TEAMCENTER

Lifecycle Visualization Integration With Teamcenter

Teamcenter 2412

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Integration overview

Integrating Lifecycle Visualization with Teamcenter

The Lifecycle Visualization integration with Teamcenter enables you to work with managed visualization data in the external standalone application viewer or in the Lifecycle Viewer perspective in the rich client. The standalone application viewer is a separate application from Teamcenter. It expands upon Teamcenter's embedded visualization components with support for optional software modules such as Concept Showroom, Visualization Illustration, and Variation Analysis. The Lifecycle Viewer is an embedded visualization application within the rich client. It provides nearly all of the visualization tools offered by the standalone viewer, many of which are not available for Teamcenter applications such as My Teamcenter or Structure Manager.

Find more information on using the visualization products in Lifecycle Visualization viewers.

The following sections provide information on configuring and using the Lifecycle Visualization integration with Teamcenter.

Before you begin

Prerequisites	The Lifecycle Visualization integration with Teamcenter supports Teamcenter lifecycle visualization standalone application viewer and the Lifecycle Viewer within the rich client. The standalone application viewer and the Lifecycle Viewer are available in the Base, Standard, Professional, and Mockup product configurations. The Base configuration is automatically installed with the Rich Client. Some optional products are available only for the standalone application viewer, including Variation Analysis, Concept Showroom, and Jack. The Teamcenter FMS Client Cache (FCC) must be installed on the client machine. This is automatically installed with the rich client. You do not need Teamcenter administrator privileges to use the Lifecycle Visualization integration with Teamcenter or to set Teamcenter user preferences, but you do need Teamcenter administrator privileges to configure preferences at the site level.
Enable the Lifecycle Visualization integration	The Lifecycle Visualization integration with Teamcenter is part of the standard Teamcenter deployment architecture. Refer to the *Add lifecycle visualization to the Teamcenter rich client* topic in *Installation* in the Teamcenter help. Teamcenter is installed using Teamcenter Environment Manager (TEM).
Configure the Lifecycle	Teamcenter is installed and initially configured using Teamcenter Environment Manager (TEM). After Teamcenter is installed, a number of configuration

Visualization integration	options exist that you can use to customize the Lifecycle Visualization integration.
Start the Lifecycle Visualization integration	If you are using the rich client, you can send visualization data into the standalone application viewer or the Lifecycle Viewer. • To send visualization data to the standalone application viewer, select the item revision, and click **Start/Open in Lifecycle Visualization** on the toolbar. • To send visualization data to the Lifecycle Viewer, right-click the item revision, and choose **Send To→Lifecycle Viewer**.

Lifecycle Visualization viewers

The Lifecycle Visualization integration with Teamcenter supports the Teamcenter lifecycle visualization standalone viewer and the Lifecycle Viewer within the rich client. In addition, many rich client perspectives include embedded visualization components.

Standalone viewer

The standalone viewer, which runs outside of Teamcenter and is a separate installation, expands upon Teamcenter's embedded visualization components with support for optional software modules such as Concept, Visualization Illustration, Quality Producer, and Variation Analysis. Standalone Lifecycle Visualization is integrated with Teamcenter, so you can send data from Teamcenter applications into the standalone viewer, perform analysis, and then save your work back to the database.

Standalone Lifecycle Visualization is available in the following product configurations:

- **Base**

  The Base product configuration enables you to view and mark up 2D images and perform basic 3D analysis operations such as measurements and cross sections.

- **Standard**

  The Standard product configuration provides many additional features, such as advanced navigation capabilities, markup tools, and support for precise 3D measurements.

- **Professional**

  The Professional product configuration adds analysis functionality such as 3D comparisons, as well as the ability to manipulate and transform 3D models, create outline captures, and play motion files that illustrate assembly sequences. You can optionally use add-on modules such as Animation, Concept, and Visualization Illustration.

- **Mockup**

  The Mockup product configuration provides all of the functionality from the other product configurations and also includes advanced features such as 3D Clearance analysis, geometry simplification, part groups, 3D filters, and movie captures. You can optionally use all of the available add-on modules, including Quality Producer, Variation Analysis, Jack, and Path Planning.

Lifecycle Viewer

The Lifecycle Viewer is a full-fledged visualization client within Teamcenter. It provides nearly all of the visualization tools offered by the standalone viewer, many of which are not available in the embedded viewers within Teamcenter applications such as My Teamcenter.

The Lifecycle Viewer is available in the same product configurations as the standalone viewer, Base, Standard, Professional, and Mockup. Features available vary depending upon the licensing level. The Base configuration is automatically installed with the rich client.

Using the Lifecycle Viewer, you can:

- Work within a comprehensive user interface that provides access to many of the options previously available only with the standalone products, including menus and views (the equivalent of Project Workspace windows such as the Assembly).
- Insert or merge files within active Viewing windows.
- Work with multiple open datasets.
- Preserve the state of your work with session files.
- Save data as PLM XML.
- Export 2D images and 3D models as supported datasets.
- Author visualization data such as motion files, swept volumes, and .vfz collaboration files.

Working with visualization data in the My Teamcenter viewer

The **Viewer** view in My Teamcenter displays content dependent on the type of object selected in the current component view or in the **Details** view. Support for visualization data includes:

- If an item or item revision is selected, the viewer displays the associated image, printed circuit board, schematic, or JT data.
- If an image, ECAD PCB, ECAD Schematic, or JT dataset is selected, the viewer displays the image, printed circuit board, schematic, or model.

Visualization use cases

- View and markup of parts, printed circuit boards, schematics, drawings and images, without having to launch the standalone viewer or the Lifecycle Viewer.

Visualization tools available

- **2D Markup**

  Create 2D markups.

- **2D Multipage**

  Navigate among pages in multiple-page 2D images or documents.

- **2D Viewing**

  Pan, zoom, rotate, and flip 2D images.

- **3D Markup**

  Create 3D markups.

- **3D Measurement**

  Perform 3D measurements.

- **3D Navigation**

  Pan, rotate, and zoom 3D models.

- **3D PMI**

  View and manipulate PMI in your model.

- **3D Section**

  Create 3D cross sections.

- **3D Selection**

  Select parts and pick part features.

- **3D Standard Views**

  Examine your model from preset viewing angles.

- **ECAD Base**

  Manipulate the view of ECAD document layers, control layer color and visibility, search, and create reports.

- **ECAD Markup**

  Create ECAD markups.

- **ECAD Multipage**

  Navigate among pages in multiple-page schematic documents.

- **ECAD Viewing**

  Pan, zoom, rotate, and flip image.

- **Print**

  Print documents.

Structure Manager viewer

The viewer embedded in Structure Manager is available within the **Viewer** tab of the data pane. The viewer allows you to view JT files attached to assemblies and components in the structure tree when you are viewing and editing a product structure.

Visualization use cases

- View 3D assemblies or structures.
- View subcomponents in an assembly.
- Compare product structures.
- Create and save product views.

Visualization tools available

- **3D Alignment**

  Align parts with other parts in the viewing window.

- **3D Appearance**

  Change the appearance of 3D models.

- **3D Clearance**

  Check the clearance of parts in 3D models.

- **3D Comparison**

  Compare the geometry of two sets of parts.

- **3D Coordinate System**

  Create and align parts to local coordinate systems.

- **3D GDT Markup**

  Create 3D GD&T markups.

- **3D Manipulators**

  Transform 3D models.

- **3D Markup**

  Create 3D markups.

- **3D Measurement**

  Perform 3D measurements.

- **3D Movie Capture**

  Capture your actions in the 3D viewing window as movie files.

- **3D Navigation**

  Pan, rotate, and zoom 3D models.

- **3D PMI**

  View and manipulate PMI in your model.

- **3D Section**

  Create 3D cross sections.

- **3D Selection**

Select parts and pick part features.

- **3D Standard Views**

  Examine your model from preset viewing angles.

- **3D Thrustline Editor**

  Create and manipulate thrustlines.

- **3D Visibility**

  Hide obscuring parts and clip areas of your model.

Multi-Structure Manager viewer

The viewer embedded in Multi-Structure Manager is available within the **Object View** tab of the data panel. The viewer allows you to view associated 2D images and 3D models when you are viewing and editing a product or process structure.

Visualization use cases

- View product or process structures.
- View images associated with objects selected on the structure tab.
- View and create markups.
- Create and save product views.

Visualization tools available

- **2D Markup**

  Create 2D markups.

- **2D Multipage**

  Navigate among pages in multiple-page 2D images or documents.

- **2D Viewing**

  Pan, zoom, rotate, and flip 2D images.

- **3D Markup**

Create 3D markups.

- **3D Measurement**

  Perform 3D measurements.

- **3D Navigation**

  Pan, rotate, and zoom 3D models.

- **3D PMI**

  View and manipulate PMI in your model.

- **3D Section**

  Create 3D cross sections.

- **3D Selection**

  Select parts and pick part features.

- **3D Standard Views**

  Examine your model from preset viewing angles.

Manufacturing Process Planner viewer

The viewer embedded in Manufacturing Process Planner is available within the **Object View** tab of the data panel. The viewer allows you to view associated 2D images and 3D models when you are viewing and editing a process structure.

Visualization use cases

- View product or process structures.
- View images associated with objects selected on the structure tab.
- View and create markups.
- Create and save product views.

Visualization tools available

- **2D Markup**

Create 2D markups.

- **2D Multipage**

  Navigate among pages in multiple-page 2D images or documents.

- **2D Viewing**

  Pan, zoom, rotate, and flip 2D images.

- **3D Markup**

  Create 3D markups.

- **3D Measurement**

  Perform 3D measurements.

- **3D Navigation**

  Pan, rotate, and zoom 3D models.

- **3D PMI**

  View and manipulate PMI in your model.

- **3D Section**

  Create 3D cross sections.

- **3D Selection**

  Select parts and pick part features.

- **3D Standard Views**

  Examine your model from preset viewing angles.

JT Preview view

The **JT Preview** view enables you to examine .jt parts associated with items, item revisions, and datasets. When you select a compatible object, the .jt part is displayed in the view.

Visualization use cases

- Preview .jt parts.

Visualization tools available

- **3D Navigation**

  Pan, rotate, and zoom 3D models.

Image Preview view

The **Image Preview** view enables you to examine 2D raster images associated with items, item revisions, and datasets. When you select a compatible object, the image is displayed in the view.

Visualization use cases

- Preview 2D raster images.

Visualization tools available

- None

Basic concepts

Primary and secondary visualization documents

Visualization files in Teamcenter are always either **primary or secondary** documents. You can open primary documents independently from other documents, while secondary documents are dependent upon primary documents. For example, a JT file is a primary document, which you can view on its own without any other file having to be open; a markup layer (VPL file), in contrast, cannot be viewed on its own, and must be opened in the context of a primary document, such as a JT file.

Static and configured product structure

Product structure from Teamcenter can be either **static or configured**, depending upon how you save and then subsequently re-open the session. When you initially send product structure into the Lifecycle Viewer or the standalone application viewer, the structure matches the currently active configuration settings from Teamcenter applications such as Structure Manager (revision rules, effectivity, variant rules, active assembly arrangements, and other settings).

Visualization session files

Session files save the state of the viewer so you can resume your work later. Saving your work as a session file enables you to preserve viewer elements such as open files, snapshots, part visibility, and part transformations.

Note:

By default, in a four-tier environment, when you launch standalone Lifecycle Visualization from the Teamcenter rich client, the viewer and the rich client share the same tcserver session. When you perform standalone viewer operations, such as saving a session file, the rich client may appear to lock up until the viewer operation is finished. If this is a problem, you can configure Teamcenter to create a separate tcserver session for the standalone viewer.

Basic tasks

An understanding of how to complete the following tasks is helpful when first beginning to use the Lifecycle Visualization integration with Teamcenter:

- Turn on the UI options in the rich client to send visualization data to the standalone application viewer.
- Use the Teamcenter Integration Preferences to specify the default behavior of visualization datasets in Lifecycle Visualization.
- **Open visualization files** from Teamcenter in the standalone application viewer or the Lifecycle Viewer.
- **Insert or merge visualization files** with an active session in the standalone application viewer or the Lifecycle Viewer.
- **Search the Teamcenter database** from the standalone application viewer.
- **Create shortcuts** to folder locations in Teamcenter.

2. Viewing 2D images and 3D models

2D and 3D visualization overview

The Lifecycle Visualization integration with Teamcenter enables you to work with managed visualization data in the external standalone application viewer or in the Lifecycle Viewer perspective in the rich client. If you are using the rich client, you can send visualization data into the standalone application viewer or the Lifecycle Viewer.

Open visualization data from Teamcenter

You can open visualization data, including 2D images and 3D models, in the standalone viewer and the Lifecycle Viewer.

> Note:
>
> The options to send Teamcenter managed visualization data to the standalone viewer may not be shown by default on the user interface of the rich client. For these options to be displayed, you must enable them using the Lifecycle Visualization options in the rich client or the **TC_show_open_in_vmu_button** preference.

Do any of the following:

To	Do this
Send any of the following to the standalone viewer: • An item or item revision that includes visualization data • A BOM view • Selected product structure • Worksets • A 3D dataset such as a JT file • A 2D or ECAD dataset such as an image or PCB file	Select the object and do one of the following: • On the **My Teamcenter** toolbar, click **Start/ Open In Lifecycle Visualization**  . • Choose **File→Open in Lifecycle Visualization**.
Send any of the following to the Lifecycle Viewer:	Right-click the object and click **Send To→Lifecycle Viewer**.

To	Do this
• An item or item revision that includes visualization data • A BOM view • Selected product structure • Worksets • A 3D dataset such as a JT file • A 2D or ECAD dataset such as an image or PCB file	

Working with product structure from Teamcenter

You can send a full or partial product structure from the Structure Manager to the Lifecycle Viewer or a standalone viewer. Open the structure in a new Viewing window, insert the structure as a new assembly in an active Viewing window, or merge the structure with an existing assembly in an active Viewing window.

To send product structure to the visualization client, select the product structure within the Structure Manager and then do one of the following:

- Click **Start/Open In Lifecycle Visualization**  to send the product structure to a standalone viewer.
- Right-click the product structure and choose **Send To→Lifecycle Viewer** to send the product structure to the Lifecycle Viewer.

To send a full product structure to the visualization client, select the root or top line of the product structure. To send a partial product structure, select any child nodes within the root product structure hierarchy. Partial product structure consists of the lines representing the unique paths down to the selected structure.

> Note:
>
> When working with partial product structures, the following limitations apply:
>
> - You can expand only the child hierarchy of the launched lines.
> - All viewer operations, such as filters and Clearance analysis, are applicable only for the launched lines.

Note:

Teamcenter applications such as Structure Manager include view toggles that enable you to see BOM lines that are configured out because of effectivity or variants. The view toggle **Show Suppressed Occurrences** enables you to see BOM lines that are suppressed in the current assembly arrangement. If you send an assembly to the standalone application viewer or the Lifecycle Viewer when this view toggle is on, the suppressed structure elements are grayed out. If you open a product view that captured suppressed occurrences, an inactive structure warning is displayed. To avoid this problem, set the **Product View Creation Preferences** to prevent the creation of product views when the **Show Suppressed Occurrences** view toggle is enabled.

Inserting and merging files

When you want to insert or merge a 2D, 3D, or ECAD file into an opened similar file format, the system asks how you want to open the file. The following insert and merge options exist:

- Insert the file into the current window.
- Merge the file into the current window.
- Insert or merge the file into a new Viewing window.

The steps required to insert or merge files vary slightly depending upon the applications involved. When working with local data in the standalone viewer, you must use the Application toolbar **Menu→File→Insert** or **File→Merge** commands. When working with Teamcenter managed data, you send the data you want to insert or merge into the standalone viewer or the Lifecycle Viewer, and then specify how you want to open the data in the **Load Option Preferences** dialog box.

View related documents in My Teamcenter

When viewing a 3D model, you can open the associated item revision in My Teamcenter to access additional information or attachments.

1. Display the product structure or part.
2. In the **Assembly** view, right-click the product structure or parts and choose **Send to My Teamcenter**.

   -or-

   In the Viewing window, right-click the geometry and choose **Send to My Teamcenter**.

   The associated item revision is opened in My Teamcenter.

Define Teamcenter User Areas

You can create shortcuts to folder locations in Teamcenter. When opening or saving files, you can go directly to a location without browsing intervening directory structure.

1. On the **File** toolbar, click **Open**  .

   > Tip:
   >
   > If you have directories containing hundreds or thousands of files, it may take a while for the complete list of files to appear. You can press Ctrl-Break (Windows) or Esc (Linux) to stop the file listing at any point.

2. In the **Open** dialog box, browse to a location that you want to add to your User Areas.

3. Choose **Tools→Add Current Location To User Areas**.

   A folder representing the location appears within your User Areas.

4. Type a name for the User Area.

   A shortcut to the specified location is created.

5. To access a User Area, click **User Areas** in the shortcuts panel on the left side of the file dialog box.

Search the Teamcenter database

When opening, inserting, or merging files in the standalone viewer, you can search a mapped Teamcenter server for datasets, item revisions, items, and parts.

1. From the **File** menu, choose one of the following:

   - **Open**
   - **Insert**
   - **Merge**

2. From the shortcut bar of the dialog box, click **Servers**.

   Your list of mapped servers appears.

3. Double-click the server you want to search to access it, and then choose **Tools→Search Server**.

4. In the **Select Search** section of the **Server Search Dialog** dialog box, select a search object. Choose from the following types of searches:

   - **Dataset**
   - **Item Revision**
   - **Item**
   - **Part**

   The **Enter Search Criteria** section is populated with the available search variations.

5. In the **Enter Search Criteria** section, select a search criteria, type an appropriate search keyword, and click **Search**.

   The server is searched using the criteria you specified. When the search is completed, the **Search Results** dialog box appears.

6. To open a search result, do one of the following:

   - Double-click the search result
   - Select the search result and then click **Select**.

Specify load option preferences

1. Choose **File→Preferences→Load Options**.

2. In the **Load Option Preferences** dialog box, choose from the following preferences:

   - On the **3D** tab:

In this section	Select this	To
Product Structure	**Open document**	Do one of the following: • Open the document in a new window. • (If the document is already open in a window) display the window.
	Insert document into active window	Insert the data into the currently active window.

In this section	Select this	To
	Merge document into active window	Merge the data into the currently active window. Note: You can merge product structure only if the data being sent is compatible with the contents of the active Viewing window. For structure to merge, the data being sent to the visualization client and the data in the active Viewing window must share the following structure configuration properties: • Revision rule • Root or top line • Variant rule (if either set of data uses a variant rule) • Active assembly arrangement (if either set of data uses arrangements)
	Ask at load time	Select your options each time you open a file.
Markups	**Open with markups**	Open markups associated with the data.
	Ask at load time	Select your options each time you open a file.

- On the **2D** tab:

Select this	To
Open document	Do one of the following: • Open the document in a new window. • (If the document is already open in a window) display the window.
Insert document into active window	Insert the data into the currently active window.
Ask at load time	Select your options each time you open a file.

Select this	To
Open with markups	Open markups associated with the data.
Ask at load time	Select your options each time you open a file.

- On the **ECAD** tab:

Select this	To
Open document	Do one of the following: • Open the document in a new window. • (If the document is already open in a window) display the window.
Insert documents into active window	Insert the data into the currently active window.
Ask at load time	Select your options each time you open a file.

Note:

- Selections are persisted each time the dialog box opens.
- The default settings for the **Load Option Preferences** dialog box are **Ask at load time** and **Merge document into active window**.
- For **3D**, for **If merge is not possible** the default is **Open document**.
- If you choose **Ask at load time**, you can use the load option preference to change how you want to open files.

Specify open preferences for 2D or 3D files

Some CAD related file types can contain 2D or 3D data. You can set preferences to always open DWG/DFX, IGES, and PRT files in a 2D Viewing window or a 3D Viewing window. Another option is to be prompted to choose each time you open a file.

1. Choose **File→Preferences→File Open**.
2. In the **File Open Preferences** dialog box, choose one of the following for each file type:
   - 2D
   - 3D

- Prompt

Note:

- This functionality is supported in Standard service levels and above. For Base service levels, these files always open as 2D file types.
- 3D IGES files are supported only in the standalone viewers.

Specify the PLM XML load preferences

1. Choose **File→Preferences→PLM XML**.
2. In the **PLM XML Preferences** dialog box, on the **Load** page, choose from the following preferences:

Select this	To
PLM XML Units	Define the unit of measurement. By default, the unit of measurement for PLM XML and Parasolid files is meters. You can use the **PLM XML Units** setting to specify another unit of measurement. Note: • The **PLM XML Units** setting is saved in **session files**. If you change and save the model units setting with a VF file, the specified model units of the session file override the current **PLM XML Units** setting. • Session files referencing PLM XML models that were created prior to Teamcenter lifecycle visualization 5.1.0.2, do not contain the model units specification. The software uses the current **PLM XML Units** setting on the **Load** page of the **PLM XML Preferences** dialog box if you load the session file with a newer viewer. This event may result in content displayed in the wrong scale. The model units is always meters for pre-5.1.0.2 PLM XML files. As a work around, migrate the session file to a Teamcenter lifecycle visualization 5.1.0.2

Select this	To
	version. Load and save the file in Teamcenter lifecycle visualization 5.1.0.2.
Apply the default product view on load **(if unchecked, it will be added as a snapshot)**	Load the default product view when the PLM XML file is loaded. If this option is not selected, the default product view is not loaded but is added as a snapshot, which reduces load time.

3. Working with sessions

Overview of session files

Session files save the state of the viewer so you can resume your work later. Saving your work as a session file enables you to preserve the following:

Note:

- To use sessions, your system administrator must define ACL (access control list) rules for Vis_Session using Access Manager. For details, see Configure Teamcenter Lifecycle Visualization sessions in Teamcenter *Visualization Deployment and Administration*.
- If a document has been inserted into the session file, the session file becomes a stand-alone Lifecycle Visualization AppSession and is not interoperable. Stand-alone Lifecycle Visualization AppSession can be identified in other applications, such as Active Workspace and NX, by the following icon  .

- Open files
- Inserted 2D and 3D models and documents
- Pruned structures
- Session package
- Snapshot information
- 3D preferences
- Alternate assembly hierarchies
- True Shading settings
- Cross sections
- 3D Measurements
- User Defined coordinate systems
- 3D layers
- Teamcenter revision rules, effectivity, variant rules, active assembly arrangements, and other configuration settings.

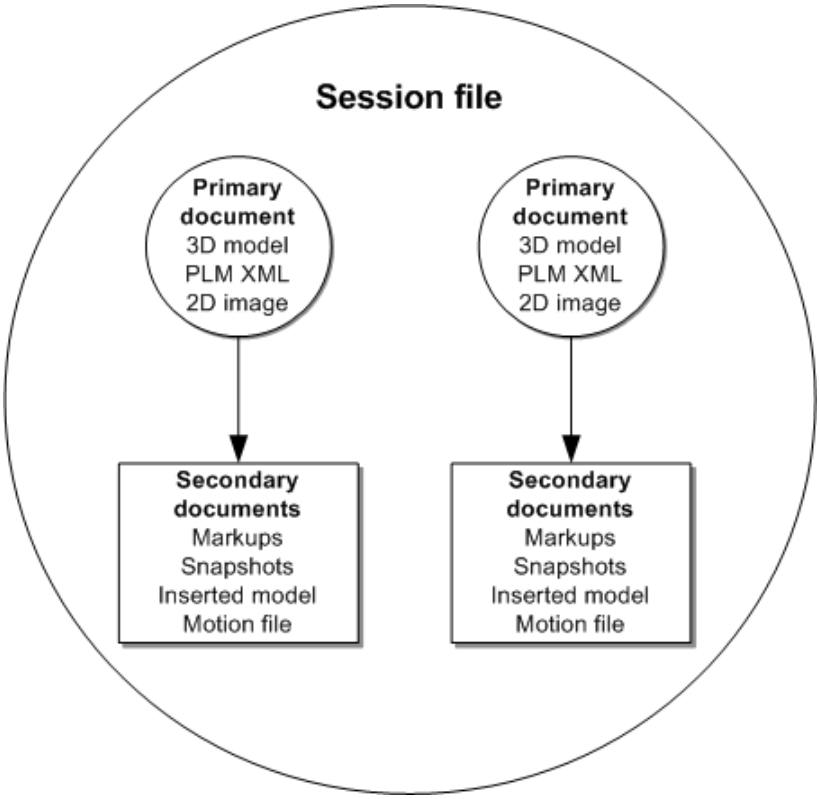
Example:

You are working with *model1.jt*, *model2.jt*, and *image.tif*. You have created snapshots, changed background colors, and created markup layers. You then save your work as a .vf session file.

When you re-open the session file, the three files open, and the snapshots, background colors, and markup layers appear as they were when you saved the session.

Primary and secondary documents

Session files reference *primary* and *secondary* documents. A session file can preserve the state of multiple primary documents, and each primary document may be associated with multiple secondary documents.



Static and configured product structure

In terms of session files, product structure is considered to be either *static* or *configured*. Static product structure is a unique version of the document that is created at the time the session is saved. This type of data ensures that loading the session at a later time will result in the same product structure that was loaded when the session was first saved. Configured product structure is dynamic and references

Teamcenter configuration settings. This type of data can be thought of as a recipe which can be used later to get different document revisions.

What is the difference between worksets and session files?

Worksets are a collection of design components that may contain subsets, items, item revisions, BOM view, and BOM view revisions that represent existing parts or assemblies.

Session files save the state of the viewer so you can resume work on your workset later. Sessions retain the filters and configurations applied to the structure and may contain worksets, snapshots, and other documents.

Primary and secondary visualization documents

Visualization files in Teamcenter are always either *primary* or *secondary* documents. You can open primary documents independently from other documents, while secondary documents are dependent upon primary documents. For example, a JT file is a primary document, which you can view on its own without any other file having to be open; a markup layer (VPL file), in contrast, cannot be viewed on its own, and must be opened in the context of a primary document, such as a JT file.

A primary document:

- Can exist in the database on its own.
- Consists of data that has been translated from some master source data such as a CAD file.
- Consists of one file (for example, a 2D image) or a logical set of files (for example, assembly and part files).
- Can be opened in a Lifecycle Visualization viewer independently of any other documents.
- May have secondary types of documents that depend on it, but may not be aware of these secondary files.

A secondary document:

- Always relies on a primary document.
- Is only meaningful in the context of a primary document (for example, a 3D markup).
- Cannot be viewed in a Lifecycle Visualization viewer without a primary document.
- Is always aware of its primary document.
- May contain many types of data which may serve different purposes (for example, a snapshot consists of layer data, view data, motion data, thumbnail data, and so forth).

- May capture additional information about the primary document.

Overview of static and configured product structure

Product structure from Teamcenter is either static or configured. Configured product structure is dynamically built according to revision rules, effectivity, variant rules, active assembly arrangements, and other settings, depending on how the structure is initially launched and how the visualization session is subsequently authored.

Configured structure

The following scenarios result in a configured structure in the viewer:

- From My Teamcenter, launch a BOM view or BOM view revision (or any object that includes a BOM view or BOM view revision, such as an item or item revision) into the standalone viewer or the Lifecycle Viewer. The structure is configured in the viewer according to your default revision rule.

- From the standalone viewer, open a BOM view or BOM view revision (or any object that includes a BOM view or BOM view revision, such as an item or item revision). The structure is configured in the viewer according to your default revision rule.

- From Structure Manager, Multi-Structure Manager, or Manufacturing Process Planner in the rich client, launch one or more BOM lines into the standalone viewer or the Lifecycle Viewer. The structure is configured in the viewer according to whatever configuration is currently active in the launching application.

Static structure

The following scenarios result in a static structure in the viewer:

- Perform any process that results in opening a PLM XML file in the standalone viewer or the Lifecycle Viewer. For example, launching a QL file or a DirectModelAssembly dataset results in the loading of a PLM XML file into the viewer. The viewer treats these data types as static structure, since a **session file** authored in the viewer references the static PLM XML.

- Open a VF session file that points to static PLM XML. This occurs under the following conditions:

  - The **Capture Static Structure** check box is selected when the session file is authored.

  - The structure in the viewer is saved as PLM XML (**File→Save As**) before the session is authored.

VF session files and configured or static structures

Opening a session dataset can result in the loading of a static structure or a configured structure, depending upon the data and the conditions under which the session authored.

When you save a session referencing configured structure, the session preserves the product structure configuration active in the viewer. However, if you select the **Capture Static Structure** check box in the **Session Save As** dialog box, the viewer also saves the exact product structure you have open at the time you save the session. When you load the session later, the viewer detects if this static structure is available and asks you how you want to open it: as a static structure (the exact product structure that was active in the viewer at the time the session was saved) or a configured structure (according to the configuration settings in effect at the time the session was saved). Note that if the **Capture Static Structure** check box is not selected when you initially save the session, when you open the session later the structure is loaded dynamically based on the configuration in effect at the time the session was saved.

You can set a Teamcenter Integration Preference to automatically handle this when loading a session. You can choose to:

- Always load the static structure
- Always load the configured structure (the latest version of the structure according to the configuration settings in effect at the time the session was saved)
- Ask how to load a structure at load time

Session save options

You have a number of options for saving session data to different locations, depending upon whether the session consists of local data only or includes data from Teamcenter.

If the session includes only data loaded from your local machine, you can save the session file to a location on your local machine or network.

If the session includes Teamcenter-managed data, you can save the session file to the Teamcenter server in the following ways:

- **Attach to Base Document** — Save the session file within the item revision of the primary document.
- **Attach to Selected Bomline** — Save the session file within the item revision of the selected BOM line in the 3D assembly tree.
- **Alternate Location** — Save the session file to a different location. Click **Browse**, and then specify the folder, item, or item revision within which you want to save the session.

Session files can be saved using either the Vis_session data model or the AppSession data model. The Vis_session data model supports all features but is not interoperable with other applications, such as NX and Active Workspace. The AppSession data model has limited feature support, but is interoperable with the NX and Active Workspace applications. AppSessions that contain an unsupported feature, such as a multi-document session, appear in other applications with the following icon  . Your administrator can define the TCVIS_APPSESSION_SAVE_DEFAULT

and TCVIS_SHOW_APPSESSION_SAVE_OPTION environment variables to determine the **Session save** behavior for your environment.

> Note:
>
> You can use the Teamcenter Integration Session preferences to specify default session save options.

Save your work session

You can save your work as a .vf session file. When you open the session file later, your work is restored.

Under certain conditions, warning messages display when saving legacy session files (release 12.4 and earlier). To avoid overwriting the legacy session file, which will cause issues with legacy viewers, on the warning dialog click **Save as** and choose a different file location to create a new session file.

> Note:
>
> If you want updated layers to be saved as external files, save the layers first using **Save All Layers** or **Save Selected Layer**. If you don't save modified layers before saving the session, the layers become part of the session file and cannot be loaded independently.

1. Choose **File→Save Session**.

2. In **Session Storage Location**, click one of the following.

Use this option	To do this
Attach to Base Document	Save the session within the Item Revision of the base document.
Attach to Selected Bomline	Save the session within the Item Revision of the selected BOM line in the 3D assembly tree.
Alternate location	Save the session to a different location. Click **Browse**, and then specify the folder, Item, or Item Revision within which you want to save the session.

3. To rename the session file or any secondary documents that you have created during your work session and not yet saved, such as markup layers, double-click the default name of the document and type a new name.

   > Note:
   >
   > You cannot use any non-ASCII character (including 8 bit accented Western European and multi-byte characters) for a file name.

4. To save the session file in a format that has interoperability between other applications, such as NX and Active Workspace, select the **Save as a collaborative session** check box.

   This check box is not displayed under the following conditions:

   - When saving to a local file path.
   - If the session contains data that is not supported by the **AppSession interoperability** data model.
   - If the TCVIS_SHOW_APPSESSION_SAVE_OPTION is set to **False**.

   > Note:
   >
   > If a document has been inserted into the session file, the session file becomes a stand-alone Lifecycle Visualization AppSession and is not interoperable. Stand-alone Lifecycle Visualization AppSession files can be identified in other applications, such as Active Workspace and NX, by the following icon  .

5. Click **Save**.

   The session file is saved. Any new or unsaved secondary documents are also saved with the session file to their specified locations.

   > Note:
   >
   > - If you have unsaved clearance results, the **Save Clearance Results As** dialog box appears. You must save to a .txt file to reference the results in a session file.
   > - If late loading product views are enabled, and the **Vis_PV_LateLoadSaveOp** preference is set to **Ask**, a dialog box appears in which you must choose how to handle saving partially loaded product views.
   > - By default, in a four-tier environment, when you launch stand-alone Lifecycle Visualization from the Teamcenter rich client, the viewer and the rich client share the same tcserver session. When you perform stand-alone viewer operations, such as saving a session file, the rich client may appear to lock up until the viewer operation is finished. If this is a problem, you can configure Teamcenter to create a separate tcserver session for the stand-alone viewer.
   > - Ensure that your administrator has related the **Vis Session** dataset to the specific item revision type that you plan to use for sessions. This enables viewing the session saved in stand-alone Lifecycle Visualization in Teamcenter rich client.

Merge a saved session with an active session

1. Start a new work session or open a session file.

2. In My Teamcenter, right-click a session dataset and choose **Send To→Lifecycle Viewer**.

   If the sessions can be merged, the **Merge Sessions** dialog box appears.

3. Click **Merge**.

   The saved session is merged with the contents of the active session.

Specify session preferences

1. Choose **File→Preferences→Session**.

2. In the **Session Preferences** dialog box, change any of the following settings:

In this section	Use this preference	To
Session Merge	**Reuse existing windows if possible**	When opening a session while another session is active, merge the sessions in the active Viewing window. Note: If this option is not turned on, the sessions are opened in separate Viewing windows.
	Ask at load time	When attempting to open a session while another session is active, display the **Merge Sessions** dialog box, from which you can specify to merge the session into a single Viewing window.
Session Save	**Enable password protection for session package**	Apply password protection to .vfz session packages.
	Maintain dynamic references when possible	When session files are opened, attempt to update linked references.
	Show compatibility warning	When a legacy session is loaded and you select **Save Session** to overwrite the original file.
	Show legacy layer resave warning	When saving legacy layers independent of a session.
	Save as collaborative	Save session using the collaborative AppSession data model, which allows session file interoperability between applications such as NX and Active Workspace.

In this section	Use this preference	To
	session when available	If the features contained in the session file are not supported by the AppSession data model, you will receive a session interoperability warning message. This checkbox is enabled only when the current contents can be saved with the AppSession data model and the TCVIS_SHOW_APPSESSION_SAVE_OPTION environment variable is *not* set to False.

3. Click **OK**.

4. Working with snapshots and product views

Introduction to snapshots and product views

Snapshots capture the state of the Viewing window. If you capture snapshots of several views of your image or model, you can return to any view by applying its snapshot.

You can create the following types of snapshots:

- **2D snapshots**

  Used to capture the state of the 2D Viewing window when working with 2D images. You can create and view 2D snapshots in the standalone viewer, the Lifecycle Viewer, Manufacturing Process Planner, and Multi-Structure Manager. When created in the standalone viewer or the Lifecycle Viewer, 2D snapshots are persisted in **session files** and PLM XML, or saved to the Teamcenter server as `Vis_Snapshot_2D_View_Data` datasets. When created in Manufacturing Process Planner or Multi-Structure Manager, 2D snapshots are saved as `Vis_Snapshot_2D_View_Data` datasets.

- **3D snapshots**

  Used to capture the state of the 3D Viewing window when working with 3D models. You can create and view 3D snapshots in the standalone viewer and the Lifecycle Viewer. 3D snapshots are persisted in session files and PLM XML only.

- **Product views**

  Used to capture the state of a 3D scene in Teamcenter. You can create product views in the Lifecycle Viewer, the standalone application viewer, Manufacturing Process Planner, Multi-Structure Manager, and Structure Manager. You can open product views in all these viewers. When you create product views, you save them as a `SnapShotViewData` dataset.

  When you send a product view to the Lifecycle Viewer or open it in the integrated viewer, you can then modify the product view (modify the existing product view, add a new one, or update the existing product view) and save it as a dataset in Teamcenter.

Teamcenter product views

Overview of Teamcenter product views

Teamcenter supports opening and modifying product views in Lifecycle Viewer or in the integrated standalone application viewer. You can also save product views to Teamcenter. Product views include

views of the assembly or part that may include markups, updates to part color, part repositioning, and motion 3D snapshots (created using NX).

You can create, modify, and save Teamcenter product views in the following Teamcenter applications:

- Any application that supports the **Product View Gallery**.

  These include Manufacturing Process Planner, Multi-Structure Manager, and Structure Manager.

- My Teamcenter

Currently, product views are always checked out when launched in Teamcenter lifecycle visualization. This is to prevent multiple users from concurrently editing the product view.

The **Vis_PV_CheckOutOnOpen** preference controls whether the product views are automatically checked out when launching them from an application in Teamcenter lifecycle visualization. By default, the value of the preference is set to *True*. If the **Vis_PV_CheckOutOnOpen** preference is set to *False*:

- The product views are not automatically checked out when launched in the viewer.

- If you want to edit the product view, you must check it out from the launching application before launching it in the viewer.

- If another user modifies the product view after you open it, they are warned at the time of save and are not allowed to over-write the new product view to avoid losing the changes made by you.

Working with the Product View Gallery

For Teamcenter applications that support the **Product View Gallery**, you can send the product view to the Lifecycle Viewer or to the integrated standalone application viewer. You are given a choice to open the product view as a static structure or live structure. You can then manage the product view, for example by adding markups, changing the view, adding new product views, and updating the product view. You can also right-click in the Snapshot page and select **Save as Teamcenter Product View** to create a new snapshot in Teamcenter.

The **Product View Gallery** is supported by Structure Manager, Multi-Structure Manager, and Manufacturing Process Planner.

When you work with product views in the **Product View Gallery**, you can:

- Send one product view from the **Product View Gallery** to the Lifecycle Viewer or to the integrated standalone application viewer.

- Send several product views to the Lifecycle Viewer or to the integrated standalone application viewer, once you have configured the **Enable Multiple Select** in **Product View Gallery**.

- Merge them into the active document or open them in a new viewing window from either the Teamcenter **Attachment** panel or the **Product View Gallery**.

  > Note:
  >
  > You can only merge the product views that share the same base structure.

Working with My Teamcenter

You can open, update, and save an existing product view from My Teamcenter in the Lifecycle Viewer or in the integrated standalone application viewer.

If you save a session, the open product views are converted to 3D snapshots, and saved in the session without reference to the Teamcenter product view datasets.

Teamcenter product view states

When product views are saved, they capture the following minimum information:

- The static structure capture of the visible occurrences.
- The configuration that was applied to the structure at the time the product view was captured.
- The view state data (for example, markups, cross sections, repositioned component transforms, and so forth).
- 2D image data (for example, thumbnail, preview images, geometry asset).

You can control how the structure is opened and configured before you apply the viewing data.

You can load and apply product views with three different behaviors:

- As static structure.

  When you open the static structure, you open the static capture of the visible product structure at the time it was saved. The structure is pruned to show only the visible lines at the time of capture. You can use this product view option when you need to be sure the exact captured 3D scene is reproduced. You open a product view in a static structure by opening it in the My Teamcenter view panel, or by sending a product view from My Teamcenter to the Lifecycle Viewer or to the integrated standalone application viewer and selecting the **static structure** load option.

- As as-saved structure configuration.

  When you open the product view in the as-saved structure configuration, the structure is configured in the same way it was configured when the product view was captured prior to applying the view. Since the structure is configured dynamically in this case, there is no way to guarantee this product

view is identical to what it was when it was captured, because the structure may have changed since the product view was captured. This allows the product view to be kept up to date as the structure is updated. You open a product view in the as-saved structure configuration by setting the **Configuration Rules→update from Product View** option when the product view is applied in the **Product View Gallery**, or by sending the product view from My Teamcenter to the Lifecycle Viewer or to the integrated standalone application viewer and selecting the **dynamic structure** load option.

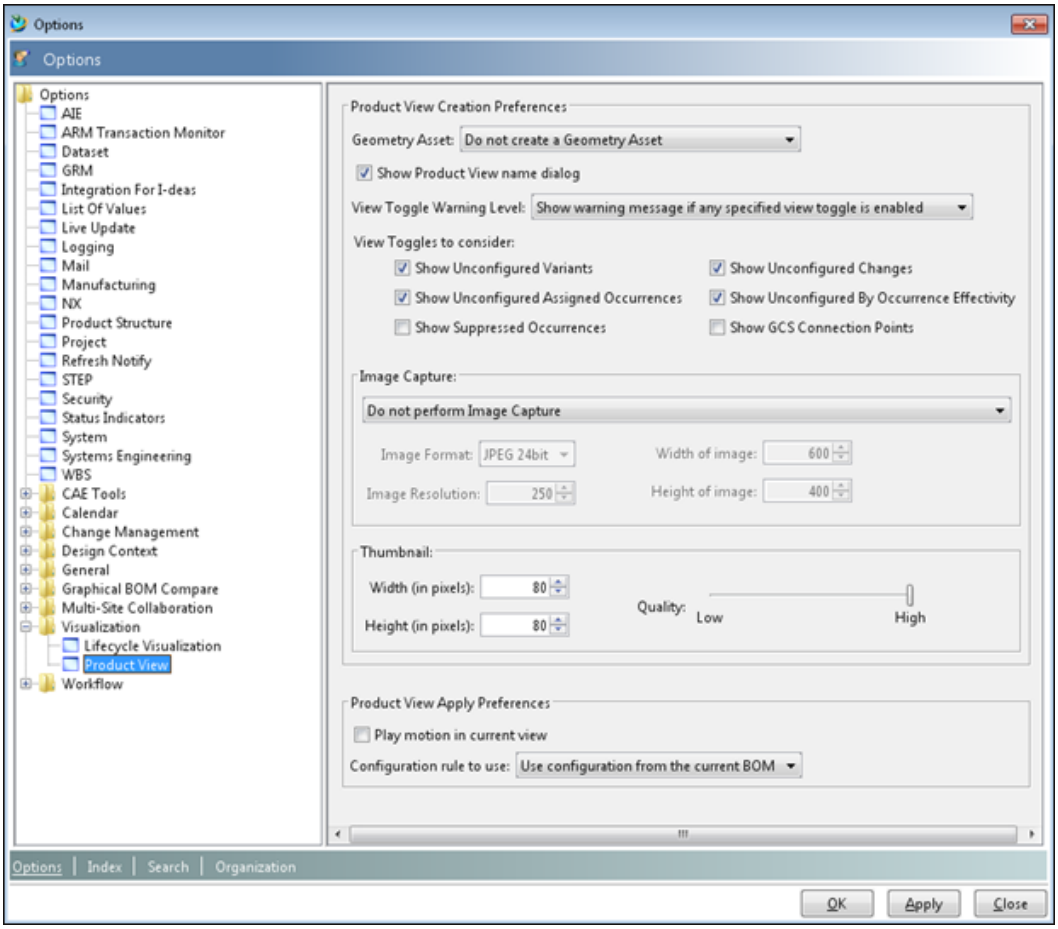
- As the current structure configuration.

  When you open the product structure in the current structure configuration, you open the product view in accordance to its current configuration set in the **Product View Gallery** of the launching program (for example, Structure Manager). You open a product view in a current structure configuration by setting the **Configuration Rules→use current** option when the product view is applied in the **Product View Gallery**, or by sending the product view from the **Product View Gallery** to the Lifecycle Viewer or to the integrated standalone application viewer and then selecting the **dynamic structure** load option.

> Note:
>
> Parts may appear in incorrect positions when product views authored in the Lifecycle Viewer or the standalone application viewer are restored in certain Teamcenter embedded viewers. This problem occurs when the motion system records part transformations on subassembly nodes, and the transformations are subsequently captured by the product view. These assembly-level transformations generated by the motion system are not applied correctly when the product view is restored in Structure Manager, Multi-Structure Manager, and Manufacturing Process Planner.
>
> You can avoid this limitation by keeping 3D part transformations at the part level when working with motion in the Lifecycle Viewer or the standalone application viewer. Rather than transforming an entire assembly or subassembly, expand the structure and select all of the individual parts and move them instead.

Teamcenter product view preferences

You can change several product view and product view related characteristics using Teamcenter product view preferences. You can access product view preferences by navigating to the Teamcenter **Options** menu; choose **Edit→Options→Visualization→Product View**.



Product view preferences are now centralized and changes to these characteristics can also be made by using Teamcenter preferences. Your site administrator can also set preference protection scope for product view preferences to USER (the default), GROUP, or SITE.

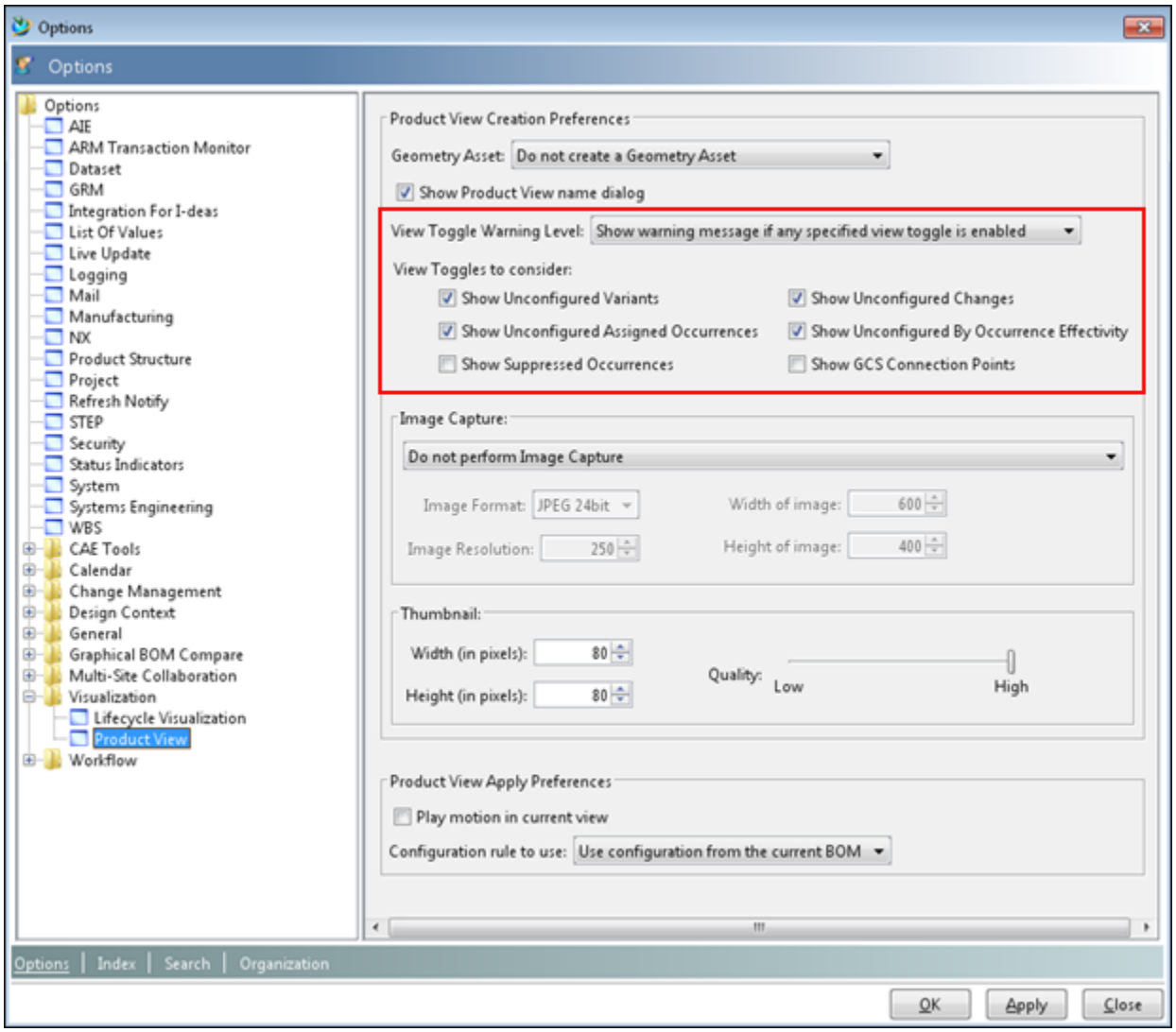
> Note:
>
> If the protection scope is set to GROUP or SITE, preferences are displayed but you may not have permission to change them.
>
> For more details about setting product view preferences using the **Options** menu, see *Teamcenter Basics*.
>
> For more details about working with product views in Teamcenter, see About product views in *Structure Management on Rich Client — Usage*.

Teamcenter product view toggle states

Using Teamcenter, you can set product view options to show or hide unconfigured objects by selecting or clearing view toggle states. When you send the product view to the viewer, these unconfigured objects are shown or hidden as they were shown or hidden when the product view was captured. You can set view toggle state preferences in Teamcenter by navigating to **Edit→Options→Product View**.

The captured product views may result in active view toggles that generate non-buildable assembly configurations. To control the creation of non-buildable product views, your administrator may prevent generating product views when certain unconfigured objects exist. In addition to preventing the creation of toggle view states, the administrator can also choose to warn or process product views which contain unconfigured data.

If you choose to update the configuration from the product view when you reopen it, the saved view selections are retrieved; if you choose to use the current configuration, the saved view selections are ignored.



The administrator can set preferences to determine how product views are created when unconfigured objects are shown. The administrators options include the following:

- **Off**
- **Warning**

> Note:
>
> In the **Invalid assembly state** dialog box that appears, a message indicates that active view toggle states were detected. You can then choose to proceed with product view creation or modification or you can cancel the task.

- **Prevent**

> Note:
>
> In the **Invalid assembly state** dialog box that appears, a message indicates that active view toggles were detected. You are asked to turn off active toggles in order to proceed with product view creation or modification.

> Caution:
>
> You use the view toggle **Show Suppressed Occurrences** to see BOM lines that are suppressed in the current assembly arrangement in Structure Manager. If you send an assembly to the standalone application viewer or the Lifecycle Viewer when this view toggle is on, the suppressed structure elements are grayed out. An inactive structure warning appears when you open a product view that contains suppressed occurrences. This can be avoided if you choose the appropriate View Toggle Warning Level for product view creation and then select **Show Suppressed Occurrences** from **Edit→Options→Product View**.

For more details about working with view toggle states in Teamcenter, see Manage unconfigured data in a product view in *Manufacturing Process Planner*.

Late loading Teamcenter product views

You can enable late loading of Teamcenter product views, by using the **Vis_PV_AllowLateLoading** preference. Late loading is useful to reduce the time it takes to load a large number of product views at once in standalone Lifecycle Visualization. A late loaded product view appears as a thumbnail on the 3D Snapshots page, but the entire product view is not loaded until you fully open the product view by applying the 3D snapshot.

When late loading is enabled, you can set how partially loaded product views are handled when you save a **session file** or a .plmxml file. You do this by setting the **Vis_PV_LateLoadSaveOp** preference with one of these values:

- **Abort**

  When late loaded product views are detected, the save operation is aborted.

- **Ignore**

  The file is saved, but partially loaded product views are not included.

- **LoadAll** (default)

  All partially loaded product views are loaded and saved.

- **Ask**

  When you save a session file or a .plmxml file and late loaded product views are present, a dialog box appears and provides these options:

  - Save the file but ignore partially loaded product views.
  - Load all partially loaded product views and save the file.
  - Abort the save operation by clicking **Cancel**.

Opening Teamcenter product views

Overview of opening Teamcenter product views

You create product views in Teamcenter using the **Product View Gallery**. Product views can then be sent to the Lifecycle Viewer or to the integrated standalone application viewer.

> Note:
>
> Product and manufacturing information (PMI) may not appear in a viewer if the model was saved in a Teamcenter product view and then the dimension of the object was changed in a CAD program in a way that changed the PMI. When this occurs, the caption **PMI Missing** appears for any PMI that cannot be restored. (The text of this caption may differ depending on how the caption is defined on the **Snapshots** tab in the **PMI Preferences** dialog box.) Also, you may need to zoom out to see the caption.

You can:

- **Open product views from the Product View Gallery or Attachment panel**. The current configuration of the structure in the launching program is loaded in the viewer when you apply the product view.
- **Open product views from My Teamcenter**. You are given the option to open the product view as a static structure or dynamic structure.
  - If you elect to open the product view as a static structure, the exact structure that was saved with the product view is reloaded and applied.
  - If you select to open the product view as a dynamic structure, the as-saved configuration of the structure when last saved is applied when the product view is applied.

- **Open an NX motion product view**. In this case, you open a product view that contains motion and that was authored by NX.

> Note:
>
> You can enable late loading of product views, by using the **Vis_PV_AllowLateLoading** preference. Late loading is useful to reduce the time it takes to load a large number of product views at once in standalone Lifecycle Visualization. A late loaded product view appears as a thumbnail on the 3D Snapshots page, but the entire product view is not loaded until you fully open the product view by applying the 3D snapshot.

Open product views from the Product View Gallery or Attachment panel

You can open product views from a Teamcenter application that supports the **Product View Gallery** and open them in the Lifecycle Viewer or in the integrated standalone application viewer. You can also open product views from the Teamcenter **Attachment panel**.

You are given a choice to open the product view in a live structure (dynamic) or in an as-saved configuration (static).

Teamcenter applications that support the **Product View Gallery** include Structure Manager, Multi-Structure Manager, or Manufacturing Process Planner.

1. From Structure Manager, Multi-Structure Manager, or Manufacturing Process Planner, do one of the following:

   - Choose **View→Show/Hide Data Panel**.

   - On the toolbar, click **Show/Hide Data Panel**  .

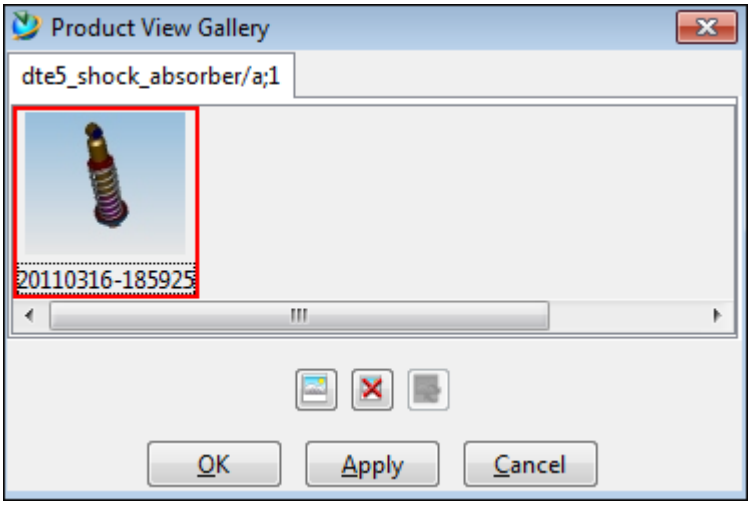
2. Click the **Viewer** tab.

3. If **Create 3D Product Views** toolbar is not visible, right-click in the viewer menu bar and choose **Create Markup**.

   Teamcenter displays the **Create Markup** toolbar.

4. On the **Create Markup** toolbar, select **Create 3D Product Views**  .

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



5. Right-click any product view thumbnail and select one of the following:

   - **Send to Lifecycle Viewer**
   - **Open in Teamcenter Visualization**

6. To configure the software to open more than one product view at a time, do the following:

   Open the **Product View Gallery**.

   Right-click in the lower portion of the **Product View Gallery** dialog box, for example near **Cancel**.

   Click **Options** and then select **Enable Multiple Selection**.

   Press **Ctrl** and click each product view you want to open in the viewer.

   In the **3D Load Options** dialog box that appears, select **Open in a new window** or **Merge into active window**.

   Note:

   - The option to merge is only available if the new 3D product view shares a base structure with the document that is already open.
   - If you selected **Merge into active window**, you are asked once again to confirm the merge. Additional product structure occurrences automatically open in the active window.

- If you open product views from the same assembly one at a time, the **3D Load Options** dialog box appears giving you the choice to open each product view in a new window or to merge it into the active window.

7. (Optional) From the **Attachments** panel do one of the following:

   - Right-click a product view and select **Send To→Lifecycle Viewer**.

     The product view opens in the Lifecycle Viewer.

   - Select the product view and then choose **File→Open**.

Open product views from My Teamcenter

You can send existing product view datasets from My Teamcenter to the Lifecycle Viewer and the integrated standalone application viewer.

1. Select the 3D product view that you want to open.

2. Do one of the following:

To	Do this
Send the product view to the Lifecycle Viewer	Right-click the product view and select **Send To→Lifecycle Viewer**.
Send the product view to the integrated standalone application viewer	Highlight the product view and do one of the following: • Choose **File→Open In Lifecycle Visualization**. • On the main toolbar, click **Open/Start in Lifecycle Visualization**  .

3. If the **Product Structure** dialog box appears, select one of the following:

Select this option	To
Configured structure	Load the latest configured structure based on the as-saved configuration settings when the product view was last saved and apply the product view. Configured product structure is dynamic.
Static structure	Load the original static structure captured when the product view was last saved and apply the product view. This option makes sure the exact 3D scene is recreated.

Opening NX motion product views

You use NX to create product views that contain motion. After you save the motion product view into Teamcenter, you can open the product view in the Lifecycle Viewer or in the integrated standalone application viewer. You can play motion files forward or backward, jump to a specific frame, fast forward, rewind, and repeat the animation.

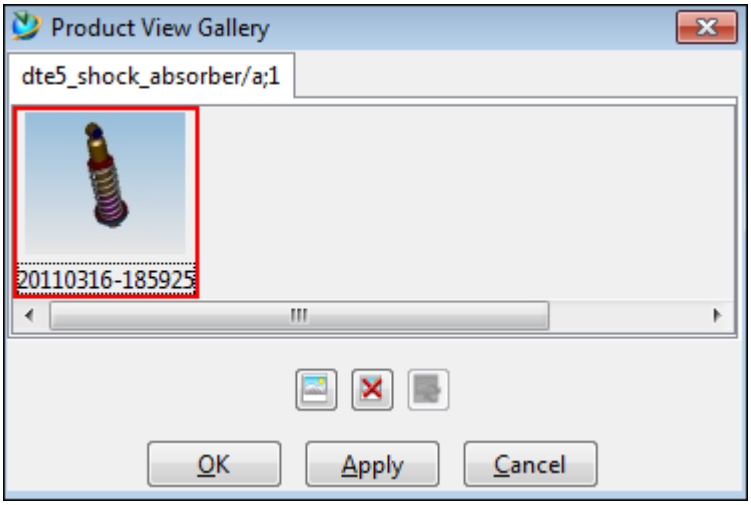
> Note:
>
> You cannot save a motion product view to Teamcenter from the Lifecycle Viewer or in the integrated standalone application viewer. You cannot update a product view that was saved by NX to preserve the interoperability with NX. You can, however, create a new product view after you open a motion product view.

Create a new product view

1. From a Teamcenter application that supports the **Product View Gallery**, create a view you want to capture in the Viewer window.

2. On the **Create Markup** toolbar, select **Create 3D Product Views** .

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



3. Click **Create a new snapshot** .

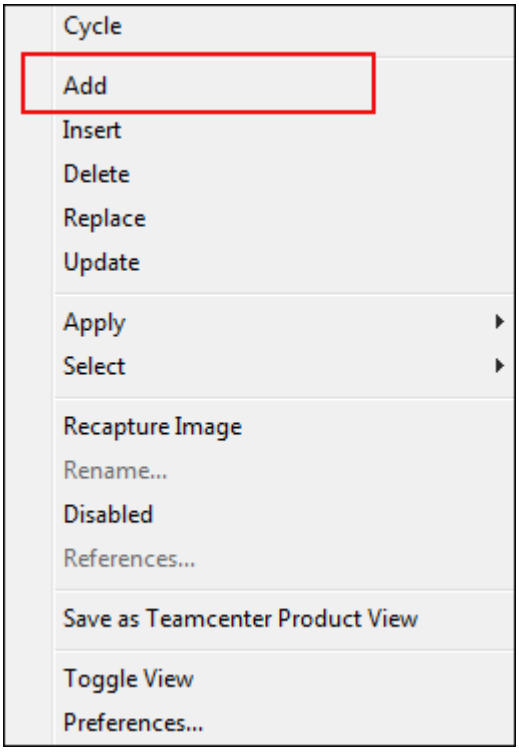
Add a product view

You can create a product view on a structure that you opened in the Lifecycle Viewer or in the integrated standalone application viewer. You can also update or create a new product view from an existing product view as long as you opened it as a dynamic structure.

1. Send a dynamic structure to the Lifecycle Viewer or the integrated standalone application viewer, or send a product view and open it with dynamic structure.

2. From the viewer, adjust the orientation, add a markup, or make changes to the view of the model.

3. On the Snapshots page, right-click and select **Add**.



   The new product view appears on the Snapshots page.

4. Select **Save as Teamcenter Product View**.

Update or replace a product view

You can update or replace an existing product view that you have opened in the Lifecycle Viewer or in the integrated standalone application viewer.

There are situations where product views cannot be updated or replaced, including the following:

- NX-generated Teamcenter product views, including all product views with motion.
- Non NX-generated Teamcenter product views where a 3D document has been inserted into the resulting view.
- Teamcenter product views that are checked out by another application or user.

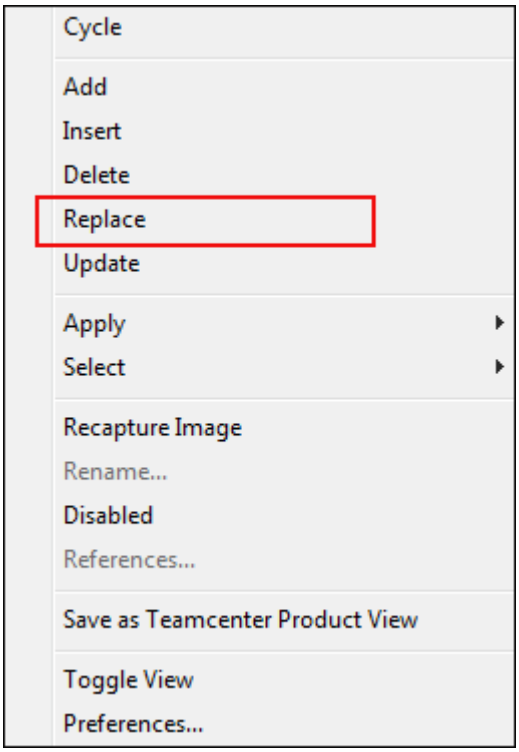
- Teamcenter product views that are already opened by this viewer (for example, load the same snapshot a second time by either merging it into the same view or opening it in a new view in the same viewer).

1. Send an existing product view to the Lifecycle Viewer or in the integrated standalone application viewer and open it as a dynamic structure.

2. From the viewer, adjust the orientation, add a markup, or make changes to the view of the model.

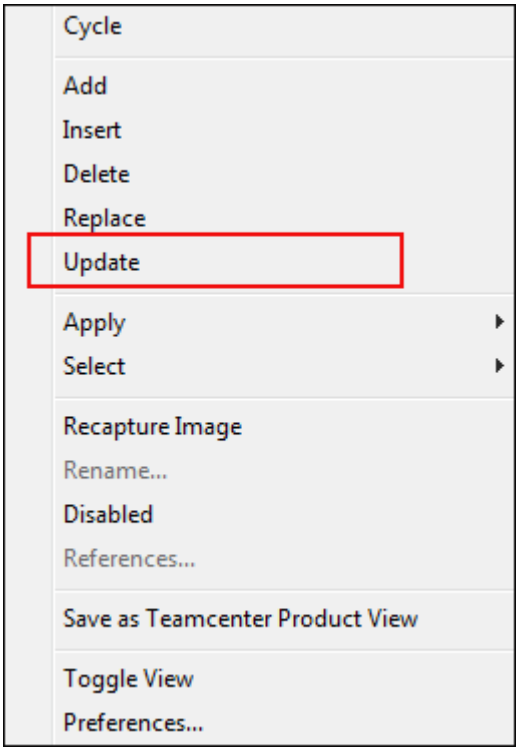
3. In the Snapshots page, right-click the product view and select **Update** or **Replace**.

> Note:
>
> Using **Replace** is similar to deleting and recapturing a snapshot. The 3D elements captured in the snapshot reflect the current Snapshot Preferences.
>
> Using **Replace** also recaptures the thumbnail image displayed in the **Snapshots** view. The name of the snapshot is retained.



> Note:
>
> Using **Update** recaptures the 3D elements that are present in the snapshot. For 3D content to be updated, the appropriate preferences must be active in the Snapshot Preferences. Only preexisting 3D elements within the snapshot are modified. 3D elements not enabled in the preferences when the snapshot was initially generated are not created.

Using **Update** also recaptures the thumbnail image displayed in the Project Workspace window **Snapshots** view.



Save product views to Teamcenter

You can update or save new dynamic product views to Teamcenter. The product view is saved as a `SnapshotViewData` dataset. You select the BOM line in the product structure for the location to attach the saved product view to. If you do not select a BOM line, the top node in the product structure is automatically used.

There are situations where product views cannot be created so the **Save as Teamcenter Product View** and **Send View to Structure Manager** options are disabled. You cannot create a product view in the following situations:

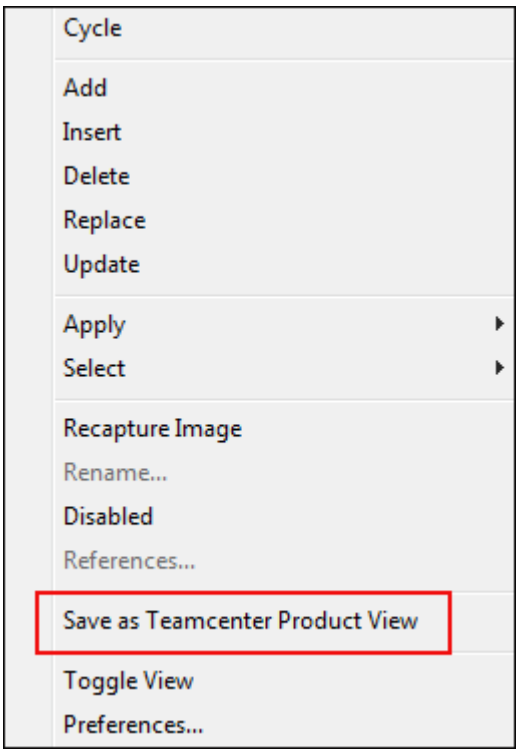
- It is a single JT part from Teamcenter.
- It is a local 3D part or assembly.
- It is an assembly from a server with Teamcenter 8.3 or earlier.
- It is an NX-generated product view from Teamcenter.
- A PLM XML from Teamcenter.

- If you load a dynamic assembly from Teamcenter and insert another unrelated assembly or part.
- A 2D image.

> Note:
>
> Saving a product view from Lifecycle Visualization to Teamcenter when the product is displayed in Massive Model Visualization (MMV) mode may take additional time to complete. This is due to the potential need to expand portions of the product structure. When product structure is loaded in MMV mode, the occurrence paths of the visible parts are not fully expanded. Due to the data model used by Teamcenter product views, the application must expand the occurrence path to all visible parts.

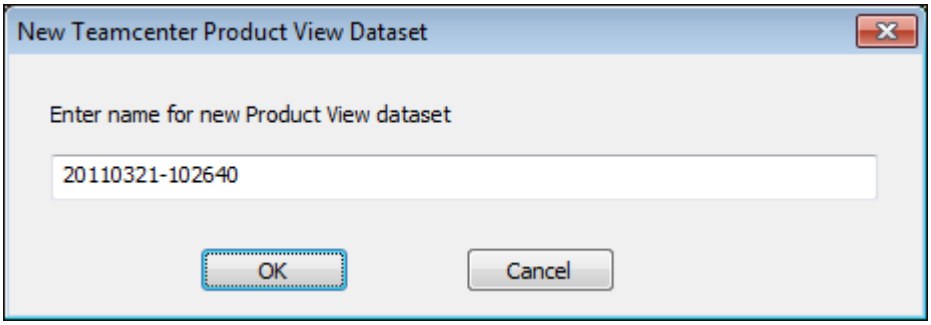
To save a single product view:

1. Load a configured structure in the viewer or load an existing product view.
2. Create a new product view, add an additional product view, or update an existing product view.
3. On the Snapshots page, right-click and select **Save as Teamcenter Product View**.



4. Do one of the following in the **New Teamcenter Product View Dataset** dialog box:
   - Accept the system name for the product view by clicking **OK**.

- Type in a name in **Enter name for new Product View dataset** and then click **OK**.



Save several product views to Teamcenter

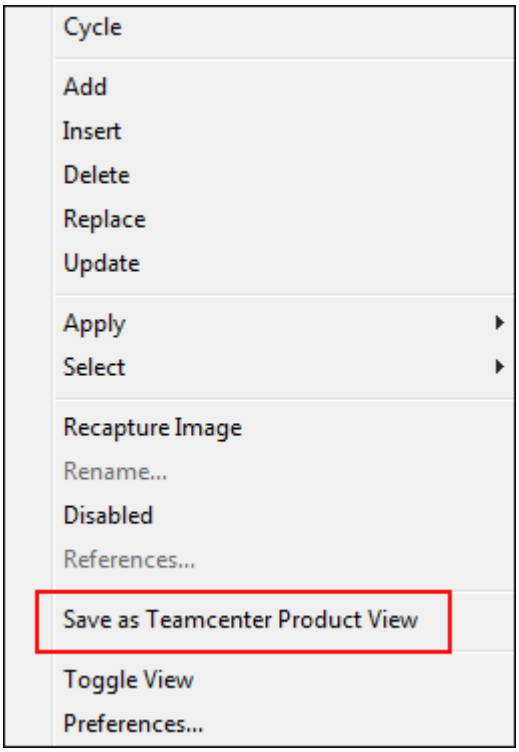
You create several different product views and you want to save them back to Teamcenter in the exact viewing state they were created in. Use the following steps to save several product views.

1. Load a configured structure in the viewer or load an existing product view.

2. Create more than one product views.

3. On the Snapshots page, highlight the first product view, then double-click.

4. On the Snapshots page, right-click and select **Save as Teamcenter Product View**.



5. Repeat Step 4 for each product view that you want to save in the initial viewing state.

> Example:
>
> You open data and create three product views. The first is a circle, the second is a square, and the third is a triangle.
>
> If you highlight the first product view, right-click and select **Save as Teamcenter Product View**, you will save the product view with the triangle (the current view) when you expected to save the product view with the circle.
>
> If you highlight the first product view, double-click, and then right-click and select **Save as Teamcenter Product View**, you save the product view with the circle.
>
> Highlight the product view with the square, double-click, and then right-click and select **Save as Teamcenter Product View**, you save the product view with the square.

Capturing images and creating 3D geometry assets

Overview of capturing images and creating 3D geometry assets

You may find it useful to capture an image of your product view when working with various issues encountered in the design and manufacturing process. For publishing, creating 3D geometry assets of the product view may be beneficial. A 3D geometry asset is data that is included in illustrations and publishing. You must have Visio in order to work with 3D geometry assets.

The appearance of the captured image and 3D geometry assets is determined by you and by your site administrator. Your site administrator controls whether or not these options are available.

If these features are made available by the administrator, you can set preferences for them using the **Snapshot** tab of the **Teamcenter Integration Preferences** dialog box.

Create product view 3D geometry assets

You can save 3D geometry assets in the Teamcenter product view dataset if 3D geometry assets are available in your environment.

> Note:
>
> Creating 3D geometry assets is only supported on Windows.

1. Choose **File→Preferences→Teamcenter Integration Preferences**.

2. From the **Snapshot** tab of the **Teamcenter Integration Preferences** dialog box, select the **Add or Update 3D Geometry Asset** check box.

3. (Optional) Select the **Draw Outline** check box if you also want to save an outline capture in the Teamcenter product view dataset.

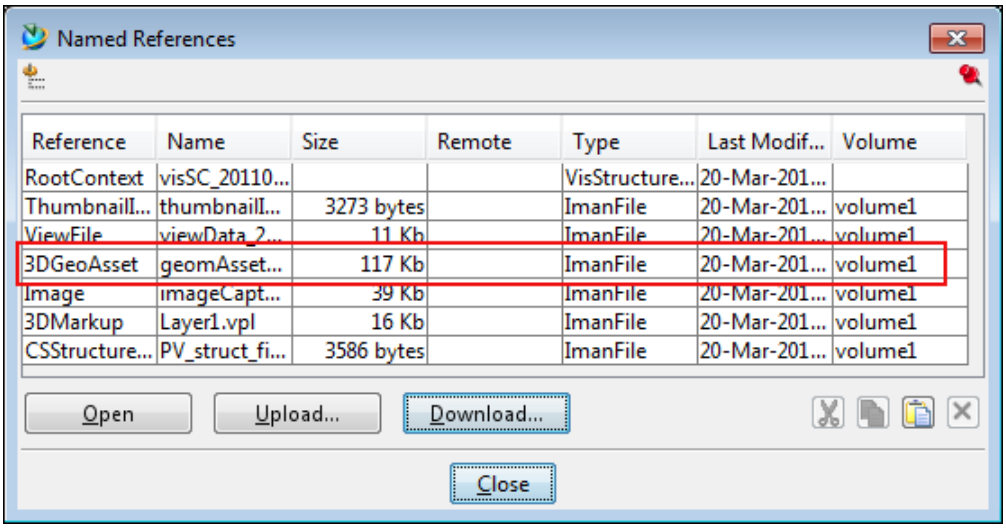
Tip:

One way to verify the saved 3D geometry asset is to use the Teamcenter **Named References** dialog box.

a. Highlight the saved product view in My Teamcenter, right-click and select **Named References**.

b. Highlight *3DGeoAsset* and click **Download**. Choose the name and location on your local file system to save the file.

c. Open the saved *.asset* file in Visio.



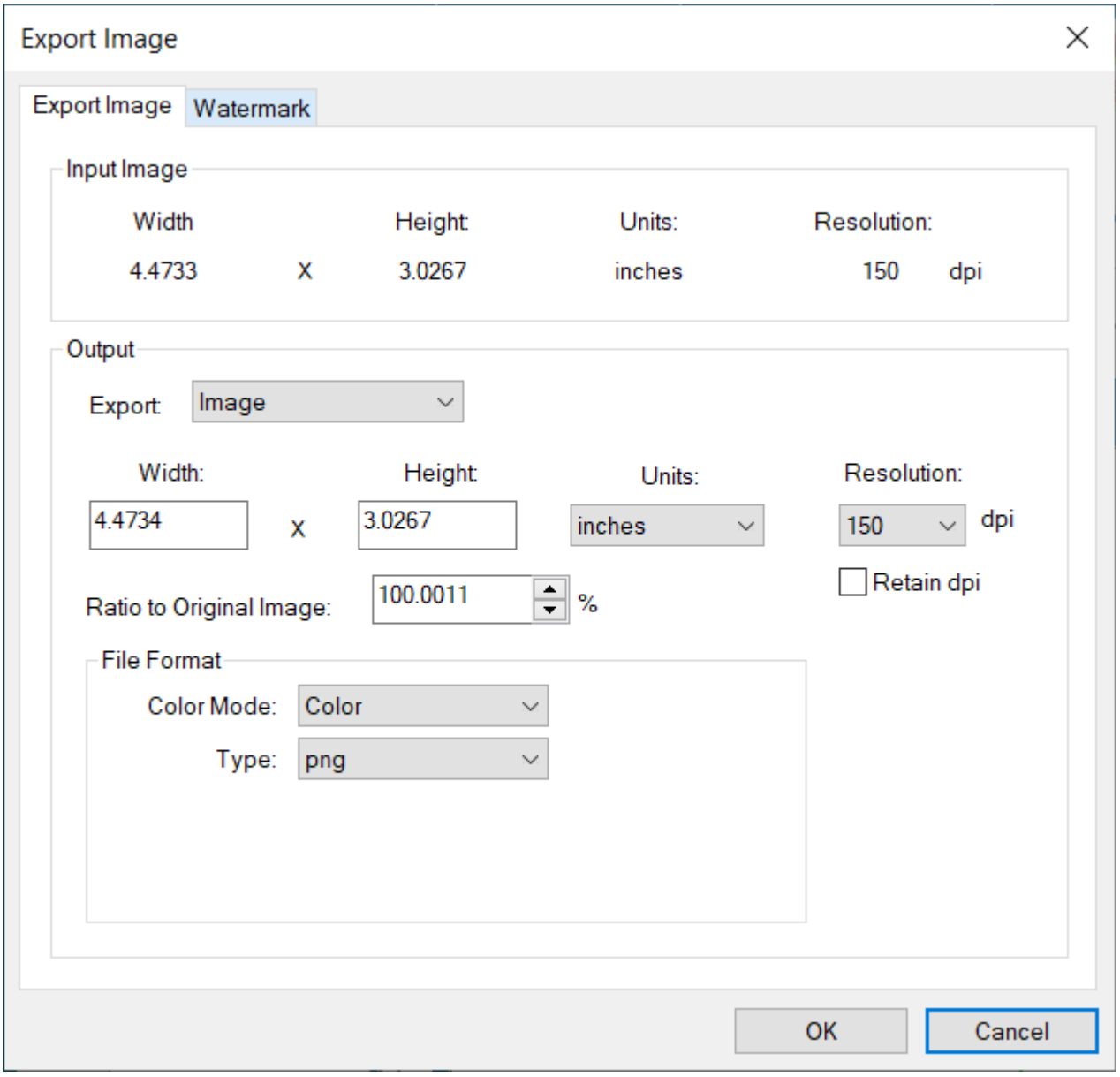
Capture an image of a product view

You can save captured images in the Teamcenter dataset If image capture is available in your environment.

1. Choose **File→Preferences→Teamcenter Integration Preferences**.

2. From the **Snapshot** tab of the **Teamcenter Integration Preferences** dialog box, select the **Image Capture** check box.

3. (Optional) Select the **Use Image Export Dialog** check box if you want the **Export Image** dialog box to appear. You can use this dialog box to change the resolution, file type, or color mode of the image capture.



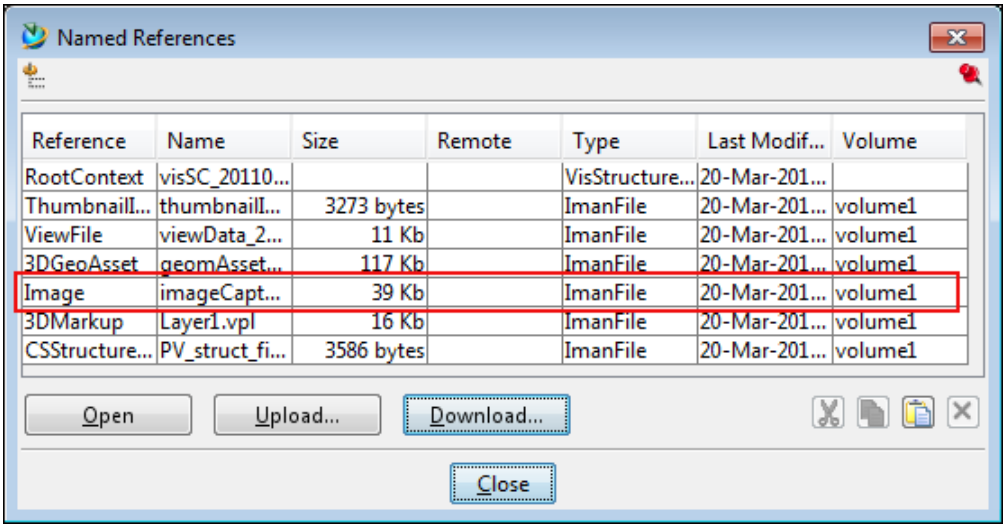
Tip:

One way to verify the saved image capture is to use the Teamcenter **Named References** dialog box.

a. Highlight the saved product view in My Teamcenter, right-click and select **Named References**.

b. Highlight *Image* and click **Download**. Choose the name and location on your local file system to save the file.

c. Open the saved file.



Product view system constraints and preferences

You or your site administrator can use system constraints and site preferences to control the appearance and behavior of thumbnails, image captures, and 3D geometry assets.

Site preferences control the following behaviors.

Thumbnail	• **Vis_PV_ThumbnailWidth** • **Vis_PV_ThumbnailHeight** • **Vis_PV_thumbnailQuality**
Image Capture	• **Vis_PV_ImageCaptureWidth** • **Vis_PV_ImageCaptureHeight** • **Vis_PV_ImageCaptureType** • **Vis_PV_ImageCaptureResolution**
3D Geometry Asset	• **Vis_PV_capture3DGeomAssetAsOuline**

System constraints control the following behaviors.

Image Capture	The **Fnd0VisPVImageCapture** constraint determines if Image Capture is available. Valid values:

	• **OffNoMenus** • **OnNoMenus** • **OnWithMenus**
3D Geometry Asset	The **Fnd0VisPVGeoAsset** constraint determines if saving 3D geometry assets is available. Valid values: • **OffNoMenus** • **OnNoMenus** • **OnWithMenus**

Using 2D snapshots in Teamcenter

Overview of using 2D snapshots in Teamcenter

Teamcenter supports creating and saving several 2D snapshots over time so you can track and review changes that have been made. For example, you may want to compare various components of a design today with changes made during the manufacturing lifecycle. Teamcenter supports tracking these changes with the **2D Compare** option, which is a tool supported by several Teamcenter applications including Manufacturing Process Planner and Multi-Structure Manager. These applications also support the **Snapshot Gallery**, and snapshots must be stored in this gallery before you can use **2D Compare**.

You can send either an item revision (base document) or a previously saved snapshot (derived data) from Teamcenter to the Lifecycle Viewer. You can also open an item revision or previously saved snapshot in the Lifecycle Visualization viewer when it is integrated with Teamcenter. If the matching base document is not open, the viewer opens the base document and inserts the snapshot. The viewer immediately applies the snapshot layer to the view. When the base document is open, you may be prompted to open this document in a new window or insert it into the existing view. Teamcenter supports sending item revision and snapshot data from My Teamcenter or from the **Snapshot Gallery**.

Once the Teamcenter item revision or previously saved snapshot is displayed in the viewer, you add markups and then create a snapshot of a specific area of the image. You save the snapshot in Teamcenter, and it is associated with the Teamcenter item revision.

While you can send 2D snapshot item revisions from Teamcenter applications such as My Teamcenter, Manufacturing Process Planner, and Multi-Structure Manager, snapshots must be in the **Snapshot Gallery** to use **2D Compare** tools.

Send Teamcenter 2D snapshots to the viewer

1. In My Teamcenter, do one of the following:

To send a Teamcenter 2D snapshot to	Do this
The Lifecycle Viewer	Right-click the Teamcenter 2D snapshot or item revision and click **Send To→Lifecycle Viewer**.
A standalone viewer	Select a Teamcenter 2D snapshot or an item revision and do one of the following: • On the **My Teamcenter** toolbar, click **Start/ Open in Lifecycle Visualization**  . • Choose **File→Open in Lifecycle Visualization**.

The viewer opens. If **Ask at load time** is turned on in the **2D Load Options**, the **Load Option** dialog box is displayed.

> Note:
>
> If the **Load Option** dialog box is not displayed, the dataset is loaded according to the current **Load Options** settings.

2. (If the **2D Load Options** dialog box is displayed) Click one of the following options:

Use this option	To do this
Open document	Do one of the following: • Open the document in a new window. • (If the document is already open in a window) display the window.
Insert document into active window	Insert the document into the currently active window.
Open with markups	Open markups associated with the dataset. Note: Markup layers appear in the 2D assembly as snapshot layers. The snapshot layer

Use this option	To do this
	is locked so you can review changes to future snapshots.
Don't show this dialog again	Always use the current settings without displaying the **2D Load Options** dialog box.

You can also send 2D snapshots from the **Snapshot Gallery**.

Create Teamcenter 2D snapshots using an item revision

1. Select an item revision and send it to a viewer.
2. Create a 2D markup on the base image.
3. Zoom into the image or pan the image and do one of the following:
   - In the **Snapshots** view, right-click and choose **Add**.
   - On the **Snapshots** toolbar, click **Add**  .

   Your snapshot is added to the **Snapshots** view.

   Note:

   The snapshot or snapshots that you created support features associated with standard 2D snapshot options. For example, these options include adding, inserting, deleting, and naming snapshots.

   When you save the image as a Teamcenter snapshot, the snapshot is locked and cannot be edited.

Save Teamcenter 2D snapshots

1. Display the item revision that includes a base image in a viewer and add both a markup and snapshot.

   The snapshot is displayed in the **Snapshots** view.

2. Right-click anywhere in the **Snapshots** view and select **Save as Teamcenter Snapshot**.

   The snapshot is saved to your Teamcenter server. The border is now wider than a non-Teamcenter snapshot and the snapshot is automatically named.

Note:

- The Teamcenter snapshot cannot be edited and all shortcut menu options are unavailable except for **Add**.
- Because the snapshot is locked, you can create future snapshots to display changes to the design.

3. (Optional) If prompted, complete the revision, page, and custom attribute values in the **Form Data** dialog box.

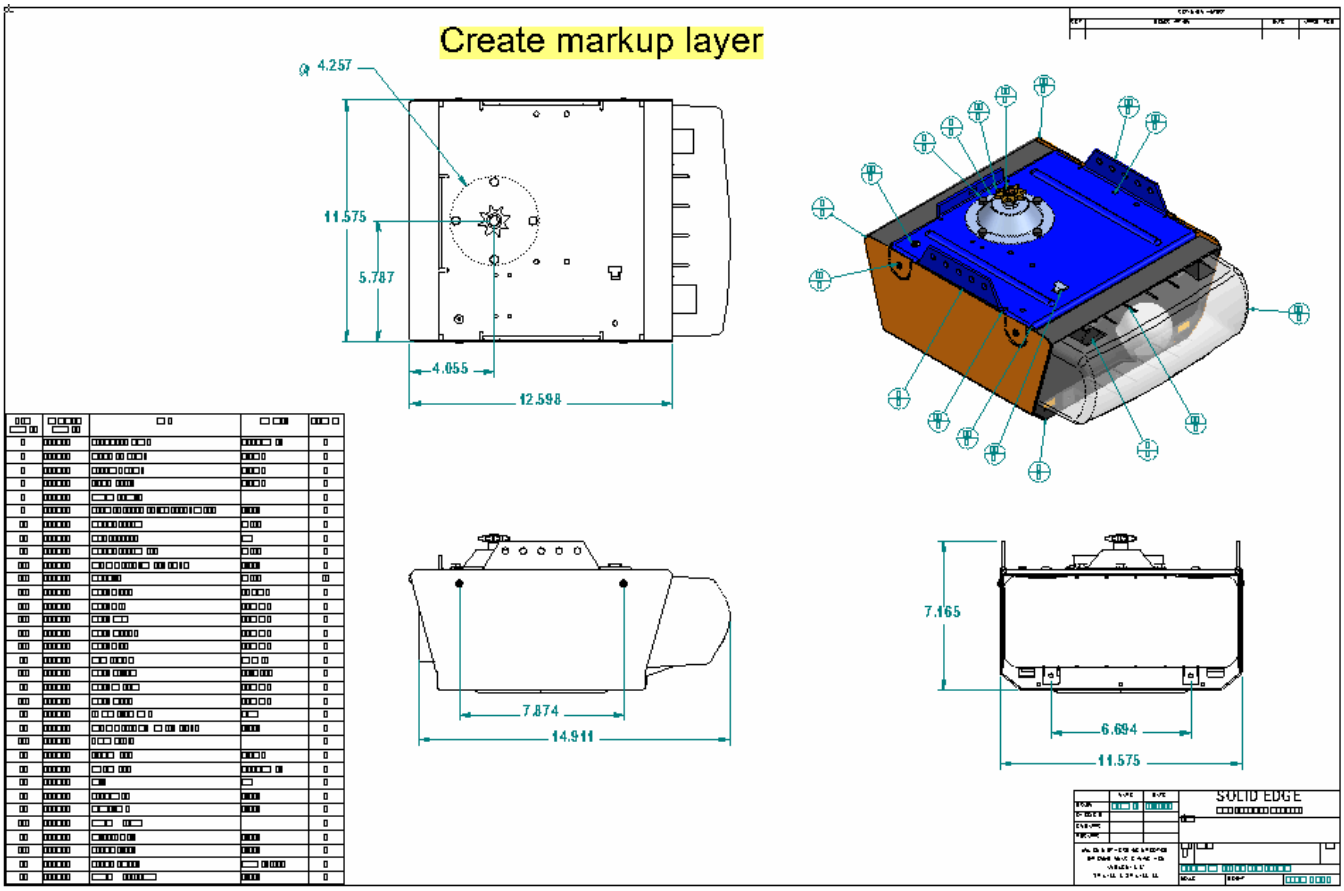
   The Revision and Page values are auto-filled. Add appropriate custom data, as needed.

Note:

Optionally, you can save the Teamcenter item revision and snapshot as a **session**. The session contains all data associated with this session and saves it as one file. When you open the session later, your work is restored.

How do I track design changes using Teamcenter 2D snapshots?

In the following example, the 2D image of a garage door assembly is used. The image is shipped with Teamcenter and is saved in the 2D example folder.

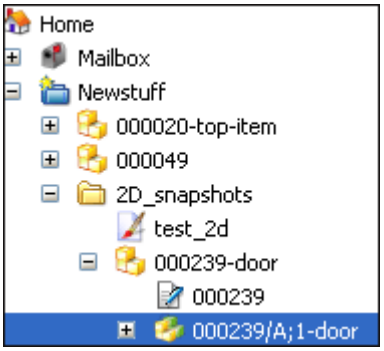


Note:

This example describes how you create and save a Teamcenter snapshot, and it includes opening the item revision in Lifecycle Visualization, adding a markup, and adding a snapshot of the image. The final step is to save the snapshot back to Teamcenter.

To realize the full benefit of comparing snapshots, use Teamcenter applications such as **Manufacturing Process Planner** and **Multi-Structure Manager** because these applications include storing snapshots in the **Snapshot Gallery**. When snapshots are stored in the **Snapshot Gallery**, the **2D Compare** feature is available.

1. From My Teamcenter, highlight an item revision.



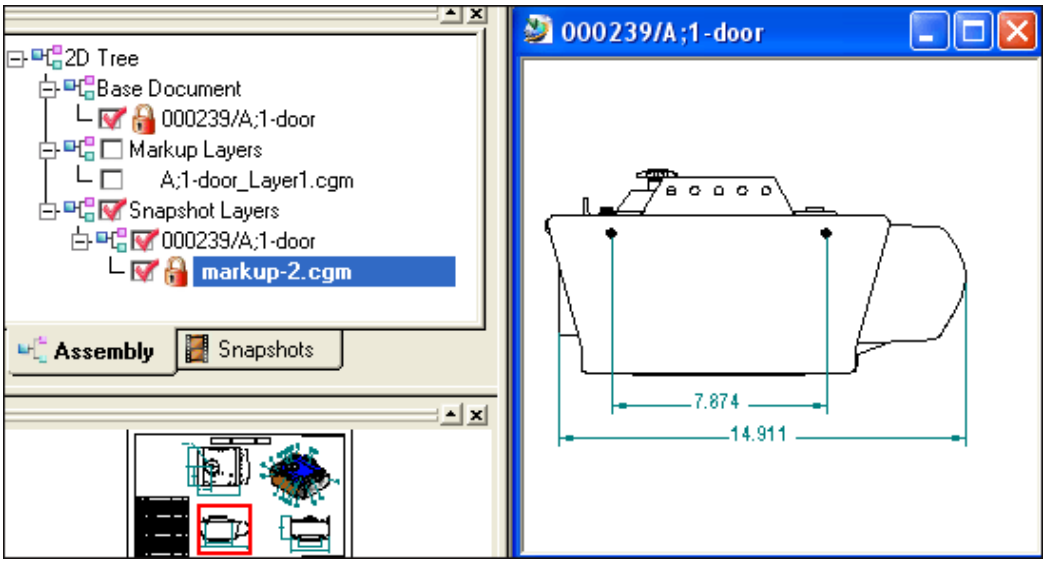
2. Choose **File→Open In Lifecycle Visualization**.

3. Create a 2D markup.

   In this example, a text markup is added to the image.

4. Zoom and pan the image until you are satisfied with the section for your snapshot.

   In this example, the area of focus is the part displayed in the following graphic.

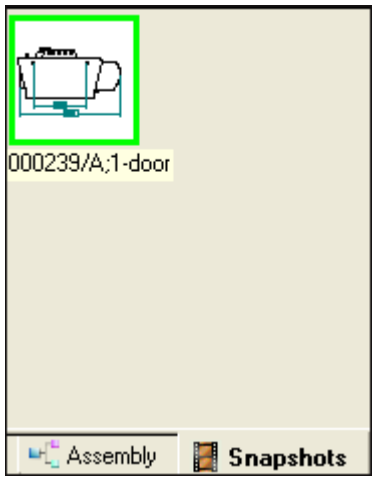


> Note:
>
> Because the snapshot layer locks the image, the image cannot be modified. Future snapshots can then be compared to this image.

5. From the **Snapshots** toolbar, select **Add**.

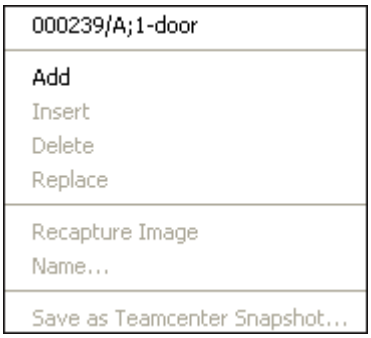
6. From the **Snapshots** view, right-click and choose **Save as a Teamcenter Snapshot**.

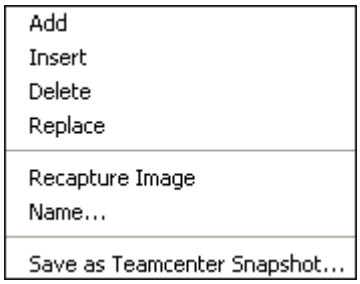
When the snapshot is saved to Teamcenter, the snapshot border is wider than non-Teamcenter snapshots. This feature makes it easier to identify both Teamcenter and non-Teamcenter snapshots. Also, the snapshot is automatically given a name. You can view the name by moving your cursor over the snapshot.



Note:

- Before you save the snapshot to Teamcenter, notice that all shortcut menu options are available.
- When you save the snapshot to Teamcenter, all shortcut menu options are unavailable except for **Add** and the name of the snapshot.





5. Working with partitions in Lifecycle Visualization

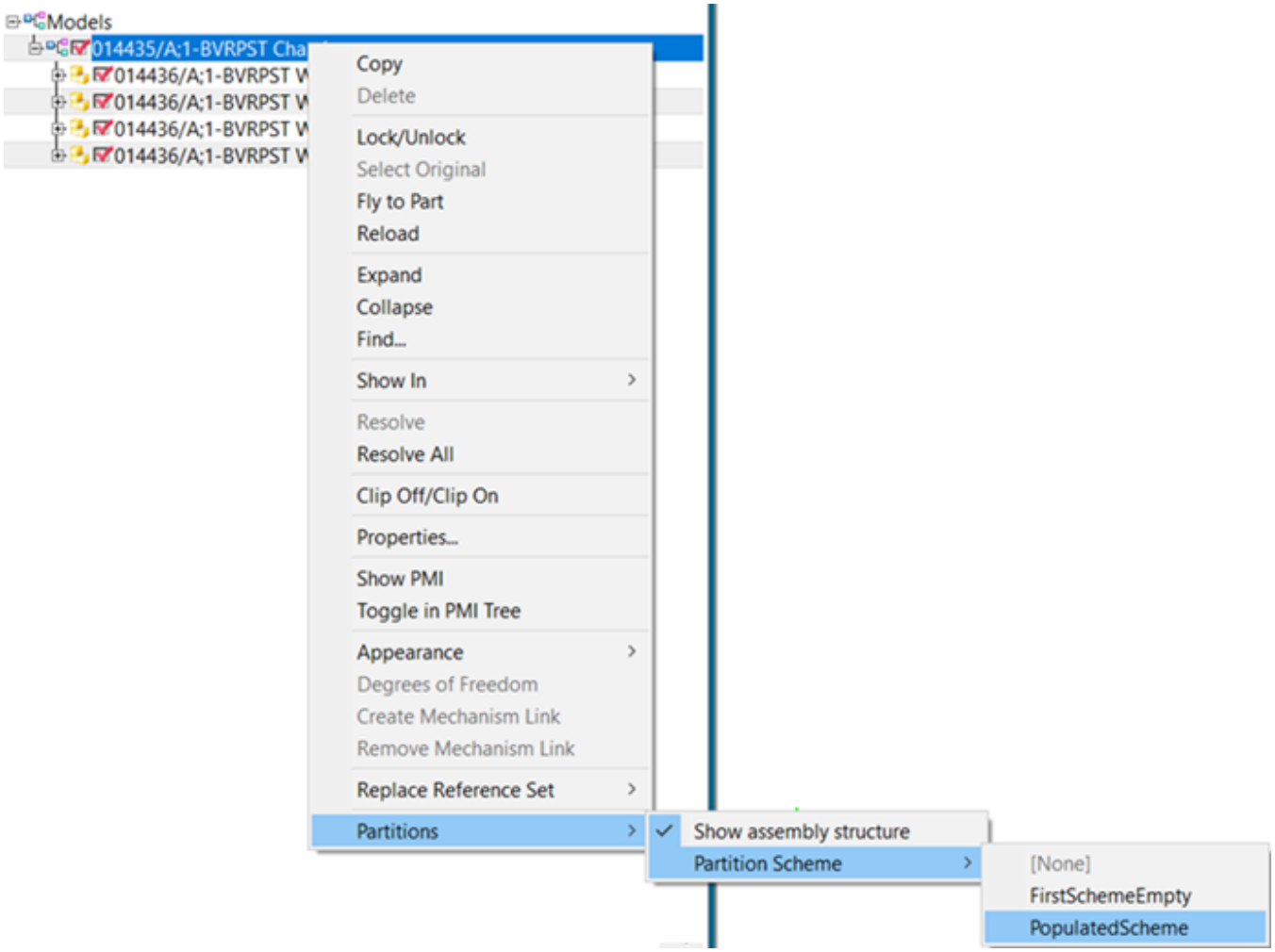
View partitions in Lifecycle Visualization

A partition scheme logically organizes sets of design components into a hierarchy of partitions and contains attributes that specify the characteristics of a collection of partitions.

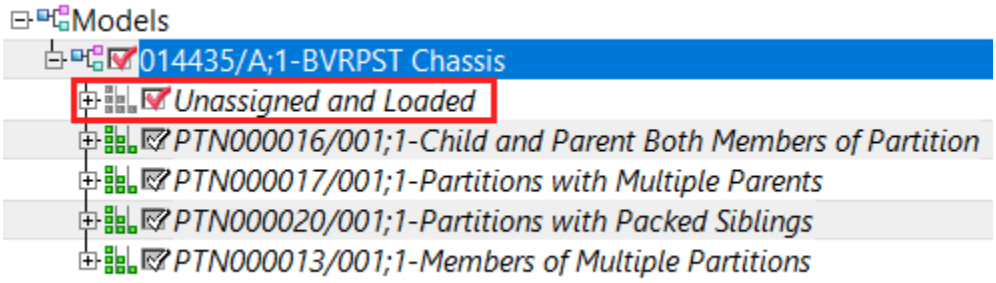
When you view 4GD worksets, you can choose the partition schemes to apply per subset. For information about partitions, see *Learn about partitions* in *4G Design Management — Deployment and Rich Client Usage* in the Teamcenter Help.

When you open and display a BOM view revision (BVR) structure in the standalone application viewer or the Lifecycle Viewer, the root node of the structure may have partition schemes that reorganize the structure based on function (for example, electrical) or on a specific use case.

For a given BVR structure with partition schemes, to choose the partition scheme to display, right-click the root node of the structure (model) and choose **Partitions** → **Partition Scheme** → the partition scheme you desire.



When you expand a BVR structure or make certain parts visible, parts (or subassemblies) that are not assigned to any partition in the active partition scheme are displayed under **Unassigned and Loaded**. This means that you have not loaded the entire structure to view everything that was unassigned, but loaded the structure that was not assigned to any partition.



Note:

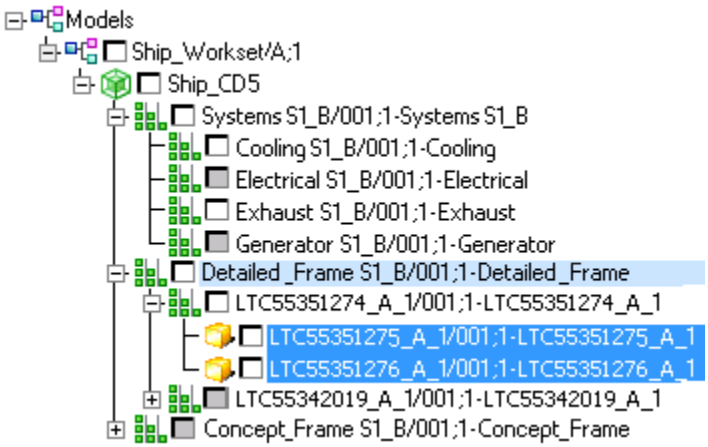
If you do not see the unassigned partition, either the structure does not contain any, or you have yet to load any parts that are not assigned to a partition in the active partition scheme.

Partitions as design component containers

Partitions are optional organizational containers for design components and may be empty. Design components may be members of one or more partitions or no partition.

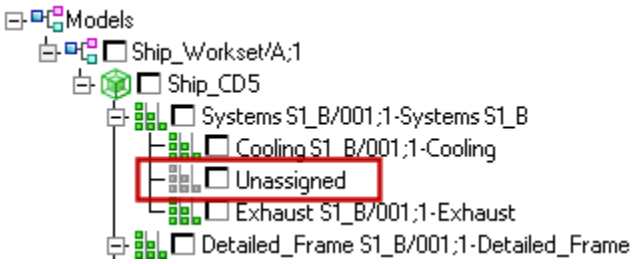
- You highlight partitions to select all the design components they contain.

  Partitions are not selectable occurrences that define the position of design components. When you click a partition line in the assembly tree, the partition line is highlighted (light blue) but not selected. However, all the child design components the partition contains are selected (dark blue).



- Some design components are unassigned.

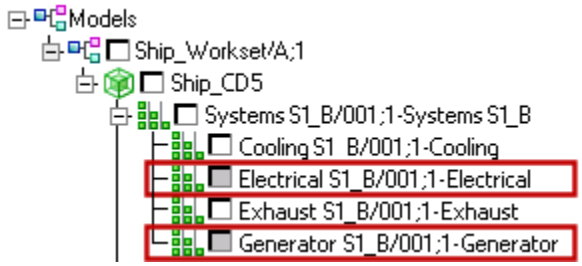
  Unassigned design components are part of the subset definition but are not a member of any partition in the subset's active partition scheme. Unassigned design components are all grouped under a pseudo partition named **Unassigned** in the assembly tree.



In case of a BOM view revision (BVR) structure, unassigned design components are all grouped under **Unassigned and Loaded**. This type of partition is represented in the assembly tree with a grayed out partition icon.

- Partitions may be empty.

  Empty partitions contain no design components, although they may contain other empty partitions.



  By default, empty partitions are not shown in the assembly tree. You can set a preference to show empty partitions, which is effective for all for subsequently loaded documents. If shown, empty partitions are identified in the assembly tree with a gray filled visibility control check box, as they contain nothing to display.

  1. Choose **File→Preferences→Teamcenter Integration**.

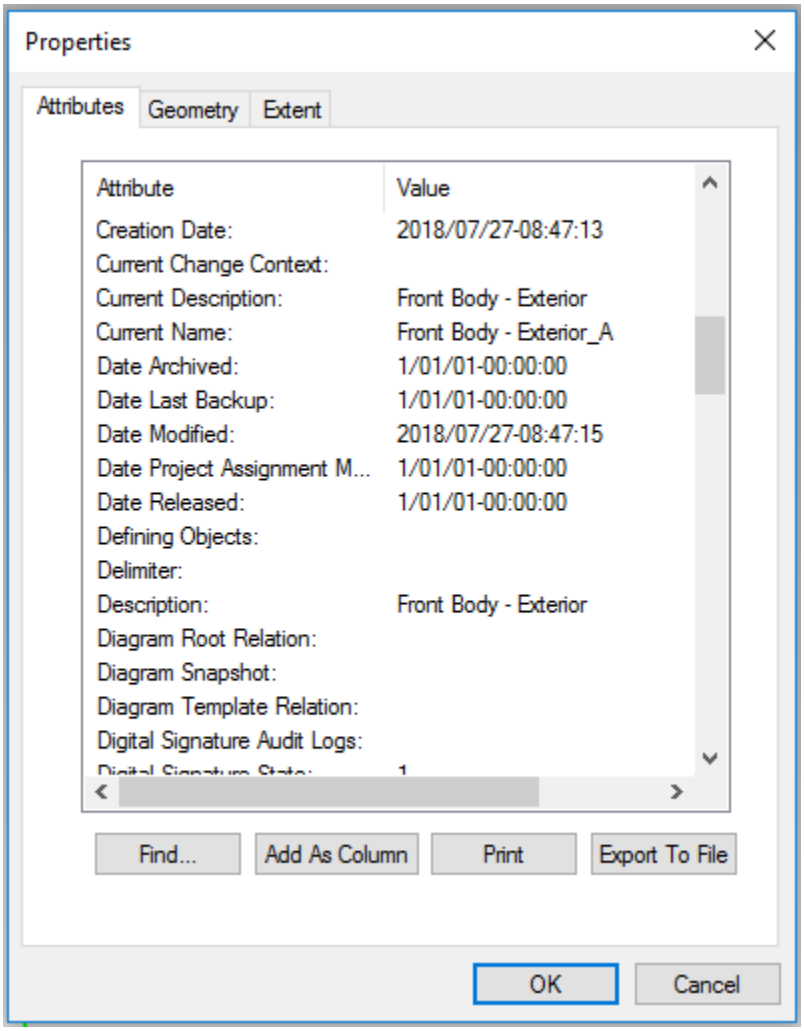
  2. Click the **3D Loader** tab.

  3. In the **Partitions** section, select the **Show empty partitions** check box.

View properties of partitions

Display the properties of a partition to view information that is included in the file about the attributes of the partition.

Right-click the partition node in the assembly tree, and choose **Properties**.



Set partition schemes for subsets or subassemblies in Lifecycle Visualization

Partition schemes contain attributes that specify the characteristics of a collection of partitions. When you view 4GD worksets or BOM view revision (BVR) structures, you can choose the partition schemes to apply for each subset or subassembly. You set the partition scheme to be applied to all subsets or subassemblies, and you can apply partition schemes to individual subsets or subassembly.

- **Apply default partition schemes to all subsets**

  You can set a preference to apply *active partition schemes* to all subsets or subassemblies, for the opened document and any subsequently loaded documents. Active partition schemes are the default schemes set on subsets or subassemblies in the **Subset Defaults** attribute group under **Viewed Partition Scheme** in Teamcenter. For subsets or subassemblies that do not have an active partition scheme defined, no partitions are shown when the subsets or subassemblies are loaded.

Note:

If you select this preference, the partition scheme setting for all subsets or subassemblies is overwritten. Any partition schemes you have selected on individual subsets or subassemblies are cleared and the subset or subassembly reverts to showing its active or default partition scheme, or no partition scheme if an active partition scheme is not defined for a subset or subassembly.

1. In the **Assembly** view, right-click an empty area and choose **Preferences**.
2. In the **Assembly Preferences** dialog box, select **Show active partition scheme in 4GD**.
3. Click **OK**.

- **Select partition schemes for selected subsets**

  You can set partition schemes on individual subsets.

  1. (Optional) Hold Ctrl and select multiple subsets.
  2. Right-click the subsets or subassemblies for which you want to set the partition scheme.
  3. Choose **Partitions→Partition Scheme→**the partition scheme from the list. The currently active partition scheme is disabled in the list. If you do not wish to apply a partition scheme, choose **None**.

6. Sending 4GD worksets to Lifecycle Visualization

4GD Lifecycle Visualization overview

You can launch 4GD worksets into standalone Lifecycle Visualization or the Lifecycle Viewer for viewing and analysis. This gives you the ability to conduct design reviews using visualization features unavailable in the 3D viewer embedded in 4G Designer, including session files and session packages. A session file enables you to save the state of your work; when you open the session file later, your work is restored. Session packages allow you to move your work to another location.

You can display visualization data associated with 4GD worksets as a flat list of design components or in the context of their hierarchy.

Subsets may have an active/viewed partition scheme, which logically organizes sets of design components into a hierarchy. When you view 4GD worksets, you can interactively set the partition scheme to view per subset.

Launch worksets into Lifecycle Visualization

You can launch 4GD worksets into the standalone application viewer or the embedded Lifecycle Viewer.

> Note:
>
> Lifecycle Visualization supports viewing configured worksets only. You cannot open other 4GD objects, such as individual design components or subsets.

1. Set the load option preferences for 3D files.

   > Note:
   >
   > You can specify to open 4GD worksets as new documents or to insert worksets into the active Viewing window as a new model in the assembly tree. You cannot merge 4GD worksets in Lifecycle Visualization.

2. Specify how to **load any subsets** contained within the workset.

3. To send 4GD worksets into standalone Lifecycle Visualization from My Teamcenter or 4GD Designer, do any of the following:

   - Right-click a workset and choose **Start/Open in Teamcenter Visualization**.

- On the **My Teamcenter** toolbar, click **Start/Open In Lifecycle Visualization**  .
- On the 4GD Designer **Content Explorer** toolbar, click **Start/Open In Lifecycle Visualization**  .

> Note:
>
> By default, these options are hidden, but you can show the user interface for sending data into the standalone application viewer.

4. To send 4GD worksets into the Lifecycle Viewer from My Teamcenter or 4GD Designer, right-click a workset, point to **Send To**, and select **Lifecycle Viewer**.

Replay subset recipes when loading worksets

You can specify to replay subset recipes when loading worksets into Lifecycle Visualization.

1. In the standalone application viewer or the Lifecycle Viewer, choose **File→Preferences→Teamcenter Integration**.
2. On the **3D Loader** tab of the **Teamcenter Integration Preferences** dialog box, in the **Product Structure** section, select **Configure an updated structure**.
3. From the **Update Subset on load** list, select one of the following:
   - **No Update**

     Use this option if you want to load subsets without replaying the subset recipes.
   - **Replay Recipe**

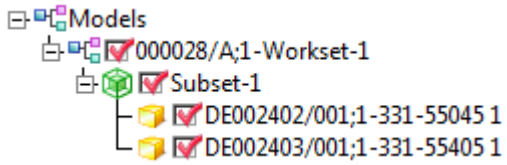
     Use this option if you want to replay subset recipes before loading the data. This ensures that you obtain the latest data.
4. Click **OK**.

> Note:
>
> When you update this preference, the changes are applicable only for data subsequently launched into Lifecycle Visualization. There is no effect on worksets currently open in the viewer.

Display presented parents in Lifecycle Visualization

You can display visualization data assigned to partitions in 4GD worksets or BOM view revision (BVR) structures as a flat list of members under the partition or in the context of the presented parent hierarchy.

1. In the standalone application viewer or the Lifecycle Viewer, open and display a 4GD workset or a BVR structure containing partitions.



2. Do one of the following:

   - Display presented parents for all subsets:

     a. In the **Assembly** view, right-click an empty area and choose **Preferences**.

     b. In the **Assembly Preferences** dialog box, select the **Show assembly structure** check box.

     c. Click **OK**.

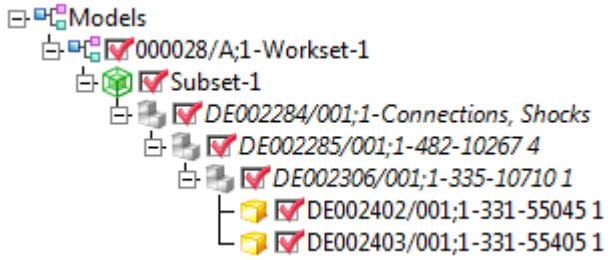
   - Display presented parents for selected subsets:

     a. (Optional) Hold Ctrl and select multiple subsets.

     b. Right-click the subsets (or subassemblies) for which you want to display presented parents.

     c. Choose **Partitions→Show assembly structure**.

3. In the assembly tree, expand the presented parents to reveal nodes for the design component members of the subset or subassembly. Presented parents that are not members of the subset are represented by a icon, while presented parents that are members of the subset are represented by a icon.



Save a session referencing workset data

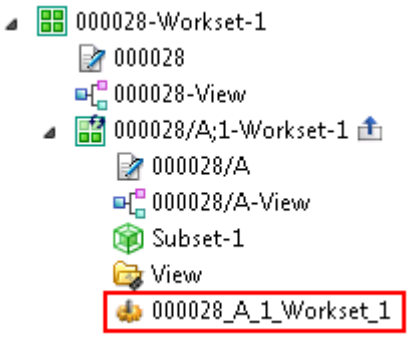
When you work with 4GD worksets in standalone Lifecycle Visualization or the Lifecycle Viewer, you can use a session file to save the state of your work. When you open the session file later, your work is restored.

1. Choose **File→Save Session**.

2. In the **Session Save As** dialog box, in the **Session Storage Location** section, select one of the following options:

   - **Attach to Base Document**

     Save the session within the workset revision.

   - **Attach to Selected Bomline**

     Save the session within the item revision of a selected BOM line in the assembly tree.

     > Note:
     >
     > The **Attach to Selected Bomline** option is unavailable for 4GD subsets and design components.

   - **Alternate Location**

     Save the session to a different location. Click **Browse**, and then specify a save location.

3. Select the **Capture static structure** check box to capture the current state of the document structure as a PLM XML file.

> Note:
>
> To load the PLM XML file and restore the capture document state when you open the session, you must specify **Load static structure (structure at time of save)** in the Teamcenter integration preferences.

4. Click **Save**.

Save worksets in session packages for offline viewing

When you launch 4GD worksets into standalone Lifecycle Visualization or the Lifecycle Viewer, you can save the files as a session package for offline viewing in locations without access to Teamcenter.

1. Choose **File→Save Session**.

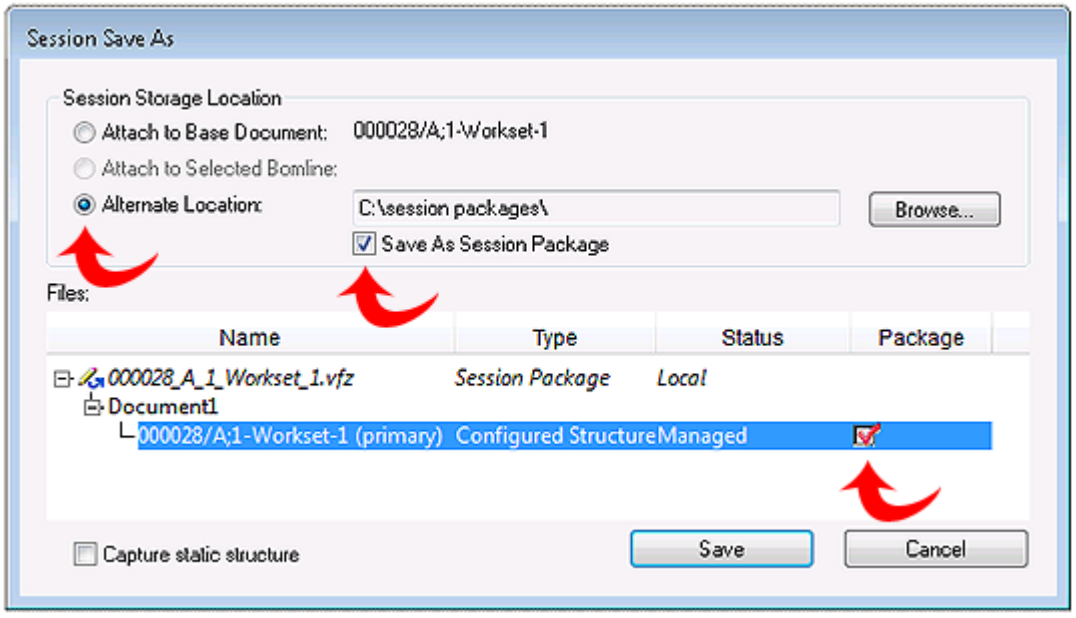
2. In the **Session Save As** dialog box, in the **Session Storage Location** section, select **Alternate Location**.

3. Click **Browse** and select the folder where you want to save the file.

4. Select the **Save As Session Package** check box.

   In the **Files** section, the **Package** column appears with a check box for each document in the session.

5. For each document that you want to include in the session package, ensure the check box is selected.



6. Select the **Capture static structure** check box to capture the current state of the document structure as a PLM XML file.

> Note:
>
> To load the PLM XML file and restore the capture document state when you open the session, you must specify **Load static structure (structure at time of save)** in the Teamcenter integration preferences.

7. Click **Save**.

Lifecycle Visualization features supported with 4GD data

The following limitations apply for the visualization of 4GD data in standalone Lifecycle Visualization or the Lifecycle Viewer:

- You can open full worksets only. Other 4GD objects are not supported, including design components outside of the context of a workset and product designs.
- Exporting to and importing from a PLM XML file does not support partition related information.
- Active/viewed partition schemes applied to individual subsets are not included in snapshot data.
- Opening individual design components or subsets within a workset are not supported.
- Merge operations are not supported.
- You cannot attach a session file to a selected subset or design component structure line.
- Massive Model Visualization (MMV) data is not supported.
- Motion datasets are not supported.
- You can create 3D markups when visualizing 4GD worksets, but you must use session files to save the markups in Teamcenter. Individual VPL datasets are not supported in the context of worksets.
- Product views are not supported.
- Teamcenter visual issues are not supported.
- Cacheless searches are not supported with 4GD workset data. This includes Teamcenter Scoping for visual reports and the Teamcenter filtering option available on various filter types.
- Visualization of the following advanced NX assembly operations in the context of a workset is not supported:

- Assembly arrangements
- Geometry and transform overrides
- Promoted geometry
- Overrides (geometry, position, attributes) on reused design components within a product design

7. Working with Teamcenter visual issues

Teamcenter visual issues overview

You can use Teamcenter visual issues to capture and track design problems with 2D images and 3D models. Created and viewed in the standalone viewer or the Lifecycle Viewer, visual issues are managed in Issue Manager.

Visual issues consist of an issue report and an issue report revision, along with an automatically generated product view, 2D snapshot, or session file. When reviewers send an issue report revision to the standalone viewer or the Lifecycle Viewer, the visualization data associated with the issue is displayed in the same state it was in when the issue was created.

Configuring Teamcenter visual issues

Configuring the viewer to work with Teamcenter visual issues

Use the following Teamcenter preferences to configure the standalone viewer to work with Teamcenter visual issues:

Use this preference	To do this
ManagedIssueServer	Enable the creation of Teamcenter visual issues. When you send visualization data from Teamcenter to the standalone viewer, the viewer is automatically configured to create Teamcenter visual issues. However, if you also use the Teamcenter community collaboration issue management system, you may need to set **ManagedIssueServer** to **true** for the viewer to create issues in the Teamcenter database.
ManagedIssueList	Specify the URL of your visual issues list. When you choose **Review** tab→**Issues** group→**View Issues List**  in the standalone viewer, the browser launches and displays either the default list of visual issues (all issue report revisions) or a filtered list.
ManagedIssueListQuery	Display a customized visual issues list. When you choose **Review** tab→**Issues** group→**View Issues List**  in the standalone viewer, the browser launches and displays a visual issues list consisting of issue report revisions that match the criteria of a Teamcenter saved search.

Specify the URL of your Teamcenter issues list

You must use the Teamcenter **ManagedIssueList** preference to specify the URL where the issues list will display. When you choose **Review** tab→**Issues** group→**View Issues List**  in the standalone viewer, the browser launches and displays the default list of visual issues.

1. In Teamcenter, choose **Edit→Options**.
2. In the **Options** dialog box, click **Search**.
3. In **Search On Preference Name**, type **ManagedIssueList**, and press Enter.
4. In **Preferences List**, click **ManagedIssueList**.

   The **Preference Details** section displays the current settings for the **ManagedIssueList** preference.
5. In **Current Values**, type the URL using this syntax:

   http://<URL>/#/showChanges

   > Example:
   >
   > **http://10.200.30.400:7001/#/showChanges**
6. Click **Modify**.

   The preference is saved.
7. Click **Cancel** to close the **Options** dialog box.
8. In Teamcenter, select an item revision that includes visualization data, and choose **File→Open in Lifecycle Visualization**.

   Teamcenter sends the visualization data to the standalone viewer.
9. Choose **Review** tab→**Issues** group→**View Issues List**  .

   The configured browser displays the default visual issues list.

   > Note:
   >
   > The default visual issues list includes all of the issue report revisions that have been created. Alternatively, you can use a Teamcenter saved search to **display only visual issues that match predefined search criteria**.

Filter the Teamcenter visual issues list

You can use a Teamcenter saved search to filter the visual issues list according to your specified criteria.

1. In Teamcenter, choose **Window→Show View→Search**.

2. At the top of the **Search** view, click **Select a Search** .

3. In the **Change Search** dialog box, expand **System Defined Searches**, and then select **IssueReport Revision**.

4. Click **OK**.

   The issue report revision search options are displayed.

5. Construct your search by specifying criteria such as **Issue Category** and **Issue Assignee**.

6. At the top of the **Search** view, click **Add Search to My Saved Searches** .

7. In the **Add Search to My Saved Searches** dialog box, type a name for the search, and then click **OK**.

   The search is saved.

8. Choose **Edit→Options**.

9. Near the bottom of the **Options** dialog box, click **Index**.

   Options related to specifying preferences are displayed.

10. In **Search On Preference Name**, type **ManagedIssueListQuery**, and press Enter.

11. In **Preferences List**, select **ManagedIssueListQuery**.

    The **Preference Details** section displays the current settings for the **ManagedIssueList** preference.

12. In **Current Values**, type the name of the saved search.

13. Click **Modify**.

    The preference is saved. When you display the visual issues list from the standalone viewer, it includes only visual issues that match your predefined search criteria.

Creating Teamcenter visual issues

Creating Teamcenter visual issues

Teamcenter issue reports are used to capture and manage design problems. When you create a visual issue in the Lifecycle Viewer or the standalone viewer, the state of the viewer is captured by a 2D snapshot, product view, or session file, which is automatically attached to the issue. When reviewers open the issue in the viewer, the associated visualization data is displayed for evaluation.

Visual issue creation involves the following tasks:

- Understand the **conditions** under which different types of visualization datasets (2D snapshots, product views, or session files) are generated and attached to visual issues.
- Create **a single visual issue** in the Lifecycle Viewer or the standalone viewer.
- Create visual issues from one or more **2D or 3D snapshots**.
- Create visual issues from one or more **Clearance results**.
- Manually **attach visualization datasets** to an existing issue report revision.

Visual issue dataset creation behavior

When you create a visual issue in the Lifecycle Viewer or the standalone viewer, the state of the viewer is captured by a 2D snapshot, product view, or session file, which is automatically attached to the issue. The type of visualization dataset generated and associated with the visual issue varies depending upon these factors:

This visualization dataset	Is created under these conditions
2D snapshot	A 2D image is the active document in the viewer. The image also must be associated with an item revision, or a session file is created instead of a snapshot.
Product view	A 3D model is the active document in the viewer. In addition, the following conditions must be met: • The model must be associated with an item revision. • The model must be larger than a single part. • The model must include configured product structure (dynamic product structure referencing Teamcenter configuration settings). • The Viewing window must not include any inserted models. If any of these conditions are not met, a session file is created instead of a product view.
Session file	A 2D image or 3D model is the active document in the viewer.

Create Teamcenter visual issues

You can create Teamcenter visual issues in the Lifecycle Viewer or the standalone viewer.

1. From Teamcenter, send an item revision that includes visualization data to the Lifecycle Viewer or the standalone viewer.

2. Adjust the view of the image or model.

   > Tip:
   >
   > Any changes you make to the state of the Viewing window are preserved by the visual issue, including markups, measurements, and part or layer visibility.

3. Select the nodes in the tree that you would like to attach as problem items. If nothing is selected, the parent node will be attached. If a leaf component node is selected, the problem item that is associated with that issue will be the closest item revision ancestor to that leaf component node.

4. On the **Issues** toolbar, click **Create and log an issue**  .

   - or -

   In the standalone viewer, choose **Review** tab→**Issues** group→**Add New Issue**  .

   The **Visual Issue** dialog box appears.

5. From the **Type** list, choose **Issue report**.

   > Note:
   >
   > **Issue Report** is the default issue type. Your organization may also allow you to choose from additional issue types.

6. In the **Name** box, type a name for the issue report.

7. In the **Data Type for state information** section, choose how you want to capture the state of the viewer:

   - **Session File**
   - **Product View or 2D Snapshot**

     Depending upon your data and your settings in the Teamcenter Integration Visual Issue Preferences, the viewer may generate a 2D snapshot or product view when the issue is created. Choose one of the following Teamcenter relation types for the dataset:

     - **Snapshot Before Fix**
     - **Snapshot After Fix**

8. Click **OK**.

   The **Issue Attribute Dialog** appears, displaying the available attributes.

9. In the **Issue Attribute Dialog**, do the following:

   a. Double-click **Synopsis** to provide a name for the issue report revision.

      The **Attribute Edit** dialog box appears.

   b. In **Value**, type a name for the issue report revision.

   c. Double-click any of the other attributes to add information relevant to the issue.

   d. Click **OK**.

      > Note:
      >
      > Depending upon the Teamcenter Integration Snapshot Preferences, you may need to specify other information for a 2D snapshot or provide a name for a product view.

      The viewer creates an issue report and an issue report revision, along with a 2D snapshot, product view, or session file.

   e. If a 2D snapshot or product view cannot be created, do the following to associate a new session file with the issue:

      A. If an error message is displayed, click **OK** to close it.

      B. In the dialog box that asks you if you want to create a session file, click **Yes**.

         A session file is created and attached to the visual issue.

Create Teamcenter visual issues from snapshots

You can create Teamcenter visual issues from 2D or 3D snapshots. If you have multiple snapshots, a separate issue report is created for each selected snapshot.

1. From Teamcenter, send an item revision that includes visualization data to the Lifecycle Viewer or the standalone viewer.

2. Create one or more snapshots.

3. Select the nodes in the tree that you would like to attach as problem items. If nothing is selected, the parent node will be attached. If a leaf component node is selected, the problem item that is associated with that issue will be the closest item revision ancestor to that leaf component node.

4. Select each snapshot from which you want to create a visual issue. For multiple selections, hold Ctrl as you click each snapshot.

   Tip:

   Selected snapshots have a green border.

5. Choose **Actions→Issues→From Snapshots**.

   - or -

   In the standalone viewer, choose **Review** tab→**Issues** group→**Issues From Snapshots** .

   The **Visual Issue** dialog box appears.

6. From the **Type** list, choose **Issue report**.

   Note:

   Issue Report is the default issue type. Your organization may also allow you to choose from additional issue types.

7. In the **Name** box, type a name for the issue report.

8. In the **Data Type for state information** section, choose how you want to capture the state of the viewer:

   - **Session File**
   - **Product View or 2D Snapshot**

     Depending upon your data and your settings in the Teamcenter Integration Visual Issue Preferences, the viewer may generate a 2D snapshot or product view when the issue is created. Choose one of the following Teamcenter relation types for the dataset:

     - **Snapshot Before Fix**
     - **Snapshot After Fix**

9. Click **OK**.

The **Issue Attribute Dialog** appears, displaying the available attributes.

10. In the **Issue Attribute Dialog**, do the following:

    a. Double-click **Synopsis** to provide a name for the issue report revision.

       The **Attribute Edit** dialog box appears.

    b. In **Value**, type a name for the issue report revision.

    c. Double-click any of the other attributes to add information relevant to the issue.

    d. Click **OK**.

    e. If you selected multiple snapshots, the **Issue Attribute Dialog** appears for each snapshot. Add information relevant to the issue, and click **OK**.

Create Teamcenter visual issues from clearance results

You can create Teamcenter visual issues from clearance results. A separate issue is created for each specified result.

1. From Teamcenter, open a 3D model in the Lifecycle Viewer or the standalone viewer.

2. Perform a clearance check.

3. In the **Results** list, select one or more clearance results. For multiple selections, hold Ctrl as you click each issue.

4. Right-click the clearance result, and select **Create Issue(s)**.

   The **Visual Issue** dialog box appears.

5. From the **Type** list, choose **Issue report**.

   > Note:
   >
   > **Issue Report** is the default issue type. Your organization may also allow you to choose from additional issue types.

6. In the **Name** box, type a name for the issue report.

7. In the **Data Type for state information** section, choose how you want to capture the state of the viewer:

   - **Session File**

- **Product View or 2D Snapshot**

  Depending upon your data and your settings in the Teamcenter Integration Visual Issue Preferences, the viewer may generate a 2D snapshot or product view when the issue is created. Choose one of the following Teamcenter relation types for the dataset:

  - **Snapshot Before Fix**
  - **Snapshot After Fix**

8. Click **OK**.

   The **Issue Attribute Dialog** appears, displaying the available attributes.

9. In the **Issue Attribute Dialog**, do the following:

   a. Double-click **Synopsis** to provide a name for the issue report revision.

      The **Attribute Edit** dialog box appears.

   b. In **Value**, type a name for the issue report revision.

   c. Double-click any of the other attributes to add information relevant to the issue.

   d. Click **OK**.

      The **Save As** dialog box appears.

   e. Type a name for the clearance results file, and click **Save**.

      The clearance results file is saved to the database.

   f. If you are posting multiple clearance results, the **Visual Issue** and **Issue Attribute Dialog** dialog boxes are displayed again. Complete the steps described above for each issue.

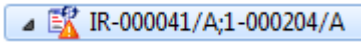
      A new visual issue is created for each clearance issue selected in the **Results** list.

Attach visualization data to Teamcenter visual issues

You can manually attach 2D snapshots or product views to issue report revisions.

1. Cut or copy a 2D snapshot or product view dataset.

2. Select the issue report revision.



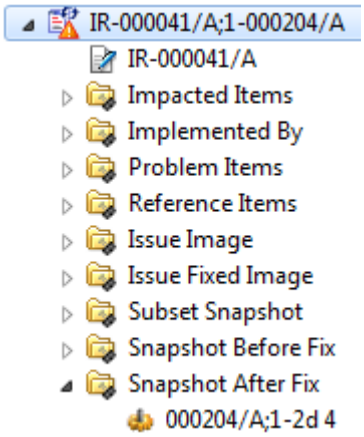
3. Choose **Edit→Paste Special**.

4. In the **Paste Special** dialog box, choose one of the following relations:

   - **Snapshot Before Fix**
   - **Snapshot After Fix**

5. Click **OK**.

   The dataset is attached to the visual issue.



> Note:
>
> When an issue report revision is launched into the Lifecycle Viewer or the standalone viewer, only 2D snapshot or product view in the **Snapshot Before Fix** and **Snapshot After Fix** folders, or session files in the **Reference Items** folder, are automatically opened in the viewer. All other pasted visualization data must be **manually opened**.

Reviewing Teamcenter visual issues

Reviewing Teamcenter visual issues overview

When a Teamcenter visual issue is created in the Lifecycle Viewer or the standalone viewer, an issue report revision is added to the database, along with an associated 2D snapshot, product view, or session file. Issue report revisions are typically accessed using issue lists in Issue Manager. You can configure issue lists to include only visual issues that match search criteria such as **Issue Category** and **Issue Assignee**.

To access your issues, you can launch Issue Manager from within the Lifecycle Viewer. You can also choose to display a list of issues from within the standalone viewer.

When you open a visual issue in the Lifecycle Viewer or the standalone viewer, the visualization dataset associated with the issue is automatically opened and displayed. You can also expand the issue report revision object from an issue list, manually select a visualization dataset, and send it to a supported viewer. You can open 2D snapshots, product views, and session files in the standalone viewer or the Lifecycle Viewer. You can also open product views in Structure Manager.

After opening a visual issue in the viewer, you can choose to update the associated visualization dataset or delete the issue report revision object from the database.

Create a visual issue list in Issue Manager

To access visual issues in Issue Manager, you must use an issue list. You can configure your issue list to include only issues that match specific search criteria.

1. In Issue Manager, in the **Issue Home** view, click **Manage Issue Lists** .

   The **Manage Issue Lists** dialog box appears.

2. Click **Add**.

   A new issue list is displayed.

3. In the **Issue List Name** column, click **New Issue List**.

4. Type a name for the issue list, and press Enter.

5. Select the **Show** check box.

6. For **Assigned Search**, choose **IssueReport Revision** to create a custom search.

7. Click **Configure**.

   The **Configure Search** dialog box is displayed.

8. Set the search options, and click **OK**.

   The **Configure Search** dialog box closes.

9. Click **OK**.

   The **Manage Issue Lists** dialog box closes. In the **Issue Home** view, the new issue list is displayed. Expand the issue list to access the issues matching your search criteria.

Display a list of Teamcenter visual issues in the viewer

You can choose to display a list of visual issues from within the Lifecycle Viewer or the standalone viewer.

On the **Issues** toolbar, click **View existing issues**  .

- or -

In the standalone viewer, choose **Review** tab→**Issues** group→**View Issues List** 

In the standalone viewer, the configured browser displays the default list of visual issues. In the Lifecycle Viewer, the Issue Manager opens.

> Note:
>
> By default, the visual issues list displayed in the browser includes all issue report revisions. You can also specify to display a list of visual issues that match **predefined search criteria**.

Search for visual issues in My Teamcenter

You can create and save custom search queries to access visual issues in My Teamcenter.

Create a saved search for visual issues

1. In My Teamcenter, choose **Window→Show View→Search**.
2. At the top of the **Search** view, click **Select a Search**  .
3. In the **Change Search** dialog box, expand the **System Defined Searches** folder, and select **IssueReport Revision**.
4. Click **OK**.

   The IssueReport Revision search options are displayed.
5. Construct your search.

   > Example:
   >
   > In **Issue ID**, type **IR*** to display a list of every issue. To narrow the scope of the search, specify additional search options such as **Issue Category** and **Issue Assignee**.
6. At the top of the **Search** view, click **Add Search to My Saved Searches** .

7. In the **Add Search to My Saved Searches** dialog box, type a name for the search.

   The search is saved and listed in your **My Saved Searches** folder.

Use a saved search for visual issues

1. In My Teamcenter, at the top of the **Search** view, click **Select a Search**  .

2. In the **Change Search** dialog box, expand the **My Saved Searches** folder, and select a saved search.

3. Click **OK**.

   The search is performed. If IssueReport Revisions matching your search query are found, they are displayed in the **Search Results** view.

Open Teamcenter visual issues

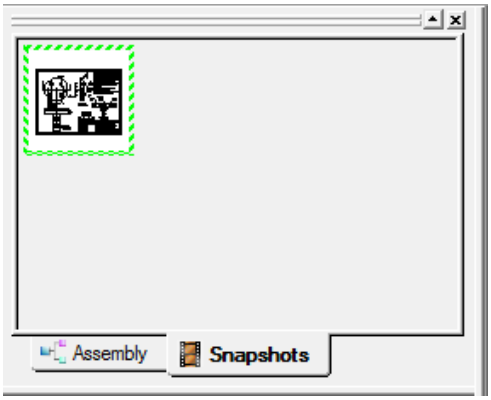
You can send an issue report revision, along with an associated visualization dataset, to the standalone viewer and the Lifecycle Viewer.

Do any of the following:

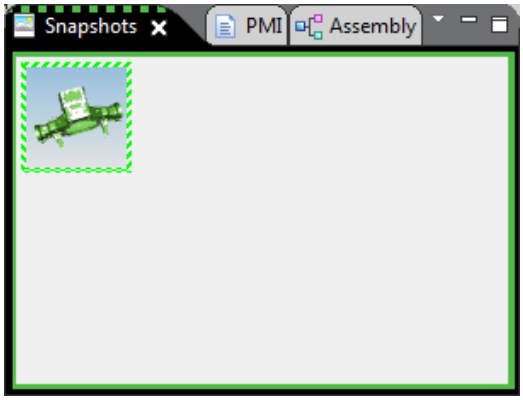
- To send a visual issue to the standalone viewer, select the issue report revision, and choose **File→Open in Lifecycle Visualization**.

- To send a visual issue to the Lifecycle Viewer, right-click the issue report revision, and choose **Send To→Lifecycle Viewer**.

The visual issue opens in the viewer and the data is displayed in exactly the same state as it was in when the issue was created or last updated. All 2D snapshots and product views with the **Snapshot Before Fix** and **Snapshot After Fix** relations are displayed on the **Snapshots** tab of the Product Workspace window (standalone viewer) or the **Snapshots** view (Lifecycle Viewer). A dashed border around the thumbnail image indicates that a product view or 2D snapshot is associated with a visual issue.



2D snapshot thumbnail in the standalone viewer



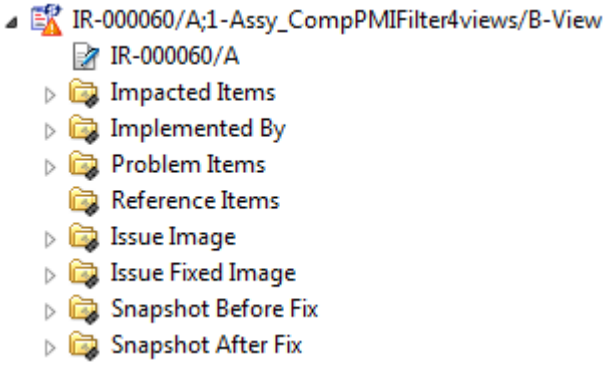
Product view thumbnail in the Lifecycle Viewer

Open Teamcenter visual issue attachments

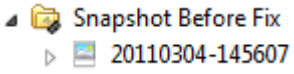
You can open Teamcenter visual issue attachments, including 2D snapshots, product views, and session files, in the standalone viewer or the Lifecycle Viewer. You can also open product views in Structure Manager.

1. Expand an issue report revision.

   The issue folders are displayed.



2. Expand the folders to display visualization datasets, if present.



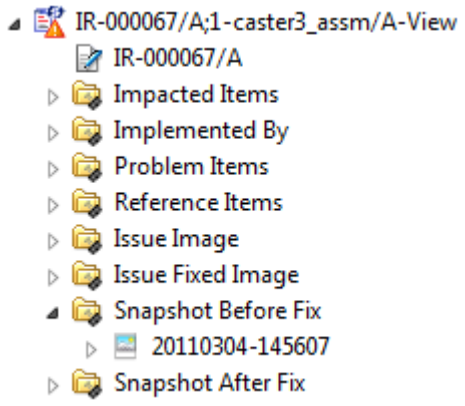
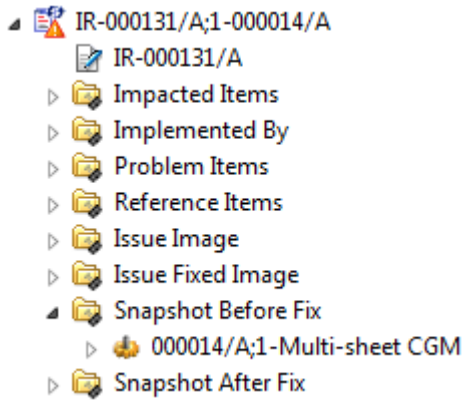
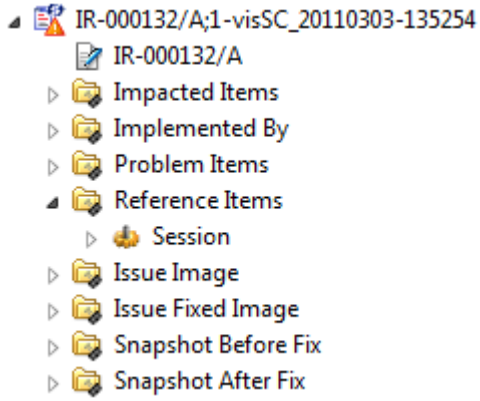
> Note:
>
> For an overview of the visual issue folder structure, see **Teamcenter visual issue attachments**.

3. Do any of the following:

- To send a visualization dataset to the standalone viewer, select the dataset, and choose **File→Open in Lifecycle Visualization**.
- To send a visualization dataset to the Lifecycle Viewer, right-click the dataset, and choose **Send To→Lifecycle Viewer**.
- To send a product view dataset to the Structure Manager, right-click the dataset, and choose **Send To→Structure Manager**.

Teamcenter visual issue attachments

Depending upon your data and the Teamcenter Integration Visual Issue Preferences in the viewer, the following types of visualization data may be generated automatically when Teamcenter visual issues are created.

Visualization dataset type	Visual issue folder	Example
product views	**Snapshot Before Fix** **Snapshot After Fix**	
2D snapshots	**Snapshot Before Fix** **Snapshot After Fix**	
session files	**Reference Items**	

Edit Teamcenter visual issues

In the Lifecycle Viewer or the standalone viewer, you can save new snapshots to an existing Teamcenter visual issue or delete existing snapshots from the issue. You can also update a single snapshot.

1. **Open the visual issue** in the standalone viewer or the Lifecycle Viewer.

2. Modify the contents of the Viewing window.

3. In the **Snapshots** view (Lifecycle Viewer) or on the **Snapshots** tab (standalone viewer), do one of the following:

   - To save new 2D snapshots or product views to the visual issue, select the new snapshots.
   - To delete 2D snapshots or product views from the visual issue, right-click the snapshots that you want to delete, and choose **Delete**.
   - To update a single 2D snapshot or product view, select the snapshot associated with the visual issue.

   > Tip:
   >
   > A snapshot associated with a visual issue has a dashed border.
   >
   > 

4. On the **Issues** toolbar, click **Update existing issue**  .

   - or -

   In the standalone viewer, choose **Review** tab→**Issues** group→**Update Existing Issue**  .

Update a problem item when updating an issue

You can update problem items attached to an issue when you are updating an issue.

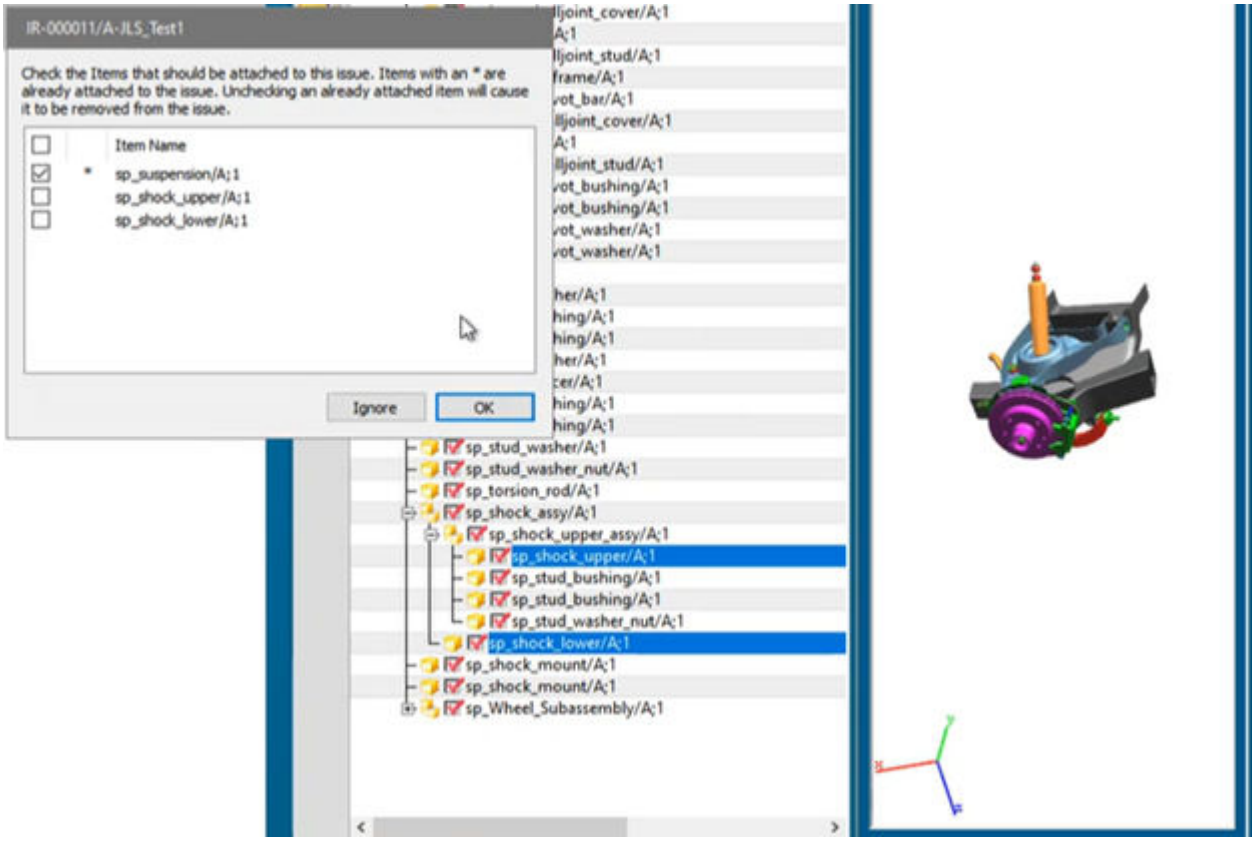
> Note:
>
> To perform this update, Teamcenter lifecycle visualization must have a hosted Active Workspace session working (either through hosting or using Active Workspace Application Connect) and must be configured to use Active Workspace to create or update visual issues.
>
> Because Active Workspace discontinued support for Internet Explorer in Active Workspace 6.0, Teamcenter lifecycle visualization 14.1 and earlier can only host Active Workspace 5.2 and earlier. Teamcenter lifecycle visualization 14.2 and later can host any supported version of Active Workspace.

1. Open an issue that has already been created in Teamcenter lifecycle visualization.
2. In the assembly (or in the 3D view), select one or more problem items that you want to add to the issue.

3. Choose **Menu→Actions→Issues→Update Existing**. The **Update Snapshot** dialog box is displayed.

4. (Optional) If you want to update the snapshot associated with the issue, click **Yes**; else, click **No**.

   The update problem item dialog box is displayed.



   The dialog box is auto-populated with any problem items that were already attached to the issue as indicated by an asterisk (*), and the new problem items that you selected in the assembly.

5. Select the check boxes for problem items that you wish to attach to the issue and clear the other check boxes.

6. Click **OK** to accept the changes.

   The issue is updated with the new problem items attached to it. You can view the updated issue in both Teamcenter lifecycle visualization and in the **Attachments** tab in the hosted Active Workspace session.

Delete Teamcenter visual issues in the viewer

You can delete Teamcenter visual issues directly in the standalone viewer or the Lifecycle Viewer.

1. **Open the visual issue** in the standalone viewer or the Lifecycle Viewer.

2. On the **Issues** toolbar, click **Delete this issue**  .

   - or -

   In the standalone viewer, choose **Review** tab→**Issues** group→**Delete Issue**  .

   The issue report and issue report revision are deleted.

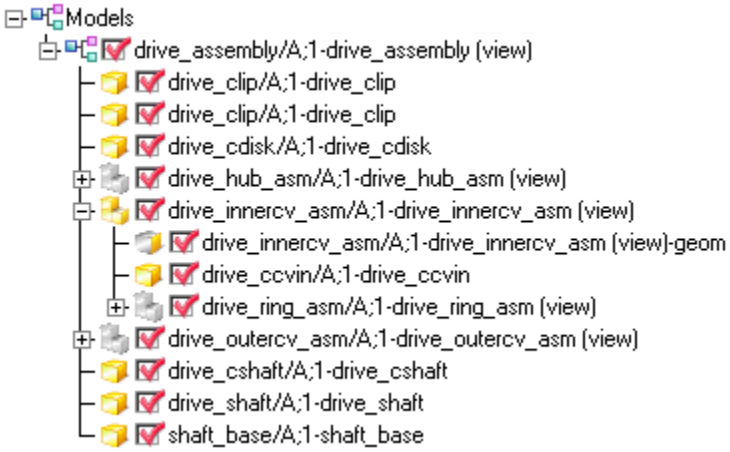
8. Working with JtSimplification data

Overview of JtSimplification data

Complex JT models accessed remotely from Teamcenter often suffer from long loading times because of the size and complexity of their data. JtSimplification datasets solve this problem by providing simplified data for each of a model's subassemblies. When you open a JtSimplification dataset and turn on the root node of the model, the simplified data is automatically loaded and displayed, which enables you to view the entire 3D model much more quickly than is otherwise possible with a standard JT file. If you choose to explore the model in greater detail, the full data for each subassembly level is loaded incrementally as the structure is expanded in the assembly tree or in the viewing window.

JtSimplification datasets are created using the **Simpgen** translator, which is included with the Teamcenter Dispatcher system. Administrators can schedule JtSimplification production from the My Teamcenter **Translation** menu.

JtSimplification data is used automatically when you send the assembly into the viewer and turn on the root node. Since the geometry from a standard JT subassembly and a simplified subassembly looks the same in the viewing window, a gray icon is used to represent subassemblies that consist of simplified geometry.



Note:

JtSimplification data requires an additional license and is supported only in the standalone viewers and the Lifecycle Viewer within the Teamcenter Rich Client. If you do not have a license for the JtSimplification functionality or if you load a JtSimplification dataset in an unsupported viewer, the full model loads as standard JT data.

Using JtSimplification data with other features

When you load a JtSimplification dataset, the Viewing window displays simplified data for each of the model's subassemblies, which may lead to unexpected results when you perform certain actions within the viewer. The table below lists features that may exhibit non-standard behavior when used with JtSimplification data.

> Tip:
>
> To avoid any of the limitations described below, **resolve the simplified data** to fully load the assembly information and geometry.

Feature	Behavior with JtSimplification data
3D file export	If you export a JtSimplification dataset, subassembly nodes that contain JtSimplification data are not included in the exported model.
Snapshots	When you capture a snapshot with a JtSimplification dataset, the simplified data is not resolved and the snapshot image is produced from the simplified geometry. Tip: You can apply a snapshot that captured simplified geometry even after the geometry is resolved.
Session save	When you save a session file with the **Capture static structure** check box selected in the **Session Save As** dialog box, all of the JtSimplification geometry is resolved as part of the saved session. Otherwise, the state of unresolved simplified geometry is maintained.
Part or assembly properties	When you right-click a part or assembly and select **Properties**, the JtSimplification data is not resolved and the displayed geometric properties are computed from the simplified geometry.
3D measurement	When you perform 3D measurements on JtSimplification datasets, the simplified geometry is not automatically resolved.
Clearance	When you perform clearance analysis with JtSimplification datasets, the simplified geometry is not automatically resolved.
Part Edit	If you perform any Part Edit operation, all JtSimplification geometry is automatically resolved and all of the parts are loaded.
Cross section	If you perform any cross section operation, all JtSimplification geometry is automatically resolved and all of the parts are loaded.
Show edges	If you right-click a subassembly and select **Show Edges**, the JtSimplification geometry of the selected subassembly is automatically resolved.

Feature	Behavior with JtSimplification data
Outline capture	If you perform an outline capture on a JtSimplification dataset, the simplified geometry is used to create the outline capture.
Concept appearance edit	If you perform any Concept appearance edit operation, all JtSimplification geometry is resolved and all the parts are loaded.
True Shading	If you apply occurrence specific materials to simplified geometry, the affected subassembly is resolved and fully loaded. Also, global wash and metallic material finishes may not display as expected.
PLM XML save	When you save a JtSimplification dataset as PLM XML, all JtSimplification geometry is automatically resolved and all the parts are loaded.

Resolve and fully load JtSimplification data

When you open a JtSimplification dataset and turn on the root node of the model, the simplified data is automatically loaded and displayed. If you want to view the contents of a subassembly in more detail, you can manually expand the simplified structure to fully load the assembly information and geometry.

Do any of the following:

To	Do this
Resolve all of the simplified data within the model	In the assembly tree, right-click the root node of the model and select **Resolve All**.
Resolve the next level of simplified data within a single subassembly	In the assembly tree, click the plus sign to the left of the subassembly node. -or- In the assembly tree, right-click the subassembly node and select **Resolve**. -or- In the Viewing window, right-click geometry within the subassembly and select **Resolve**.
Resolve all levels of simplified data within a single subassembly	In the assembly tree, right-click the subassembly node and select **Resolve All**. -or- In the Viewing window, right-click geometry within the subassembly and select **Resolve All**.
Resolve a part in the Viewing window	Press Shift and then, in the Viewing window, click the part.

To	Do this
	The viewer automatically determines the minimum set of JtSimplification data to resolve in order to fully load the part.

9. Using ClearanceDB with Teamcenter

Using ClearanceDB with Teamcenter

You can perform ClearanceDB analysis on product data stored in Teamcenter. Analysis of managed product data is performed via the *analyze_managed_product.pl* script, which launches the processes that evaluate the data and then automatically uploads the results to the ClearanceDB database.

ClearanceDB offers a number of options for working with Teamcenter, including:

- Analyze the data associated with BOM lines on a product-by-product basis.
- Perform a single clearance variant analysis that excludes all non-buildable part pairs from a 150% BOM line.
- Work with Design Context to identify a series of target parts and then quickly find other relevant data within a given proximity to those parts.
- Analyze the data associated with 4GD worksets.

You can evaluate ClearanceDB results in standalone Mockup, the Teamcenter Lifecycle Viewer, Structure Manager, and Design Context. However, ClearanceDB results based on 4GD worksets can be evaluated only in standalone Mockup.

Product and system requirements

The ClearanceDB integration with Teamcenter has the following requirements:

- A properly configured and functioning ClearanceDB software environment, including the ClearanceDB Server, Proxy, and Client tiers.
- A Teamcenter server.

  For information about the platforms on which you can run Teamcenter lifecycle visualization, download the appropriate platform matrix spreadsheet from **Support Center**.
- An FMS file client cache (FCC).
- A Teamcenter user account with system administrator privileges.
- Product data in the JT or PLM XML format within an item revision on the Teamcenter server.
- Absolute occurrence IDs for all BOM lines to be analyzed.

Enable batch clearance calculation for ClearanceDB

You must enable ClearanceDB functionality to utilize clearance results from your database.

1. On the **3D Clearance** toolbar, click **Clearance**  .
2. Choose **Clearance→Preferences→Requirement Components**.
3. In the **Requirement Components** dialog box, select one or more of these options:

Select this option	To obtain results in this way
Universal Clearance Requirement	From analysis that you conduct locally in Mockup.
Requirement Rules from ClearanceDB Server	According to requirement rules and conditions that you access in your organization's ClearanceDB Oracle database.

4. Choose **Clearance→Preferences→Result Components**.
5. In the **Result Components** dialog box, select one or more of these options:

> Note:
>
> You must choose **General Clearance Results** to work with results in the **Results** list.

Select this option	To work with results in this way
General Clearance Results	Visually display the results within Mockup.
ClearanceDB Results	Upload the results to your organization's Oracle database.

6. Click **OK**.

Steps to analyze managed products

The following process describes the tasks needed to analyze a Teamcenter item revision in ClearanceDB:

1. Ensure that your environment meets the **requirements for performing ClearanceDB analysis on data from Teamcenter**.

2. Create a ClearanceDB product, following the procedures located in ClearanceDB — Administration. This includes the following:

   - The product configuration, which is required.

     > Note:
     >
     > In a managed environment, ClearanceDB is configured by Teamcenter revision rules, so ClearanceDB configuration names are Teamcenter revision rule names.

   - Rules, at least one of which is required.
   - Conditions, which are optional.
   - Zones, which are optional.

   > Note:
   >
   > The name of the product must be the same as the top-level node in the assembly. Send the item revision containing the product data to Structure Manager to obtain the name of the top level assembly node, which is displayed in the **BOM Line** column.
   >
   > If you are working within a Teamcenter multifield key environment, see *Configuring ClearanceDB for multifield key data*.

3. Update the **global configuration options for working with Teamcenter data**.

4. Specify for ClearanceDB to use **absolute occurrence IDs**.

5. Specify **the item and revision IDs** for the top level assembly of your product.

6. Specify your web server protocol in the global .vvi file.

7. If you want to perform analysis using Teamcenter variant conditions, enable **variant analysis for Clearance**.

8. If you want to cache the product data on your local machine to improve the performance of the analysis, adjust the **load_fcccache options**.

9. Use the *analyze_managed_product.pl* script to **perform analysis** on the managed product and upload the results to the database.

Performing adhoc ClearanceDB analysis

Although ClearanceDB analysis is most frequently performed as part of a regularly scheduled batch process from the command prompt, you can also manually analyze ClearanceDB products in real-time within the Viewer, according to the rules and conditions associated with the product in the database.

Adhoc ClearanceDB analysis is subject to all of the considerations and restrictions of ClearanceDB analysis, including the following:

- To analyze data from Teamcenter, you must configure ClearanceDB to work with Teamcenter-managed data. For information on configuring ClearanceDB to work with Teamcenter, refer to the Using ClearanceDB with Teamcenter section of *ClearanceDB — Administration*.

- To access ClearanceDB product information, including rules and conditions, the **clearance requirements** must be set to **Requirement Rules from ClearanceDB Server**.

- To upload the results of adhoc ClearanceDB analysis to the ClearanceDB database, the **clearance results settings** must be set to **ClearanceDB Results**.

Define ClearanceDB roles

To protect Teamcenter ClearanceDB data viewed in Active Workspace, assign users to one of the ClearanceDB roles within the ClearanceDB group. For more information, see Define ClearanceDB roles in Active Workspace.

Configuring ClearanceDB to work with Teamcenter

Teamcenter global configuration options

You must update the *Clearance.cfgglobal* file to match your Teamcenter environment.

1. Using a text editor, open the *Clearance.cfgglobal* file.

2. Change any of the following settings in the *Section 1: Teamcenter Configuration* section of the file to configure ClearanceDB to work with Teamcenter:

TC_ROOT

Specifies the Teamcenter root directory.

TC_DATA

Specifies the Teamcenter *TC_DATA* directory.

ObjectType or ItemRevisionType (Optional)

Specifies to perform analysis of 4GD worksets. If **ObjectType=Workset**, then **item**, **rev**, and **rev_rule** arguments are interpreted as those of a workset. If **ObjectType=ClearanceCalculationSubset**, then **ModelId**, **ClearanceCalculationName**, and **PartitionSchemes** arguments are interpreted as those of a clearance calculation subset. The **plmxml_export** utility will be invoked to extract the product structure from Teamcenter, rather than the BOMwriter utility.

ModelId, **ClearanceCalculationName**, and **PartitionSchemes** are Teamcenter variables used only for the script **analyze_managed_product.pl**, which runs clearance analysis on the managed product (clearance calculation subset) in Teamcenter.

> Example:
>
> **ModelId=JCB-Fastrac_id ClearanceCalculationName=CC_JCB-Fastrac PartitionSchemes= "Ptn0SchemePhysicalForJCB-Fastrac;Ptn0SchemeFunctionalForJCB-Fastrac"**
>
> If no Partition schemes are specified, no 4GD partition data will be exported.

TeamcenterUserId

Specifies a Teamcenter user name with Teamcenter system administration privileges. If no user name is provided, ClearanceDB uses the operating system user name.

> Note:
>
> This is the same option as the **bomwriter -u=** command line argument.

TeamcenterUserPassword

This setting is deprecated. The Teamcenter user password is now stored in a separate file, and the path to the file is specified with the **TeamcenterUserPasswordFile** setting. Now if the password is specified with **TeamcenterUserPassword**, it is written to an unencrypted file in the user's home directory with a randomly generated name beginning with *CLDB*.

TeamcenterUserPasswordFile

Specifies the path to a file containing the Teamcenter user password.

> Note:
>
> This is the same option as the **bomwriter -pf=** command line argument.

TeamcenterUserGroupId

Specifies the Teamcenter group ID. If no group ID is provided, ClearanceDB uses the default group of the specified Teamcenter user.

> Note:
>
> This is the same option as the **bomwriter -g=** command line argument.

RevisionRule

Specifies the revision rule for the product's top level product structure node, or the revision rule of a workset when **ItemRevisionType=Workset**.

> Note:
>
> This is the same option as the **bomwriter -revision_rule=** command line argument, or the **plmxml_export -rev_rule** when **ItemRevisionType=Workset**.

SavedVariantRule

Specifies the saved variant configuration to pass to the BOMwriter. The setting is not active when **ItemRevisionType=Workset**.

LexicographicalVariantAnalysis

Defines the mode of the evaluation of variant condition relational expressions. Choose one of the following:

No — If indeterminable variant conditions exist, the affected variant inferences are asked from the server. This is the default.

Yes — If indeterminable variant conditions exist, evaluate them lexicographically.

> Note:
>
> Variant conditions that cannot be evaluated based on textual representations are indeterminable.

VariantAnalysisClientTraceFile

Specifies the name for the log file of the variant analysis. By default, this is not set, and a log file is not generated.

Example:

VariantAnalysisClientTraceFile=cldb_variant_analysis.log

VariantAnalysisClientTraceFlags

Specified the content of the log file of the variant analysis. The trace flags are additive, concatenated with the plus (+) character.

Example:

VariantAnalysisClientTraceFlags=CONFIGURATION+STATISTICS

Add any of the following flags:

CONFIGURATION	Lists the variant analysis configuration attributes.
STATISTICS	Provides the basic variant analysis statistics.
VARIANTCONDITIONS	Provides details of textual variant conditions.
DETERMINABILITY	Lists the determinability of variant conditions.
SATISFIABILITY	Lists the satisfiability of variant conditions.
EXCLUDEDVCPAIRS	Lists excluded variant condition pairs.
EXCUDEDUIDPAIRS	Lists excluded clearance element pairs as ABSOCCs.
EXCLUDEDNGIDPAIRS	Lists excluded clearance element pairs as NGIDs.
IMPACT	Lists the impact of variant conditions on the product structure.

Caution:

Enabling the **EXCUDEDUIDPAIRS** and **EXCLUDEDNGIDPAIRS** trace flags may result in extremely large log files.

VariantLogicalExpression

Defines the variant condition UserValue title and BOM line property pair in the .plmxml file. This has the form of:

“Variant Condition”:bl_variant_condition

“Variant Formula”:bl_formula

Example:

VariantLogicalExpression="VC:bl_variant_condition"

> Note:
>
> This must match the content of the **BomWriterUserAttributes** setting.

RunLevel

Specifies the actions of the *analyze_managed_product.pl* script. Use a value from **1** to **6**.

1 — In the product directory, a. vvi file is created, which is used by the BOMwriter to generate a .plmxml file referencing the managed data.
2 — Using the .vvi and .plmxml files in the product directory, the Clearance Calculator performs analysis upon the managed product data and generates a results file.
3 — The results file is uploaded to the ClearanceDB database.
4 — Both the **RunLevel 1** and **2** actions are performed.
5 — Both the **RunLevel 2** and **3** actions are performed.
6 — All of the **RunLevel** actions are performed, **1**, **2**, and **3**.

BomWriterUserAttributes

Specifies the variant conditions for the BOMwriter to include in the generated .plmxml file. Type these according to the following syntax:

target:Instance,key:myAttribute,literal:\"My Attribute Value\"

> Note:
>
> This is the same option as the **bomwriter -ua=** command line argument.

> Example:
>
> Use this option to include variant model related BOM line properties in the generated .plmxml file. For example:
>
> **BomWriterUserAttributes=target:Instance,key: VC,prop: bl_variant_condition**

TeamcenterWebServerPath

Specifies the Teamcenter web server path, including the protocol, host name, and port number. Type this according to the following syntax:

TeamcenterWebServerPath=http://machine_name:port

> Example:
>
> **TeamcenterWebServerPath=http://tcserver:80/tc8_2008/**

JtDataStagingProcess

Specifies to use the Teamcenter **load_fcccache** utility to download the model data from the Teamcenter server to the local system for clearance analysis. Enabling this option pre-populates the FMS client cache (FCC), which leads to faster and more reliable analysis.

Valid values are **0** (off) or **1** (on). The default value is **0**.

JtDataStagingProcessErrorLimit

Specifies when to abort the *analyze_managed_product.pl* script, based on the following custom error codes:

FILECOPY_FAILED
INVALID_DAKID_FORMAT
FCC_OPENFILE_FAILED
FCC_DOWNLOAD_FAILED
GET_READ_TICKET_FAILED
DATASET_READ_FAILED
PLMXML_MISSING_JT
CHMOD_FAILED
COPYOUT_CLEANUP_FAILED

You can specify a numerical value for each error code. By default, the error codes are given values that correspond to the severity of the problem, with the lowest value representing the most severe failure. If a value is not specified for the **JtDataStagingProcessErrorLimit** setting, the script stops whenever an error occurs during the staging process.

The default value is **30**.

> Note:
>
> The default values are recommended for the **JtDataStagingProcessErrorLimit** setting and the related error codes. Essentially, with these defaults the clearance analysis will abort when any of these errors occur, and you can use the reported error message to troubleshoot the problem.

FILECOPY_FAILED

Specifies the error code that indicates a copy operation to the output directory has failed.

The default value is **20**.

INVALID_DAKID_FORMAT

Specifies the error code that indicates an invalid DAKID was found.

The default value is **21**.

FCC_OPENFILE_FAILED

Specifies the error code that indicates the FCC failed to open the file using the ticket.

The default value is **22**.

FCC_DOWNLOAD_FAILED

Specifies the error code that indicates a failure most likely due to a missing file in the volume.

The default value is **23**.

GET_READ_TICKET_FAILED

Specifies the error code that indicates a read ticket failed.

The default value is **24**.

DATASET_READ_FAILED

Specifies the error code that indicates no read access on the dataset.

The default value is **25**.

PLMXML_MISSING_JT

Specifies the error code that indicates a missing JT file reference in the .plmxml file.

The default value is **26**.

CHMOD_FAILED

Specifies the error code that indicates a failure to set the access mode during copy out.

The default value is **27**.

COPYOUT_CLEANUP_FAILED

Specifies the error code that indicates a failure to remove a file during lifetime cleanup.

The default value is **28**.

CopyOutLocation

Specifies the location for the dataset files downloaded from Teamcenter server.

The default location is the product directory in the ClearanceDB Work Area.

> Note:
>
> Do not use special characters in folder names.

BucketCount

Specifies how many directories to use for the cached files. Spreading the files over multiple directories can lead to better performance.

The default value is **30**.

UseAbsoluteLocation

Specifies to use an absolute value for the location attribute in the .plmxml file generated by the BOMwriter. It is usually better to have a relative reference, although there are instances where an absolute reference is required, such as when the .plmxml file is moved to a different location from the referenced files.

The default value is **No**.

DirAccessMode

Specifies the access mode setting for the directories created to hold the cached files. Use a chmod octal value. This setting is used only on Linux systems.

The default value is **0640**.

FileAccessMode

Specifies the access mode setting for the cached files. Use a chmod octal value. This setting is used only on Linux systems.

The default value is **0640**.

BucketPrefix

Specifies a prefix to add to the names of directories created to hold the cached files.

The default value is **RW**.

FilenamePrefix

Specifies a prefix to add to the names of the cached files.

The default value is **fmsr_**.

CopyOutLifetime

Specifies the lifetime of the files cached in the *StagingProcessDownloads* directory. The directory is scanned for files older than the specified value, which are removed. The lifetime value is specified in seconds, where one day is equal to 86400 seconds and two weeks is equal to 1209600 seconds.

The default value is **1209600** (two weeks).

> Note:
>
> This option requires the **FilenamePrefix** option to be set since it uses the prefix as validation of ownership to prevent the accidental removal of files.

LifetimeCheck

Specifies to scan the *StagingProcessDownloads* directory for files older than the **CopyOutLifetime** value.

Valid values are **0** (off) or **1** (on). The default value is **0**.

LifetimeCheckInterval

Specifies how often to scan the *StagingProcessDownloads* directory for files older than the **CopyOutLifetime** value. If the directory holds many files and it is not important to check the lifetime each time the *analyze_managed_product.pl* script is run, you can improve performance by increasing the value so the check is made less frequently. If the specified value is 10, the lifetime check occur once over the course of 10 script executions.

The default value is **10**.

LifetimeProcessLimit

Specifies the maximum number of seconds the file lifetime check is allowed to continue. The lifetime check randomly examines cached files. If the *StagingProcessDownloads* directory consists of many files, this option has the effect of randomly processing a subset of files each time the lifetime check takes place. Over time, all of the files are examined.

The default value is **300**.

LogTypes

Specifies the type of logging to be reported. The following are valid log types:

NONE

ERROR

WARNING

INFORMATION

DEBUG

PERFORMANCE

ALL

> Note:
>
> Use the + sign to use multiple log types. For example, **ERROR+WARNING**.

RulesObject = Requirement Rules from ClearanceDB Server

Specify to perform analysis using the product's rules and conditions from the ClearanceDB database. To enable this option, remove the number sign symbol (**#**) that precedes the **RulesObject = Requirement Rules from ClearanceDB Server** line.

RulesObject = Variant Analysis

Specify to perform analysis using Teamcenter variant conditions. To enable this option, remove the number sign symbol (**#**) that precedes the **RulesObject = Variant Analysis** line.

ResultsObject = ClearanceDB Results

Specify to generate a ClearanceDB results file (*ClearanceResultsDbUpload.csvcldb*). To enable this option, remove the number sign symbol (**#**) that precedes the **ResultsObject = ClearanceDB Results** line.

Attribute=__PLM_ABSOCC_UID, Part and Parents (Part First)

Specify to use product structure absolute occurrences. To enable this option, remove the number sign symbol (**#**) that precedes the **Attribute=__PLM_ABSOCC_UID,Part and Parents (Part First)** line.

3. Save the file.

Specify to use absolute occurrence IDs

For ClearanceDB to work with data from Teamcenter, an absolute occurrence ID is required for each product structure node of the BOM line to be analyzed.

1. Enable absolute occurrence IDs in the **global configuration options** (specified in the *Clearance.cfgglobal* file) by removing the number sign symbol (**#**) that precedes the **Attribute=__PLM_ABSOCC_UID,Part and Parents (Part First)** line.

2. Add the following entry to the process configuration (specified in the *configuration.csvcldb* file) for each product:

   "000092/A;1-cottonpicker (View)",EAICL_RELEVANT_PART_ATTRIBUTE,__PLM_ABSOCC_UID

Configure the Clearance.cfgproduct file

For the Clearance Calculator to analyze Teamcenter managed data, you must specify the item ID and revision of the top level assembly of your product. If your Teamcenter data is configured with multifield key data, you must specify the item key.

1. Use a text editor, open the *Clearance.cfgproduct* file for the product and provide the following information:

   ItemKey

   Specifies the Teamcenter values of the multifield key properties for the item containing your product.

   > Note:
   >
   > This setting is applicable only to Teamcenter products configured with multifield key data. It corresponds to the **–key** argument for the Teamcenter BOMwriter utility.

You can obtain the necessary multifield key strings with the Teamcenter **get_key_string** utility.

ItemId

Specifies the Teamcenter item ID of the top level assembly of your product.

ItemRevision

Specifies the Teamcenter revision of the top level assembly of your product.

2. Save the file.

Encrypt the Teamcenter user password

You can use the Teamcenter **install** utility to encrypt the Teamcenter user password. The encrypted password is stored in an external file.

1. In an environment configured to run Teamcenter utilities, open a command prompt.

   For information about configuring an environment to run Teamcenter utilities, see Manually configure your environment for Teamcenter utilities in *Utilities Reference*.

2. At the command prompt, type:

   install –encryptpwf –f=<path>

   where

   path is the full path and file name for the password file that you want to generate.

   Example:

   install –encryptpwf –f=C:\ClearanceDB_Work_Area\account_key

   The **install** utility displays the following message:

   ```
   Please enter password:
   ```

3. Type the password and press Enter.

   The utility displays the following message:

   ```
   Please re-enter the password:
   ```

4. Type the password again and press Enter.

The password is encrypted and saved to the specified location.

5. Navigate to the ClearanceDB Work Area.

6. Open the *Clearance.cfgglobal* file or a *Clearance.cfgproduct* file in a text editor.

7. To specify for ClearanceDB to obtain the Teamcenter user password from the encrypted password file, locate the **TeamcenterUserPasswordFile** setting, and type the full path and file name for the password file.

   Example:

   TeamcenterUserPasswordFile=C:\ClearanceDB_Work_Area\account_key

8. Save the file.

Configuring ClearanceDB for multifield key data

Multifield keys are identifiers assigned to objects to ensure their uniqueness in the database. For example, if the item business object type is configured to use multifield keys, it is possible to have two item objects with the same item ID.

For ClearanceDB to analyze Teamcenter data configured with multifield key data, you must do the following:

- When running the *create_product.pl* script to create the product in the ClearanceDB database, append the **__PLM_ITEMREV_UID** for the item revision to the product name.

  To find the UID for an item revision, open the item revision in Structure Manager, and view the **bl_rev_fnd0objectId** property. Include this value within brackets after the (View) suffix, enclosing the entire product name in quotation marks, as shown below:

  Example:

  “000092/A;1-cottonpicker (View) [4BYKHklYy$_loP]”

- When configuring the *Clearance.cfgproduct* file for the product, populate the **ItemKey** parameter with the multifield key properties of the item. This setting corresponds to the **–key** argument for the Teamcenter BOMwriter utility.

  To obtain the key information, use the Teamcenter **get_key_string** utility.

  Example:

  ItemKey=item_id=000092,MFK_strkey1=val1

Optionally configure Teamcenter export for 4GD worksets

When you export 4GD data to PLM XML, you can export design element properties that are in addition to the properties that are exported by default. To do this, you must add the properties to the PLM XML transfer mode. You may also customize the titles of the properties for the .plmxml file.

Add the property to the PLM XML transfer mode

To include the additional property, you must edit the transfer mode used for exporting data from Teamcenter by adding the property derived from the 4GD root business object **Cpd0DesignElement**.

1. In Teamcenter, start the *PLM XML/TC XML Export Import Administration* application.

   > Note:
   >
   > For more information, see the PLM XML/TC XML Export Import Administration application documentation.

2. Select the **4GDPIEDataExportTcVisClearanceDB** transfer mode from the **PLM XML Import Export Modes** tree.

   The **TransferMode** pane appears, with the options for the selected transfer mode.

3. Expand **4GDPIEDataExportTcVisClearanceDB** in the left pane, and select **4GDPIEDataExportCLDB_PS**.

4. Create the clause that specifies how the data is traversed:

   a. Click the **Add clause** button + located to the right of the clause table.

   b. Select **CLASS** from the **Primary Object Class Type** list.

   c. Type **Cpd0DesignElement** in the **Primary Object** box.

   d. Select **PROPERTY** from the **Relation Type** list.

   e. Type **object_name** in the **Related Property Or Object** box.

   f. Select **DO** from the **Property Action Type** list.

   g. Click the **Modify** button.

Customize the property title in the .plmxml file

When the property is added to the property set, it is exported to the PLM XML with its name as *object_name*. You can change this to a more specific name.

1. Open the rule file **4GD_cldb.csv** at this location:

   TC_DATA\xformer\LLTCXML_PLMXML

2. Under the **Cpd0DesignElement** business object, in the **ProductRevisionView** section, add the **ProductRevisionView/UserData** rule as shown in this example, where *DesignElementName* is the new name you want to create for the property.

```
########################################
# Cpd0DesignElement
########################################
Cpd0DesignElement|ProductInstance
Cpd0DesignElement.object_name|ProductInstance.name
Cpd0DesignElement<fnd0affectedObject.Mdl0VariantExprBlock.fnd0express
ions>
      Cfg0ApplicationVariantExp.fnd0formula|ProductInstance/UserData|
      add_user_value($TARGET_END_OBJECT
Cpd0DesignElement.owning_user>User.user_name|ProductInstance/
UserData|
      add_user_value($TARGET_END_OBJECT
Cpd0DesignElement.owning_group>Group.name|ProductInstance/UserData|
      add_user_value($TARGET_END_OBJECT

Cpd0DesignElement|ProductInstance.partRef>ProductRevisionView

Cpd0DesignElement|Occurrence
Cpd0DesignElement.puid|Occurrence/UserData|
add_user_value($TARGET_END_OBJECT
Cpd0DesignElement|Occurrence.instanceRefs>ProductInstance
Cpd0DesignElement<cpd0presented_parent.Cpd0DesignElement|
      Occurrence.occurrenceRefs>Occurrence
Cpd0DesignElement|Occurrence.partRef>ProductRevisionView
Cpd0DesignElement.cpd0UG_ENTITY_HANDLE|Occurrence/UserData|
      add_user_value($TARGET_END_OBJECT

Cpd0DesignElement|ProductRevisionView
Cpd0DesignElement.object_name|ProductRevisionView.name

Cpd0DesignElement.object_name|ProductRevisionView/UserData|add_user_value
   ($TARGET_END_OBJECT, 'DesignElementName', '',$SOURCE_VALUES, false, false)

Cpd0DesignElement.cpd0source_object>ItemRevision.items_tag>Item.fnd0i
s_
      monolithic|ProductRevisionView/UserData|
add_user_value($TARGET_END_OBJECT
Cpd0DesignElement<cpd0presented_parent.Cpd0DesignElement|
ProductRevisionView.
      instanceRefs>ProductInstance
Cpd0DesignElement<mdl0positioned_object.Mdl0DefaultGeometry|
```

```
      ProductRevisionView/Representation
Cpd0DesignElement<mdl0positioned_object.Mdl0DefaultGeometry.
      mdl0direct_model_data>Dataset.object_type|ProductRevisionView/
      Representation.format|lookup_table( DSFormatList
```

3. Near the beginning of the file, add the **ProductRevisionView** rule as shown in this example.

```
!source_hierarchy Cpd0WorksetLine\BOMLine
!source_hierarchy Cpd0SubsetLine\BOMLine
!source_hierarchy Cpd0WorksetRevision\ItemRevision

!target_graph_definition UserValue.title

!target_graph_definition UserValue.value
!target_id_reference InstanceGraph.rootRefs|*.id
!target_id_reference ProductRevisionView.instanceRefs|*.id
!target_id_reference ProductView.rootRefs|*.id

|ProductView/ApplicationRef.application| 'NX'|
      @ProductView.usage == 'modelView'

|InstanceGraph.$CHILD_ELEMENT|
concat(@@InstanceGraph.$CHILD_ELEMENT>$MAPPED
|InstanceGraph.$CHILD_ELEMENT|
concat(@@InstanceGraph.$CHILD_ELEMENT>$MAPPED

|ProductView.$CHILD_ELEMENT|
concat(@@ProductView.$CHILD_ELEMENT>$MAPPED
|ProductRevisionView/UserData/UserValue| remove_object($SOURCE_VALUE)|
   @UserValue.title == 'object_name'

##########################################
# BOMWindow
##########################################
```

Caching managed data for analysis

You can configure ClearanceDB to use the **load_fcccache** utility to download and cache model data from the Teamcenter server to your local machine, improving both the reliability and performance of the analysis. Options to control the **load_fcccache** utility are located in the *Clearance.cfgglobal* file.

> Note:
>
> For most of these settings the default values are recommended and they should not be modified unless you understand how the changes will affect the data staging process. Exceptions include

- **JtDataStagingProcess** — By default the **load_fcccache** option is disabled and you must change this setting to enable it.
- **CopyOutLocation** — This setting specifies where to copy the files cached from Teamcenter.
- **LogTypes** — This setting controls the content of the log files.

For more information on the Teamcenter File Management System (FMS), see Teamcenter Administration in the Teamcenter help.

1. Using a text editor, open *Clearance.cfgglobal* and adjust the following settings:

   JtDataStagingProcess

   Specifies to use the Teamcenter **load_fcccache** utility to download the model data from the Teamcenter server to the local system for clearance analysis. Enabling this option pre-populates the FMS client cache (FCC), which leads to faster and more reliable analysis.

   Valid values are **0** (off) or **1** (on). The default value is **0**.

   JtDataStagingProcessErrorLimit

   Specifies when to abort the *analyze_managed_product.pl* script, based on the following custom error codes:

   FILECOPY_FAILED
   INVALID_DAKID_FORMAT
   FCC_OPENFILE_FAILED
   FCC_DOWNLOAD_FAILED
   GET_READ_TICKET_FAILED
   DATASET_READ_FAILED
   PLMXML_MISSING_JT
   CHMOD_FAILED
   COPYOUT_CLEANUP_FAILED

   You can specify a numerical value for each error code. By default, the error codes are given values that correspond to the severity of the problem, with the lowest value representing the most severe failure. If a value is not specified for the **JtDataStagingProcessErrorLimit** setting, the script stops whenever an error occurs during the staging process.

   The default value is **30**.

   Note:

   The default values are recommended for the **JtDataStagingProcessErrorLimit** setting and the related error codes. Essentially, with these defaults the clearance analysis will abort when any of these errors occur, and you can use the reported error message to troubleshoot the problem.

FILECOPY_FAILED

Specifies the error code that indicates a copy operation to the output directory has failed.

The default value is **20**.

INVALID_DAKID_FORMAT

Specifies the error code that indicates an invalid DAKID was found.

The default value is **21**.

FCC_OPENFILE_FAILED

Specifies the error code that indicates the FCC failed to open the file using the ticket.

The default value is **22**.

FCC_DOWNLOAD_FAILED

Specifies the error code that indicates a failure most likely due to a missing file in the volume.

The default value is **23**.

GET_READ_TICKET_FAILED

Specifies the error code that indicates a read ticket failed.

The default value is **24**.

DATASET_READ_FAILED

Specifies the error code that indicates no read access on the dataset.

The default value is **25**.

PLMXML_MISSING_JT

Specifies the error code that indicates a missing JT file reference in the .plmxml file.

The default value is **26**.

CHMOD_FAILED

Specifies the error code that indicates a failure to set the access mode during copy out.

The default value is **27**.

COPYOUT_CLEANUP_FAILED

Specifies the error code that indicates a failure to remove a file during lifetime cleanup.

The default value is **28**.

CopyOutLocation

Specifies the location for the dataset files downloaded from Teamcenter server.

The default location is the product directory in the ClearanceDB Work Area.

> Note:
>
> Do not use special characters in folder names.

BucketCount

Specifies how many directories to use for the cached files. Spreading the files over multiple directories can lead to better performance.

The default value is **30**.

UseAbsoluteLocation

Specifies to use an absolute value for the location attribute in the .plmxml file generated by the BOMwriter. It is usually better to have a relative reference, although there are instances where an absolute reference is required, such as when the .plmxml file is moved to a different location from the referenced files.

The default value is **No**.

DirAccessMode

Specifies the access mode setting for the directories created to hold the cached files. Use a chmod octal value. This setting is used only on Linux systems.

The default value is **0640**.

FileAccessMode

Specifies the access mode setting for the cached files. Use a chmod octal value. This setting is used only on Linux systems.

The default value is **0640**.

BucketPrefix

Specifies a prefix to add to the names of directories created to hold the cached files.

The default value is **RW**.

FilenamePrefix

Specifies a prefix to add to the names of the cached files.

The default value is **fmsr_**.

CopyOutLifetime

Specifies the lifetime of the files cached in the *StagingProcessDownloads* directory. The directory is scanned for files older than the specified value, which are removed. The lifetime

value is specified in seconds, where one day is equal to 86400 seconds and two weeks is equal to 1209600 seconds.

The default value is **1209600** (two weeks).

> Note:
>
> This option requires the **FilenamePrefix** option to be set since it uses the prefix as validation of ownership to prevent the accidental removal of files.

LifetimeCheck

Specifies to scan the *StagingProcessDownloads* directory for files older than the **CopyOutLifetime** value.

Valid values are **0** (off) or **1** (on). The default value is **0**.

LifetimeCheckInterval

Specifies how often to scan the *StagingProcessDownloads* directory for files older than the **CopyOutLifetime** value. If the directory holds many files and it is not important to check the lifetime each time the *analyze_managed_product.pl* script is run, you can improve performance by increasing the value so the check is made less frequently. If the specified value is 10, the lifetime check occur once over the course of 10 script executions.

The default value is **10**.

LifetimeProcessLimit

Specifies the maximum number of seconds the file lifetime check is allowed to continue. The lifetime check randomly examines cached files. If the *StagingProcessDownloads* directory consists of many files, this option has the effect of randomly processing a subset of files each time the lifetime check takes place. Over time, all of the files are examined.

The default value is **300**.

LogTypes

Specifies the type of logging to be reported. The following are valid log types:

NONE

ERROR

WARNING

INFORMATION

DEBUG

PERFORMANCE

ALL

> Note:
>
> Use the + sign to use multiple log types. For example, **ERROR+WARNING**.

2. Save the file.

Set the default owner for each clearance result

To show the default owner for clearance results, you must set the default owner attribute in the BOMwriter, which is then included in the generated .plmxml file.

1. In the *Clearance.cfgglobal* file, add the following attribute under the BomWriterUserAttributes section:

```
BomWriterUserAttributes=target:Instance,key:"Item Revision
Owning User",prop:bl_rev_owning_user,key:"Last Modified
Date",prop:awb0RevisionLastModifiedDate
```

2. In the *configuration.csvcldb* file, add the following attributes:

```
<product name>,EAICL_RELEVANT_PART_ATTRIBUTE,Last Modified Date

<product name>,EAICL_RELEVANT_PART_ATTRIBUTE,Item Revision Owning User

<product name>,EAICL_INITIAL_CLEARANCE_OWNER_ASSIGNMENT,ON

<product name>,EAICL_INITIAL_CLEARANCE_OWNER_CHOICE,Item Revision Owning
User

<product name>,EAICL_INITIAL_CLEARANCE_OWNER_CHOICE_CRITERION,Last
Modified Date
```

The configuration file changes can be added in the default product's *configuration.csvcldb* and then copied to all new products when they are created by using either the -uc (copy default product's *configuration.csvcldb* file) or -ua (copy all default product's configuration files) flag in the create_product.pl command line call. Alternatively, the configuration file changes can be added to the individual product's *configuration.csvcldb* file.

Analyzing managed ClearanceDB products

Analyze managed ClearanceDB products

Analysis of managed products is performed via the *analyze_managed_product.pl* script, which triggers the following events in sequence:

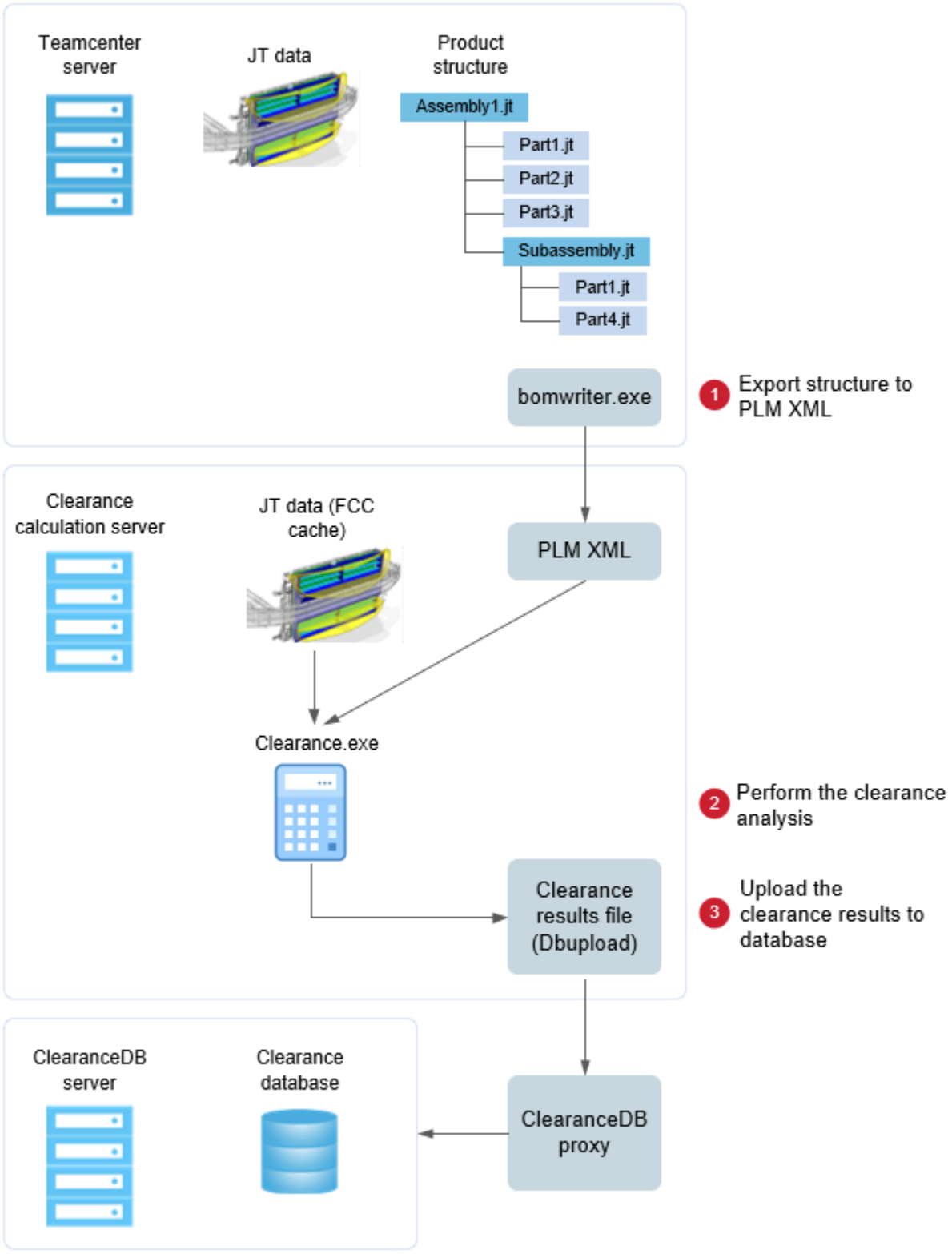
1. The BOMwriter utility generates a .plmxml file referencing the Teamcenter product data.

2. The **load_fcccache** utility downloads the product data to your local machine. A second .plmxml file referencing the cached data is generated.

3. The Clearance Calculator analyzes the cached data according to a ClearanceDB product configuration (defined in the *configuration.csvcldb* file, together with any specified rules, conditions, and zones). ClearanceDB results are generated and uploaded to the ClearanceDB database.

Analyze a managed product

Take the following steps to perform a ClearanceDB analysis upon a Teamcenter managed product.



1. Configure the Clearance Calculator, as described in the Configure the Clearance Calculator section in *ClearanceDB — Administration*.

2. Navigate to the appropriate product directory in your ClearanceDB Work Area.

3. From the command prompt, type

```
analyze_managed_product.pl <product>
```

> Example:
>
> `analyze_managed_product.pl flux_capacitor`

Depending upon how you set the `RunLevel` parameter in the *Clearance.cfgglobal* file, one or more of the following actions are performed:

This RunLevel setting	Does this
1	In the product directory, a .vvi file is created, which is used by the BOMwriter to generate a .plmxml file referencing the managed data.
2	Using the .vvi and .plmxml files in the product directory, the Clearance Calculator performs analysis upon the managed product data and generates a results file.
3	The results file is uploaded to the ClearanceDB database.
4	Both the `RunLevel 1` and 2 actions are performed.
5	Both the `RunLevel 2` and 3 actions are performed.
6	All of the `RunLevel` actions are performed, 1, 2, and 3.

The analysis runs, and when it is complete the clearance results file, *ClearanceResultsDbUpload.csvcldb*, appears in the product directory.

Example output from managed analysis

The command line output below is from a successful ClearanceDB analysis of a Teamcenter managed product.

```
C:\ClearanceDB_Work_Area\Products\141-f10002_A_1-
Front_Suspension__view_>analyze_managed_product.pl

#----------------------------------------
# analyze_managed_product.pl
#----------------------------------------

#----------------------------------------
# Teamcenter Configuration:
# TC_ROOT=Y:\
# TC_DATA=Z:\
```

```
# TeamcenterUserId=tcuser
# RevisionRule=Latest Working
# RunLevel=6
# JtDataStagingProcess=1
#----------------------------------------

"141-f10002_A_1-Front_Suspension__view_.vvi" file is
created in the product directory. Please
verify it.

#----------------------------------------
# Step 1a of 3: Run Bomwriter.exe
#----------------------------------------

Running:
Y:\\bin\bomwriter -u=tcuser -p=xxxxxxxx
-g= -item="141-f10002" -rev=A -format=plmxml+type=
AbsoluteOccurrences+ua=target:Root,key:Configuration,literal:"Latest Working"
-revision_rule="Latest
Working" -output_file="C:/ClearanceDB_Work_Area/Products/141-f10002_A_1-
Front_Suspension__view_/
141-f10002_A_1-Front_Suspension__view_.plmxml"

platform=MSWin32
C:/ClearanceDB_Work_Area/Products/141-f10002_A_1-Front_Suspension__view_/
bomwriter_exec.bat
C:\ClearanceDB_Work_Area\Products\141-f10002_A_1-Front_Suspension__view_>set TC_ROOT=Y:\

C:\ClearanceDB_Work_Area\Products\141-f10002_A_1-Front_Suspension__view_>set TC_DATA=Z:\

C:\ClearanceDB_Work_Area\Products\141-f10002_A_1-Front_Suspension__view_>call
Z:\\tc_profilevars

#----------------------------------------
# Bomwriter.exe execution SUCCEEDED
# Execution time = 00:15:03
#----------------------------------------

#----------------------------------------
# Step 1b of 3: Run Load_fcccache.exe
#----------------------------------------

Staging process uses config file: C:/ClearanceDB_Work_Area/Clearance.cfgglobal
The staging process saved the original plmxml as: C:/ClearanceDB_Work_Area/Products/
141-f10002_A_1-Front_Suspension__view_/141-f10002_A_1-Front_Suspension__view__orig.plmxml
Warning: Invalid "CopyOutLocation" in the configuration file. Use product dir by default.

Running:
Y:\\bin\load_fcccache -u=tcuser -p=xxxxxxxx
-config=C:/ClearanceDB_Work_Area/Clearance.cfgglobal
-f=load -plmxml=C:/ClearanceDB_Work_Area/Products/141-f10002_A_1-Front_Suspension__view_/
141-f10002_A_1-Front_Suspension__view__orig.plmxml -output_plmxml=C:/
ClearanceDB_Work_Area/
Products/141-f10002_A_1-Front_Suspension__view_/141-f10002_A_1-
Front_Suspension__view_.plmxml
-copy_out=C:/ClearanceDB_Work_Area/Products/141-f10002_A_1-Front_Suspension__view_/
StagingProcessDownloads -log_filename=C:/ClearanceDB_Work_Area/Products/
141-f10002_A_1-Front_Suspension__view_/JtDataStagingProcess.log

platform=MSWin32
```

```
C:/ClearanceDB_Work_Area/Products/141-f10002_A_1-Front_Suspension__view_/stage_exec.bat
C:\ClearanceDB_Work_Area\Products\141-f10002_A_1-Front_Suspension__view_>set TC_ROOT=Y:\

C:\ClearanceDB_Work_Area\Products\141-f10002_A_1-Front_Suspension__view_>set TC_DATA=Z:\

C:\ClearanceDB_Work_Area\Products\141-f10002_A_1-Front_Suspension__view_>call
Z:\\tc_profilevars
DEBUG 2023-02-09T19:21:16.462Z: Setting logTypes to: -1
DEBUG 2023-02-09T19:21:16.462Z: Setting minor error: FILECOPY_FAILED, error code: 20
DEBUG 2023-02-09T19:21:16.478Z: Setting minor error: INVALID_DAKID_FORMAT, error code: 21
DEBUG 2023-02-09T19:21:16.478Z: Setting minor error: FCC_OPENFILE_FAILED, error code: 22
DEBUG 2023-02-09T19:21:16.478Z: Setting minor error: FCC_DOWNLOAD_FAILED, error code: 23
DEBUG 2023-02-09T19:21:16.478Z: Setting
minor error: GET_READ_TICKET_FAILED, error code: 24
DEBUG 2023-02-09T19:21:16.493Z: Setting minor error: DATASET_READ_FAILED, error code: 25
DEBUG 2023-02-09T19:21:16.493Z: Setting minor error: PLMXML_MISSING_JT, error code: 26
DEBUG 2023-02-09T19:21:16.493Z: Setting minor error: CHMOD_FAILED, error code: 27
DEBUG 2023-02-09T19:21:16.493Z: Setting
minor error: COPYOUT_CLEANUP_FAILED, error code: 28
DEBUG 2023-02-09T19:21:16.509Z: Setting BucketCount to: 30
DEBUG 2023-02-09T19:21:16.509Z: Setting UseAbsoluteLocation to: No
DEBUG 2023-02-09T19:21:16.603Z: Setting DirAccessMode to: 0750 (488)
DEBUG 2023-02-09T19:21:16.618Z: Setting FileAccessMode to: 0640 (416)
DEBUG 2023-02-09T19:21:16.618Z: Setting BucketPrefix to: RW
DEBUG 2023-02-09T19:21:16.618Z: Setting FilenamePrefix to: fmsr_
DEBUG 2023-02-09T19:21:16.618Z: Setting CopyOutLifetime to: 1209600
DEBUG 2023-02-09T19:21:16.618Z: Setting LifetimeCheck to: 0
DEBUG 2023-02-09T19:21:16.618Z: Setting the LifetimeCheckInterval to: 10
DEBUG 2023-02-09T19:21:16.634Z: Setting the LifetimeProcessLimit to: 300
FCC Interface Implementation fms.8.2.0.20091029.01(fms.8.2.0.20091029.01) initialized.

#----------------------------------------
# Load_fcccache.exe execution SUCCEEDED
# Execution time = 00:13:05
#----------------------------------------

#----------------------------------------
# Step 2 of 3: Run Clearance.exe
#----------------------------------------

Running:
C:/ClearanceDB_Work_Area/Products/141-f10002_A_1-Front_Suspension__view_/
clearance_exec.bat
C:\ClearanceDB_Work_Area\Products\141-f10002_A_1-Front_Suspension__view_>set
VP_AUTO_TESTING=True

C:\ClearanceDB_Work_Area\Products\141-f10002_A_1-Front_Suspension__view_>set
EAI_CL_DATASOURCE=
cldbmachine:7206

C:\ClearanceDB_Work_Area\Products\141-f10002_A_1-Front_Suspension__view_>set
EAI_CL_CONNECT_DATA=
CLDB_PROXY_CONNECT

C:\ClearanceDB_Work_Area\Products\141-f10002_A_1-Front_Suspension__view_>set
PATH=C:\Perl\bin;
C:\WINDOWS;C:\WINDOWS\System32;C:\vis\Products\Mockup\ClearanceDB

C:\ClearanceDB_Work_Area\Products\141-f10002_A_1-
Front_Suspension__view_>C:\vis\Products\Mockup\
```

```
clearance.exe -d 5 -c
C:/ClearanceDB_Work_Area/Products/141-f10002_A_1-Front_Suspension__view_/
141-f10002_A_1-Front_Suspension__view_.vvi

Teamcenter Visualization Clearance Testing.
Launching worker process.
Creating clearance components.
Loading input file.
Performing clearance test.
Generating pairs.
Product = 141-f10002/A;1-Front Suspension (view)(Latest Working)
2023/02/09-14:30:41: Connected to ClearanceDB Proxy on machine cldbmachine, at port 7206.
2023/02/09-14:30:44: Reconnected to
ClearanceDB Proxy on machine cldbmachine, at port 7206.
2023/02/09-14:30:45: Reconnected to
ClearanceDB Proxy on machine cldbmachine, at port 7206.
Number of unique rules = 1
2023/02/09-14:30:48: Reconnected to
ClearanceDB Proxy on machine cldbmachine, at port 7206.
2023/02/09-14:30:49: Reconnected to
ClearanceDB Proxy on machine cldbmachine, at port 7206.
The statistics of 141-f10002/A;1-Front Suspension (view):
   Number of element occurrences           =        55
   Number of unchanged element occurrences =         0
   Number of excluded element occurrences  =         0

The requirement engine called total of 1461 times.
Clearance test bed has been created with
CADID matching keyed by PART names.
All pairs have been generated.
Processing pairs.
Launching 2 processes for analysis.
Process 1: All pairs have been processed.
Process 2: All pairs have been processed.
Generating results.
Testing finished.  Results written to 'ClearanceResultsDbUpload.csvcldb'.
Process ended normally.

#----------------------------------------
# Clearance.exe execution SUCCEEDED
# Execution time = 00:01:12
#----------------------------------------

#----------------------------------------
# Step 3 of 3: Run Update_product.pl
#----------------------------------------

Running:
C:\vis\Products\Mockup\ClearanceDB\update_product.pl -ud

No local .dbc file in the product directory.
Looking for global version(s) in ClearanceDB_Work_Area directory ....

Uploading via ClearanceDb Proxy .....

2023/02/09-14:31:09: Connecting to Clearance Database...

2023/02/09-14:31:09: Connected to ClearanceDB Proxy on machine cldbmachine, at port 7206.
2023/02/09-14:31:09: Successfully connected to Clearance Database.
```

```
2023/02/09-14:31:09: Lock the Clearance Database for results update...

2023/02/09-14:31:11: Starting upload for C:/ClearanceDB_Work_Area/Products/
141-f10002_A_1-Front_Suspension__view_/ClearanceResultsDbUpload.csvcldb ...

2023/02/09-14:31:11: 100% complete.

2023/02/09-14:31:11: Starting merge results.
 This could take quite a while, please be patient...

2023/02/09-14:31:17: Merge successful.

2023/02/09-14:31:17: Upload successful.


#----------------------------------------
# Update_product.pl execution SUCCEEDED
# Execution time = 00:00:08
#----------------------------------------

#-----------------------------------------------------------------------
# analyze_managed_product.pl complete
#
# Step 1a: Bomwriter.exe.       Result = SUCCEEDED.     Time=00:15:03
# Step 1b: Load_fcccache.exe.   Result = SUCCEEDED.     Time=00:13:05
# Step 2: Clearance.exe.        Result = SUCCEEDED.     Time=00:01:12
# Step 3: Update_product.pl.    Result = SUCCEEDED.     Time=00:00:08
# Total Time = 00:29:31
#-----------------------------------------------------------------------
Completed: Tue Feb  9 14:31:17
C:\ClearanceDB_Work_Area\Products\141-f10002_A_1-Front_Suspension__view_>
```

View results in the Lifecycle Viewer and Structure Manager

View results in the Lifecycle Viewer

1. In My Teamcenter, right-click the item revision containing your product data and choose **Send To→Lifecycle Viewer**.

   The dataset opens in the Lifecycle Viewer.

2. Choose **Clearance→Preferences→Requirement Components**.

3. In the **Requirement Rule Components** dialog box, select the **Requirement Rules from ClearanceDB Server** check box, and then click **OK**.

4. On the **3D Clearance** toolbar, click **Load Results**  .

5. In the **Load Clearance Results** dialog box, from the **Files of Type** list, choose **ClearanceDB DataBase Connection (*.dbc)**.

6. Select your DataBase Connection (DBC) file, and click **Open**.

   The 3D model and the database content are matched by the name of the top-level assembly node. Results are displayed in the **Results** list.

View results in Structure Manager

1. In My Teamcenter, right-click the item revision containing your product data and choose **Send To→Structure Manager**.

   The Structure Manager opens and displays the product structure.

2. Choose **View→Show/Hide Data Panel**.

3. In the Data Panel, click the **Viewer** tab.

   The visualization components load and the Structure Manager embedded viewer opens.

4. Choose **Graphics→Clearance→Preferences→Clearance→Requirements**.

5. In the **Requirement Rule Components** dialog box, select the **Requirement Rules from ClearanceDB Server** check box, and then click **OK**.

6. Right-click the embedded viewer toolbar area and choose **3D Clearance**.

   The **3D Clearance** toolbar is displayed.

7. On the **3D Clearance** toolbar, click **Load Results**  .

8. In the **Load Clearance Results** dialog box, from the **Files of Type** list, choose **ClearanceDB DataBase Connection (*.dbc)**.

9. Select your DataBase Connection (DBC) file, and click **Open**.

   The 3D model and the database content are matched by the name of the top-level assembly node. Results are displayed in the **Results** list.

Working with Design Context

Work with Design Context

You can combine ClearanceDB with Teamcenter's Design Context application to create an Integrated Clearance Management (ICM) system. Design Context identifies a series of target parts and then quickly finds other relevant data within a given proximity to those parts. This data can be sent to ClearanceDB to perform clearance analysis in database query (batch) mode or real-time mode. Results are displayed

in Design Context, and also can be sent to the Structure Manager, the Lifecycle Viewer, or standalone Mockup for display and further analysis.

ClearanceDB accepts any pruned or full product structure provided it is represented by a JT file in the Teamcenter database. Any parts for which JT data is not available are not included in the clearance analysis. The product structure also should be searchable in Design Context.

The ICM system offers two clearance analysis modes:

- **Database query mode**

  In database query mode, the ClearanceDB administrator creates a batch process to perform clearance analysis periodically as a background task, typically every night. The batch process invokes the Clearance Calculator to perform the analysis and uploads the results to the ClearanceDB database. The Design Context end user can then evaluate the results, identify issues, and assign the issues via a workflow to designers to analyze and resolve within other applications such as the Lifecycle Viewer, Structure Manager, NX, or other CAD package.

- **Real-time mode**

  In real-time mode, the rich client user selects target and background Bill of Materials (BOM) lines in Design Context, and then invokes a clearance analysis that is performed in real time. Typically, this option is used to make on-the-fly clearance calculations after design changes or prior to releasing a part. Teamcenter runs these calculations in the background, allowing the end user to continue with other work while waiting for the results. Results are displayed in the Design Context **Issues** panes.

  A SCO (Structure Context Object) containing the clearance results can also be created in the *Newstuff* folder, provided the **RDVCreateSCOForClearance** preference is set to `true`. The SCO can be opened in a subsequent session to retrieve the selected product structure lines and analysis results.

> Note:
>
> For more information on using Design Context, see Design Context in the Teamcenter help.

Design Context clearance analysis modes

Database query mode

The ClearanceDB administrator configures the scope of the analysis and the Design Context end user can only view the results. The end user can use the Design Context search engine capabilities to focus upon particular parts.

Clearance issues are displayed in one of the following **Issues** panes:

- **Target-Target Issues**

Shows clearance issues among all the appearances in the Design Context target appearances table in the third window. The specific issue between each pair of parts is listed.

- **Target-Background Issues**

  Shows clearance issues among target parts against all the appearances in the Design Context background appearances table in the third window. The specific issue between each pair of parts is listed.

- **Target-Other Issues**

Teamcenter displays each pair of parts that violate one of the defined clearance rules. All violations are shown in the context of the selected target part appearance or appearances. For each violation, the following information is listed:

- **Type**

  The clearance violation type.

- **Result**

  The calculated violation with respect to the requirement.

- **Requirement**

  The required clearance.

- **Location**

  The x,y,z coordinates of the violation.

> Note:
>
> You can also view additional results information such as issue **Status**, **Priority**, and **Date First Found**. To update the selection of columns shown in the **Issues** panes, modify the **ClearanceDBShownColumns** preference in the rich client.

Real-time mode

Real-time clearance analysis is a two step process. The first step is to create search criteria for the clearance calculation. The second step is to send the search criteria to Design Context to see the clearance analysis results.

To perform real-time clearance analysis, the end user manually selects BOM lines of interest in Design Context. BOM lines involved in the analysis process are Design Context target parts. The user selects these parts from the target and background BOM lines that are configured in the Design Context third

window. Global background parts cannot be included in a real-time clearance analysis. If particular BOM lines are not selected, all BOM lines in the target appearances are considered target parts.

Teamcenter analyzes the BOM lines selected as Design Context target parts against all other BOM lines in the Design Context third window. It presents the issues in the following categories:

- Target parts against all the appearances in the Design Context target appearances table in the third window.
- Target parts against all the appearances in the Design Context background appearances table in the third window.

Optionally, Teamcenter may create an SCO (Structure Context Object) in the *Newstuff* folder containing information about the session. The SCO can be opened in a subsequent session to retrieve the selected product structure lines and analysis results.

> Note:
>
> Creation of an SCO is optional and occurs only if the **RDVCreateSCOForClearance** preference is set to `true` in the rich client.

Specify connection information for Design Context

For Design Context to connect with the ClearanceDB database, you must use the Teamcenter **RDVClearanceProxyServers** preference to specify the ClearanceDB connection information.

> Note:
>
> You must have Teamcenter administrator rights to modify the **RDVClearanceProxyServers** preference.

1. Log on to the rich client as the administrator.
2. Choose **Edit→Options**.
3. At the bottom of the **Options** dialog box, click **Search**.
4. In the **Search On Keywords** box, type `RDVClearanceProxyServers`, and then click the magnifying glass icon to search for the preference.
5. In the **Preferences List**, select **RDVClearanceProxyServers**.
6. In the **Current Values** box, type your connection information according to the following syntax:

   ```
   <machine_name>:<port>:<connection_name>
   ```

where

For this parameter	Type this
`machine_name`	The name of the system running the ClearanceDB Proxy or Oracle Client.
`port`	The port number used for the ClearanceDB connection.
`connection_name`	The name of the Oracle connection.

7. Click the **+** sign to the right of the **Current Values** box.

> Note:
>
> The **RDVClearanceProxyServers** preference can consist of multiple ClearanceDB connections. For each additional connection that you want to establish, type the required connection information as described above and then click the **+** sign to the right of the **Current Values** box to update the preference.

8. Click **Modify**.

Specify to create an SCO for clearance results

Set the **RDVCreateSCOForClearance** preference to `true` if you want to create an SCO (Structure Context Object) after performing real-time analysis.

> Note:
>
> You must have Teamcenter administrator rights to modify the **RDVCreateSCOForClearance** preference.

1. Log on to the rich client as the administrator.
2. Choose **Edit→Options**.
3. At the bottom of the **Options** dialog box, click **Search**.
4. In the **Search On Keywords** box, type `RDVCreateSCOForClearance`, and then click the magnifying glass icon to search for the preference.
5. In the **Preferences List**, select **RDVCreateSCOForClearance**.
6. In the **Current Values** box, type `true`.
7. Click **Modify**.

Display additional clearance results information

Modify the **ClearanceDBShownColumns** preference to display additional clearance results information in the Design Context **Issues** panes.

> Note:
>
> You must have Teamcenter administrator rights to modify the **ClearanceDBShownColumns** preference.

1. Log on to the rich client as the administrator.
2. Choose **Edit→Options**.
3. At the bottom of the **Options** dialog box, click **Search**.
4. In the **Search On Keywords** box, type `ClearanceDBShownColumns`, and then click the magnifying glass icon to search for the preference.
5. In the **Preferences List**, select **ClearanceDBShownColumns**.
6. In the **Current Values** box, type the names of the ClearanceDB results columns that you want to display.
7. Click **Modify**.

Load ClearanceDB results in Design Context

1. Choose **Tools→Clearance Analysis**.
2. In the **Clearance Analysis** dialog box, select **Query the database for existing results**.
3. Click **Start Analysis**.

   After a delay that depends on the quantity of stored data, Teamcenter displays the retrieved clearance issues in one of the **Issues** panes.
4. To view the associated parts in the embedded viewer, select one or more issues and click the **Communicate to Design Context** button.

   Teamcenter opens the relevant BOM lines in Design Context, allowing you to examine the clearance details in the embedded viewer.

   Alternatively, you can also view the parts associated with one or more selected issues in standalone Teamcenter lifecycle visualization mockup if you click the **Start/Open In TcVis** button.

Perform real-time analysis

1. Select the product structure lines of interest in the third Design Context window. If you do not select any lines, Teamcenter includes all appearances in the third Design Context window in the analysis.

2. Choose **Tools→Clearance Analysis**.

3. In the **Clearance Analysis** dialog box, select **Perform Real-Time Clearance Analysis**.

4. Click **Start Analysis**.

   A progress bar shows the percentage completion of the calculation, and you can click **Cancel** above the progress bar to terminate the process if necessary. After a delay that depends on the scope of the query, Teamcenter displays the clearance issues in one of the **Issues** panes.

5. Click **OK** on the form.

   > Note:
   >
   > Real-time analysis results are not stored in the ClearanceDB database. If you want to preserve them, you must create an SCO (Structure Context Object) object. You can open the SCO in a subsequent session to retrieve the selected product structure lines and analysis results. The **RDVCreateSCOForClearance** preference must be set to `true` for an SCO to be created.

Open clearance results in an SCO

1. In your *Newstuff* folder, right-click the SCO containing your results and choose **Send To→Design Context**.

   Teamcenter opens the results in the first Design Context window.

2. Click **Finish**.

   Teamcenter opens the third Design Context window.

   > Note:
   >
   > Click **Yes** on any confirmation dialog boxes that are displayed.

3. Choose **Tools→Clearance Analysis**.

   Teamcenter displays the **Clearance Analysis** dialog box.

4. Select **Display Cached Results from SCO** and then click **Start Analysis**.

After a delay that depends on the quantity of stored data, Teamcenter displays the retrieved clearance issues in one of the **Issues** panes.

Working with variants

Understanding variant-based clearance analysis

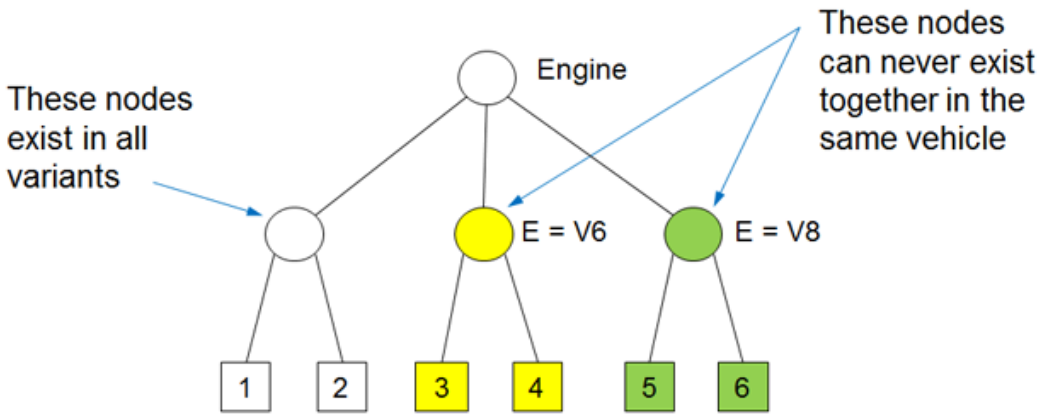
Variant-based clearance analysis uses product variant information stored in Teamcenter. Analyses can be performed on a 150% BOM structure, which is the union of two or more product variants. Non-buildable combinations of product structure are detected and excluded from the clearance analysis.

The benefits of removing non-buildable occurrence relationships from the ClearanceDB analysis include the following:

- Eliminate results between non-buildable product configurations.
- Faster clearance analysis.
- Fewer clearance incidents for engineers and designers to evaluate.

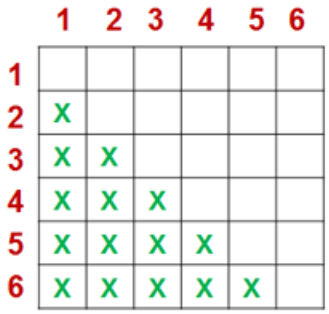
A simple example with variant conditions (150% BOM with variants)

Using variant analysis, a single 150% BOM can contain all buildable product combinations. This enables you to perform a single clearance analysis, which excludes all non-buildable part pairs.



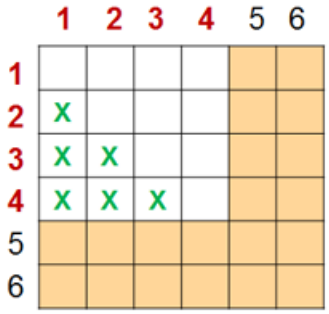
With no variants, all nodes are analyzed (15 part pairs).

No nodes are excluded.



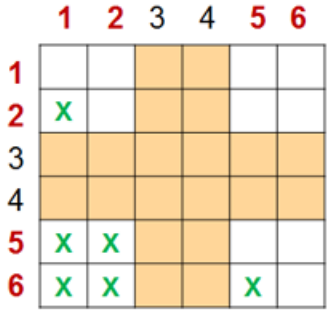
With the E=V6 variant, nodes 1, 2, 3, and 4 are analyzed (6 part pairs).

Nodes 5 and 6 are excluded (9 part pairs).



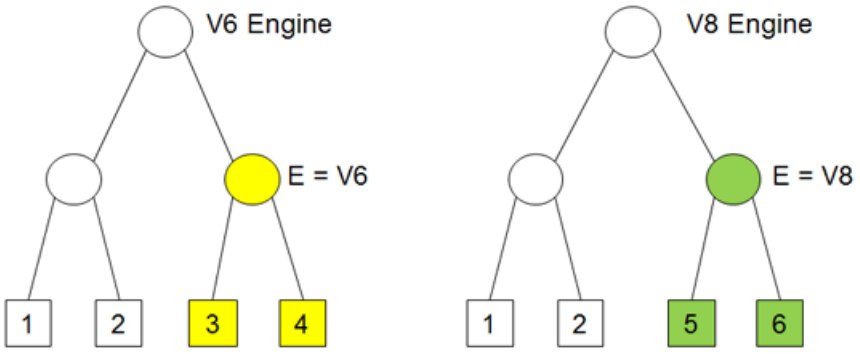
With the E=V8 variant, nodes 1, 2, 5, and 6 are analyzed (6 part pairs).

Nodes 3 and 4 are excluded (9 part pairs).



A simple example without variant conditions (separate 100% BOMs)

Without using variant analysis, you must create and manage separate 100% BOMs to represent each buildable product combination. You must evaluate each BOM with a separate clearance analysis.



For the analysis of the V6 Engine, without variant conditions, nodes 1, 2, 3, and 4 are analyzed (6 part pairs).

No nodes are excluded.

	1	2	3	4
1				
2	X			
3	X	X		
4	X	X	X	

For the analysis of the V8 Engine, without variant conditions, nodes 1, 2, 5, and 6 are analyzed (6 part pairs).

No nodes are excluded.

	1	2	5	6
1				
2	X			
5	X	X		
6	X	X	X	

For more information about working with Teamcenter variant conditions, see Structure Management on Rich Client — Usage in the Teamcenter help.

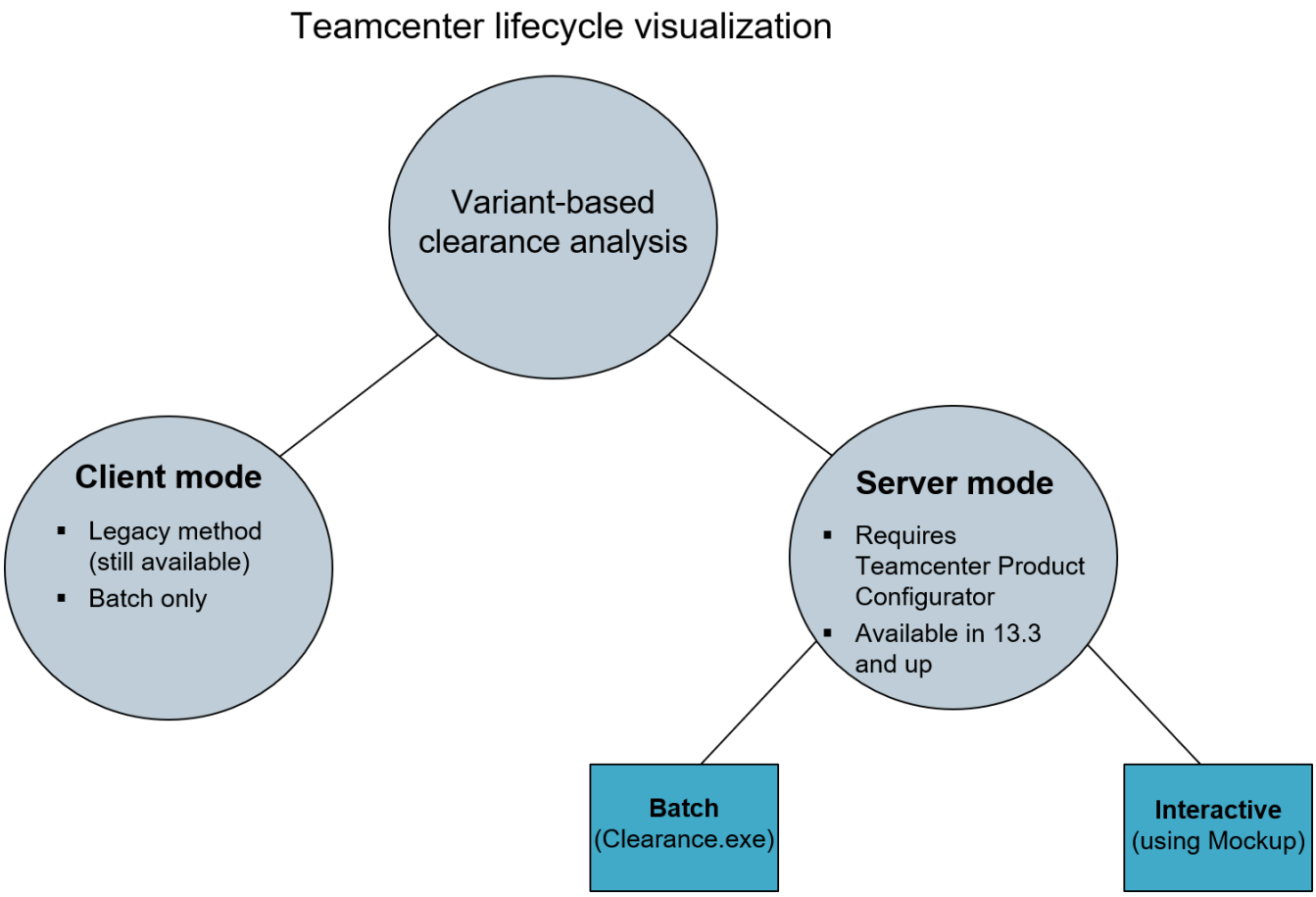
Variant-based clearance analysis methods

You can perform variant-based clearance analysis using the following methods:

- Client-side
  - No Teamcenter connection is required during the analysis.
  - Can only be run in batch using *Clearance.exe*.
- Server-side

- Requires a connection to Teamcenter Product Configurator during the analysis.
- Can be run either interactively in Teamcenter lifecycle visualization or in batch using *Clearance.exe*.

See Product Configurator on Rich Client to learn more about creating, modifying, and managing variants in Teamcenter.



Variant-based clearance analysis (client-side)

You must enable the option to evaluate ClearanceDB products according to Teamcenter variant conditions.

1. Using a text editor, open *Clearance.cfgglobal* and adjust the following settings:

> Note:
>
> You can also specify these options in the *Clearance.cfgproduct* file for the product.

LexicographicalVariantAnalysis

Defines the mode of the evaluation of variant condition relational expressions. Choose one of the following:

No — If indeterminable variant conditions exist, the affected variant inferences are asked from the server. This is the default.

Yes — If indeterminable variant conditions exist, evaluate them lexicographically.

> Note:
>
> Variant conditions that cannot be evaluated based on textual representations are indeterminable.

VariantAnalysisClientTraceFile

Specifies the name for the log file of the variant analysis. By default, this is not set, and a log file is not generated.

> Example:
>
> **VariantAnalysisClientTraceFile=cldb_variant_analysis.log**

VariantAnalysisClientTraceFlags

Specified the content of the log file of the variant analysis. The trace flags are additive, concatenated with the plus (+) character.

> Example:
>
> **VariantAnalysisClientTraceFlags=CONFIGURATION+STATISTICS**

Add any of the following flags:

CONFIGURATION	Lists the variant analysis configuration attributes.
STATISTICS	Provides the basic variant analysis statistics.
VARIANTCONDITIONS	Provides details of textual variant conditions.
DETERMINABILITY	Lists the determinability of variant conditions.
SATISFIABILITY	Lists the satisfiability of variant conditions.
EXCLUDEDVCPAIRS	Lists excluded variant condition pairs.
EXCUDEDUIDPAIRS	Lists excluded clearance element pairs as ABSOCCs.
EXCLUDEDNGIDPAIRS	Lists excluded clearance element pairs as NGIDs.
IMPACT	Lists the impact of variant conditions on the product structure.

> Caution:
>
> Enabling the **EXCUDEDUIDPAIRS** and **EXCLUDEDNGIDPAIRS** trace flags may result in extremely large log files.

VariantLogicalExpression

Define the variant condition UserValue title and BOM line property pair in the .plmxml file. This has the form of:

“Variant Condition”:bl_variant_condition

“Variant Formula”:bl_formula

> Example:
>
> **VariantLogicalExpression="VC-V6:bl_variant_condition"**

> Note:
>
> This must match the content of the **BomWriterUserAttributes** setting.

BomWriterUserAttributes

Specify the variant conditions for the BOMwriter to include in the generated .plmxml file. Type these according to the following syntax:

target:Instance,key:myAttribute,literal:\"My Attribute Value\"

> Note:
>
> This is the same option as the **bomwriter -ua=** command line argument.

> Example:
>
> Use this option to include variant model related BOM line properties in the generated .plmxml file. For example:
>
> **BomWriterUserAttributes=target:Instance,key: VC-V6,prop: bl_variant_condition**

RulesObject = Variant Analysis

Specify to perform analysis using Teamcenter variant conditions. To enable this option, remove the number sign symbol (**#**) that precedes the **RulesObject = Variant Analysis** line.

2. Save the file.

Variant-based clearance analysis (server-side)

Performing variant-based clearance analysis in Lifecycle Visualization

1. With an unconfigured .plmxml file open, choose **Menu→Clearance→Preferences→Product Configurator**.

2. In the **Product Configuration** dialog box, do the following.

   a. Select the **Enable Product Configurator** check box.

   b. From the **Variant Rule** dropdown, select the desired variant rule or criteria to apply against the loaded file during clearance analysis.

   c. Click **OK**.

3. Run a clearance analysis.

Performing variant-based clearance analysis in batch

To perform variant analysis in batch mode (*Clearance.exe*) using Teamcenter Product Configurator, complete the following steps.

1. Ensure that you are connected to Teamcenter and that the connection is maintained for the duration of the analysis process.

2. Using a text editor, open *Clearance.cfgglobal* and adjust the following settings:

   > Note:
   >
   > You can also specify these options in the *Clearance.cfgproduct* file for the product, which will override settings in the *Clearance.cfgglobal* file.

   EnableProductConfigurator

   Enables *Clearance.exe* to use the Teamcenter Product Configurator to perform variant analysis.

   > Example:
   >
   > **EnableProductConfigurator=True**

   ProductConfiguratorVariantRule

   Specifies the saved variant rule that is used for communicating with the Product Configurator.

   > Example:
   >
   > **ProductConfiguratorVariantRule=**<*valid variant rule*>

   VariantLogicalExpression

   Define the variant condition UserValue title and BOM line property pair in the .plmxml file. This has the form of:

“Variant Condition”:bl_variant_condition

“Variant Formula”:bl_formula

> Example:
>
> **VariantLogicalExpression="VC-V6:bl_variant_condition"**

> Note:
>
> This must match the content of the **BomWriterUserAttributes** setting.

BomWriterUserAttributes

Specify the variant conditions for the BOMwriter to include in the generated .plmxml file. Type these according to the following syntax:

target:Instance,key:myAttribute,literal:\"My Attribute Value\"

> Note:
>
> This is the same option as the **bomwriter -ua=** command line argument.

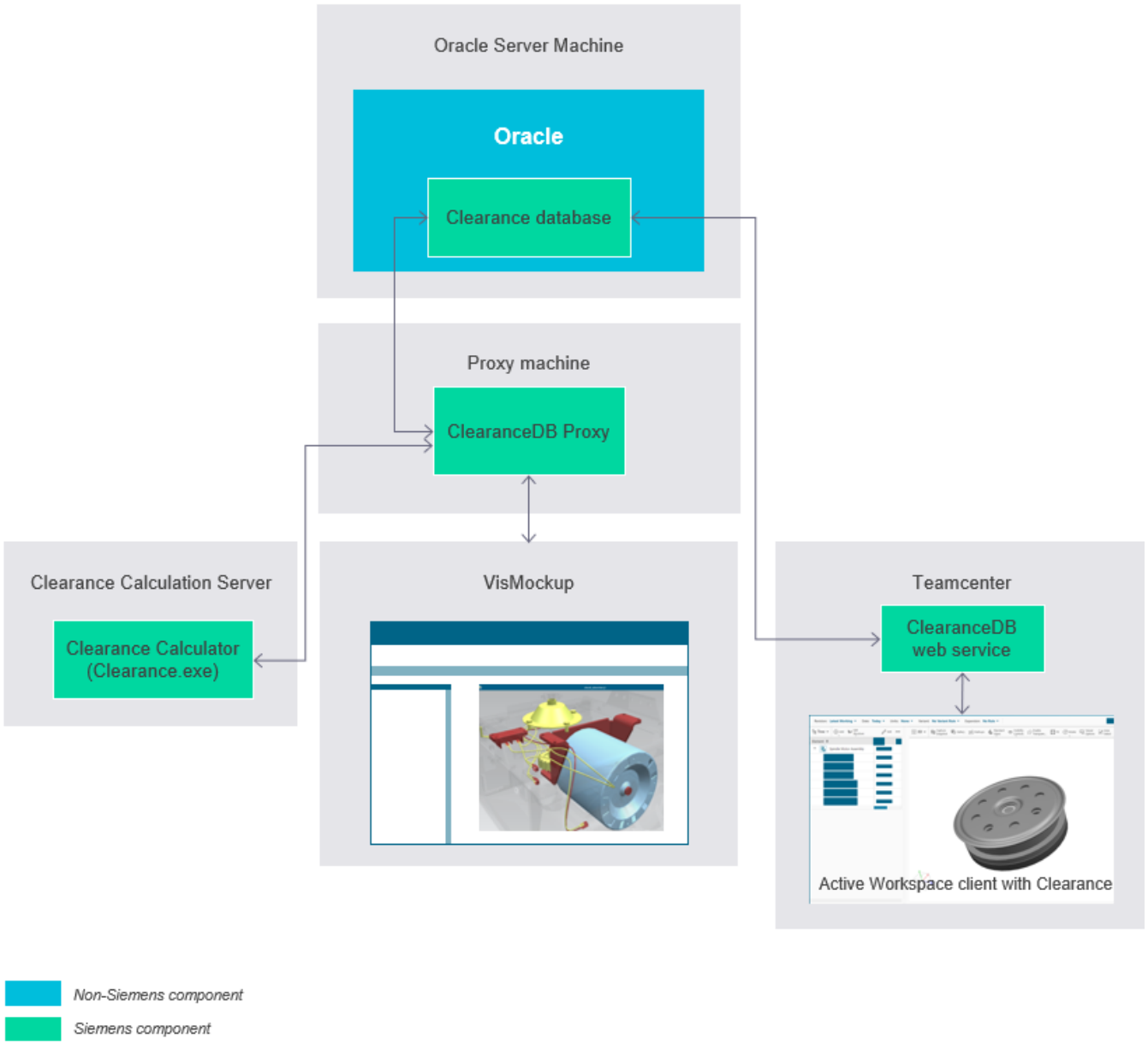
> Example:
>
> Use this option to include variant model related BOM line properties in the generated .plmxml file. For example:
>
> **BomWriterUserAttributes=target:Instance,key: VC-V6,prop: bl_variant_condition**

3. Save the file.

Using ClearanceDB with Active Workspace

Using ClearanceDB with Active Workspace

The ClearanceDB with Active Workspace client uses a web service to connect to the ClearanceDB. For more information, see *Connect to an existing 3D Clearance database using Deployment Center*.



Clone stable IDs

To view clearance results in Active Workspace, you must specify the clone stable ID for the BOMwriter to include in the generated .plmxml file. You can specify this attribute in the *Clearance.cfgglobal* file if you do not have specific metadata for every product, or in the *Clearance.cfgproduct* file if you have product metadata.

Add the following attribute under the BomWriterUserAttributes section in either of the files identified above.

```
BomWriterUserAttributes=target:Instance,key:__PLM_CLONE_STABLE_INST_UID,prop
:bl_clone_stable_occurrence_id
```

Note:

After adding this attribute to either the *Clearance.cfgglobal* or *Clearance.cfgproduct* file, run the *update_ngids.pl* utility for each product to ensure that the clearance results for each product can be viewed in Active Workspace.

Run the clone stable IDs utility

After **adding the clone stable ID attribute** to either the *Clearance.cfgglobal* or *Clearance.cfgproduct* file, you must run the *update_ngids.pl* utility for each product to ensure that the clearance results for each product can be viewed in Active Workspace. If you add the attribute but do not run the utility, when the clearance results are updated your end users may not be able to view the updated results in Active Workspace.

1. In an environment configured to run Teamcenter utilities, open a command prompt.

   For information about configuring an environment to run Teamcenter utilities, see Manually configure your environment for Teamcenter utilities in *Utilities Reference*.

2. At the command prompt, type:

   update_ngids.pl

3. Run the utility for each product you want to view in Active Workspace.