automatically when you open the **Time** view.

- If you select a service requirement, these calculations can be very time-consuming, so you must initiate them manually by clicking **Calculate**.

> Note:
>
> Teamcenter caches the time analysis calculations for a service requirement but does not update them automatically if any changes occur. If you make any changes that affect stored times, you must click **Calculate** again to obtain the updated values.
>
> Teamcenter does not save the time analysis information to the database, it only saves it in the current session. It does this because a time analysis result depends on the current configuration of the structure. You can generate a report of the time analysis which is saved as an attachment to the service requirement.

Populate allocated time

Allocated time is the *official* time of each service requirement and work card. You can manually define the allocated time or you can populate it from other time fields. You can choose the basis on which to calculate the allocated time. This calculation updates the allocated time of all the descendents of the selected service requirement or work card. The calculation is done from the lowest level upwards (*rollup*).

1. Do one of the following:

   - In the **Time** view, in the **Time Values** section, click **Calculate**.

   - Choose **Tools** → **Populate Allocated Time**.

   Teamcenter opens the **Populate Allocated Time** dialog box.

2. Select one of the following:

Use this option	To calculate allocated time based on
Estimated Time	Time information used in the preplanning stages, before detailed time analysis data is available.
Simulated Time	Time values that are determined as a result of a simulation.
Time Analysis Duration	The total duration as calculated in the **Time Analysis** section.
Best Available Time	The best time available on the service requirement or work card. • For a work card, the calculation uses the time available on it in the following order: time analysis duration → simulated time → estimated time. • For a service requirement with no children, the calculation uses the estimated time.

Filtering activity attachments from the structure

You can suppress the display of different types of attachments in the **Activities** section of the **Time** view using the **METimeTabFilteredComponents** preference. If you want to see the attachments, open the **Attachments** view on the work card activity.

Run a time report

When working in the **Time** view, you can run two reports:

- **Time Analysis Report**

  This report summarizes the time analysis for the selected object and below that object. It includes the time analysis information for each service requirement and work card. It contains the name of the service requirement, work card or activity, code, unit time, frequency, work time, duration, and times for different categories. You run this report from the **Time Analysis** section of the **Time** view.

- **Allocated Time Report**

  This report contains the name of the service requirement or work card, allocated, estimated, and simulated times and the duration. You run this report from the **Time Values** section of the **Time** view.

Teamcenter creates these reports as Excel files that are attached as datasets to the corresponding object. You can customize the reports in the Report Builder application.

1. In the **Time** view, do one of the following:

- In the **Time Analysis** section, click **Report** to create a time analysis report.
- In the **Time Values** section, click **Report** to create an allocated time report.

Teamcenter opens a dialog box where you can specify the name of the dataset.

- If the **TC_CRF_overwrite_existing_dataset_content** preference is set to **true**, Teamcenter replaces the contents of the dataset.
- If the **TC_CRF_overwrite_existing_dataset_content** preference is set to **false**, Teamcenter creates a new dataset.

2. Type a new name into the box, or click **Replace** to overwrite the dataset contents.
3. Click **OK** to close the resulting dialog box and open the report.

If you create a time analysis report, Teamcenter calculates and exports the time analysis values of the selected object and all its descendents. If you generate an allocated time report, no calculation is performed. The report reflects the current state of the data.

Customizing a time report

You can customize a time report in any of the following ways.

- Change the report to be used by changing the value of the **METimeAnalysisReportDefinitionID** or **MEAllocatedTimeReportDefinitionID** preferences.
- Add one or more style sheet to the report definition by modifying the **METimeAnalysisReportStylesheet** and **MEAllocatedTimeReportStylesheet** preferences.
- Customize the report contents in the Report Builder application.
  - The **SHOW** parameter specifies which Teamcenter columns are displayed as rows in the report.
  - The **TRANSFER_MODE** parameter specifies the name of the transfer mode to be used to export additional data. You must customize the XSL style sheet to show the exported data.

Configuring the Time view

Configure the categories list

You add new categories in the Business Modeler IDE application.

1. Open the foundation template in the Business Modeler IDE application.

2. Choose **Extension → LOV → Activity Category LOV**.

   Teamcenter displays a list of time categories.

3. Add a new category to the list.

4. (Optional) Choose a color for the new category.

Configure color categories

You can specify the color in which each time category appears. This category is reflected in the **Activities** section of the **Time** view and in the colors of the pie chart in the **Time Analysis** section.

1. Choose **Edit → Options**.

   Teamcenter opens the **Options** dialog box.

2. Click **Manufacturing** in the hierarchy tree.

3. Click the **Time** tab.

4. In the **Colors Representing Time Analysis Types** section:

   - Click any of the displayed colors.

     Teamcenter opens the **Color Chooser** dialog box.

   - Click a new color.

   - Click **OK**.

Configure time units

Change the time unit that appears in the **Time Analysis** section as follows:

1. Choose **Edit → Options**.

   Teamcenter opens the **Options** dialog box.

2. Click **Manufacturing** in the hierarchy tree.

3. Click the **Time** tab.

4. Choose the time unit that you want to display in the **Current Time Unit** list. You can choose from any of the following units:

Unit ID	Long display name (localizable)	Short display name (localizable)	Multiplier to seconds
1000th_min	1/1000 min	0.001m	0.06
100th_min	1/100 min	0.01m	0.6
10th_min	1/10 min	0.1m	6
FAC	FAC	FAC	0.18
MOD	MOD	MOD	0.129
TMU	TMU	TMU	0.036
day	Day	d	86400
hour	Hour	h	3600
minute	Minute	min	60
second	Second	sec	1

5. (Optional) Make further adjustments to the time units using the **MEAvailableTimeUnits** and **MECurrentTimeUnit** preferences.

Managing process times with a Gantt chart

Understanding the Process Gantt view

The **Process Gantt** view displays service requirements and work cards and the relations between them in a chart. A process Gantt chart is a bar chart that illustrates the work breakdown structure of a project. It illustrates the start and finish times of the work cards or service requirements and summary elements (work cards or higher level service requirements) of the project using a time line. The Gantt chart also shows the dependency (sequence) relationships between the elements.

Using the **Process Gantt** view, you can:

- Create and remove flows.
- Change the duration of elements.
- Populate the duration time based on leaf elements.
- Show and hide the critical path.
- Expand and collapse elements within the chart.

- Zoom in and out of the chart.

Note the following about the **Process Gantt** view.

- The duration of an element in the Gantt chart represents its allocated time. You can also set the allocated time in the **Time** view.
- You cannot set start times manually in the **Process Gantt** view. Start times are calculated based on predecessor service requirements or work cards.
- To help you avoid making inadvertent changes to activity durations, the **Process Gantt** view is locked in edit mode when you first open it. You must unlock this mode by clicking  before you can modify duration times by dragging the time bar.
- If objects are configured out in the initiating service requirement structure, the Gantt chart ignores them.
- You can drop a service requirement into the Gantt chart; the behavior is identical to dropping it in the same position in the structure view.
- When you select a service requirement or time element in the **Process Gantt** view, the same service requirement is selected in the structure view.
- You cannot delete a service requirement that has flows attached to it.

Open the Process Gantt view

1. Select a service requirement or work card in the structure tab.
2. Do one of the following:
   - Choose **Open With** → **Process Gantt** from the shortcut menu.
   - Choose **Window** → **Show View** → **Process Gantt**.

Teamcenter displays the process Gantt chart. The selected service requirement or work card is the root node of the process tree. The pane on the right displays the start time and duration time for each line of the process structure. You can open multiple **Process Gantt** views for comparison purposes.

> Note:
>
> You cannot manipulate start times in the **Process Gantt** view.

Change duration times

Do one of the following:

1. Make sure that the **Lock editing** button is off.
2. Move the cursor over the end of the time bar until it changes to a double-ended arrow ↔.
3. Drag the end of the bar to the desired duration time.

-or-

1. Right-click the time bar and choose **Show property dialog**.
2. Type a new end time and click **OK**.

Teamcenter changes the length of the time element to reflect the new time.

> Tip:
>
> Teamcenter displays the duration time in a tool tip for the service requirement or work card, as well as in the **allocated_time** column of the view navigation pane.

Reset the scope

1. Select a service requirement or work card in the structure view.
2. Click .

Teamcenter removes the current service requirement or work card from the **Process Gantt** view and replaces it with the selected one.

Modify the view

Do one of the following:

Click	To
	Update the Gantt chart.
	Scale the chart up or down to accommodate the entire process flow.
	Scale the chart up to show the currently selected time element placed in the middle of chart and taking up most approximately two thirds of the chart.
	Reduce the scale of the chart by a factor of two.
	Enlarge the scale of the chart by a factor of two.

> Tip:
>
> Use the Ctrl key to help you draw a box around a group of time elements to select multiple objects.

You can also use the following shortcut menu commands to help you modify the view:

Menu command	Description
Collapse element	Collapses the tree structure under the selected line. It also collapse the corresponding time elements.
Expand element	Expands the tree structure to one level under the selected line. It also expands the corresponding time elements.

Create a flow

You can only create flows between service requirements or work cards at the same level in a structure that have the same parent (sibling lines).

Do one of the following:

- Create a flow between elements by selecting at least two bars in the Gantt chart and click .

  Teamcenter creates a flow between the elements in the order that you selected them.

- Create a flow by dragging one bar to another in the representation pane.

  If, for example, you drag **Process 1** to **Process 2**, Teamcenter creates a flow from **Process 1** to **Process 2**.

- Select the desired nodes in the tree structure in the navigation pane and click .

  Teamcenter creates a flow between the elements in the order that the nodes appear in the tree.

> Tip:
>
> Teamcenter displays the names of the source and target elements in a tool tip on the flow.

Delete a flow

Select the flow by clicking the line and do one of the following:

- Click .

- Choose **Delete flow** from the shortcut menu.

- Press the Delete key.

Show/hide the critical path

The *critical path* is the sequence of service requirements or work cards that defines the longest path of the project. The project cannot be completed in a shorter time than the critical path. A project might have more than one critical path. In the case of a single critical path, if you make a modification that shortens the duration of any of the elements, you shorten the overall duration of the project.

1. Click the **Mark Critical Path** button to display or hide the critical path.

   If there is more than one critical path in the Gantt chart or some alternative paths have the same critical path length, Teamcenter shows all the critical paths.

2. (Optional) Click to view the duration of the critical path.

   Teamcenter displays the read-only **Critical Path Length** dialog box.

Understanding the calculated duration time

Duration of an element is the overall time it takes to perform its direct children. If all the children are parallel (no flows between them), it is the length of the longest child. In the case where there are flows between the children, it is the overall time it takes to perform the children according to the order (flows) between them. Calculated duration of upper levels is based on the calculated duration of lower levels. If the lower level has no children (for example, a service requirement that has no service requirements or work cards below), its calculated duration is equal to its duration

- For a service requirement with only child work cards, the calculated duration is the length of the longest path of work cards. If the work cards have flows between them, it is the overall time it takes to perform them according to the flows.

- For a service requirement with child service requirements, Teamcenter first calculates the calculated duration of each child service requirement containing only child work cards, and then calculates the longest process duration of the service requirements based on the calculated duration time of the sub-service requirements and work cards.

If there are, for example, four work cards with the same parent, having duration times of one second, two seconds, three seconds, and four seconds, the calculated time for the parent service requirement is four seconds. If, however, the second work card must be completed before the third, the calculated duration time is 5 seconds for the parent service requirement.

Use the **Show calc duration** button to show or hide the calculated duration time. Teamcenter shows a bar across the top of each time element displaying the calculated duration path of the children of this time element.

Configure the Gantt

1. Choose **Edit** → **Options**.

   Teamcenter displays the **Options** dialog box.

2. Select **Manufacturing** from the tree.

3. Click the **Gantt** tab and set any of the following preferences:

Option	Description
Show calculated duration	Specifies whether the calculated duration time is displayed by default in the **Process Gantt** view. This information is stored in the **MEGANTTDefaultDisplayMode** preference.
Full edit mode	Allows you to use drag options to edit and modify the elements in the Gantt chart. This information is stored in the **MEGANTTDefaultEditMode** preference.
Zoom level	Specifies the X-axis zoom level that is active when a Gantt chart is opened.
Element height	Specifies the height of one element of the Gantt chart in the navigation and the representation area (the amount of pixels that are used for one element). There is no space between the elements (10 elements use 10 times the space of one element). This information is stored in the **MEGANTTElementHeight** preference.
Element color	Specifies the fill color of the elements in RGB code. This information is stored in the **MEGANTTElementRGBfillColor** preference.
Critical path element color	Specifies the color of the critical path elements in the **Process Gantt** view representation area. This information is stored in the **MEGANTTDefaultMarkedColor** preference.
Selection color	Specifies the color of a selected element in the **Process Gantt** view representation area. This information is stored in the **MEGANTTDefaultMarkedColor** preference.

Option	Description
Calculated duration color	Specifies the color of the duration time bar in the **Process Gantt** view representation area. This information is stored in the **MEGANTTDefaultDurationTimeColor** preference.
Flow color	Specifies the color of a flow in the **Process Gantt** view representation area. This information is stored in the **MEGANTTDefaultFlowColor** preference.
Critical path flow color	Specifies the color of critical path flow in the **Process Gantt** view representation area. This information is stored in the **MEGANTTMarkedFlowColor** preference.
Implicit flow color	Specifies the color of an implicit flow (created by Teamcenter to retain necessary dependencies) in the **Process Gantt** view representation area. This information is stored in the **MEGANTTImplicitFlowColor** preference.

These preferences are applied to any newly opened **Process Gantt** view.

12. Creating, viewing, and editing work instructions

Creating, viewing, and editing work instructions

You can create work instructions for the information contained in your service plan using Teamcenter Publish. Teamcenter Publish enables you to author, distribute, and view the most current service planning data. The main features of Teamcenter Publish 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.

Using Teamcenter Publish

To create or view work instructions using Teamcenter Publish, install Microsoft Visio before or after the Teamcenter installation.

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 view for each of these is available.

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 **Graphics** view 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.

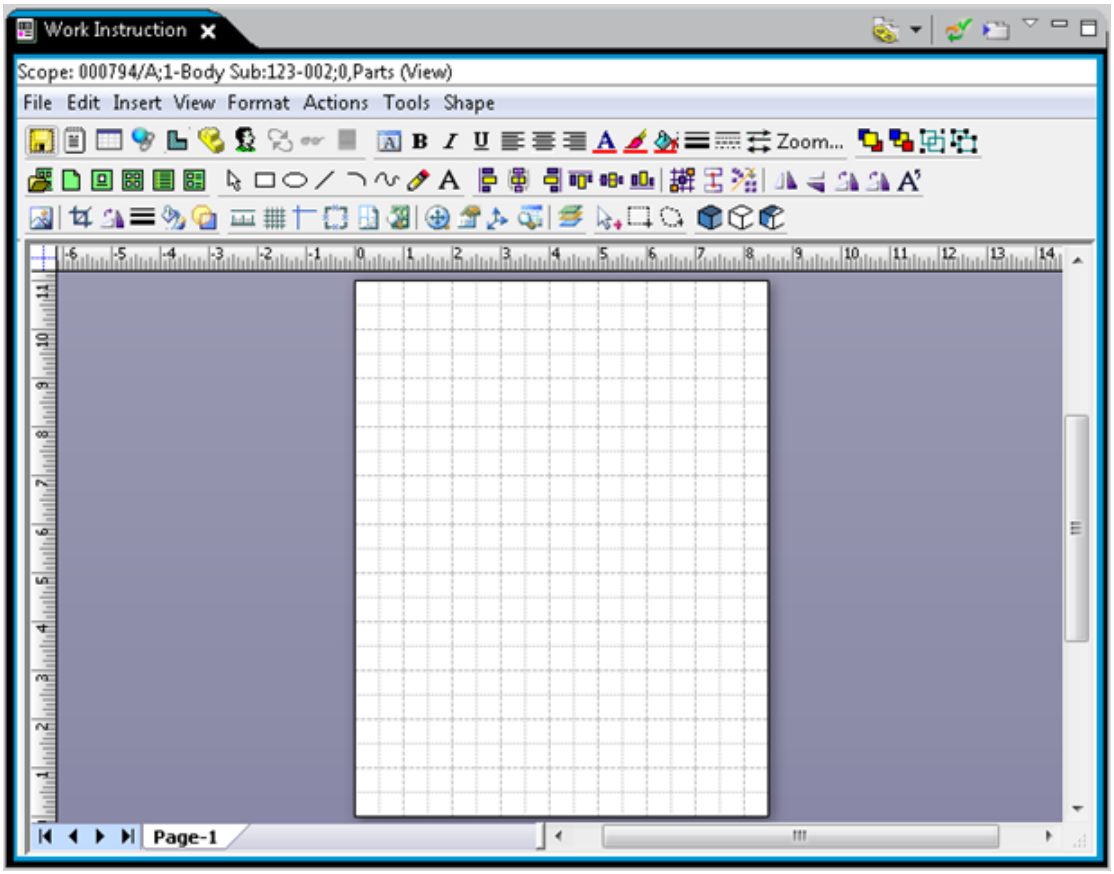
Publishing page roles

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.

Composing work instructions in publishing pages

Creating and editing publishing pages overview

When you first open the **Work Instructions** view, 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.

The objects used to populate assets depend on which structure line is selected.

> Note:
>
> Be careful when selecting new structures for populating assets. You must first click the **Disable response to selections** button and then select a different structure. If you do not, the scope of the **Work Instruction** view changes and Teamcenter attaches the newly created work instruction dataset to the newly selected structure.

Create a publishing page

1. Right-click the BOM line with which you want to associate the work instructions, for example, the item revision of an assembly or operation, and choose **Open with → Work Instructions**.

   The selected line is the scope for the work instruction that you create. The new work instruction is attached to the line that you select here.

   > Note:
   >
   > Be careful when selecting new structures. You must first click the **Disable response to selections** button then select a different structure. If you do not, the scope of the

Work Instruction view changes and Teamcenter attaches the newly created work instruction dataset to the newly selected structure.

2. From the menu commands in the **Work Instructions** view, choose **File → New TI Dataset**.

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

3. 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.

4. 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.

5. Drag these placeholders to the desired spot on the page, resizing if necessary.

6. Right-click the asset and choose **Bind**.

   Teamcenter displays the **Bind Table Placeholder** dialog box.

7. 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.

Connecting structure data to a publishing page

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. In the **Work Instructions** view, click .

   Teamcenter creates a placeholder for the text on the work instruction page.

2. Save the work instruction.

   You must always save a work instruction once to create the dataset before you can populate an asset.

3. Click the **Text Tool** button to add free-form text to the asset.

4. Right-click the placeholder and select **Bind**.

   Teamcenter displays the **Bind Text Placeholder** dialog box.

5. From the **Transfer Modes** list, select **tcm_export** transfer mode.

   You can select only one transfer mode per text alias.

6. 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.

7. 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.

8. Select the object in the structure view 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 view.

9. In the **Work Instruction** view, 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. In the **Work Instructions** view, click .

   Teamcenter creates a placeholder for the table on the work instruction page.

2. Save the work instruction.

   You must always save a work instruction once to create the dataset before you can populate an asset.

3. Right-click the placeholder and select **Bind**.

   Teamcenter displays the **Bind Table Placeholder** dialog box.

4. From the **Transfer Modes** list, select **tcm_export** transfer mode.

5. 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.

6. Click **OK**.

7. Select the revision in the structure view 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 view.

8. In the **Work Instruction** view, 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. In the **Work Instructions** view, click .

   Teamcenter creates a placeholder for the link on the work instruction page.

2. Save the work instruction.

   You must always save a work instruction once to create the dataset before you can populate an asset.

3. Right-click the placeholder and choose **Bind**.

   Teamcenter displays the **Bind Link Placeholder** dialog box.

4. From the **Transfer Modes** list, select the **ExportGraphic** transfer mode.

5. From the **Aliases** list, select **LinkedDataset**.

6. In the **Attachment** view, select the text dataset and click **Populate** in the **Work Instructions** view.

   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. In the **Work Instructions** view, click .

   Teamcenter creates a placeholder for the image on the work instruction page.

2. Save the work instruction.

   You must always save a work instruction once to create the dataset before you can populate an asset.

3. Right-click the placeholder and select **Bind**.

Teamcenter displays the **Bind Image Placeholder** dialog box.

4. From the **Transfer Modes** list, select **ExportGraphic** transfer mode.

5. In the **Aliases** list, open the **2DGraphic** entry and select **file**.

6. Open the **Attachments** view.

7. Select the image that you want to embed.

8. In the **Work Instruction** view, 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 must exist for it.

1. In the **Work Instructions** view, click  .

   Teamcenter creates a placeholder for the image on the work instruction page.

2. Save the work instruction.

   You must always save a work instruction once to create the dataset before you can populate an asset.

3. Right-click the placeholder and select **Bind**.

   Teamcenter displays the **Bind Image Placeholder** dialog box.

4. From the **Transfer Modes** list, select **ExportGraphic** transfer mode.

5. In the **Aliases** list, open the **2DSnapshot** entry and select **file**.

6. Do one of the following to specify which 2D snapshot should be populated:

   - In the **Attachments** view, select the snapshot.
   - In the **2D Viewer** view, open the **2D Snapshots Gallery** dialog window and select an existing snapshot.
   - In the **2D Viewer** view, arrange the snapshot. When you populate the asset, Teamcenter automatically creates the snapshot for you.

7. In the **Work Instruction** view, 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. In the **Work Instructions** view, click the **3D Graphic** button .

   Teamcenter creates a placeholder on the work instruction page.
3. In the **Work Instructions** view, 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.
4. Right-click the placeholder and select **Bind**.

   Teamcenter displays the **Bind Geometry Asset Placeholder** dialog box.
5. From the **Transfer Modes** list, select **ExportGraphic** transfer mode.
6. In the **Aliases** list, open the **3DGeometryAsset** entry and select **file**.
7. Do one of the following to specify which 3D geometry should be populated:

   - In the **Graphics** view, 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** view, select the 3D snapshot.

- In the **Graphics** view, arrange the snapshot. When you populate the asset, Teamcenter automatically creates the snapshot for you.

8. In the **Work Instruction** view, 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. Disable response to selections by clicking .

   When selecting structures to populate assets, it is important to understand the role of the **Disable response to selections** button. Clicking this button locks the view so that when you select a line in a different structure, the scope of the view does not change and the work instruction dataset, when created, is attached to the originally selected structure line. If the view is not locked (it responds to selection), when you select a line in a different structure to populate an asset, the work instruction dataset is attached to the newly selected structure line.

4. Click the **Populate Asset** button or menu command.

Selecting structure lines for the populate action

When selecting structures to populate assets, it is important to understand the role of the **Disable response to selections** button . Clicking this button locks the view so that when you select a line in a different structure, the scope of the view does not change and the work instruction dataset, when created, is attached to the originally selected structure line. If the view is not locked (it responds to selection), when you select a line in a different structure to populate an asset, the work instruction dataset is attached to the newly selected structure line.

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 publishing page view.

2. Select the component in another view, and choose **Edit** → **Populate Asset** in the publishing page view.

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 only can display what is already in the database. To update a 3D asset, you must first update the snapshot dataset in the **Graphics** view.

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** view.

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.

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.

Create a publishing page from a template

1. 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.

2. 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.

3. (Optional) Click the **Add To Favorites** button to add the selected template to the list in the **Templates** pane above it. Publishing pages for activities are tracked separately from other publish pages.

4. (Optional) Click the **Use as Default** button to use the specified dataset as the default template if no TI dataset is loaded.

5. In the **File** section, select **Use Template**.

6. Type a name and description in the relevant boxes.

7. Click **OK**.

   Teamcenter creates the new publishing page dataset.

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. Open the **Work Instructions** view.

3. In the **Work Instructions** view, 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.

Collecting work instructions in 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 **Graphics** view. 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. • Choose **Show Details** to display custom shape properties. • Choose **Go to Page** to include navigation for multi-page work instructions or product manual.

Tab	Options	Description
		• 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.

Processing multiple documents at once

Creating work instructions and portfolios in batch mode

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 Service 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.

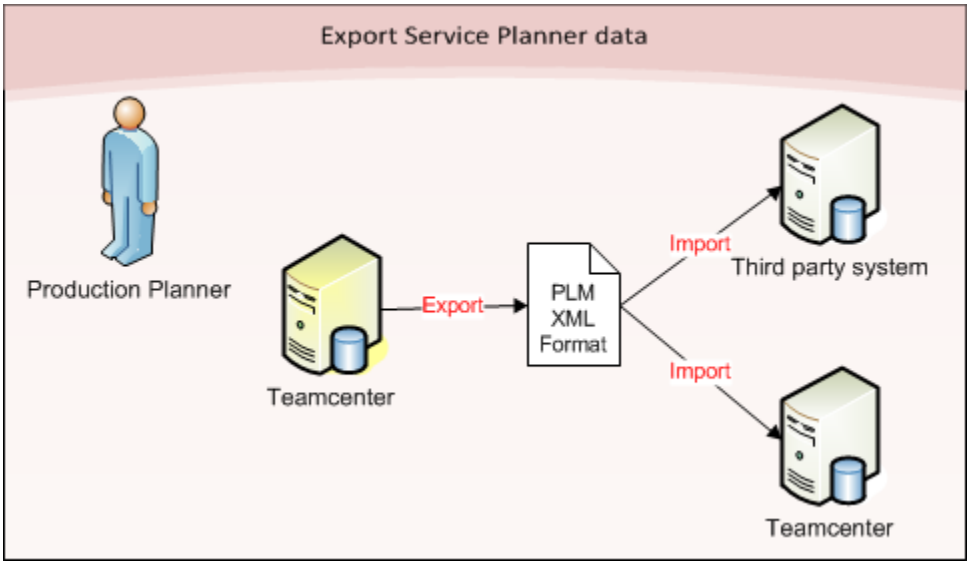
   - Select **Scheduled** to select a specific start date and time.

   - 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.

13. Sharing Service Planner data

Export Service Planner data

A user such as a production planner can export Service Planner data from Teamcenter to other Teamcenter sites or third-party systems.



Exporting Service Planner data

You can export the following Service Planner objects in PLM XML format:

- Service plan (with schema extension)
- Service requirement (with schema extension)
- Work card (with schema extension)
- Activity (no schema extension)
- Fault code (with schema extension)
- Notice (with schema extension)
- Skill (with schema extension)

1. Select the object to be exported.
2. Choose **Tools** → **Export** → **To PLMXML**.

The system displays the **PLMXML Export** dialog box.

3. In the **Export Directory** box, select the directory in which to place the PLM XML file. Click **Browse** to locate the directory.

4. Specify the name of the export file in the **Export Filename** box.

5. Select the **ServicePlanningDataExport** transfer mode from the **Transfer Mode Name** list. to export service planning data.

6. (Optional) Click **Select Languages** to display the **Language Selection** dialog box for the languages configured at your site.

   a. **Main Language** is the site master language. This cannot be changed.

   b. The **Available Languages** box lists the languages you can select as additional languages for export.

   c. The **Select Additional Languages** box lists the preconfigured languages for the selected transfer mode.

   d. To select additional languages for export, follow these steps:

      A. Select a language in the **Available Languages** box.

      B. Click the **Add** button +.

         i. The selected language is added to the **Selected Additional Languages** box.

         ii. To reorder the languages in the **Selected Additional Languages** box, select a language and use the move ▲ ▼ buttons as required.

      C. Click **OK** or **Apply**.

         The languages selected for export are displayed in the **Languages** box.

   > Note:
   >
   > If you change the transfer mode, the **Languages** entries remains unchanged. You can use the **Language Selection** dialog box again to add or remove more languages.

7. (Optional) Select a revision rule to configure the assembly to be exported.

8. If you do not apply a revision rule, only the parent item revision is exported.

9. (Optional) Select **Open PLM XML File** to view the file when the export operation is complete.

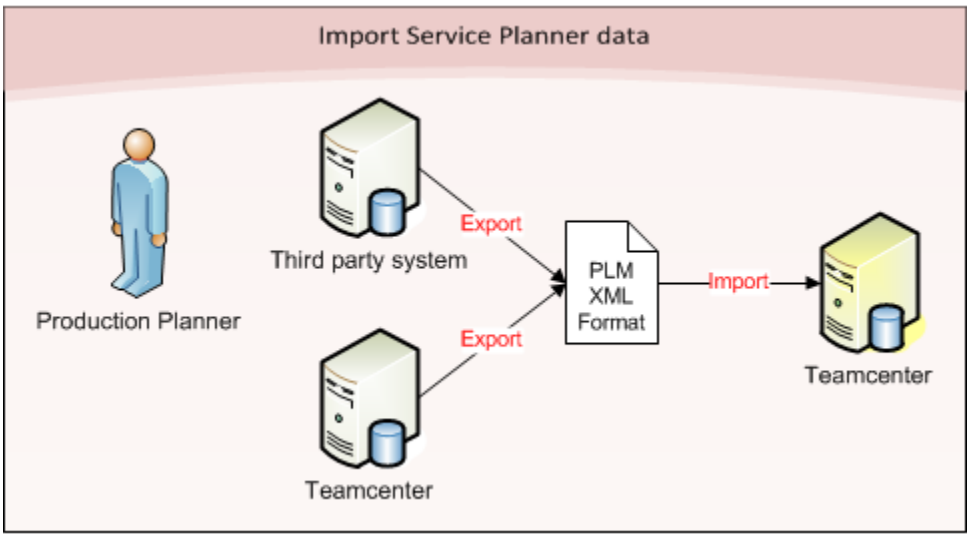
10. (Optional) Select the **View Log File** check box to view the log file when the data translation is complete.

11. (Optional) Select the **Perform Export In Background** check box to perform an asynchronous export.

12. Click **OK** to export the objects in the **Object List** and close the dialog box.

Import Service Planner data

A user such as a production planner can import Service Planner data from Teamcenter to other Teamcenter sites or third-party systems.



Importing Service Planner data

You can import Service Planner data into Teamcenter from any third-party system if it conforms to the PLM XML schema.

Refer to the following table for PLM XML elements and the associated Teamcenter Service Planner classes.

PLM XML element	Teamcenter class
ServicePlan	**SSP0ServicePlan**
ServicePlanRevision	**SSP0ServicePlanRevision**
OccurrenceGroup	**SSP0ServicePartition**

PLM XML element	Teamcenter class
ServiceRequirement	**SSP0ServiceReq**
ServiceRequirementRevision	**SSP0ServiceReqRevision**
WorkCard	**SSP0WorkCard**
WorkCardRevision	**SSP0WorkCardRevision**
Frequency	**SSP0Frequency**
FrequencyRevision	**SSP0FrequencyRevision**
FaultCode	**FaultCode**
Skill	**SSP0Skill**
SkillRevision	**SSP0SkillRevision**
Warning	**Smr0Warning**
PartApplicabilityRelation	**SSP0PartApplicabilityData**

1. Choose **Tools** → **Import** → **From PLMXML**.

   The system displays the **PLMXML Import** dialog box.

2. Click **Browse** ... to the right of the **Importing Object** box.

   The **Select Object** dialog box appears.

3. Select **PLM XML File (.xml)** from the **Files of type** list.

4. Navigate to the directory containing the file and select the file.

   The system displays the file name in the **Directory** name box.

5. Click **Select**.

   The system displays the path to the selected file in the **Importing Object** box of the dialog box.

6. Select the transfer mode to be used to configure the import operation.

   > Note:
   >
   > The **ServicePlanningDataExport** transfer mode is provided with Service Planner for importing service planner data from a third party into Teamcenter.

7. (Optional) Select the **View Log File** check box to view the log file when the data transfer is complete.

8. Click **Apply** to start the import operation and retain the dialog box, or click **OK** to start the import operation and exit the dialog box.

   The system imports the data as follows:

   - By default, the imported object has no container reference. You can use relevant search criteria to find the imported object and so you can copy it to a folder.

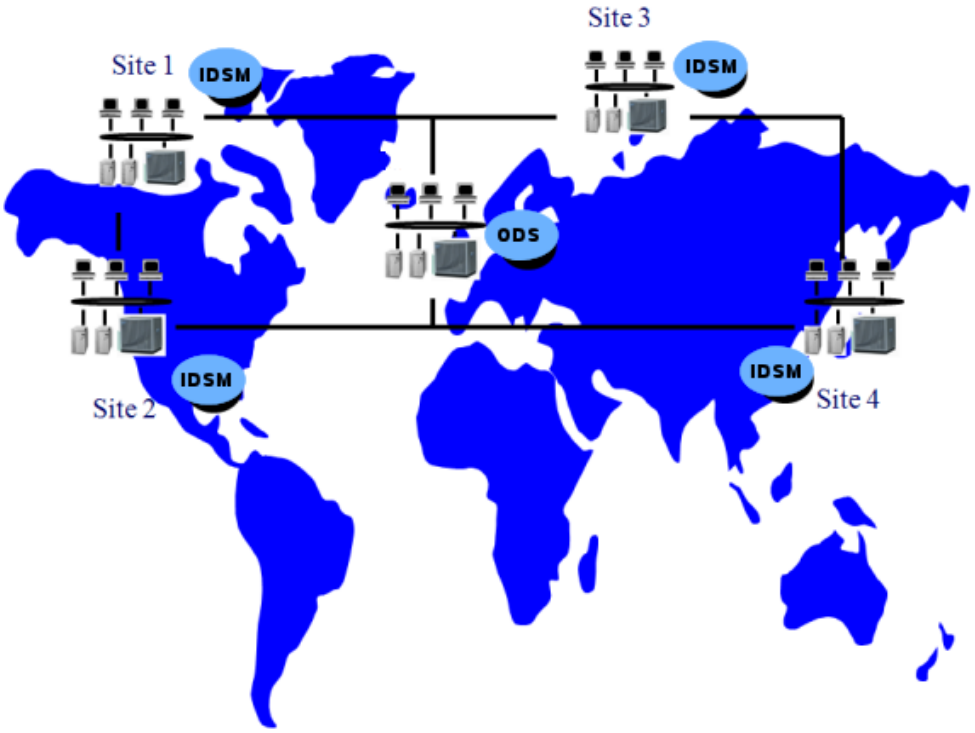
   - To have Teamcenter import objects into your **Newstuff** folder, create the **PLMXML_put_objects_in_newstuff_on_import** preference and set the value to **TRUE**. Imported objects are placed in a folder with the same name as the imported XML file.

   > Note:
   >
   > If object names or IDs are encountered that exceed the character limit for those fields in Teamcenter, the name and/or ID is truncated when imported in to Teamcenter. Teamcenter provides 128 bytes for item IDs and names.

Exchanging Service Planner data using Multi-Site Collaboration

Using Multi-Site Collaboration, you can share Service Planner data between multiple Teamcenter sites. Each Teamcenter site has its own independent database with its own set of users and groups, data model, business rules, and business processes.

Data sharing is done through object replication where an exact copy of an object is made at a remote site using remote export and import functions. The replicas are synchronized when the master copy is modified.



The *Object Directory Services* server (ODS) site maintains a record of each object in the entire Multi-Site Collaboration network.

The *Integrated Distributed Services Manager* (IDSM) provides the mechanism used to export an object from the owning site, transmit it over the network, and import it into the destination site.

When you export Service Planner data using Multi-Site Collaboration, Data Exchange also exports the relations and the related objects. The table summarizes which relations and corresponding related objects are exported for each Service Planner object.

Exported Service Planner object	Exported relation	Exported related object
Service plan (with schema extension)	**PS Occurrence**	Service requirement
	SSP0ServicePlanForNeutralProduct	Neutral item
	Occurrence Group	Service partition
Service requirement (with schema extension)	**PS Occurrence**	Work card
	PS Occurrence	Frequency
	SSP0PartApplicability	Neutral item
	SSP0Satisfies	Service requirement

Exported Service Planner object	Exported relation	Exported related object
	SSP0Requires	Service requirement
	SSP0Resolves	Fault Code
	PS Occurrence	Skill
Work card (with schema extension)	**PS Occurrence**	Activity
	SSP0HasWarning	Notice
	SSP0UpgradedConfiguration	Structure context
	PS Occurrence	Skill
	SSP0CollectsData	Characteristic definition
Activity (no schema extension)	**SSP0CollectsData**	Activity
		Characteristic definition
Fault code (with schema extension)	**SSP0Resolves**	Neutral part
Notice (with schema extension)		
Skill (with schema extension)	Tag	Discipline

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