TEAMCENTER

Teamcenter Upgrade Using TEM

Teamcenter 2412

SIEMENS

About Siemens Digital Industries Software

Siemens Digital Industries Software is a global leader in the growing field of product lifecycle management (PLM), manufacturing operations management (MOM), and electronic design automation (EDA) software, hardware, and services. Siemens works with more than 100,000 customers, leading the digitalization of their planning and manufacturing processes. At Siemens Digital Industries Software, we blur the boundaries between industry domains by integrating the virtual and physical, hardware and software, design and manufacturing worlds. With the rapid pace of innovation, digitalization is no longer tomorrow’s idea. We take what the future promises tomorrow and make it real for our customers today. Where today meets tomorrow. Our culture encourages creativity, welcomes fresh thinking and focuses on growth, so our people, our business, and our customers can achieve their full potential.

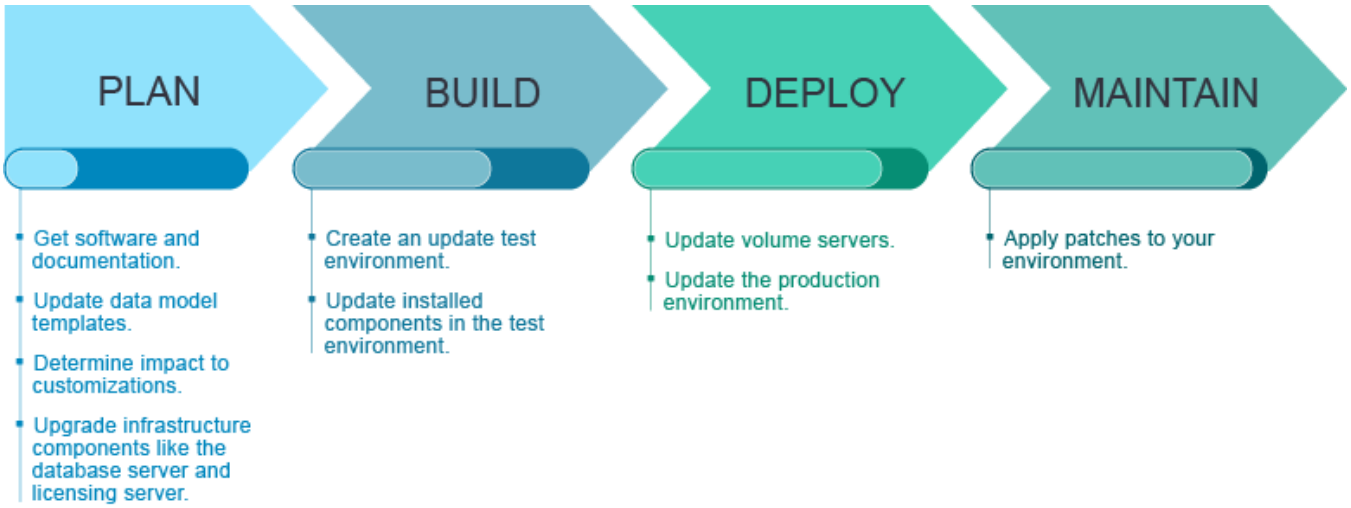
Support Center: **support.sw.siemens.com**

Send Feedback on Documentation: **support.sw.siemens.com/doc_feedback_form**

Contents

1. Upgrading Teamcenter

Upgrading Teamcenter with Active Workspace follows a similar four-phase process as installing the Teamcenter environment with Active Workspace.



Proceed to the stages of the upgrade process:

- **Plan** your upgrade process.
- **Build** an upgrade test system and perform a test upgrade.
- **Deploy** the upgrade to your production environment.
- **Maintain** your environment with patches between upgrades.

This process applies when you upgrade to any new version of Teamcenter.

If you do not use Active Workspace, but you use the Teamcenter *rich client*,[1] you can upgrade rich clients at the same time as you upgrade Teamcenter servers, or upgrade them after.

Where do I go from here?

You can begin with *Plan the Teamcenter upgrade*, or proceed to one of the following common upgrade tasks:

1 The Teamcenter rich client is a Java-based desktop client that is an alternative to Active Workspace.

Administrator	
Downloading software and documentation, learning about upgrading templates	See *Plan the Teamcenter upgrade*.
Upgrading database, updating licenses	See *Build a Teamcenter update test environment*.
Upgrading a rich client	See the appropriate Teamcenter rich client installation guide for Windows or Linux.
Upgrading a production environment	See *Deploy the Teamcenter upgrade*.
Applying Teamcenter patches	See *Installing Teamcenter patches*.

Part I: Plan the Teamcenter upgrade

Plan your Teamcenter upgrade in consideration of all software components in your environment, including infrastructure components like database servers and license server, which may need upgrading before you perform the Teamcenter upgrade.

Plan to perform an upgrade on a test environment to identify and resolve potential issues before you upgrade production systems.

The *Teamcenter Deployment Reference Architecture*, available from the Teamcenter downloads page on Support Center, is an essential resource during upgrade. It provides information such as:

- Guidelines for copying a Teamcenter environment for upgrade testing.
- Detailed examples of Teamcenter and Active Workspace deployments.
- Sample configurations and scripts to use with Deployment Center.

Use the *Teamcenter Deployment Reference Architecture* to help plan your upgrade of Teamcenter with Active Workspace. Then proceed to building a test environment for upgrade.

2. Where to start

Get documentation

Teamcenter documentation is available from two sources:

- **Internet: Support Center**

  This is Siemens Digital Industries Software's comprehensive support portal, which provides documentation for all Siemens software products and versions.

  You require a Webkey account to access Support Center. However, you can avoid this requirement by installing the *Siemens Documentation Proxy*, which provides secure documentation access using a personalized API key, with no need to log on. Teamcenter clients can be configured to access help through the Documentation Proxy.

- **Intranet: Siemens Documentation Server**

  This is a locally installed server that can host documentation for all your Siemens Digital Industries Software products. No Internet access is required. You can configure the server for single-machine use or network-wide access with no Webkey or API key required.

  Teamcenter clients can be configured to access the help on the Siemens Documentation Server.

For an orientation to Support Center, see Siemens Software **Support Center videos** on YouTube.

Install the Documentation Proxy or the Documentation Server

Log on to Support Center and open the **Siemens Documentation Server Downloads** page:

Products→Siemens Documentation Server→Downloads

Choose how you want to access documentation, and then install the Documentation Proxy or the Documentation Server.

Installing Siemens Documentation Proxy	Installing Siemens Documentation Server
1. Under **Select a Version**, choose **Documentation Proxy 3**, and then click the tile for the latest **Documentation Proxy 3.***x* release. 2. Download the Documentation Proxy installer: **Windows: DocumentationProxy.***version***.exe**	1. Under **Select a Version**, choose **Siemens Documentation Server 3**, and then click the tile for the latest **Siemens Documentation Server 3.***x* release. 2. Download the Documentation Server installer:

Installing Siemens Documentation Proxy	Installing Siemens Documentation Server
Linux: DocumentationProxy.*version*.aol 3. Install the Documentation Proxy according to the *Documentation Proxy Installation Guide* for Windows or Linux, available under **Release Documentation** on the software download page. Installing the Documentation Proxy requires generating an API key at the **Siemens Support Center account site**. This may require you to obtain your Siemens site ID from your Teamcenter administrator.	**Windows: HelpServer.*version*.exe** **Linux: HelpServer.*version*.aol** 3. Install the Documentation Proxy according to the *Siemens Documentation Server Installation Guide* for Windows or Linux, available under **Release Documentation** on the software download page.

Note the machine and port on which you configured the Documentation Proxy or Documentation Server. These are required to configure help access from Teamcenter clients.

Install the Teamcenter 2412 documentation kit

If you installed the Siemens Documentation Proxy, skip this section.

Teamcenter documentation is delivered in *documentation kits*. Each kit contains documentation content and an installation wizard that automatically installs documentation onto your Documentation Server.

1. Log on to Support Center and open the **Teamcenter Downloads** page:

   Products→Teamcenter→Downloads

2. Under **Select a Version**, choose **Teamcenter 2412**, and then click the **Teamcenter 2412** tile.

3. Install the Teamcenter 2412 documentation onto the Documentation Server:

   Windows: Double-click the **docs-teamcenter-2412-*locale*.exe** file.

   Linux: Enter the following commands:

   ```
   sudo chmod 777 docs-teamcenter-2412-locale.aol
   sudo teamcenter-2412-locale.aol
   ```

   These commands require administrative privileges.

For more information about installing documentation kits and managing the Documentation Server, see the *Siemens Documentation Server Installation Guide* for Windows or Linux.

Verify documentation access

Open the Teamcenter 2412 documentation from your preferred source:

- Support Center (Webkey logon):

  https://docs.sw.siemens.com/en-US/doc/282219420/PL20240523460057788.tc_doc_home

- Support Center (via Documentation Proxy):

  http://*doc-proxy-host***:***doc-proxy-port***/en-US/doc/282219420/PL20240523460057788.tc_doc_home**

- Siemens Documentation Server:

  http://*doc-server-host***:***doc-server-port***/en-US/doc/282219420/PL20240523460057788.tc_doc_home**

Enable help access in Teamcenter clients

Configure help in the rich client

If you use the rich client, configure the **Help** button in the client to open Teamcenter help from your preferred source.

During installation:

When prompted in the installation tools (Deployment Center or TEM), enter your preferred documentation URL in the **Documentation server URL** box.

After installation:

Configure help access in the rich client as described in the appropriate rich client installation guide for Windows or Linux.

Configure help in Active Workspace

Configure the **Help** button in the client to open Teamcenter help from your preferred source.

During installation:

The Active Workspace **Help** button links to Support Center by default and cannot be changed during installation. Accessing help directly on Support Center requires a Webkey account.

After installation:

If you use the Documentation Proxy or the Documentation Server, set the **TC_Help_Documentation_Link** preference to the path to your preferred documentation source. This configures the Active Workspace **Help** button to link to that source.

If you use Support Center via the Documentation Proxy, set this preference to **http://***doc-proxy-host***:***doc-proxy-port***/en-US/doc/282219420/PL20240523460057788.**

If you use Siemens Documentation Server, set the preference to **http://***doc-server-host***:***doc-server-port***/en-US/doc/282219420/PL20240523460057788.**

Get software

Upgrading Teamcenter requires the Teamcenter software kit, which includes microservice framework and Active Workspace software.

1. Log on to Support Center and open the **Teamcenter Downloads** page:

   Products→Teamcenter→Downloads

2. Under **Select a Version**, choose **Teamcenter 2412**, and then click the **Teamcenter 2412** tile.

3. Download the Teamcenter 2412 software kit for your platform:

   - Windows: **Tc2412_wntx64.zip**
   - Linux: **Tc2412_lnx64.zip**

4. Extract its contents to a local directory.

If an update (patch) to Teamcenter 2412 is available, for example, Teamcenter 2412.0001, you can additionally download the update, and apply it during the Teamcenter installation.

Can I place the software in a remote location?

You can place software kits on a non-local drive, with the following considerations.

TEM cannot install software from UNC paths, for example, **\\mediaserver\tcmedia**. If the software kits are located on a remote host, map a drive to each software location using the **net use** command.

Open an administrator command prompt and type the **net use** command:

```
net use drive-letter: UNC-path
```

For example:

```
net use z: \\mediaserver\tcmedia
```

If you mount software kits on a remote NFS server, you must launch Teamcenter Environment Manager on the local server node.

System requirements

Verify system software requirements

1. Log on to Support Center and open the **Support White Papers Certifications** page:

   a. Open **Products→Teamcenter→Downloads**.

   b. Under **Select a Version**, choose **Support White Papers→Support White Papers Certifications**, and then click the **Support White Papers Certifications** tile.

2. Download the following support documents:

   Software Certifications Matrix (Tc2412PlatformMatrix-*date*.xlsx)

   Contains information about system software certified for Teamcenter, such as operating systems and Java runtime environments (JREs).

   Teamcenter Interoperability Matrix (Teamcenter Interoperability Matrix *date*.xlsx).

   Lists supported Teamcenter versions that can be upgraded to Teamcenter 2412. Also lists versions of Siemens Digital Industries Software products that are compatible with Teamcenter 2412.

   The Teamcenter Interoperability Matrix also correlates versions of Deployment Center with compatible versions of Teamcenter, and shows supported paths for upgrading Deployment Center. For information about upgrading Deployment Center, see *Deployment Center — Usage*.

Make sure you install versions of the required software that are listed in the Software Certifications Matrix and the Teamcenter Interoperability Matrix.

Supported upgrades

See the Teamcenter Interoperability Matrix for versions of Teamcenter that can be upgraded to Teamcenter 2412.

If your current Teamcenter version is earlier than those supported for upgrade, you must upgrade to a supported version before you upgrade to Teamcenter 2412.

Platforms

Determine from the following table which Teamcenter 2412 components are supported on your operating system. Check marks (√) indicate components supported on the given operating system.

Operating system	Corporate server	Web tier	Active Workspace	Rich Client	Business Modeler IDE client	TCCS
Microsoft Windows (desktop platforms)			✓	✓	✓	✓
Microsoft Windows Server	✓	✓			✓	
SUSE Linux	✓	✓	✓	✓	✓	✓
Red Hat Linux	✓	✓	✓	✓	✓	✓

- On Windows platforms, disable Windows User Account Control (UAC) before you install Teamcenter. This option is available in the **Control Panel→User Accounts** dialog box.

  Windows UAC can interfere with Teamcenter installation programs. Siemens Digital Industries Software recommends turning off UAC for administrative users only.

  For more information, see Microsoft Windows documentation.

- If you use a non-English language operating system version of Windows, you must install and enable the Multilingual User Interface (MUI) pack to ensure the language font is displayed properly.

  1. Download and install the MUI pack for Windows from Microsoft.
  2. Open the **Regional and Language Options** dialog box in the Windows Control Panel.
  3. In the **Languages** tab, set the required language for the menus and dialogs.
  4. In the **Advanced** tab and the **Regional Options** tab, set the required language.

- Linux hosts must have graphics capabilities to run Teamcenter installation tools.

  For operating system requirements, see the Hardware and Software Certifications knowledge base article on Support Center.

- Linux hosts must have the **nslookup** utility available to ensure operation of the license server.

- Make sure Linux host names do not exceed 31 characters in length. Host names longer than 31 characters cause Teamcenter corporate server installation to fail during saving of the POM schema file in the *TC_DATA* directory.

  Teamcenter installation tools do not require fully qualified domain names for host names. If your fully qualified domain name exceeds 31 characters, use the server short host name instead.

For more information, see the solutions document 002-7004480 on Support Center.

- Teamcenter Environment Manager (TEM) and Web Application Manager require the ISO8859-1 character set. Make sure this character set is available on your host.

Database

Teamcenter requires a relational database management system (RDBMS) for storing Teamcenter data. Before you install Teamcenter, you must install an Oracle database server or a Microsoft SQL Server database server.

If your database server is not a supported version, upgrade your database server to a supported version before you install Teamcenter.

Choose a database management system that suits the platforms of your Teamcenter servers and clients, and make sure your Teamcenter corporate server host has access to the database server.

If you use Oracle, set system parameters to recommended values to ensure adequate database performance.

Java Runtime Environment

Teamcenter Environment Manager (TEM) requires a supported 64-bit Java Runtime Environment (JRE) or Java Development Kit (JDK). If a certified JRE is not available on the host, TEM cancels installation.

> Note:
>
> If you use open-source Java, you must use a JDK, as some open-source JREs do not contain all required libraries.

Before you launch TEM to install Teamcenter:

1. Download and install a certified 64-bit JRE or JDK.

   For certified Java versions, see the Software Certifications Matrix on Support Center.

2. Set the **JRE_HOME** environment variable to the location of the supported JRE or JDK. After installation is complete, TEM no longer requires this variable.

   Alternatively, you can launch TEM in a command prompt and specify the JRE location using the **-jre** argument:

   ```
   tem -jre JRE-path
   ```

   For example:

```
tem -jre c:\apps\jre1.8
```

Web tier support

Install the required software for the Teamcenter web tier you use:

- **Java EE web tier**

  Java Runtime Environment (JRE)

  Install a supported JRE on the host where you build Teamcenter web applications.

  Java EE application server

  Install a supported application server on the host where you deploy Teamcenter web applications.

- **.NET web tier**

  Microsoft Internet Information Server (IIS)

  Install IIS on your Teamcenter corporate server host and add the required role services.

  Microsoft .NET framework

  Install the .NET framework on all Teamcenter hosts.

If you use the Teamcenter Java EE web tier, install the following software:

Java Runtime Environment (JRE)

Install a supported JRE on the host where you build Teamcenter web applications.

Java EE application server

Install a supported Java EE application server on the host where you deploy Teamcenter web applications.

Some web application servers require special configuration for use with Teamcenter.

Web browser

A web browser is required if you use the following:

- Teamcenter online help
- Active Workspace

- Deployment Center

For these products, Teamcenter supports the following web browsers:

- Windows systems: Microsoft Edge, Mozilla Firefox, and Google Chrome
- Linux systems: Mozilla Firefox and Google Chrome

For supported browser versions, see the Software Certifications Matrix on the **Support White Papers Certifications** page on Support Center.

3. Upgrading templates

Templates

A *template* is a container that holds data model definitions. A template can contain any number of business objects, classes, lists of values, and business rules. Any Teamcenter feature that adds definitions to the data model has an associated template. In addition, templates can be supplied to you from another Teamcenter site, partner, or third party.

> Caution:
>
> You *must* have access to all templates used at your site before beginning the upgrade of the corporate server. This is very important. During the corporate server upgrade, you load all templates used by your site. Templates can only be loaded during the upgrade of the corporate server. They cannot be loaded after the upgrade. Failing to load all templates your site depends on causes problems in managing the data model and can result in loss of data, time, and money.

How templates are supplied

Templates are supplied by:

- The Teamcenter software kit
- Software kits for asynchronous Teamcenter releases and integrations
- Other Teamcenter sites, partners, or third parties

Templates supplied on the Teamcenter software kit

Teamcenter supplies templates to organize sets of definitions for specific industries, applications, or functional areas. Examples of templates provided by Teamcenter are Teamcenter Foundation and Wire Harness Configuration.

These templates are available in the software kit (the installation DVD or downloaded software). For example, the Teamcenter Foundation feature and the Wire Harness Configuration feature are both installed using the software kit, both add definitions to the data model, and both have associated templates found in the software kit.

Templates supplied by asynchronous Teamcenter releases

Some Teamcenter features are released asynchronously and are distributed separately from the Teamcenter software kit (the installation DVD or downloaded software) and are found on their own software kit. An example is the CATIA integration.

Templates supplied by other Teamcenter sites, partners, or third parties

You can use templates created by other sites, partners, or third parties.

Loading templates

Before you upgrade the corporate server, you must have access to all templates on which your site depends.

- Templates supplied by Teamcenter on the installation kit are automatically detected by Teamcenter Environment Manager (TEM) and loaded during the upgrade.
- Templates supplied asynchronously by Teamcenter must be detected and loaded during the upgrade of the corporate server. This is done using the **Upgrade Database Features** panel in TEM during the upgrade.

  You must have access to these templates before beginning the corporate server upgrade. Therefore, you cannot begin your upgrade until all asynchronous features that you use are released.
- Templates supplied by another Teamcenter site, partner, or third party must be loaded manually during the upgrade of the corporate server. This is done using the **Upgrade Database Features** panel in TEM during the upgrade.

  You must have access to these templates before beginning the corporate server upgrade.

Upgrade Database Features panel

- Templates are loaded into your environment during your corporate server upgrade using the **Upgrade Database Features** panel in TEM.

  All features available from the software kit are listed. Those that you have not installed are grayed-out.
- Templates supplied by Teamcenter asynchronous from the kit, templates supplied by another site, partner, or third party are not listed in the **Upgrade Database Features** panel until you manually load them. Click the **Browse** button and select the templates.
- After you select the template, it is listed in the **Upgrade Database Feature** panel.

Business Modeler IDE

The Business Modeler Integrated Development Environment (IDE) is a tool for customizing the data model of your Teamcenter installation. Use the IDE to create business objects, classes, attributes, lists of values (LOVs), and rules.

The Business Modeler IDE is built on top of the Eclipse platform. Eclipse is a generic platform for tool development that is extended via its plug-in and extension point technology.

You can install the Business Modeler IDE two ways:

- As a stand-alone application

  This method installs the Eclipse platform.

- As part of an existing Eclipse environment

4. Using the Upgrade Assistant

Teamcenter provides a tool, the *Upgrade Assistant* utility, to help you determine impact to your server side customization extension applications when you upgrade to a target release. It evaluates whether custom code needs to be reworked before upgrade. You can evaluate the tool's recommended remediation, for example, ensuring API stability or removing calls to deprecated or obsolete APIs.

This tool currently reports only the usage of deprecated and obsolete ITKs in server side customization applications. The utility takes server side customization application libraries (**dll**s) as input and runs a **dumpbin** report on the library looking for import symbols. The import symbols are then analyzed with the deprecated and obsoleted API in the target release to produce a **csv** file report indicating whether rework is needed immediately (if the application is using an obsolete ITK) or future rework should be planned (if the application is using a deprecated ITK).

The *What's changed in Teamcenter APIs* reference on Support Center identifies replacements for deprecated and obsolete APIs. This reference also provides replacement information for other deprecated and obsolete artifacts like functions and macros. Use this reference when updating your customizations in preparation for upgrade.

Run the Upgrade Assistant as part of your upgrade planning, to help identify and correct customization problems before you begin upgrading your Teamcenter environment. You can run this utility before you download your target upgrade version of Teamcenter.

Download the Upgrade Assistant

1. Log on to Support Center and browse to the Teamcenter 2412 downloads page.

2. Browse to **Additional Downloads→ Tools for Teamcenter→ Tools for Teamcenter Upgrade Assistant**.

3. In the resulting list of downloads, find the Upgrade Assistant, and then download the **Tc2412_UpgradeAssistantITKReporter.zip** package for your platform (Windows or Linux).

Install the Upgrade Assistant (Windows)

1. Make sure a supported version of Microsoft Visual Studio is installed on your local machine. For certified versions of Visual Studio, see the Hardware and Software Certifications knowledge base article on Support Center.

2. Make sure the following system environment variables are set:

   MSDEV_HOME

   Set to the Visual Studio installation directory, for example, **set MSDEV_HOME=C:\apps\MVS16\VC**.

   PATH

Make sure this value includes your Teamcenter Perl install directory, for example, **set PATH=C:\apps\tc\tc2412\TR\perl\bin;%PATH%**.

3. Expand the **Tc2412_UpgradeAssistantITKReporter.zip** package to a local directory.

4. Open a Teamcenter command prompt from the Windows program list by choosing **Teamcenter→***Tc-config-name* **Command Prompt**.[1]

5. Change to the directory in which you expanded the Upgrade Assistant package:

   `cd` *upgrade-assistant-dir*

6. Type the following command to launch the Upgrade Assistant and view its arguments and options:

   ```
   Tc2412_UpgradeAssistantITKReporter\ITKReporter\bin\TcUpgradeAssistant
   ITKReporter.bat -h
   ```

Install the Upgrade Assistant (Linux)

1. Expand the **Tc2412_UpgradeAssistantITKReporter.zip** package to a local directory.

2. Change to the directory in which you expanded the Upgrade Assistant package:

   `cd` *upgrade-assistant-dir*

3. Run the following command to launch the Upgrade Assistant and view its arguments and options:

   ```
   ./ITKReporter/bin/TcUpgradeAssistantITKReporter.sh -h
   ```

Generate an Upgrade Assistant report

The Upgrade Assistant utility accepts the following arguments:

Argument	Description
apps	Specifies a single path or a sequence of comma-separated file paths, or a text file containing a list of custom applications (absolute path of one application per line) or a directory path containing a list of custom applications.
from_release	Specifies your current Teamcenter version, for example, **2412**. This argument is optional. If this argument is not provided, the utility reads the Teamcenter version from the environment variables in the Teamcenter command prompt.
out	Specifies the output file (**csv** format) and path for the Upgrade Assistant report. For example:

1 Alternatively, you can set Teamcenter environment variables in a standard command prompt by typing *TC_DATA***tc_profilevars**, replacing *TC_DATA* with the path to your Teamcenter data directory.

Argument	Description
	D:\Temp\mycustom_13_2412.csv
h	Displays help for the utility.

To generate an Upgrade Assistant report, perform the following steps:

1. Open a Teamcenter command prompt from the Windows program list by choosing **Teamcenter→***Tc-config-name* **Command Prompt**.

2. Change to the *upgrade-assistant-dir***\Tc2412_UpgradeAssistantITKReporter\ITKReporter\bin** directory (on Windows systems) or *upgrade-assistant-dir***/Tc2412_UpgradeAssistantITKReporter/ITKReporter/bin** (on Linux systems).

3. Type the following command:

   - **Windows:**

     TcUpgradeAssistantITKReporter.bat -apps=*custom-path* **-from_release=***current-ver* **-out=***report-path*

   - **Linux:**

     TcUpgradeAssistantITKReporter.sh -apps=*custom-path* **-from_release=***current-ver* **-out=***report-path*

   In the appropriate command, replace *custom-path* with the path or paths to your custom application **dll** files. Replace *current-ver* with your current Teamcenter version. (This argument is optional.[2]) Replace *report-path* with the location in which to generate the report, in **csv** format.

Examples (Windows):

- To generate an Upgrade Assistant report in the current directory:

```
TcUpgradeAssistantITKReporter.bat -apps=D:\\myDir\\MyCustom
```

- To generate an Upgrade Assistant report into a specific directory:

```
TcUpgradeAssistantITKReporter.bat -apps=D:\\myDir\\MyCustom -out=D:\
\Temp\\mycustom_13_2412.csv
```

- To generate an Upgrade Assistant report for a Teamcenter version other than the version specified in the Teamcenter command prompt:

2 If **from_release** is not specified, the Teamcenter version is read from the environment variables in the Teamcenter command prompt.

```
TcUpgradeAssistantITKReporter.bat -apps=D:\\myDir\\MyCustom
-from_release=13.0 -out=D:\\Temp\mycustom_13_2412.csv
```

Examples (Linux):

- To generate an Upgrade Assistant report in the current directory:

```
TcUpgradeAssistantITKReporter.sh -apps=/home/myusername/myDir/
MyCustom.so -from_release=11.0 -out=<output directory>\
\mycustom_13_2412.csv
```

- To generate an Upgrade Assistant report into a specific directory:

```
TcUpgradeAssistantITKReporter.sh -apps=/home/myusername/myDir
-from_release=11.0 -out=<output directory>\\mycustom_13_2412.csv
```

- To generate an Upgrade Assistant report for a Teamcenter version other than the version specified in the Teamcenter command prompt:

```
TcUpgradeAssistantITKReporter.sh -apps=/home/myusername/myfile.txt
-from_release=11.0 -out=<output directory>\\mycustom_13_2412.csv
```

5. Install the Siemens License Server

For the version of the Siemens License Server certified with Teamcenter 2412, see the Hardware and Software Certifications knowledge base article on Support Center.

Download and install the Siemens License Server:

1. Open Support Center:

   https://support.sw.siemens.com

2. Under **Product Centers**, find **Siemens License Server**.

   > Caution:
   >
   > Make sure you download **Siemens License Server**, *not* **Siemens PLM Licensing**.[1]

3. In the Siemens License Server product center, click **Downloads**, and then download the certified version of the Siemens License Server.

4. Install the License Server according to the *Siemens Digital Industries Software License Server Installation Instructions* available from the Siemens License Server downloads page.

5. On your designated Teamcenter corporate server host, set the following system environment variables:

   SPLM_LICENSE_SERVER

   Set to the location of the Siemens License Server:

   port@host

   Replace *port* with the port number and *host* with the machine name of the License Server, for example, **29000@tchost**.

   TCP_NODELAY

   Set to a value of **1** on the License Server host. This helps optimize logon time when launching Teamcenter.

6. Install Teamcenter licenses on the License Server according to the information provided to you by Siemens Digital Industries Software support.

1 Siemens PLM Licensing is no longer supported by Teamcenter. The Siemens License Server is the currently supported license server.

The **Siemens License Server downloads page** contains additional links to documentation, Knowledge Base articles, and videos about installing and maintaining the License Server.

> Caution:
>
> The License Server must be running and two or more seats must be available on that license server during Teamcenter server installation. Otherwise, database creation fails because the **make_user** utility cannot create the required users in the database.

6. Upgrading database servers

Supported database server versions

If your database server version is not a version certified for Teamcenter 2412, you must upgrade your database server before you upgrade Teamcenter.

Siemens Digital Industries Software supports Teamcenter 2412 with Oracle and Microsoft SQL Server databases. For supported versions of Oracle and Microsoft SQL Server, see the Hardware and Software Certifications knowledge base article on Support Center.

Configuring character settings in non-English locales

To ensure correct display and processing of Teamcenter data, you must set required values in your system environment and your Teamcenter configuration.

If your Teamcenter servers run Linux and use the Unicode UTF-8 character set, you must configure your operating system and your Teamcenter configuration to use Unicode UTF-8, observing the following considerations during Teamcenter upgrade:

- An existing Teamcenter installation must not configure Unicode UTF-8 character set support with an upgrade to Teamcenter 2412. An existing Teamcenter installation is required to complete an upgrade to Teamcenter 2412 under its existing database character set encoding.

- After upgrade is completed, you must contact your database vendor for processes and tools to convert your existing database character set encoded data to Unicode UTF-8 character set encoded data for storage to a new database.

For more information about environment settings for your locale, platform, and character set, see UTF-8 settings for Windows or Linux systems, or non-UTF-8 settings for Windows or Linux systems in the Teamcenter installation guides.

Set shell limits and parameters

Overview of shell limits and parameters

Oracle RDBMS uses extensive Linux resources such as shared memory, swap memory, and semaphore for interprocess communication. Inadequate parameter settings cause problems during installation and startup. Increasing the volume of data stored in memory reduces disk I/O activity and improves database performance.

The Oracle RDBMS installation program displays warnings if kernel parameters are not adequate. To avoid warnings and errors during or after installation, make sure kernel parameters meet the recommended settings for typical environments described in the following topics.

Before you install Oracle RDBMS, set initial parameters as described in Oracle documentation, and then adjust parameters according to available system memory. Set the **ulimit** parameter to **unlimited**.[1] Then, set the **kernel parameters** to recommended Teamcenter values for your operating system.

If you previously tuned kernel parameters for other installed applications to levels that meet or exceed the values recommended for Teamcenter, keep those existing values.

The parameter settings recommended herein are *minimum* values. For production database systems, Oracle recommends you tune values to optimize system performance. For information about performance tuning, see:

- Documentation for your operating system
- Teamcenter installation documentation on Support Center

Set SUSE Linux shell limits

1. Increase shell limits for the **oracle** user to the minimum values listed in the following table by adding the following lines to the **/etc/security/limits.conf** file:

   ```
   oracle              soft    nproc   2047
   oracle              hard    nproc   16384
   oracle              soft    nofile  1024
   oracle              hard    nofile  65536
   ```

   Do not change the shell limit values if they were set for another program and the values are greater than the levels Oracle requires.

SUSE Linux shell limit	Item in limits.conf	Minimum hard limit
Maximum number of open file descriptors	**nofile**	65536
Maximum number of processes available to a single user	**nproc**	16384

2. Add or edit the following lines in the **/etc/pam.d/login** file:

   ```
   session required /lib64/security/pam_limits.so
   session required pam_limits.so
   ```

3. Change the **oracle** user default shell startup file:

   - For the Bourne, Bash, or Korn shell, add the following lines to the **/etc/profile.local** file:

1 The **ulimit** parameter specifies a maximum number of processes per user.

```
if [ $USER = "oracle" ]; then
        if [ $SHELL = "/bin/ksh" ]; then
              ulimit -u 16384
              ulimit -n 65536
        else
              ulimit -u 16384 -n 65536
        fi
fi
```

- For the C shell (csh or tcsh), add the following lines to the **/etc/csh.login.local** file:

```
if ( $USER == "oracle" ) then
        limit maxproc 16384
        limit descriptors 65536
endif
```

Upgrade an Oracle server and database

Export an Oracle database

Windows systems:

1. Log on to the Oracle server as an administrator user.

2. Export the contents of your Teamcenter Oracle database to the dump file:

   ORACLE_HOME`\bin\expdp` *db-user/password* `full=y dumpfile=`*file-name*`.dmp logfile=`*export*`.log`

   Replace *db-user* with the Teamcenter database user account name; replace *password* with the database user account password; replace *file-name* with the full path and name of the dump file to contain the exported data; replace *export* with the name of the log file to contain export output.

3. Store the dump file in a safe place.

Linux systems:

1. Either log on to the Oracle server as **oracle** or switch the user to **oracle**:

   ```
   su - oracle
   ```

2. Set the **PATH** environment variable to include the Oracle **bin** directory:

   `export PATH=$PATH:`*ORACLE_HOME*`/bin`

3. Manually set the shared library path for Linux:

```
export LD_LIBRARY_PATH=${LD_LIBRARY_PATH}:${ORACLE_HOME}/lib
```

4. Export the contents of the Teamcenter Oracle database to the dump file:

   ```
   ORACLE_HOME/bin/exp db-user/password full=y file=file-name.dmp
   log=export.log
   ```

   Replace *db-user* with the Teamcenter database user account name; replace *password* with the database user account password; replace *file-name* with the name of the dump file to contain the exported data; replace *export* with the name of the log file to contain export output.

5. Store the dump file in a safe place.

If you have multiple databases, repeat this procedure for each database.

> Caution:
>
> Siemens Digital Industries Software strongly recommends backing up the dump file on tape or another disk. If the dump file becomes corrupted or lost, all data from the existing database is lost.

Terminate Oracle sessions on Windows systems

Stop the listener process

1. Log on to the operating system as a user with administrator privileges.
2. Open the **Services** dialog box in the Windows Control Panel.
3. Select the Oracle TNS listener services (**Oracle***release-ID***TNSListener**) and click **Stop**.

Shut down an Oracle database

Shut down Oracle using Windows Control Panel

1. Log on to the operating system as a user with administrator privileges.
2. Open the **Services** dialog box in the Windows Control Panel.

   Windows displays the Services window.

3. Select the **OracleService***SID* service.

   Replace *SID* with the system identifier of the database instance.

4. Click **Stop**.

Shut down Oracle using SQL*Plus

1. Log on to the operating system as a user with administrator privileges.
2. Start the Oracle SQL*Plus utility:

   ```
   sqlplus sys/password@Oracle-SID as sysdba
   ```

   Replace *password* with the password for the **sys** user account.

   Oracle starts the Oracle SQL*Plus utility.

   The **sys** user must be in the Oracle **sysdba** group for the Oracle system identifier (SID) used by Teamcenter. To connect as internal (without a password), the account must be part of the **ORA_DBA** local group in Windows.
3. Shut down the database instance by typing the following command:

   ```
   shutdown
   ```
4. Exit SQL*Plus:

   ```
   exit
   ```

Terminate Oracle sessions on Linux systems

Before installing a new version of Oracle, you must terminate all Oracle sessions and Oracle processes.

1. Either log on to the Oracle server as **oracle** or switch the user to **oracle** as follows:

   ```
   su - oracle
   ```
2. Set the **ORACLE_HOME** environment variable to point to the location of the Oracle files. For example:

   ```
   export ORACLE_HOME=/u01/app/oracle/product/oracle-version
   ```

   Replace the path with the system path to the Oracle files.
3. Define **ORACLE_HOME/bin** in the **PATH** variable:

   ```
   export PATH=${PATH}:${ORACLE_HOME}/bin
   ```
4. Manually set the shared library path or Linux:

   ```
   export LD_LIBRARY_PATH=${LD_LIBRARY_PATH}:${ORACLE_HOME}/lib
   ```

5. If a **tnslsnr** listener process is running, terminate it. For example:

   ```
   $ORACLE_HOME/bin/lsnrctl stop listener-name
   ```

   Replace *listener-name* with the name of the listener process.

6. Shut down all Oracle database instances using the **dbshut** utility. Shut down database instances listed in the **oratab** file:

   ```
   $ORACLE_HOME/bin/dbshut
   ```

Back up an Oracle installation

If you are upgrading to the certified Oracle version, back up the existing Oracle installation.

Backing up your Oracle installation before upgrading is strongly recommended. Failure to back up existing data could result in loss of data if problems occur during the upgrade process.

Back up the following files and directories:

- The Oracle home directory on each installed workstation.
- The directories containing database files for each configured database.
- The Oracle Net **listener.ora** and **tnsnames.ora** configuration filesin the **/etc** directory.

These are the only Teamcenter directories affected by Oracle installation. If you created other directories containing data used by Oracle, such as an administration script directory, you should also back up these directories.

Upgrading an Oracle server

Upgrade the Oracle server

Upgrade your Oracle server by one of the following methods:

- *Upgrade using the Oracle installer*
- *Upgrade by uninstalling/reinstalling Oracle*

Upgrade using the Oracle installer

1. Launch the Oracle installer to install a certified version of Oracle server.
2. When the Oracle installer prompts you to upgrade existing databases, enter the required information about the databases you want to upgrade.

Installing an Oracle server is described in the Teamcenter installation guides for Windows and Linux.

Upgrade by uninstalling/reinstalling Oracle

1. Remove existing Oracle databases.

2. Uninstall all existing Oracle server software.

3. Install a certified version of Oracle server.

   Installation of an Oracle server is described in the Teamcenter installation guides for Windows or Linux.

4. After Oracle installation is complete, import your Teamcenter database from the Oracle dump file into the new Oracle database. Enter the following command on a single line:

   ORACLE_HOME`\bin\imp` *db-user/password* `fromuser=`*db-user* `touser=`*db-user* `file=`*file-name*`.dmp log=`*import*`.log`

   Replace *db-user* with the Teamcenter database user account name, *password* with the database user account password, *file-name* with the full path and name of the dump file that contains the exported data, and *import* with the name of the log file.

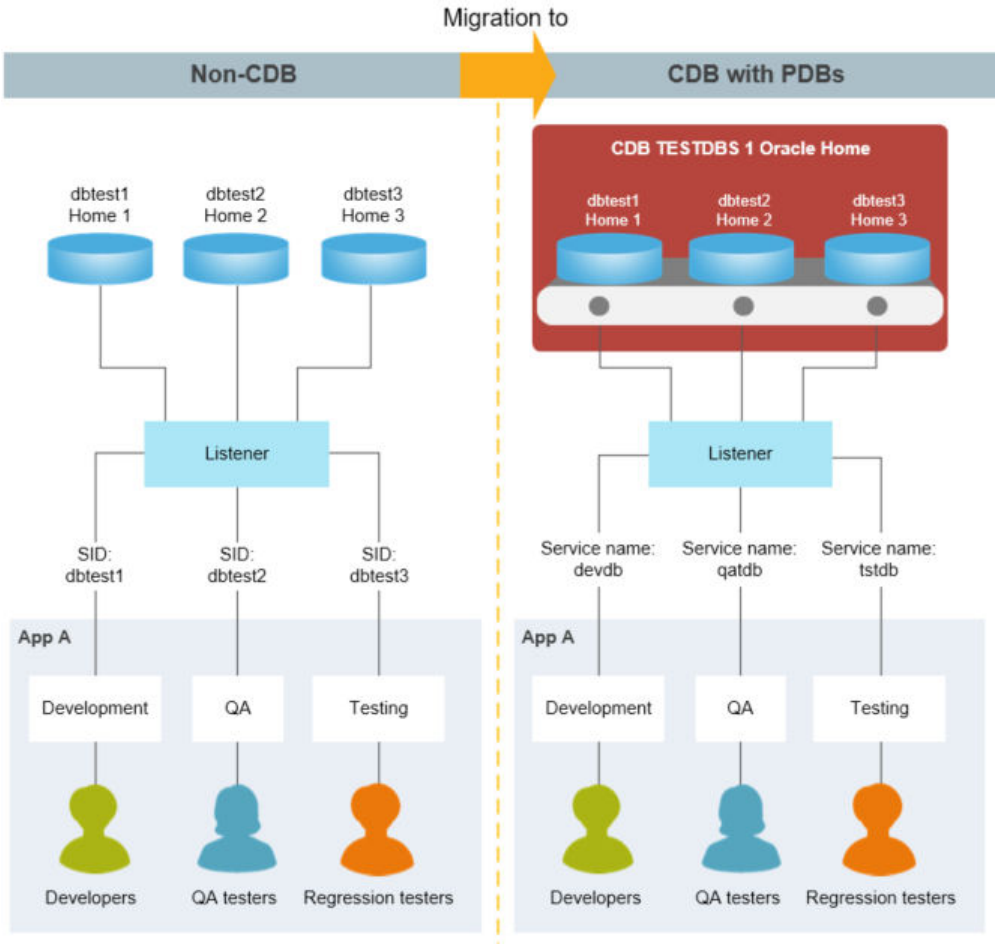
Migrate a non-CDB database to a CDB database

Teamcenter supports Oracle's **multitenant database architecture** if you use Oracle 12c or later. A multitenant architecture is deployed as a Container Database (CDB) with one or more Pluggable Databases (PDB).

A *Container Database* (CDB) is similar to a conventional (non-CDB) Oracle database, with familiar concepts like control files, data files, undo, temp files, redo logs, and so on. It also houses the data dictionary for objects owned by the root container and those that are visible to databases in the container.

A *Pluggable Database* (PDB) contains information specific to the database itself, relying on the container database for its control files, redo logs and so on. The PDB contains data files and temp files for its own objects, plus its own data dictionary that contains information about objects specific to the PDB. From Oracle 12.2 onward a PDB can and should have a local undo tablespace.

You can **migrate a non-CDB database to a CDB database** using Oracle tools. The following example illustrates the database architectures before and after migration.



Teamcenter supports CDB and non-CDB databases. Be aware that **Oracle has deprecated support for non-CDB databases** and may discontinue support after Oracle 19c.

If you migrate a non-CDB Teamcenter database to a CDB database, you must perform the migration *after* you upgrade to Teamcenter 2412.

Upgrade Microsoft SQL Server databases

Upgrading a Microsoft SQL Server database server with an existing Teamcenter database requires exporting the contents of the existing database, installing the new Microsoft SQL Server database server, and importing the database into the new server.

Microsoft describes several methods for transferring databases between servers an the article titled *How to move databases between computers that are running SQL Server* at **https://support.microsoft.com**.

Siemens Digital Industries Software recommends a backup and restore method for transferring an existing Teamcenter database to a new Microsoft SQL Server server. One advantage of this method is the simplicity of a single backup file, rather than multiple files (**.mdf**, **.ndf**, and so on), as with an attach/detach method. A single backup file also minimizes potential compatibility mode issues between versions of Microsoft SQL Server.

Using Data Transformation Services (DTS) for transferring a database is the least recommended method because is relatively more time-consuming and requires communication between the old and new database servers. In contrast, other methods for database transfer require only a means to move export files from one server to the other.

Siemens Digital Industries Software recommends creating the Teamcenter database user in the new target database *before* importing the existing database into the new server.

For transferring logins and passwords to a new Microsoft SQL Server instance, Microsoft provides an article titled *How to transfer logins and passwords between instances of SQL Server* at **https://support.microsoft.com**.

To ensure the owner of the database is the new server's Teamcenter database user account rather than the old server's Teamcenter database user account,[2] enter the following commands:

```
exec sp_changedbowner 'sa'
exec sp_changedbowner 'Tc-db-user'
```

2 Internal integer IDs used by SQL Server can differ between sites.

Part II: Build a Teamcenter update test environment

Create a copy of your production environment for update testing. Update your data model to the current data model format, and then upgrade the test environment.

7. Test upgrading a Teamcenter corporate server

Pre-upgrade tasks

Install C Shell on Linux servers

Before upgrading a corporate server that is hosted on a Linux machine, you must verify that C Shell is installed.

If it is not installed, the Pre-Upgrade Diagnostic test fails at the Volume Access Check step with an error similar to the following:

```
Name: Volume Access Check
Description:
Test whether the FSC is up and running
Analysis:
An attempt to contact the FSC running at http://SERVER:4544 failed.
Check that the FSC is running and configured correctly.
```

If you see this error, install C Shell and rerun the Pre-Upgrade Diagnostic test.

Verify required groups and roles

Before you begin upgrade, verify the following groups exist in your database:

dba
system
Project Administration
Validation Administration

Also, verify the following roles exist in the specified groups.

Role	Group
Project Administrator	**Project Administration**
Validation Administrator	**Validation Administration**

Upgrade may fail if these groups and roles are not present.

Verify required character set

You must have the same locale installed on your Teamcenter host as you use to communicate with your database server, and the database server must support this locale as well.

On Linux systems, Teamcenter installation tools, verify that the required character set is loaded by running the **locale -a** command in a shell. If the output does not list the required character set, you must add this character set before you install Teamcenter.

1. Set or export the **LC_ALL** environment variable by typing **LC_ALL=***character-set* or the equivalent command for your platform.

2. Verify the setting using the **echo** command or equivalent. Make sure the correct value for **LC_ALL** is displayed.

3. Run the **locale** command and make sure the **LANG** variable and all the **LC_***x* variables are set the same as **LC_ALL**.

4. If **LANG** is still set to **C**, manually export **LANG** to be the same value as **LC_ALL**.

5. Launch Teamcenter Environment Manager (**tem.sh**) from the current shell.

Alternatively, your system administrator may modify the date file (named **TIMEZONE** in the **etc** directory), which can preset this environment, so every time you log on and launch a shell, the environment is preset.

The recommended method, however, is to log on to the system using the Common Desktop Environment (CDE) with the minimum required locale by choosing **Option→Language→***character-set* during logon.

If the required character set is not loaded on your machine, contact your system administrator to have it installed before you install the GM Overlay.

This requirement is necessary because current Teamcenter versions use XML files rather than **.dat** files and associated scripts. Because of this, GM Overlay data is transformed from **.dat** files into XML files.

To read and parse the XML files correctly, the system must be able to process non-English (non-ASCII) locale characters. To facilitate this, the system must be first loaded with the fonts for that locale.

Terminate Teamcenter sessions

Prior to upgrade, you must terminate Teamcenter sessions if:

- You are reinstalling or upgrading Teamcenter executables by overwriting an existing Teamcenter data directory. The Teamcenter installation procedure cannot overwrite files when they are in use.

- You are upgrading a Teamcenter database.
- You are migrating an Oracle database to a Windows database server.

1. Instruct all users to check in all Teamcenter business objects, and then close and log off of Teamcenter sessions, including **tcserver** processes.
2. Open a Teamcenter command prompt.
3. Use the **clearlocks** utility to check for nodes connected to the database and remove locks on the database:

   Windows systems:

   ```
   %TC_BIN%\clearlocks -u=Tc-Oracle-user -p=Tc-Oracle-user-password -g=dba
   -assert_all_dead
   ```

   Linux systems:

   ```
   $TC_ROOT/bin/clearlocks -node_names
   ```

4. On Linux systems, note the node names returned, and then type the following command for each node name returned:

   ```
   $TC_ROOT/bin/clearlocks -assert_dead node-name
   ```

   Replace *node-name* with a returned node name.
5. Stop all Teamcenter services, including FMS.

Back up existing Teamcenter data

If you upgrade a Teamcenter database, back up existing Teamcenter data.

> Caution:
>
> Back up the database, Teamcenter data directory, and all Teamcenter volume directories to an external backup device before performing an upgrade. This provides a safeguard against data loss in case problems occur during the upgrade.

Back up the following directories:

- The Teamcenter application root directory on each installed workstation
- The Teamcenter data directory for each configured database

- The Teamcenter volume directories for each configured database

These are the only directories affected by Teamcenter installation. If you created other directories that contain data used by your existing Teamcenter installation, such as a separate POM transmit schema directory, Siemens Digital Industries Software recommends that you back up these directories as a precautionary measure.

Clean unused columns from the database

If you use an Oracle database, upgrade performance may decrease when dropping columns from a large Teamcenter class. This can affect overall upgrade time.

To minimize overall upgrade time, you can mark a column to be dropped as unused by typing the following SQL statement:

```
ALTER TABLE table-name SET UNUSED column-name
```

This statement marks the column as unused and hides it from any SQL used on that table. Commands like **DESCRIBE** *table_name* or **SELECT * from** *table-name* will not show the column. Any column that is marked as unused is not displayed in queries or data dictionary views and its name is removed so that a new column can reuse the same name. All constraints, indexes, and statistics defined on the column are also removed.

To physically clean up unused columns and reclaim space, use the **install** utility with the **clean_unused_columns** argument:

```
install -clean_unused_columns Tc-Oracle-user password dba
```

Depending on the number of unused columns in the database and size of their related tables, this command may generate large **redo** logs, especially if large tables are involved. Siemens Digital Industries Software recommends you adjust the size of the **redo** logs appropriately before attempting to use this utility, and make sure you have exclusive access to the schema, for example, during the maintenance window.

Upgrade a template project to the current data model format

If you have installed a new version of the Business Modeler IDE, you can use a project from the previous version. But first you must upgrade the project to the new data model format. This upgrade is necessary because the XML format used for data model files can change between product releases, and the project must be adjusted to fit the new XML format.

> Caution:
>
> After a template project is upgraded, it cannot be used for installation or upgrade in a previous version of Teamcenter. To find the version the template has been upgraded to,

open the **dependency.xml** file in the **extensions** folder of the template project and view the **currentTemplateVersion** value.

You can upgrade a project three ways:

Welcome window

When you first open the Business Modeler IDE after installing it, the **Welcome** window is displayed. Click the **Upgrade your BMIDE template from a previous Teamcenter release** link in this window to run the import wizard. This imports your template into the new version of the Business Modeler IDE.

Import wizard

If your template project is not already in the workspace, use the Import wizard to import it into the new version of the Business Modeler IDE.

1. Choose **File**>**Import**.

2. In the **Import** dialog box, choose **Business Modeler IDE**>**Import a Business Modeler IDE Template Project**.

   While importing the project, the Business Modeler IDE automatically upgrades the project to the new data model format.

Re-run Template Project Upgrade wizard

If your template project is already in the workspace, upgrade it to the new version of the Business Modeler IDE:

1. On the menu bar, choose **BMIDE**>**Upgrade Tools**>**Re-run Template Project Upgrade Wizard**.

   The wizard runs.

2. In the **Template Project Upgrade** dialog box, click the arrow in the **Project** box to select the project to upgrade.

3. Click **Finish**.

   The project is upgraded to the new data model format. The **Console** view displays success or failure messages for the upgrade.

   After upgrade, open the **Project Files** folder and check for any error or warning messages in the log in the **output\upgrade** folder.

Upgrade the custom template when you upgrade to the latest version of Teamcenter

1. Import the older project into the latest version of the Business Modeler IDE. This updates the data model to the latest data model version.

2. If your project contains custom code, you must treat it as though it were new code. Perform the following steps:

    a. Clean up the **output** and **source** folders.

    b. Generate Code for the project.

    c. Perform these steps in stages to aid in troubleshooting:

        A. Insert your old source code into the new files.

        B. Build the project.

3. Package the template in the Business Modeler IDE.

4. Install the packaged template to the upgraded server.

Upgrade a test environment

Create an upgrade testing environment

Methods for creating a test environment for the upgrade

Before you upgrade Teamcenter production systems, upgrade a test system to ensure that the upgrade works successfully with the latest templates.

Upgrading a test database allows you to identify and correct upgrade problems and plan your production system upgrade accordingly. This can help prevent upgrade failures and minimize downtime when implementing the upgrade on your production system.

If you use Deployment Center, create an upgrade environment as described in *Deployment Center — Usage*.

If you use TEM, you can create a test environment in two ways:

- **Copy a Teamcenter environment using TEM**.
- **Manually create a test environment**.

Warning:

Do not copy a Teamcenter environment to provide multiple servers in a production environment. You should copy a Teamcenter environment only for test purposes.

Copy a Teamcenter environment using TEM

Teamcenter Environment Manager (TEM) can copy an existing Teamcenter environment for upgrade testing.

1. Copy your Teamcenter database using the utilities and documentation provided by your database vendor.

2. Copy any volumes that contain any data you may want to access before or after the test upgrade.

   It is not necessary to copy any volume data, but volume data not copied would not be available in the copied environment.

   Note:

   There are three possible scenarios for copying volume data:

   - **Copying no data**

     TEM creates empty volumes to represent the actual volumes. New data can be created in these volume, but no existing data would be available in the copied environment.

   - **Copying all data**

     TEM provides the option (in the **Volume Information** panel) to specify individual directories. If all volume directories are copied and made available to the destination copy system, they can be specified. If all volume data is copied, all data is available in the copied environment.

   - **Copying partial data**

     The option in TEM to specify individual volume directories does not require that *all* directories be specified. If you want, only some of the volume data can be copied and TEM will create empty directories for any volume directories not copied. Data not copied would not be available in the copied environment.

3. Launch TEM from the installation media for your current Teamcenter version.

4. Proceed to the **Welcome to Teamcenter** panel and select **Teamcenter**.

5. In the **Install / Upgrade Options** panel, select **Create environment for upgrade testing** and then click **Install**.

6. In the **Media Locations** panel, specify locations of Teamcenter installation media.

   If your current Teamcenter version is a minor release:

   - Enter the location of the previous release software kit in the **Original Media** box.
   - Note that the location of the software kit from which you launched TEM is shown in the **Update Location** list.

   In the **Update Location** list, add the locations of any other Teamcenter patches included in your production environment. You must include all patches to ensure the test environment reflects your production environment.

   TEM applies updates in the order you specify. If updates contain different versions of the same software component, the update closest to the bottom of the list takes precedence. To change the order in which updates are applied, select an update in the list and click **Shift Up** or **Shift Down**.

7. In the **Configuration** panel, type a configuration name for the test environment.

8. In the **Test Environment Location** panel, enter the installation directory for the test environment.

   > Note:
   >
   > TEM does not prompt you to select features. Features are installed in the test configuration based on the data models installed in the database.

9. In the **File System Cache Service (FSC)** panel, type the required values for creating the FSC. The FSC must be a master FSC.

   The copy process creates its own FSC to support the volumes.

10. In the **Operating System User** panel, type the user's password in the **Password** and **Confirm** boxes and then click **Next**.

11. In the **Foundation Database** panel:

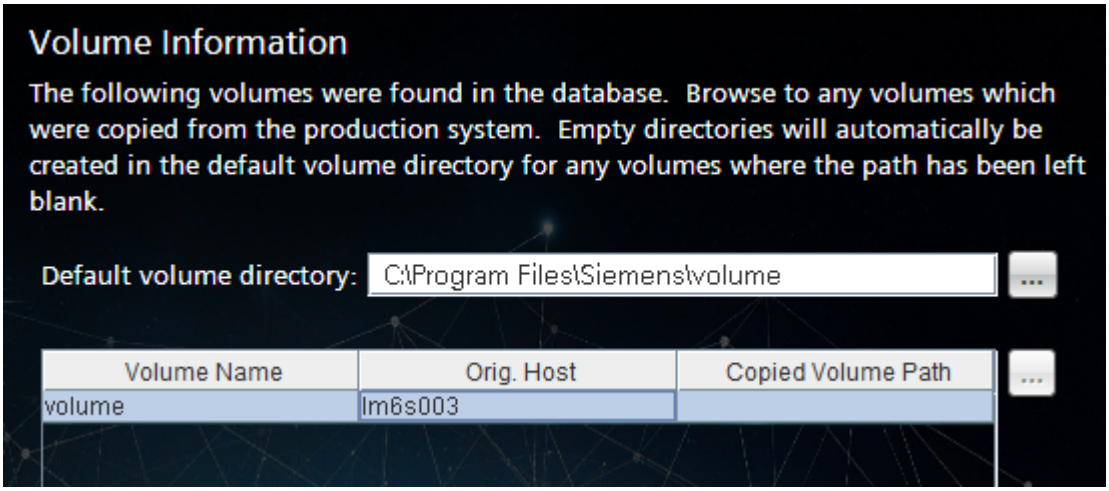
    - Enter the database information for the copy of the database you created in step 1.
    - Enter the location in which to create the test environment's *TC_DATA* directory in the **Data Directory** box.

    After you enter access information for the copied database, TEM determines which features are installed from the data models registered with the database. If any features are not included in the Teamcenter software kit, locate those features in the following step.

12. In the **Database Configuration** panel, examine the list of features found in the database. If any feature is missing a **Path** value, click **Browse** to locate those features.

    You must locate all features in the list before you can continue.

13. On the **Volume Information** panel, determine where to create the volumes associated with the database for the test environment.



Note:

- Ownership of *all* volumes is transferred to the target system as part of the copy process.
- By default, TEM creates volumes in the path specified in the **Default volume directory** path. If you want to specify a location for a given volume, enter the path in the **Copied Volume Path** box for the volume.

  The **Copied Volume Path** value for a volume must be unique. (No other volume may use this location.)
- The **Copied Volume Path** value can point to an actual volume directory, a partial volume directory, or an empty directory. TEM creates whatever subdirectories are missing.
- The originating host name of the volume is used in the default volume location. This is done in the case two volumes originating from different servers use the same path.

14. In the **Teamcenter Administrative User** panel, type the user name and password and then click **Next**.

15. In the **Flex License Server** panel, enter access information for the Teamcenter license server.

16. In the **Confirmation** panel, review the information shown, and then click **Start** to begin creating the test environment.

Note:

If you install a rich client that points to the *TC_DATA* directory of a copied corporate server environment, set the **TC_SKIP_CLIENT_CACHE** variable to **TRUE** in the appropriate rich client launch file:

- Linux systems: *TC_ROOT***/portal/start_portal**
- Windows systems: *TC_ROOT***\portal\portal.bat**

Set this variable *before* you launch the rich client that points to the copied server environment.

If your original corporate server environment contains a rich client *before* you copy the environment, this step is not necessary to launch that rich client. However, if you add an additional rich client, you must set **TC_SKIP_CLIENT_CACHE** to **TRUE** before you launch the additional client.

Manually create a test environment

1. Export a database backup from your production environment using the utilities and documentation provided by your database vendor.

2. In your test environment, create folders for each volume in your production environment. If your production environment has multiple volume servers, you can create all test volumes on a single test server. This reduces the number of volume servers involved in testing.

   The absolute paths to the volumes on the test server is not important, but the directory structure and names of the subfolders under each test volume must match those of the production volumes. The upgrade process fails if all volumes and their subfolders are not re-created in the test environment.

3. You must copy all contents of the **dba_***xxxxxxxx* subfolder under the default volume owned by the Teamcenter database user in the production environment to the corresponding volume subfolder in the test environment; otherwise, the upgrade process fails if this is not done.

4. Copy data needed for testing from the production environment to the corresponding volume subfolders in the test environment. For the upgrade to succeed, it is not necessary to copy any volume data, but volume data not copied is not available for testing after the upgrade.

5. If custom templates are deployed in your production environment, export those templates to packages and copy them to your test server. You must install these packages when installing the test corporate server.

6. On the test server, install a corporate server and a two-tier rich client to the same Teamcenter version as your production environment.

In the **Features** panel in TEM, select the same list of features installed in your production environment including your custom template packages and third-party custom template packages. To install a custom template package:

a. In the **Features** panel, click **Browse**.

TEM displays an **Open** dialog box.

b. In the **Open** dialog box, browse to the location on the test server where you copied the custom template package. Select the feature file (**feature_***template-name***.xml**) for your custom template, and then click **Select**.

c. In the **Features** panel, the custom template package in now listed, under **Extensions**, but the template package is not selected. Select the custom template package so that it is installed.

7. Once the test corporate server is installed, import your production database backup into your test database using the utilities and documentation provided by your database vendor.

8. Preferences are stored in the database. Because you imported the production database backup into your test database, you need to modify a few preferences:

a. From a Teamcenter command prompt, run:

preferences_manager -u=*user* **-p=***password* **-g=dba -mode=export -out_file=%TC_DATA%***preferences-file***.xml -scope=SITE**

user/*password* must be a Teamcenter user in the **dba** group.

*preferences-file***.xml** is the file to which the preferences are exported.

b. Open *preferences-file***.xml** in a text editor.

c. Modify the following preferences:

- **Fms_BootStrap_Urls**

  The host name and port must match those of your test corporate server.

- **Transient_Volume_Installation_Location**

  The host name must match that of your test corporate server.

- **WEB_default_site_server**

  If you are using the four-tier architecture in your test environment, the host name and port must match that of your test corporate server.

- **Default_Transient_Server**

  The host name and port must match those of your test corporate server.

- **Default_Transient_Volume_Id**

  This value should be modified to match the value of the transient volume id defined in the **backup_xmlinfo** result and the FMS master file.

- **Transient_Volume_RootDir**

  The path must match that of the transient volume on your test corporate server. For example:

  On Linux: **/tmp/transientVolume_tcAdmin**

  On Windows: **C:\Temp\transientVolume_tcAdmin**

d. Save and close *preferences-file*.

e. In the Teamcenter command prompt, load the modified *preferences-file* into the database by running:

preferences_manager -u=*user* -p=*password* **-g=dba -mode=import -file=%TC_DATA%***preferences-file***.xml -scope=site -action=override**

9. From a Teamcenter command prompt, regenerate the POM schema file by running:

install -regen_schema_file -u=*Tc-db-user* **-p=***password* **-g=dba**

10. From a Teamcenter command prompt, regenerate the POM schema transmit file by running:

install -gen_xmit_file -u=*Tc-db-user* **-p=***password* **-g=dba**

11. Modify the FMS master file:

a. From a Teamcenter command prompt, run:

backup_xmlinfo -u=*user* **-p=***password* **-g=dba**

user/*password* must be a Teamcenter user in the **dba** group.

This command generates a file in the directory from which it was run called **backup.xml**. This file contains the FMS information stored in the database. This includes the production environment's enterprise ID, volume IDs, and volume paths. You use information from **backup.xml** to update the test environment's FMS master file.

b. Open **backup.xml** and the test environment's FMS master file in a text editor.

c. In the FMS master file, make these changes:

- In the FMS master file's **fmsenterprise** tag, set the **id** attribute to the value of the **enterpriseID** tag in **backup.xml**.

  This a 10-digit integer. Be sure to include the negative sign (-) at the beginning of this value.

- In the FMS master file, there is only one **volume** tag (excluding the transient volume). Set the **enterpriseid** attribute of that tag to the value of the **enterpriseID** tag in **backup.xml**.

  This a 10-digit integer. Be sure to include the negative sign (-) at the beginning of this value.

- In the FMS master file, you must have one **volume** tag for each volume listed in **backup.xml**. In the FMS master file, copy the **volume** tag and paste as many volume tag copies as needed.

- For each volume listed in **backup.xml**, copy the value of the **volumeUid** tag and paste it in the **id** attribute of a **volume** tag in the FMS master file. Set the **root** attribute of that **volume** tag to the location of that volume on the test server.

- In the FMS master file, set the **enterpriseid** attribute of the **transientvolume** tag to the value of the **enterpriseID** tag in **backup.xml**.

  This a 10-digit integer. Be sure to include the negative sign (-) at the beginning of this value.

- In **backup.xml**, there are two **transientVolumeInfo** tags, one for Windows and one for Linux. You must copy the appropriate **transVolId** value (Windows or Linux). Paste the copied value into the **id** attribute of the **transientvolume** tag in the FMS master file.

d. Save and close the FMS master file.

12. On the test server, stop and restart the FSC services.

13. On the test server, log on to rich client using an account in the **dba** group and open the Organization application.

14. For each volume:

a. Set **Node Name** to the name of the test server on which the volume resides.

b. Click **Modify**. Keep the volume panel open.

c. Set either **Linux Path Name** or **Windows Path Name** to the volume's location on the test server.

d. Click **Modify**.

e. In the **Move volume** popup window, click **No**. (You are not trying to move files. You are only editing the path.)

f. In the second **Move volume** popup window, click **Yes**.

15. Run **index_verifier** to verify that all database indexes are present. Missing indexes can cause performance issues after the database is upgraded.

a. Open a Teamcenter command prompt.

b. Optionally, perform a dry run to identify missing indexes but do not create missing indexes:

*TC_ROOT***bin\index_verifier -u=***Tc-db-user** **-p=***password* **-g=dba -o=DRYRUN >** *missing-indexes*.**sql**

missing-indexes.**sql** is the file to which index creation statements for missing indexes are written.

c. Create missing indexes using one of these methods:

- From the Teamcenter command prompt, run:

  *TC_ROOT***bin\index_verifier -u=***Tc-db-user** **-p=***password* **-g=dba -o=DRYRUN**

- Use a database vendor tool (such as SQL*Plus for Oracle, SQL Server Management Studio or **sqlcmd** for Microsoft SQL Server) to process the index creation statements in the *missing-indexes*.**sql** file generated by running **index_verifier** with the **DRYRUN** option.

16. Launch the rich client in your test environment to verify custom functionality.

Verify site consistency

If your production database contains any transfer locks or site inconsistency objects, the test upgrade will not start. When TEM performs pre-upgrade diagnostics, the site consistency check fails and TEM does not allow the upgrade to proceed until site inconsistencies are corrected. TEM provides a tool to fix site inconsistencies, but the tool runs only on Multi-Site environments.

Before you copy a production database for a test upgrade, Siemens Digital Industries Software strongly recommends performing the following steps:

1. Perform upgrade diagnostics on your production database. Begin an upgrade TEM, proceed to the **Pre-upgrade Diagnostics** panel, and then click **Run** to perform pre-upgrade diagnostics.

2. When pre-upgrade diagnostics complete, click **Review** to view the pre-upgrade diagnostics report.

3. Perform any steps recommended in the report to resolve site inconsistency errors.

Upgrade the test environment

Launch the installer

1. Locate the Teamcenter 2412 software kit.

2. If you use Teamcenter Integration for I-deas, run the **TcII.bat** script (on Windows systems) or the **TcII.sh** script (on Linux systems) on the Teamcenter Integration for I-deas software kit. This sets the **CLASSPATH** variable and other variables required for TEM to find installation files for the integration.

3. Specify the path to the Java Runtime Environment (JRE) in the **JRE64_HOME** environment variable on your host.

4. Start Teamcenter Environment Manager (TEM):

   a. Change to the root directory of the Teamcenter 2412 software kit.

   b. Launch TEM:

      - Windows systems: Right-click the **tem.bat** program icon and choose **Run as administrator**.
      - Linux systems: Run the **tem.sh** script.

5. Proceed to the **Welcome to Teamcenter** panel and choose **Teamcenter**.

6. In the **Install / Upgrade Options** panel, click **Upgrade**.

7. Proceed to the **Media Locations** panel. If you want to apply any patches during upgrade, enter locations of those kits in the **Update Location** table.

Identify old and new configurations

1. In the **Old Application Root** panel, enter the path to *TC_ROOT* directory of the corporate server to be upgraded.

2. In the **Old Configuration** panel, select the corporate server configuration you want to upgrade.

3. In the **Configuration** panel, type an ID and a description for the new corporate server.

4. Proceed to the **New Application Root** panel.

   This panel contains a list of features in your current installation and the status of each feature:

   - A status of **Upgrade** means the feature will be upgraded to target Teamcenter release.
   - A status of **Deprecated** means the feature will not be upgraded.
   - A status of **WARNING: Browse to a feature XML file** indicates that you must provide the location of the upgraded custom feature file. Click **Browse**, navigate to the package that was exported from the upgraded custom Business Modeler IDE template project, and select the feature XML file. After you provide the location of the feature file, the status will be **Upgrade**.

   In the **New Application Root Directory** box, enter the root directory for the new corporate server. This is the *TC_ROOT* directory for the upgraded Teamcenter installation.

5. In the **Operating System User** panel, type the password for the operating system user performing the upgrade.

6. In the **Teamcenter Administrative User** panel, type the password for the Teamcenter administrator account.

7. Proceed to the **Upgrade Information** panel and enter the required values.

Value	Description
Old TC_DATA Location	Specifies the path to the *TC_DATA* directory for the corporate server to be upgraded. Verify that the path shown is correct.
New TC_DATA Location	Specifies the path you want to use for the new *TC_DATA* directory on the upgraded corporate server.
Database User	Specifies the user name of the Teamcenter database user.
Database Password	Specifies the password for the database user. Caution: The password must not be empty nor contain any whitespace characters such as space, tab, newline, carriage return, form feed, or vertical tab. In addition, the password must not contain any of the following characters: **! # @ $ % = & ' " ^ : ; . _ < > ( ) { }**

8. The **Confirmation** window informs you that providing the correct information in the **Upgrade Database Features** panel is highly important. Failure to do so will result in issues with your upgrade and migration of custom data model definitions. Click **Confirm**.

9. The **Upgrade Database Features** panel contains a table of feature templates found in the database with the status of each in the **Status** column.

   If TEM prompts you for a custom template, click the **Browse** button and navigate to the newly packaged template and libraries.

   Standard Teamcenter features whose status is **Upgrade** are included in the Teamcenter software kit and will be upgraded to the target Teamcenter release.

   If your site depends on templates from asynchronously released features or on templates supplied by other sites, partners, or third parties, click the **Browse** button to locate the template package (**ZIP**) file for each missing template.

   You must provide paths to all feature templates before you can proceed with upgrade. The **Next** button is disabled until valid paths are provided for all templates.

   Failure to locate the correct paths for all template packages results in migration issues with your custom data model to the Business Modeler IDE, possible corruption of data, and problems with the Teamcenter server.

Configure components

1. Complete the **Upgrade Options** panel.

   The **Generate client cache** option specifies that you want to generate a cache of data that rich clients can download once at initial logon and then reuse on the client host. This option reduces server demand, reduces startup time, and improves overall performance. When this option is selected, TEM generates the client cache at the end of the install, upgrade, or update action. If you clear this option, but a client cache already exists, the old client cache is deleted.

2. In the **Flex License Client** panel, enter the license server and license file information.

3. In the **Password Security** panel, define an **Administrative Password Directory**. Encrypted password files are kept in this directory.

4. In the **TcServer Character Encoding Settings** panel, choose the appropriate **Canonical Name** for the character set the rich client uses to access the database.

   > Caution:
   >
   > To prevent data corruption, this character encoding set must match the encoding set used by the Teamcenter database.

5. If the **Server Manager** feature is installed on the server being upgraded, the **Multiplexing Proxy (MUX)** panel appears.

   The MUX listens on a single port for incoming requests from the web tier, forwards those requests to a server process, and streams responses back to web tier.

   - **Port**

     Specifies the TCP/IP port on which the MUX listens for web tier requests

   - **TECS Admin Port**

     Specifies the port used by the Teamcenter Enterprise Communication System (TECS).

6. If the **Server Manager** feature is installed on the server being upgraded, the **Communication Configuration** panel appears. It is prepopulated with the values from the existing server. Modify values as needed.

7. If the **Server Manager** feature is installed on the server being upgraded, the **Server Manager Cluster Configuration** panel appears. It is prepopulated with the values from the existing server. Modify values as needed.

Start the upgrade

1. Proceed to the **Pre-Upgrade Diagnostics** panel.

   Enter the path to a directory in which to store upgrade diagnostic log files.

   Click **Run** to begin pre-upgrade diagnostics.

   TEM performs a series of diagnostics on the Teamcenter configuration and reports any problems found.

2. Allow time for the pre-upgrade diagnostic tests to complete.

   If any test fails, click the appropriate **View** button to view details of the failed test. Click **Review** to view complete results of the pre-upgrade diagnostics.

   Perform any recommended steps in the diagnostic reports to resolve the failures. After performing these steps, click **Run** to perform pre-diagnostic tests again. TEM does not allow the upgrade to proceed until pre-diagnostic failures are resolved.

   If all diagnostic tests are successful (the **Results** column displays **Passed** for all tests), click **Next** to continue.

If your corporate server is hosted on a Linux machine, **C-Shell must be installed**, otherwise, the Pre-Upgrade Diagnostic test fails at the Volume Access Check.

3. In the **Confirmation** panel, review your selections. If you need to make a change, click **Back**. When you are ready to begin the upgrade, click **Start**.

   The **Upgrade** panel displays the status of the upgrade.

4. If the upgrade is successful, close TEM.

   If the upgrade is not successful, click **Navigate Logs** to open the upgrade log viewer.

How to upgrade servers in parallel

When upgrading additional Teamcenter servers, you do not need to wait for an upgrade on one server to complete before you begin upgrading the next server. Allow the upgrade of the corporate server to complete, then you can upgrade the remaining servers concurrently, in parallel.

When you upgrade your first server, TEM uploads a dataset to the volume that contains key items from the TC_DATA directory. This provides necessary information for upgrading additional servers. TEM references this dataset during subsequent upgrade operations, instead of needing an exclusive lock on the Teamcenter database. This allows you to initiate upgrade operations on your remaining servers at the same time, in parallel. This saves a significant amount of time when upgrading environments with multiple servers.

Post-upgrade tasks

Run the postinstallation tasks script

If you installed the corporate server without root privileges, a user with root privileges must run the root postinstallation tasks scripts. These scripts register daemons and perform other installation actions that require root privileges.

Run all scripts in the *TC_ROOT***/install** directory that have names of the following form:

root_post_tasks*ID***.ksh**

Replace *ID* with the unique part of each script name.

Enable a UTF-8 database

If you converted your Teamcenter database from non-UTF-8 to UTF-8 before you upgraded Teamcenter, update the **uTF8Enabled** setting in the **configuration.xml** file:

1. Locate the *TC_ROOT***\install\configuration.xml** file in your upgraded environment and open the file.

2. Locate the **uTF8Enabled** parameter in the file and set its value to **true**:

```
<uTF8Enabled value="true" />
```

3. Save the changes to the file.

Configure units of measure

The units of measure capability in Teamcenter changed in Teamcenter 2406 from the legacy Business Modeler IDE units of measure to the *unit management system* (UMS), which uses the **ums_mapping** utility. The utility links legacy units to unit definitions in the UMS.

If you are updating from a Teamcenter version earlier than Teamcenter 2406, you can migrate legacy units of measure to the unit management system as described in *Teamcenter Administration*.

Resolve Schedule Manager model errors

In current Teamcenter versions, the **Schedule**, **Schedule Task**, **Schedule Revision**, **Schedule Task Revision** and the associated forms (**Scheduling**, **Execution**, **SchMgtCostForm**) are re-parented from **Item** and **Item Revision** to **Workspace Object**.

In the default template, all references from **Schedule** and associated objects to **Item** and **Item Revision** have been corrected. However, for custom templates containing Schedule Manager customizations, the following steps must be performed to resolve any model errors during the Business Modeler IDE template migration.

Associated forms (**Scheduling**, **Execution**, **SchMgtCostForm**), **Schedule Revision** and **ScheduleTaskRevision** are not used by Schedule Manager and will be deprecated in a future release of Teamcenter.

Examine model errors during migration of custom template to Teamcenter 2412

Study the model errors reported in the console of Business Modeler IDE during migration of the Business Modeler IDE custom template. These errors are typically in the **extensions/default.xml** and **extensions/lang/en_US/default_en_US.xml** files. Look for errors similar to the following examples:

- `Property "pv5_MFK_Prop1" is not attached to Business Object "PV5_MFK_SchdTsk1" in TcTypeConstantAttach element.`
- `Invalid type found in constant attach element. "PV5_MFK_SchdTsk1" is not a subtype of any constant scope definition`
- `Incompatible MFK Definition: The property named "pv5_MFK_Prop1" on MFK definition "PV5_MFK_Require" is not valid on the business object "PV5_MFK_SchdTsk1".`

- `The OperationInputType "PV5_MFK_SchdTsk1RevisionRevI" cannot be loaded because the parent Type "ScheduleTaskRevisionRevI" does not exist.`
- `Property "pv5_MFK_Prop1" is not attached to Business Object "PV5_MFK_SchdTsk1" in TcPropertyConstantAttach element.`
- `Property "items_tag" is not attached to Business Object "Mr9a_SSJbTsk1Revision" in pathToSource element.`
- `Invalid type found in constant attach element. "Mr9a_SSJbTsk1" is not a subtype of any constant scope definition.`
- `Property "mr9a_jobact2prop" is not attached to Business Object "Mr9a_SSJbTsk1Revision" in Property{::}Mr9a_SSJbTsk1Revision{::}mr9a_jobact2prop element`
- `Attaching a Naming Rule to the "item_id" property on the "ScheduleTask" Business Object is not supported.`

Resolve the model errors

1. Open the XML file in a text editor, XML editor, or the Business Modeler IDE text editor.
2. Find the line number where the error is reported and delete the invalid element at that line number in the XML file.
3. Save the XML file.
4. Reload the custom template in BMIDE again and ensure there are no model errors being reported in the custom template.

> Caution:
>
> Do not remove **TcStandardType** and **TcClass** model statements for any subtypes of **Schedule** and **ScheduleTask** business objects.

After the upgrade process in TEM is complete, the custom **Schedule** and **ScheduleTask** business objects are automatically re-parented to **WorkspaceObject**.

Upgrade Access Manager rules

Special steps are required to upgrade the Access Manager rule tree. These steps are required to ensure the rule tree in your upgraded system contains any new rules added by Teamcenter and also any custom rules you added to your previous installation. You can upgrade rules in two ways. Choose the appropriate method depending on how many custom rules are in your Access Manager rule tree.

- If you have many custom rules, migrate your legacy rule tree and then manually add new Teamcenter-supplied rules:

  1. Create a backup of your existing rule tree using the Access Manager **Export** action.
  2. Upgrade your Teamcenter configuration to Teamcenter 2412. During Teamcenter upgrade, TEM automatically imports your legacy rule tree to Teamcenter 2412.
  3. Identify changes in the rule tree by comparing the **..***TC_DATA***tc_am_rule_tree.default** file in your previous environment to the same file in your Teamcenter 2412 environment.
  4. Start Access Manager and add rules introduced to Teamcenter since your previous version.

- If you have few or no custom rules, use the standard Teamcenter 2412 rule tree and then manually add your custom rules.

  1. Create a backup of your existing rule tree using the Access Manager **Export** action.
  2. Identify your custom rules in order to add them after upgrade.
  3. Upgrade your Teamcenter configuration to Teamcenter 2412. During Teamcenter upgrade, TEM automatically imports your legacy rule tree to Teamcenter 2412.
  4. Import the standard Teamcenter 2412 rule tree using the **am_install_tree** utility. Use the **mode=replace_all** argument to overwrite the legacy rule tree with the Teamcenter 2412 rule tree. The utility automatically creates ACLs and privileges during import.
  5. Manually add your custom rules into the rule tree in the appropriate locations.

The Access Manager supports localization. This includes locale-specific display names of access control list (ACL) objects, privilege names, and accessor type values such as group names and role names. This localization capability is provided using text server XML files. The rule tree import/export functionality supports XML format input files.

The **am_install_tree** utility supports both ASCII text format and XML format rule tree files. However, export in the Access Manager application generates the output file only in XML format. This allows exported ACL name translations to be migrated to other sites.

An XML Access Manager rule tree resembles the following example.

```
<?xml version="1.0" encoding="UTF-8"?>
<Tc_data_access_config>
  <privileges>
    <priv_name>READ</priv_name>
    <priv_name>WRITE</priv_name>
    <priv_name>COPY</priv_name>
    <priv_name>CHANGE</priv_name>
    <priv_name>DELETE</priv_name>
  </privileges>

  <named_acls>
    <named_acl>
      <acl_name>Working</acl_name>
      <acl_name language="fr_FR">working_fr</acl_name>
      <acl_name language="de_DE">working_de</acl_name>
      <acl_name language="jp_JP">working_jp</acl_name>
      <ace_entry>
     <accessor_type>group</accessor_type>
     <accessor>dba</accessor>
     <grant>
        <p>READ</p>
        <p>WRITE</p>
        <p>COPY</p>
     </grant>
     <revoke>
        <p>DELETE</p>
        <p>CHANGE</p>
         </revoke>
      </ace_entry>
      <ace_entry>
     <accessor_type>Owning Group</accessor_type>
     <accessor> </accessor>
     <grant>
        <p>READ</p>
        <p>WRITE</p>
        <p>COPY</p>
     </grant>
     <revoke>
        <p>DELETE</p>
        <p>CHANGE</p>
         </revoke>
       </ace_entry>
    </named_acl>
    <named_acl>
       <acl_name>In Project ACL</acl_name>
       <acl_name language="fr_FR">In Project ACL fr</acl_name>
       <acl_name language="de_DE">In Project ACL de</acl_name>
       <acl_name language="jp_JP">In Project ACL jp</acl_name>
       <ace_entry>
         <accessor_type>group</accessor_type>
         <accessor>dba</accessor>
```

Access Manager rule tree example (Continued)

```
      <grant>
         <p>READ</p>
         <p>WRITE</p>
         <p>COPY</p>
      </grant>
          <revoke>
         <p>DELETE</p>
         <p>CHANGE</p>
          </revoke>
        </ace_entry>
        <ace_entry>
          <accessor_type>Owning Group</accessor_type>
          <accessor> </accessor>
         <grant>
         <p>READ</p>
         <p>WRITE</p>
         <p>COPY</p>
      </grant>
         <revoke>
         <p>DELETE</p>
         <p>CHANGE</p>
          </revoke>
        </ace_entry>
    </named_acl>
  </named_acls>
<rule_tree>
    <tree_node>
       <rule_name>Has Class</rule_name>
       <rule_argument>POM_object</rule_argument>
       <acl_name></acl_name>
       <tree_node>
          <rule_name>Has Bypass</rule_name>
          <rule_argument>true</rule_argument>
          <acl_name>Bypass</acl_name>
       </tree_node>
       <tree_node>
          <rule_name>Has Status</rule_name>
          <rule_argument></rule_argument>
          <acl_name>Vault</acl_name>
       </tree_node>
       <tree_node>
          <rule_name>Has Class</rule_name>
          <rule_argument>POM_application_object</rule_argument>
          <acl_name>Working</acl_name>
          <tree_node>
             <rule_name>Has Class</rule_name>
            <rule_argument>Dataset</rule_argument>
         <acl_name>Dataset ACL</acl_name>
       </tree_node>
        </tree_node>
    </tree_node>
  </rule_tree>
</Tc_data_access_config>
```

Access Manager rule tree example

Maintain COTS scope rules

COTS scope rules (transfer modes, closure rules, filter rules, and so on) are maintained in XML files in the *TC_DATA* directory (for example, **defaultTransfermodes.xml**). The file is imported to Teamcenter using the **tcxml_import** command line utility during the database installation and upgrade.

The transfer mode **.xml** files are imported in overwrite mode as part of the upgrade. You need not manually import the files. To reload the latest changes from the **.xml** file, you can run the **tcxml_import** utility in overwrite mode to ensure that the updates to existing scope rules are also imported to the database. For example:

```
$TC_ROOT/bin/tcxml_import -u=user -p=password -g=group -file=$TC_DATA/
defaultTransfermodes.xml -scope_rules -scope_rules_mode=overwrite
```

Siemens Digital Industries Software recommends that you do not modify the COTS scope rules. If necessary, you can create a copy of the COTS rules and modify the copy as needed.

> Caution:
>
> All references to obsolete attributes and classes must be removed from custom closure rules or property sets. Additionally, remove any deprecated attributes and classes from custom closure rules or property sets.
>
> For information about deprecated and obsolete classes and attributes, see the latest Teamcenter **README** file in the **Downloads** area on Support Center.

Set the time zone

Some Teamcenter applications including Schedule Manager and Workflow utilize calendars. When creating new calendars, Teamcenter determines the default time zone as follows:

1. Teamcenter checks the **Time Zone** property on the default calendar. If this property is set, its value is used.

2. If that property is not set, Teamcenter checks the **SiteTimeZone** preference. If this preference is set, its value is used.

3. If neither of these are set, Teamcenter uses GMT as the time zone.

If Teamcenter is using GMT and that is not the correct time zone for your site, you may encounter unexpected behavior. Therefore, Siemens Digital Industries Software recommends that you set both the **Time Zone** property on the default calendar using the Organization application and the **SiteTimeZone** preference.

Update Active Workspace components

Remerge Solr and Teamcenter schemas and update the index

After moving to the target Active Workspace and Teamcenter versions, the Teamcenter and Solr schemas are not synchronized. You can merge the schemas and then choose the method for updating the index. You must determine if you need a full index or delta reindex of your data before planning your index update.

Evaluate the delta of object data changes

If your indexing changes are additions, modifications, and deletions for types and properties, you can perform a delta indexing update rather than a complete reindex.

1. Merge the Teamcenter and Solr schemas.

2. Stop synchronization by the indexer if it's running.

   ```
   runTcFTSIndexer -stop
   ```

3. Determine the scope of the changes between the last indexing schema and the current schema.

   Run the **awindexerutil** utility using **-delta -dryrun** to get a report of the expected delta of changes. For example:

   ```
   awindexerutil -u=adminuser -p=password -g=group -delta -dryrun
   ```

   The differences are output to the command window as well as to a log file.

4. After you evaluate the report, determine whether you want to use the delta of changes for reindexing. If so, run **awindexerutil** to index the changes from the report:

   ```
   awindexerutil u=adminuser -p=password -g=group -delta
   ```

5. Test indexer connectivity by running the indexer test flow.

   ```
   runTcFTSIndexer -task=objdata:test
   ```

6. Restart the synchronization flow using the **runTcFTSIndexer** utility:

   ```
   runTcFTSIndexer -task=objdata:sync -interval=seconds
   ```

Reindex your data if needed

Your index may have a high number of changes or other kinds of changes that are outside the scope of delta changes. If that is the case, reindex your data instead:

1. Merge the Teamcenter and Solr schemas.

2. Test indexer connectivity by running the indexer test flow.

```
runTcFTSIndexer -task=objdata:test
```

3. Reindex the data.

Additional Active Workspace postupdate steps

Import table column configuration

If you have configured any custom table columns other than those available by default, perform the following after upgrading or patching:

1. Update the custom column information in the **Awb0ContentTableUiConfigCots.xml** file.

2. Run the **import_uiconfig** utility to import the column configuration.

Reindex classification data

If you are new to classification and want to search for classification data in Active Workspace using classification standard taxonomy, your first step is to create a classification hierarchy.

If you already use traditional classification and want to search for classification data in Active Workspace or Teamcenter Manufacturing Access, perform the following steps:

1. Create search index views and specify facetable properties.

2. Update and merge the schema file.

3. Index or reindex your data. If your data is already indexed, it is sufficient to index only the modified classification data.

These steps are described in *Advanced Classification — Deployment and Administration*

Set up a custom template after patching

If you have a custom template that is dependent on the Active Workspace template (**aws2**) and other Active Workspace templates, you must follow a special procedure to set up this template after patching Active Workspace.

1. Add the Active Workspace template (**aws2**) any other needed Active Workspace templates to the Business Modeler IDE by selecting **Add/Update Templates for working within the Business Modeler IDE Client** in the **Feature Maintenance** panel of Teamcenter Environment Manager (TEM).

2. Run TEM and re-patch Active Workspace.

   This copies the required Business Modeler IDE *.jar* files for Active Workspace into the installation.

3. In the Business Modeler IDE, import your custom template. To add the Active Workspace template (**aws2**) and the other dependent Active Workspace templates:

   a. Right-click your custom template project and choose **Properties**.

   b. In the left pane, choose **Teamcenter→BMIDE**.

   c. In the **Dependent Templates** pane, select the **aws2** template and the other Active Workspace templates previously added using the **Add/Update Templates for working within the Business Modeler IDE Client** option in TEM.

   d. Click **OK**.

      The template is now ready to be deployed.

Restart Teamcenter Process Manager

After completing updates to Active Workspace, ensure the updates made to the Teamcenter GraphQL Service take effect:

1. Stop the Teamcenter Process Manager service in the **Services** dialog of the Windows Control Panel.

2. Wait for all affected processes to stop, at least 15 seconds.

3. Restart the Teamcenter Process Manager service.

Some Active Workspace features such as Discussions (Active Collaboration) and Reports rely on updates to the Teamcenter GraphQL Service in order to function properly. This restart process ensures the updates are implemented for those features.

Publishing changes to the Active Workspace file repository

After patching, upgrading, or adding features to the Active Workspace client, publish changes to the Active Workspace file repository.

1. Start TEM on the Active Workspace Gateway host.

2. In the **Maintenance** panel, select **Configuration Manager**.

3. In the **Configuration Maintenance** panel, select **Perform maintenance on an existing configuration**.

4. In the **Old Configuration** panel, select the configuration.

5. In the **Feature Maintenance** panel, select **Update Active Workspace client settings**.

6. In the **Active Workspace Client Settings** panel, type the URL to the Active Workspace Gateway and enable publishing of client content to the Gateway.

Value	Description
Publish to Gateway	Select this check box to enable automatic publishing of Active Workspace content to the Gateway.
Gateway URL	Type the URL to Active Workspace Gateway: **http://***host***:***port* Replace *host* with the host on which you installed the Gateway. Replace *port* with the port used by the Gateway. The default port is **3000**.

7. In the **Confirmation** panel, click **Start**.

8. When the installation is complete, close TEM.

Additional postupgrade steps

- **Transfer access rules for Classification Admin objects**

  If you created classification access rules for admin objects that resided in the **Has Class(POM_object)** area, you must move these rules manually to the **Has Application(Any)** area of the rule tree after upgrade.

  In current versions of Teamcenter, access to classification administrative objects is restricted to dba users, but you can grant other users access to classification objects by creating a rule for each of these users or groups of users in the **Has Application(Any)** group in the rule tree.

- **Add new Classification units**

  When you upgrade Teamcenter, new Classification units are not added because they may conflict with other units created by Teamcenter administrators. Update unit definitions manually as described in *Basic Classification —Deployment and Administration*.

- **Set variant rule preference**

  If you already use classic variants, you can use your existing variability data with the Product Configurator. You can now use variant rules to store variant configuration criteria and optional

validation records. They are attached to the product item revision or the application model (collaborative design) by GRM relationships.

Variant rules perform the same function as stored option sets (SOSs), which will be deprecated in a future version. Siemens Digital Industries Software encourages customers who use classic variants to transition to variant rules by setting the **DisableSaveSos** preference to **TRUE**. This setting prevents users from saving SOSs, thereby forcing them to create variant rules.

Existing modular variant customers should not change the default preference setting of **false**.

- **Transfer HTTPS certificates**

  If you use HTTPS transports, you must transfer all the HTTPS certificate information to the upgraded Teamcenter installation.

Part III: Deploy the Teamcenter upgrade

After you successfully upgrade a test environment, deploy the upgrade to your production system by upgrading your volume servers and production environment.

8. Upgrade volume servers

If you have volume servers (Teamcenter configurations that contain an FSC separate from the corporate server), you must upgrade those configurations *before* you upgrade the corporate server.

This is because Teamcenter utilities that run during the corporate server upgrade are not compatible with FSCs from other Teamcenter versions. The installation tools upgrade the FSC in the corporate server configuration during upgrade of the corporate server.

9. Upgrade the production environment

Upgrade your production environment using TEM.

> Caution:
>
> Make sure you **back up your Teamcenter data** before you update your production environment.

Upgrade the production environment

1. Open TEM in the new version and upgrade the production database.

   During the upgrade, TEM automatically installs the dependent templates from the new version.

2. When TEM prompts for the custom template, click the **Browse** button and navigate to the newly packaged template and libraries.

How to upgrade servers in parallel

When upgrading additional Teamcenter servers, you do not need to wait for an upgrade on one server to complete before you begin upgrading the next server. Allow the upgrade of the corporate server to complete, then you can upgrade the remaining servers concurrently, in parallel.

When you upgrade your first server, TEM uploads a dataset to the volume that contains key items from the *TC_DATA* directory. This provides necessary information for upgrading additional servers. TEM references this dataset during subsequent upgrade operations, instead of needing an exclusive lock on the Teamcenter database. This allows you to initiate upgrade operations on your remaining servers at the same time, in parallel. This saves a significant amount of time when upgrading environments with multiple servers.

Part IV: Maintain Teamcenter between upgrades

If you use Deployment Center, apply patches to your environment as described in *Deployment Center — Usage*.

If you maintain your environment using Teamcenter Environment Manager (TEM), you apply software patches to your environment using the Updates Manager, an option in TEM when run in maintenance mode.

Patches to the Teamcenter Java EE web tier you install using the Web Application Manager.

Teamcenter updates (minor releases and patches) are posted for download on Support Center when available:

https://support.sw.siemens.com

10. Installing Teamcenter patches

Distribution of Teamcenter updates

Teamcenter updates are delivered in patches and in minor releases. Patches to Teamcenter servers and two-tier rich clients are applied using the Updates Manager in Teamcenter Environment Manager (TEM). Patches to the Java EE web tier are applied using the Web Application Manager.

Teamcenter patches are named using the following convention:

- *product-level_number_platform*.**zip**

  Contains the server, TEM rich client, and web tier patches

- *product-level_number*_**PV_all.zip**

  Contains the Teamcenter Visualization patches

- *product-level_number*_**install.zip**

  Contains the TEM updates

Downloading Teamcenter patches

1. Locate the patches you want to apply in software downloads area on Support Center.

2. Download the patch files to a temporary location on your host.

   Make sure you download the appropriate patch file for your platform.

Before you apply downloaded Teamcenter patches to your server, you must do the following:

- Install the base Teamcenter release.

- Stop all Teamcenter related processes and services (such as FSC, database daemons, and others).

TEM does not allow you to install patches for a version of Teamcenter that is earlier than your current installation. For example, you cannot apply a Teamcenter 12.3 patch to a Teamcenter 2412 installation.

Patch Teamcenter Environment Manager

If the patch you downloaded has a corresponding installer patch file (*patch-id*_**install.zip**), download this installer patch and update Teamcenter Environment Manager (TEM) to the latest version using the following steps.

If *no* corresponding installer patch is posted on Support Center, use the existing TEM in your **install** directory under *TC_ROOT* and skip the following steps.

1. Copy the *patch-id*_**install.zip** file to your **install** directory under *TC_ROOT*.

2. Open a command prompt.

3. Change to the **install** directory under *TC_ROOT*.

4. Enter the following command to expand the *patch-id*_**install.zip** file, overwriting existing files:

   ```
   7za x patch-id_install.zip -aoa -bb2 -bd
   ```

   If errors occur while expanding the file, do one of the following tasks:

   - Add the path to your *TC_ROOT***install\install** directory (on Windows systems) or *TC_ROOT*/**install/install** directory (on Linux systems) to your **PATH** environment variable and enter the **7za** command again.

   - Enter the **7za** command with the full path to your *TC_ROOT***install\install** directory (on Windows systems) or *TC_ROOT*/**install/install** directory (on Linux systems). For example:

     Windows systems:

     ```
     TC_ROOT\install\install\7za x patch-id_install.zip -aoa -bb2 -bd
     ```

     Linux systems:

     ```
     TC_ROOT/install/install/7za x patch-id_install.zip -aoa -bb2 -bd
     ```

5. On Linux systems, add execute permissions back to the **tem.sh** shell script with the following command:

   ```
   chmod 755 tem.sh
   ```

Migrate trace links

Beginning with Teamcenter 10.1.2.*x* patches, trace links are created on revisions of the absolute occurrence objects. In earlier versions of Teamcenter, trace links are created on absolute occurrence objects.

If your database contains trace links on absolute occurrence objects, run the **req_migrate_bomview_tracelinks** utility before you patch the corporate server. This utility migrates trace links on absolute occurrence objects to create trace links on the latest revision of the absolute occurrence objects.

You must have modify privileges on all the existing trace links in the database to run the migration. If you do not have modify privileges on some of the trace links, those trace links are not migrated, and a message is written to the log file.

1. In the Teamcenter environment, open a Teamcenter command prompt.

2. Type the following command:

   ```
   req_migrate_bomview_tracelinks -u=Tc-admin-user -p=Tc-admin-password
   -g=dba
   ```

   The utility returns the number of trace links found in the database and lists each trace link as it is processed. The migration is complete when the command prompt is returned.

Install patches on a Teamcenter server

> Caution:
>
> If the patch contains an updated installer file (**install.zip**), **patch Teamcenter Environment Manager (TEM)** before you begin the following steps.

1. Expand the *product-level_number_platform*.**zip** file to a temporary location.

2. Shut down services:

   - **Windows systems:**

     If you use the .NET web tier, shut down Microsoft Internet Information Services (IIS) before you begin installing patches.

   - **Linux systems:**

     Stop all Teamcenter services except FMS services before you begin the update process.

3. Launch TEM:

   - **Windows systems:**

     Start→Programs→Teamcenter→Environment Manager

   - **Linux systems:**

     TC_ROOT/**install/tem.sh**

   If you **patched TEM**, make sure you launch the patched TEM.

4. In the **Maintenance** panel, select **Updates Manager** and click **Next**.

5. In the **Apply Updates** panel, enter the following values, and then click **Next**.

   a. **Update kit location**

      Enter the location of the patch files you expanded in step 1.

   b. **Backup directory**

      Enter the location in which you want to store backups of files replaced during the update process.

6. If the patch contains enhancements to features in your configuration, TEM displays the **Optional Configuration Enhancements** panel. Review the list of enhancements and decide whether to install the enhancements:

   a. Click **View Enhancement Info** for each feature to view information about the enhancements. Note each feature that has enhancements.

   b. If you want to install the optional feature enhancements, select **Yes**. Otherwise, select **No**.

   Warning:

   If you select **Yes**, features containing data model objects may be upgraded. That is, database model changes may occur. Siemens Digital Industries Software recommends you back up your database before continuing.

   If you select **No**, features containing data model objects are not updated. If you want to perform this update at a later time, you must repeat the patch installation procedures to reinstall the patch, and choose **Yes** to include the template update.

7. Click **Next**.

8. If any feature enhancements require the Teamcenter administrative user password, TEM displays the **Teamcenter Administrative User** panel. Type the user name and password, and then click **Next**.

9. In the **Confirmation** panel, click **Start** to begin patching the server.

   Make sure all Teamcenter clients and processes on the host are stopped before you continue. If Teamcenter services or processes are running, the update may fail because TEM cannot copy replacement files from the patch to the installed location. All users logged on to the environment are notified that it will not be available until the update process is complete.

   On Windows systems, TEM stops all Teamcenter services during the update process. If you use the .NET web tier, make sure IIS is stopped before you continue.

10. After the server is successfully patched, you must manually update your *TC_DATA* directories.

    a. Create backups of your current *TC_DATA* directories.

    b. Expand the *platform***tc\data.zip** file from the temporary location you created in step **1**.

    c. Copy the expanded contents of the **data.zip** file to your *TC_DATA* directories, overwriting existing files.

    d. Copy the **tc_profilevars.bat** file from the backup to the *TC_DATA* directory.

11. If you have a custom template project created in the Business Modeler IDE client, and you selected **Yes** to install enhancements in step **6**, upgrade your custom template project:

    a. Launch the Business Modeler IDE client.

    b. Open the custom project.

    c. Ensure the custom project loads successfully with no errors in the Business Modeler IDE console view.

    d. Analyze and fix any errors.

    e. If you made any additional changes to the custom template to fix loading errors, package your custom template.

    f. Update the *updated-feature* template in the Teamcenter corporate server database:

        A. Launch TEM in maintenance mode.

        B. Select the configuration that contains the updated feature.

        C. Select **Update database (Full Model - System downtime required)**.

            TEM displays all templates installed in your database.

        D. Browse to the location of your custom template package file and select the feature file for the updated template (for example, **feature_custom.xml**).

        E. Confirm your selections, and then click **Start**.

            TEM updates the database.

12. Perform any additional steps in the patch **README** file to complete the patch.

13. Restart all Teamcenter-related processes and services (such FSC, database daemons, and so on).

14. Restart the Teamcenter server.

How to update servers in parallel while patching

When patching multiple Teamcenter servers, it is not necessary to wait for a patch operation on one server to complete before you begin patching the next server. Allow the patching of the corporate server to complete, then after this, you can patch the remaining servers concurrently, in parallel.

When you patch your first server, TEM uploads a dataset to the volume that contains key items from the TC_DATA directory. This provides necessary information for patching additional servers. TEM references this dataset during subsequent patching operations, instead of needing an exclusive lock on the Teamcenter database. This allows you to initiate patch operations on your remaining servers at the same time, in parallel. This saves a significant amount of time when updating deployments with multiple servers.

Copy SOA Policy Files

When patching is complete, copy the latest SOA policy files to your patched Teamcenter environment.

Structure Manager and other perspectives that manage structures may show performance degradation after patching, due to missing **BOMLine** properties from SOA policy files. Copying the latest SOA policy files helps prevent this performance degradation.

1. In the directory in which you expanded the patch **.zip** file, open the **tc** directory and locate the **data.zip** file.

2. Expand the **data.zip** file to a temporary directory.

3. Copy *all* files from the resulting **data\soa\policies** directory to the *TC_DATA***soa\policies** directory in your patched Teamcenter environment.

Patching the rich client

Patch the rich client using TEM

> Caution:
>
> If the patch contains an updated installer file (**install.zip**), **patch Teamcenter Environment Manager (TEM)** before you begin the following steps.

1. Expand the *product-level_number_platform*.**zip** file to a temporary location.

2. Shut down services:

   - **Windows systems:**

If you use the .NET web tier, shut down Microsoft Internet Information Services (IIS) before you begin installing patches.

- **Linux systems:**

  Stop all Teamcenter services except FMS services before you begin the update process.

3. Launch TEM:

   - **Windows systems:**

     Start→Programs→Teamcenter→Environment Manager

   - **Linux systems:**

     TC_ROOT/**install/tem.sh**

   If you **patched TEM**, make sure you launch the patched TEM.

4. In the **Maintenance** panel, select **Updates Manager** and click **Next**.

5. In the **Apply Updates** panel, enter the following values, and then click **Next**.

   a. **Update kit location**

      Enter the location of the patch files you expanded in step **1**.

   b. **Backup directory**

      Enter the location in which you want to store backups of files replaced during the update process.

6. If the patch contains enhancements to features in your configuration, TEM displays the **Optional Configuration Enhancements** panel. Review the list of enhancements and decide whether to install the enhancements:

   a. Click **View Enhancement Info** for each feature to view information about the enhancements. Note each feature that has enhancements.

   b. If you want to install the optional feature enhancements, select **Yes**. Otherwise, select **No**.

   Warning:

   If you select **Yes**, features containing data model objects may be upgraded. That is, database model changes may occur. Siemens Digital Industries Software recommends you back up your database before continuing.

If you select **No**, features containing data model objects are not updated. If you want to perform this update at a later time, you must repeat the patch installation procedures to reinstall the patch, and choose **Yes** to include the template update.

7. Click **Next**.

8. If any feature enhancements require the Teamcenter administrative user password, TEM displays the **Teamcenter Administrative User** panel. Type the user name and password, and then click **Next**.

9. In the **Confirmation** panel, click **Start** to begin patching the rich client.

   Make sure all Teamcenter clients and processes on the host are stopped before you continue. If Teamcenter services or processes are running, the update may fail because TEM cannot copy replacement files from the patch to the installed location. All users logged on to the environment are notified that it will not be available until the update process is complete.

   On Windows systems, TEM stops all Teamcenter services during the update process. If you use the .NET web tier, make sure IIS is stopped before you continue.

10. Perform any additional steps in the patch **README** file to complete the patch.

11. Restart all Teamcenter-related processes and services (such FSC, database daemons, and so on).

12. Restart the Teamcenter server.

Patch the rich client silently

Teamcenter Environment Manager allows you to install patches silently, with no prompts or user interface:

1. Patch Teamcenter Environment Manager.

2. Expand the *patch-id*.**zip** file to a directory on your local host.

3. Open a command prompt.

4. Change to the *TC_ROOT***install** directory (on Windows systems) or the *TC_ROOT*/**install** directory (on Linux systems).

5. Type the **tem.bat** command (Windows systems) or **tem.sh** command (Linux systems):

   `tem.`*bat*|*sh* `-patch="`*patch-location*`" -pass=`*password*`@`*configID*

Replace *patch-location* with the full path in which you expanded the *patch-id*.**zip** file. Replace *password* with the Teamcenter administrator password, and *configID* with the ID of the Teamcenter configuration you are patching.[1]

This procedure launches TEM and applies the patch with no user interaction required.

For more information about command line arguments for the **tem.bat/sh** utility, see the *Utilities Reference*.

Note:

If the path to the patch location contains spaces, you must enclose the path in quotation marks (**"**). For example:

Windows systems:

```
tem.bat -patch="..\Teamcenter patches"
```

Linux systems:

```
tem.sh -patch="/../Teamcenter patches"
```

Patch the web tier

1. Unzip the downloaded patch file (*product-level_number_platform*.**zip**) to a temporary location. This location is referenced in this procedure as *WEB_FILES_LOC*.

2. Change to the **Web_tier** directory under *WEB_FILES_LOC* and inspect its contents.

3. Locate your existing *WEB_ROOT* directory, which contains the Web Application Manager (**insweb**).

4. Update the Web Application Manager:

   a. Change to the **Web_tier** directory in the Teamcenter 2412 software kit.

   b. Expand the **INSTALL_TCWEB.EXE** file (on Windows systems) or **INSTALL_TCWEB.TZ** file (on UNIX systems) into your existing *WEB_ROOT* directory, overwriting existing files.

5. Open the *WEB_ROOT* directory and run the Web Application Manager (**insweb.bat** on Windows systems or **insweb** on Linux systems).

6. Click **Copy ICDs**.

7. Browse to the **icd** directory and then click **OK**:

1 You create the configuration ID when you create the Teamcenter configuration in TEM.

Windows systems:

*WEB_FILES_LOC***Web_tier\icd**

Linux systems:

*WEB_FILES_LOC***Web_tier\icd**

8. Select the web application in the list corresponding to your web tier installation and click **Modify**.

9. In the **Modify Web Application** dialog box, click **Modify Disk Locations**.

10. In the **Modify Disk Locations** dialog box, click the **Add** button to add the *WEB_FILES_LOC***Web_tier** directory to the **Disk Locations for Install Images** list.

11. In the **Modify Disk Locations** dialog box, click **OK**.

12. In the **Modify Web Application** dialog box, click **Reinstall Solutions**.

13. In the confirmation dialog box, click **Yes** to confirm the changes to the disk location list prior to opening to the **Reinstall Solutions** dialog box.

14. In the **Reinstall Solutions** dialog box, click **OK**.

15. If the **Modify Required Context Parameters** dialog box appears, type the appropriate values for any required context parameters and click **OK**.

16. The Web Application Manager regenerates the web tier web application with the patched files. Make sure a deployable file (WAR) is generated during this process. If it is not, click **Generate Deployable File** in the **Modify Web Application** dialog box.

17. After the deployable file is generated, go to the web tier web application's staging directory and find the deployable file (WAR) under the deployment directory.

18. Take the new deployable file and deploy it to your web application server, replacing the previous deployment. The new deployable file contains the web tier patches.

Review the README file

In the patch download location on Support Center, locate the **Tc2412.0_patch_***patch-number***_README.pdf** file, which contains information about the patch. Review this document for details relevant to your environment, and identify any possible additional steps required to complete the patch installation.

Part V: Appendices

Supplemental procedures and references for upgrading Teamcenter and Active Workspace.

11. Troubleshooting

Using the upgrade log viewer

At the end of the upgrade process, the **Upgrade Features** panel in TEM displays the results of each step in the upgrade process. Clicking the **Navigate Logs** button in this panel opens the upgrade log viewer.

The upgrade log viewer is a dynamic interface that includes:

- Results of each step in the upgrade process.
- Links to log files for each step.
- Detailed contents of log files.

Use the upgrade log viewer to diagnose and address upgrade failures:

1. In the **Pre-Upgrade** and **Upgrade** sections in the top pane, find the description of a step that failed during the upgrade process.

2. In the **Navigate Logs** pane, locate the step in the list, with the names of the logs generated by that step.

3. Click a link to one of the logs.

   The upgrade log viewer displays the contents of the selected log in the **Log Details** pane.

4. Review the log contents to find details about the step that failed and the steps that preceded it.

Finding help for resolving upgrade failures

Depending on the type of error, the log file contents may provide sufficient information to help you resolve the problem, or direct you to other Teamcenter documentation for help. For further help, see the following resources:

- **Teamcenter Upgrade Guide**

  Contains troubleshooting information in *Troubleshooting Teamcenter upgrade*.

- **Support Center**

  Provides support resources for all Siemens Digital Industries Software products.

  Submit information from the upgrade log viewer about specific upgrade failures to Siemens Digital Industries Software support on Support Center:

  https://support.sw.siemens.com

- **Packaged upgrade logs**

  Contains all logs generated during the upgrade process.

  When an upgrade fails, TEM automatically packages the upgrade logs into a ZIP archive you can submit to Siemens Digital Industries Software support for review and analysis. The archived upgrade logs are in the following location:

  Windows systems:

  *TC_ROOT***install\upgrade_logs\install_upgrade_logs_***package-ID**.zip

  Linux systems:

  TC_ROOT/**install/upgrade_logs/install_upgrade_logs_***package-ID*.zip

Note:

To access the upgrade log viewer outside TEM, open the following location in a Web browser:

Windows systems:

*TC_ROOT***install\upgrade_display_results.html**

Linux systems:

TC_ROOT/**install/upgrade_display_results.html**

Troubleshooting Microsoft SQL Server

Microsoft SQL Server 2014 performance is poor

If you migrate a database application to Microsoft SQL Server 2014 from a previous version, the database server may consume excessive CPU resources and cause poor performance.

To correct this problem, change the SQL Server 2014 Compatibility Level setting from SQL Server 2014 (**120**) to SQL Server 2012 (**110**).

For more information about this issue, see the following Microsoft support article:

https://msdn.microsoft.com

Teamcenter update fails with ODBC error

When upgrading a Microsoft SQL Server server, an error similar to the following can occur:

```
++++++++++++++++++++++++++++++++++
ODBC error. SQLSTATE: 42000 Native error: 5074
Message: [Microsoft][ODBC SQL Server Driver][SQL Server]The column '***'
is
dependent on column '***'.
ODBC error. SQLSTATE: 42000 Native error: 4922
Message: [Microsoft][ODBC SQL Server Driver][SQL Server]ALTER TABLE
ALTER COLUMN
<name> failed because one or more objects access this column.
++++++++++++++++++++++++++++++++++
```

This error occurs when the upgrade process attempts to modify a column that has a dependent column with an index. Microsoft SQL Server does not allow changes to columns with indexes. Also, local DBA indexes may exist that don't match the standard OOTB template for indexes, so it was not anticipated.

This problem can happen because columns that have manually-created statistics attached cannot have their properties modified without first dropping the statistics object. This to ensure the statistics object accurately reflects the content of the column. Manual creation of statistics objects is important to ensuring query performance if you set `AUTO_CREATE_STATISTICS = OFF`.

An auto-created statistics object does not prevent a modify action to a column because auto-created statistics objects can be removed automatically. But, if the system encounters a manually-created statistics object, it cannot be removed automatically, and may result in an access error.

To resolve this problem, perform the following steps:

1. Delete the index ***.
2. Delete the dependent column ***.
3. Continue the upgrade.
4. Run the **index_verifier** utility to re-create standard OOTB indexes:

   ```
   index_verifier -u=tc-admin -p= -g=dba -o=DO_IT
   ```

   Replace *tc-admin* with the Teamcenter administrative user.

Troubleshooting Teamcenter upgrade

Possible solutions to upgrade issues

Locate possible solutions to problems you may encounter during Teamcenter upgrade.

Problem	Possible cause	Solution
Errors when uploading or downloading files	**FMS_HOME** environment variable does not point to the location of the File Management System (FMS) client executables Incomplete installation of FMS client cache executables	Uninstall the rich client as described in the appropriate client installation instructions (for Windows or Linux). Then reinstall the rich client. Caution: Always uninstall a rich client using this procedure before installing a new rich client.
	Incompatible configurations of FMS	If two rich clients are installed on the workstation, report the errors to the Teamcenter administrator. When two rich clients are installed on the same workstation, FMS uses the **FMS_HOME** value set during the first installation. The configuration of the file client cache (FCC) to a file server cache (FSC) must support both deployments, especially if the second deployment is to a different database.
Teamcenter displays an error message when you attempt to access Teamcenter online help	The Teamcenter administrator did not include online help when configuring your rich client	Contact the Teamcenter administrator.
Unable to view or to search Teamcenter online help	The Web browser you are using does not meet requirements to view and search Teamcenter online help	Make sure you are using a Siemens Digital Industries Software-supported Web browser. For information about supported Web browsers, see the Siemens Digital Industries Software Certification Database.
Teamcenter upgrade fails with custom types	A custom data type has the same name as the parent class.	If you have a custom type name with the same name as the parent class, the custom type is identified and added to the custom templates, but the upgrade fails. For example, you have a custom **storage_media** type that belongs to the **storage_media** class. Before upgrading Teamcenter, rename the custom type name to anything other than the parent class. For example, rename the **storage_media** type to **storage_media_custom** before you upgrade.

Teamcenter upgrade fails with large database issues	The database is not sized properly.	If your upgrade changes or deletes a large number of records, it can fail if the database is not sized properly. Oracle displays an error similar to the following:
		
		`ORA-01652: unable to extend temp segment by 128 in tablespace TEMP`
		
		The following upgrade examples can lead to this error:
		
		`install -mod_attr tc-admin ${TC_USER_PASSWD} dba POM_application_object owning_user POM_attr_no_pom_backpointer +`

Problem	Possible cause	Solution

```
install -mod_attr tc-admin $
{TC_USER_PASSWD}
    dba POM_application_object
last_mod_user
    POM_attr_no_pom_backpointer +
```

Replace *tc-admin* with the Teamcenter administrative user.

These commands update many rows in the **pom_backpointer** table. The number of rows updated is approximately three times the size of the **ppom_application_object** table. You can determine the table size with the following SQL command:

```
SELECT COUNT(puid) FROM
ppom_application_object;
```

To resolve this issue, you must have a large undo or rollback tablespace and a large **TEMP** tablespace. Increase the size of both the **TEMP** and undo tablespaces to at least 5 GB each.

1. Use the following SQL command to determine where the data files reside:

```
SELECT tablespace_name,file_name
FROM dba_data_files;
```

   The results may resemble the following:

TABLESPACE-_NAME	FILE_NAME
SYSTEM	D:\ORACLE\ORADATA\SYSTEM01.DBF
UNDOTBS1	D:\ORACLE\ORADATA\UNDOTBS01.DBF
SYSAUX	D:\ORACLE\ORADATA\SYSAUX01.DBF
IDATA	D:\ORACLE\ORADATA\IDATA01.DBF
ILOG	D:\ORACLE\ORADATA\ILOG01.DBF
INDX	D:\ORACLE\ORADATA\INDX01.DBF

   In this case, all data files are located in the **D:\ORACLE\ORADATA** directory.

2. Add a data file to the **TEMP** tablespace:

Problem	Possible cause	Solution

```
ALTER TABLESPACE TEMP ADD tempfile
  D:\ORACLE\ORADATA\temp2.dbf' size
5000M;
```

3. Add a data file to the undo tablespace:

```
ALTER TABLESPACE UNDOTBS01 ADD
datafile
'D:\ORACLE\ORADATA\' undotbs2.dbf
size 5000M;
```

To help ensure the upgrade is successful, make sure the redo logs are sized properly (100M each) and reside on a separate disk from the data. If necessary, resize the redo logs.

1. Set the **ORACLE_SID** environment variable.

2. Log on to Oracle:

   ```
   sqlplus /nolog
   connect system/password as
   sysdba;
   ```

3. Find the list of the redo log groups and see where the files reside.

   ```
   SELECT
   GROUP#,TYPE,STATUS,MEMBER
   FROM V$LOGFILE;
   ```

   The results may look like this:

```
3 ONLINE  STALE
E:\ORACLE\ORADATA\DPVPERF\REDO03.LOG
2 ONLINE
E:\ORACLE\ORADATA\DPVPERF\REDO02.LOG
1 ONLINE  STALE
E:\ORACLE\ORADATA\DPVPERF\REDO01.LOG
```

4. Create the new redo logs as follows. You can change the drive where you can create these, but redo logs should reside on a separate disk from the data.

   ```
   ALTER DATABASE ADD LOGFILE
   GROUP 4

   ('E:\ORACLE\ORADATA\DPVPERF\
      REDO04.LOG') SIZE 100M;
   ```

Problem	Possible cause	Solution
		ALTER DATABASE ADD LOGFILE GROUP 5 ('E:\ORACLE\ORADATA\DPVPERF\REDO05.LOG') SIZE 100M; ALTER DATABASE ADD LOGFILE GROUP 6 ('E:\ORACLE\ORADATA\DPVPERF\REDO06.LOG') SIZE 100M; 5. Run the following command to force the log switch: ALTER SYSTEM SWITCH LOGFILE; 6. (Optional) Drop redo log groups 1, 2, and 3: ALTER DATABASE DROP LOGFILE GROUP 1; ALTER DATABASE DROP LOGFILE GROUP 2; ALTER DATABASE DROP LOGFILE GROUP 3; Note: If the group number is the current group and you cannot drop it, run the command to force the log switch to make group 4, 5, or 6 current.
Rich client startup performance is slow	Wait time for hierarchy tree checked-out icon display.	Set the **TC_show_checkedout_icon** preference to **FALSE**. Note: Users and administrators can set the **TC_show_checkedout_icon** preference to **TRUE** to enhance usability or to **FALSE** to enhance rich client startup performance. For more information, see the *Teamcenter Environment Variables*.

Resolving FSC master diagnostic failure

This FSC master diagnostic test performed during upgrade checks the FMS server cache (FSC) to determine whether the FSC was promoted to a master FSC or demoted to a nonmaster FSC without the Teamcenter configuration being updated in Teamcenter Environment Manager (TEM).

For example, if your FSC was promoted to master, the **configuration.xml** and FMS master files may not be synchronized. To continue with the current upgrade, you must correct this discrepancy.

If you manually promoted an FMS server cache (FSC) to a master FSC, you must update the **configuration.xml** file:

1. In the *Teamcenter-kit***install****modules****feature_fsc.xml** file, locate the **<componentmap>** node, and then note the GUID value for **FSCMasterSettings**:

   ```
   <componentmap>
            ...
   <component tag="FSCServiceNonMasterSettings"
   guid="NVPX362MLFVJ76QGOFQIE6TYL6H9CMY9"

   classname="com.teamcenter.install.tceng.fms.fsc.dc.FscServiceNonMasterCo
   mp"/>
   <component tag="FSCMasterSettings" guid="DY7K9ORHEQBGYWZ5ECDNK8VSERTA7R5T"

   classname="com.teamcenter.install.tceng.fms.fsc.dc.FscMasterComp"/>
            ...
   </componentmap>
   ```

2. Open the **configuration.xml** file.

3. In the **<data>** section of the file, add the following:

   ```
   <FSCMasterSettings guid="guid-value">
        <masterModel value="Simple Model" />
   </FSCMasterSettings>
   ```

   Replace *guid-value* with the **FSCMasterSettings** GUID value from the **feature_fsc.xml** file.

   The actual value of the **<masterModel>** setting does not matter; the presence of the **<FSCMasterSettings>** node causes TEM to detect an FSC master.

If you manually demoted an FSC to a nonmaster, you must perform the following steps:

1. In the *Teamcenter-kit***install****modules****feature_fsc.xml** file, locate the **<componentmap>** node, and then note the GUID value for **FSCNonMasterSettings**:

   ```
   <componentmap>
            ...
   <component tag="FSCServiceNonMasterSettings"
   guid="NVPX362MLFVJ76QGOFQIE6TYL6H9CMY9"

   classname="com.teamcenter.install.tceng.fms.fsc.dc.FscServiceNonMasterCo
   mp"/>
   ```

```
<component tag="FSCMasterSettings"
guid="DY7K9ORHEQBGYWZ5ECDNK8VSERTA7R5T"

classname="com.teamcenter.install.tceng.fms.fsc.dc.FscMasterComp"/>
         ...
</componentmap>
```

2. Open the **configuration.xml** file.

3. In the **<data>** section of the file, remove the **<FSCMasterSettings>** section.

4. Add the following section:

   ```
   <FSCServiceNonMasterSettings guid="guid-value">
            <masterList value="http://fsc_parent_host:4544(0)" />
   </FSCServiceNonMasterSettings>
   ```

   Replace *guid-value* with the **FSCNonMasterSettings** GUID value from the **feature_fsc.xml** file.

   The **<masterList>** value must be the current FSC's parent FSC. The **(0)** at the end indicates it is a priority 0 connection.